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Manual # 99906210

# SIII Telescopic Single Proportional Radio Remote System

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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 [www.hc-sc.gc.ca/rpb](http://www.hc-sc.gc.ca/rpb).

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 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.

#### 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.**

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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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## IMT Inc. Safety Precautions

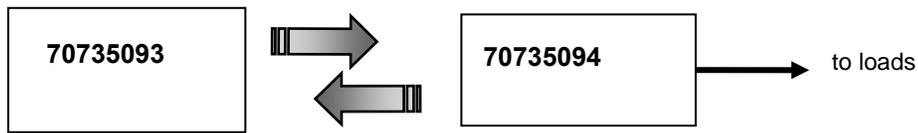
- ✓ **Read and follow all instructions.**
- ✓ **Failure to abide by Safety Precautions may result in equipment failure, loss of authority to operate the equipment, and personal injury.**
- ✓ **Use and maintain proper wiring. Follow equipment manufacturer instructions. Improper, loose, and frayed wiring 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 installation and operation of the equipment. 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.**
- ✓ **Power is removed from the base unit by detaching the 12-pin cables from the base unit connector P1 and P2, 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 result in destruction of or damage to the base unit.**
- ✓ **Operate and store units only within the specified operation and storage temperatures defined in this document.**
- ✓ **Keep high-energy RF devices away from handheld remotes. Activation of high-power communication radios, for instance, in close proximity to handheld remotes can result in interference and “false” circuit activation.**
- ✓ **Do not key 2-way radios while using the handheld remote.**

# 1.0 List of Equipment

✓ **Note:** To order parts, use the part numbers listed in the table below.

**Table 1 List of Equipment**

Qty.	Part Number	Description
1	70735093	TRANSM-RAD S3 SP EM 5LED FHSS 2400
1	70735094	RECEIVER-RAD S3 SP 5LED FHSS 2400



**Figure 1. System Diagram**

## ✓ Important Note:

**The 70735094 system base unit can be controlled by only one pistol grip handheld remote at any given time. The default condition of the 70735094 when first shipped is that it is to be paired with a 70735093.**

**To do so, the chosen 70735094 (base unit) must be manually associated to the 70735093 handheld remote control, the details of which are explained in Heading 2.5, Associate Mode. Please allow about 70 seconds for the base unit to complete the software conversion. The system is ready for use when the base unit display shows IMT.**

## 2.0 70735093 Handheld Remote Details



**Figure 2. Handheld Remote and Switch Layout**

## 2.1 Handheld Remote Switch and LED Description

**Table 2. Handheld Switch Description**

Switch Location	Label	Switch Style
Stop	MACHINE STOP	Maintained
Trigger	(none)	Momentary
SW1 UP SW1 DOWN	AIR ON/OFF RPM HI/LO	Momentary
SW2 UP SW2 DOWN	ENGINE START ENGINE STOP	Momentary
SW3 UP SW3 DOWN	HORN TX ON TX OFF	Momentary
SW4 UP SW4 DOWN	BOOM DOWN BOOM UP	Momentary
SW5 UP SW5 DOWN	WINCH DOWN WINCH UP	Momentary
SW6 UP SW6 DOWN	EXTEND IN EXTEND OUT	Momentary
SW7 UP SW7 DOWN	ROTATE CCW ROTATE CW	Momentary

**Table 3. Handheld LED Diagnostic Information**

LED Information	Condition	Color
TX rapid blinking	Handheld is transmitting	Green
TX solid	Switch active on handheld	
RX blinking (indication of RF signal integrity)	Base unit messages received	Amber
RX rapidly blinking	Handheld is in umbilical mode	
ERR solid	Trigger without crane function	Red
BATT slow blinking	Low battery	Amber
TX and ERR alternating with RX and BATT	Attempt made to turn on the handheld while the STOP is down	Alternating
TX and RX alternating with ERR and BATT	Attempt made to turn on the handheld While a switch is stuck, held, broken, etc.	Alternating
20%, 40%, 60%, 80%, 90%	Each %LED is the % of PSI Overload. These LEDs light solid as tripped and will remain lit when/if the percentage raises to where the next %LED trips. At 100% overload, the Red LED (90%) will begin flashing.	20% Green 40% Green 60% Green 80% Amber 90% Red

