



WIRED-WIRELESS TECHNOLOGY ALLOWS YOU TO SWITCH SEAMLESSLY FROM ONE COMMUNICATION MODE TO THE OTHER. CONNECT THE HELMET VIA NEXUS FOR WIRED MODE AND DISCONNECT IT TO GO WIRELESS WITH NO COMMUNICATION INTERRUPTION.

COMMUNICATE IN ANY CONDITION THANKS TO WW TECHNOLOGY.

⚠ SAFETY WARNING

ZERONOISE AMPLIFIERS ARE EXTREMELY POWERFUL, AND HIGH VOLUMES CAN POTENTIALLY HARM YOUR EARS. APPROPRIATE USE OF THE SYSTEM IS THE USER'S RESPONSIBILITY.

⚠ BATTERY CHARGE WARNING

MAKE SURE THE HELMET IS CHARGED AHEAD OF USE. CHARGE IT BY USING THE USB-C PORT ON THE HELMET SIDE. IF THE BATTERY IS COMPLETELY EMPTY, IT CAN ONLY BE CHARGED VIA USB-C, NOT VIA NEXUS CONNECTOR.



You can find the ZeroNoise App on Play Store/A-apple Store. It allows you to connect to the intercom via Wi-Fi to control it from a smartphone and access updates easily and safely.

INTRODUCTION

The Fearless Wired-Wireless (WW) system is a cutting-edge communication solution specifically designed for motorsport, enabling clear and uninterrupted communication between the DRIVER and CO-DRIVER in any condition, inside and outside the car within a 20 meters range.

The Fearless WW system stands out for its unique and innovative Wired-Wireless (WW) technology and the integrated display. Together, these elements deliver a significantly more intuitive and feature-rich user experience. The display on our intercom provides comprehensive, real-time control and information, unlocking a wide array of advanced functionalities and simplifying complex operations.

Here's what's important to understand to quickly harness its full potential.

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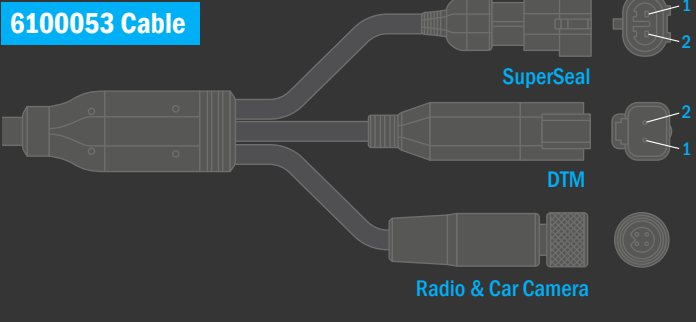
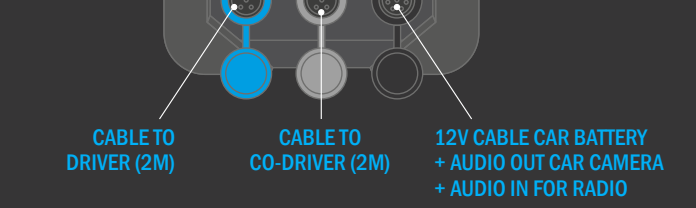
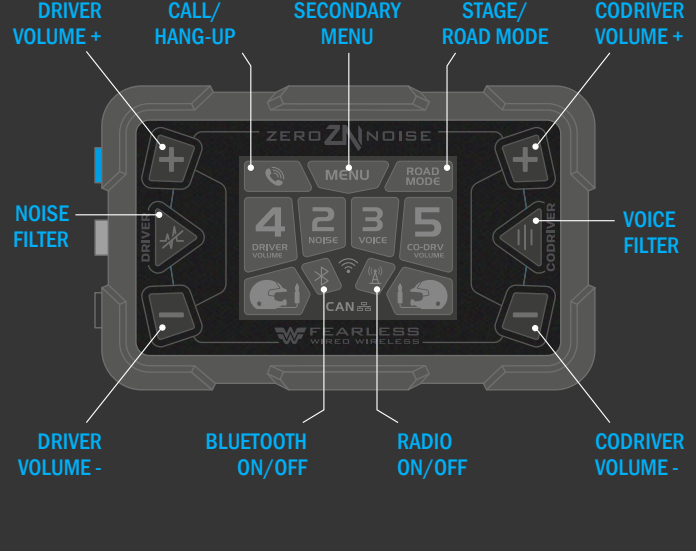
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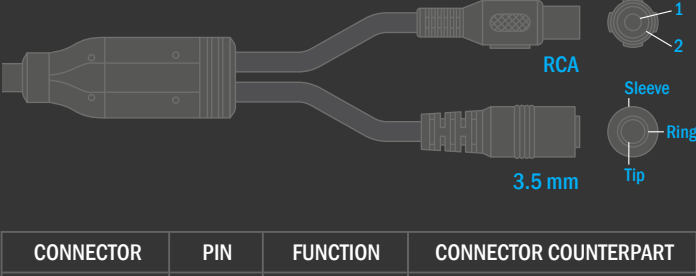
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QUICK FEATURES OVERVIEW



