



PG-x14
Pistol Grip
Remote Control User Manual
U045.11.0

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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.

IC 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 (e.i.r.p.) is not more than that necessary for successful communication.

Partie 1 : 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-305) 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.

Partie 2 : Cet émetteur radio (LOBSRF-305) a été approuvé par Industrie Canada pour fonctionner avec le type d'antenne indiqué ci-dessous avec le gain maximal admissible et l'impédance d'antenne requise pour chaque type d'antenne indiqué. Il est strictement interdit d'utiliser avec cet appareil un type d'antenne ne figurant pas dans cette liste ou ayant un gain supérieur au gain maximum indiqué pour ce type.

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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Definitions

Associate/Association

Mode whereby SmaRT handhelds and base units are paired for operation (IDs exchanged). This mode is used to commission spare handhelds or base units.

DSSS

Direct Sequence Spread Spectrum; an advanced wireless communication technology resistant to intended or unintended jamming.

Dissociation

The process of decommissioning a handheld from a base unit ID memory — clears both handheld and base unit memory.

Latch

Command from the handheld remote to maintain an output state until specifically signalled again to change state.

Line of Sight (aka Direct-Line-of-Sight)

Term used to describe radio frequency (RF) communication where the pathway between the units is clear of physical obstacles such as walls, earth, and other obstructions.

Momentary

A switch or button capable of turning a base unit output to either an “on” or “off” state when an end-user presses the switch. The output returns to its original state when the button is released.

SmaRT Base Unit

Input/output (I/O) unit that the controlled machine is connected to. SmaRT base units communicate with each other and SmaRT handheld, console, pistol grip, and belt pack remote controllers.

SmaRT Handheld Remote Control

Portable unit that controls base unit activity using RF signals or through a hardwired tether connection.

SmaRT Remote Control System

SmaRT system consisting of one or more SmaRT base units and from one to eight SmaRT remote control units. The system operates in the 900 MHz or 2.4 GHz range and has inputs/outputs or data communications.

TX/RX

Transmit/Receive.

Tether

Hardwired connection between the handheld remote and base unit. When the tether is connected, handheld RF control is disabled, and all commands are sent over the unbilical connection to the base unit. This connection is detachable from the handheld remote and, when removed the system, returns to RF control as long as the RF link has been previously established.

Note to the Manual User

- ✓ **Note:** *The higher transmit power SmaRT pistol grips are available to operate at 900 MHz or 2.4 GHz using Direct Sequence Spread Spectrum (DSSS) wireless technology. To avoid repetition and possible confusion, the pistol grip remote control units are referred to as the “PG-x14 remote” throughout this document, where “x” represents either 900 MHz for PG-9X14 or 2.4 GHz for PG-2H14.*
- ✓ **Note:** *Images used in this document are generic and may not exactly represent the Manual User’s unit.*

Related Documents

Engineered systems related Cervis, Inc. ESD documents — such as **WSMB-9999 Engineered System Document** as provided with that particular engineered system.

Installation or Troubleshooting Questions?

Contact Cervis, Inc. at (724) 741-9000 if you have any questions during installation or troubleshooting of a system, a handheld, or a base unit.

1.0 Safety Instructions

Caution!



Carefully read these instructions to properly use the Smart PG-x14, to keep it in safe working condition, and to reduce the risks of misuse.

Do not use the system in potentially explosive atmospheres.

Any use other than that specified in this manual is **DANGEROUS**.

Strict adherence to the following instructions is a **MUST**.

- ✓ **Note:** To comply with United States Federal Communications Commission (FCC) radio frequency (RF) exposure compliance requirements, do not co-locate or operate this device and its antenna in conjunction with any other antenna or transmitter.

Caution!



Certain adjustments may need to be made while the controlled machinery is active. All personnel must be at a safe distance from the machine during these adjustments to avoid risk of injury or accidental death.

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 you are 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 harness wiring cables from the base unit connectors 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 intentionally 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 radio base unit before welding on the machine. Failure to disconnect the base unit may destroy or damage the base unit.**
- ✓ **Keep high-energy radio frequency (RF) devices away from handheld remotes. Activating high-power communication radios, for instance, close 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.**
- ✓ **Do not key two-way radios when the handheld remote is active.**

Cervis, Inc. Safety Precautions (continued)

Caution!



Outputs under sole control of momentary switches—push-to-operate (PTO), for instance—should only change state when the appropriate handheld remote button or switch is pressed or positioned; and then only for the duration of time that particular output button is pressed or switch is positioned. Investigate any unexpected motion that occurs when pressing the handheld remote output controls.

Immediately stop operating if a jerky motion occurs while constantly pressing an output switch. Check the base unit diagnostic LEDs for any indication of a problem. Diagnostic descriptions are found in the manual of the particular SmaRT base unit in use.

