CERVIS

WARRIOR

HH2S-9XW10

Handheld Remote Manual

U101.3.2

FCC Statements

15.19 – Two Part Warning

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference and

(2) This device must accept any interference received, including interference that may cause undesired operation.

15.21 – Unauthorized Modification

NOTICE: The manufacturer is not responsible for any unauthorized modifications to this equipment made by the user. Such modifications could void the user's authority to operate the equipment.

15.105(b) – Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- **Reorient or relocate the receiving antenna.**
- **Increase the separation between the equipment and receiver.**
- **Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.**

Industry Canada Statement

This device complies with Industry Canada RSS-210.

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/radiation/safety-code-6-health-canada-radiofrequency-exposure-guidelines-environmental-workplace-health-health-canada.html.

Le présent appareil est conforme à la norme CNR-210 d'Industrie Canada.

Le programme d'installation de cet équipement radio doit s'assurer que l'antenne est située ou fait telle qu'elle n'émet pas de champ RF dépassant les limites de Santé Canada pour la population générale ; consulter le Code de sécurité 6, disponible auprès de Santé Canada site Web https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/radiation/safety-code-6-health-canada-radiofrequency-exposure-guidelines-environmental-workplace-health-health-canada.html.

Industry Canada Statement

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Industry Canada Unlicensed Devices EIRP Statements for Removable Antennas

Part 1: Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Part 2: This radio transmitter (LOBSRF-310) has been approved by Industry Canada to operate with the antenna type listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (LOBSRF-310) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

RoHS Compliance Statement

Cervis, Inc. complies with the requirements of ***Restriction of Hazardous Substances (RoHS/WEEE) Specification*** based on in-house practice and declaration of compliance from our vendors. For additional information concerning RoHS compliance, please contact Cervis, Inc. at:

CERVIS, Inc.

170 Thorn Hill Road • Warrendale, PA 15086

Phone: 724.741.9000 • Fax: 724.741.9001

This product may contain material that may be hazardous to human health and the environment. In compliance with EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE):

- ✓ Do not dispose of the product as unsorted municipal waste.
- ✓ This product should be recycled in accordance with local regulations. Contact local authorities for detailed information.
- ✓ This product may be returnable to the distributor for recycling. Contact your distributor for details.

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Cervis, Inc. Safety Precautions

- ✓ *Read and follow all instructions.*
- ✓ *Failure to abide by Safety Precautions may result in equipment failure, loss of authority to operate the equipment, and personal injury.*
- ✓ *Use and maintain proper wiring. Follow equipment manufacturer instructions. Improper, loose, and frayed wiring can cause system failure, equipment damage, and intermittent operation.*
- ✓ *Changes or modifications made to equipment not expressly approved by the manufacturer will void the warranty.*
- ✓ *Owner/operators of the equipment must abide by all applicable Federal, State, and Local laws concerning equipment installation and operation. Failure to comply could result in penalties and could void user authority to operate the equipment.*
- ✓ *Make sure that the machinery and surrounding area is clear before operating. Do not activate the remote control system until certain that it is safe to do so.*
- ✓ *Turn off the handheld remote and remove power from the receiver before attempting any maintenance. This will prevent accidental operation of the controlled machinery.*
- ✓ *Use a damp cloth to keep units clean. Remove mud, concrete, dirt, etc. after use to prevent obstructing or clogging the buttons, levers, wiring, and switches.*
- ✓ *Do not allow liquid to enter the handheld or receiver enclosures. Do not use high pressure equipment to clean the handheld remote or receiver.*
- ✓ *Disconnect the receiver before welding on the machine. Failure to disconnect the receiver may result in destruction of or damage to the receiver.*
- ✓ *Operate and store units only within the specified operation and storage temperatures defined in this document's specifications.*
- ✓ *Keep high-energy RF devices away from handheld remotes. Activation of high-power communication radios, for instance, in close proximity to handheld remotes can cause interference and "false" circuit activation.*
- ✓ *Do not key two-way radios while using the handheld remote.*

1.0 Warrior Handheld Remote (HH2S-9XW10)

The Warrior HH2S-9XW10 handheld is a small, compact handheld remote control transmitter that interfaces with any Cervis, Inc. machine unit (MU) receiver. The HH2S-9XW10 consists of ten 2-step actuators and uses two “AAA” alkaline batteries for power. The HH2S-9XW10 enclosure is made of rugged polycarbonate, designed to meet an IP55 ingress protection rating, according to IEC 60529. The unit has four diagnostic Light-Emitting Diodes (LEDs) that indicate wireless link (radio frequency, “RF”), Battery (“Bat.”), A and B selection.