CONNECTOR	PIN	FUNCTION	CONNECTOR COUNTERPART
SuperSeal	1	+12V	282080-1 housing + 282403-1 pin
	2	GND	
DTM	1	CAN_H	DTM06-2S
	2	CAN_L	

Connect the connector of the cable 6100053 labeled as Radio & Car Camera to the cable with code 6100054 available on the ZeroNoise catalog website.



CONNECTOR	PIN	FUNCTION	CONNECTOR COUNTERPART
RCA	1	RCA_OUT	RCA male type connector
	2	GND	
3.5 mm	Ring	Radio_IN	3.5mm male connector
	Sleeve	GND	
	Tip	Radio_OUT	

Power Up

The system turns ON automatically when connected to the car's power supply, so there's no power button on the unit.

Simple Wireless Setup

Pairing your WW helmets/headsets is straightforward and guided by the display. Just remember, pair one helmet/headset at a time, long-press the helmet/headset icon on the screen, and the display will visually confirm the connection by changing the icon from BLACK to RED, then to BLUE. The helmet's LED also provides a visual confirmation.

Intuitive Visual Status

The display constantly shows the connection status (BLACK for unpaired, RED for registered but disconnected, BLUE for wireless connected, GREEN for cable connected) and your helmet battery levels at a glance. No more guessing if you're connected or running low on battery.

Precise Audio Control

Adjusting your sound is simple with the display. You can independently control driver and co-driver volumes and fine-tune noise cancelling filters for car noise and terrain noise using intuitive on-screen controls. The display's ability to show these settings visually makes it far easier to get the perfect audio balance.

Adaptable Modes

Easily switch between ROAD and STAGE modes with a single tap on the display. The display clearly indicates the active mode, and you can even unlock a "CUSTOM" mode to independently control Bluetooth, Radio, and Camera Car audio, tailoring the system to your exact needs.

Seamless External Connectivity

Connecting your smartphone via Bluetooth, or integrating a Radio or Camera Car audio is simplified, with visual icons and dedicated menu controls on the display for volume adjustments.

Smart Battery Management

The display offers real-time battery status for your helmets/headsets, and features like automatic battery recharge (AUTOCHARGE ON in the secondary menu) ensure your helmets are always ready.

Can-bus Connectivity

The intercom can be connected to the car Can-bus and controlled remotely from the dashboard with no direct interaction with the intercom itself.

In essence, the Fearless WW system provides unprecedented flexibility with its Wired Wireless technology and unrivalled control through its intuitive display. This combination ensures crystal-clear communication in any condition, making complex operations simple, and keeping you informed at all times, a distinct advantage over systems that rely on less comprehensive feedback methods.