Be aware that even if the handheld and base unit diagnostic LEDs do not indicate a problem, one may be present and further troubleshooting steps may be needed.

If a problem is found, do not operate the SmaRT System until the problem is resolved.

2.0 SmaRT PG-x14 Pistol Grips

✓ **Note:** The “x” in PG-x14 represents either 900 MHz for PG-9X14, or 2.4 GHz for PG-2H14.

The SmaRT™ pistol grip remotes are designed for both traditional and non-traditional mobile applications. The SmaRT pistol grips can activate digital and trigger-controlled proportional pulse-width-modulation (PWM) SmaRT base unit outputs. They permit single-handed operation in a comfortable ergonomic layout. Using direct sequence spread spectrum (DSSS) wireless technology at 900 MHz or 2.4 GHz, SmaRT pistol grip remotes provide a robust link with a receiver in congested radio environments. The remotes feature seamless association with SmaRT base units without the need to open the case of either unit. The rugged weatherproof pistol grip enclosure allows the unit to operate worry free in harsh weather conditions.



Figure 1. SmaRT PG-x14 Pistol Grip Remote

Two RF Power Levels Available

Two radio frequency (RF) operation configurations are available – one in the 900 MHz spectrum and one in the 2.4 GHz spectrum:

- The PG-9X14 pistol grip remote operates in the 900 MHz range @ 100 mW.
- The PG-2H14 pistol grip remote operates in the 2.4 GHz range @ 100 mW.

Features

- Direct Spread Spectrum Technology (DSSS)
- Controls a variety of SmaRT base units
- Controls accessible while wearing gloves
- Oversized Machine Stop button
- Seven three-position, bi-direction toggle switches (standard)
- Trigger as a digital output enable, a digital output, or as a proportional output control
- Various diagnostic information via LEDs and/or a display
- Comfortable weatherproof design
- Tether connection option
- Magnet-embedded handle (to attach to machine surfaces)
- Powered by four “AA” cell batteries (+3.0 VDC nominal)

3.0 SmarT Pistol Grip Remote Control System

A standard SmarT PG-x14 remote control system consists of a SmarT pistol grip remote control unit and one or more SmarT base units. The PG-x14 can communicate with SmarT base units in congested radio environments using Direct Sequence Spread Spectrum (DSSS) wireless technology at 900 MHz or 2.4 GHz.

The communication link between the pistol grip remote control and the base unit is established at the factory using a process known as "Association." Situations may arise in the field where it becomes necessary to reestablish the system RF link. The flexible wireless system can be seamlessly associated in the field by a series of switch operations (detailed in Section 7.0) without the need to open the enclosures of either the handheld or base unit.

SmarT base units come in a variety of standard configurations for 900 MHz or 2.4 GHz operation, among which are the base units shown in Figure 2. SmarT handhelds and base units can be standard or custom configured by Cervis Engineering.



Figure 2. SmarT PG-x14 Pistol Grip Remote and Base Unit Examples

4.0 Smart Pistol Grip Battery Installation

Four size AA cell batteries power the Smart pistol grip handheld unit. 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. Loosen the four Phillips battery compartment cover screws on the rear of the remote and lift the cover from the handheld.
2. Install (or replace with) four fresh size AA cell batteries. Observe proper polarity by positioning the batteries as shown in Figure 3.
3. Replace the compartment cover and tighten the four Phillips screws. Do not over-tighten these screws, *but make sure they are tight enough to ensure the gasket provides a proper watertight seal.*

Caution!



