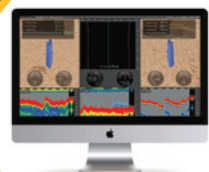


# M3 & M5 Systems User Guide



MARPORT



# Contents

<b>Legal.....</b>	<b>4</b>
History.....	4
Copyright.....	5
Disclaimer.....	5
<b>Introduction and Presentation.....</b>	<b>6</b>
Introduction.....	6
Safety Guidelines.....	7
Description.....	8
M3 System Overall Architecture.....	8
Equipment List.....	9
Technical Specifications.....	10
<b>Computer Configuration.....</b>	<b>11</b>
Adding a Virtual Keyboard.....	11
<b>Installation.....</b>	<b>13</b>
Installing the System.....	13
M3 Receiver Cabling.....	14
Mac Mini Cabling.....	15
Installing Hydrophones.....	16
List of Marport Hydrophones.....	16
Hydrophone Cabling.....	19
Passive Hydrophone.....	19
Passive Hydrophone + Wideband Preamplifier.....	20
Active Hydrophone.....	24
Active Wideband Hydrophone.....	25
Scanmar Hydrophone.....	30
Simrad PI Hydrophone.....	31
Simrad ITI Hydrophone.....	32
Furuno Passive Hydrophone.....	34
Passive Hydrophone from other brands + Wideband Preamplifier.....	35
Receiving Hydrophone Data on Two Systems.....	36
Connecting the Hydrophone to the Receiver.....	38
Understanding Receiver LEDs.....	38
Adding SC Sensor and SC Compatible Sensor to the Receiver.....	39
Adding the Sensor to the Receiver.....	39
Displaying Data on Scala.....	42
Installing ShipModul MiniPlex Multiplexer (Optional).....	45
Installing MPX-Config3.....	45
NMEA Multiplexer Cabling.....	46
Detecting the Multiplexer.....	48

Wired Ethernet Network.....	48
WiFi Connection / No Wired Ethernet Network.....	50
Multiplexer with Defined IP address.....	52
Multiplexer Not Detected.....	55
Configuring Inputs.....	55
Configuring Scala.....	58
<b>Servicing and Maintenance.....</b>	<b>60</b>
Interference Check.....	60
Spectrum Analyzer Display.....	60
Checking Noise Interference.....	60
Troubleshooting.....	62
Downloading a VMware Fusion license under version 10.....	62
Receiver page: hydrophone modules are disconnected / system not answering.....	63
Receiver page is empty.....	64
Receiver page: code 02 error message.....	65
Receiver page: hydrophones have bad streaming status.....	66
No Internet Access.....	67
VMware Fusion Pop-Up Message.....	68
Giving Remote Access to the Computer.....	69
Recording Audio Files.....	69
Support Contact.....	70
<b>Appendix.....</b>	<b>71</b>
Appendix A: Frequency Plan.....	71
Appendix B: Technical Drawings.....	76
Mac Mini Mounting Bracket Dimensions.....	76
Mx Receiver Dimensions.....	77
Hydrophone Junction Box Dimensions.....	78
Wideband Preamplifier Dimensions.....	79
Thru-Hull Penetration Dimensions.....	80
ShipModul MiniPlex NMEA Multiplexer Dimensions.....	81
<b>Index.....</b>	<b>82</b>



# Legal

## History

V1	05/10/17	First release
V2	07/12/17	<p>New topics:</p> <ul style="list-style-type: none"> <li>Additional hydrophone cabling procedures: <a href="#">Simrad PI Hydrophone</a> on page 31 and <a href="#">Furuno Passive Hydrophone</a> on page 34</li> </ul> <p>Improved topics:</p> <ul style="list-style-type: none"> <li><a href="#">Installing ShipModul MiniPlex Multiplexer (Optional)</a> on page 45: now includes cabling and detection procedures for different network setups.</li> <li><a href="#">Active Wideband Hydrophone</a> on page 25: now includes configurations for second generation of pre-amplifiers.</li> </ul> <p>Corrected topics:</p> <ul style="list-style-type: none"> <li><a href="#">Passive Hydrophone + Wideband Preamplifier</a> on page 20: configuration 3 was missing a strap to set a low gain.</li> </ul>
V3	03/09/18	<p>New topics:</p> <ul style="list-style-type: none"> <li>New active wideband hydrophones (NC-1-08) documented, see <a href="#">List of Marport Hydrophones</a> on page 16.</li> <li>Additional hydrophone cabling procedures: <a href="#">Simrad ITI Hydrophone</a> on page 32, <a href="#">Passive Hydrophone from other brands + Wideband Preamplifier</a> on page 35, <a href="#">Receiving Hydrophone Data on Two Systems</a> on page 36.</li> <li><a href="#">Adding SC Sensor and SC Compatible Sensor to the Receiver</a> on page 39</li> <li>Procedure to upgrade to M5: <a href="#">Upgrading from M3 to M5 System</a>.</li> </ul>

## Copyright

---

© 2016-2017 Marport. All Rights reserved.

No part of this document may be reproduced, stored in a retrieval system or transmitted in any form by any means; electronic, mechanical, photocopying or otherwise, without the express written permission from Marport. “Marport ”, the Marport logo and Software Defined Sonar are registered trademarks of Marport. All other brands, products and company names mentioned are the trademark and property of its respective owners only. Marport is a division of Airmar Technology Corporation.

## Disclaimer

---

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

**The present user guide is applicable for the following versions:**

U.S. Patent 9,091,790

# Introduction and Presentation

Read this section to get a basic knowledge of your M3 system.

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

## Introduction

---

Among Marport's receivers, the M3 is specifically designed for smaller vessels.

Marport M3 is designed as a highly sophisticated multi-function acoustic receiver. Although it is the most compact receiver from Marport, it uses leading edge digital signal processing that we have combined with the smartest software available. The aim is to make possible multi-channel operation without any compromise between transmission range and signal detection.

The M3 works with an Apple Mac Mini computer, that processes the data from the sensors and displays them on your screen.

The M3 has a full range of capabilities:


- You can listen to 3 hydrophones simultaneously. Only data coming from the hydrophone delivering the best signal are interpreted. As a result, you do not need an hydrophone selection switch, as often used in older types of receivers.
- You can have a simultaneous reception from up to 12 data (depth, pitch, roll...) from standard sensors (e.g. door spread, catch).
- You can combine standard sensors with 1 high-definition reception sensor (e.g. HDTE or NBTE sensor such as trawl explorer, catch explorer).
- You can configure your sensors to have a net monitoring configuration that suits your type of trawl's gear.
- There are 1 NMEA and 2 NTC entries to receive hydrophones' temperature data.

You can upgrade the M3 system to an M5 system to be able to add more standard (up to 100 PRP sensors) and high-definition sensors (up to 10).



## Safety Guidelines

---

 **Important:** To ensure proper and safe use of this equipment, carefully read and follow the instructions in this manual.

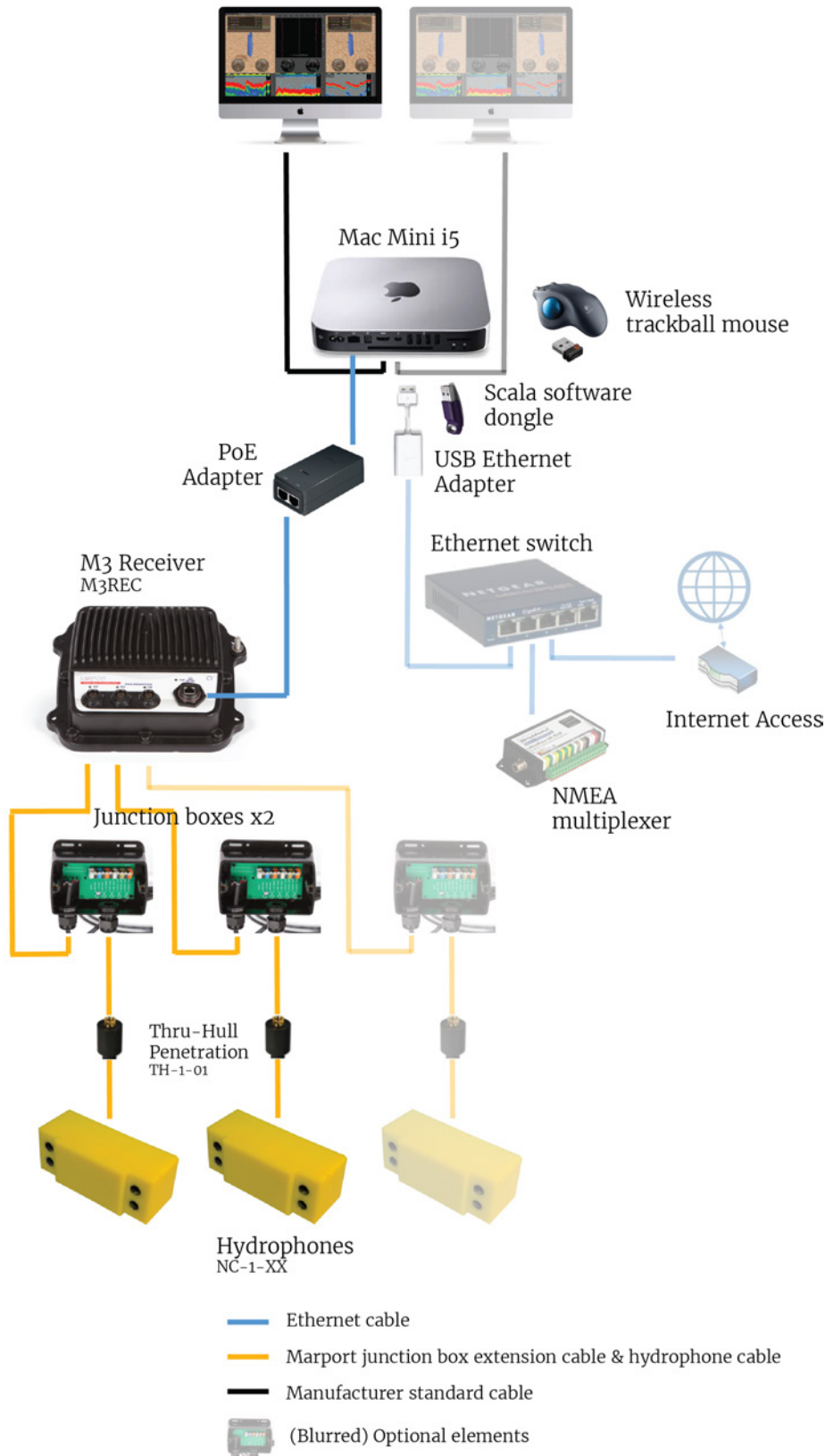
### Product installation and use

Install and use this product in accordance with this user manual. Incorrect use of the product may cause damage to the components or void the warranty.

Only qualified Marport dealers can do installation and maintenance interventions.

## Description

### M3 System Overall Architecture





## Equipment List

Below are the hardware and software required to install a M3 system. Box 1 and 2 contain the minimum hardware needed to install the system.

### Box 1: Receiver (M3REC)

- 1 M3 receiver
- 2 Mx hydrophone junction boxes
- 1 CAT5e network cable
- 1 Ethernet connector kit
- 1 M3 hardware kit (mounting screws and ground strap)

### Box 2: Computer (PC-0-03)

- 1 Mac mini i5 computer (2.6 GHz)
- 1 wireless trackball mouse
- 1 Mac mini power cord
- 2 Thunderbolt to HDMI/VGA/DVI adapters
- 1 USB Ethernet adapter
- 1 USB serial adapter
- 1 Ethernet cable for PoE adapter
- 1 Mac mini mount
- 1 hardware kit (mounting screws for Mac mini mount)
- 1 Scala software dongle

### Optional equipment (not included)

- 1 to 2 monitors
- 1 Uninterruptible Power Supply (UPS) to prevent problems if the mains power fails (recommended). Size: 500VA.
- 1 additional hydrophone junction box, for a third hydrophone.
- 1 test hydrophone that you can keep on board and connect to the receiver to do functional tests.
- 1 NMEA multiplexer to receive NMEA data and display them in Scala: ShipModul MiniPlex-3E-N2K if using NMEA2000 and NMEA0183 or Miniplex-3E if using only NMEA0183.
- 1 Ethernet switch, if you are connected to the internet and to an NMEA multiplexer.

## Software

Software Application Name	Definition
Marport validated MacOS	Operating system on computer
VMware Fusion	Virtual machine software, necessary to run processor virtual machine.
Scala	Marport software application collecting, processing, storing and displaying data received from sensors, sounders and other connected devices.
Scala Replay	Marport software application replaying data recorded in Scala.
Mosa	Marport software application used to configure sensors.
Marport Tools	Marport software application used to manage the receiver firmware.
Mozilla Firefox (from version 22 to 51)	Web browser
Java (version 7 or lower)	To correctly display system web page.
Filezilla	File management tool.
TeamViewer	To give remote access of your computer to support service
MPX-Config3	To configure the MiniPlex multiplexer (for NMEA data).

## Technical Specifications

Frequency range	30–60 kHz
Active bandwidth	24 kHz
Number of Rx/Tx channels	3
Hydrophones	3
Bearing to sensor measurement	Yes
Distance to sensor measurement	Yes
Number of simultaneous data reception	12
Number of high resolution sounders (NBTE, HDTE)	1
Temperature input	2 NTC + 1 NMEA
Network cables	CAT5e, 100 meters max., U/FTP shielding

# Computer Configuration

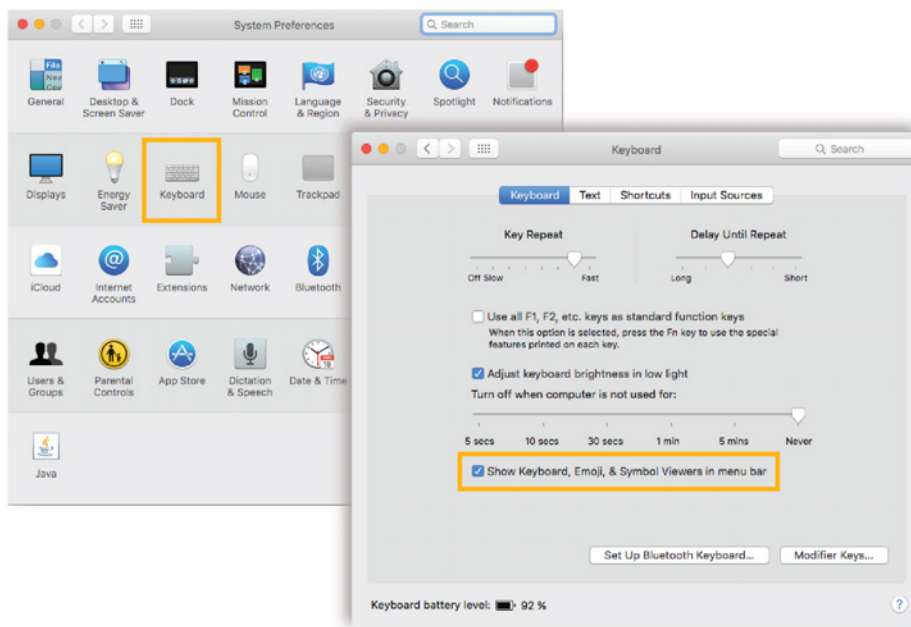
Read this section to learn how to configure the Mac computer.

## Adding a Virtual Keyboard

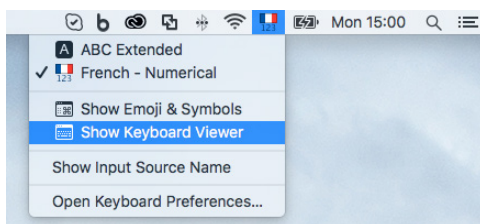
If you do not have a keyboard, you can add a virtual keyboard to the screen and type words using the mouse.

### Procedure

1. From the top left corner of the screen, click **Apple Menu**  > **System Preferences** > **Keyboard**.
2. Select **Show Keyboard, Emoji, & Symbol Viewers** in menu bar.

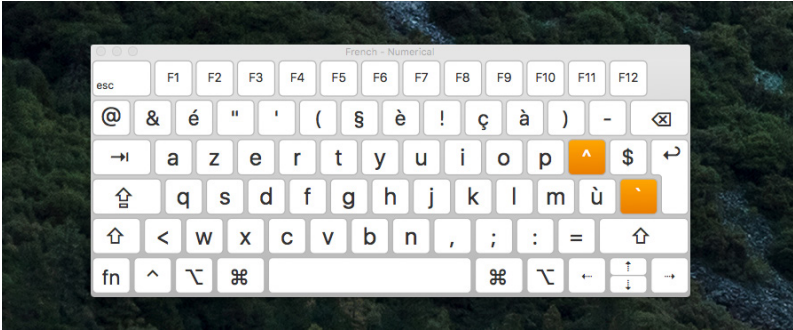


3. Close the window.
4. From the top right corner of the screen, click the little flag corresponding to the keyboard language preferences, then select **Show Keyboard Viewer**.



## Results

A virtual keyboard is displayed on the screen. You can change its size by dragging its corners.



# Installation


Read this section to learn how to connect and configure the equipment of the M3 system.

## Installing the System

---


Marport technicians or dealers need to connect the different components of the system.

### About this task

 **Note:** The system is installed by Marport or by a dealer. If there is a problem, you can read these installation steps to check the system installation.

### Procedure

1. Check that you have all the items needed for the installation (See [Equipment List](#) on page 9)
2. Install the hydrophones and their cables, or find the cables from hydrophones that have already been installed.
3. Route the hydrophone cables toward the junction boxes.
4. Put the receiver in a dry and clean area, as close as possible to the hydrophones. If the receiver is in a closed environment, make sure it is enough ventilated and that the ambient temperature does not exceed 55 °C (131 °F).
 

 **Note:** Make sure that the cables from the junction box are long enough to reach the receiver.
5. Put the Mac mini mounting bracket in a dry and ventilated area, without dust, in the wheelhouse.
6. From the mounting bracket:
  - a) Connect an Ethernet cable from the PoE (computer slot) to the Mac mini.
  - b) Connect an Ethernet cable from the PoE (OSU power slot) to the receiver.
  - c) Connect the power cable to a power supply or UPS if you have one (recommended).
7. Remove the lock screw from the Mac mini mounting bracket, and slide the Mac mini into it. Put the lock screw back and fasten it.
8. Install the monitor(s).
9. Install loudspeakers, if applicable.
10. You can switch on the computer.
11. Connect the hydrophone cables to the junction boxes according to [Hydrophone Cabling](#) on page 19 and connect the junction boxes to the hydrophone connectors on the receiver.
12. When adding sensors to the system, refer to the [Appendix A: Frequency Plan](#) on page 71 to help you allocating frequencies.




## M3 Receiver Cabling

Connect the M3 receiver according to the following cabling.

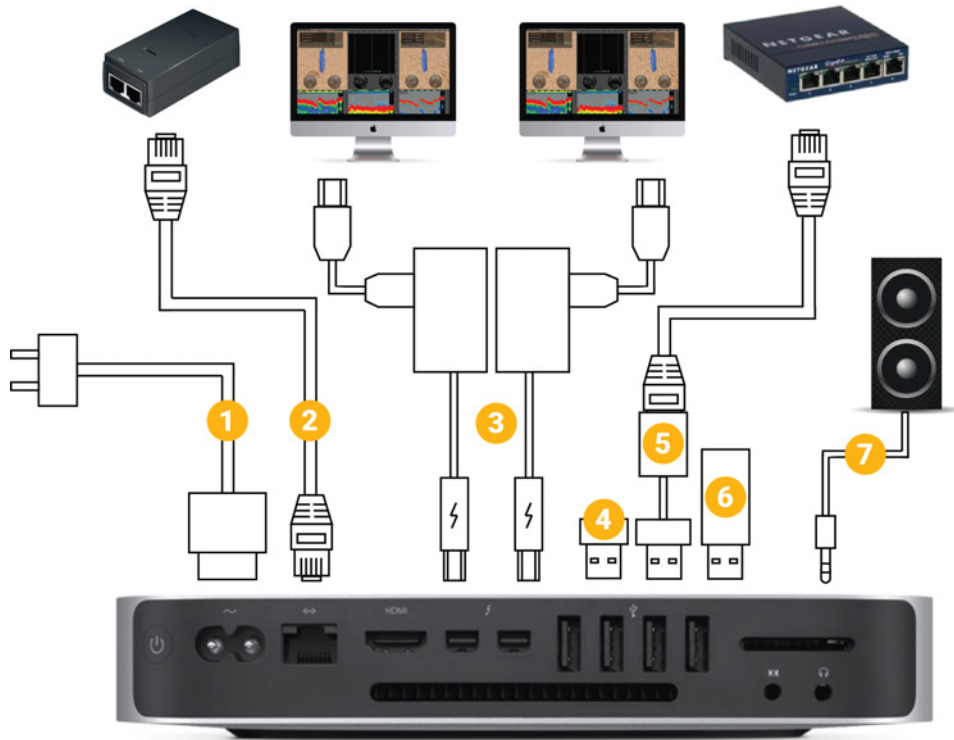


	Cable	Connected to
1	Marport junction box extension cable	Junction box
2	Ethernet cable	PoE injector in Mac mini mounting bracket (OSU power slot)
3	Ground strap	Grounded to the ship ground

**Important:** Do not press the button  on the receiver. It changes the IP address of the receiver and you will not receive data anymore.

## Mac Mini Cabling

Connect the Mac Mini according to the following cabling.



	Cable	Connected to
1	Power cable	100-240V AC power supply*
2	Ethernet cable	PoE injector in mounting bracket (computer slot)
3	Thunderbolt to HDMI/VGA/DVI adapters † + monitor cable	Monitor 1 and 2 (optional)
4	USB trackball transmitter	Wireless trackball mouse
5	USB to Ethernet adapter + Ethernet cable	Ethernet switch ‡
6	Scala software dongle	-
7	Audio cable	Loudspeakers

\* We recommend to use an Uninterruptible Power Supply (UPS) to prevent problems if the mains power fails.

† Or thunderbolt cable if monitor is compatible

‡ The Ethernet cable can be connected directly to an internet access if you have no NMEA multiplexer, or directly to the NMEA multiplexer if no internet access. Using an Ethernet switch is only useful if you need to connect to both the NMEA multiplexer and the internet.

## Installing Hydrophones

You need to connect hydrophones to the system.

### List of Marport Hydrophones

These are technical specifications for hydrophones currently sold by Marport. For information about obsolete hydrophones, please contact Marport support.

