USER GUIDE V 3.3

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.

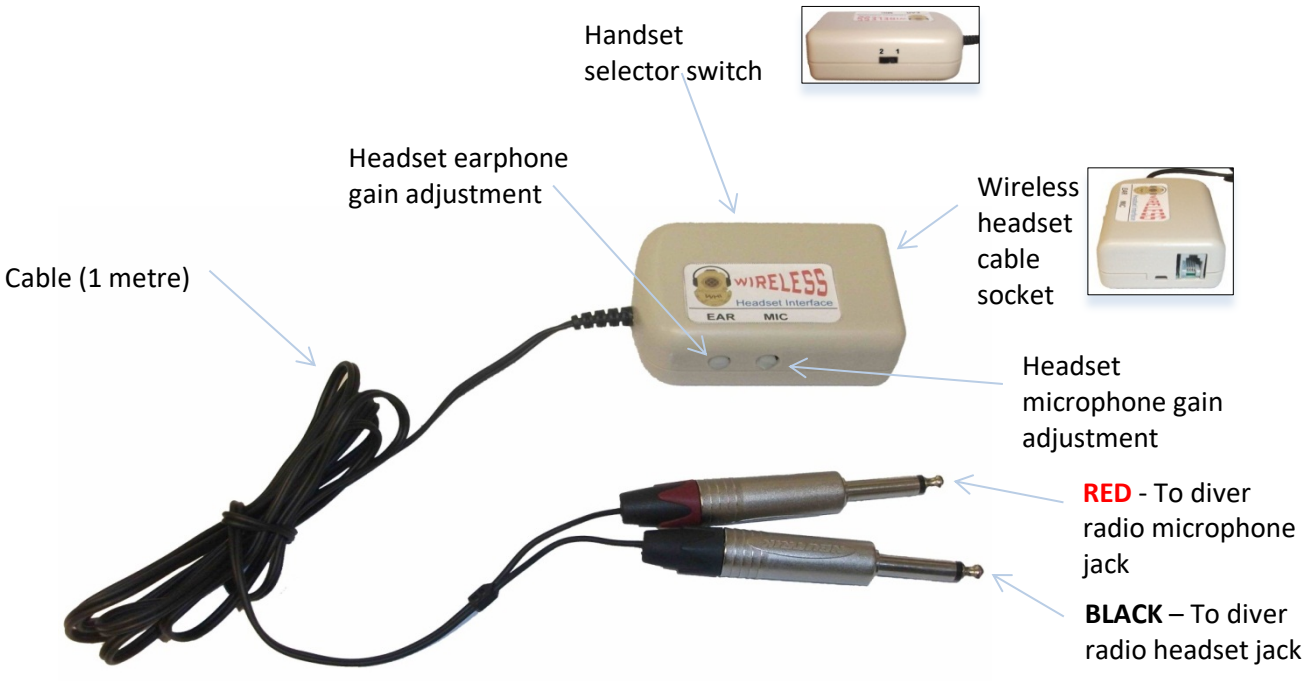
The WHI has isolation circuitry to prevent audio interference (e.g. ground loop) and to protect the wireless headset unit from damage caused by problems in diver audio circuits (e.g. poor shielding, feedback, short-circuits).

The WHI was developed using a 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. It will NOT work with a wireless headset designed for use with a personal computer, mp3 player or any other multimedia audio device.

The WHI does not require any external power or batteries.

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

Features and Controls



Components

The Wireless Headset Interface is supplied with the following components:

Wireless Headset Interface

The WHI is fitted with 2 x ¼" TRS mono male plugs (1/8" or 3.5mm from late-2017 onwards). These plugs will connect directly to Helle and some older Nautronics diver radios.

Banana Plug Adapters

¼" TRS mono female jack (1/8" or 3.5mm from late-2017 onwards) to twin banana plug adapters to fit radios with banana plug inputs, such as Amcom and DTS radios.

3-Wire Y-Adapter

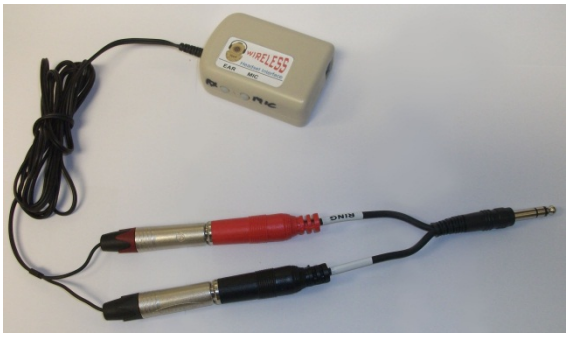
Twin ¼" TRS female mono plugs (1/8" or 3.5mm from late-2017 onwards) to a single ¼" TRS male stereo jack to fit radios with 3-wire supervisor headset jacks, such as Divex radios.

Connection Diagram

1. Assemble the Wireless Headset Interface and your Wireless Headset unit as per the picture below:

2. Check the dive radio jacks and determine what adapters you will need. Connect the appropriate dive radio adapters to the WHI's ¼" TRS (1/8" or 3.5mm from late-2017 onwards) male plugs (if required). Connect RED to RED (microphone) and BLACK to BLACK (headphone). *Helle and some older Nautronics dive radios will accept the two ¼" TRS male plugs and will not require adapters.*

Banana Plug Adapter



3-Wire Y-Adapter

Initial Set Up (first use)

NOTE: 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 range to LOW to maximise battery life and talk time. Ensure your wireless headset is paired to the base unit.*

2. Set the controls on the Wireless Headset Interface as follows:
   a. Headset Selector Switch to **2** (this switch should always be set to 2)
   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* Steps 1 and 2 above.