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

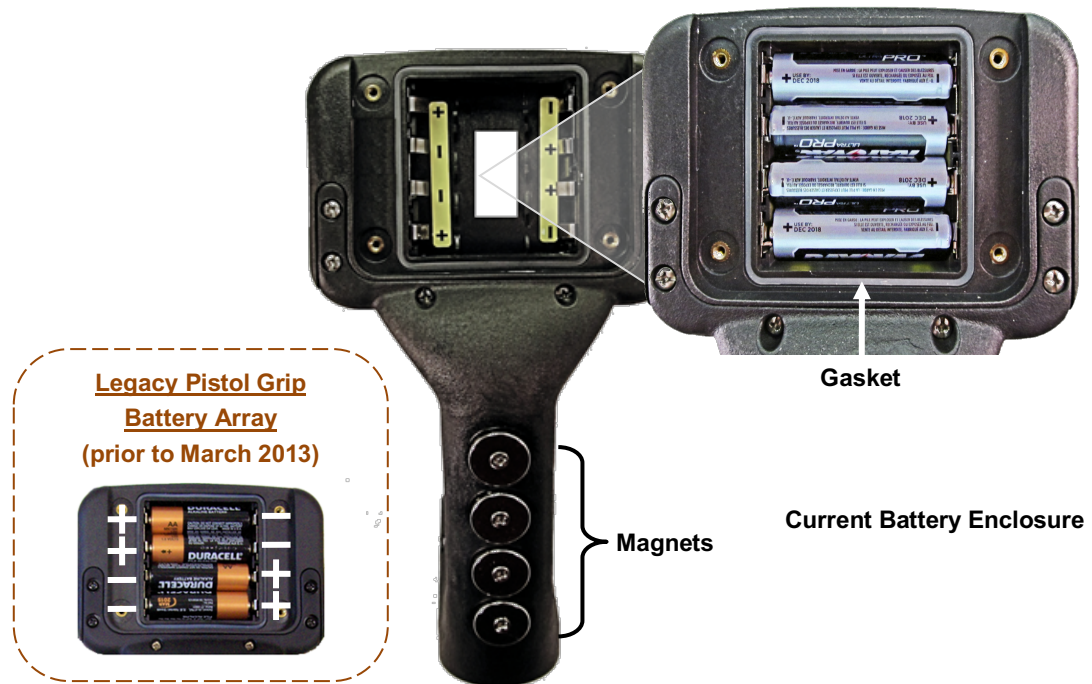


Figure 3. Smart Pistol Grip Battery Installation

✓ **Note:** Tighten cover screws enough to compress the sealing gasket. Do not over-tighten the screws.

5.0 Pistol Grip Tether Connection

The pistol grip tether connection is a 4-pin A-code or C-code connection that is keyed to prevent connector pin misalignment. A cap is attached to the handheld remote with a sturdy chain to prevent loss while it is unscrewed from the connector. When not in use, the operator should cap the connector. Radio communication is disabled whenever the unit is powered via cable and connected to the base unit. When the cable is attached, all control signals are transmitted via the cable. The example shown in Figure 4 uses a Cervis C6-12 C-Code style cable, but other cables and configurations are available. For detailed information on tether options, contact your Cervis, Inc. sales representative at: (724) 741-9000.

✓ **Note:** Any similarly configured handheld remote can operate a base unit in tether mode. But, when the tether is removed, the handheld and base unit will not communicate unless the units have been associated— that is, the RF link is established.

✓ **Note:** Keyways may be positioned other than as shown. Pins are always positioned relative to the Keyway positions.