Product reference	Name	Use case	Bandwidth	Typical current consumption	Cable*
NC-1-05	Passive wideband hydrophone (no preamplifier)	<ul style="list-style-type: none"> <li>Vessel with very low level of noise (below -110 dBV).</li> <li>Sensors close to the vessel (approx. 300 m)</li> <li>For positioning systems with Slant Range/pinger (one passive hydrophone is necessary for transmission).</li> </ul>	33-60 KHz	0.0 mA	Blue
NC-1-05 + NC-2-02	Passive hydrophone + Wideband preamplifier box	<ul style="list-style-type: none"> <li>Vessel with normal level of noise (below -100 dBV).</li> <li>Large number of sensors.†</li> <li>Use at great depths (&gt; 500 m).</li> <li>Gain configurable (Low or High)</li> <li>Filters configurable (38 and/or 50kHz).</li> <li>Low noise environment between passive hydrophone and wideband preamplifier box</li> </ul>	33-60 KHz	25-29 mA	Blue

Product reference	Name	Use case	Bandwidth	Typical current consumption	Cable*
NC-1-04	Active hydrophone (integrated preamplifier)	<ul style="list-style-type: none"> <li>• Vessel with normal level of noise (below -80 dBV).</li> <li>• Limited number of sensors.†</li> <li>• No filtering options.</li> <li>• Not used for positioning system</li> </ul>	38-45 KHz	8-12 mA	Black
NC-1-07	Active hydrophone (integrated preamplifier)	<ul style="list-style-type: none"> <li>• Vessel with normal level of noise (below -100 dBV).</li> <li>• Limited number of sensors.†</li> <li>• No filtering options.</li> <li>• Not used for positioning system</li> </ul>	38-45 KHz	4-6 mA	Green
NC-1-06	Active wideband hydrophone (integrated preamplifier)	<ul style="list-style-type: none"> <li>• Vessel with normal level of noise (below -100 dBV).</li> <li>• Large number of sensors.†</li> <li>• Use at great depths (&gt; 500 m).</li> <li>• Gain configurable (Low or High)</li> <li>• Filters configurable (38 and/or 50kHz)</li> </ul>	30-60 KHz	25-29 mA	Yellow
NC-1-08	Active wideband hydrophone (integrated preamplifier)	<ul style="list-style-type: none"> <li>• Vessel with normal level of noise (below -100 dBV).</li> <li>• Large number of sensors.†</li> <li>• Use at great depths (&gt; 500 m).</li> <li>• Gain configurable (Low or High)</li> <li>• Filters configurable (38 and/or 50kHz)</li> </ul>	30-60 KHz	18-22 mA	Yellow

\*After NC-1-04, cables are colored according to the type of hydrophone: blue for passive, green for active narrowband and yellow for active wideband.

† Standard active hydrophones have an available bandwidth of 6kHz. So, if:  $(PRP\_number * 100) + (NBTE\_number * 800) < 6000$  you have enough place. If:  $(PRP\_number * 100) + (NBTE\_number * 800) > 6000$  then you need a wideband hydrophone.



## Hydrophone Cabling

You need to connect the hydrophone to a junction box.

The following cabling instructions are for hydrophones currently sold by Marport: NC-1-04, NC-1-05, NC-1-06, NC-1-07 and NC-1-08.

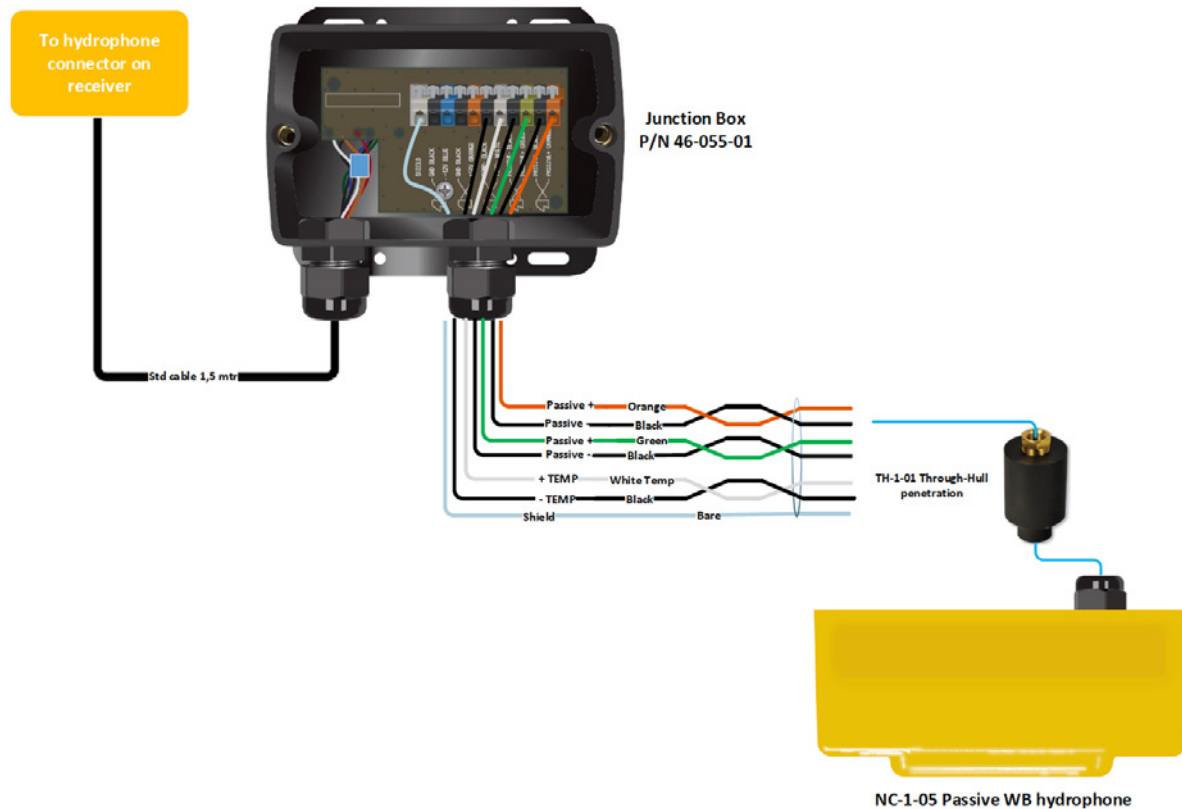
For information about obsolete hydrophones, please contact Marport support.

### Passive Hydrophone

We recommend the following wiring for the installation of the wideband passive hydrophone NC-1-05.

Beamwidth:

- $55^\circ \times 55^\circ$  : only connect cell with black + green wires
- $55^\circ \times 35^\circ$  : connect both cells



**Note:** To be able to receive temperature from Marport hydrophones, connect to the NTC hydrophone input H1 or H2.

## Passive Hydrophone + Wideband Preamplifier

We recommend the following wiring for the installation of a passive hydrophone NC-1-05 with a preamplifier NC-2-02.

### About


The main functions of a preamplifier are:


- Allow signal filtering at 38kHz: configurable on/off
- Allow signal filtering at 50kHz: configurable on/off
- Filter signal out of 30-60kHz range: fixed
- Amplify signal in the 30-60kHz range: configurable low / high

By default the hardware configuration is Gain High / Notch filter 38 kHz / Notch filter 50 kHz.

The notches are activated by two wire straps that come with the preamplifier.

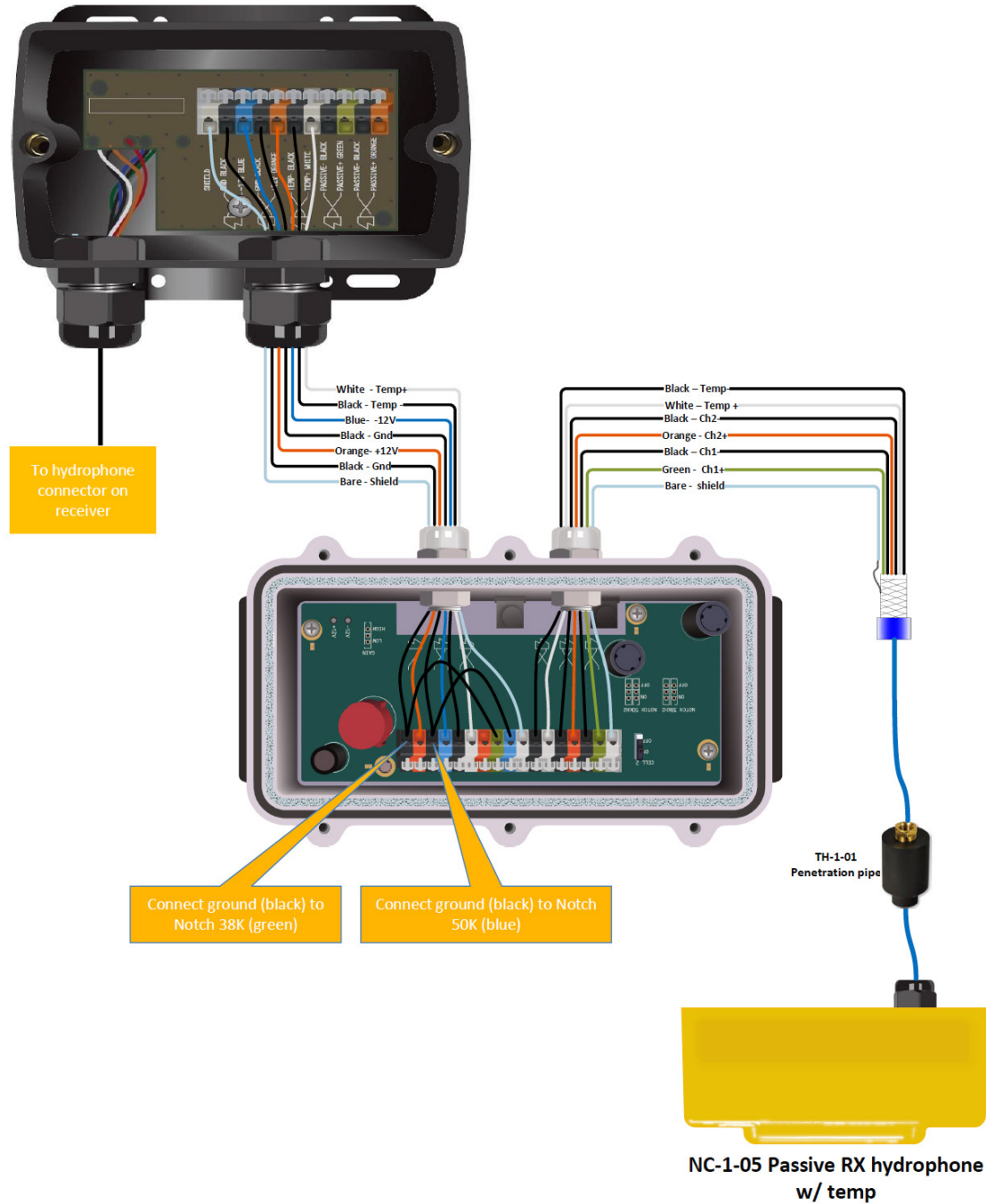
Preferably install the preamplifier as close as possible to the hydrophone and put the junction box as close as possible to the receiver.

 **Note:** On recent versions of the preamplifier (PCBA 25-992-01 rev 03 and above) high and low gains have been reduced so that the output signal level is 12dB lower than with the previous version. Gains are now respectively 40dB and 20dB. This improves performance by reducing saturation with strong signals, especially in shallow waters.

 **Note:** To be able to receive temperature from Marport hydrophones, connect to the NTC hydrophone input H1 or H2.

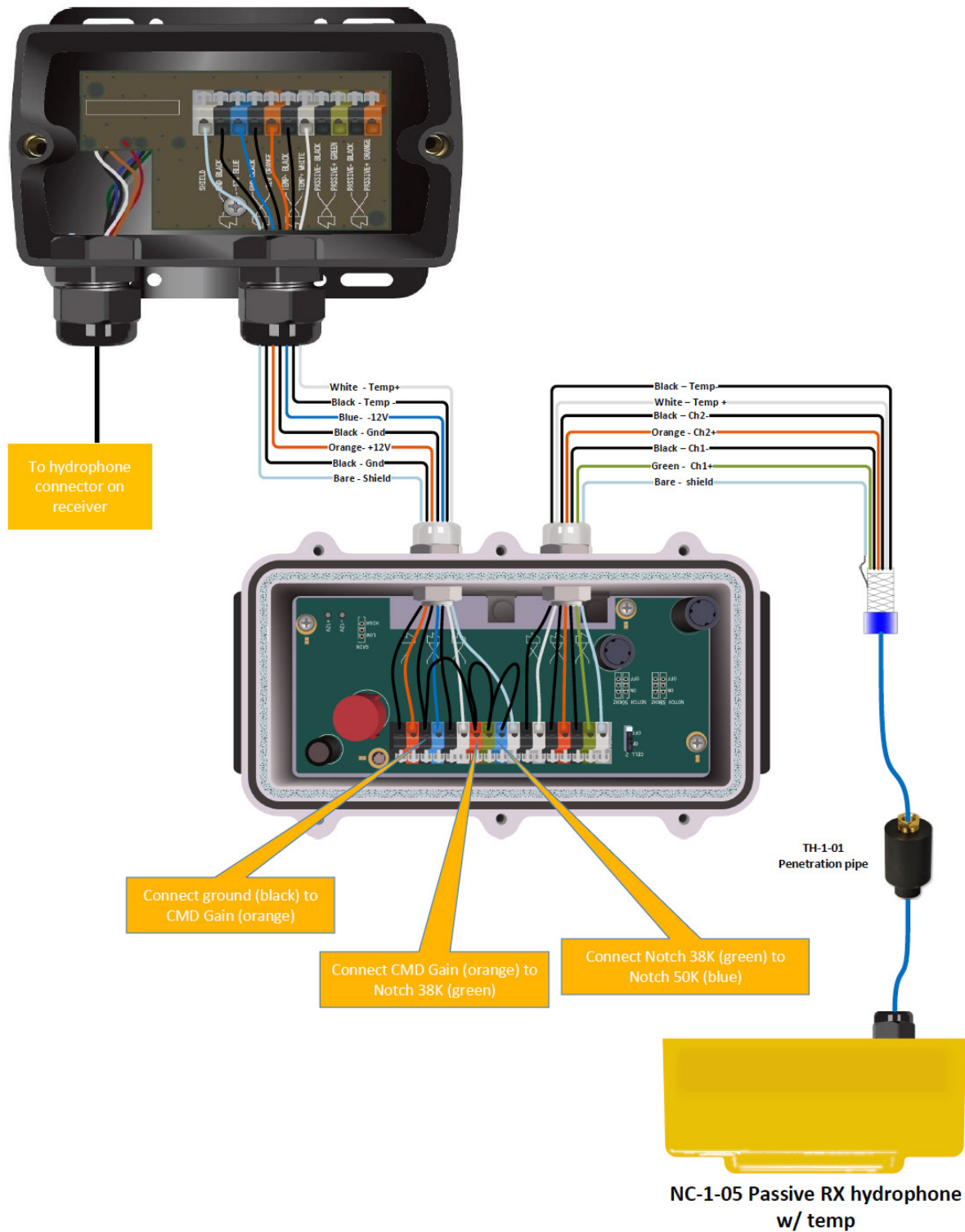
## Configuration 1

- Gain: High
- Notch filter 38kHz: On
- Notch filter 50kHz: On



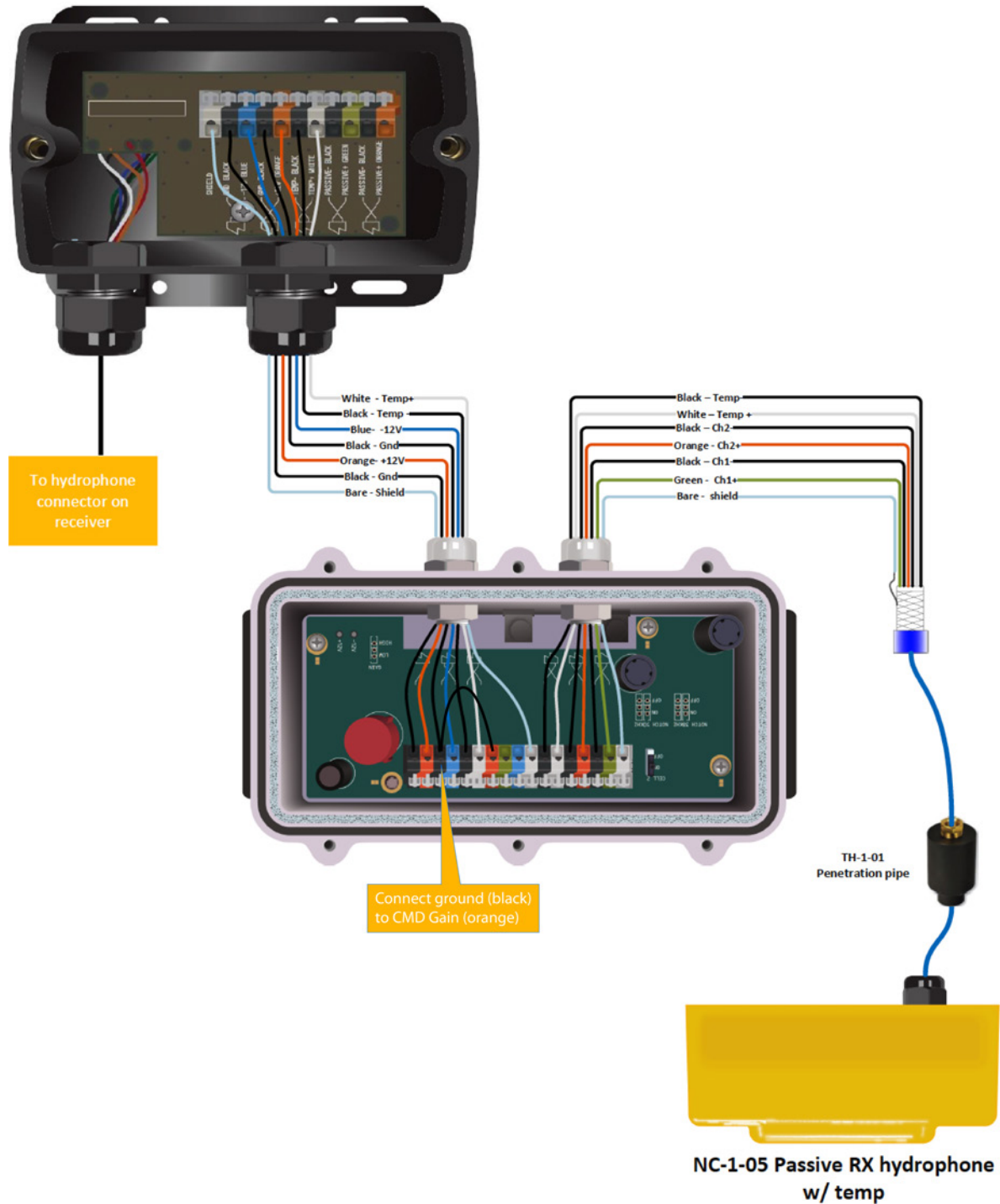
## Configuration 2

- Gain: Low
- Notch filter 38kHz: On
- Notch filter 50kHz: On



### Configuration 3

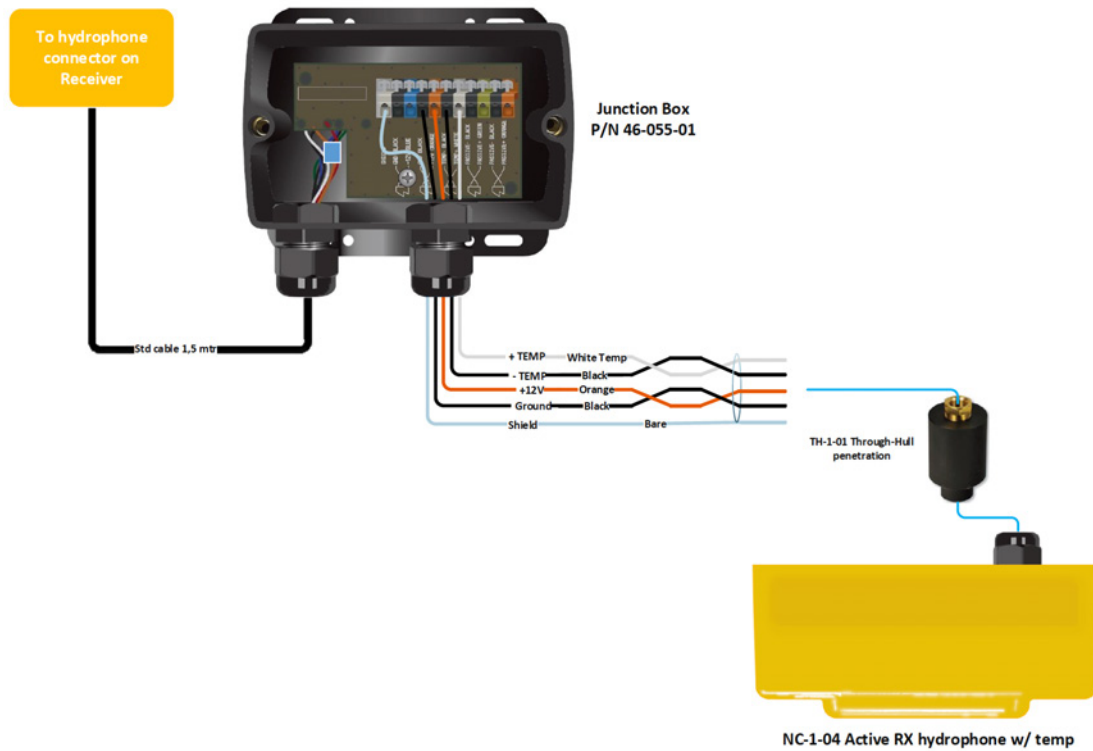
- Gain: Low
- Notch filter 38kHz: Off
- Notch filter 50kHz: Off





## Active Hydrophone

We recommend the following wiring for the installation of the active hydrophones NC-1-04 and NC-1-07.



**Note:** To be able to receive temperature from Marport hydrophones, connect to the NTC hydrophone input H1 or H2.


## Active Wideband Hydrophone

We recommend the following wiring for the installation of the wideband active shielded hydrophone NC-1-06 and NC-1-08.