4. On the Wireless Headset base unit set the microphone and speaker volume controls (finger wheels) as follows:

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 charged yet.

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

HEADSET	DIVER RADIO		
	Amcom	**Divex**	**Nautronix Modular**
Plantronics Savi-Office W300 Series	D	D	A
Plantronics Savi-Office W700 Series	D or E	D or E	A
Plantronics CS500 Series			

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.

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 near minimum for both MIC and EAR. Gain settings for a Divex diver radio should be much higher.*

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.

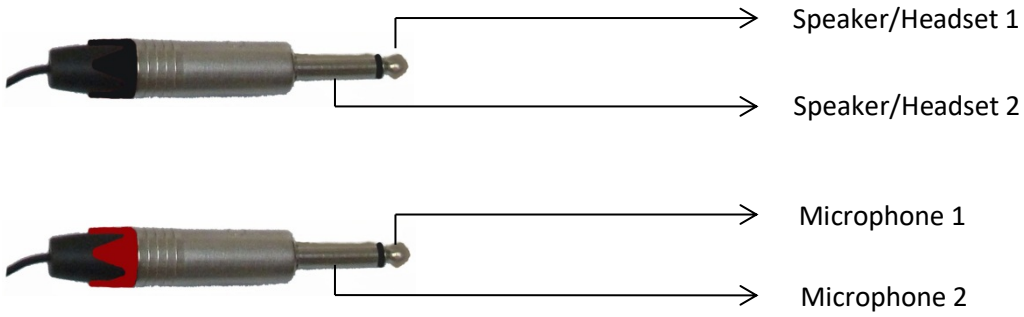
Custom Adapter Wiring Instructions

If your diver radio has a unique jack which is not compatible with those supplied with the WHI, then you (or the Electrical Tech) can make one up to suit. Just make sure you travel with two spare ¼" TRS mono female jacks (1/8" or 3.5mm from late-2017 onwards) so you can make it up without cutting the WHI cables. They are available for a few dollars each from your local electronics store (e.g. Jaycar in Australia, Sim Lim Square in Singapore).

The diver radio supervisor headset input will be either a 4-wire or a 3-wire configuration.

4-WIRE

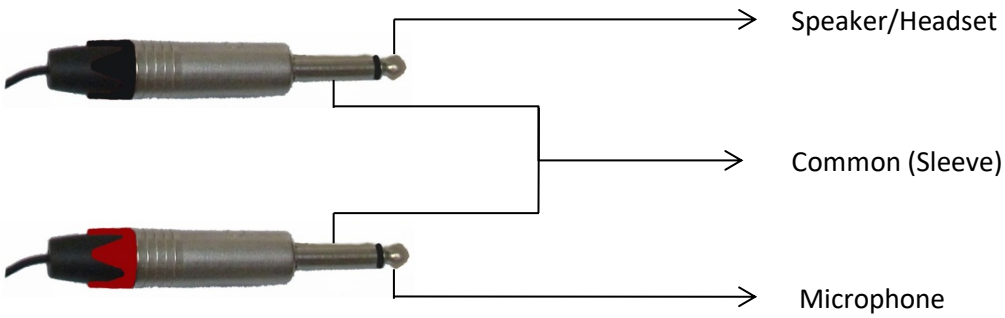
A 4-wire configuration has 2 dedicated wires for the headset speakers and 2 dedicated wires for the microphone.



3-WIRE

In a 3-wire configuration, one of each of the microphone and speaker wires are joined to become a “common” wire. It doesn’t matter which of the two are joined as long as it is one speaker and one microphone wire. The microphone and speaker are then left with one dedicated wire each.

You will need to determine which of the pins or contacts in the diver radio jack correspond to MIC, EAR and COMMON respectively. Check the user manual or get the Electrical Tech to figure it out if you are not electronically minded.



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 Online Store. This attenuating adapter assists with tuning the WHI to match the input/output of the Nautronix Tender Module.

WHI with Attenuating Nautronix Adapter

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.

Suitable Wireless Headsets

The Wireless Headset Interface was developed using a Plantronics Savi-Office WO350 headset unit. Audio quality with this unit is excellent. This headset has now been superseded by the Plantronics Savi w700 series headset.

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.

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

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

Plantronics Savi-Office W700 Series – recommended system.

Plantronics CS500 Series – this unit is known to have some issues when used with Amcom diver radios and is not recommended if you are likely to use this diver radio.

Plantronics Savi 8200 Series (released in Q2, 2019) – replaces the Savi W700 series. **This system has not yet been tested with the Wireless Headset Interface.**

Plantronics have just released a new model Savi 8200 series which has a higher specification headset. Given that the Savi 8200 series replaces the Savi w700 series and works on 2.4GHz wireless technology (and not Bluetooth), it should work fine but I cannot yet guarantee it.

The Savi 8200 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 that loads onto a laptop computer.*

As I have not yet trialled this headset, I could not offer advice on the optimum settings. It is unlikely that I will have more feedback on the new Savi 8200 series until sometime in 2020.

Version Update

The WHI's shipped since late-2017 are fitted with 1/8" or 3.5mm jacks and plugs instead of the original ¼" or 6.3mm.

If you purchase the Nautronix Modular Adapter at a later date, make sure you make a note of which size you require.

The WHI Graphic Equaliser Add-on Kit (EQ-KIT) is sold with adaptors to fit both the ¼"(6.3mm) and 1/8"(3.5mm) jacks.

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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