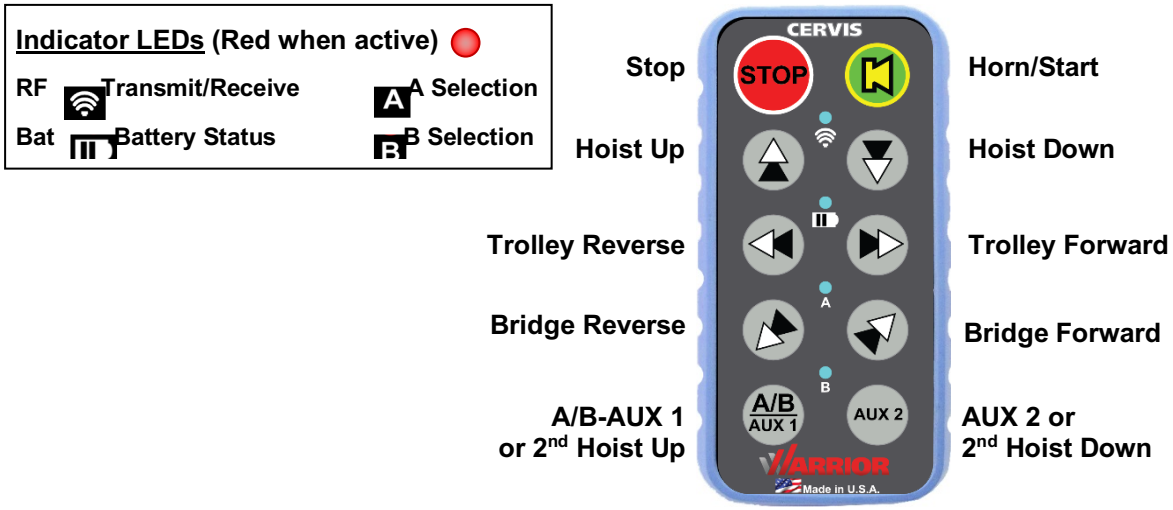


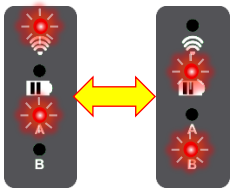
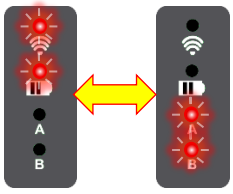
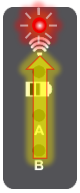
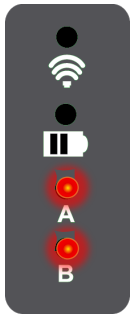
Figure 1. HH2S-9XW10 LED and Button Descriptions

✓ ***Note**: You can configure the HH2S-9XW10 handheld remote button functions by manipulating the MU-6E/15 receiver switch SW01 DIP Switch mode settings. See the receiver manual being used or specific project documentation for relay operation details.*

Figure 2. Warrior HH2S-9XW10 Transmitter Warnings and Precautions

Figure 2 is the label that is permanently attached to the battery compartment cover. It describes warnings and precautions that must be followed when using the transmitter.

Table 1. HH2S-9XW10 Advanced LED Diagnostics

LEDs	Indication	Diagnostic
RF (Transmit/ Receive)		Solid: Transmitting, looking for receiver.
		Flashing: Transmitting to and receiving from the mounted receiver.
		Alternating: Stop Check: Cycle Stop Switch, Blinks back-and-forth.
Battery Status		Alternating: Stuck Switch: Check switches/proportional not neutral.
		Scrolling: Signifies Maintenance Mode
A Select		Blinking: Batteries low; replace with fresh batteries soon.
		Solid: Shutting Off: Batteries below operating level, shutting unit down; replace batteries with fresh set.
B Select		Scrolling: Shutting Off: Unit is shutting down: Inactivity timeout Stop engaged Unit wake-up without S09
		Solid: Shutting Off: Button command reached out-of-bounds. Condition unsafe, operation turning off.

1.1 HH2S-9XW10 Battery Installation

Two size “AAA” cell batteries power HH2S-9XW10 handheld units. When installing batteries, be sure to observe proper polarity—as marked on the inside of the battery compartment—to avoid damaging the unit.