### About

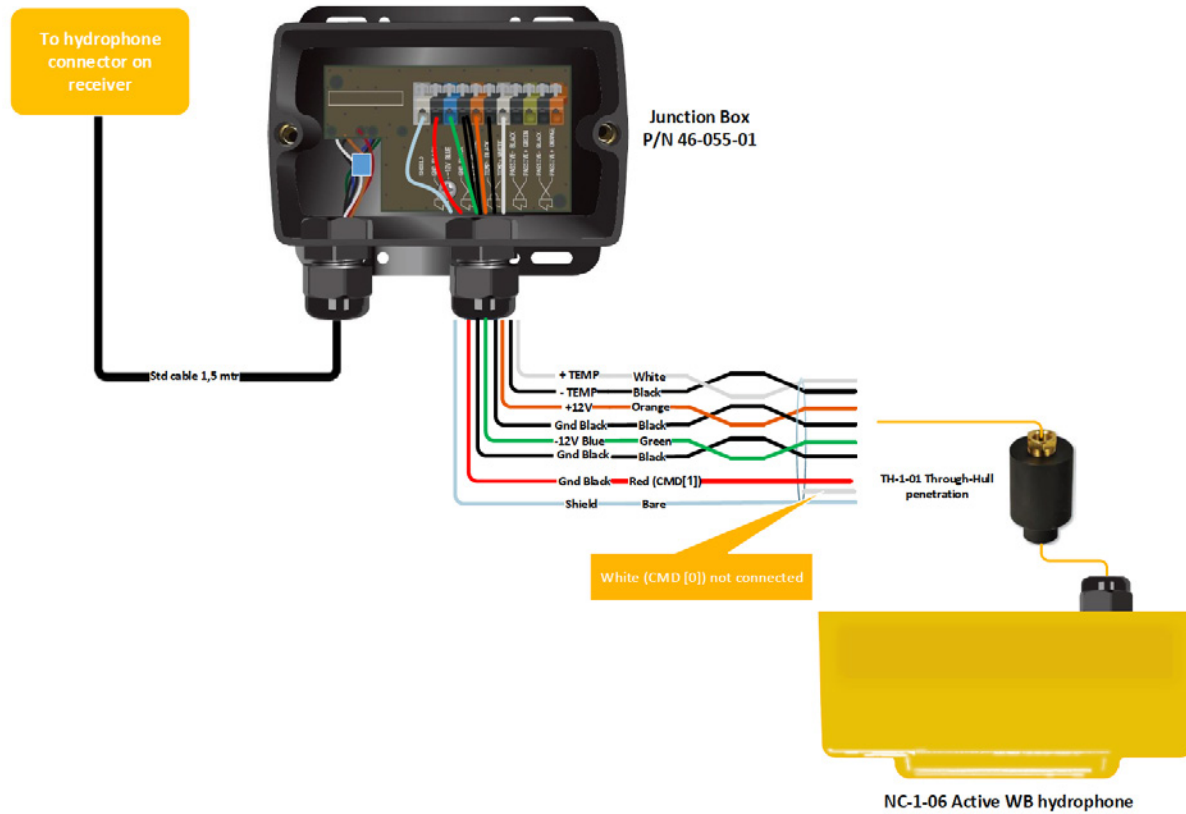
The preamplifier inside the hydrophone can be configured depending on the hydrophone wiring to the junction box. There are 4 different configurations:

	First generation of NC-1-06 (46-127-X)	NC-1-06 second generation (46-138-X) and NC-1-08 (46-139-X)
Configuration 1	38kHz and 50kHz filters activated / Gain High	38kHz filter activated / Gain High
Configuration 2	38kHz and 50kHz filters activated / Gain Low	38kHz filter activated / Gain Low
Configuration 3	38kHz filter activated / Gain High	38kHz and 50kHz filters activated / Gain High
Configuration 4	No Filters / Gain High	50kHz filter activated / Gain High

 **Note:** To be able to receive temperature from Marport hydrophones, connect to the NTC hydrophone input H1 or H2.

## Configuration 1

First generation 46-127-X	Second generation 46-138-X / 46-139-X
38kHz and 50kHz filters activated / Gain High	38kHz filter activated / Gain High

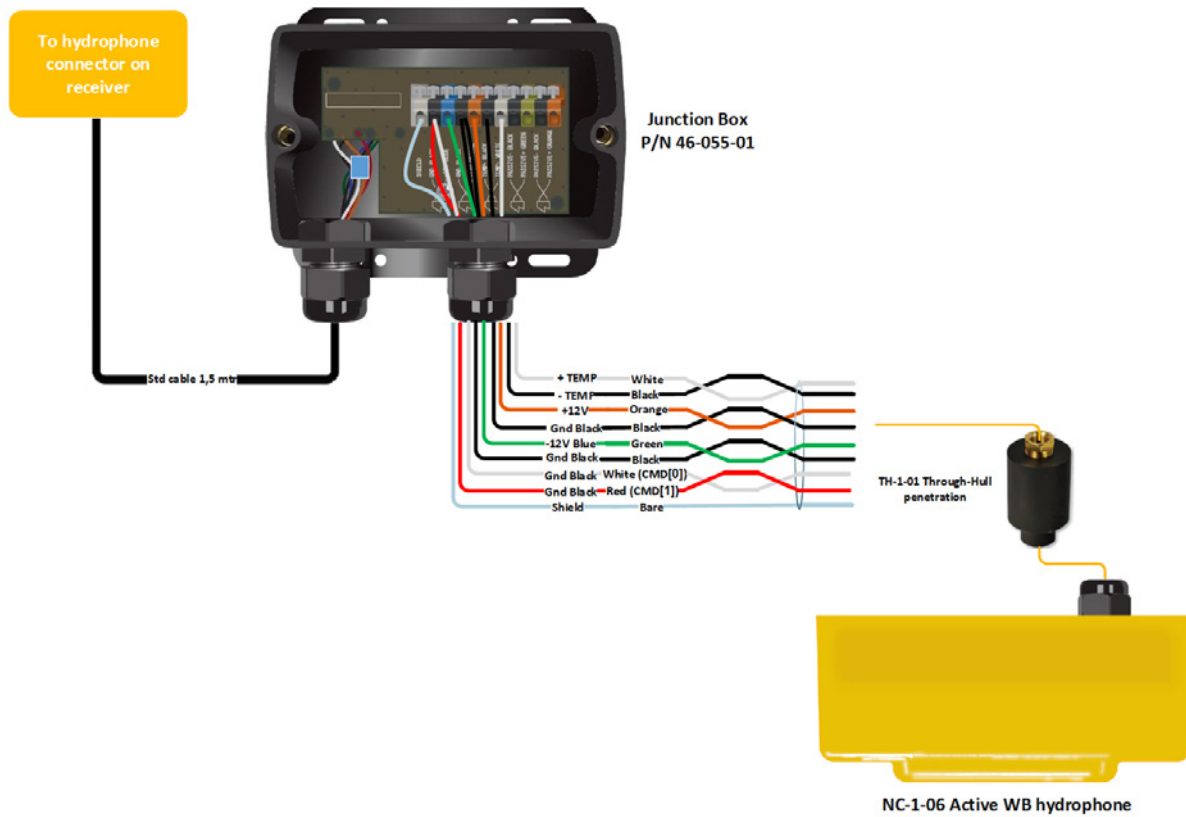


**Note:** NC-1-08 hydrophone black/green (ground/-12V) cables are not needed and cut off at cable end.

## Configuration 2

First generation 46-127-X	Second generation 46-138-X / 46-139-X
38kHz and 50kHz filters activated / Gain Low	38kHz filter activated / Gain Low

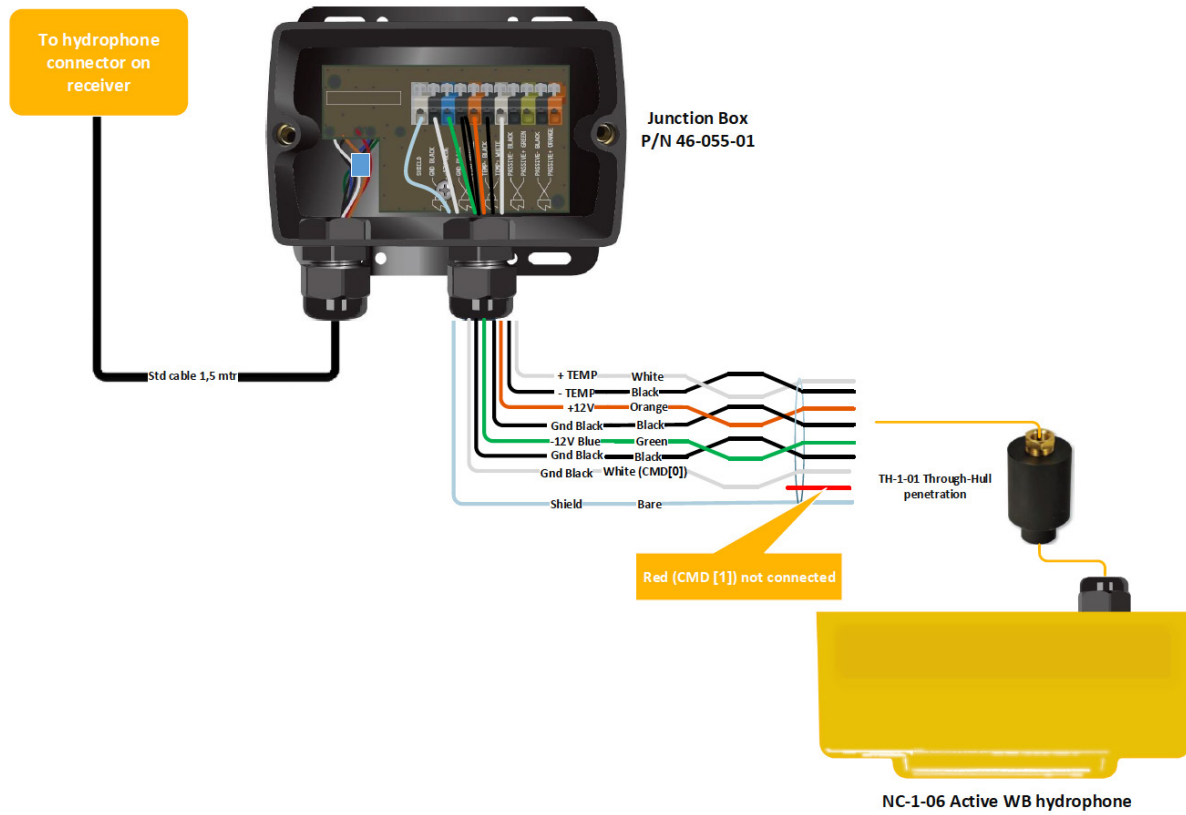
This configuration is recommended for seine fishing and trawling in shallow water.



**Note:** NC-1-08 hydrophone black/green (ground/-12V) cables are not needed and cut off at cable end.

## Configuration 3

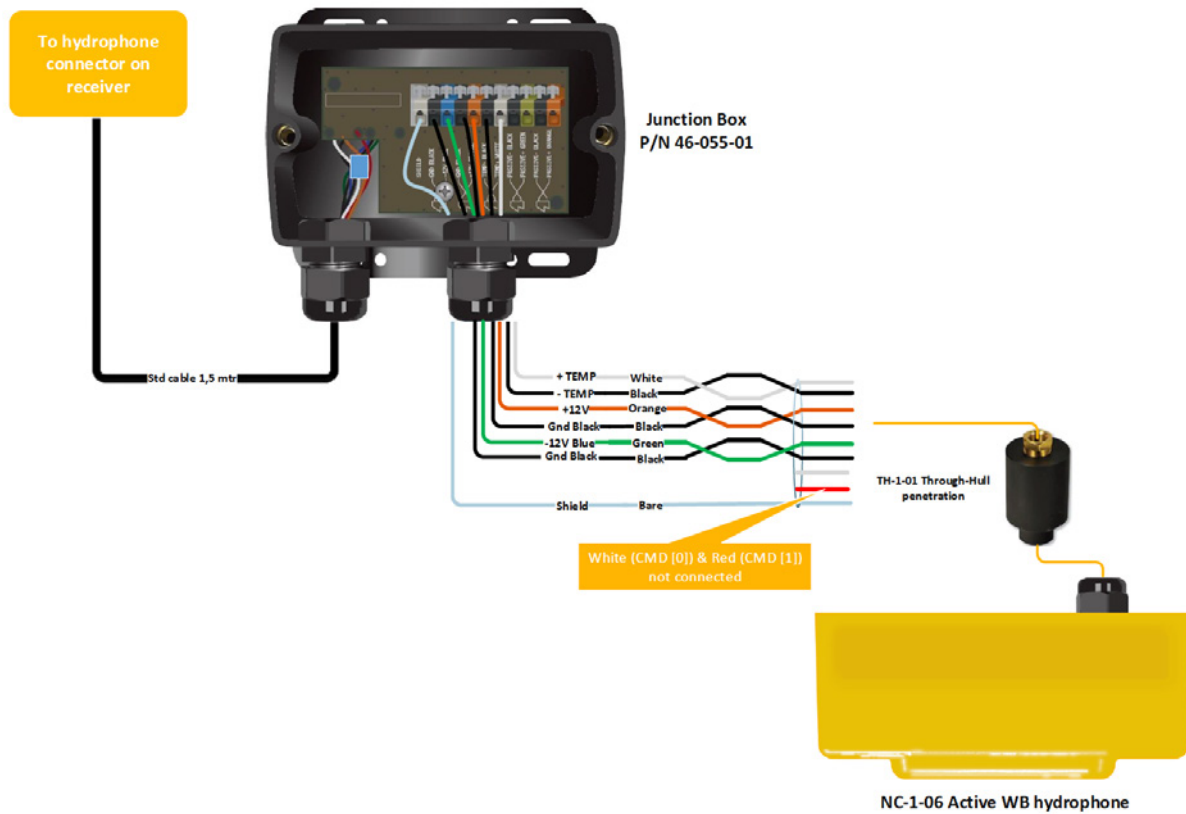
First generation 46-127-X	Second generation 46-138-X / 46-139-X
38kHz filter activated / Gain High	38kHz and 50kHz filters activated / Gain High



**Note:** NC-1-08 hydrophone black/green (ground/-12V) cables are not needed and cut off at cable end.

## Configuration 4

First generation 46-127-X	Second generation 46-138-X / 46-139-X
No Filters / Gain High	50kHz filter activated / Gain High



**Note:** NC-1-08 hydrophone black/green (ground/-12V) cables are not needed and cut off at cable end.

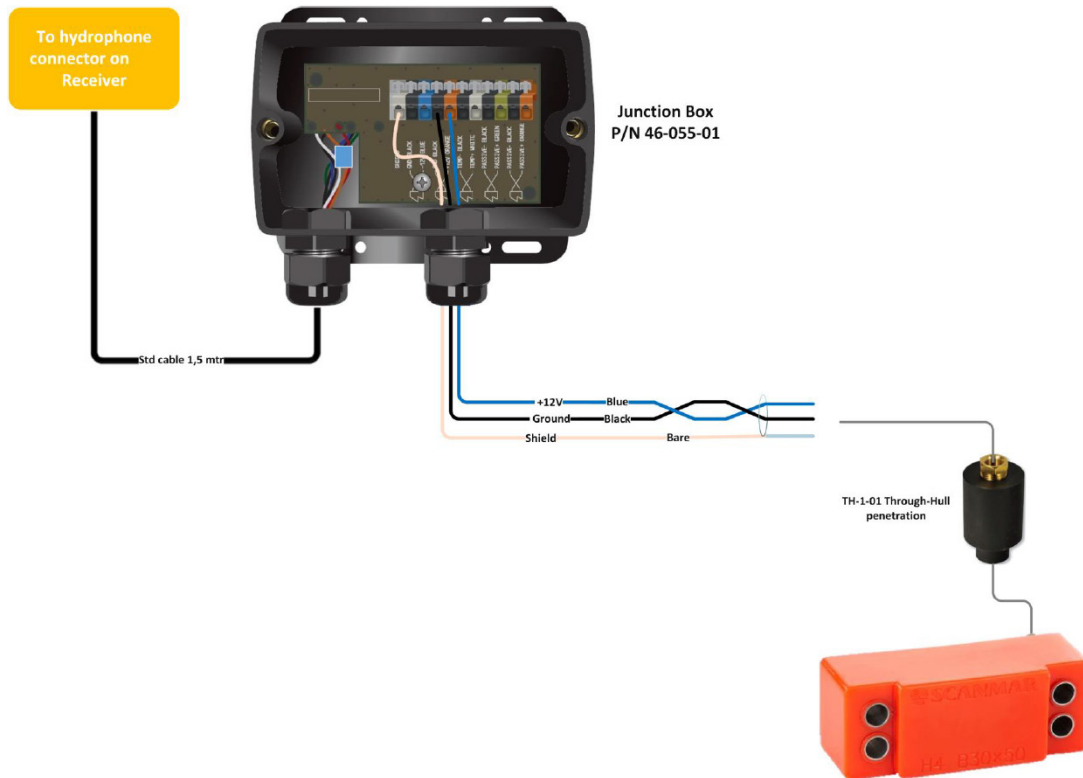
## Scanmar Hydrophone

We recommend the following wiring to connect a Scanmar hydrophone to a Marport system.

Scanmar hydrophones can be used with Marport receivers. They will show a lower current (5.5mA instead of 8–9mA).

If you want to receive temperature data from this hydrophone, connect the junction box to H3 port on M3 and M6 receivers or to H1 or H2 on an M4 receiver.

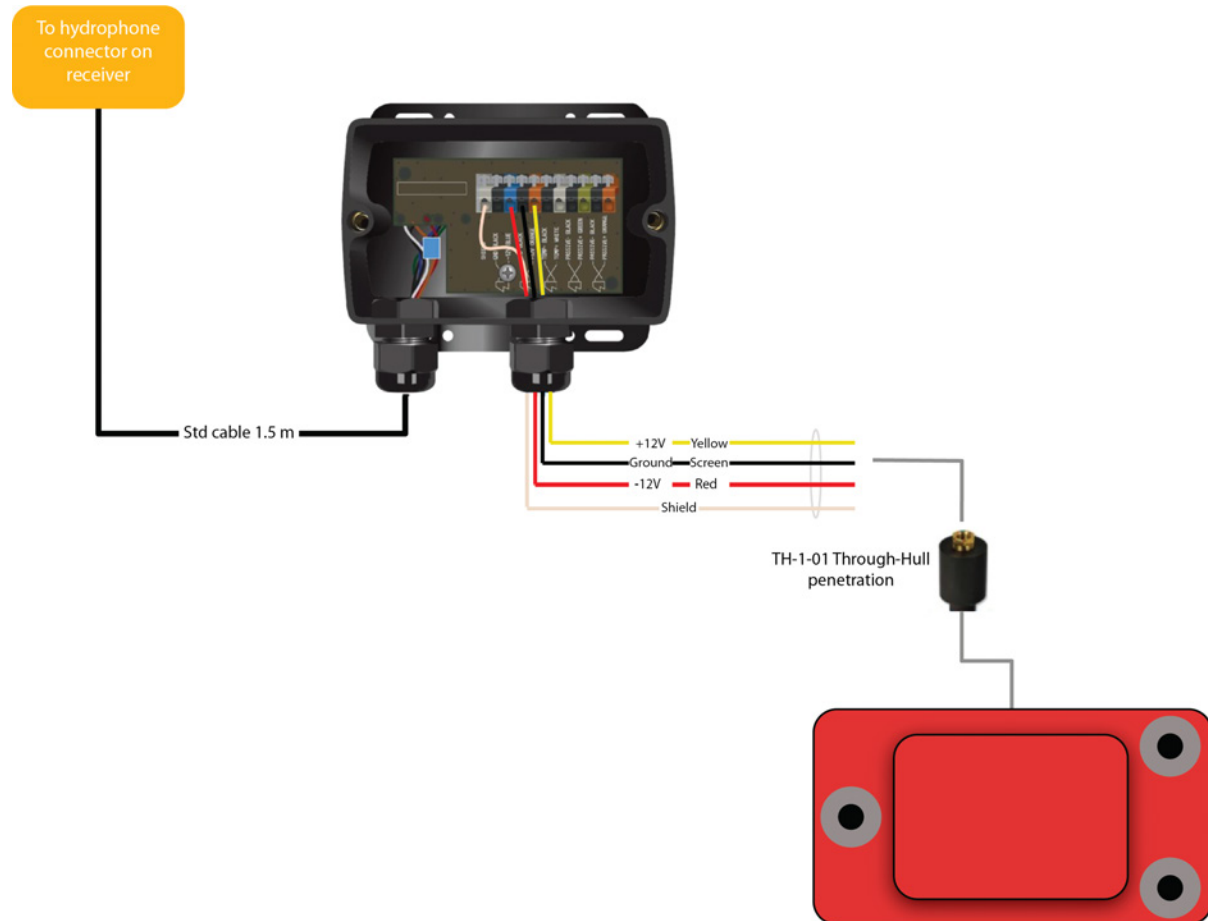
From Scala, Scanmar hydrophone can be added to the receiver as an active Scanmar hydrophone (typical current consumption is 5–6 mA).



## Simrad PI Hydrophone

We recommend the following wiring to connect Simrad PI hydrophone to a Marport system.

On Scala, Simrad PI hydrophone can be added to the receiver as an active Simrad hydrophone (typical current consumption is 15–17 mA).



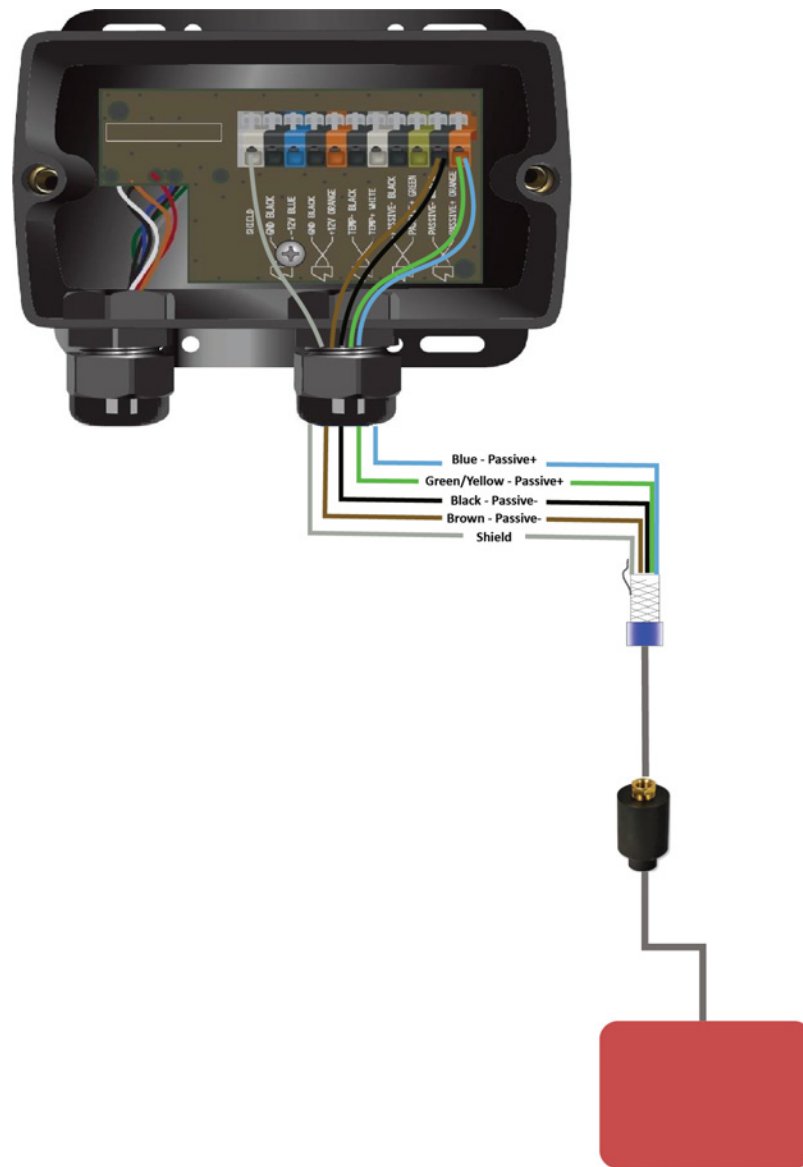


## Simrad ITI Hydrophone

We recommend the following wiring to connect Simrad ITI passive hydrophone to a Marport system.