## 2.2 Battery Installation/Replacement

This Smart handheld remote unit is powered by four size AA 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. 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 (4) fresh size AA alkaline batteries. Observe the proper polarity by positioning the batteries as indicated in the battery compartment. See Figure 3.
3. Replace the compartment cover and tighten the four Phillips screws. These screws should not be over-tightened, *but they must be tight enough to assure the gasket provides a proper seal.*



**Observe proper polarity when placing batteries into the cradle. Improper battery placement can result in excessive heat, battery explosion, injury to the operator, and damage to the remote.**



**Figure 3. Remote Battery Installation**

✓ **Note:** Cover screws must be tightened enough to assure the sealing gasket is compressed. Do not over-tighten the screws!

## 2.3 Pistol Grip Remote Special Considerations

- Inactivity timeout is ten (10) minutes.
- Pistol grip input power for non-RF mode is +12VDC.
- Function switch must be engaged before the proportional trigger can be used.

## 2.4 Power Up The Pistol Grip Remote

To activate (turn on) the pistol grip remote, twist the **STOP** button **UP** (clockwise) and then hold **SW3 UP** until the LEDs flash and TX begins to rapidly blink (approximately one second). Release SW3. Normal system operation is indicated by LEDs TX and RX rapidly blinking.

## 2.5 Associate Mode

The 70735093 pistol grip remote allows 1-to-1 association to a 70735094 receiver base unit. To associate, there must be a clear line of sight between the handheld and the base, and both units must be OFF (powered down). Association cannot occur while in non-RF mode. The pistol grip remote is powered down by depressing the oversized mushroom-style STOP button or by actuating SW3 DOWN. The base unit is powered down by removing P1 and P2 connectors, or by removing the source power from the unit. Do not operate the trigger while Associating.

1. Stand near to the base unit (in line of sight).
2. Twist the **MACHINE STOP** button clockwise to the **UP** position.
3. Hold **SW2** in the **ASSOCIATE (DOWN)** position.
4. Hold **SW3** in the **TX ON (UP)** position.

All four LEDs will light. When all but the TX go out and is blinking, continue to hold SW3 and SW2.

5. **Power Up** the base unit.
6. Release SW2 and SW3.

Handheld and base unit association is complete when TX and RX continue to blink (flicker) when the switches are released.