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1. FULL INSTRUCTIONS

The Fearless WW system is built for seamless operation and intuitive control, offering both wired reliability and wireless freedom, all managed through a clear visual interface.

1. SYSTEM SETUP

Installation

1. With Velcro applied on the bottom of the intercom box
2. On a roll-bar using the supplied zip-ties to secure its metal bracket.

Power Supply

1. Connect the power supply cable to the multi-pin connector on the side of the intercom.
2. connect the 12V cable to the car battery.

Automatic Power On/Off

The intercom starts automatically when connected to the power supply. It will turn OFF when the car battery is OFF.

Reset

The intercom can be rebooted by enabling the reset option on the secondary menu. The secondary menu is accessible through the menu icon at the top of the display.

Additionally, this option resets all parameters on the display and on the secondary menu of the intercom to default values.

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2. WIRED AND WIRELESS COMMUNICATION

The core of the Fearless WW system is its Wired Wireless (WW) technology, enabling seamless transitions between communication modes.

Wired Connection

You can connect any compatible Nexus helmet by plugging in the provided Nexus connectors, which are labelled for the DRIVER and CO-DRIVER. This ensures compatibility with all Nexus helmets you may already own.

Wireless Connectivity

For wireless operation, the system is compatible exclusively with WW (Wired Wireless) Bell helmets. The WW technology allows you to switch effortlessly: connect the helmet via Nexus for wired mode and simply disconnect it to go wireless with no communication interruptions. This dynamic feature ensures continuous communication in any condition.

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3. WIRELESS PAIRING: FIRST-TIME REGISTRATION

For first-time wireless use, helmets must be registered to the intercom. The display guides you through this process.

Crucial Pairing Rule

Always pair one helmet at a time and ensure it is the only helmet currently turned ON during the pairing procedure.

Resetting a Helmet (if previously paired)

If a helmet has been paired to another intercom, it needs to be reset. Quickly press the ZN button (power button) on the helmet's side cover 3 times in 1 second. The helmet's LED will show three quick flashes, then resume blinking, indicating it's ready for a new pairing. Alternatively, all paired units can be reset by enabling the RESET Plus setting in the secondary menu.

Turning ON the Helmet

Press the ZN button on the helmet once; the LED on the button will start blinking, signifying the helmet is searching for an intercom to connect to.

Initiating Pairing on the Intercom

On the intercom's display, long press the corresponding helmet icon (DRIVER or CO-DRIVER) for a couple of seconds. The icon will begin blinking, indicating the intercom is searching for a new helmet to register.

Successful Pairing Indication

- The intercom and helmet find each other.
- The icon on the intercom will stop blinking and first turn RED (meaning a helmet is registered but currently not connected). Then, it will become BLUE, indicating the helmet is registered and connected. The blue icon also shows the battery state of charge.
- The LED on the helmet button will stop blinking and become fixed.

Pairing Timeout

If the intercom and helmet do not find each other within 30 seconds, the intercom icon will stop blinking and remain BLACK. In this case, you should try the pairing procedure again. If issues persist, it's recommended to reset all involved units (intercom and helmet) and reboot the intercom before a new attempt.

