HH-xH06 Manual

DN: U076.4.1

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 Canadian 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.

L'installateur de cet équipement radio doit s'assurer que l'antenne est située ou orientée de façon à ne pas émettre un champ RF dépassant les limites de Santé Canada pour la population générale; consulter le Code de sécurité 6, disponible sur le site Web de Santé Canada 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. Le fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférences, et (2) cet appareil doit accepter toute interférence, y compris les interférences susceptibles de causer un fonctionnement non désiré de l'appareil.

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.

CERVIS

Notes/Definitions

Associate
SmaRT configuration method using a series of specific remote unit button presses to establish a communication link between a SmaRT Handheld and a SmaRT Base Unit.

DSSS
Direct sequence spread spectrum; an advanced wireless communication technology.

Dissociate
Dissolution of all established communication links between handhelds and a base unit.

PTO
Push to Operate: Command broadcast only while a button is depressed. The command ends when the button is released.

DO
Dual Operation: Used to define handheld remotes that use one button for two operations. For instance, the SmaRT DO-206 handheld remote uses one button (button 6, typical) to both turn on the handheld remote and turn the units off.

OO
On and Off Operation: Where two buttons or buttons are used for two operations or processes. For instance, the SmaRT DO-206 handheld remote uses one button (button 6, typical) to both turn on the handheld remote and turn the unist off.

Line of Sight (aka Direct-Line-of-Sight)
Type of communication between transceivers, or a transmitter and a receiver, where the pathway between the two units must be clear of obstacles.

TX/RX
Transmit/Receive

Document Conventions

✓ **Note:** *Notes are used to indicate points of interest or pertinent information.*

Caution	
⚠️	*Cautions are used to warn of serious consequences of actions or inactions that may result in injury, death, or serious damage to the equipment.*

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Cervis, Inc. Safety Precautions

✓ *Read and follow all instructions.*

✓ *Failure to abide by Safety Precautions may cause 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.*

✓ *Equipment owner/operators 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 base unit before attempting any maintenance. This will prevent accidental operation of the controlled machinery.*

✓ *Remove power from the base unit either by detaching the 12-pin cable from the base unit connector P1, or by removing the source power from the circuit.*

✓ *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 base unit enclosures. Do not use high-pressure equipment to clean the handheld remote or base unit.*

✓ *Disconnect the BU-xH8D base unit before welding on the machine. Failure to disconnect the base unit may cause destruction of or damage to the unit.*

✓ *Keep high-energy RF devices away from handheld remotes. Activating high-power communication radios, for instance, in close proximity to the handheld remotes can cause interference and "false" circuit activation.*

✓ *Operate and store units only within the specified operation and storage temperatures defined in this document's Specifications section.*

✓ *Abide by the recommendations in Appendix A, Exposure to Radio Frequency Energy.*

1.0 SmaRT HH-xH06 Handheld Remotes

Handheld Features

- ✓ **License free Direct Sequence Spread Spectrum (DSSS) Technology 900 MHz or 2.4 GHz**
- ✓ **Direct line-of-sight communications up to 1000 ft. (330 m) range.**
- ✓ **Six (maximum) LED Indicators**
- ✓ **Powered by three "AAA" cell batteries (+3.6 to +4.5 VDC)**
- ✓ **Low Battery Warning (at or below +3.3 VDC); Low Battery Auto-Shutdown (at +3.2 VDC)**
- ✓ **Rugged high-impact polymer enclosure, compact weatherproof design**
- ✓ **Removable rubber bumper and detachable lanyard or belt clip**
- ✓ **Operating temperature: –4° F to 131° F (–20° C to +55° C)**
- ✓ **Storage temperature: –40° F to 131° F (–40° C to +55° C)**

SmaRT wireless high-power HH-xH06 handheld remote control units are used to communicate with and control SmaRT base units operating in the 900 MHz or 2.4 GHz ranges. Handheld remotes are available as:

- PTO—push-to-operate that powers on when any button is pressed
- DO—single dual function ON/OFF button
- OO—individual ON and individual OFF buttons

All handheld remotes have an automatic shutdown timeout: A period of time after which the handheld remote turns itself off to conserve power if no buttons are pushed. The Cervis naming convention for SmaRT handheld remotes indicates unit details as shown in the Table 1.