From Scala, this hydrophone can be added to the receiver as a passive Marport hydrophone.

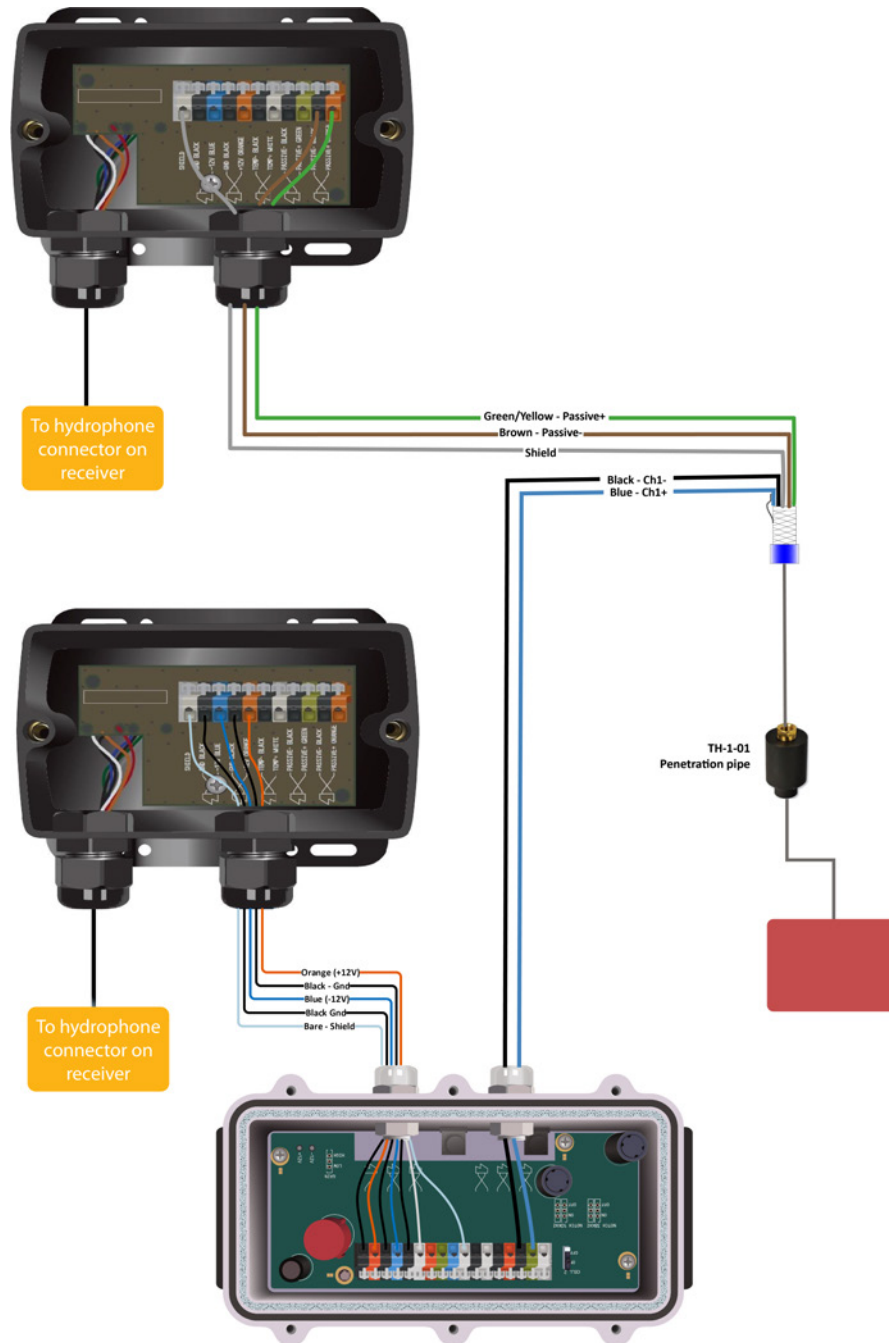
### Receiving (Rx)



### Receiving and transmitting (Rx + Tx)

Connect ITI cables to a junction box to receive (Rx) and to a preamplifier to transmit (Tx).

See [Passive Hydrophone + Wideband Preamplifier](#) on page 20 to know how to configure the gain and notch filters on the preamplifier.



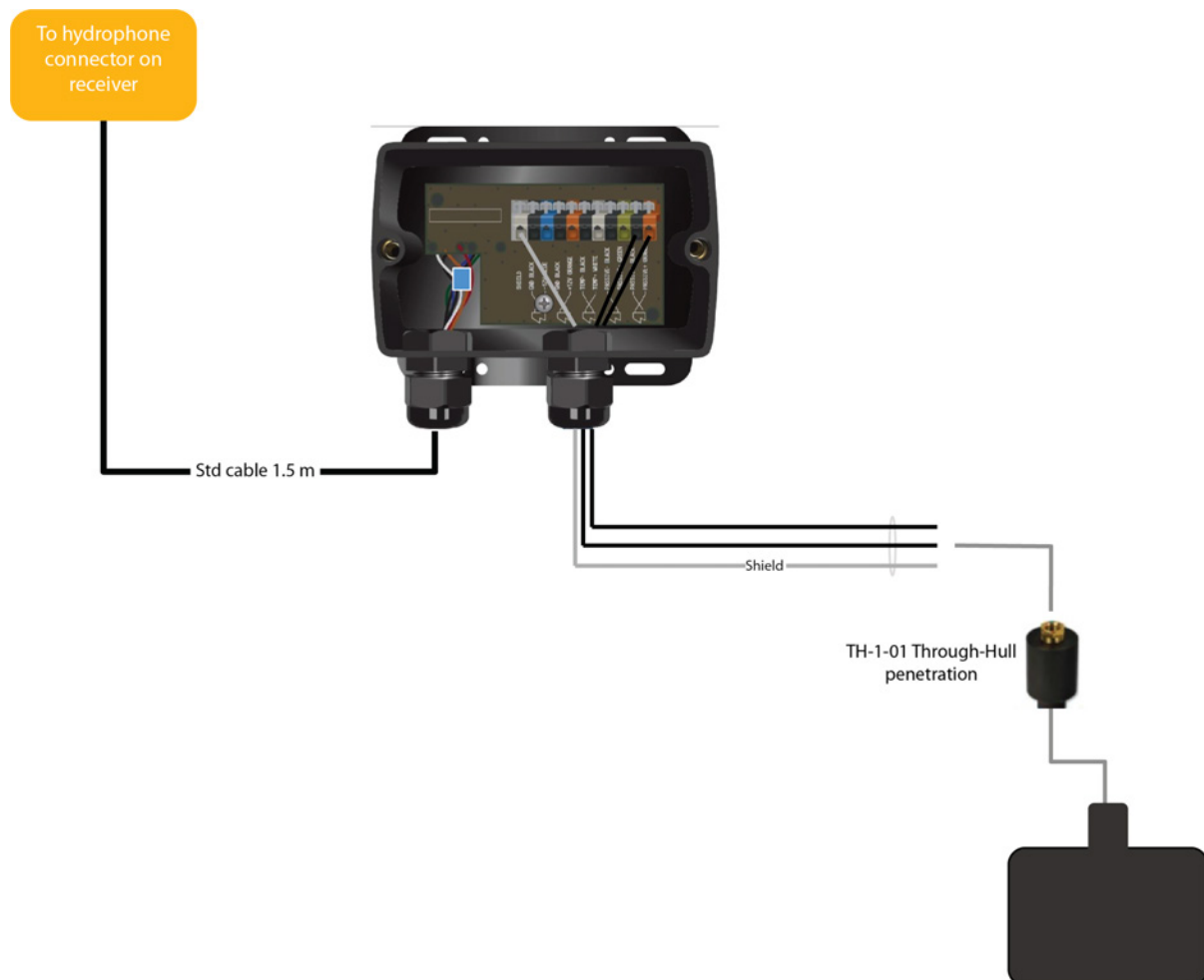
## Furuno Passive Hydrophone

We recommend the following wirings to connect Furuno passive hydrophones to a Marport system.

There are three passive Furuno hydrophones, with different bandwidths:

- 31.5-34.5kHz
- 38-42kHz
- 47.5-52.5kHz

From Scala, Furuno passive hydrophone can be added to the receiver as a passive Furuno hydrophone, according to the bandwidth (33kHz, 40kHz or 50kHz).



## Passive Hydrophone from other brands + Wideband Preamplifier

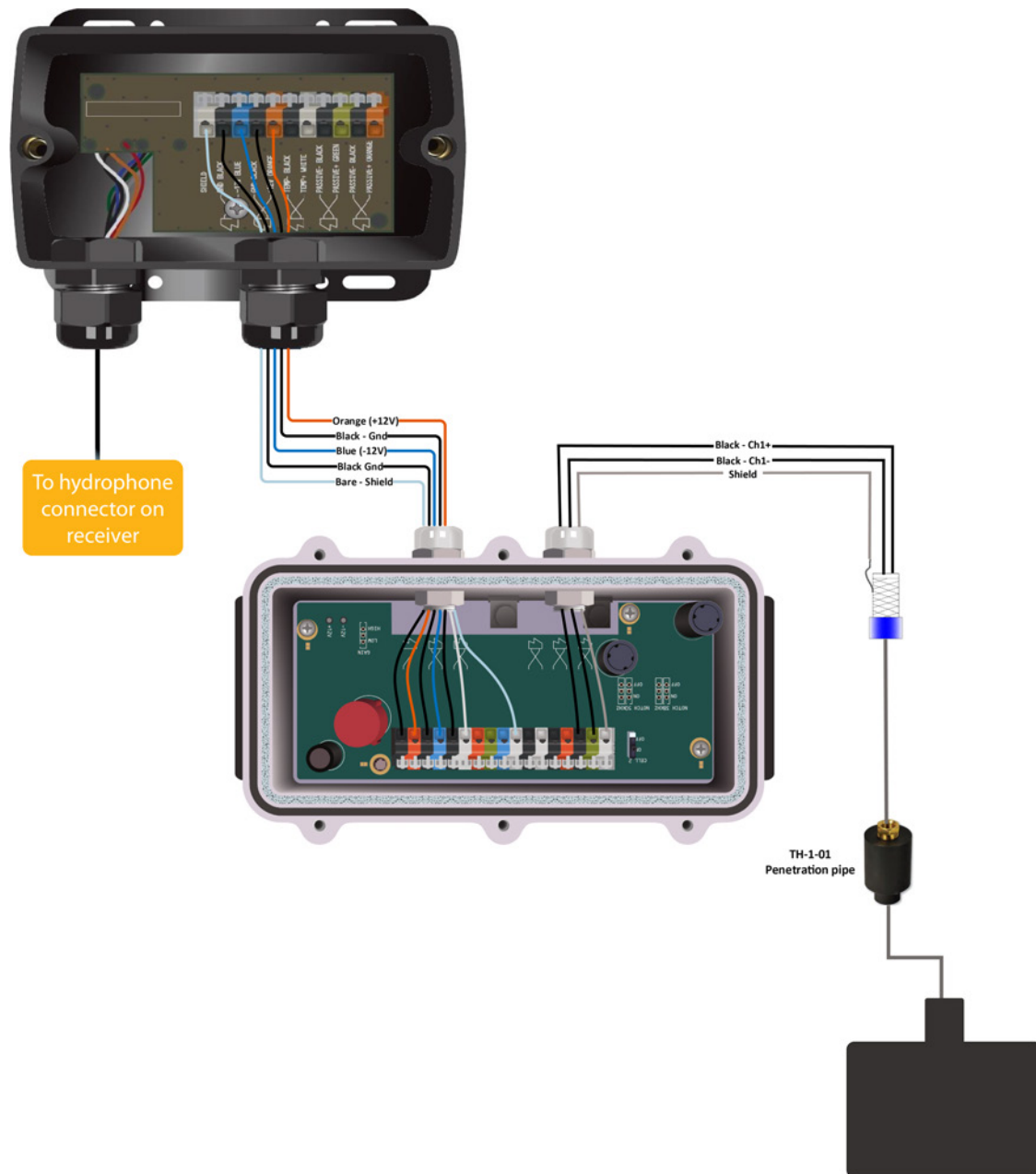
You can connect passive hydrophones from other brands to Marport wideband preamplifier.

Passive hydrophones can be connected to Marport wideband preamplifier the same way Marport passive hydrophone is connected.

This drawing is an example of connection of a Furuno passive hydrophone with 1 cell.

See [Passive Hydrophone + Wideband Preamplifier](#) on page 20 to know how to configure the gain and notch filters on the preamplifier.

From Scala, add this hydrophone to the receiver as active - Hydro NC-1-03 or NC-1-05 + NC-02-02.



## Receiving Hydrophone Data on Two Systems

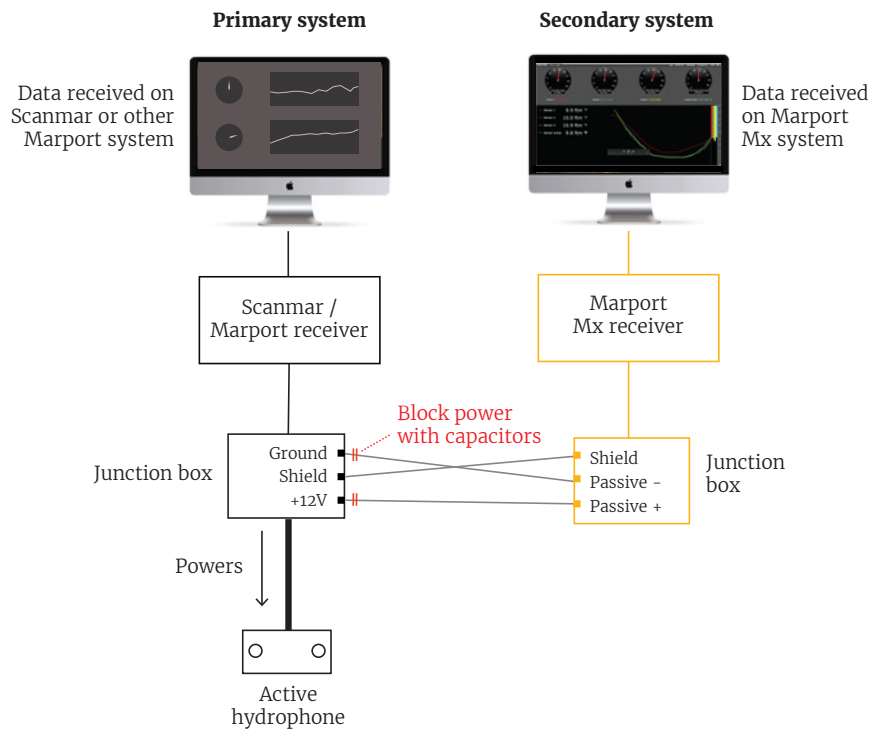
If you have two different systems, you can receive on both systems data coming from a hydrophone connected to one of the systems.

### About this task

The following procedure explains how to receive data on a Marport Mx system from an active hydrophone connected to another system.

### Procedure

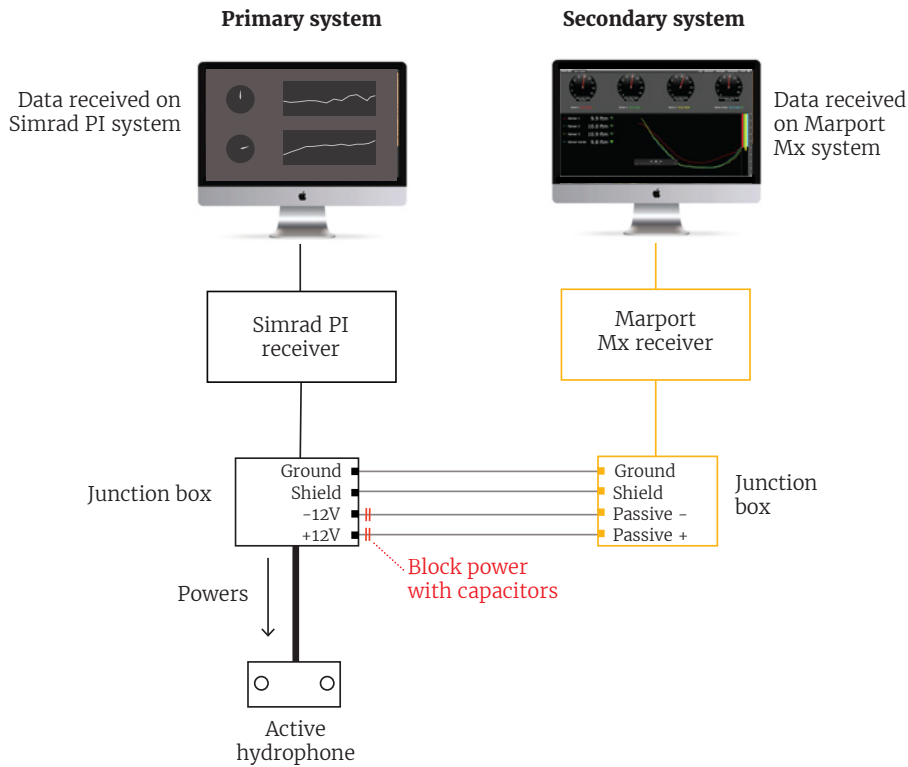
1. To receive data from a **Scanmar system or another Marport system**, connect a shielded multi-conductor cable as described below:



⚠ **Important:** Use ceramic capacitors of 10  $\mu\text{F}$ / 25V. They are necessary to block power supply.

📋 **Note:** The primary system must be switched on in order for the secondary system to work.

2. To receive data from a **Simrad PI system**, connect a shielded multi-conductor cable as described below:



❗ **Important:** Use ceramic capacitors of 10  $\mu\text{F}$ / 25V. They are necessary to block power supply.

📖 **Note:** The primary system must be switched on in order for the secondary system to work.

3. On the Mx receiver page, add the hydrophone as **passive**, because there is no power supply from this system.

	H1	H2	H3	H4	H5	H6
Front panel:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrophones:	<input type="button" value="CLICK TO ADD"/>	<input type="button" value="CLICK TO ADD"/>	<input type="button" value="CLICK TO ADD"/>	 NC - 1 - (03/05)	<input type="button" value="CLICK TO ADD"/>	<input type="button" value="CLICK TO ADD"/>
Type:	-	-	-	Passive	-	-
Bandwidth:	-	-	-	33;60 kHz	-	-
Beam Width Angle:	-	-	-	55 °	-	-
Beam Height Angle:	-	-	-	55 (one cell) 35 (both cells) °	-	-
Location:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="Port - Keel"/>	<input type="text"/>	<input type="text"/>
Horizontal Tilt	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>	<input type="text"/>	<input type="text"/>
Vertical Tilt Angle:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="0"/>	<input type="text"/>	<input type="text"/>
Current status:	-	-	-	0.0 mA	-	-
Rx/Tx:	<input type="text" value="Off"/>	<input type="text" value="Off"/>	<input type="text" value="Off"/>	<input type="text" value="Receive"/>	<input type="text" value="Off"/>	<input type="text" value="Off"/>

4. To add sensors from other systems on Scala:
  - a) Scanmar: add in the same way as for a Marport sensor, according to the type of sensor. Only data sent on boat/channel codes can be read by the Mx receiver. When TEY option is activated on your system, you can read all TEY sensor data (add as **Trawl Explorer SC Compatible**).
  - b) Simrad PI: add as PI Sensor, according to the type of sensor. Only data such as catch status, depth, height, temperature and door spread can be read.

### Results

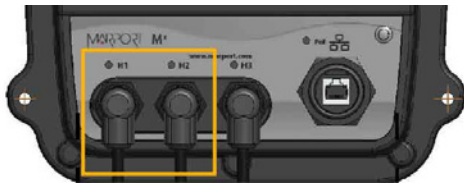
You receive data from the hydrophone on both systems.

## Connecting the Hydrophone to the Receiver

You need to connect the hydrophone to the receiver to be able to display sensor data received by the hydrophones.

### Procedure

- Connect the extension cable of the junction box to a hydrophone input on the receiver:
  - Connect to the NTC hydrophone input H1 or H2 to be able to receive temperature from Marport hydrophones.



**Note:** H3 hydrophone input allows to receive temperature from an NMEA connection (Scanmar hydrophone or NMEA converter junction box). If you connect a Marport hydrophone to H3 without NMEA converter, you will not have temperature data from the hydrophone.

## Understanding Receiver LEDs

LEDs on the receiver are useful to know if the receiver is connected to the computer and what types of hydrophones are connected to the receiver.

### Boot sequence

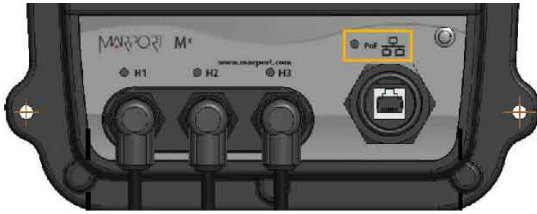
When the receiver restarts, the hydrophone and PoE LEDs light up according to a specific sequence. At the end of the sequence:

- LEDs are off if no hydrophone is configured.
- LEDs are red or blue if hydrophones are configured.

If one or several LEDs stay green after the boot sequence, there is a problem with the receiver. Contact your local support service.

### PoE LED

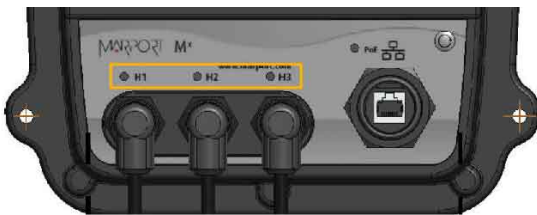
You can refer to the PoE LED color to know if the receiver is correctly connected to the computer.



- Blinking green: the receiver is connected to a power source and to the computer.
- Blinking blue: the receiver is connected to a power source but it is disconnected from the computer. Check that the computer is connected to the PoE adapter.
- Blinking red: Ethernet is resetting.

### Hydrophone LEDs

The LEDs on the hydrophone inputs identify the type of hydrophone that is connected to the receiver.