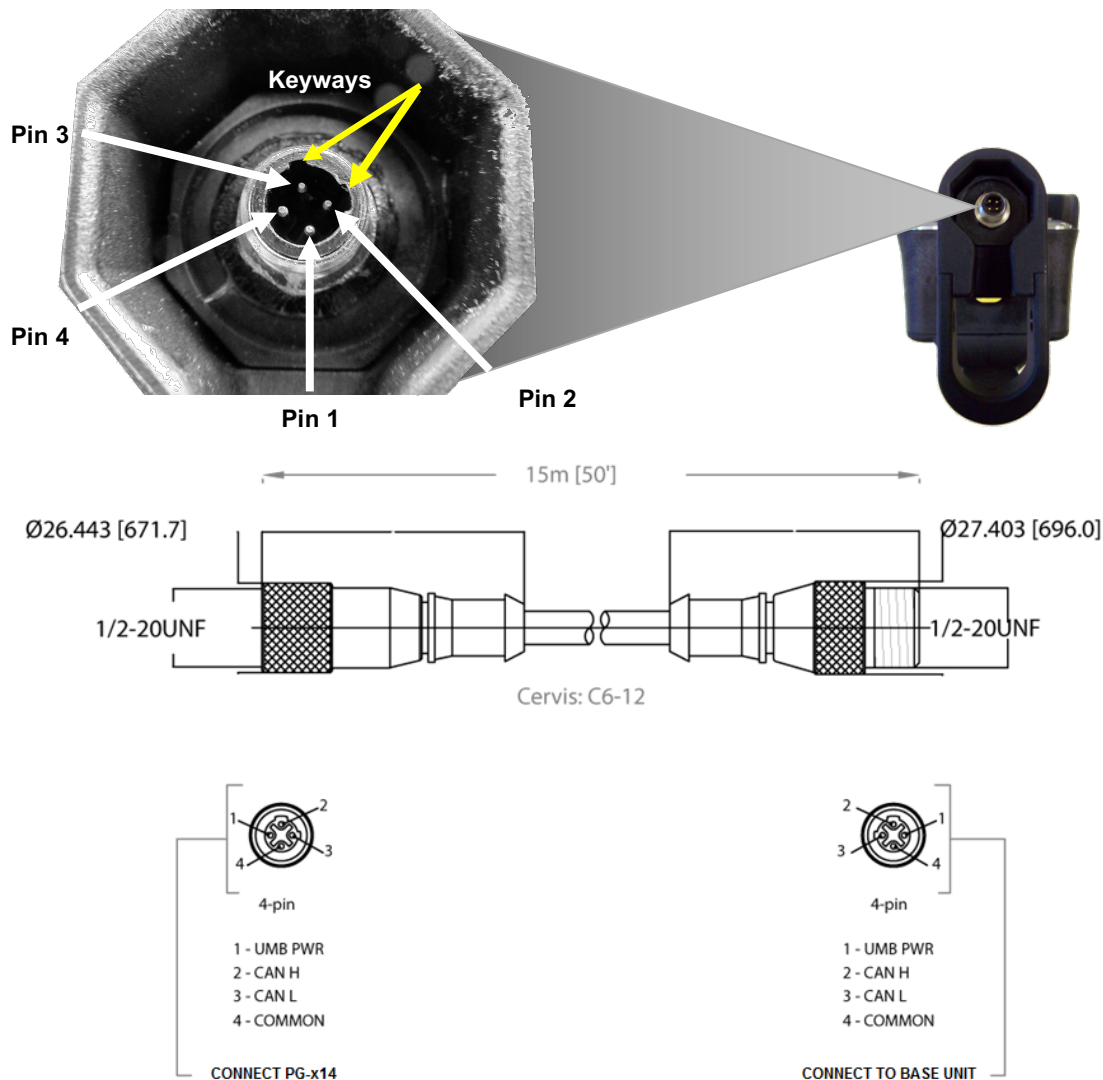


Figure 4. Pistol Grip Tether Connection

6.0 Operation

6.1 Activating the Unit

Activate the SmaRT PG-x14 Pistol Grip Remote by releasing the large red mushroom-style button up; and then activate a toggle switch. The unit will not transmit or receive messages before activating the toggle switch.

Caution!



A stuck switch is indicated if the remote's Stop button is released, the switch used to activate the unit is thrown, and the TX and RX LEDs alternate with the ERR and BATT LEDs. Check all switches before use. If the LEDs continue to alternate, the remote needs to be serviced before it can be safely used. Contact Cervis, Inc. Support at (724) 741-9000.

- ✓ **Note:** Enable the standard pistol grip transceiver by operating the toggle switches designated to activate the unit following Stop button release. (A specific switch or all switches can be configured as an "ON" switch on non-standard/custom pistol grip remotes.) Initial toggle switch operation following handheld power-up does not send a command to the base unit.
- ✓ **Note:** If a switch is held before the Stop button is released (enable the remote), the TX and ERR LEDs begin to alternate with the RX and BATT LEDs and if installed the display will indicate to "Release All Switches!" The handheld will not operate until the condition is remedied.

6.2 Deactivate the Unit

Deactivate the SmaRT PG-x14 Pistol Grip Remote by pushing the large red mushroom-style button **IN** or by allowing the unit to "time out."

6.3 Proportional Control Trigger

The SmaRT PG-x14 spring-loaded trigger either controls a digital output, is an output enable, or a proportional output control.

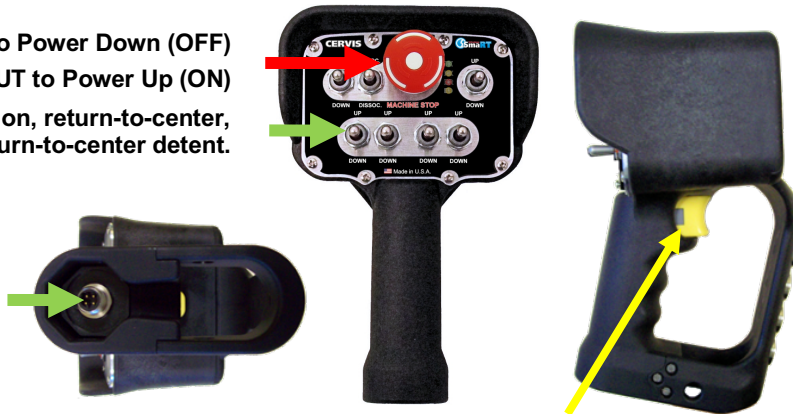
6.4 Toggle Switches S1 through S7

Toggle switches S1 through S7 (see Figure 6 and Figure 7) are three-position, return-to-center, Up or Down with a return-to-center detent. These switches are used for digital control and for various setup and adjustment functions described later in this manual.

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Push Button IN to Power Down (OFF)
 Pull Button OUT to Power Up (ON)
 Toggles are three-position, return-to-center,
 Up/Down with a return-to-center detent.

Connector for optional
 tether cord is in the base of
 the grip and recessed for
 protection.



Spring-loaded Trigger either controls a digital output, is a
 function enable or proportional output control.