Table 1. HH-xH06 Naming Conventions

Unit	Mnemonic (PTO, DO, OO)	Frequency	Buttons	Control Buttons
PTO-2H02	PTO – (Push-To-Operate)	2 (2405–2480 MHz)	02 (Two)	Two
PTO-2H04	PTO – (Push-To-Operate)	2 (2405–2480 MHz)	04 (Four)	Four
PTO-2H06	PTO – (Push-To-Operate)	2 (2405–2480 MHz)	06 (Six)	Six
PTO-9H02	PTO – (Push-To-Operate)	9 (906–924 MHz)	02 (Two)	Two
PTO-9H04	PTO – (Push-To-Operate)	9 (906–924 MHz)	04 (Four)	Four
PTO-9H06	PTO – (Push-To-Operate)	9 (906–924 MHz)	06 (Six)	Six
DO-2H02	DO – (Dual Operation ON/OFF)	2 (2405–2480 MHz)	02 (Two)	One
DO-2H04	DO – (Dual Operation ON/OFF)	2 (2405–2480 MHz)	04 (Four)	Three
DO-2H06	DO – (Dual Operation ON/OFF)	2 (2405–2480 MHz)	06 (Six)	Five
DO-9H02	DO – (Dual Operation ON/OFF)	9 (906–924 MHz)	02 (Two)	One
DO-9H04	DO – (Dual Operation ON/OFF)	9 (906–924 MHz)	04 (Four)	Three
DO-9H06	DO – (Dual Operation ON/OFF)	9 (906–924 MHz)	06 (Six)	Five
OO-2H04	OO – (ON button and OFF button)	2 (2405–2480 MHz)	04 (Four)	Two
OO-2H06	OO – (ON button and OFF button)	2 (2405–2480 MHz)	06 (Six)	Four
OO-9H04	OO – (ON button and OFF button)	9 (906–924 MHz)	04 (Four)	Two
OO-9H06	OO – (ON button and OFF button)	9 (906–924 MHz)	06 (Six)	Four

Figure 1. HH-xH06 6-LED Handheld Remote Button Assignments

A handheld can communicate with a variety of SmaRT base units and can provide up to six command functions using direct sequence spread spectrum (DSSS) wireless technology at 2.4 GHz or 900 MHz. It provides a robust link with a base unit in congested radio environments. SmaRT handheld units feature seamless association with SmaRT base units without the need to open either the handheld or base unit cases.

The weatherproof handheld enclosure is constructed of rugged high-impact polymer with a polycarbonate face plate securely sealed and attached by eight screws. It is further protected by a removable rubber bumper that covers the back and sides of the unit extending beyond the recessed faceplate. A convenient lanyard is provided that can be attached to the unit through a recess on the bottom of the rubber bumper.

SmaRT handhelds operate between +3.6 to 4.5 VDC powered by three size "AAA" cell batteries. Six visible status/diagnostic LEDs (see Figure 2) indicate radio frequency transmit and receive status, errors, button press and output control, low battery warning, and low battery unit auto-shutdown, as well as two additional indicators under control of a base unit.

ASSOCIATE (button 1)

DISSOCIATE (button 2)

TX blinking Green when transmitting

RX blinking Yellow when receiving

ER blinking Red when error occurs

BA blinking Yellow when Low Battery

A1 (Auxiliary 1) Custom program use

A2 (Auxiliary 2) Custom program use

Protective Bumper

Figure 2. Standard PTO Six button Example

Notice in the example above that standard 6-button handheld pushbuttons are assigned to specific SmaRT base unit outputs. This button layout applies to the two-button and four-button PTO units where:

- Pushbutton outputs 1 and 2 apply to two-button units.
- Pushbutton outputs 1 through 4 apply to four-button units.
- Associate and Dissociate buttons are factory-selectable and apply to all PTO handheld remotes.

1.1 DO and OO Button Operation

DO (Dual Operation) and OO (dedicated ON, dedicated OFF) handheld remotes offer the advantage of more control when the handheld remote is powered ON and OFF. A DO-206, for instance, can have one of the six buttons—Button 6—dedicated as an ON/OFF (toggle) that, when pressed once, turns the unit ON, and when pressed again turns the unit OFF. In the case of an OO handheld—OO-206, for instance— Button 5 can be dedicated as an ON button while Button 6 can be dedicated as an OFF button. See the examples in Figure 1 for DO and OO button placements.

2.0 Associate Handheld to Base Unit

Each SmaRT handheld must first establish a communication link with the base unit before the base unit will recognize the handheld unit. This process is called "Association," and it applies to all HH-xH06 handhelds. As part of a system, a handheld remote is associated with the system base unit before leaving Cervis, Inc. In situations where it is necessary to re-establish handheld-to-base-unit communications, follow these steps:

1. Remove power from the base unit and turn off (PTO – time out) the handheld device.
2. Stand near the base unit in unobstructed, clear line-of-sight with the handheld in hand.
3. Simultaneously press and hold the Associate (B1) and Dissociate (B2) buttons. The RX and ER LEDs light solid.
4. Continue to hold both buttons until the TX and RX LEDs light steady.
5. When TX and RX light, release B1 and B2. The ER and BA LEDs light steady.