- Blue: passive hydrophone
- Red: active hydrophone
- No light: no configured hydrophone

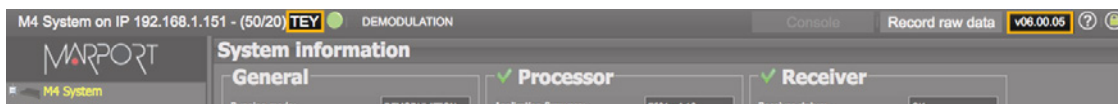
## Adding SC Sensor and SC Compatible Sensor to the Receiver

You can add an SC sensor or a Marport SC compatible sensor to a Marport receiver.

### Before you begin

To add this sensor to Marport receiver, you need to have:

- Mx version **06.00.05 and above**
- **TEY** option activated.





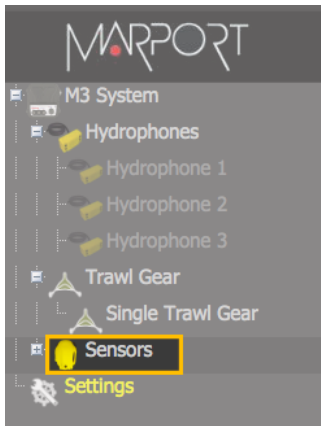
## Adding the Sensor to the Receiver

### Procedure

1. Open Mx receiver page:



- From Scala, click **Menu**  > **Expert Mode**, then **Menu**  > **Receivers**.
  - Or enter your receiver IP address on Firefox web browser.
2. From the left side of the screen where the system is displayed, click **Sensors**.



3. From the page that appears:
  - a) From **Product Category** select **Trawl Explorer**.
  - b) from **Product Name** select **Trawl Explorer SC Compatible**.
  - c) From **Trawl Gear Location**, choose the location of the sensor on the trawl.

Add Sensor Product	
Add from Marport Sensor Config Utility	
1. Product Category	Trawl Explorer
2. Product Name	Trawl Explorer SC Compatible
3. Trawl Gear Location	009

The sensor configuration page appears.

4. Complete the settings according to the configuration you did on Mosa (for a Marport SC compatible sensor) or on the SC programmer (SC sensor).

**Sensor Name**  
Sensor Name: TRAWL-EXPLORER-008  
Sensor Product: Trawl Explorer SC Compatible  
Remove

**Sensor Options**  
**Sensor Processing**  
Allowance: 3  
Detection: Synchro 1

**Trawl Explorer SC Compatible**  
Frequency (Hz): 43600  
Down-Sounding (m): 15  
Up-Sounding (m): 0  
Quality: MEDIUM  
Trawl Code: 2  
Filter  
Configure...  
Apply

**Uplink**  
Uplink Frequency (Hz): 43600

**SC Trawley**  
Trawl Code: 1  
Gain: 1  
Quality: Medium  
Echo Expansion Mode: Normal  
Down Sounding: ☒  
Range: 15m  
Pulse Length: Manual 400  
Up Sounding: ☐  
Range: 60m  
Pulse Length: Manual 400

**SC Configuration Tool**  
SC connected. 35%  
Down Ranges (m): 0 15 30 60 90 120 150 180 240 300  
Up Ranges (m): 0 15 30 60 90 120 150  
Image Quality: WORST BEST  
Resulting Operating time:   
Frequency Band: NORMAL HIGH  
Footrope Transponder: YES NO  
Trawl Code: 1 2 3 4 5 6  
Long Range: YES NO  
Gain: 0 1 2 3 4 5 6 7 8 9  
Extrapolation Filter: NORMAL H2 H2W2 H3W3 H4W4  
Retrieving Configuration... INFO

**Note:** **Frequency Band:** normal = 43600 kHz / high = 45000 kHz

**Note:** To deactivate Up sounding, enter 0 or deselect the check box.

5. On Scala receiver page, complete **Quality** settings according to the up and down settings:

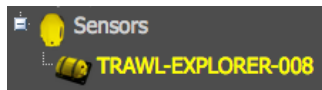
UP	DOWN	Available quality settings on Scala
Yes	No	Worst / Medium / Best
No	$\leq 150$ m	Worst / Medium / Best
Yes	$\leq 150$ m	Worst / Medium*
Yes/No	$> 150$ m	Worst

❗ **Important:** \*Displayed as **Best** in SC application.

6. Click **Apply**.

### Results

The sensor is added to Marport receiver.



## Displaying Data on Scala

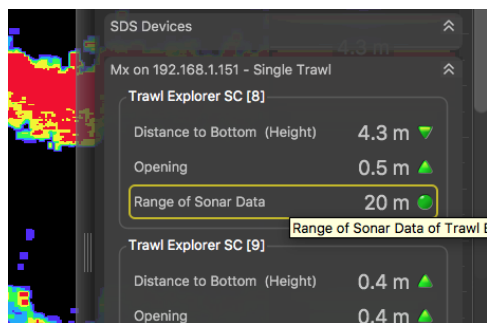
### About this task

Scala can only receive echogram data from the SC sensor. The other data (distance to bottom and opening) are automatically measured by Scala.

❗ **Important:** SC sensor has a blind zone of 1,4 m.

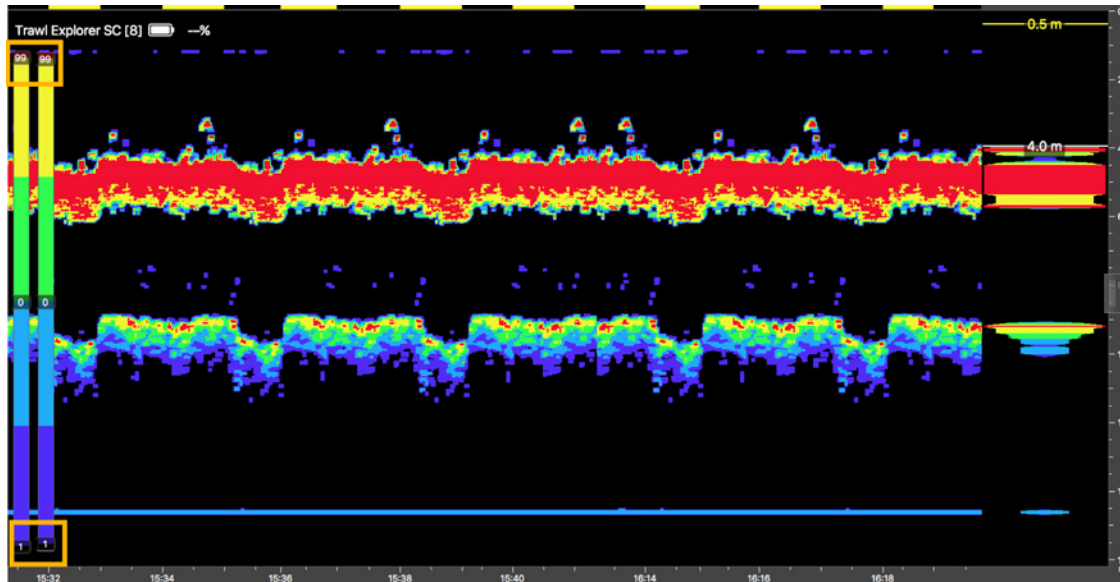
### Procedure

- SC sensor data appears under the name **Trawl Explorer SC** in the control panels, in **Sensors Data**. To display the echogram:
  - Click **Menu** ≡ > **Customize** and enter the password eureka.
  - Click + hold **Range of Sonar Data** and drag it to a page.



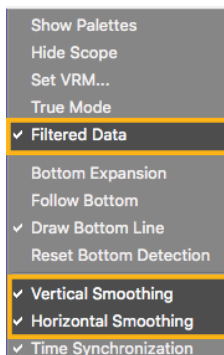
- To have colors similar to an SC system:
  - Right-click the echogram and select **Show Palettes**.
  - Right-click each of the palette scales and select **NC42ScanmarTrawleye**.

c) Drag bottom handles to 1 and upper handles to 99.

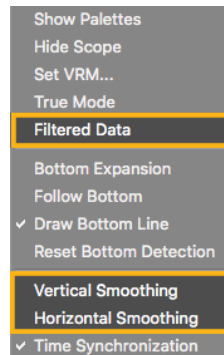


3. By default, Scala applies filters on data to reduce interference. You can remove these filters to have a display similar to an SC system:
  - a) Right-click the echogram and click **Filtered Data** to deactivate it.
  - b) Again, right-click the echogram and click **Vertical Smoothing** and **Horizontal Smoothing** to deactivate them.

Smoothing and filters on data activated (default)

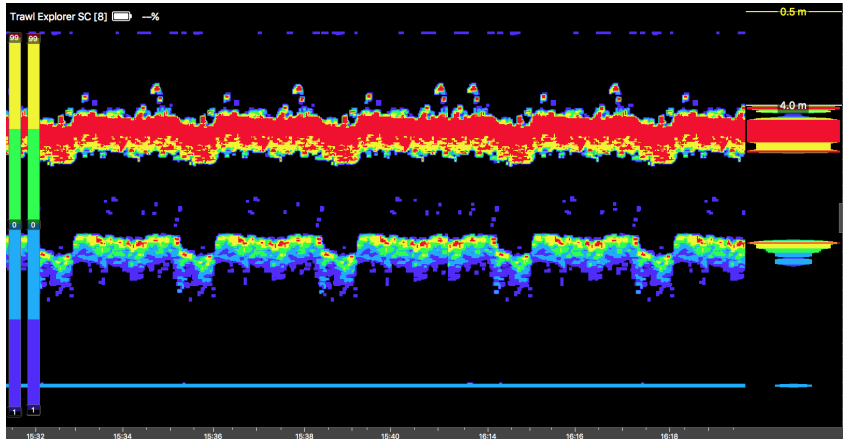


Smoothing and filters on data deactivated

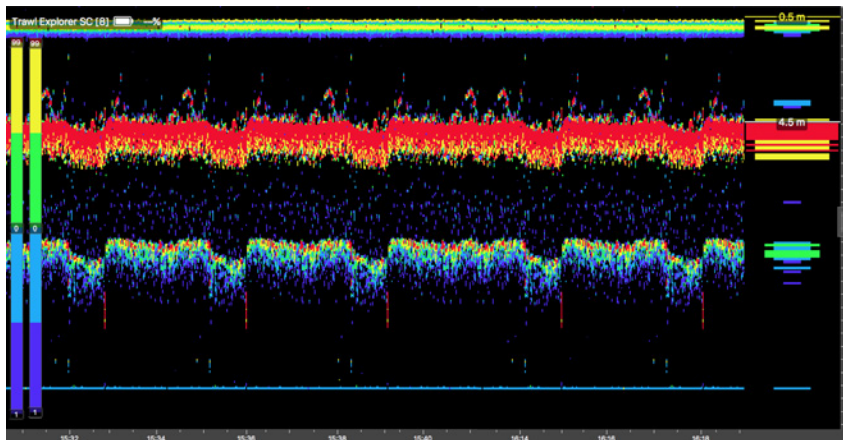


- a) Click **Menu** ≡ > **Expert Mode** and enter the password `copernic`.
- b) Click **Menu** ≡ > **Receivers**.
- c) From the system tree view on the left side of the page, click the sensor name.
- d) Click **Configure** next to **Filter**.
- e) From **Echograms Filter**, select **Signal Interference Reduction Low**.

Default display with filters



Display without filters



## Installing ShipModul MiniPlex Multiplexer (Optional)

You can use a ShipModul MiniPlex multiplexer to receive simultaneously NMEA data from devices such as GPS, compass or warp length sensor module and display them in Scala.

❗ **Important:** ShipModul multiplexer cannot read NMEA messages longer than the standard maximum length (82 characters), nor other format messages longer than 61 characters, nor Marelec messages. Use another multiplexer if this is your case.

### Installing MPX-Config3

You need to download and install MPX-Config3 software to configure the MiniPlex multiplexer.

#### About this task

MPX-Config3 software enables you to change the settings of the MiniPlex multiplexer.

#### Procedure

1. To download MPX-Config3, go to: <http://www.shipmodul.com/en/index.html>. Then, click **Downloads > Utilities > MPX-Config3 for MiniPlex-3**.
2. From the **Downloads** folder, click the \*.dmg file you downloaded.
3. From the MPX-Config3 window that appears, copy MPX-Config3 application and paste it in the **Applications** folder.



MPX-Config3 is installed on your computer and accessible via the Launchpad 🖱️.

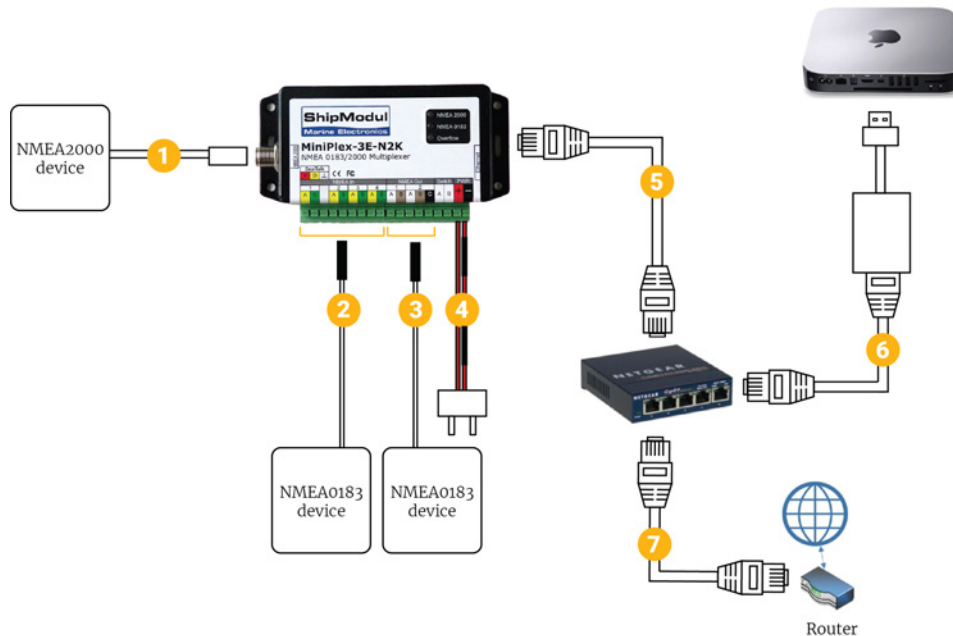
## NMEA Multiplexer Cabling

You can connect ShipModul MiniPlex-3E-N2K or Miniplex-3E NMEA multiplexers in two different ways, depending on whether you have a network with DHCP server or not.

### Wired Ethernet network

Connect the multiplexer according to the following schema if:

- You have an Ethernet switch
- You have a wired Ethernet network with a DHCP server

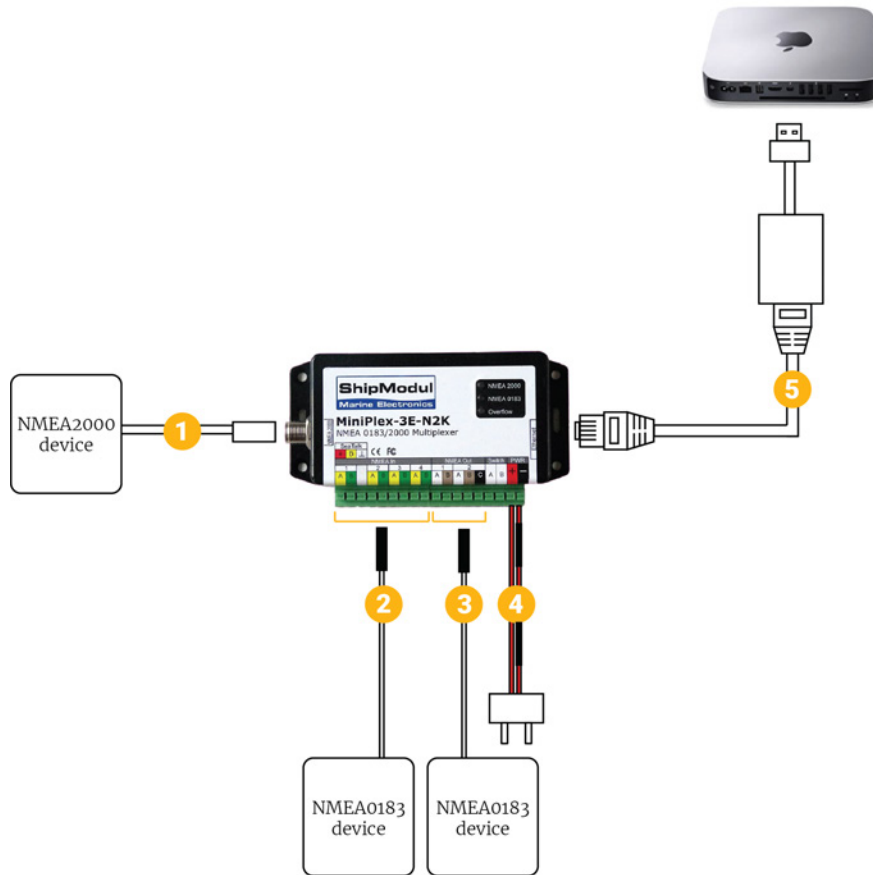


	Cable	Connected to
1	NMEA2000 bus (only for Miniplex-3E-N2K)	Device outputting NMEA2000
2	NMEA0183 input bus (can be plugged into input 1 to 4)	Device outputting NMEA0183
3	NMEA 0183 output bus	Device receiving NMEA0183
4	Power cables	12V DC power supply
5	Ethernet cable	Ethernet switch
6	Ethernet cable	Computer
7	Ethernet cable	Router

### WiFi connection / No wired Ethernet network

Connect the multiplexer according to the following schema if:

- you connect to the internet via WiFi,
- or you do not have a wired Ethernet network.



	Cable	Connected to
1	NMEA2000 bus (only for Miniplex-3E-N2K)	Device outputting NMEA2000
2	NMEA0183 input bus (can be plugged into input 1 to 4)	Device outputting NMEA0183
3	NMEA 0183 output bus	Device receiving NMEA0183
4	Power cables	12V DC power supply
5	Ethernet cable	Computer



## Detecting the Multiplexer

You need to detect the multiplexer on the network to be able to use it. Wiring and configuration change according to your type of network installation.

### Before you begin

- Scala must be closed.
- You can connect a device outputting NMEA data to the multiplexer beforehand to see directly if the connection is working.
- If you have devices connected on different networks but no DHCP server, make sure that each device is on a different subnet. When adding a device on a new network, check that the third set of numbers of its IP address is different from other subnets: you can choose a number between 0 and 254. Avoid 192.168.1 and do not use 192.168.44.

### About this task

Follow the procedure corresponding to your network installation.


## Wired Ethernet Network

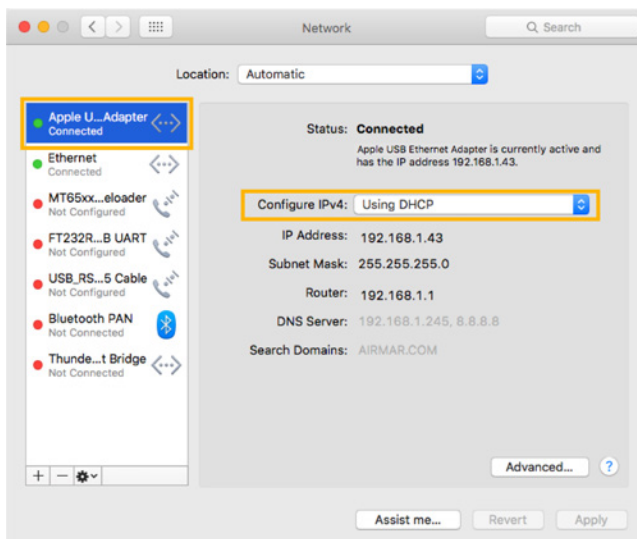
### About this task

Do this procedure if:

- You have a wired Ethernet network with a DHCP server (with or without an internet connection)
- The router, multiplexer and computer are connected to the same Ethernet switch.

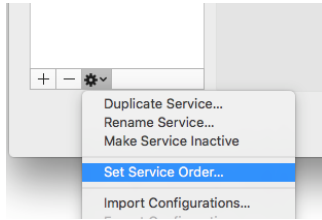
### Procedure

1. Connect the computer, multiplexer and router to the same Ethernet switch.
2. Power on the multiplexer.
3. Click **Apple Menu**  > **System Preferences** > **Network**:

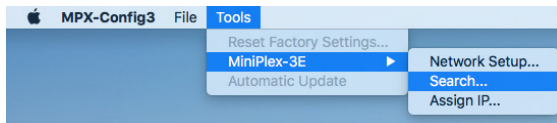


- a) Check that the Ethernet network has a green LED and is configured as **Using DHCP**.

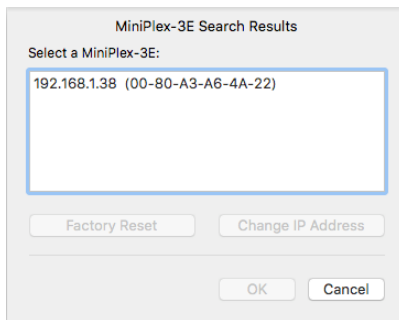
- b) Check that the USB/Thunderbolt to Ethernet adapter is on top of the network list. If not, click the tooth wheel icon at the bottom of the list, select **Set Service Order** and drag USB/Thunderbolt to Ethernet adapter to the top.



4. Open MPX-Config3 and from the toolbar, click **Tools** > **MiniPlex-3E** > **Search**.

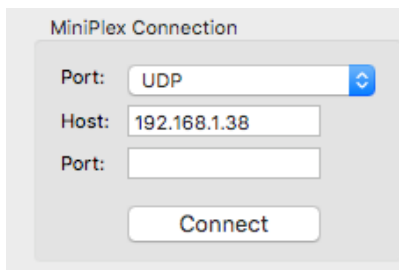


The MiniPlex is detected and displayed in the search results.



5. Select it and click **OK**.

The part **MiniPlex Connection** is automatically filled in.



6. From **MiniPlex Connection**, click **Connect**.

If you have connected and correctly configured the baud speed of the device outputting NMEA data, you should see incoming NMEA messages.



