# USER GUIDE V 4.1

## Overview

The wireless headset interface unit (WHI) will enable a Diving Supervisor to use a wireless telephone headset with most diver radio systems currently in use around the world. The WHI achieves this by providing wide range bi-directional gain adjustment control to the diver audio signal.

The MIC gain adjustment control tunes the headset microphone output to match the parameters of the diver radio microphone input.

The EAR gain adjustment control tunes the diver radio speaker output to match the parameters of the headset speaker input.

The WHI was developed using a Poly (formerly Plantronics) wireless headset designed for use with telephone systems only. Telephony wireless headset systems provide features that are very useful to the Diving Supervisor, such as microphone muting, long talk-time and call conferencing where multiple headsets are online simultaneously. The WHI will NOT work with a wireless headset designed for use with a personal computer, mp3 player, Bluetooth connection or any other multimedia audio device.

The WHI is designed and manufactured in Australia and has a one (1) year manufacturer's warranty.

Two models are currently available:

1. **Wireless Headset Interface (WHI v3.2)**

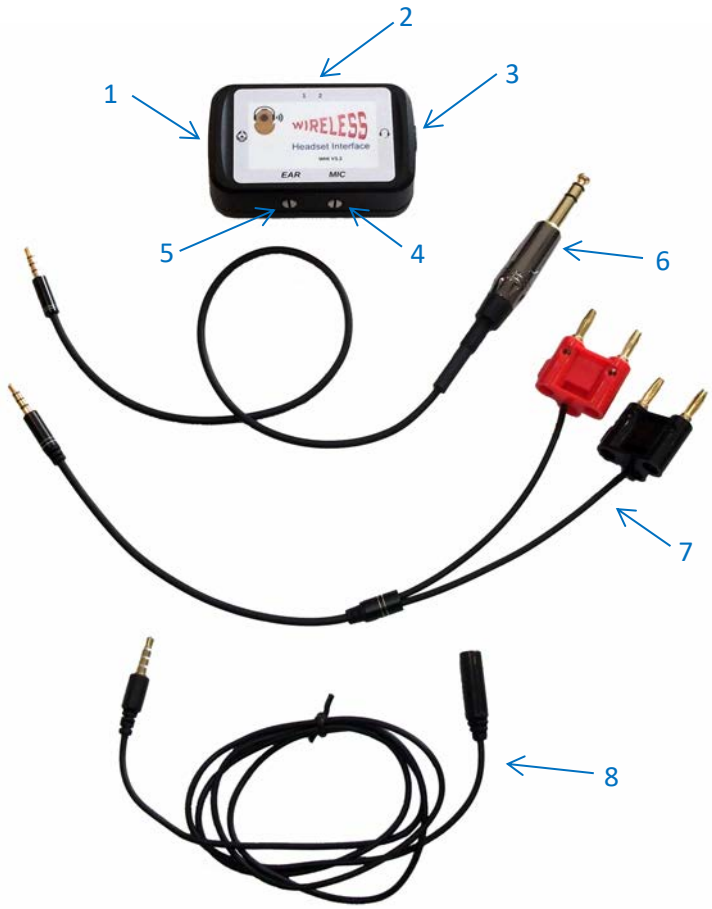
   - Classic WHI interface with upgraded adapter cables
   - Adapters for Amcom and Divex radios
   - No power or batteries required
   - Dimensions: 82mmL x 52mmW x 25mmH


2. **Wireless Headset Interface with integrated Wireless Press-To-Talk system (WHI-PTT v1.2)**

   - Classic WHI interface system
   - Wireless PTT switch system
   - 2 x wireless PTT remotes
   - Adapters for Amcom and Divex radios
   - Powered via wireless headset power supply
   - Dimensions: 100mmL x 100mmW x 35mmH

## WIRELESS HEADSET INTERFACE (WHI v3.2)

### Features and Controls




Wireless Headset Interface Kit

1. Diver radio adaptor jack, 3.5mm TRRS
2. Handset selector switch
3. Wireless headset cable jack
4. Headset MIC gain adjustment
5. Headset EAR gain adjustment
6. Divex radio adapter
7. Amcom radio adapter
8. Diver radio adapter extension cable, 1 metre

### A. Connect the WHI to the Wireless Headset

Assemble the Wireless Headset Interface and your Wireless Headset unit as per the pictures below. The 4-contact TRRS connectors can sometimes take a bit of effort to fully engage, so make sure the plug is firmly pushed in. The 1 metre extension cable can be used with all diver radio adapters if required. The wireless headset connector cable is supplied with the wireless headset.