✓ *Note: If the next button press is not immediately performed (approximately two seconds), all LEDs flash and the Association procedure is aborted. The process to establish the communication link must be restarted from Step 1.*

6. Immediately press and hold the Associate button (B1). All LEDs light.
7. TX begins to slowly blink. Continue to hold B1.
8. Apply power to the base unit.

The handheld and base unit begin to establish a communication link while the Associate button is held. Once the process is complete, all LEDs light briefly and then go out.

9. Release the Associate button.

The SmaRT System is ready for use with that particular handheld remote.
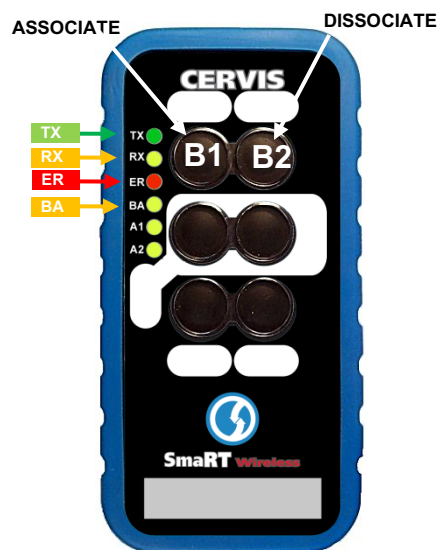

Figure 3. Handheld Buttons

3.0 Dissociate Handheld from Base Unit

In some circumstances, it may become necessary to break the communication link, or "dissociate" a handheld and a base unit. The Dissociation procedure is almost identical to the Association procedure, except the Dissociate button is used and held throughout the process instead of the Associate button.

> **Caution**
> ⚠️
> *Using the following steps breaks all previously established handheld remote links. It will be necessary to perform the Associate Procedure (Section 2.0 above) using each handheld to re-establish communication links with a base unit.*

1. Remove power from the base unit and turn off (PTO – time out) the handheld device.
2. Stand near the base unit in unobstructed, clear line-of-sight with the handheld in hand.
3. Simultaneously press and hold the Associate (B1) and Dissociate (B2) buttons. The RX and ER LEDs light solid.
4. Continue to hold both buttons until the TX and RX LEDs light steady.
5. When TX and RX light steady, release B1 and B2. The ER and BA LEDs light steady.

✓ *Note: If the next button press is not immediately performed (approximately one second), all LEDs flash and the Dissociate procedure is aborted. The process to establish the communication link must be restarted from Step 1.*

6. Immediately press and hold the Dissociate button (B2).
7. TX begins to slowly blink. Continue to hold B2.
8. Apply power to the base unit.

All established links with the base unit are removed. The SmaRT base unit will not communicate with any handheld remote units. To connect any handheld remote, use the Association Procedure (Section 2.0) to re-establish a communication link with the base unit.

4.0 Battery Installation or Change

SmaRT HH-xH06 handheld units are powered by three size "AAA" cell batteries. When installing batteries, be sure to observe proper polarity as marked on the inside of the compartment to avoid damaging the unit. To replace or install batteries in the handheld:

1. Remove the four small Phillips screws from the Battery Compartment cover, and lift the cover from the handheld.
2. If installing batteries in an empty battery compartment, install three fresh size "AAA" batteries. Be sure to position the batteries as shown in Figure 4 below.
3. If replacing expired batteries, remove the old batteries and install three fresh size "AAA" batteries. Be sure to position the batteries as shown in Figure 4 below.
4. Replace the compartment cover and tighten the four Phillips screws. Do not over-tighten these screws, but they should be tight enough to properly seal the gasket.

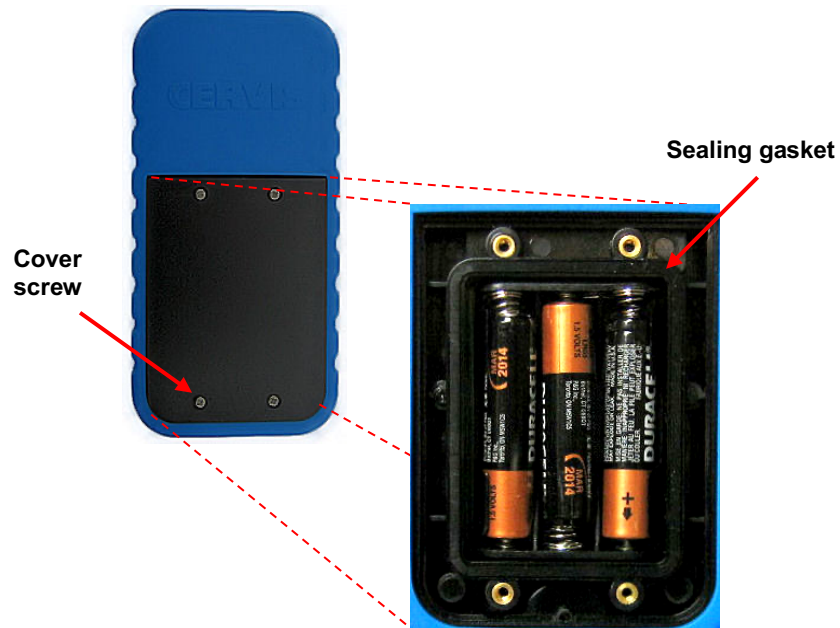*Figure 4. Handheld Battery Installation*

