



IOWA MOLD TOOLING CO., INC.

P.O. Box 189
Garner, IA 50438
Tel: 641.923.3711
Fax: 641.923.2424
www.imt.com

Manual # 91728558

SII Electric Crane On-Off Remote System

Revised: 12-13-2022

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WARNING

Operating, servicing and maintaining this vehicle or equipment can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle or equipment in a well-ventilated area and wear gloves or wash your hands frequently when servicing. For more information go to www.P65Warnings.ca.gov.

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Section - 1

Introduction

Equipment Safety

PERSONNEL REQUIREMENTS

Certain inherent risks are associated with heavy equipment. Personnel working in the area of these vehicles are subject to certain hazards that cannot be guarded against by mechanical means, but only by the exercise of intelligence, care, and common sense. It is therefore essential for the owner / operator to be trained in the safe operation of this equipment.



Read this manual and on-product labels carefully. Learn how to inspect, use, test, and maintain this equipment correctly, and strictly follow all safety information and instructions contained in this manual and on the equipment, as well as any requirements of local, state, and federal law, industry standards, and any other applicable safety procedures. Failure to do so could result in death, serious personal injury, property damage, or damage to the equipment.



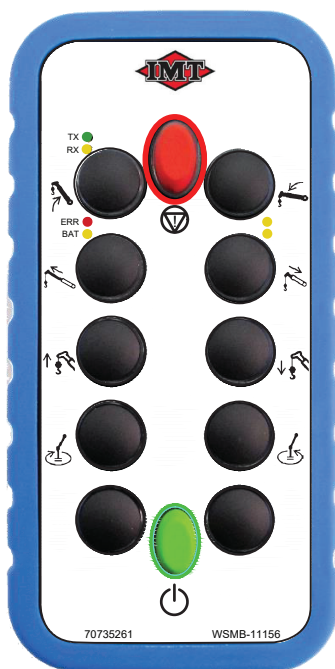
You WILL be electrocuted if you are near a crane that approaches or contacts energized electric power lines. The equipment is not insulated and does not provide protection from contact or proximity to electrical current. Death or serious injury WILL result from touching or being in or near vehicle, or a tethered remote control if the crane becomes electrically charged.

Section - 2

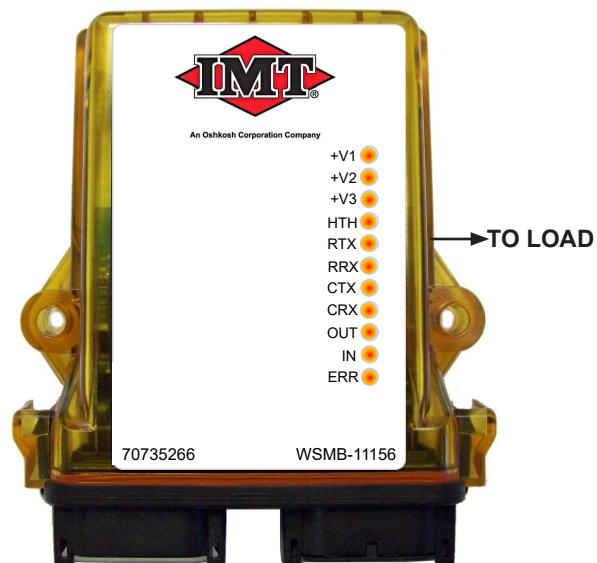
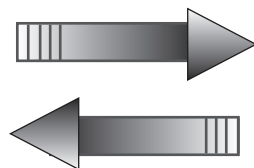
List of Equipment