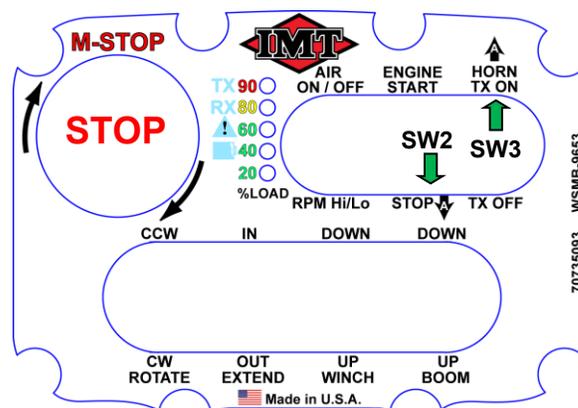


Figure 4. Associate Pistol Grip to Base Unit

## 2.6 Cable Backup Connector

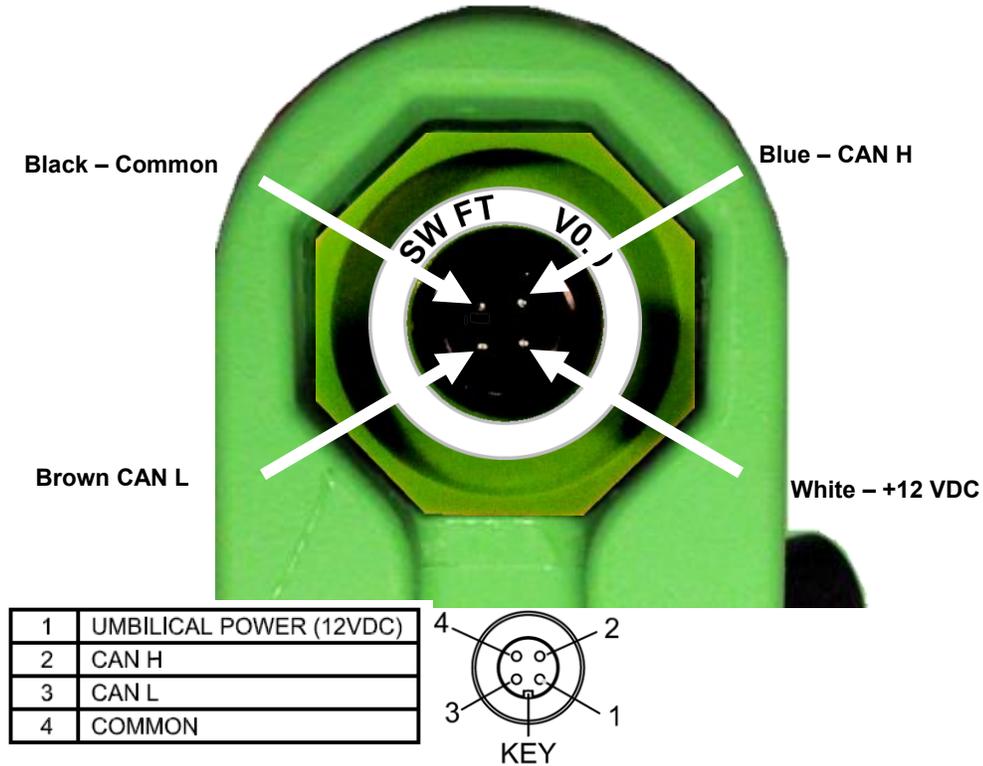


Figure 5. Umbilical Connector Pinout and Cable Wire Connections

## 2.7 Configuration Notes

1. Inactivity Timeout is ten (10) minutes.
2. Configuration is 1:1.
3. Percent LEDs represent % of PSI Overload.

## 2.8 Proportional Output MIN and MAX Adjustments

### 2.8.1 MIN and MAX Adjustment Fundamentals



**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 on page 1, Cervis Inc. Safety Precautions of this manual.**

- The operator must make sure the area around the controlled machine is safe to operate before performing dynamic MIN and MAX adjustments.
- The base unit must be powered for dynamic adjustment.
- The base unit LEDs and display should be close enough to be easily read.
- Adjust Mode timeout defaults to a twenty (20) second window of opportunity, where the unit returns to normal operating mode if none of the switches are operated within the 20 second window. The timer resets to 20 seconds each time a switch or the trigger is operated while in Adjust Mode.

- Adjust Mode is exited by pressing the **STOP** button, by waiting for 20 seconds without operating any of the function switches on the unit, or by releasing the function switch used to enter trigger adjustment.

✓ **Note: Min and Max adjustment made for any crane function sets the chosen values for all of the crane functions.**

## 2.8.2 Enter Adjust Mode

1. Activate the controller on by twisting the **STOP** button clockwise until the button pops UP, then move SW3 UP and allow it to return to center activating the handheld.
2. Adjust Mode is entered by first holding SW3 UP and then, while still holding SW3, hold SW1 DOWN for eight seconds (until the bottom three base unit LEDs begin to flash). Adjust Mode is indicated when the bottom three base unit LEDs – OUT, IN, and ERR – begin flashing. If a display is present on the base unit it will show CAL.
3. Allow SW3 and SW1 to return to center. The bottom three LEDs will stop flashing and ERR will light solid.

To enter Adjust Mode, hold handheld SW1 and then SW3 until base unit LEDs OUT, IN, and ERR begin to flash.

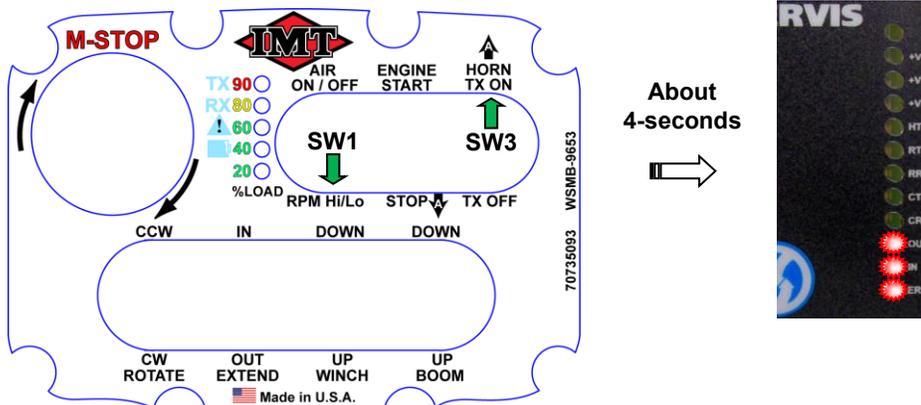


Figure 6. Enter Adjust Mode

## 2.8.3 Low End Calibration (Min)

The 'ERR' on the base unit will light solid indicating **Function Select Mode Min**. The base unit display will show 'L xx', where xx represents the last saved value.