## WiFi Connection / No Wired Ethernet Network

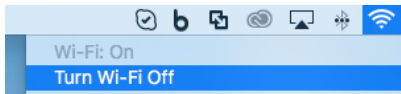
### About this task


Do this procedure if:

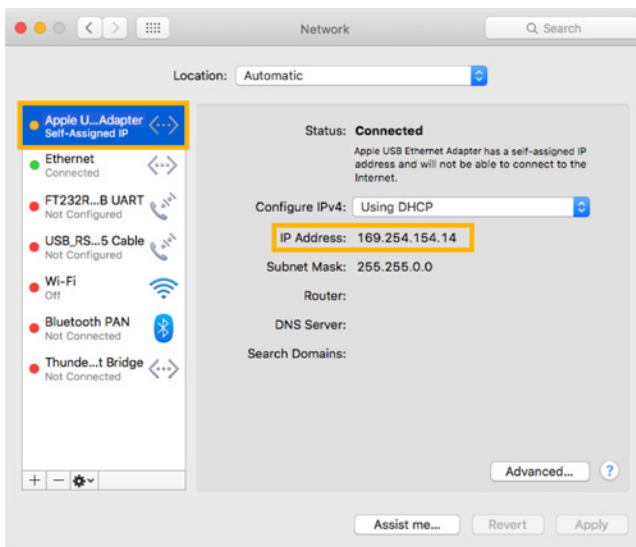
- You have a wireless internet connection
- Or you have no wired Ethernet network

### Procedure

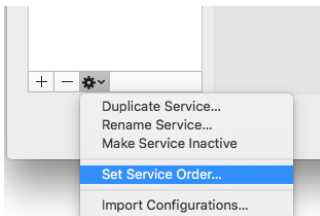
1. If you are connected to a WiFi network, turn off the WiFi on your computer.



2. Connect the multiplexer to your computer using a USB/Thunderbolt to Ethernet adapter and power on the multiplexer.
3. Click **Apple Menu**  > **System Preferences** > **Network**. From the network list, you can see the USB/Thunderbolt to Ethernet adapter. Wait a few seconds until the LED becomes orange and until an IP address appears. Its IP address has been given automatically and randomly. You need to change it.

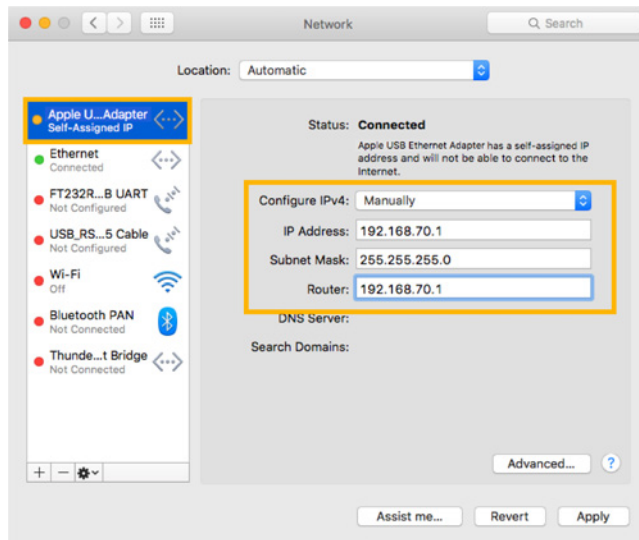


- a) Check that the USB/Thunderbolt to Ethernet adapter is on top of the network list. If not, click the tooth wheel icon at the bottom of the list, select **Set Service Order** and drag USB/Thunderbolt to Ethernet adapter to the top.



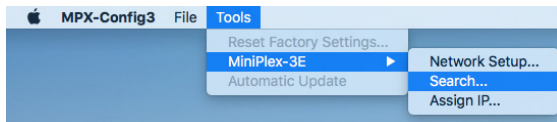
- b) From **Configure IPv4**, select **Manually**.
- c) From **IP Address**, enter a correct IP address, such as **192.168.70.1**. Make sure the third set of numbers is not used for another subnet.

- d) From **Subnet Mask**, enter **255.255.255.0**.
- e) From **Router**, enter the same numbers as for the IP address.

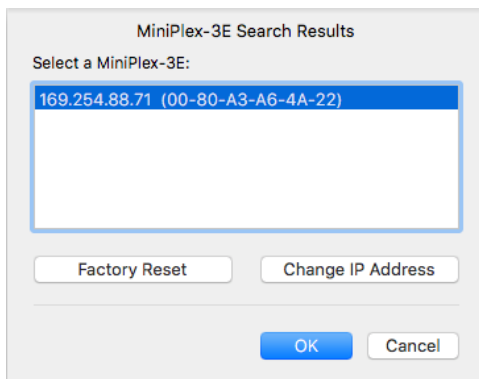


- f) Click **Apply**.

4. Open MPX-Config3 and from the toolbar click **Tools > MiniPlex-3E > Search**.

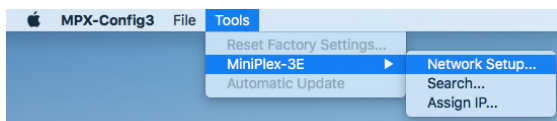


The multiplexer is displayed. Its IP address is also an auto-IP address that you need to change.



- Troubleshooting:** If the multiplexer is not displayed: wait for a few seconds, then try again. It may take a few minutes to recognize the auto-assigned IP address.

5. Select the IP address then click **OK**.
6. Click **Tools > MiniPlex-35 > Network Setup**.



- a) From **IP Address**, enter an IP address beginning by the same 3 sets of numbers as in the USB to Ethernet adapter IP address, such as **192.168.70.2**.

- b) From **Netmask**, enter **255.255.255.0**.
- c) From **Gateway IP**, enter the USB to Ethernet adapter IP address: **192.168.70.1**.
- d) Click **OK**.

The image shows the 'MiniPlex-3E Network Settings' dialog box. It has two main sections: 'IP Settings' and 'Protocol'. In 'IP Settings', the 'IP Address' is 192.168.70.2, 'Netmask' is 255.255.255.0, 'Gateway IP' is 192.168.70.1 (highlighted with a blue selection box), and 'Port Number' is 10110. In the 'Protocol' section, 'UDP' is selected with a radio button, 'UDP Mode' is set to 'Broadcast' via a dropdown menu, and 'Destination' is 255.255.255.255. At the bottom right are 'OK' and 'Cancel' buttons.

From the part **MiniPlex Connection**, the Host IP address is updated.

The image shows the 'MiniPlex Connection' dialog box. It contains three input fields: 'Port' set to 'UDP' (via a dropdown), 'Host' set to '192.168.70.2', and another 'Port' set to '10110'. A 'Connect' button is located at the bottom.

7. From **MiniPlex Connection**, click **Connect**.

If you have connected and correctly configured the baud speed of the device outputting NMEA data, you should see incoming NMEA messages.



## Multiplexer with Defined IP address

### About this task

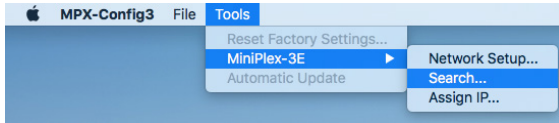
Do this task if:

- The multiplexer has already been given an IP address.

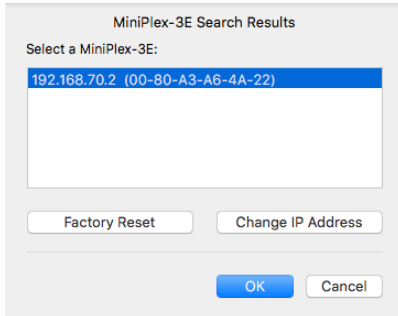
### Procedure


1. Connect the multiplexer to the computer using the USB to Ethernet adapter or to the Ethernet switch.

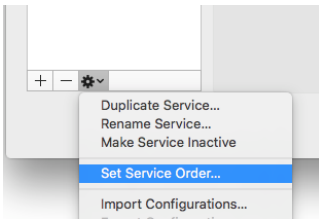
2. Open MPX-Config3 and from the toolbar click **Tools > MiniPlex-3E > Search**.



The multiplexer is displayed. You can see its IP address (192.168.70.2).

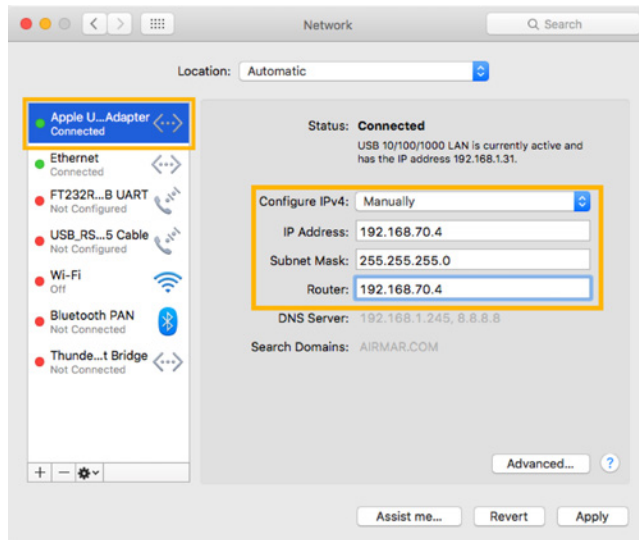


3. Click **Apple Menu**  > **System Preferences > Network**.
4. Check that the USB/Thunderbolt to Ethernet adapter is on top of the network list. If not, click the tooth wheel icon at the bottom of the list, select **Set Service Order** and drag USB/Thunderbolt to Ethernet adapter to the top.

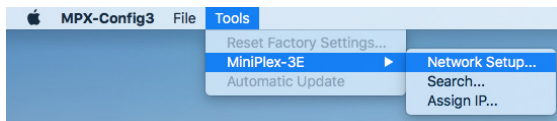


5. From the networks, click USB/Thunderbolt to Ethernet adapter:
  - a) From **Configure IPv4**, select **Manually**.
  - b) From **IP Address** enter an address belonging to the same subnet as the multiplexer.  
For example, if the multiplexer IP address is 192.168.70.2, enter an IP address such as 192.168.70.4.
  - a) From **Subnet Mask**, enter **255.255.255.0**.

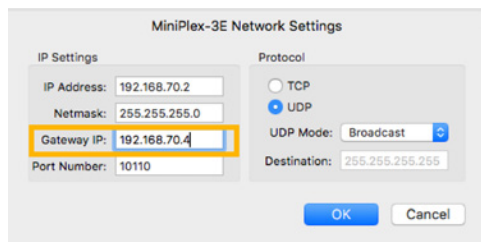
b) From **Router**, enter the same numbers as the IP address (in this example 192.168.70.4).



6. From MPX-Config3, click **Tools** > **MiniPlex-35** > **Network Setup**.



a) from Gateway IP, enter the IP address of the USB/Thunderbolt to Ethernet adapter (in this example 192.168.70.4).



b) Click **OK**.

**7. From **MiniPlex Connection**, click **Connect**.**

If you have connected and correctly configured the baud speed of the device outputting NMEA data, you should see incoming NMEA messages.



## Multiplexer Not Detected

### Before you begin

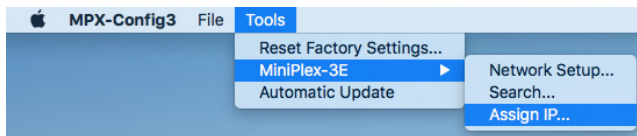
Make sure that your firewall does not block the multiplexer: from **System Preferences > Security & Privacy > Firewall** check that your firewall is off.

### About this task

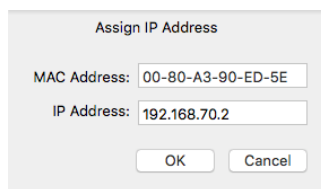
The multiplexer might not be detected because of a wrong configuration in the network settings, such as a duplicate or illegal IP address. You need to assign a new IP address to the multiplexer.

### Procedure

1. Click **Tools > MiniPlex-3E > Assign IP**.



2. From **Assign IP Address** dialog box:
  - a) Enter the MAC address of the multiplexer (see label on topside of multiplexer). Fields must be separated by dashes.
  - b) Enter a valid IP address.
  - c) Click **OK**.



Wait for the update process to complete (approx. 10 sec.).

3. You can now have access to the multiplexer settings through **Network Settings** dialog box.

## Configuring Inputs

You can configure the NMEA inputs of the multiplexer from MPX-Config3 software.

NMEA devices are connected to the multiplexer. See [NMEA Multiplexer Cabling](#) on page 46 for guidance.

- ❗ **Important:** Close Scala if open: MPX-Config3 software uses UDP channel to transmit and receive commands to the MiniPlex multiplexer. This channel needs to remain exclusive during the configuration of the multiplexer.
- ❗ **Important:** ShipModul multiplexer cannot read NMEA messages longer than the standard maximum length (82 characters), nor other format messages longer than 61 characters, nor Marelec messages. Use another multiplexer if this is your case.

You need to indicate the correct baud speed for each input so that the multiplexer can extract data and diffuse it correctly through all outputs.



## NMEA0183 Example

- Device 1 is a heading sensor with GPS at 4800 bauds.
- Device 2 is a warp length sensor module at 9600 bauds.

The multiplexer has to be set up the following way:

	Speed	Talker ID	To Output 1	To Output 2	Input Mode
In 1:	4800		<input type="checkbox"/>	<input type="checkbox"/>	NMEA
In 2:	9600		<input type="checkbox"/>	<input type="checkbox"/>	NMEA

As it is, the multiplexer will not output NMEA messages to Output 1 or 2. Only UDP output on port 10110 will be done.

If Device 1 and Device 2 emit the same type of data (e.g. temperature, position), give them a talker ID like the following image, in order to distinguish data between the two of them when they are received by Scala.

	Speed	Talker ID	To Output 1	To Output 2	Input Mode
In 1:	4800	AA	<input type="checkbox"/>	<input type="checkbox"/>	NMEA
In 2:	9600	BB	<input type="checkbox"/>	<input type="checkbox"/>	NMEA

The console will output the following messages:

```
$BBVTG,148.29,T,,M,0.19,N,0.35,K,A*22
$BBHDG,342.49,0.00,E,1.59,W*6E
$AAGGA,103257.580,4744.462,N,00324.315,W,1,07,2.20,45.67,M,50.80,M,,*5D
$BBZDA,103335.180,07,10,2016,,*4C
$BBROT,-0.05,A*3E
$AARMC,103257.580,A,4744.462,N,00324.315,W,0.09,123.99,071016,1.59,W,A*29
$AAHDG,342.49,0.00,E,1.59,W*6E
$BBGLL,4744.462,N,00324.315,W,103334.580,A,A*56
$AAZDA,103256.180,07,10,2016,,*48
$BBGGA,103334.580,4744.462,N,00324.315,W,1,09,1.10,46.46,M,50.80,M,,*57
$BBRMC,103334.580,A,4744.462,N,00324.315,W,0.29,158.49,071016,1.59,W,A*2E
$AAGLL,4744.462,N,00324.315,W,103257.580,A,A*52
$AAROT,-0.05,A*3E
$AAVTG,55.99,T,,M,0.09,N,0.16,K,A*14
```

You can see the talker IDs AA and BB at the beginning of the NMEA sentences.

On the multiplexer, the LED NMEA0183 blinks green.

## NMEA2000 Example

Device 3 is a WeatherStation WX220 from Airmar on NMEA 2000.

The multiplexer has to be set up the following way:

	Speed	Talker ID	To Output 1	To Output 2	Input Mode
In 1:	4800	AA	<input type="checkbox"/>	<input type="checkbox"/>	NMEA
In 2:	9600	BB	<input type="checkbox"/>	<input type="checkbox"/>	NMEA
In 3:	4800		<input type="checkbox"/>	<input type="checkbox"/>	NMEA
In 4:	9600		<input type="checkbox"/>	<input type="checkbox"/>	NMEA
NMEA 2000:		CC	<input type="checkbox"/>	<input type="checkbox"/>	
NMEA Conversions:			<input type="checkbox"/>	<input type="checkbox"/>	

The console will output the following messages:

```
$BBROT,2.81,A*1D
$AAHDG,342.49,0.00,E,1.59,W*6E
$CCHDG,342.58,0.00,E,1.59,W*6E
$CCGLL,4744.458,N,00324.312,W,092805.720,A,A*50
$CCGGA,092805.720,4744.458,N,00324.312,W,1,10,0.90,27.45,M,50.80,M,,*54
$CCRMC,092805.720,A,4744.458,N,00324.312,W,0.19,150.19,071016,1.59,W,A*26
$BBHDG,342.49,0.00,E,1.59,W*6E
$BBVTG,11.69,T,,M,0.09,N,0.16,K,A*18
$AAZDA,103308.180,07,10,2016,,*42
$CCMWV,256.99,R,0.58,N,A*31
$AAROT,3.95,A*19
$CCVTG,106.59,T,,M,0.09,N,0.16,K,A*2F
$BBGLL,4744.462,N,00324.315,W,103307.580,A,A*56
$BBGGA,103307.580,4744.462,N,00324.315,W,1,07,2.20,45.74,M,50.80,M,,*58
$CCMDA,29.82,I,1.010,B,25.40,C,,,,,,,,,,,,*2C
$BBRMC,103307.580,A,4744.462,N,00324.315,W,0.09,167.49,071016,1.59,W,A*20
$AAGLL,4744.462,N,00324.315,W,103307.580,A,A*56
$CCZDA,092806.320,12,10,2016,,*42
$AAGGA,103307.580,4744.462,N,00324.315,W,1,07,2.20,45.74,M,50.80,M,,*58
$CCROT,-35.63,A*08
$BBZDA,103307.180,07,10,2016,,*40
```

NMEA sentences from this device all begin by \$CC.


On the multiplexer, the LED NMEA2000 blinks green.

### Other formats

If your device outputs messages in other formats than NMEA, for example Rapp Marine or non-standard NMEA messages beginning by @: from **Input Mode**, select **Plain Text**.

	Speed	Talker ID	To Output 1	To Output 2	Input Mode
In 1:	38400	AA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
In 2:	38400		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
In 3:	38400	CC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	NMEA
In 4:	38400		<input type="checkbox"/>	<input checked="" type="checkbox"/>	NMEA
NMEA 2000:			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
NMEA Conversions:			<input type="checkbox"/>	<input checked="" type="checkbox"/>	

If you do not select **Plain Text**, messages will not be received by the multiplexer.

 **Note:** Messages in plain text longer than 61 characters will not be received by the multiplexer.


## Configuring Scala

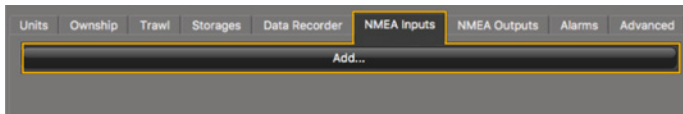
You need to configure Scala software to receive and display the NMEA data received on the multiplexer.

### About this task

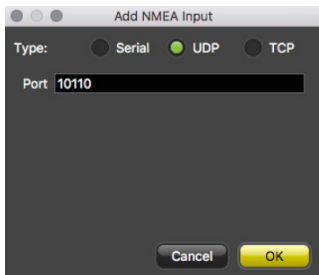
**Important:** You cannot use Scala and configure the multiplexer on MPX-Config3 at the same time: MPX-Config3 software uses UDP channel to transmit and receive commands to the MiniPlex multiplexer. This channel needs to remain exclusive during the configuration of the multiplexer.

### Procedure

1. Open Scala.
2. From the top left corner of the screen, click menu  > **Settings**.
3. From the tab **NMEA Inputs**, click **Add**.

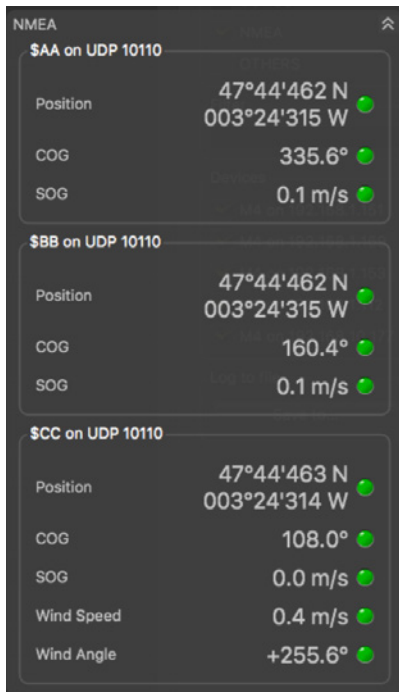


4. Select **UDP** and enter 10110 as port.



5. Click **OK**.

6. From the **Sensor Data** section of the control panels, under the tab **NMEA**, check the activity of data received.



If you gave talker IDs to the devices you configured on MPX-Config3, you can see that each device is identified by its talker ID (AA, BB and CC).

 **Note:** You need to give talker IDs to devices sending the same type of data, so that Scala can distinguish them.

# Servicing and Maintenance

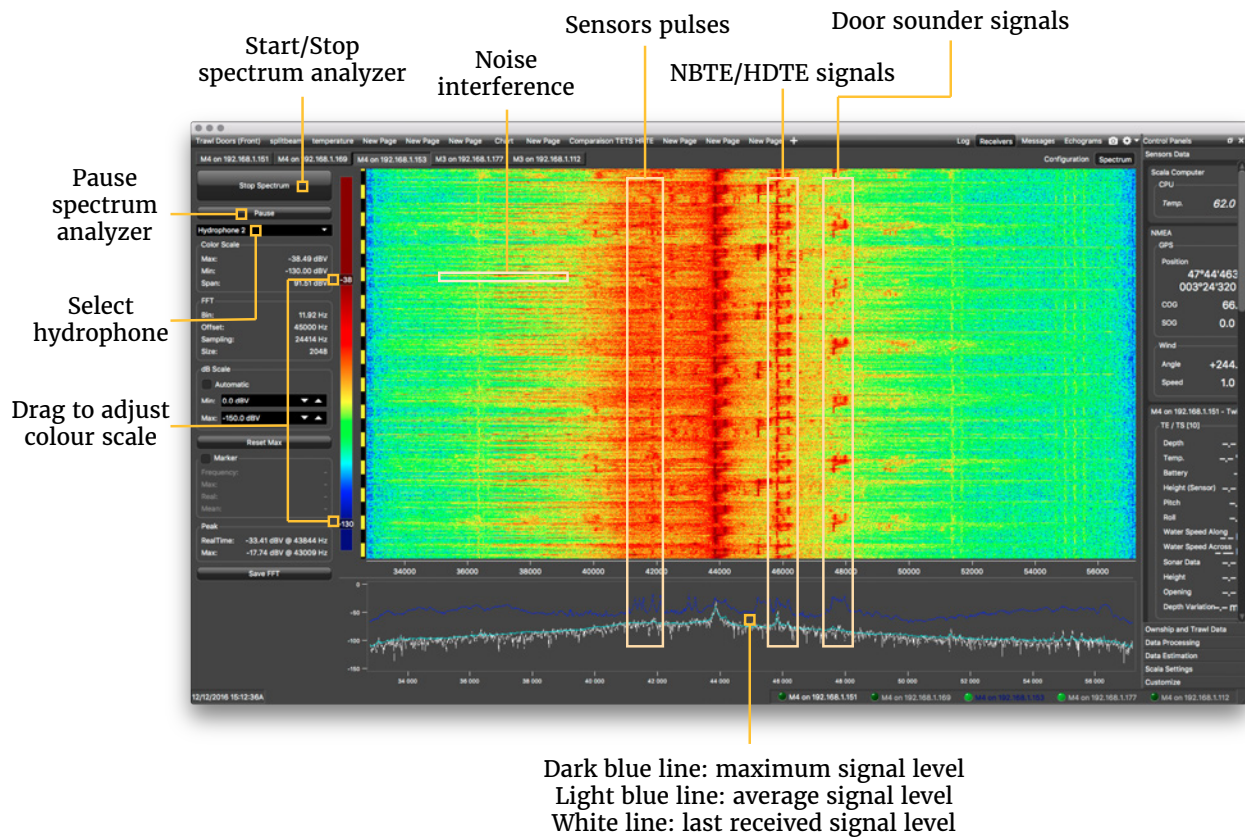
Read this section for troubleshooting and maintenance information.