70735261 & 70735266

PART NO.	DESCRIPTION	QTY.
70735261	TRANSM-RAD REM S2 ELECTRIC ON-OFF	1
70735266	RECEIVER-RAD REM S2 ELECTRIC ON-OFF	1



70735261
HH-2H10-11156



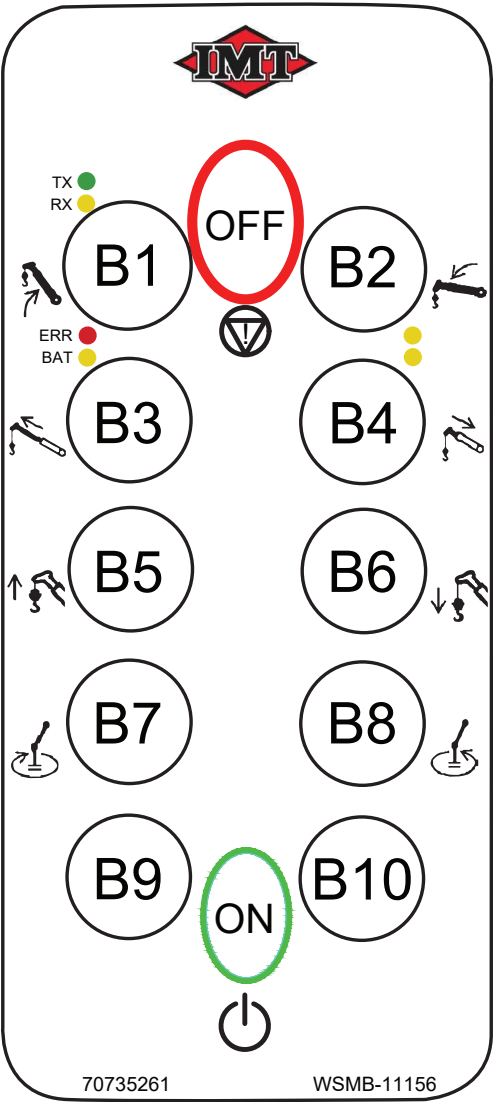
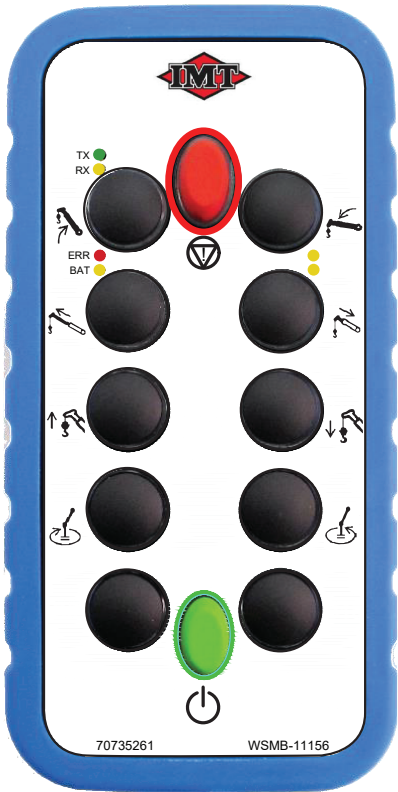
70735266
BU-2H20XF-11156

Section - 3

70735261 SII Handheld Remote

70735261 - SII Radio Remote (Handheld) On-Off System - Electric Crane

LEDs		
LED 1	TX	GREEN
LED 2	RX	AMBER
LED 3	ERR	RED
LED 4	BAT	AMBER
LED 5	(NONE)	AMBER
LED 6	(NONE)	AMBER



BUTTON LOCATION	LABEL	BUTTON STYLE
STOP / OFF	(RED)	
B1	BOOM UP	MOMENTARY
B2	BOOM DOWN	MOMENTARY
B3	EXTEND OUT	MOMENTARY
B4	EXTEND IN	MOMENTARY
B5	WINCH UP	MOMENTARY
B6	WINCH DOWN	MOMENTARY
B7	ROTATE CW	MOMENTARY
B8	ROTATE CCW	MOMENTARY
B9*	(NONE)	MOMENTARY
B10*	(NONE)	MOMENTARY
ON	(GREEN)	
*NO FUNCTION		