Figure 5. Button, Switch, and Trigger Operation

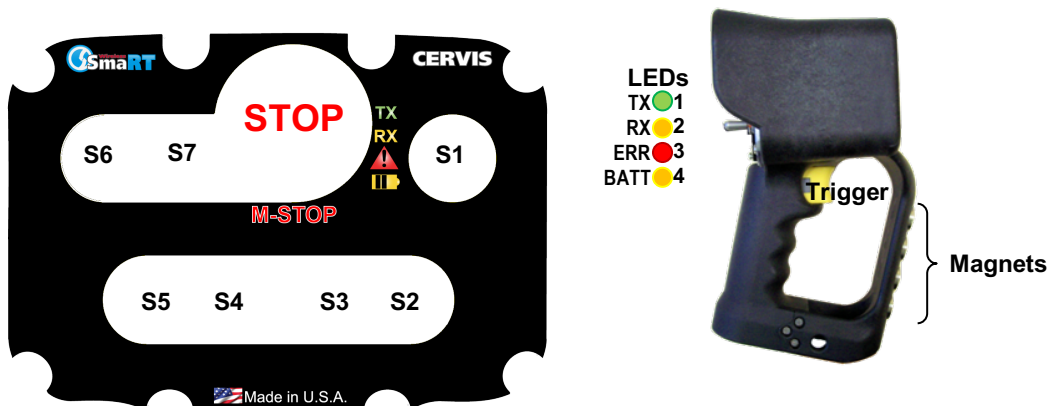


Figure 6. SmaRT PG-x14 Switch and LED Layout

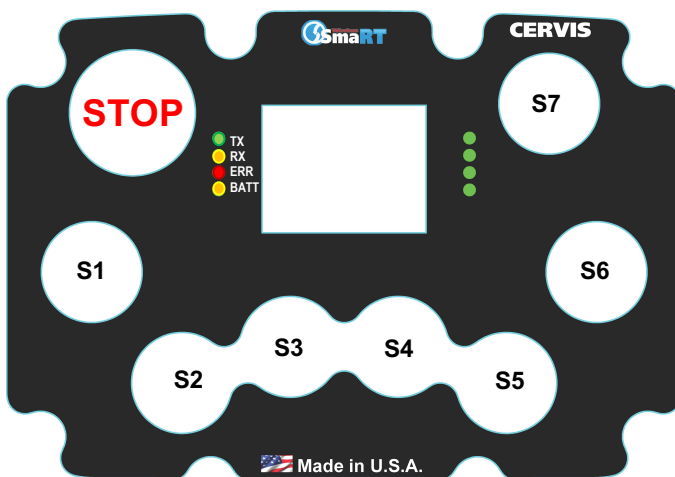


Figure 7. SmaRT PG-x14-OLED Switch and LED Layout

6.5 Standard LED Indications

Table 1. Standard LED Indications

LED	Action	Indication
TX Transmit – Green LED 1	Steady lit	Switch active
	Blink	Transmitting
RX Receive – Amber LED 2	Blink	Receiving
ERR Error – Red LED 3	Stuck Switch or MSTOP pressed	See Table 2.
BATT Battery – Amber LED 4	Cycle on/off	Change batteries

Table 2. Special Conditions LED Indication

State	LED Indication
Stuck Switch	TX and ERR alternate with RX and BATT
MSTOP Pressed	TX and RX alternate with ERR and BATT

7.0 Associate and Dissociate Radio (RF) Link

Cervis, Inc. establishes the RF link between a system handheld and base unit before shipping the system. In some circumstances after the system is received, it may be necessary to re-establish or to remove the communications link – for the purpose of troubleshooting, for instance. The pistol grip remote establishes or removes the radio link between the handheld remote and the base unit when necessary via the Association procedure. The Dissociation procedure removes the radio link between the pistol grip remote and the base unit.

To associate or dissociate, a clear line of sight must be between the handheld remote and the base unit, and both units must be OFF (powered down). Immediately turn off the pistol grip remote by pushing in the oversized red mushroom STOP button, which removes power from the unit. The pistol grip also turns off if the auto-shutdown time limit is exceeded. Standard auto-shutdown time is four minutes of switch or button inactivity. Safely power down a SmART base unit by removing the power source from the unit.

✓ **Note:** If a tether cable is attached, remove it before establishing the RF link using the Associate procedure, or before using the Dissociate procedure to break the link.

Caution! To prevent inadvertent movement of the controlled machine, be sure to remove power from the Base Unit before attempting to enter Associate Mode.



7.1 Associate PG-x14 to Base Unit

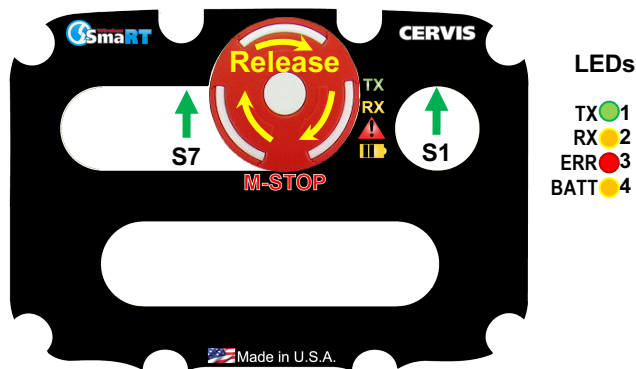


Figure 8. Associate Mode Switches

1. Remove power from the base unit, and shut down the PG.
2. Stand near the base unit (in line of sight).
3. Twist the **MACHINE STOP** button clockwise to its **UP** position.
4. Hold switch **S7** in the **ASSOCIATE (UP)** position.
5. Hold switch **S1** in the **UP** position. This activates the handheld remote.