Amcom Diver Radio - WHI Connection Diagram

Divex Diver Radio - WHI Connection Diagram

## B. Wireless Headset Configuration

*The volume controls on the diver radio and the wireless headset base unit are **fine** tune controls only for adjustments within each unit's specific operating range. The Wireless Headset Interface MIC and EAR gain controls provide **coarse** adjustment to match the operating range of the wireless headset to the diver radio in use.*

1. Connect your Wireless Headset to mains power and conduct the set up as per the manufacturer's instructions for use as a telephone (NOT computer or mobile phone). Ensure the wireless headset is fully charged. Do not try to set the base unit configuration switch yet – this is covered later.

   NOTE: *It is recommended that you set the wireless headset range to LOW to maximise battery life and talk time. Ensure your wireless headset is paired to the base unit (see headset User Guide). Installing **Plantronics Hub** (free download from Plantronics website) on your computer and managing your W8200/W8400 series wireless headset settings via Plantronics Hub is recommended.*

2. Set the controls on the Wireless Headset Interface as follows:
   a. Headset Selector Switch to **2** (Divex, Amcom & Fathom Digital Radios) or **1** (Nautronix Radios)
   b. MIC gain at half-way
   c. EAR gain at half-way

3. Connect the Wireless Headset to the Wireless Headset Interface, then to the Diver Radio as per the *Connection Diagram* above.

4. On the Wireless Headset base unit set the microphone and speaker volume controls (finger wheels) as follows (no base unit controls on Poly 8400 series onwards):

   | | | |
   |---|---|---|
   | Speaker Volume: | 3 | |
   | Microphone Volume: | 2 – 3 | Start on 2 and adjust up if audio to diver is a bit quiet. |
   | | | Adjust down to remove sound of your own voice in your ears. |

5. Switch on the diver radio and set all volume controls to half-way or mid-range. Ensure the diver radio speaker is off. On Nautronix modular radios, set the master volumes to about one-third or a bit lower.

6. If you are using the EQ-KIT graphic equaliser system (recommended for saturation diving), ensure you complete steps 6, 7 and 8 in the EQ-KIT User Guide for best headset audio performance.

7. Leave everything connected and on for about 5 minutes before continuing with the set up.

   *NOTE: When first using the WHI out of the box, or if it has been sitting idle for a long time (i.e. between offshore jobs) it will take a few minutes after it is connected and switched on for the WHI capacitors to become fully charged. If you find you can hear on the headset but the microphone doesn't work immediately, then it is most likely that the capacitors haven't properly charged yet.*

8. Set the wireless headset base unit configuration switch as per the following table:

| HEADSET | DIVER RADIO | | | |
|---|---|---|---|---|
| | Amcom | Divex | Fathom | Nautronix Modular |
| Plantronics Savi-Office 8400 Series | E | E | E | A |
| Plantronics Savi-Office 8200 Series | E | E | E | A |
| Plantronics Savi-Office W700 Series | E | E | E | A |
| Plantronics Savi-Office W300 Series | D | D | D | A |

9. If the configuration setting in the table above does not work, or you are using a headset that is not listed, you can manually determine the wireless headset base unit configuration setting as follows:

    a. Ensure power is on to the wireless headset and to the diver radio;
    b. Press the call control button on the headset to activate the audio link between the wireless headset and the base unit; then
    c. Switch the base unit configuration selector through all the switch settings (there may be 3 to 5 settings, depending on the brand of headset) and determine which one has the best send and receive audio quality. There will usually be one setting that has clearly the best quality audio. Some settings will not work at all and, in fact, there may only be one that does work.