Handheld Remote Special Considerations

- Inactivity timeout is ten (10) minutes

Power Up/Down the Handheld Remote

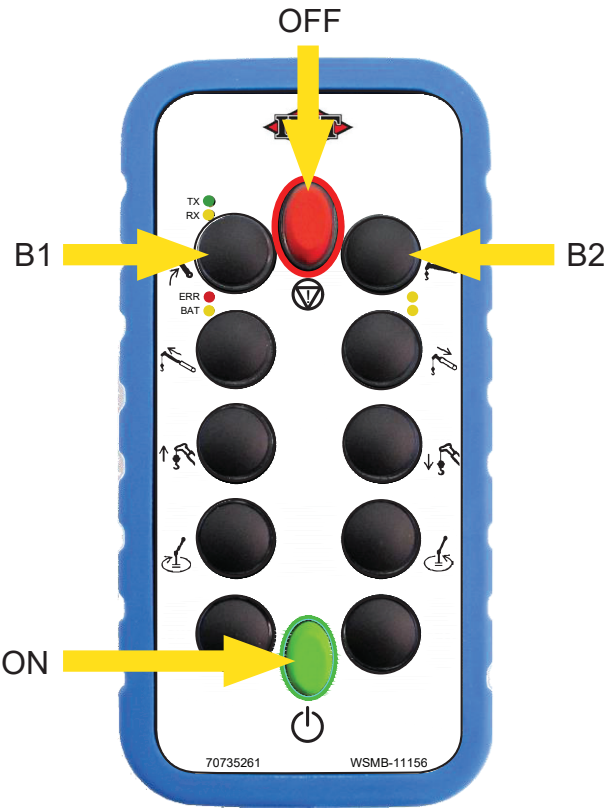
To activate (turn on) the handheld remote, press the green ON button. The TX LED will blink green when transmitting. The RX LED will blink amber when receiving.

To deactivate (turn off) the handheld remote, press the red OFF button. The remote will also power down due to inactivity. This occurs when there has been no button activity for ten (10) minutes.

Associate Mode

The handheld remote (70735261) allows 1-to-1 association to a receiver base unit (70735266). To associate, there must be a clear line of sight between the handheld and the base, and both units must be powered down.

1. Power down the remote by pressing the red OFF button.
2. Power down the base unit by disconnecting the power or by unplugging the two (2) connectors (P1 and P2).
3. Press and hold the B1 (BOOM UP) and ON buttons simultaneously for two (2) seconds. The two (2) amber LEDs below B2 (BOOM DOWN) will be on.
4. Press and hold B1 while powering up the base unit.
5. Release B1. The TX (green) and RX (amber) LEDs will blink rapidly indicating the association has completed successfully.



LED	ACTION	INDICATIONS
TX TRANSMIT GREEN LED 1	BLINK	TRANSMITTING
RX RECEIVER AMBER LED 2	BLINK	RECEIVING
ERR (ERROR) RED LED 3	BLINK	ERROR
BAT (BATTERY) AMBER LED 4	BLINK	LOW BATTERY

Low Battery Warning and Low Battery Auto-Shutdown

The BAT LED will flash once per second to indicate a Low Battery Warning when the handheld remote reaches 2.1 VDC. Two (2) fresh AAA batteries should be installed as soon as possible. The remote will transmit messages and can still be used at this time.

The amber BAT LED will turn solid at 2.0 VDC and the remote will initiate a self power shutdown. The base unit will receive a Low Battery Power Down message. The BAT LED will flash for 1.25 seconds before auto-shutdown. Two (2) fresh AAA batteries must be installed in order to use the handheld remote again.