To replace or install batteries in the handheld:

1. Loosen the four small Phillips screws from the Battery Compartment cover, and lift the cover from the handheld. The screws remain attached to the cover.
2. If installing batteries in an empty battery compartment, install two fresh size “AAA” cell batteries. Be sure to position the batteries as shown in Figure 3.
3. If replacing expired batteries, remove the old batteries, and install two fresh size “AAA” batteries. (Discard the used batteries according to local regulations.) Be sure to position the batteries as shown in Figure 3.
4. Replace the compartment cover, and tighten the four Phillips screws. Do not over-tighten these screws, but make sure they are tight enough for the gasket to create a proper seal.

✓ ***Note:*** *Discard expired batteries according to local regulations.*

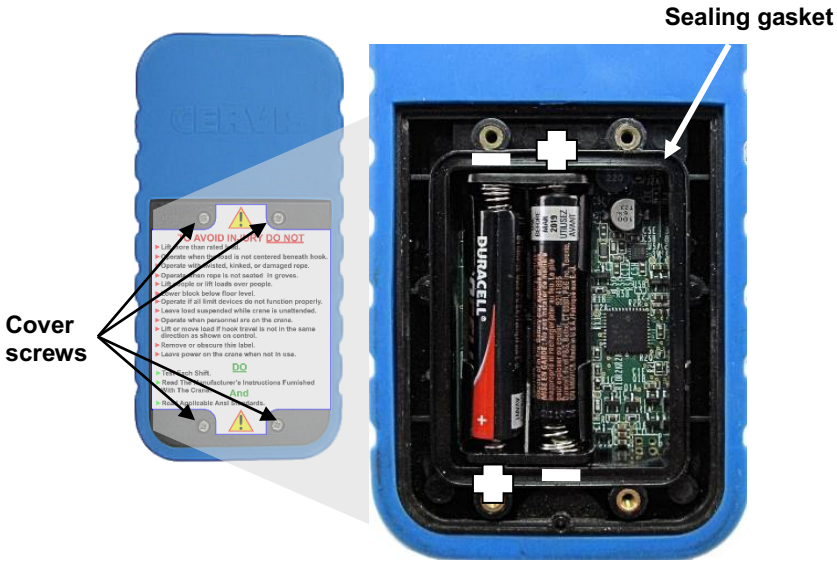


Figure 3. HH2S-9XW10 Battery Installation

Caution!

Observe proper polarity when placing batteries in the handheld transmitter battery compartment.

1.2 HH2S-9XW10 Battery Warning and Shutdown

The HH2S-9XW10 will alert you when the remaining battery life is either getting low or is too low for normal operation.

LOW BATTERY

The **Bat** LED flashes once per second, indicating a LOW BATTERY (2.1V or less) situation is present. Replace with two fresh "AAA" batteries as soon as possible. The LED will continue to flash at 100ms intervals until either the batteries are changed or the voltage level drops to 2.0V and Auto-Shutdown occurs.

AUTO-SHUTDOWN

At 2.0V, the **Bat** LED briefly lights solid for approximately 1.25 seconds before the handheld remote automatically shuts down.

Install two fresh "AAA" cell batteries before using the handheld again.

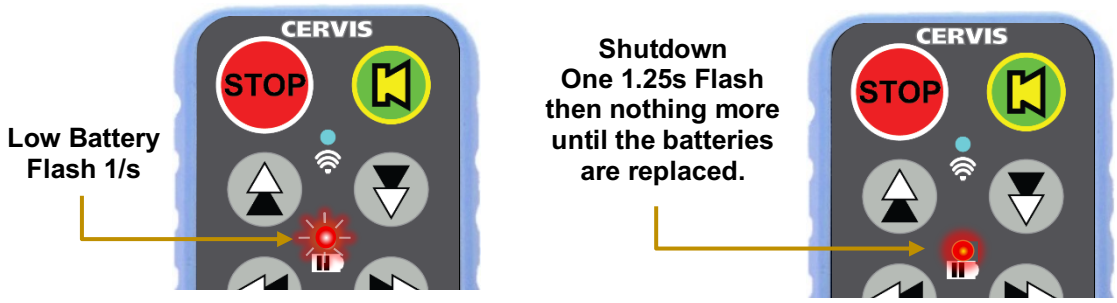


Figure 4. HH2S-9XW10 Remote Low Battery Warning and Auto-Shutdown

1.3 System Startup

For the following procedure, assume that power is applied to the Warrior MU-9 receiver.