✔ *Note: Cover screws must be tightened enough to compress the sealing gasket. Do not over-tighten the screws.*

Caution ⚠	**Be sure to observe proper polarity when placing batteries in the handheld battery compartment.**

5.0 Using a Standard SmaRT Handheld Remote

✓**Note:** *Three-LED handheld units use the same button sequence as 6-LED remotes.*

Handheld control is achieved under the following conditions:

5. Communication between the handheld and base unit must be established using the Associate Procedure (Section 2.0).

6. You must be line of sight of the base unit while holding the handheld, within approximately 300–1000 ft. (100–333 m) of the unit.

7. Each button is Push-To-Operate (PTO). Each is dedicated to its assigned (or hardwired) output driven by the base unit. The output is only controlled when the appropriate button is pressed and held.

The front panel of SmaRT HH-xH06 handheld remotes have two, four, or six buttons respectively; all have three diagnostic LEDs. Buttons 1 and 2 have dual functions used to Associate and Dissociate the handheld to base units as previously described. Each button has an area adjacent to it in which you can use a pen or a marker to write an Identifier for the button.

Output buttons control a particular base unit output only for as long as the button is pressed and held. Output buttons are assigned as shown in the tables in Section 5.4 for the particular types of SmaRT handheld remotes.
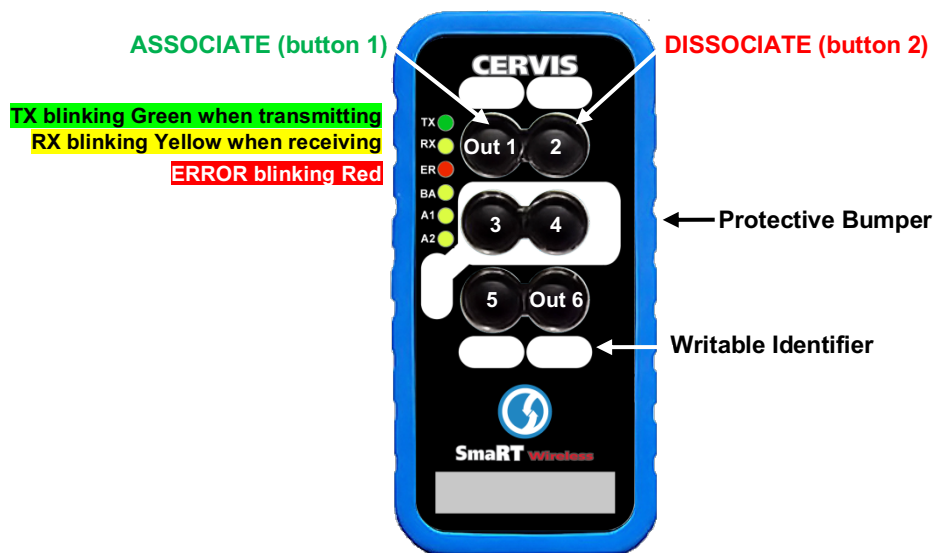
Figure 5. PTO-906 and PTO-206 Front Panel

5.1 PTO Start and Stop

A standard PTO handheld remote activates (powers up) when any pushbutton is pressed. Blinking TX and RX LEDs indicate that the remote is alive and communicating with the base unit.

To conserve battery power, the PTO unit stays active for approximately three seconds and will automatically power down unless there is button activity within the three second limit. When the unit times out and powers down, all LED activity stops.

5.2 DO Start/Stop

A standard DO handheld remote has a designated button that when pressed powers the handheld, and when pressed again powers down the unit. Blinking TX and RX LEDs indicate that the remote is alive and communicating with the base unit when the unit is ON.

The standard DO handheld remote auto-shutdown is set to four minutes of button inactivity (default). To conserve battery power, unless there is button activity within the four-minute limit, the DO handheld remote automatically powers down. When the unit times out and powers down, all LED activity stops.

5.3 OO Start and Stop

A standard OO handheld remote has a ON and a designated OFF button that when pressed powers and powers-down the handheld respectively. Blinking TX and RX LEDs indicate that the remote is alive and communicating with the base unit when the unit is ON.

The OO handheld remote auto-shutdown is set to four minutes of button inactivity (default). To conserve battery power, unless there is button activity within the four-minute limit, the OO handheld remote automatically powers down. When the unit times out and powers down, all LED activity stops.