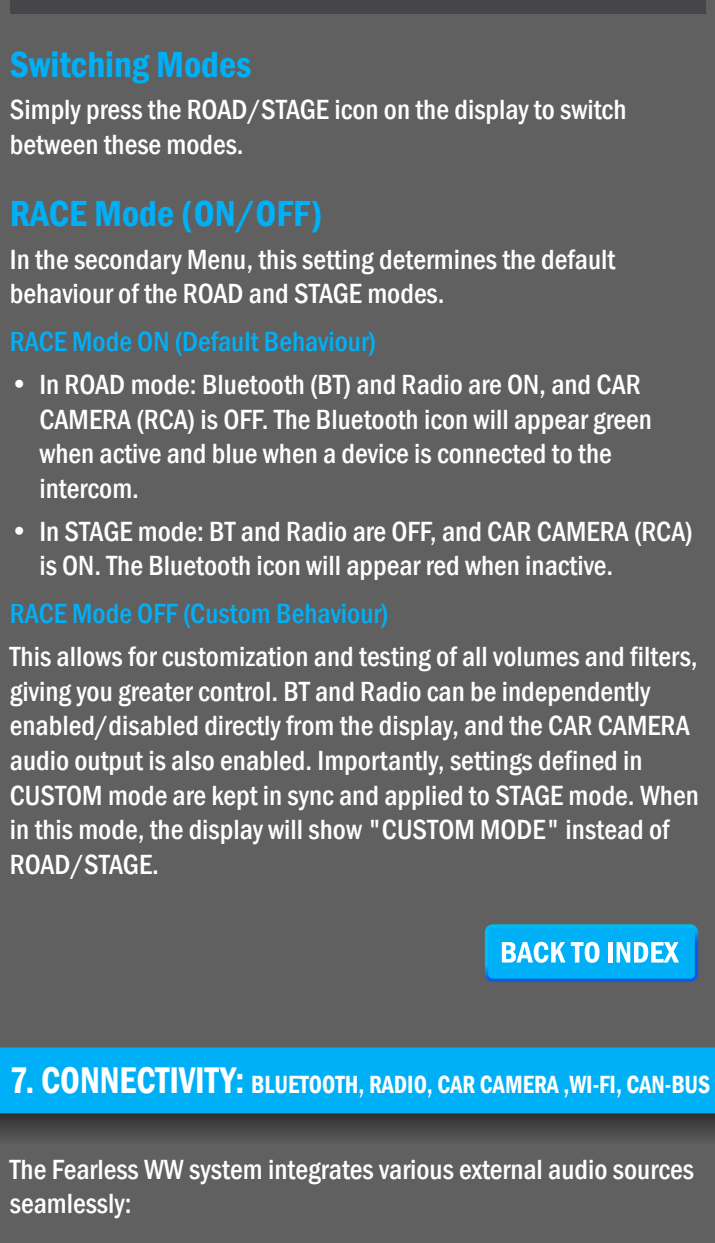
Final stage

After having repeated the process for both helmets, the helmet icons on the intercom are blue as well as the lights on the helmets' button.

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4. HELMET ICON STATUS EXPLAINED

The intercom's display provides clear visual cues regarding the status of your connected helmets:



BLACK Helmet Icon

Indicates no active registration for that helmet. If the icon is black, you can start the pairing process for a new helmet for that user (DRIVER or CO-DRIVER).

RED Helmet Icon

Indicates that a helmet is registered for this user, but it is currently not connected. If you turn on the paired helmet, it will connect, and the icon will turn blue.

BLUE Helmet Icon

Shows that a helmet is registered and currently connected for that user. This icon also constantly updates to show the battery state of charge:

- Four full bars correspond to a battery with charge above 75%.
- All four empty bars correspond to a battery state of charge below 25%, which is also signalled by a red light on the helmet button.

GREEN Helmet Icon

The helmet is connected via cable, hence in wired mode.

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5. AUDIO SETTINGS

Achieving optimal sound clarity is crucial, and the Fearless WW system offers granular control through the Clearvoice™ technology.

IMPORTANT - Microphone Position

For the best performance, adjust the ZN microphone on the helmet to be 5mm or less distance from your lips.

Individual Volume Control

You can adjust the volume independently for the DRIVER and CO-DRIVER using the +/- buttons on their respective sides of the intercom display. The left buttons control the CO-DRIVER's output volume, and the right buttons control the DRIVER's output volume.

Volume Boost

Extra volume power is available by enabling Volume Boost in the secondary menu of the intercom, accessible through the menu icon at the top of the display.