    *NOTE: Once you have determined the configuration setting for the base unit once for a particular type of diver radio, you should never need to change it.*

## C. Tuning the Wireless Headset Interface Unit

Once you have completed the initial setup the WHI has to be tuned to match the diver radio. This will also need to be done when switching to a different brand of diver radio. Switching between different radios of the same make (i.e. different Amcom radios) should NOT require any adjustment.

1. Connect and switch on all components as above.
2. Ensure the audio link between the wireless headset and the base unit is active.
3. Set the WHI MIC and EAR gain adjustment both to minimum (fully counter-clockwise).
4. Slowly increase the WHI EAR gain adjustment until the audio level (diver's voice) in the headset speakers is just comfortable. DO NOT increase the gain any further.
5. Slowly increase the WHI MIC gain adjustment until the diver reports the audio level in the hat is good. DO NOT increase the gain any further.

*NOTE: The WHI gain settings required for an AMCOM diver radio will be approximately 20% to 35% for both MIC and EAR. Gain settings for a Divex diver radio should be much higher, approximately 80% to 90%.*

*You should not be able to hear your own voice in the headset speakers. If you can then the MIC gain is set too high. You can fine-tune both MIC and EAR gain using the headset base unit adjustment if the WHI gain is too coarse, but try to get it right with the WHI gain adjustment first.*

*Most modern telephone based wireless headset systems now contain "DECT" technology. This technology will limit unusually or dangerously high audio levels by clipping the high incoming and outgoing signals. Increasing the WHI gain settings above the minimum level required will result in the wireless headset clipping the audio signals. Both the divers and supervisors audio will then lose fidelity and the signal being*

*recorded by the "black box" and audio-out to the vessel will sound very artificial. The headset's noise-cancelling microphone will most likely not function correctly either.*

## WHI WITH INTEGRATED WIRELESS PRESS-TO-TALK SYSTEM (WHI-PTT v1.2)

### Features and Controls

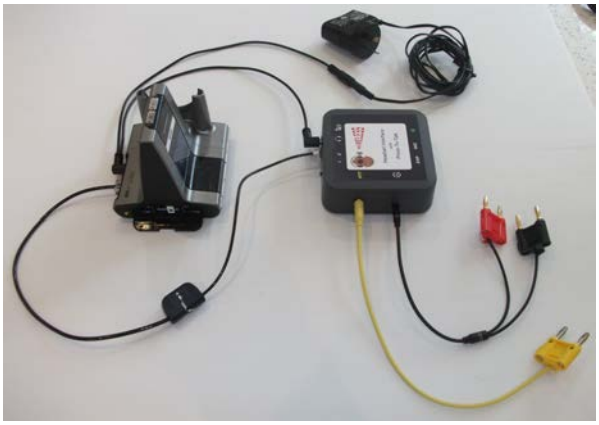

Wireless Headset Interface with Press-To-Talk Kit

1. WHI with integrated PTT system
2. 2 x wireless remote PTT switches
3. Divex radio adapter
4. Amcom radio adapter
5. PTT switch adapter
6. Headset power Y-splitter cable
7. PTT switch adapter extension cable, 1 metre
8. Diver radio adapter extension cable, 1 metre


1. Diver radio adapter jack 3.5mm TRRS
2. PTT adapter jack 3.5mm TS
3. Handset selector switch
4. Wireless headset cable jack
5. Power in jack (for PTT system)
6. Power ON indicator light
7. Headset MIC gain adjustment
8. Headset EAR gain adjustment

## A. Connect the WHI-PTT to the Wireless Headset & Diver Radio

1. Assemble the Wireless Headset Interface with PTT and your Wireless Headset unit as per the pictures below. The 4-contact TRRS connectors can sometimes take a bit of effort to fully engage, so make sure the plug is firmly pushed in. The 1 metre extension cable can be used with all diver radio adapters if required – only use the 4-contact TRRS extension cable with the diver radio adapter. The wireless headset connector cable is supplied with the wireless headset.