To select the minimum crane function value, first activate the selected toggle switch and then move the Trigger beyond 50% deflection, the display will show the current minimum value saved. Release the trigger, but continue to hold the toggle and observe that the 'ERR' LED on the base unit will flash indicating **Function Adjust Mode Min active**.

- The *factory default value* shown will be 'L 20'. If this value is what you want, activate SW1 DOWN and release to maintain the current value. **DO NOT STORE!**

Or

- To reset the Minimum value to 00, activate SW3 UP (Store).

Or

- To adjust the Minimum value, continue to hold the chosen toggle switch and slowly activate the Trigger again until machine movement is initiated or the desired value is shown on the base

unit display. Activate switch SW3 UP to store the desired value. Release the trigger and the toggle switch.

After Storing, the 'IN' LED on the base unit will light solid, indicating **Function Select Mode Max**. Proceed to High End Calibration (Max) below.

✓ **Note: Activating SW1 DOWN will toggle between MIN and MAX while in function select mode.**

#### 2.8.4 High End Calibration (Max)

The 'IN' LED on the base unit will light solid, indicating **Function Select Mode Max**. The base unit display will show 'H xx', where xx represents the last saved value.

To select the maximum, first activate the chosen toggle switch and then move the Trigger beyond 50% deflection. The display will show the current maximum value stored. Release the trigger, but continue to hold the toggle and observe that the 'IN' LED on the base unit will flash indicating **Function Adjust Mode Max active**.

- If the previously set value is desired, activate switch SW3 UP to Store that value. The current default value will be shown as 'H 64'. Proceed to Low End Calibration (Min) if needed by toggling SW1 DOWN.

**Or**

- To adjust the Maximum value, continue to hold the chosen toggle switch and slowly activate the Trigger again until the desired machine movement is achieved or the desired value is shown on the base unit display. Activate switch SW3 UP to store the desired value. Release the trigger and toggle switch.

After storing, the 'ERR' LED on the base unit will light solid indicating that the process has returned to **function select mode min**. Return to Low End Calibration (Min) above.

#### 2.8.5 Exit Adjust Mode

Adjustment Mode is exited by releasing all controls and waiting approximately 20 seconds (when in **Function Select Modes** only), or by shutting off the pistol grip (switch SW3 DOWN or STOP button)

## 3.0 70735094 Receiver Base Unit Details

### 3.1 Hardware

Table 4. Base Unit Hardware Specifications

Required Fields	Description	Notes
Control Power	7-28VDC	Using 12VDC
RF Frequency	2400MHz	2405-2480MHz @ 100mW
Antenna Option	Internal	
Discrete Channels	16	15 High Side Outputs; One High Side Inputs
Proportional Channel	1	PWM Output
Analog Channel	1	4-20mA
Message Periodicity	10x/s	One message every 100ms
On Air Time	2mS	8 or 16 byte payload
Link Loss Criteria	0.5mS	5 consecutive messages
Valve Information		PWM Freq: 150Hz; Duty Cycle: 20-80%; Load: 4.7Ω
CAN Information	J1939	Refer to Standard Extended Configuration for CAN messaging between PG and BU