Voice Isolation and Enhancement

- Noise Cancellation: The Clearvoice™ algorithm reduces noise from the car. The higher the setting value (changed with the > button), the more car noise is cancelled.
- Voice Enhancement: The Clearvoice™ algorithm reduces noise generated by the surface. The setting value can be changed with the < button, with a higher value corresponding to a stronger reduction. You should select the right balance between the two that suits your specific environment best.

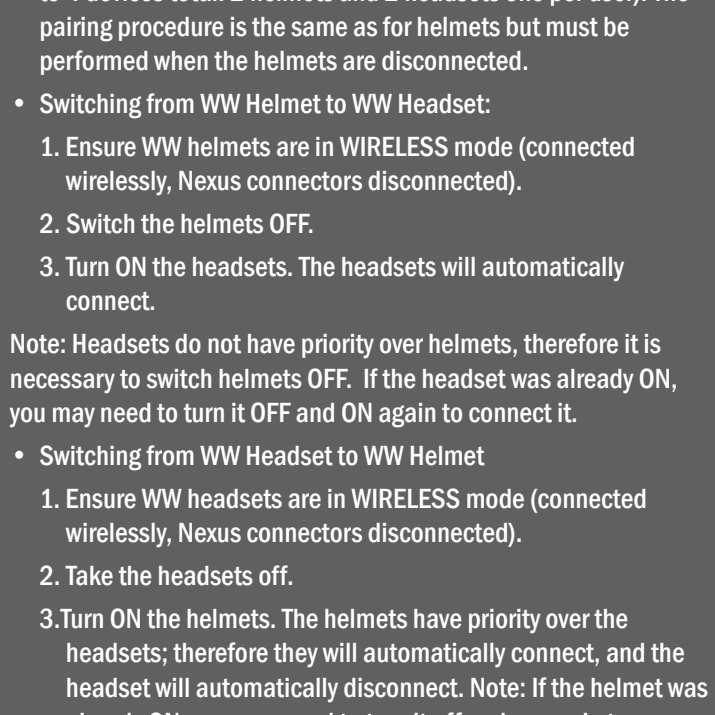
DRIVER VOLUME ATTENUATION

In the secondary Menu, the DRIVER can reduce his/her own audio feedback. This attenuation value can be adjusted from 0 (no attenuation) to a maximum of 9 (lowest volume).

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6. MODES OF OPERATION

The system features distinct modes tailored for different scenarios, easily switched via the display:



Switching Modes

Simply press the ROAD/STAGE icon on the display to switch between these modes.

RACE Mode (ON/OFF)

In the secondary Menu, this setting determines the default behaviour of the ROAD and STAGE modes.

RACE Mode ON (Default Behaviour)

- In ROAD mode: Bluetooth (BT) and Radio are ON, and CAR CAMERA (RCA) is OFF. The Bluetooth icon will appear green when active and blue when a device is connected to the intercom.
- In STAGE mode: BT and Radio are OFF, and CAR CAMERA (RCA) is ON. The Bluetooth icon will appear red when inactive.