## Interference Check

You can check if there is noise interfering with the reception of signals.

### Spectrum Analyzer Display

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



### Checking Noise Interference

You can use the spectrum analyzer to check the noise level of the hydrophones and check for interference.

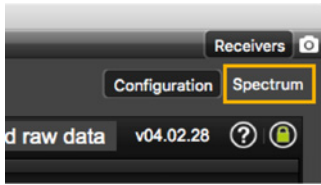
#### About this task

See **Spectrum Analyzer Display** above for details about the spectrum analyzer display.

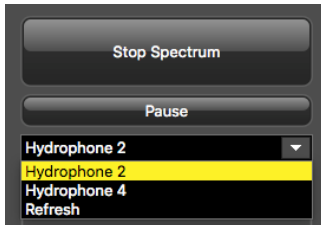
#### Procedure

1. From the top left corner of Scala window, click **Menu** > **Expert Mode** and enter the password **copernic**.
2. Again in the menu, click **Receivers**.

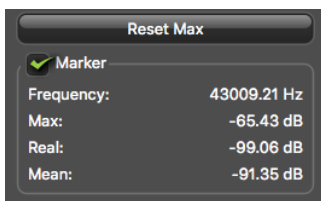
- From the top right corner of the screen, click **Spectrum**.



- From the top left corner of the screen, click **Start Spectrum**.
- Select the hydrophone you want to test. Only the hydrophones that are switched on are displayed. Select refresh to update the list.

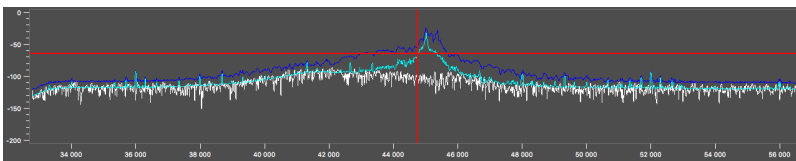


- To check the maximum, mean and real measures of noise level at a specific frequency, select **Marker** on the left side of the screen.



- Click the plot at the bottom of the screen to display the marker, made of two crossing red lines. Move your mouse over the plot to place the marker on a frequency.

The noise levels are displayed under the part **Marker**. Use the marker to see at which frequencies sensors are transmitting and at which frequencies the signal noise is higher. Look at the **Max** and **Mean** measures of the noise level.



The acceptable average level of noise depends on the conditions (distance from the sensor to the hydrophone, fishing method, type of hydrophone). You can have better performance with the following levels:

- Active wideband hydrophone with high/low gain: below -100 dBV
  - Active narrowband: NC-1-04 below -80 dBV / NC-1-07 below -100 dBV
  - Passive hydrophone: below -110 dBV
- Click **Reset Max** to reset the maximum value.
  - Check that there is more than 12dBV between the maximum noise level (dark blue line) and the average noise level (light blue line) on the peak of the sensor frequency.

10. Data displayed in **Peak** is the higher noise level coming from sensors signals and their frequency. **RealTime** is the last peak recorded, and **Max** is the highest peak since the spectrum is recording.
11. To save data recorded by the spectrum in a \*.txt file, click **Save FFT**.
12. When you have enough data, click **Stop Spectrum**.

## Troubleshooting

---

Learn how to solve common problems.

### Downloading a VMware Fusion license under version 10

You need to download a VMware Fusion PRO license but VMware Fusion website only sells version 10 licenses, that are not compatible with Mavericks, Yosemite, El Capitan or Sierra Mac OS.

 **Note:** Compatible VMware Fusion licenses are the following:

- Yosemite or Mavericks OS: Fusion 7 PRO
- Sierra OS: Fusion 8.5 PRO
- El Capitan OS: Fusion 8 PRO

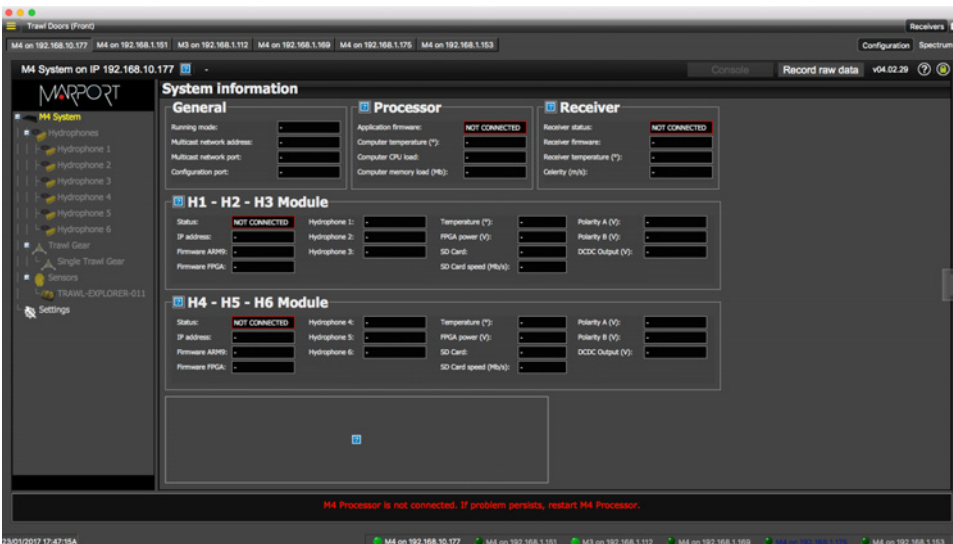
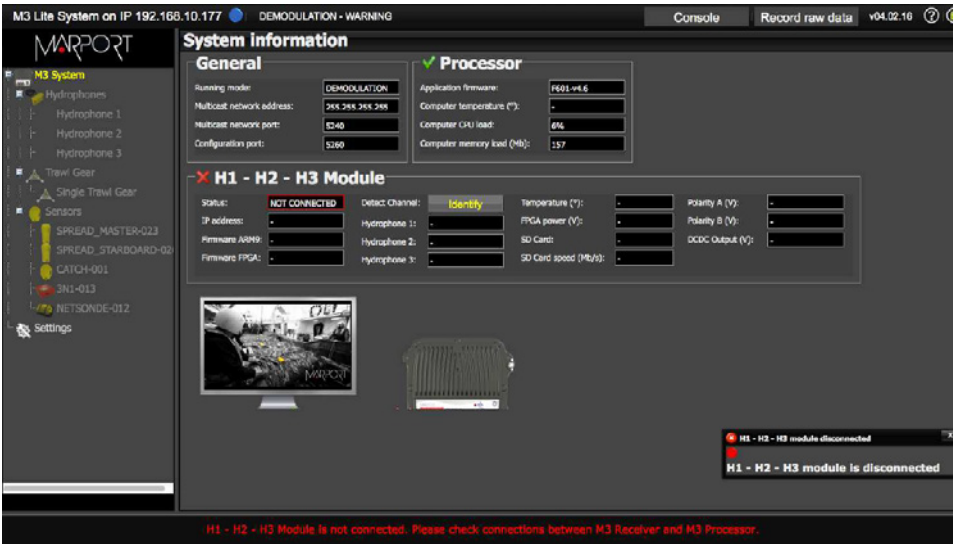
→ If you need to download a VMware Fusion license under version 10, you need to do a specific procedure because older versions are not sold anymore:

1. Buy a license for VMware Fusion 10.
2. Downgrade the license to the version you need.
3. Guidance can be found on VMware Fusion website: <https://kb.vmware.com/s/article/2006975>.

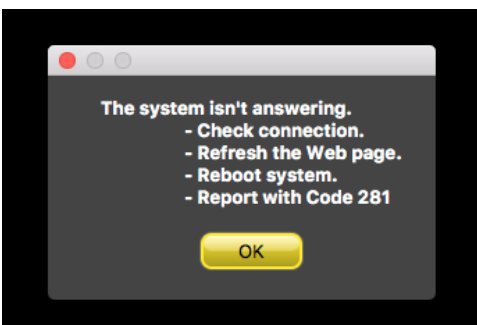


## Receiver page: hydrophone modules are disconnected / system not answering

The receiver page is displayed like one of the following ways:



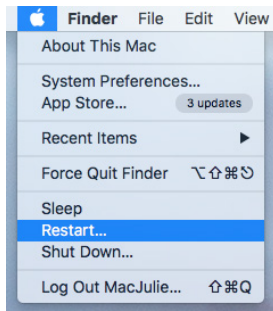
Or you have the following error message:



→ The computer cannot connect to the receiver. There might be an issue with the network or the virtual machine.

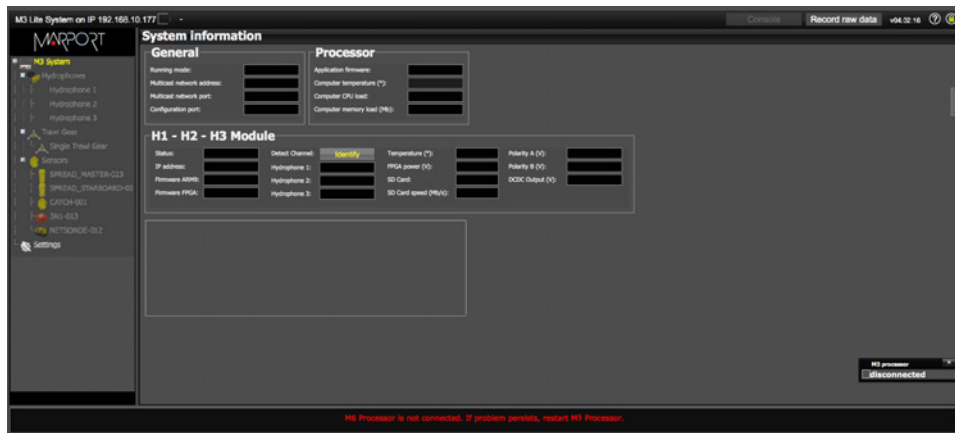


1. Check connections and refresh the page.
2. If the system still does not work, restart the computer.



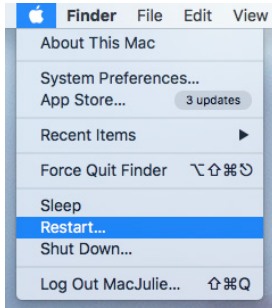
## Receiver page is empty

You do not receive sensor data anymore on Scala, and the receiver page looks like one of the image below:

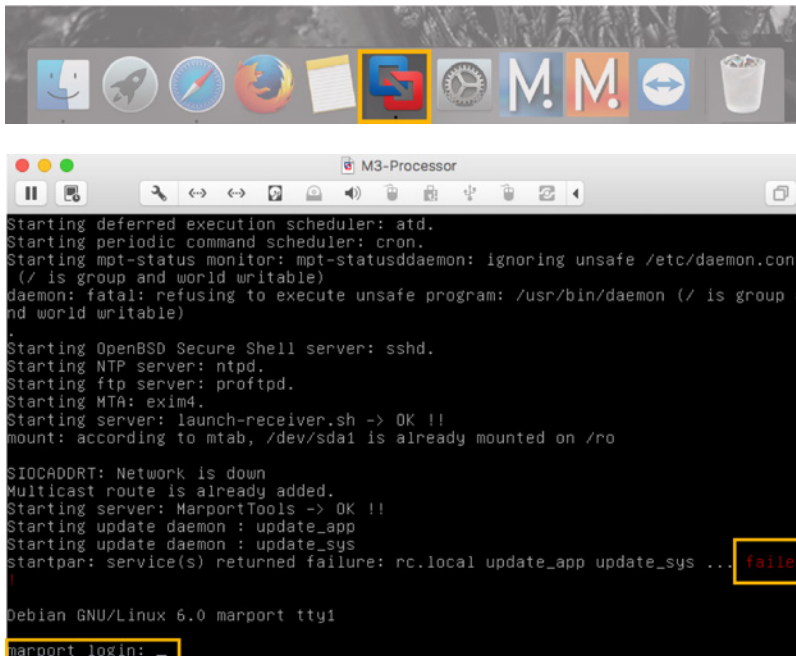



→ The virtual machine (VMware Fusion) is off.


1. Restart your computer.



2. When the computer is on, from the Dock, click VMware Fusion icon and check that there are command lines in the M3-Processor window.

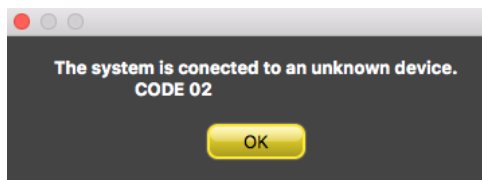


 **Note:** The prompt ending by **failed** does not impact the correct functioning, you can ignore it.

3. Click  to hide it. M3-Processor virtual machine must always be active, **never close this window**.
4. Check that you see the receiver page and data in Scala.

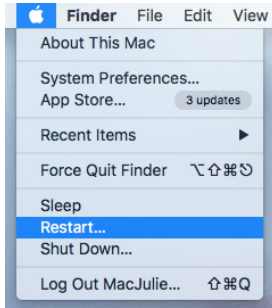
## Receiver page: code 02 error message

On the receiver page, you have the following error message:



→ The M3 receiver is not connected to the Mac mini.

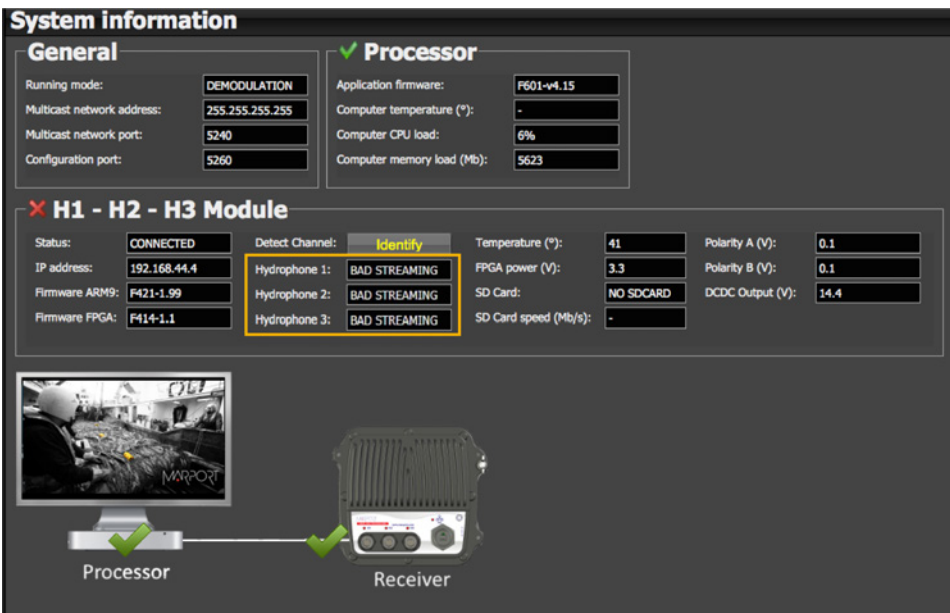
1. Restart the computer.



2. Check the cabling and connect the receiver according to cabling indicated in [Mac Mini Cabling](#) on page 15.

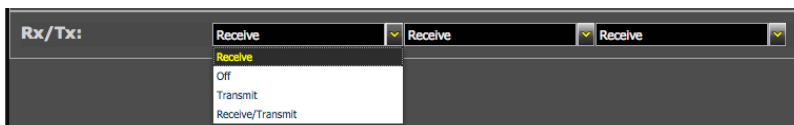
## Receiver page: hydrophones have bad streaming status

On the receiver page, one or several hydrophones have a BAD STREAMING status.



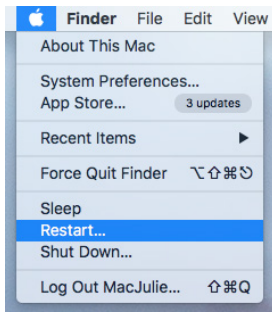
→ There is a communication issue between the M3-Processor and the receiver.

1. From the left side of the receiver page, click **Hydrophones**.
2. From **Rx/Tx**, click the drop-down menu and select again the correct hydrophone configuration (even if it is already selected).

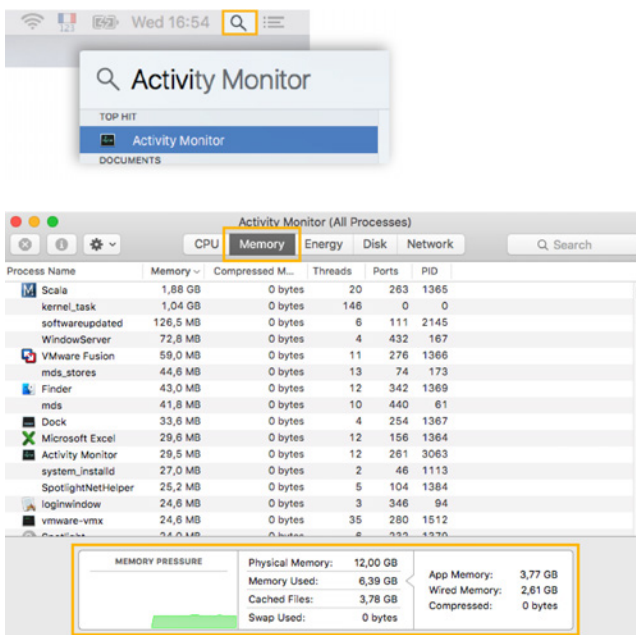


The software updates the hydrophone configuration.

3. Check the status of the hydrophones on the receiver page. If the status stays on **BAD STREAMING**, restart the computer.



4. It is also possible that another application is using too much memory resource on the computer. Open **Activity Monitor** and from the **Memory** pane, check how the memory is used. Close non-vital applications if needed.

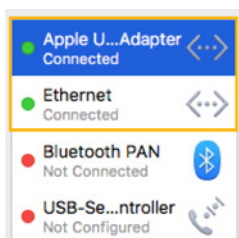


## No Internet Access

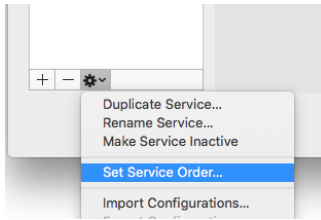
You cannot connect to the internet or see the system control panel page on Firefox web browser.

→ The order of the computer networks is wrong.

1. From the top left corner of the screen, click **Apple Menu** > **System Preferences** > **Network**.
2. Make sure that the network called **Apple USB Ethernet Adapter** is at the top of the list, then is followed by the network called **Ethernet**.

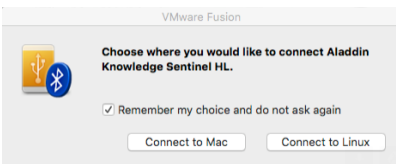



3. If not, to change the order click the tooth wheel icon at the bottom of the list and select **Set Service Order**.



## VMware Fusion Pop-Up Message

A VMware Fusion message appears when adding a new USB key.



- This message is due to the virtual machine (VMware Fusion) installed on the computer.
1. From the message box, select **Remember my choice and do not ask again**.
  2. Click **Connect to Mac**.
  3. If the M3-Processor window appears, click  to hide it. DO NOT close the M3-Processor window or you will have to reboot the system.

## Giving Remote Access to the Computer

---

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

### Before you begin

You need to have access to a good internet connection.

### Procedure

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



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

## Recording Audio Files

---

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

### Procedure

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

### Results

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

## Support Contact

---

You can contact your local dealer if you need maintenance on your Marport products. You can also ask us at the following contact details:

### FRANCE

Marport France SAS  
2, allée Copernic  
Espace Eureka, Parc technologique de Soye  
56270 Ploemeur, France  
supportfrance@marport.com

### SPAIN

Marport Spain SRL  
Camino Chouzo 1  
36208 Vigo (Pontevedra), Spain  
supportspain@marport.com

### ICELAND

Marport EHF  
Fossaleyni 16  
112 Reykjavik, Iceland  
supporticeland@marport.com

### USA

Marport Americas Inc.  
12123 Harbour Reach Drive, Suite 100  
Mukilteo, WA 98275, USA  
supportusa@marport.com

# Appendix

## Appendix A: Frequency Plan

When the system is installed, you can add sensors to it. It is important to carefully plan the setup of your sensors before adding them to the system. You can create a table with a list of frequencies and complete it when you add sensors.

### Boat & Channel Codes

This list shows the standard frequencies for PRP telegrams. When you configure boat codes, make sure to respect the correct interval between frequencies (see table above).


Codes		
BC/CH	Frequency	FID (Scanmar)
C-1/CH1	42833	45
C-1/CH2	41548	32
C-1/CH3	41852	35
C-1/CH4	40810	25
C-1/CH5	42500	42
C-1/CH6	43200	49
C-2/CH1	42631	43
C-2/CH2	41417	31
C-2/CH3	41690	33
C-2/CH4	40886	26
C-2/CH5	42300	40
C-2/CH6	43100	48
C-3/CH1	42429	41
C-3/CH2	41285	30
C-3/CH3	41548	32
C-3/CH4	40970	27
C-3/CH5	42100	38
C-3/CH6	43000	47
C-4/CH1	42226	39
C-4/CH2	41852	35
C-4/CH3	41417	31
C-4/CH4	41160	29



C-4/CH5	42700	44
C-4/CH6	43300	50
C-5/CH1	42024	37
C-5/CH2	41690	33
C-5/CH3	41285	30
C-5/CH4	41060	28
C-5/CH5	42900	46
C-5/CH6	43400	51
C-6/CH1	39062	3
C-6/CH2	39375	7
C-6/CH3	39688	11
C-6/CH4	40000	15
C-6/CH5	40312	19
C-6/CH6	40625	23
C-7/CH1	38906	1
C-7/CH2	39219	5
C-7/CH3	39531	9
C-7/CH4	39844	13
C-7/CH5	40156	17
C-7/CH6	40469	21

## Frequencies and intervals

The diagrams below show the bandwidth of the different types of Marport sensors and intervals you must respect when adding other sensors.

 **Note:** The bandwidth of wide band HDTE is 1200 kHz. Intervals are the same.

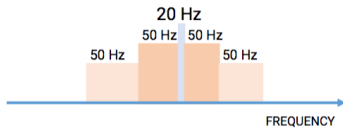


Figure 1: PRP sensors (e.g. Catch sensor, Trawl Speed, Spread sensor...)