1. Press the handheld **STOP** button (**B1**).
2. Wait until the **Wireless** (**RF**) LED begins flashing.
3. Press the **Horn/Start** button (**B2**). This energizes the Main Line Contact (MLC) relay(s) in the receiver.

The handheld is ready for normal functional operation.

Figure 5. System Startup

2.0 Associating a Handheld with Receivers

Warrior system transmitters are linked (or “associated”) to the receiver before the system is shipped, and the association process is locked. The receiver will only communicate with the transmitter it is associated with. When necessary, other Warrior transmitters can be associated to the receiver as additional spares or to replace damaged transmitters, but the receiver association ability must first be unlocked.

2.1 Two Unlock Association Methods

2.1.1 Unlock Association Method 1 (MU-6E/15)

On Warrior MU-6E/15 receivers, manually change the position of receiver switch SW01 DIP switch 8. To unlock association, open the receiver enclosure, and change SW01 DIP switch 8 (Associate Lock) from its default position 0 (OFF) to 1 (ON). Unlocking receiver DIP switch 8 permits association until the switch is changed back to the 0 (OFF or LOCKED) position.

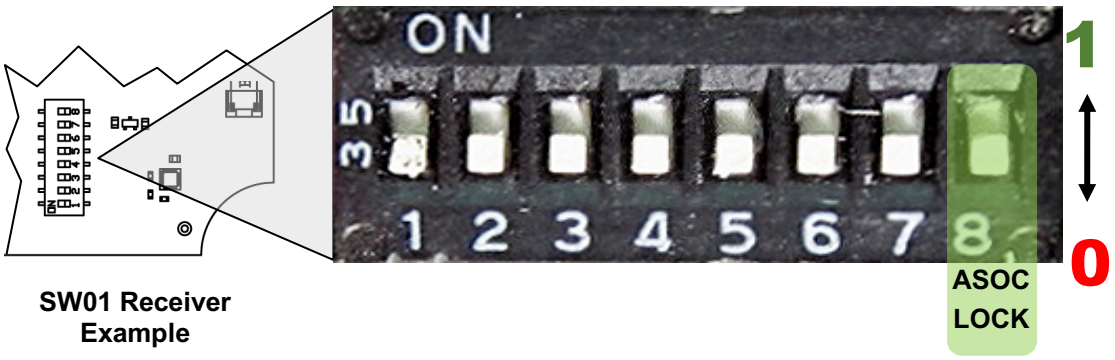


Figure 6. Receiver Switch SW01 DIP Switch 8 (Associate Lock)

Enable Association to a Desired Receiver Via DIP Switch Unlock

This process unlocks receiver association, allowing you to associate handheld transmitters to the receiver until you set the DIP switch back to the locked position.

1. Set machine unit SW01 DIP switch 8 ON (Figure 6).
2. If the receiver is **Off** (powered down), the Horn/Light relay will activate when it is powered. If the receiver is **On** (powered), the Horn/Light relay will immediately activate.
3. Go to Section 2.2.

Caution!

Do not leave receivers in an UNLOCKED state. Move DIP switch 8 to the “0” (OFF) position once association is complete.

2.1.2 Unlock Association Method 2

Use an already associated handheld to perform a “virtual” unlock. This process allows you to unlock a Warrior MU-6E/9/15 receiver from a distance without needing to directly access the receiver. A virtual unlock starts a five-minute countdown timer on the receiver that allows you to associate another transmitter with that receiver. After five minutes, the virtual unlock expires—even after a successful handheld association—and the receiver automatically locks again.

Associating a Handheld Using the Virtual Unlock Process

✓ ***Note:*** *You can only associate a new transmitter using Virtual Unlock from a transmitter that is already associated to the receiver.*

This process unlocks association for **five** minutes, allowing you to associate another handheld transmitter to the receiver. The receiver returns to a locked state once it receives a virtual unlock command from a handheld transmitter.

✓ ***Note:*** *The target receiver must be powered on.*

1. Turn on the handheld by pressing the **STOP** button (**B1**).
2. Wait for the **RF** LED to begin blinking rapidly.
3. Press and hold buttons **A/B-AUX 1** (**B9**), **AUX 2** (**B10**), and then **STOP** (**B1**).

The receiver activates the Association relay to confirm the receiver is now unlocked. The handheld then powers down.