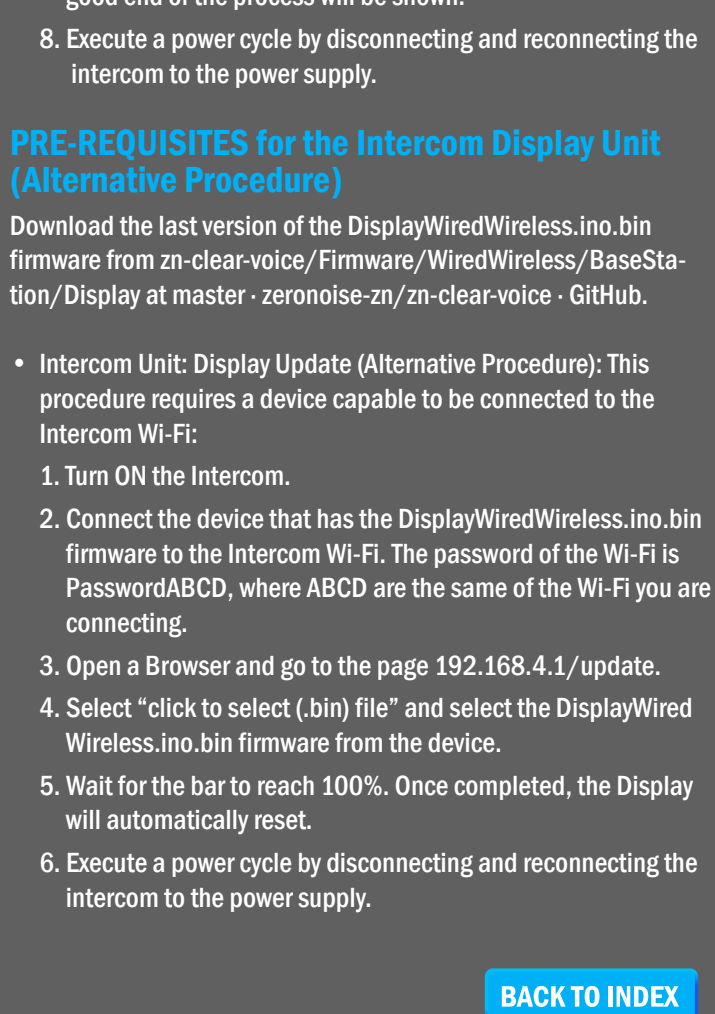
RACE Mode OFF (Custom Behaviour)

This allows for customization and testing of all volumes and filters, giving you greater control. BT and Radio can be independently enabled/disabled directly from the display, and the CAR CAMERA audio output is also enabled. Importantly, settings defined in CUSTOM mode are kept in sync and applied to STAGE mode. When in this mode, the display will show "CUSTOM MODE" instead of ROAD/STAGE.

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7. CONNECTIVITY: BLUETOOTH, RADIO, CAR CAMERA, WI-FI, CAN-BUS

The Fearless WW system integrates various external audio sources seamlessly:



Bluetooth (BT)

Activation: To connect a smartphone, ensure the intercom is in ROAD mode (where Bluetooth is ON by default) or CUSTOM mode (with Bluetooth explicitly enabled). The Bluetooth icon will appear green when active.

Pairing: Activate Bluetooth on your smartphone and find "WIRELESS" to pair the devices, once paired the Bluetooth icon will appear blue.

Audio Sharing: Audio from Bluetooth will be heard by both the DRIVER and CO-DRIVER, allowing them to participate in the same phone call.

- Volume Control: Adjust Bluetooth input/output volumes during voice calls (INCOMING/OUTGOING CALL VOL) and the volume of the music (BT MUSIC VOL) from the Menu, with values ranging from 0 to 9.

- AUTOANSWER: This option can be enabled in the menu to automatically answer incoming calls from a Bluetooth-connected smartphone.

Radio

- Connection: A Radio device can be connected via the dedicated 3.5mm jack connector.

- Activation: The Radio channel is ON in ROAD mode and OFF in STAGE mode when RACE mode is enabled. In CUSTOM mode (RACE mode OFF), the Radio can be turned on/off independently.

- Volume Control: Adjust Radio input/output volumes (RADIO IN/OUT VOL) from the menu, with values ranging from 0 to 9.

Car Camera (RCA)

- Connection: You can connect a camera with an RCA connector (female) to get audio from the intercom.

- Activation: The RCA channel is OFF in ROAD mode and ON in STAGE mode when RACE mode is enabled. RCA is also ON when RACE mode is disabled (CUSTOM behaviour).

- Volume Control: Adjust the output volume for the CAR CAMERA from the Menu, with values ranging from 0 to 9.

Wi-Fi

The intercom is equipped with Wi-Fi, allowing you to connect to the intercom via the ZeroNoise app. With the app, you can control all intercom functions on the display and install updates from your smartphone easily and safely. Wi-Fi can be enabled from the Menu.