### 3.2 Safety Link

Table 5. Safety Link

Base Unit Safety Link	
	X
<p><b>ENABLED</b></p> <p>When any of the following occurs:</p> <ul style="list-style-type: none"> <li>Machine Stop is pressed</li> <li>HH unit goes out of range</li> <li>HH unit deactivates due to loss of power, inactivity timeout, or deliberate deactivation (off switch)</li> </ul> <p>Then, all latched outputs unlatch and all momentary outputs that are active deactivate. Upon activation of the HH, no outputs are allowed to be activated until all switches (unless masked) are first centered or returned to their neutral state.</p>	<p><b>DISABLED</b></p> <p>When any of the following occurs:</p> <ul style="list-style-type: none"> <li>Machine Stop is pressed</li> <li>HH unit goes out of range</li> <li>HH unit deactivates due to loss of power, Inactivity timeout, or deliberate deactivation (off switch)</li> </ul> <p>Then all latched outputs remain latched but all momentary commands that are active deactivate. Note: If HH unit is powered on and a momentary command that was deactivated due to range is still active when the HH returns in range, the output will immediately be active again.</p>

### 3.3 Notes

1. Air compressor remains on with the loss of link; the engine runs at high speed.
2. The Machine Stop latches all functions OFF.
3. Proportional outputs reduced by 50% when in overload condition.
4. Configuration with the handheld is 1:1.

### 3.4 Receiver Base Unit Mounting

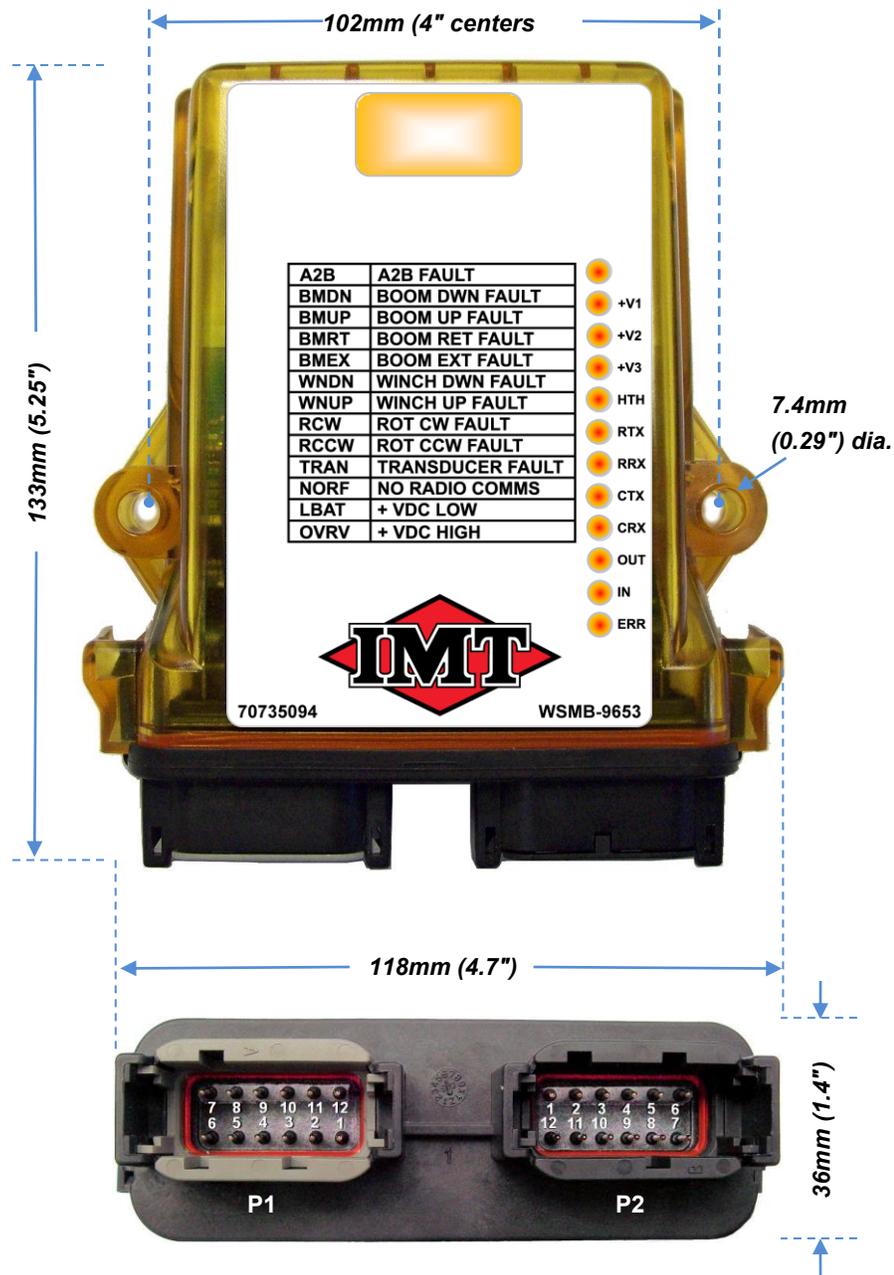
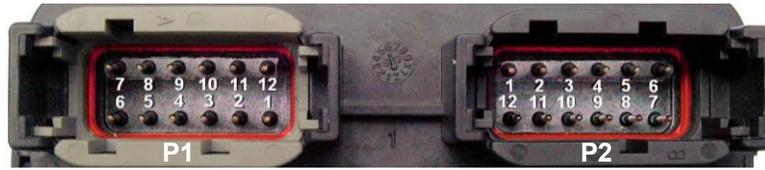