4. Go to Section 2.2.

✓ ***Note:*** *If there is an external horn/light wired to the receiver, that device will sound/light with when the Associate relay activates.*

2.2 Associate a Handheld to a Receiver

This process is required when either the handheld memory slot is empty or the user wishes to associate to a different receiver.

✓ ***Note:*** *During this process, a receiver that is in use with another handheld cannot be associated.*

1. Turn on the handheld by pressing and releasing the **STOP** button.
2. Within one second—while the **B Select** LED is active—simultaneously press and release buttons **A/B-AUX 1** (**B9**) and **AUX 2** (**B10**).

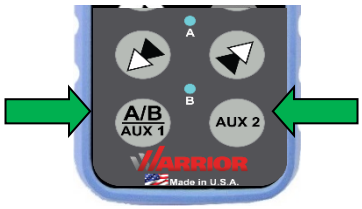


Figure 7. Associate Step 2

The handheld LEDs begin cycling from bottom to top, indicating that the handheld is in **Maintenance Mode**.

1. Simultaneously press and hold buttons **Hoist UP** (**B3**) and **Hoist DOWN** (**B4**) for approximately five seconds.
2. Release the buttons when the **A Selection** LED starts blinking.
3. The **RF** and **B Selection** LEDs light steadily, indicating that the handheld is attempting to locate all available Warrior receivers (scan mode).
4. Once the handheld has completed its search—and one or more receivers have been found—the **RF** and **A Selection** LEDs light steadily.

If no receivers are available, the handheld stays in scan mode until the handheld either times out or is turned off.

1. A detected receiver will start blinking its association LED indicator and the horn sounds. To select this receiver, press button **AUX 2** (**B10**). The **RF** LED starts blinking rapidly, indicating that communication is established. The selected receiver identity (ID) is now stored in the handheld memory.
2. If the found receiver unit is **NOT** the receiver desired, press button **A/B-AUX 1** (**B9**) to scroll through the detected receivers until you find the desired receiver. Its association LED indicator begins blinking, and its Horn/Light relay sounds the horn. Press button **AUX 2** (**B10**) to select the receiver. The **RF** LED starts blinking rapidly, indicating that communication is established. The selected receiver ID is stored in the handheld memory.

2.3 Associate for Tandem Operation (Requires Special Handheld Software)

2.3.1 Terminology

ASSOCIATE – The process of exchanging and storing serial numbers. This allows the transmitter and receiver to work together. Multiple transmitters can be associated to the receiver. This is done at the factory.

PAIRING – The process of "linking" a transmitter to a receiver. Pairing can only take place if the transmitter and receiver have been associated. Only one transmitter can ever be paired to a receiver at one time.

2.3.2 Association

- The association procedure is the same, except multiple receiver selection is permitted in Tandem mode.
- The transmitter remembers the serial number (S/N) of the receivers being associated and will be the determining factor when selecting receivers for tandem operation. *Custom handheld (HH) code is required for tandem operation*.
- Start the association process as normal by entering **Maintenance Mode**: Press buttons **A/B-AUX 1** (**B9**) and **AUX 2** (**B10**), then hold buttons **Hoist UP** (**B3**) and **Hoist DOWN** (**B4**) for five seconds. Just like the standard association procedure, the transmitter nominates a receiver. You may then confirm the nomination or select another receiver. The confirmed receiver stored in memory **SLOT A** will be activated when receiver "A" is selected. The transmitter then starts the nomination process again for **SLOT B**, which will activate when receiver "B" is selected. Once the two receivers are stored, press the **Horn/Start** button (**B2**) to launch into normal operating mode with both receivers selected (tandem operation).

2.3.3 Receiver Selection (For Individual Receiver Control)

This procedure describes receiver operation using the HH2S-9XW10.