Can-bus

The intercom can be connected to the car Can-bus to be controlled remotely from the dashboard. The DBC file is available on ZeroNoise - GitHub with further information.

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8. BATTERY MANAGEMENT (HELMETS)

The system provides clear indications for helmet battery status and flexible charging options.

IMPORTANT

Charging: WW helmets are charged using a USB-C cable. A full charge typically takes up to a couple of hours. It is necessary to recharge the battery at least once every six months if not used to guarantee functionality both in wired and wireless mode. It is recommended to charge them whenever possible to make sure the battery is not completely empty.

BATTERY INDICATORS

On the Helmet:

- The LED light is green if the battery state of charge is above 25%.
- The LED light is red if the battery state of charge is below 25% or if the helmet is charging.
- A fixed light indicates the helmet is connected to a nearby WW intercom.
- A blinking light indicates the helmet is in pairing mode, searching for an intercom.

On the Intercom (Blue Icon):

If the helmet is connected wirelessly (BLUE icon), the corresponding helmet icon shows the current battery state of charge with full bars.

- Four full bars mean the battery charge is above 75%.

- All four empty bars correspond to a battery state of charge below 25%, which is also signalled by a red light on the helmet button. If this is the case, you should charge the helmet.

- Battery Autonomy: With the helmet always ON, the battery autonomy is around 4 hours.

AUTORECHARGE FUNCTION

- You can enable this option in the Menu to automatically recharge WW helmet batteries when specific conditions are met.

- WW helmets can be recharged automatically. In this scenario, the communication is in WIRELESS mode while the WW helmets are connected to the intercom and being charged via cable. The BATTERY RECHARGE function must be enabled (AUTOCHARGE ON) in the secondary menu.

- When helmets are recharging, the light on their power buttons will be fixed red.

- You can disable this option to prevent the intercom from automatically recharging the WW helmet batteries whenever they are connected to the intercom via cable. Helmets can always be recharged manually via USB cable when not in use.

- If you forget to turn a helmet OFF, it will turn off automatically after two minutes of wireless inactivity, if not charging, to preserve the battery.

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9. DEREGISTRATION & FACTORY RESET

The system provides options to reset individual components or the entire intercom:

- Deregister a WW Helmet: To deregister a helmet from the intercom, quickly press the power button on the helmet 3 times in 1 second. The LED on the helmet button will start blinking, and the corresponding icon on the intercom will turn BLACK again. After deregistration, it's recommended to turn off the helmet by pressing and holding the button until the LED turns OFF.

- Deregister all WW Helmets/Headsets from the Intercom: To deregister all units from the intercom, go to the Menu and enable "RESET Plus". If successful, all helmets and headsets icons on the intercom will become BLACK. Remember to also reset any helmets that were previously associated with this intercom.

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10. WW HEADSET

The Fearless WW system supports both standard and WW (Wired Wireless) headsets, offering versatile options for different scenarios:

- Standard Headset: To switch from a standard helmet to a standard headphone, simply disconnect the Nexus connector from the helmet and connect it to the headset. The same procedure applies for switching back to helmets.

- WW Headset

- Registration: WW headsets can be registered to the intercom (up to 4 devices total: 2 helmets and 2 headsets one per user). The pairing procedure is the same as for helmets but must be performed when the helmets are disconnected.

- Switching from WW Helmet to WW Headset:
 1. Ensure WW helmets are in WIRELESS mode (connected wirelessly, Nexus connectors disconnected).
 2. Switch the helmets OFF.
 3. Turn ON the headsets. The headsets will automatically connect.

Note: Headsets do not have priority over helmets, therefore it is necessary to switch helmets OFF. If the headset was already ON, you may need to turn it OFF and ON again to connect it.

- Switching from WW Headset to WW Helmet
 1. Ensure WW headsets are in WIRELESS mode (connected wirelessly, Nexus connectors disconnected).
 2. Take the headsets off.
 3. Turn ON the helmets. The helmets have priority over the headsets; therefore they will automatically connect, and the headset will automatically disconnect. Note: If the helmet was already ON, you may need to turn it off and on again to connect it in place of the headphone.