Figure 7. Receiver Base Mounting Dimensions

### 3.5 Base Unit Wiring



**Figure 8. P1 and P2 Pinout**

**Table 6. Base Unit Wiring Table**

Pin	Signal Name	Pin	Signal Name
P1:1	+VDC	P2:1	M5: BOOM UP
P1:2	M17: Proportional Out	P2:2	M6: BOOM DOWN
P1:3	M9: SPEED HI/LO	P2:3	M7: WINCH IN
P1:4	M10: ENGINE START	P2:4	M8: WINCH OUT
P1:5	M11: ENGINE KILL/STOP	P2:5	OPTIONAL TO PG
P1:6	M12: AIR COMPRESSOR ON/OFF	P2:6	OPTIONAL TO PG
P1:7	M13: CRANE HOURMETER	P2:7	+VDC
P1:8	M14: A2B/OVERLOAD	P2:8	OPTIONAL TO PG
P1:9	M15: WARNING 1/HORN	P2:9	M1: BOOM EXTEND
P1:10	M16: WARNING 2/HORN	P2:10	M2:BOOM RETRACT
P1:11	M18: TRANSDUCER SIGNAL	P2:11	M3: ROTATE CCW
P1:12	-VDC	P2:12	M4: ROTATE CW

## 4.0 Specifications

Table 7. Handheld Remote Specifications

Item	Description	
Power	<b>V<sub>in</sub></b>	+1.6V to +3.2VDC
	<b>Batteries</b>	Four (4) AA
	<b>Battery Life</b>	100 hours
	<b>Low V Shutdown</b>	1.6VDC
	<b>Auto-shutdown</b>	10 min. of button inactivity
Environment	<b>Operating Temp</b>	-20°C to 55°C (-4°F to 131°F)
	<b>Storage Temp</b>	-40°C to 55°C (-40°F to 131°F)
	<b>Humidity</b>	0 to 100%
Radio	<b>Frequency</b>	2405-2480MHz
	<b>RF Power</b>	100 mW (max.)
	<b>License</b>	None required
	<b>Modulation</b>	DSSS
	<b>Antenna</b>	Internal
Enclosure	<b>Dimensions</b>	mm: 230.6x133.9x146.9; inch: 9.1 x 5.3 x 5.8
	<b>Total Weight</b>	3lbs
	<b>Durability</b>	High Impact Polymer case
	<b>Faceplate</b>	Aluminum or Polycarbonate
LED Indicators (4)	<b>TX (green)</b>	Blinking – transmitting, no switch active Solid – transmitting, switch active
	<b>RX (amber)</b>	Blinking – receiving, no output of interest active
	<b>ERR (red)</b>	Indicates error with handheld remote
	<b>BATT (amber)</b>	Low battery indication
	<b>The following are percent PSI of overload setpoint</b>	
	<b>100%</b>	Red (90%) LED flashing
	<b>90% (red)</b>	Solid when tripped
	<b>80% (amber)</b>	Solid when tripped
	<b>60% (green)</b>	Solid when tripped
	<b>40% (green)</b>	Solid when tripped
<b>20% (green)</b>	Solid when tripped	
Control Switches	<b>Toggle</b>	Seven 3-position spring return to center
	<b>Trigger</b>	Spring release
	<b>Mushroom</b>	Professional Stop