All four LEDs flash once, and then the TX (transmit) LED lights steady, and the RX, Error, and Battery LEDs go out.

6. Continue to hold switches **S1** and **S7**.
7. **Power Up** the base unit.
8. Release switches **S1** and **S7**.

Handheld and base unit are Associated when the TX and RX LEDs continue to flash (flicker) while the handheld is on, indicating communication is established. If Association is not successful, restart the process from Step 1.

7.2 Associate PG-x14-OLED Remote to a Base Unit

1. Remove power from the base unit, and shut down the PG.
2. Stand near the base unit (in line of sight).
3. Pull up the **MACHINE STOP** button.
4. Simultaneously push and hold **S1** and **S7** in the **UP** position.

All four LEDs illuminate for approximately 2 seconds, then the RX, ERR, and BATT LEDs go out, the TX LED begins to blink, and the display reads “Apply Power to Receiver”.

5. Continue to hold **S1** and **S7**.
6. **Power Up** the base unit.
7. Release S1 and S7.

The Handheld and Base Unit are Associated when the display reads “Link Successful” and the TX and RX LEDs continuously flash. If association was not successful, the display will read “Link Not Successful” and only the TX LED will begin flashing.

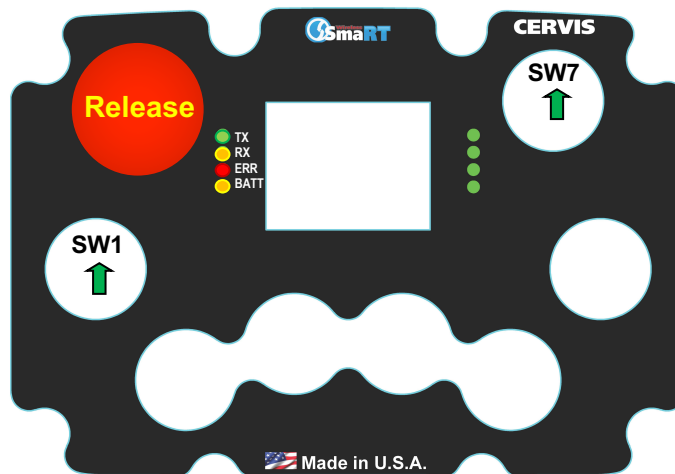


Figure 9. Associate PG-x14-OLED Remote to Base Unit

7.3 Dissociate PG-xH14 Remote from a Base Unit

1. Remove power from the base unit, and shut down the PG.
2. Stand near the base unit (in line of sight).
3. Twist the **MACHINE STOP** button clockwise to the **UP** position.
4. Hold switch **S7** in the **DISSOC. (DOWN)** position.
5. Hold switch **S1** in the **UP** position. This activates the handheld remote.

All four LEDs flash once and then the TX (transmit) LED continuously flashes (flickers), the RX LED goes out, and the Error and Battery LEDs light steady.

6. Continue to hold switches S1 and S7.
7. **Power Up** the base unit.
8. Release switches S7 and S1.

Handheld and base unit are Dissociated when the Error, Battery, and RX LEDs go out, while the TX LED continues to flash (flicker) when the switches are released. An inactive RX LED while

the base unit is powered affirms that the communication link between the handheld and base unit is broken.

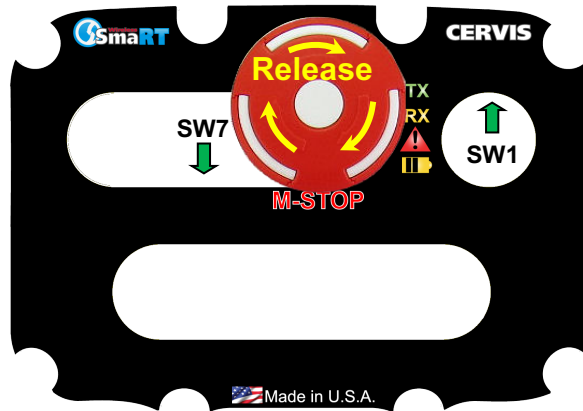


Figure 10. Dissociate PG-xH14 Remote from Base Unit

7.4 Dissociate PG-x14-OLED from a Base Unit

1. Remove power from the base unit, and shut down the PG.
2. Stand near the base unit (in line of sight).
3. Pull up the **MACHINE STOP** button.
4. Simultaneously push and hold **S1** in the **UP** position and **S7** in the **DOWN** position.