- Battery Preservation: It's recommended to charge unused devices or turn them OFF to preserve battery. Devices will automatically turn OFF after two minutes of inactivity if they are not charging.

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11. FIRMWARE UPDATES

Firmware for all WW system components (intercom display, intercom device, and helmet unit) can be updated to incorporate bug fixes and general improvements. It can be done through two different procedures; it is recommended to follow the main procedure through the ZeroNoise app and only resort to the alternative procedure if you momentarily have no access to the app.

PRE-REQUISITE for the Main Procedure

Download the last version of the ZeroNoise app from the Play Store or the Apple Store.

- Intercom Unit: Board Update (Main Procedure):
 1. Turn ON the Intercom.
 2. Connect the mobile with the ZeroNoise app to the Intercom Wi-Fi. The password of the Wi-Fi is PasswordABCD, where ABCD are the same of the Wi-Fi you are connecting.
 3. If there is a new version of the mainboard firmware, an "UPDATE" box will be shown on the app.
 4. Press the "UPDATE" box and wait for the updating bar to reach the 100%. The intercom will reboot with the new firmware version uploaded.

- Intercom Unit: Display Update (Main Procedure):
 1. Turn ON the Intercom.
 2. Connect the mobile with the ZeroNoise app to the Intercom Wi-Fi. The password of the Wi-Fi is PasswordABCD, where ABCD are the same of the Wi-Fi you are connecting.
 3. If there is a new version of the display firmware, an "UPDATE LCD" box will be shown on the app.
 4. Press the "UPDATE LCD" box and wait for the text "LCD uploaded. Device rebooting..." to appear. The intercom will reboot with the new firmware version uploaded.

PRE-REQUISITE for the Helmet Unit

Download the last version of the WW_PU_vX.X.X_RELEASE.uf2 firmware from zn-clear-voice/Firmware/WiredWireless/PU/Unit at master · zeronoise-zn/zn-clear-voice · GitHub.

- Helmet Unit: Specific Update:
 1. Connect the device to your PC via a USB-C cable.
 2. Quickly press the ON/OFF button on the helmet 5 times in a 1-second span to enter bootloader mode. The device will be recognized by your computer as an external memory device named "RPI-RP2".
 3. Drag and drop the specific firmware file (e.g. WW_PU_vX.X.X_RELEASE.uf2 for the helmet) onto the "RPI-RP2" device. The new firmware will flash automatically.
 4. Disconnect the device from the computer and reboot it.

PRE-REQUISITE for the Intercom Unit (Alternative Procedure)

Download the last version of the DisplayWiredWireless.ino.bin firmware from zn-clear-voice/Firmware/WiredWireless/BaseStation/Display at master · zeronoise-zn/zn-clear-voice · GitHub.

- Intercom Unit: Display Update (Alternative Procedure): This procedure requires a device capable to be connected to the Intercom Wi-Fi:
 1. Turn ON the Intercom.
 2. Connect the device that has the last version of the WiredWireless.ino.bin firmware to the Intercom Wi-Fi. The password of the Wi-Fi is PasswordABCD, where ABCD are the same of the Wi-Fi you are connecting.
 3. Open a Browser and go to the page 192.168.4.1/update.
 4. Select "Update Mode".
 5. Select "Choose file" and select the DisplayWiredWireless.ino.bin firmware from the device, then press "Upload firmware".
 6. Wait for the first bar to reach 100%, then press "Start update".
 7. Wait for the second bar to reach 100%. Information about the wait end of the process will be shown.
 8. Execute a power cycle by disconnecting and reconnecting the intercom to the power supply.

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12. SAFETY WARNING

Zeronoise amplifiers are extremely powerful, and high volumes can potentially harm your ears. Appropriate use of the system is the user's responsibility.

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