1. After the association is complete and the transmitter is turned on, it will automatically enter *Receiver Select Mode*. The **A Selection** and **B Selection** LEDs blink, indicating what receivers can be selected for operation. **LED A = Receiver A** while **LED B = Receiver B**. The selection possibilities will be **Receiver A, Receiver B,** or **BOTH (Receiver A and Receiver B).**
   - You can enter *Receiver Select Mode* at any time by pressing the **A/B-AUX 1** Button (**B9**). Once in this mode, the transmitter pushbuttons are disabled, and there is no output functionality. The MLC stays energized.
   - Be careful NOT to press the **A/B-AUX 1** button (**B9**) unless you want to change receiver control. If *Receiver Select Mode* is entered, all outputs will be temporarily disabled until a new selection is made.
2. Once you have chosen the desired receiver configuration, press the **Horn/Start** button (**B2**). At that time:
   - The transmitter and receiver(s) will be paired
   - The MLC will energize (MLC link) on any previously inactive receiver
   - The Horn/Light relay energizes for ½ second on each active receiver – **MOTION IS NOW ENABLED**
3. Once the transmitter and receiver are paired, the indicating LEDs remain solid. **LED A = Receiver A, LED B = Receiver B**. If the **A Select** LED is solid on Transmitter One, that transmitter is paired with Receiver A. Once a transmitter is paired with a receiver, no other transmitter can select or operate that receiver.
   - First come/first serve software.
   - If a secondary transmitter tries to link with a receiver that is already in use, it will be kicked back into *Receiver Select Mode* (LEDs **A** and **B** will be blinking). That transmitter will either have to select a different receiver or wait until the desired receiver becomes available.
   - Shutting off the transmitter clears the link between the transmitter and receiver (auto ID release). At that time, the receiver would be available to link with any other associated transmitter.
4. If you have selected both receivers at once (Tandem)—and want to change to single receiver operation—go back into *Receiver Select Mode* and de-select the receiver you no longer want to control. When you do this, that receiver's mainline relay drops out. The just-de-selected receiver LED also turns off.
5. Be careful when using systems in tandem. Do not press the **A/B-AUX 1** button (**B9**) unless receiver selection is required. Shutting off the transmitter is an easy way to exit *Receiver Select Mode* (and clear receiver IDs from transmitter).

✓ ***Note:*** *Receivers configured to work in a tandem group may still operate independently and with standard handhelds, 1:1.*

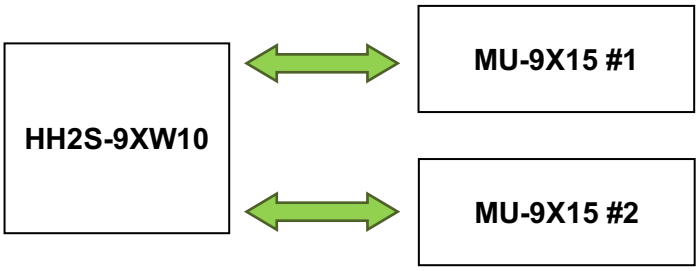


Figure 8. HH2S-9XW10 Tandem MU-9X15 Diagram

2.4 Adjusting the HH2S-9XW10 Inactivity Timeout Interval

The Warrior HH2S-9XW10 transmitter ships from the factory configured with a standard four-minute inactivity timeout. To adjust the timeout interval length—from one minute to infinity (or no timeout)—in the field, follow these steps.

1. Press and release the **STOP** button (**B1**) to turn on the transmitter.
2. **Within one second** of activating the transmitter—while the **A Selection** LED is active—simultaneously press and release the **A/B-AUX 1** and **AUX 2** buttons (**B9** and **B10**). The LEDs start scrolling from bottom to top, indicating that the transmitter is in **Maintenance Mode**.
3. Press and hold the **Trolley Reverse** button (**B5**) for five seconds. The LEDs stop scrolling. The **A Selection** LED lights solid, and the other LEDs are off. This signifies that the timeout is set to four minutes (factory configuration).
4. To increase the timeout, press and release the **Hoist Up** button (**B3**).
5. To decrease the timeout, press and release the **Hoist Down** button (**B4**).
6. When the **RF** LED is lit solid, it indicates that a time of one minute will be added. When the **Bat** LED is lit solid = two minutes; **A Selection** LED = four minutes; **B Selection** LED = 8 minutes. (This is a binary representation. So, if the **RF** and **A** LEDs are lit solid—and the others are unlit—you have a five-minute timeout.)
7. When the **RF** LED is blinking, the timeout = 20 minutes. When the **Bat** LED is blinking = 30 minutes. **A Selection** LED blinking = 45 minutes; **B Selection** LED blinking = 60 minutes; and all four LEDs blinking = infinite timeout.
8. Once you have chosen the desired timeout, press and release the **AUX 2** button (**B10**) to return to **Maintenance Mode**.
9. Press the **Horn/Start** button (**B2**) to return to operational mode.

3.0 HH2S-9XW10 Handheld Factory Reset (Memory Clear)

Follow these steps to perform a factory reset on the handheld transmitter. Once this process is complete, the transmitter's memory slot is cleared, and it will not communicate with any receivers.