2. Connect the PTT adapter cable as shown to the PTT jack. If the PTT extension cable is required, only use this 2-contact TS cable with the PTT system.

   *NOTE: The diver radio adapter and PTT extension cables are NOT interchangeable.*

3. Connect the headset power Y-splitter cable to the headset power supply lead. Connect one plug to the wireless headset base and the second to the POWER IN jack on the WHI-PTT.

   *NOTE: Power is only required for the wireless PTT switch function. The WHI only system does not require power.*

## B. Wireless Headset Configuration

The process for configuring the Wireless headset is the same for the WHI-PTT as for the WHI. See section **B – Wireless Headset Configuration** above.

## C. Tuning the Wireless Headset Interface Unit

The process for tuning the Wireless Headset Interface with PTT is the same as for the WHI. See section **C – Tuning the Wireless Headset interface Unit** above.

## D. Using the wireless PTT function

1. The WHI-PTT is supplied with two wireless PTT switches, with one as a spare. The wireless PTT switch is a momentary switch, which must be pressed and held whilst talking – just like the diver radio and Shure mic PTT switch.

2. The wireless PTT function requires power to be supplied to the WHI-PTT via the supplied Y-splitter connected to the wireless headset power supply as shown above. POWER On is indicated when the power light on the front of the WHI-PTT is glowing GREEN.

3. The wireless PTT switches and WHI-PTT are coded the same and are pre-paired. The pair code can be found on the underside of the WHI-PTT and inside the cover of the wireless PTT switch as shown in the diagram.

4. The PTT function is not required when diver comms are operating on 4-wire. However, if the diver-3 or bell comms are wired as 2-wire, then the wireless PTT function can be used to talk to the divers instead of using a wired PTT switch or hand-held microphone.

5. 2-wire diver comms can now be operated fully wireless by using a wireless headset together with the wireless PTT switch when talking to the divers.


**WHI-PTT wireless code**

## E. Wireless PTT Switch Battery

1. The WHI-PTT remote switch uses a CR2016, 3v lithium coin battery.

2. The battery can easily be changed by opening the remote cover by inserting a small flat head screwdriver between the casings in the middle of the long edge of the remote. The cover will pop open quite easily.


## F. Pairing the Wireless PTT Switch

1. The WHI-PTT remote switch can be paired and un-paired as the internal WHI-PTT remote switch system is a learning switch. The WHI-PTT is supplied with both remotes already paired.

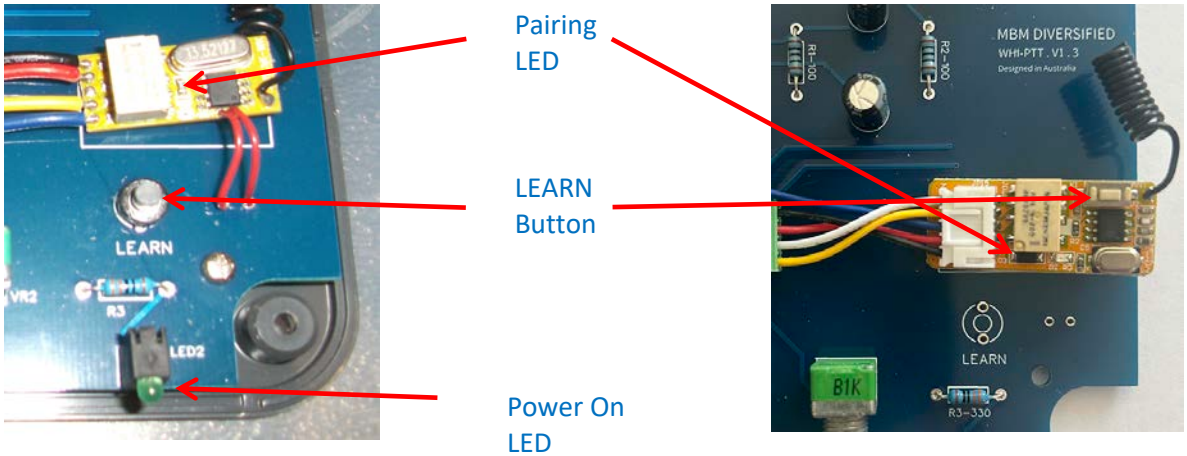
2. The remote PTT switch system operates on 433MHz and is pre-programmed to MOMENTARY, meaning that the switch must be held down while talking.