All four LEDs illuminate for approximately 2 seconds, then the RX, ERR, and BATT LEDs go out, the TX LED begins to blink, and the display reads “Apply Power to Receiver”.

5. Continue to hold **S1** and **S7**.
6. **Power Up** the base unit.
7. Release S1 and S7.

Handheld and base unit are Dissociated when the display reads “Unlink Successful” and only the TX LED flashes. An inactive RX LED while the base unit is powered on affirms that the communication link between the handheld and base unit is broken.

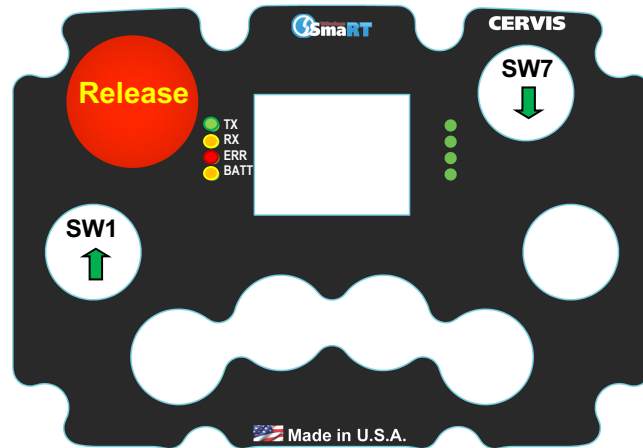


Figure 11. Dissociate PG-x14-OLED Remote from Base Unit

8.0 Proportional Output MIN and MAX Adjustments

8.1 MIN and MAX Adjustment Fundamentals

Caution!



Keep in mind at all times that you are going to control a moving piece of machinery. You must strictly adhere to the safety instructions described in Section 1.0, Safety Instructions.

- Must make sure that the area around the controlled machine is safe to operate before performing dynamic MIN and MAX adjustments.
- Power the base unit for dynamic adjustment.
- Ensure that the base unit LEDs and display are close enough to be easily read.
- Adjust Mode timeout defaults to a ten-second window of opportunity, where the unit returns to normal operating mode if none of the switches are operated within the ten-second window. The timer resets to ten seconds each time a switch or the trigger is operated while in Adjust Mode.
- Exit Adjust Mode either by:
 - Pressing the STOP button
 - Waiting for 20 seconds without operating any of the function switches on the unit
 - Releasing the function switch used to enter trigger adjustment

8.2 MIN and MAX Adjustment Procedure

✓ *Note: The "x" in a base unit name represents the radio module included.*

1. Turn the controller on by releasing the red **STOP** button up.
2. Move the **SET** switch **DOWN** and allow it to return to center. Refer to Table X to determine which switch is the **SET** switch.

Pistol Grip Model	SET	STORE
PG-x14	S1	S7
PG-x14-OLED	S1	S7

3. Enter Adjust Mode by first holding the **STORE** switch down. Then, while still holding the **STORE** switch, hold the **SET** switch **DOWN** for four seconds. Adjust Mode is indicated when the bottom three Base Unit LEDs (6, 7, and 8) begin flashing.

To enter Adjust Mode on the PG-x14, hold handheld switch S7 and then S1 DOWN until base unit LEDs 6, 7, and 8 begin to flash.