**Table 8. Base Unit Specifications**

<b>Item</b>	<b>Description</b>			
<b>Power</b>	<b>Vin</b>	+7 to +28VDC		
<b>Radio</b>	<b>Frequency</b>	2405-2480MHz @ 100mW		
	<b>License</b>	License Free		
	<b>Modulation</b>	DSSS		
	<b>Antenna</b>	Internal		
<b>Environment</b>	<b>Operating Temp</b>	-20°C (-4°F to 158°F)		
	<b>Storage Temp</b>	-40°C to 85°C (-40°F to 185°F)		
	<b>Humidity</b>	0 to 100%		
	<b>Vibration/Shock</b>	IEC60068-2-6 10Hz to 150Hz @ 1.0g peak acceleration 10.0g peak shock acceleration		
<b>Indicators (12)</b>	<b>+V1, +V2, +V3</b>	Unused		
	<b>HTH</b>	Blink — Unit active		
	<b>RFTX</b>	Blink — RF transmitting		
	<b>RFRX</b>	Blink — RF receiving		
	<b>CAN TX</b>	Blink — CAN transmitting		
	<b>CAN RX</b>	Solid — CAN receiving		
	<b>OUT</b>	Solid — Output active		
	<b>IN</b>	Solid — Input active		
	<b>ERR</b>	Solid — Current out of bounds Flashing — Voltage out of bounds		
<b>Enclosure</b>	<b>Dimensions</b>	119mm x 133mm x 36mm (5.24' x 4.69' x 1.42')		
	<b>Durability</b>	High Impact Polymer		
	<b>Mounting Holes</b>	7.4mm (0.29') dia. 102mm center-to-center (4' center-to-center)		
<b>Discrete Outputs/Inputs</b>	<b>Eighteen</b>	FET—Open Drain (high side)		
	<b>Current</b>	2A max. per channel 15A max. total		
<b>I/O</b>	<b>Assignments</b>	<b>M1(Ch1)</b> P2-9	<b>M2 (Ch2)</b> P2-10	<b>M3 (Ch3)</b> P2-11
		<b>M4 (Ch4)</b> P2-12	<b>M5 (Ch5)</b> P2-1	<b>M6 (Ch6)</b> P2-2
		<b>M7 (Ch7)</b> P2-3	<b>M8 (Ch8)</b> P2-4	<b>M9 (Ch9)</b> P1-3
		<b>M10(Ch10)</b> P1-4	<b>M11 (Ch11)</b> P1-5	<b>M12 (Ch12)</b> P1-6
		<b>M13 (Ch13)</b> P1-7	<b>M14 (Ch14)</b> P1-8	<b>M15 (Ch15)</b> P1-9
		<b>M16 (Ch16)</b> P1-10	<b>M17 (Ch17)</b> P1-2	<b>M18 (Ch18)</b> P1-11
		<b>CANH</b> P2-5	<b>CANL</b> P2-8	
<b>Display</b>	<b>LED</b>	Four character		

## 5.0 Base Unit LED Diagnostic Troubleshooting

**Table 9. Base Unit LED Diagnostic Troubleshooting**

Indication	
+V1, +V2, +V3 Power LED not active	<ul style="list-style-type: none"> <li>✓ Is +VDC input power present?</li> <li>✓ Check input power polarity.</li> </ul>
TX/RX not active	<ul style="list-style-type: none"> <li>✓ Check for obstructions preventing line-of-sight transmission.</li> <li>✓ Check that the handheld remote is active.                             <ul style="list-style-type: none"> <li>• Re-associate the handheld remote to the base unit.</li> </ul> </li> </ul>
Health LED blinking rapidly	<ul style="list-style-type: none"> <li>• Indicates an internal problem.</li> </ul>
Out LED not active	<ul style="list-style-type: none"> <li>✓ Check that the handheld LEDs are active when the appropriate buttons are pushed.</li> </ul>
ERR LED active	<ul style="list-style-type: none"> <li>✓ Check the outputs for loose wiring, etc.</li> <li>• Check to see if current output or voltage input is out of bounds</li> </ul>