3. The remote PTT switch operation is virtually instantaneous and has no noticeable delay when opening the MIC circuit to talk to the divers.

4. If the supplied remote switches are lost or stop working, they can be replaced with any other 433MHz single button remote switch. The new remote switch must be paired to the WHI-PTT before it can be used.

5. To access the **LEARN** button:

   - Remove the 4 x rubber feet from the bottom of the WHI-PTT case by pulling them out with your fingers.
   - Using a small/jewellers phillips (star) head screwdriver, remove the 4 screws from each of the screw holes.
   - Carefully remove the top cover and 2 x side panels from the WHI-PTT to expose the PCB.
   - Locate the **LEARN** button in the bottom right hand corner of the PCB, as shown in the photos (newer PCB's have the LEARN button on the remote switch mini-PCB).
   - Supply power to the WHI-PTT by plugging the wireless headset power supply cable into the WHI-PTT **POWER IN** jack. The green Power On LED will illuminate.




Older Wireless Switch

Newer Wireless Switch

6. **<u>To clear the existing learned codes from the WHI-PTT switch</u>:**

   - Press **LEARN** button and hold for 8-10 seconds, until **Pairing LED** switches **ON**.
   - Once **Pairing LED** switches **OFF**, release **LEARN** button.
   - All remotes are now unpaired from the WHI-PTT switch.

7. **<u>To pair a new remote to the WHI-PTT switch</u>:**

   - Press **LEARN** button once.
   - When **Pairing LED** comes **ON**, press remote PTT button for 1-3 seconds, then release.
   - Wait until **Pairing LED** flashes 3 times, then remote is paired. This should only take a few seconds.
   - To test the operation of the newly-paired remote PTT switch:
     - Press and hold the remote PTT button as if talking to the divers. The WHI-PTT switch should **CLICK once to MATE** and the **Pairing LED** will slow flash once.
     - Release the remote PTT button. The WHI-PTT switch should **CLICK once to UN-MATE** and the **Pairing LED** will slow flash twice.
   - Repeat to pair a second or third remote.

8. Replace the WHI-PTT cover by following the steps in paragraph 3 above, in reverse order.
   - DO NOT overtighten the screws as they are being tightened into plastic retainers and can easily be stripped.
   - Ensure that the side panels are properly lined up with the grooves in the base and the jacks, prior to replacing the cover.

## Custom Adapter Wiring Instructions

If your diver radio has a unique jack which is not compatible with those supplied with the WHI, then please let me know your requirements and I can custom wire one for you.

I recommend you purchase a spare 3.5mm TRRS (4-contact) MALE-MALE or FEMALE-FEMALE cable (like the Diver Radio Adapter Extension Cable) and keep it with your WHI. If you find a diver radio that you do not have an adapter for, you can split this spare cable and make one up on site. If you need to do so, just contact me and I will email you the wiring diagram.

## Nautronix Diver Radios

Newer modular style Nautronix diver radio's use a unique 4-contact jack for the headset connection in the Tender Module.

An attenuating adapter is available to fit the Nautronix Modular Diver radio system and can be purchased in the WHI Online Store. This attenuating adapter assists with tuning the WHI to match the custom input/output of the Nautronix Tender Module. The Nautronix Modular Adapter (NMA) will work with both WHI models.

Nautronix Modular Adapter - WHI Connection Diagram

Make sure the master volume controls on the Nautronix radio are set very low (about 1/3 or less) when using the wireless headset interface. The Nautronix system is quite sensitive compared to other radios, so just make fine adjustments to the Nautronix master volumes until you get it right.