5.4 Pushbutton Output Assignments and Output Control

As a PTO, action will only occur when a pushbutton is pressed, and the duration of the action only occurs for the length of time that the button is held down. Once the system is operating, the pushbuttons are assigned to particular base unit outputs as shown in the following tables.

Table 2. PTO Button Output Assignments (x = 2 or 9)

Applies to PTO Type	Pushbutton	Output	ON	OFF
x06, x04, x02	1	1		
x06, x04, x02	2	2		
x06, x04	3	3	Any button press	3-second timeout (default)
x06, x04	4	4		
x06	5	5		
x06	6	6		

Table 3. DO Button Output Assignments (x = 2 or 9)

Applies to DO Type	Pushbutton	Output	Unit ON/OFF
x06, x04, x02	1	1	
x06, x04, x02	2	2 (N/A for x02)	ON/OFF for DO-x02
x06, x04	3	3	
x06, x04	4	4 (N/A for x04)	ON/OFF for DO-x04
x06	5	5	
x06	6	N/A	ON/OFF for D0-x06

Table 4. OO Button Output Assignments (x = 2 or 9)

Applies to OO Type	Pushbutton	Output	ON or OFF
x06, x04	1	1	
x06, x04	2	2	
x06, x04	3	3 (N/A for x04)	ON for x04
x06, x04	4	4 (N/A for x04)	OFF for x04
x06	5	N/A	ON for x06
x06	6	N/A	OFF for x06

6.0 Low Battery and Low Battery Auto-Shutdown

✓*Note: Low Battery and Low Battery Auto-shutdown applies to all PTO, DO, and OO handheld remotes, but because the Inactivity Timeout value (the set time within where there must be button activity or the unit powers down) is so brief for PTOs, it is difficult to observe the Low Battery and Low Battery Auto-Shutdown.*

6.1 6-LED Remote Low Battery Warning

DO and OO Handheld Remotes

At 3.3 VDC and below the Amber BA LED will begin to flash approximately once per second to indicate a Low Battery Warning. Messages are still being transmitted, and the handheld can still be used, but it is recommended that a fresh set of AAA batteries should be installed as soon as possible.

At 3.2 VDC the Yellow BA LED will turn on solid and the unit will begin a self powerdown. The associated device will receive a low battery powerdown message.

PTO Handheld Remotes

Low Battery Warning on PTO handheld remotes can only be observed while a button is being press.

LOW BATTERY WARNING

At 3.3 V or less, the TX LED stops flashing as messages are sent from the handheld remote to the base unit. Messages are still being sent, but they are not indicated by the LED.

TX LED begins flashing once per second indicating a LOW BATTERY (3.3 V or less) situation is present. Three fresh AAA batteries should be replaced as soon as possible. The LED will continue to flash at one second intervals unit the batteries are changed, or until the voltage level drops to 1.1 V and Auto-Shutdown occurs.

LOW BATTERY AUTO-SHUTDOWN

At 3.1 V, the Green TX LED stops flashing. The Amber BA LED flashes briefly, for approximately 1.25 seconds, and the handheld remote automatically shuts down.

Three fresh AAA batteries must be installed before the handheld can be used again.

Figure 6. Six-LED Remote Low Battery Warning and Auto-Shutdown

6.2 6-LED Remote Low Battery Auto-Shutdown

DO and OO Handheld Remotes

At 3.1 VDC, the Green TX LED will cease to pulse, messages will not be sent or received, the Amber BA LED will very briefly pulse once for approximately 1.25 seconds, and the handheld remote will completely shut down. Subsequent attempts to use the handheld results in immediate shut down of the unit. A fresh set of AAA batteries must be installed before the handheld remote can be used.

PTO Handheld Remotes

Low Battery Auto-Shutdown is indicated on a PTO handheld remote only when a button is held down, and then so briefly that it can be easily missed. Therefore, the more telling indication is that the transmit (TX) and receive (RX) LEDs are inactive, and the Green TX LED is not illuminated while any button is being held.