✓ ***Note:*** *If you order spare handhelds from Cervis, Inc., their memory will be clear when they arrive.*

1. Press and release the **STOP** button (**B1**) to turn on the handheld.
2. **Within one second** of activating the handheld—while only the **B Selection** LED is active—simultaneously press and release the **A/B-AUX 1** and **AUX 2** buttons (**B9** and **B10**). The LEDs start scrolling from bottom to top, indicating that the transmitter is in **Maintenance Mode**.
3. Simultaneously press and hold the **A/B-AUX 1** and **AUX 2** buttons (**B9** and **B10**).
4. Press and release the **STOP** button (**B1**).
5. The handheld turns off, indicating the factory reset was successful.

A handheld that has been cleared will power up and immediately shut down, indicating that it has no receiver in its memory.

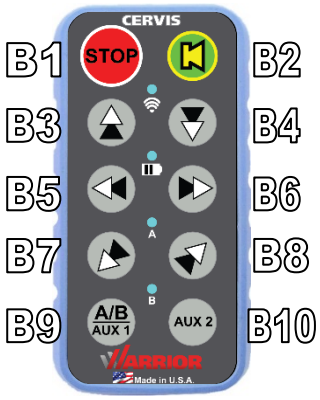


Figure 9. HH2S-9XW10 Button Numbers

4.0 HH2S-9XW10 Handheld Specifications

Table 2. HH2S-9XW10 Handheld Specifications

Item	Description	
Power	**V_{in}**	+2.1V to +3.2V
	Source	Two “AAA” cell batteries
	Low Battery Warning	~2.1V – batteries should be immediately replaced
	Low Battery Shutdown	<2.0V – batteries must be replaced to operate
Environment	**Operating Temp**	-40°C to 60°C (-40°F to 140°F)
	Storage Temp	-40°C to 85°C (-40°F to 185°F)
	Humidity	0–95% non-condensing
Radio	**Frequency**	904–926 MHz @ 100mW
	License	No license required
	Modulation	Direct Sequence Spread Spectrum (DSSS)
	Antenna	Internal
Enclosure	**Dimensions**	mm: 136.38 x 68.96 x 28.42
		Inches: 5.37 x 2.68 x 0.92
	Weight	200g / 7.2 oz. (With lanyard or belt clip)
	Durability	High Impact Polymer case
		Polycarbonate faceplate
		Impact absorbing bumper
Indicators	**Wireless (RF)**	Indicates wireless communications
	Bat	Indicates battery status
	A	Indicates A selected when lit
	B	Indicates B selected when lit
Buttons	**Ten**	Two-step pushbuttons

Appendix A: Exposure to Radio Frequency Energy

Warrior handheld remote transmitter and receiver units contain radio transceivers. When active, a handheld remote transmitter sends out radio frequency (RF) energy through its internal antenna. The Warrior handheld remote complies with limits set by the United States Federal Communications Commission (FCC) for operating distance from human tissue.

Appendix B: RF Exposure Considerations

The radio module may be used in a variety of host applications that fall into two general categories:

1. **Mobile** applications: Any operating locations **not** on a human body. In mobile applications, the host application is typically fixed to mobile equipment, with either an internal or external antenna.
2. **Portable** applications: Applications where the transmitting equipment **is** located on the hand, arm, or other part of the human body. In portable applications, the equipment is typically held in the hand of an operator or affixed to either a belt or harness on the torso.

Equipment containing the radio module was evaluated for RF exposure hazards by two approaches:

1. Maximum Permissible Exposure (MPE) for mobile applications.
2. Specific Absorption Rate (SAR) for portable applications.

The required separation distances are measured from the actual location of the radiating part of the antenna. An antenna may be inside the host application, affixed to the enclosure of the host application, or at the end of an optional extension coaxial cable.

Mobile Applications

Equipment must be located at least 20cm away from areas likely to be occupied by an unaware person.

Handheld Applications

All operators of handheld equipment with any type of antenna require proper equipment operation training, and such training must include RF exposure safety instructions. Once training is completed, they are considered to be aware persons.

If the portable operating pose is on the hand or arm, a 5mm separation is required between the radiating part of the antenna and nearby human tissue.

Required Training

All installers and operators of host applications that include an SRF310 radio frequency transceiver (RT) module **must** be trained to use proper RF safety precautions as presented in this appendix.