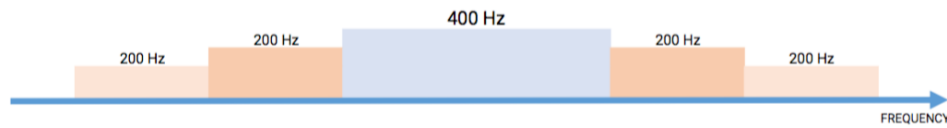


Figure 2: NBTE sensors (e.g. Speed Explorer, Trawl Explorer, Catch Explorer, Door Sounder)

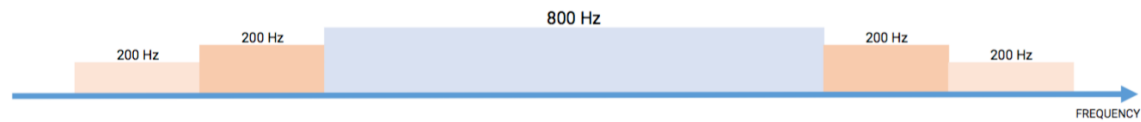
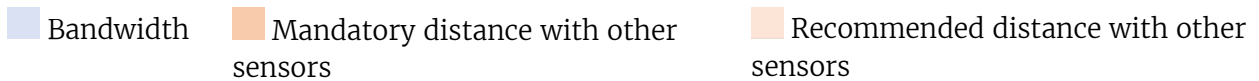


Figure 3: HDTE



### Examples of frequency allocations

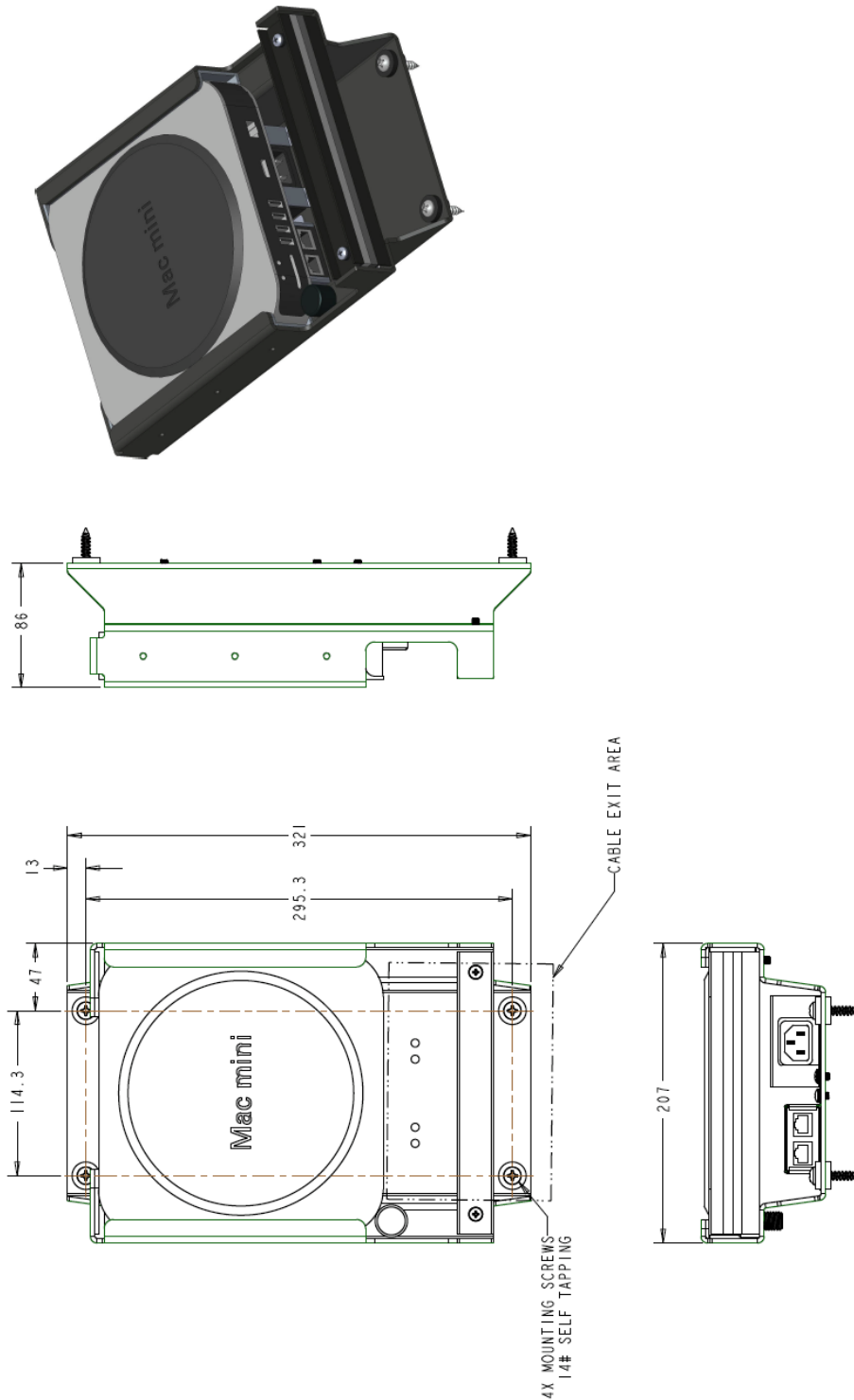
- We recommend to allocate frequencies between 37 and 52 kHz.
- Echo sounders are usually placed around 38 kHz, make sure to allow enough distance with them.



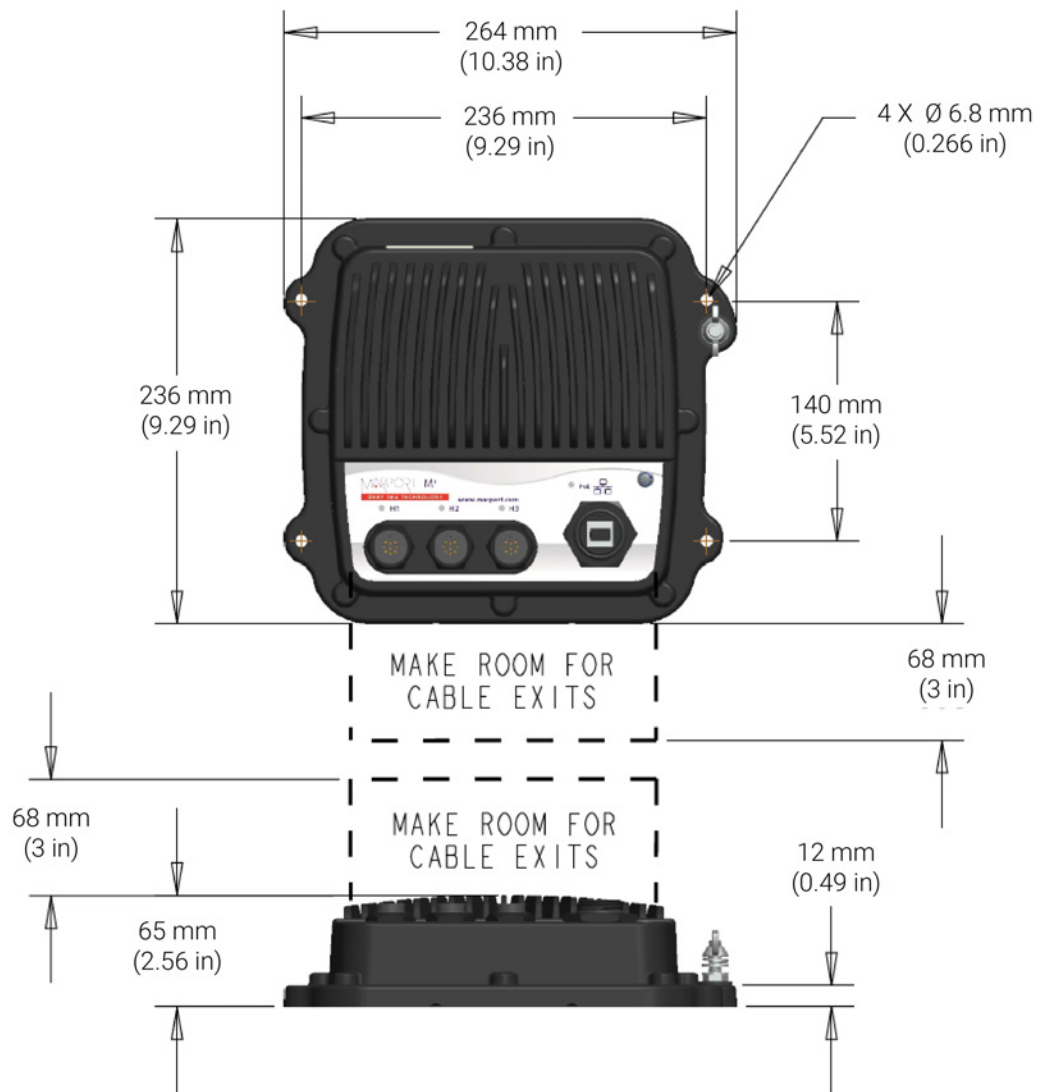
## Appendix B: Technical Drawings

Technical drawings of the components of the system.

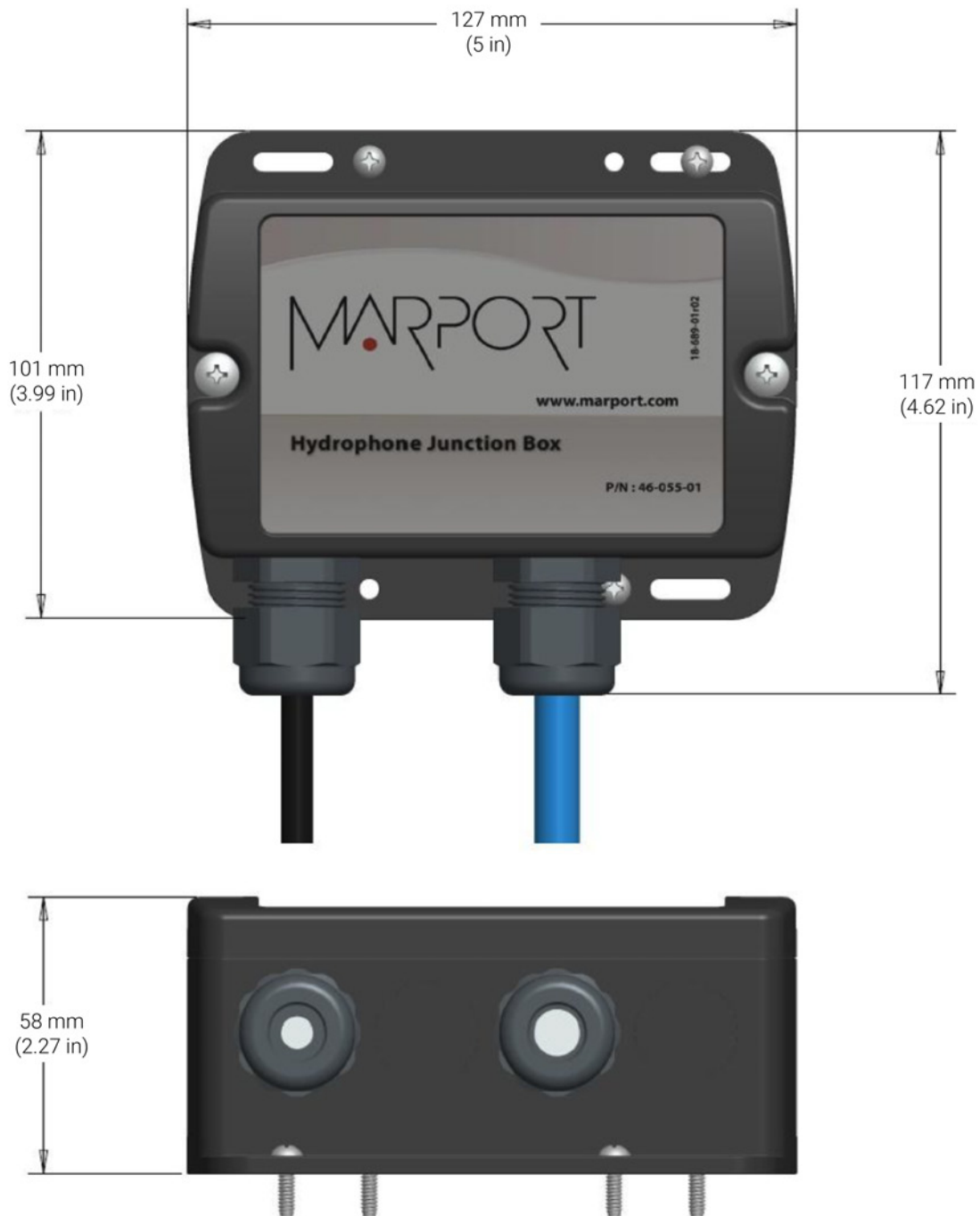
### Mac Mini Mounting Bracket Dimensions



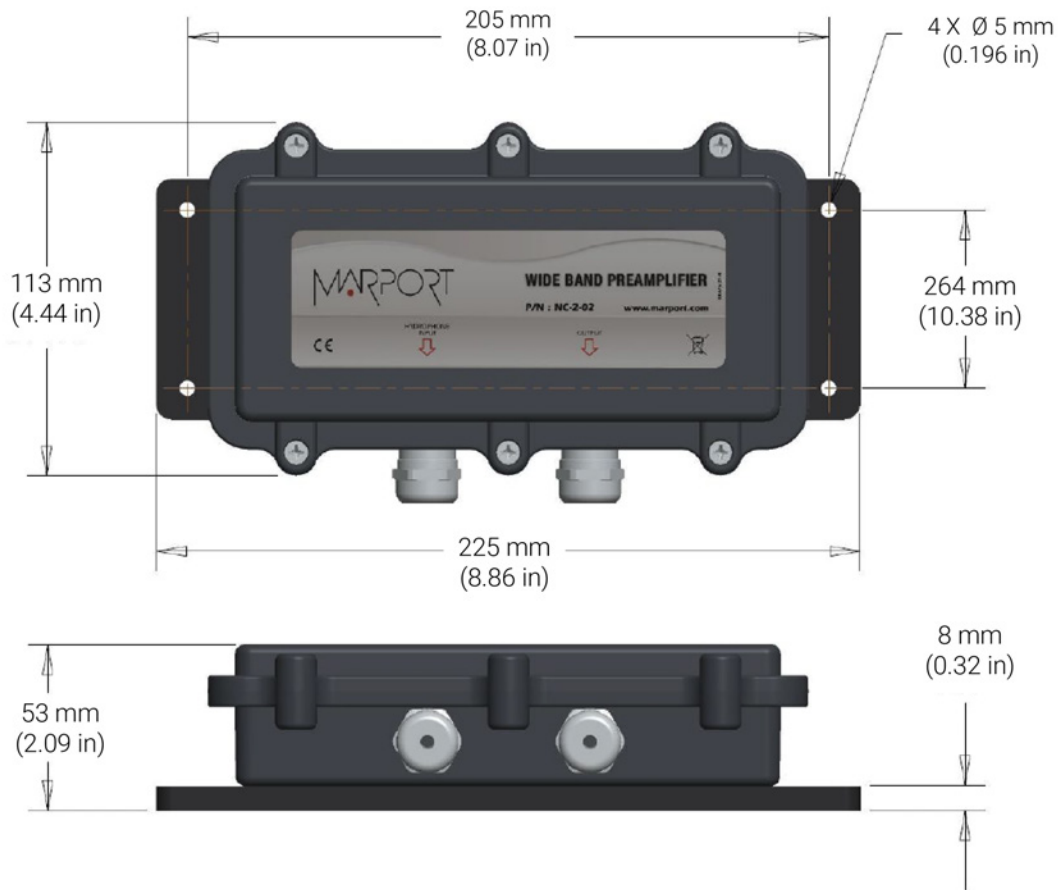
## Mx Receiver Dimensions



## Hydrophone Junction Box Dimensions

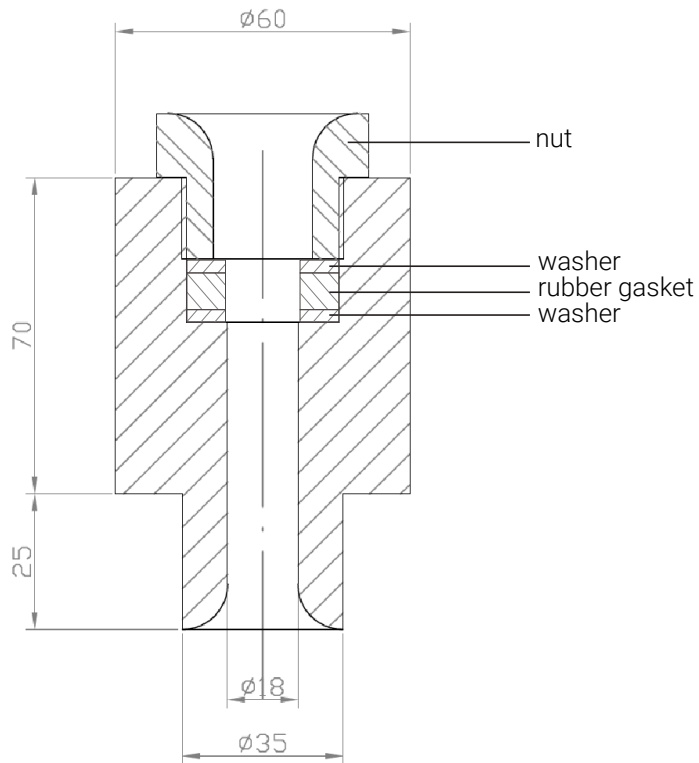


## Wideband Preamplifier Dimensions

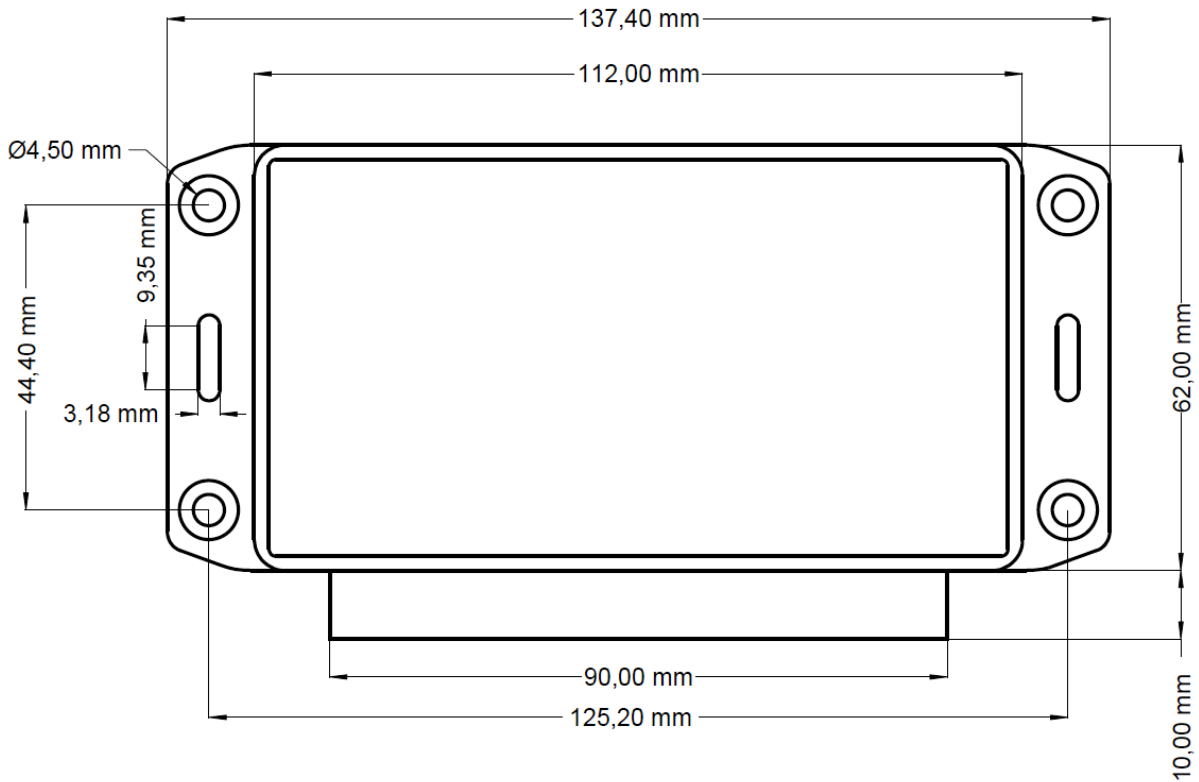




## Thru-Hull Penetration Dimensions



**NOTE:**  
ALL MEASUREMENTS ARE IN MILLIMETERS  
THE DRAWING IS NOT TO SCALE

**ShipModul MiniPlex NMEA Multiplexer Dimensions**

# Index

## B

Bad streaming 66  
Boat code 71

## C

Channel code 71  
Contact 70

## D

Data recording  
    Audio recording 69

## F

Frequency plan 71

## H

Hydrophone  
    Active 24  
    Cabling 19  
    Furuno 34  
    Passive 19  
    Passive with wideband preamplifier 20  
    Scanmar 30  
    Simrad PI 31  
    Types 16  
    Wideband active 25

## I

Internet  
    No access 67

## J

Junction box  
    Cabling 19  
    Dimensions 78

## K

Keyboard  
    Virtual 11

## M

Mac mini  
    Cabling 15  
    Installation 13  
Module is disconnected 63  
Mounting bracket  
    Dimensions 76  
    Installation 13  
MPX-Config3 45

## N

NMEA0183 46  
NMEA2000 46  
NMEA converter junction box 38  
NMEA multiplexer, *See* ShipModul MiniPlex multiplexer  
Noise Interference 60

## P

Parallel systems 36

## R

Receiver  
    Connecting to 38  
    Dimensions 77  
    Error message 63  
    H# LEDs 38  
    Installation 13  
    Lights 38  
    Not answering 63, 64  
    PoE LED 38

## S

Scala  
    NMEA inputs 58  
ShipModul MiniPlex multiplexer  
    Baud speed 55  
    Cabling 46  
    Dimensions 81  
    Inputs 55  
    Installing 48  
    NMEA0183 55

- NMEA2000 55
- Not detected 48
- Rapp Marine 55
- Search 48

## Software

- List 9

Spectrum 60

## System

- Architecture 8

- List of equipment 9

## T

TeamViewer 69

Technical drawings 76

Technical specifications 10

## Thru-hull

- Dimensions 80

## V

## VMware Fusion

- License under version 10 62

- Message connect to Mac/Linux 68

- OS compatibility 62

## W

## Wideband preamplifier

- Dimensions 79