7.0 Specifications

Table 5. SmaRT HH-xH06 Handheld Specifications

Item	Description	
Power	V_{in}	+3.6 V to +4.5 V
	Batteries	Three AAA alkaline
	Auto-shutdown	PTO – three seconds of button inactivity DO and OO – four minutes of button inactivity
	Low Battery Warning	3.3 V and below
	Low Battery Shutdown	3.2 V
Environment	**Operating Temp**	–20° C to 55° C (–4° F to 131° F)
	Storage Temp	–40° C to 55° C (–40° F to 131° F)
	Humidity	0 to 100%
Radio	**Frequency**	906–924 MHz or 2405–2480 MHz
	RF Power	900 MHz @ 10 mW; 2.4 GHz @ 100 mW
	License	License-free
	Modulation	DSSS
	Antenna	Internal
Enclosure	**Dimensions**	mm: 136.38 x 68.96 x 28.42 Inches: 5.37 x 2.68 x 0.92
	Total Weight	200 g/7.2 oz. (with lanyard)
	Durability	High Impact Polymer case Polycarbonate faceplate Impact absorbing bumper
LED Indicators (6)	**TX (Green)**	Transmit – Flashes when transmitting message
	RX (Amber)	Receive – Flashes when receiving message
	ER (Red)	Error **–** Blinks when error detected
	BA (Amber)	Low battery – Blinks when battery voltage $\leq$ 3.3 V
	A1 (Amber)	Auxiliary 1 – Custom use only
	A2 (Amber)	Auxiliary 2 – Custom use only
Buttons	**Two, Four, or Six**	Pushbuttons
	Number of Functions	Handheld type dependent, see Section 5.4
	Style	Push-to-operate
	Button Life	5-million operations (typical)
Umbilical	Not Applicable	
Display	Not Applicable	
Proportional Inputs	Not Applicable	

8.0 Spare Parts List

Table 6. Spare Parts List

Item	Cervis Bin Location
Protective Rubber Bumper	AA6-02
Lanyard	AA8-01B
Battery Cover with 4 Screws	Call Cervis @ 724-741-9000
AAA 1.5V Alkaline Batteries (pk. 3)	AA6-03
Belt Clip	AA5-07
Replacement Antenna	Disallowed

Appendix A: HH-xH06 Product Variation List

Table 7. HH-xH06 Product Variation List

Model	Model #	Frequency	RF Power	Activation	Discrete Pushbutton Inputs	Dedicated Stop	Attachment
PTO-9H06	07116550	900 MHz	10 mW	Any Input	6	No	Lanyard
PTO-9H04	07116551	900 MHz	10 mW	Any Input	4	No	Lanyard
PTO-9H02	07116552	900 MHz	10 mW	Any Input	2	No	Lanyard
OO-9H06	07116553	900 MHz	10 mW	ON, OFF	6	Yes	Lanyard
OO-9H04	07116554	900 MHz	10 mW	ON, OFF	4	Yes	Lanyard
OO-9H02	07116555	900 MHz	10 mW	ON, OFF	2	Yes	Lanyard
DO-9H06	07116556	900 MHz	10 mW	ON/OFF	6	Yes	Lanyard
DO-9H04	07116557	900 MHz	10 mW	ON/OFF	4	Yes	Lanyard
DO-9H02	07116558	900 MHz	10 mW	ON/OFF	2	Yes	Lanyard
PTO-9H06S	07116559	900 MHz	10 mW	Any Input	6	No	Lanyard
OO-9H06S	07116560	900 MHz	10 mW	ON, OFF	6	Yes	Lanyard
DO-9H06S	07116561	900 MHz	10 mW	ON/OFF	6	Yes	Lanyard
PTO-9H06B	07116562	900 MHz	10 mW	Any Input	6	No	Belt Clip
PTO-9H04B	07116563	900 MHz	10 mW	Any Input	4	No	Belt Clip
PTO-9H02B	07116564	900 MHz	10 mW	Any Input	2	No	Belt Clip
OO-9H06B	07116565	900 MHz	10 mW	ON, OFF	6	Yes	Belt Clip
OO-9H04B	07116566	900 MHz	10 mW	ON, OFF	4	Yes	Belt Clip
OO-9H02B	07116567	900 MHz	10 mW	ON, OFF	2	Yes	Belt Clip
DO-9H06B	07116568	900 MHz	10 mW	ON/OFF	6	Yes	Belt Clip
DO-9H04B	07116569	900 MHz	10 mW	ON/OFF	4	Yes	Belt Clip
DO-9H02B	07116570	900 MHz	10 mW	ON/OFF	2	Yes	Belt Clip
PTO-2H06	07126550	2.4 GHz	100 mW	Any Input	6	No	Lanyard
PTO-2H04	07126551	2.4 GHz	100 mW	Any Input	4	No	Lanyard
PTO-2H02	07126552	2.4 GHz	100 mW	Any Input	2	No	Lanyard
OO-2H06	07126553	2.4 GHz	100 mW	ON, OFF	6	Yes	Lanyard
OO-2H04	07126554	2.4 GHz	100 mW	ON, OFF	4	Yes	Lanyard
OO-2H02	07126555	2.4 GHz	100 mW	ON, OFF	2	Yes	Lanyard
DO-2H06	07126556	2.4 GHz	100 mW	ON/OFF	6	Yes	Lanyard
DO-2H04	07126557	2.4 GHz	100 mW	ON/OFF	4	Yes	Lanyard
DO-2H02	07126558	2.4 GHz	100 mW	ON/OFF	2	Yes	Lanyard
PTO-2H06S	07126559	2.4 GHz	100 mW	Any Input	6	No	Lanyard
OO-2H06S	07126560	2.4 GHz	100 mW	ON, OFF	6	Yes	Lanyard
DO-2H06S	07126561	2.4 GHz	100 mW	ON, OFF	6	Yes	Lanyard
PTO-2H06B	07126562	2.4 GHz	100 mW	Any Input	6	No	Belt Clip
PTO-2H04B	07126563	2.4 GHz	100 mW	Any Input	4	No	Belt Clip
PTO-2H02B	07126564	2.4 GHz	100 mW	Any Input	2	No	Belt Clip
OO-2H06B	07126565	2.4 GHz	100 mW	ON, OFF	6	Yes	Belt Clip
OO-2H04B	07126566	2.4 GHz	100 mW	ON, OFF	4	Yes	Belt Clip
OO-2H02B	07126567	2.4 GHz	100 mW	ON, OFF	2	Yes	Belt Clip
DO-2H06B	07126568	2.4 GHz	100 mW	ON/OFF	6	Yes	Belt Clip
DO-2H04B	07126569	2.4 GHz	100 mW	ON/OFF	4	Yes	Belt Clip
DO-2H02B	07126570	2.4 GHz	100 mW	ON/OFF	2	Yes	Belt Clip