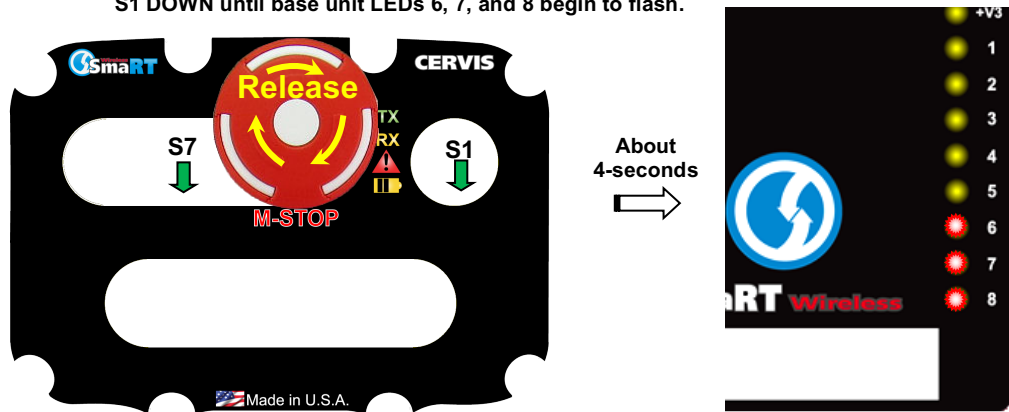


Figure 12. Enter Adjust Mode for Min/Max Adjustments PG-x14



Figure 13. Enter Adjust Mode for Min/Max Adjustments PG-x14-OLED

4. Release switches the **SET** and **STORE** switches.
5. Operate any of the function toggles either UP or DOWN and hold it in position. Continue to hold the function switch throughout the entire Adjustment procedure. The base unit LED 8 lights solid indicating *MIN Adjust Mode*. LEDs 6 and 7 go out (extinguish).
6. While observing the machine being controlled, slowly press the pistol grip trigger (proportional control) to the point where the machine just begins to move.
7. When the desired result is achieved, activate the **STORE** switch **DOWN**. Base unit LED 7 activates.
8. Release all switches including the trigger. The base unit LED 8 goes out, and LED 6 lights solid indicating *MAX Adjust Mode*.
9. Engage and hold a function switch. Operate the trigger while observing the machine being controlled.
10. When the desired MAX value is achieved, activate the **STORE** switch **DOWN**. The MAX value is stored. Base unit LED 8 activates.
11. Release all switches, including the trigger. The system returns to *MIN Adjust Mode*.

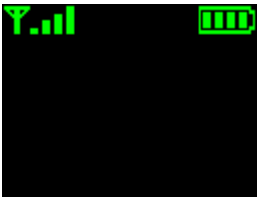
✓ **Note:** *Activating the STORE switch down toggles between MIN and MAX while in Adjust Mode.*

Exit Adjustment Mode either by:

- Releasing all switches—including the trigger—and waiting for the handheld to timeout.
- Pressing the red **STOP** button, which powers down the handheld remote.

9.0 Specifications

Table 3. SmaRT PG-xH14 Pistol Grip Remote Specifications

Item	Description						
Power	V_{in} +1.6V to +3.2 VDC						
	Batteries Four AA cell						
	Battery Life						
	<table border="1"> <tr> <td>PG-x14</td> <td>>100 Hours</td> </tr> <tr> <td>PG-x14-OLED, Screen Saver</td> <td>>70 Hours</td> </tr> <tr> <td>PG-x14-OLED, Screen Always on</td> <td>>40 Hours</td> </tr> </table>	PG-x14	>100 Hours	PG-x14-OLED, Screen Saver	>70 Hours	PG-x14-OLED, Screen Always on	>40 Hours
	PG-x14	>100 Hours					
PG-x14-OLED, Screen Saver	>70 Hours						
PG-x14-OLED, Screen Always on	>40 Hours						
Low V Shutdown 1.6 VDC							
Auto-shutdown Four min. of button inactivity (standard)							
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 @ 100 mW 2405–2480 MHz @ 100 mW						
	License None required						
	Modulation DSSS						
	Antenna Internal						
Enclosure	Dimensions mm: 230.6 x 133.9 x 146.9; inch: 9.1 x 5.3 x 5.8						
	Total Weight 1.36 kg; 3 lbs						
	Durability High Impact Polymer case						
	Faceplate Aluminum or Polycarbonate						
Indicators (4 LED)	TX (green) Blinking – transmitting, no switch active Solid – transmitting, switch active						
	RX (amber) Blinking – receiving, no output of interest active Solid – receiving, output of interest active						
	Error (red) Indicates error with handheld remote						
	Battery (amber) Low battery indication						
Display (if applicable)	Main Screen RSSI and Battery Level Indication						
							
Control Switches	Toggle 7 Three-position, return-to-center, push-to-operate or latch						
	Trigger Proportional controller, function enable, or digital output						
	M-Stop One mushroom-style, spring-loaded two-position						

Appendix A: Exposure to Radio Frequency Energy

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

Appendix B: Agency Identification Label Location



✓ **Note:** The pistol grip agency ID label position is identical for all pistol grip remote units, including all 900 MHz and 2.4 GHz units.

Figure 14. Agency Identification Label Location

Appendix C: Declaration of Conformity



Declaration of Conformity

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)

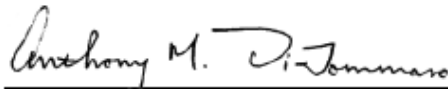
Relevant Harmonized Standards or Other Technical Specifications:

- | | |
|--------------------------------|--------------------------------|
| 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)

<u>MODEL NUMBER</u>	<u>PART NUMBER</u>	<u>BATCH OR SERIAL NUMBER RANGE</u>
PG-2H10JS	07128570	_____ to _____
PG-2H10JS-UMB	07128571	_____ to _____
PG-2H12JS	07129570	_____ to _____
PG-2H12JS-UMB	07129571	_____ to _____
PG-2H14	07125570	_____ to _____
PG-2H14-UMB	07125571	_____ to _____
PG-2H14-DIS	07125572	_____ to _____
PG-2H14-DIS-UMB	07125573	_____ to _____



Anthony M. Di Tommaso
Director of Product Development, Quality, & Finance

February 14, 2018

Date