**Table 10. Display Messages**

Display Message	Meaning	Occurs When...
<b>A2B</b>	A2B Fault	A2B switch is active
<b>BMDN</b>	BOOM DWN FAULT	No connection
<b>BMUP</b>	BOOM UP FAULT	No connection
<b>BMRT</b>	BOOM RET FAULT	No connection
<b>BMEX</b>	BOOM EXT FAULT	No connection
<b>WNDN</b>	WINCH DWN FAULT	No connection
<b>WNUP</b>	WINCH UP FAULT	No connection
<b>RCW</b>	ROT CW FAULT	No connection
<b>RCCW</b>	ROT CCW FAULT	No connection
<b>TRAN</b>	TRANSDUCER FAULT	No connection
<b>NORF</b>	NO RADIO COMMS	Loss of Link
<b>LBAT</b>	+ VDC LOWA2B	Input voltage <8V
<b>OVRV</b>	+VDC HIGH	Input voltage >28V

## Appendix A: Exposure to Radio Frequency Energy

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

## Appendix B: Agency Identification Label Locations

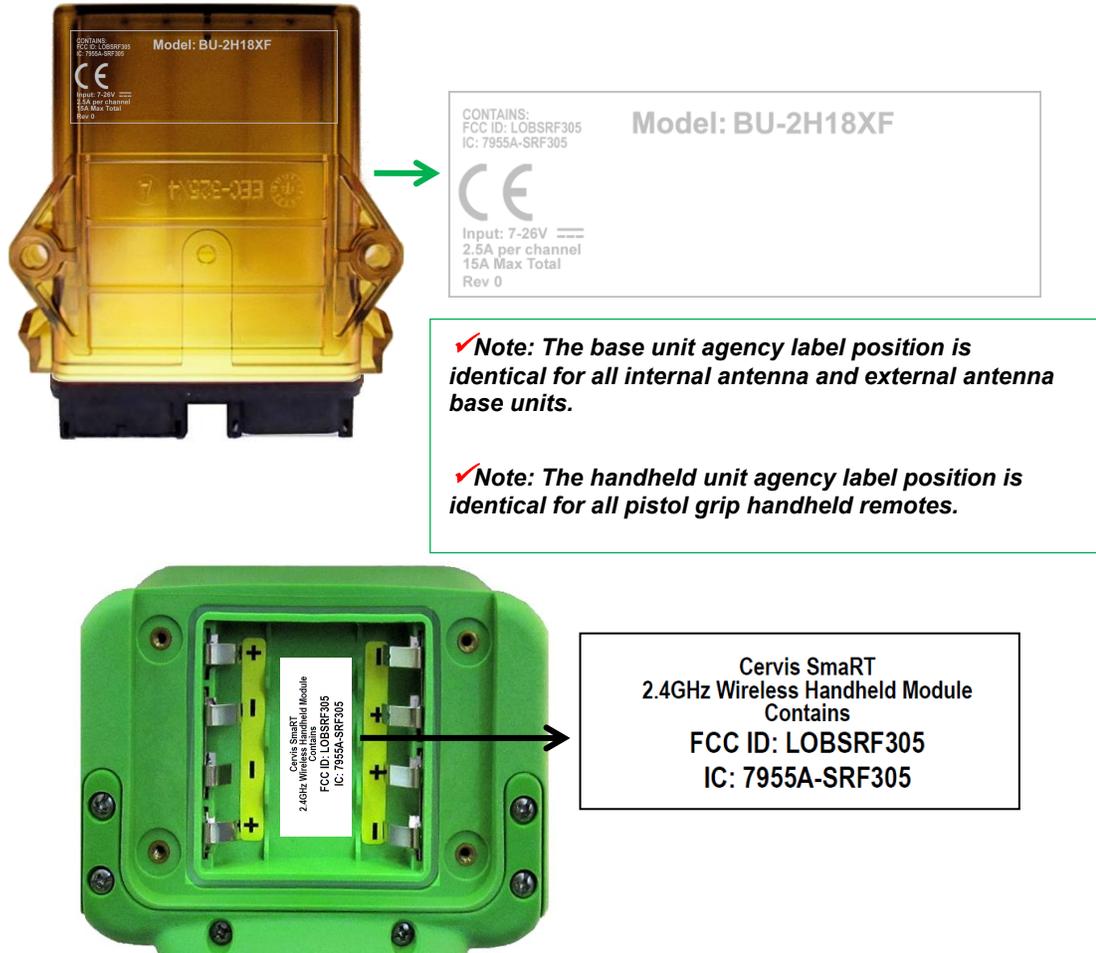


Figure 9. Agency Identification Label Locations



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