Appendix B: Exposure to Radio Frequency Energy

SmaRT handheld remote units contain radio transceivers. When active, a handheld remote sends out radio frequency (RF) energy through its internal antenna. The SmaRT handheld remote complies with limits set by the FCC for operating distance from human tissue.

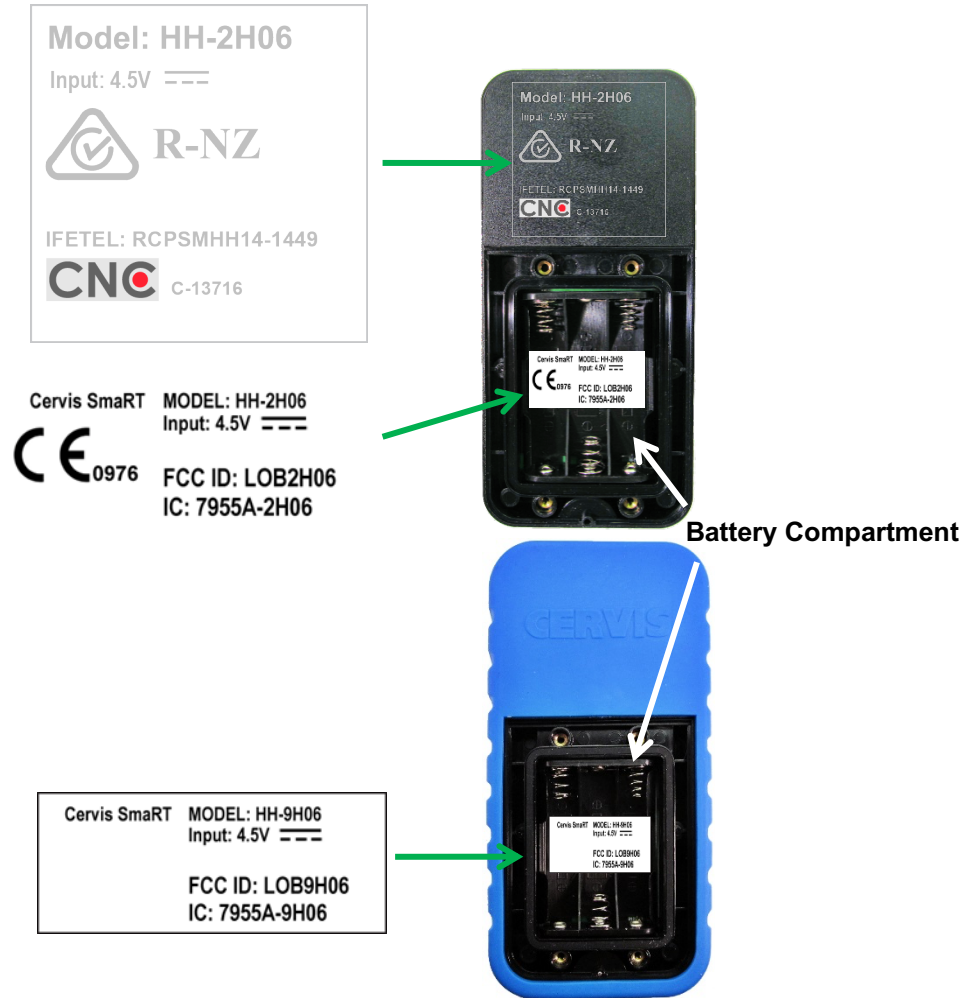## Appendix C: Agency Identification Label Locations

Battery Compartment

Figure 7. Agency Identification Label Locations

Appendix D: Regulatory Compliance Information

See this document's front matter.