You may also need to change the Handset Selector Switch on the WHI to 1. This varies from radio to radio, so just try on 2 first and then switch to 1.

## Fathom Digital Diver Communication System

Fathom Digital Comms Adapter

A custom adapter is available to fit the Fathom Digital Diver Communication System and can be purchased in the WHI Online Store. The Fathom Digital Diver Communications Adapter (FDA) connects to the HEADSET jack on the front of the Fathom Systems Digital Communications System and provides connections for the WHI and also for a Press-To-Talk (PTT).

See the connection procedures below.

| | OPERATORS CONTROL PANEL V1 & 2 | OPERATORS CONTROL PANEL V3 |
|---|---|---|
| **1** | HEADSET jack location to connect FDA:<br>  | HEADSET jack location to connect FDA:<br>  |
| **2** | Select **HEADSET** as input and output on the **Supervisor Channel Adjustment** screen:<br>  <br>Select "**Audio Path is Headset**".<br>Adjust volumes to mid-level initially. | Select **OCP WIRED HEADSET** as input and output on the **Supervisor Channel Adjustment** screen:<br>  <br>Select Supervisor Microphone to Use to: **OCP Wired Headset.**<br>Set Supervisor Output(s) to use to: **OCP Wired Headset.**<br>It is not recommended to enable **OCP Front Speaker** or **External Panel Speaker** unless there is a specific reason to do so, or unless the Supervisor Headset is far enough away. Keeping the two external speakers disabled will assist in preventing feedback through the Supervisor Headset MIC.<br>Adjust volumes to mid-level initially. |
| **3** | Follow the procedures in **Tuning the Wireless Headset Interface Unit** above. | |
| | The PTT function will not be available if using the WHI, unless a PTT switch is connected to the yellow 3.5mm TS male connector on the FDA.<br>If using the WHI-PTT, connect the yellow 3.5mm TS male connector on the FDA to the PTT jack on the WHI-PTT. Wireless PTT operation via the WHI-PTT wireless remote will now be available.<br>Note that if diver and bell comms are connected as 4-wire, with open MIC between divers, bellman and supervisor, then the PTT function will not be required. | |

## Suitable Wireless Headsets

The Wireless Headset Interface was developed using Plantronics Savi-Office 2.4GHz wireless headsets. Audio quality with these units is excellent. Plantronics has now been re-branded as Poly.

Sennheiser headsets have also been trialled and audio quality was found to be not quite as good as the Plantronics units. This is mostly due to the Sennheiser units having less configuration settings available for variable microphone type emulation.

Bluetooth headsets (such as the Plantronics Voyager) have been trialled and found to not be suitable. Bluetooth uses audio compression and decompression technology, which causes audio transmission delay (high audio latency) and "echo" issues in the wireless headset earphones.

Other brands may also be suitable, but have not been trialled.

Any Poly (formerly Plantronics) headset unit designed for use with telephony systems should be suitable, such as:

***Plantronics Savi-Office W700 Series***

***Plantronics Savi 8200 UC Series (released in Q2, 2019)*** – replaces the Savi W700 series.

***Poly Savi 8400 UC Series (released in Q2, 2024)*** – replaces the Savi 8200 series. Headset is the same as the 8200 series and only the base unit has been updated.

*The Savi 8200 & 8400 series offers the following advantages:*

- *Higher fidelity headphones (20kHz) than the Savi w700 series (6.8kHz) and therefore should have higher quality audio in the supervisor's headphones.*
- *Longer battery life – 13 hours versus 9 hours.*
- *Active Noise Cancelling (ANC).*
- *Conferences with Savi w700 and w350 series headsets.*
- *Headset settings are very customisable via management software (**Plantronics Hub**) that can be installed on a Windows or Mac laptop.*

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## Thank you for purchasing the Wireless Headset Interface

Check out the website www.diverwireless.com for more information.

If you have any questions, feedback or need advice on setup or wiring configurations, I can be contacted as follows:

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