The Following applies only to HH-2H06 handheld remotes:

Resolução 506 -ANATEL
Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário.

Informações sobre Regulamentação

Este equipamento está devidamente certificado e homologado pela ANATEL, em conformidade com as Res. 242 e 323, conforme selo abaixo:

(For 2.4GHz Units Only)

CNC: C-13716

Certificado No.:
IFETEL:RCPSMHH14-1449
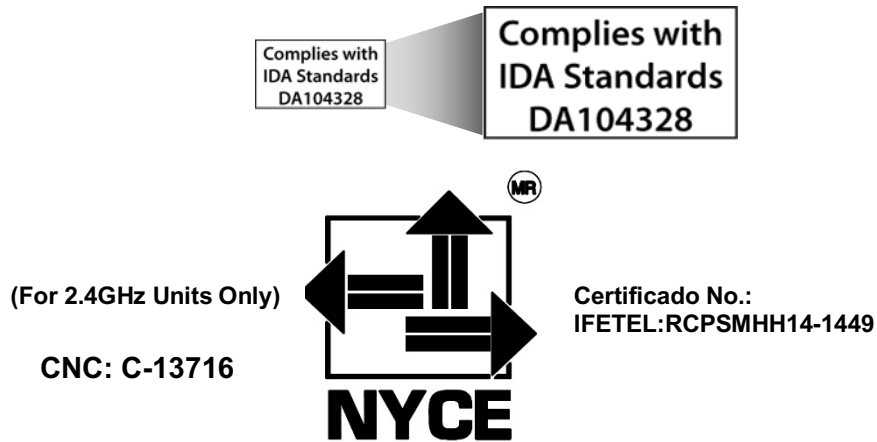
Appendix E: Declaration of Conformity

Declaration of Conformity

CERVIS INC.

EU DECLARATION OF CONFORMITY

Manufacturer: Structured Mining Systems, Inc.
(d.b.a. Cervis, Inc.)
170 Thorn Hill Road
Warrendale, PA 15086 USA
Telephone No. (724) 741-9000

Date: February 14, 2018

This declaration of conformity is issued under the sole responsibility of the manufacturer. The undersigned hereby declares, on behalf of Structured Mining Systems, Inc. (d.b.a. Cervis, Inc.) of Warrendale, Pennsylvania, that the below referenced list of Industrial (ISM) radio equipment products, to which this declaration relates, is in conformity with the provision of the following European Union harmonization legislation:

Council Directive 1999/5/EC (R&TTE)
Council Directive 2006/95/EC (Low Voltage)
Council Directive 2004/108/EC (Electromagnetic Compatibility)
Council Recommendation 1999/519/EC (Human Exposure to Electromagnetic Fields)

Relevant Harmonized Standards or Other Technical Specifications:

ETSI EN 300 328 v1.7.1:2006	ETSI EN 301 489-17 v2.2.1:2012
IEC 60950-1 Ed 2.2; 2013-05-28	BS EN 62311:2008
ETSI EN 301 489-1 v1.9.2:2011	BS EN 62209-2:2010

The technical documentation is maintained at the corporate headquarters of Structured Mining Systems, Inc. (d.b.a. Cervis, Inc.), 170 Thorn Hill Road, Warrendale, PA.
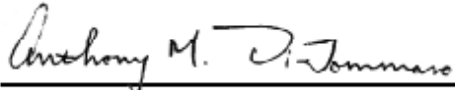
Products: (see other sections/areas of the product user manual for product images, accessories, components, and software, which allow the radio equipment to operate as intended)

MODEL NUMBER	PART NUMBER	BATCH OR SERIAL NUMBER RANGE	
PTO-2H06	07126550		to
OO-2H06	07126553		to
DO-2H06	07126556		to
PTO-2H06S	07126559		to
PTO-2H06B	07126562		to
OO-2H06B	07126565		to
DO-2H06B	07126568		to
PTO-2H04	07126551		to
OO-2H04	07126554		to
OO-2H04	07126557		to
OO-2H04S	07126560		to
PTO-2H04B	07126563		to
OO-2H04B	07126566		to
OO-2H04B	07126569		to
PTO-2H02	07126552		to
OO-2H02	07126555		to

ID048.8.0

Declaration of Conformity

CERVIS INC.

MODEL NUMBER	PART NUMBER	BATCH OR SERIAL NUMBER RANGE		
DO-2H02	07126558	_____	to	_____
DO-2H02S	07126561	_____	to	_____
PTO-2H02B	07126564	_____	to	_____
DO-2H02B	07126567	_____	to	_____
DO-2H02B	07126570	_____	to	_____

Anthony M. Di Tommaso (signature)

Anthony M. Di Tommaso

Director of Product Development, Quality, & Finance

February 14, 2018

Date