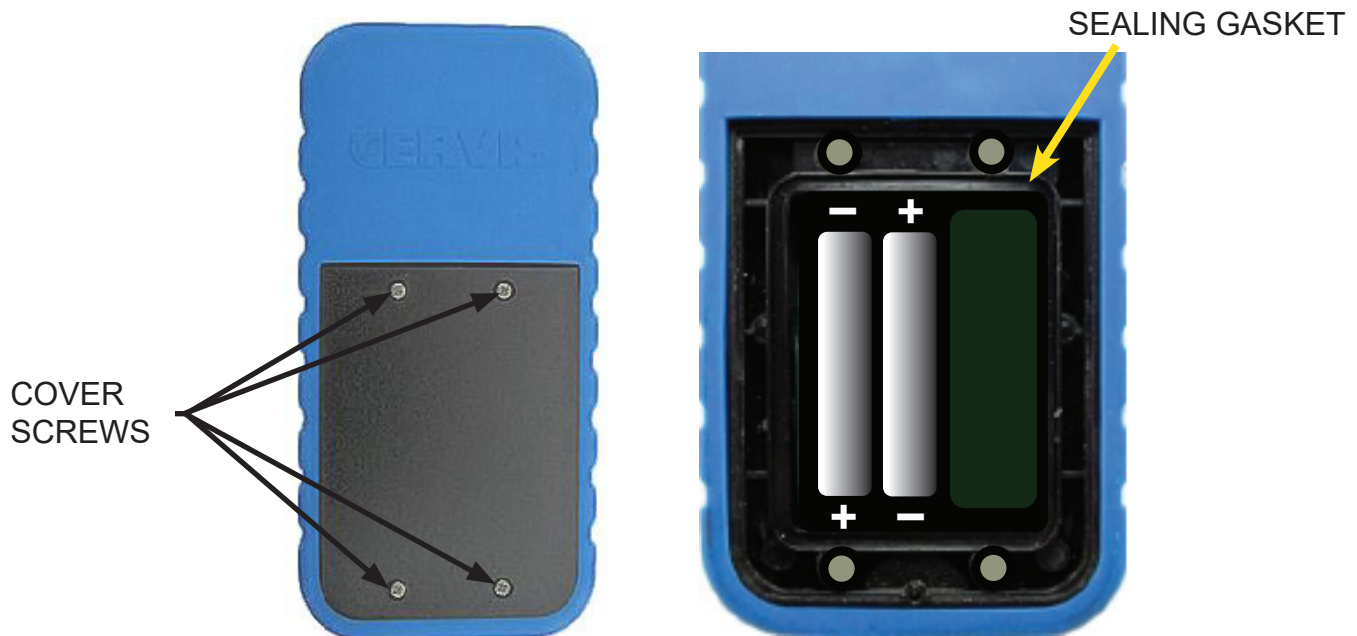
HANDHELD REMOTE SPECIFICATIONS (70735261)		
ITEM	DESCRIPTION	
POWER	VIN	+2.1 V TO +3.2 VDC
	BATTERIES	TWO (2) AAA ALKALINE
	LOW BATTERY WARNING	≈2.1 V - BATTERIES SHOULD BE IMMEDIATELY REPLACED
	LOW BATTERY SHUTDOWN	≤2.0 V - BATTERIES MUST BE REPLACED TO OPERATE
	AUTO-SHUTDOWN	10 MIN OF BUTTON INACTIVITY
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	0-100%
RADIO	FREQUENCY	2405-2480 MHz
	LICENSE	NONE REQUIRED
	MODULATION	DSSS
	ANTENNA	INTERNAL
ENCLOSE	DIMENSIONS	INCH: 5.37 x 2.68 x 0.92 (136.38 x 68.96 x 28.42 mm)
	TOTAL WEIGHT	7.2 oz
	DURABILITY	HIGH IMPACT POLYMER CASE IMPACT ABSORBING BUMPER
	FACEPLATE	POLYCARBONATE
LED INDICATORS	TX (GREEN)	TRANSMIT - FLASHES WHEN TRANSMITTING MESSAGES
	RX (AMBER)	RECEIVE - FLASHES WHEN RECEIVING MESSAGES
	ER (RED)	FLASHES WHEN ERRORS ARE DETECTED
	BAT (AMBER)	BLINKS WHEN LOW BATTERY CONDITIONS EXIST
	A1 (AMBER)	(NONE)
	A2 (AMBER)	(NONE)
BUTTONS	TWELVE	PUSHBUTTONS
	NUMBER OF FUNCTIONS	TEN TO TWENTY, PROGRAM DEPENDENT

Section - 4

Battery Installation

Battery Installation / Replacement

1. The handheld remote unit is powered by two-size AAA alkaline 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:
2. Loosen the four Phillips battery compartment cover screws on the rear of the remote. Lift the cover from the handheld. The screws remain attached to the cover.
3. Install or replace with two (2) fresh size AAA alkaline batteries. Observe the proper polarity by positioning the batteries as indicated in the battery compartment. Discard the used batteries according to local regulation.
4. Replace the compartment cover and tighten the four (4) Phillips screws. These screws should not be over tightened, but they must be tight enough to assure the gasket provides a proper seal.



CAUTION

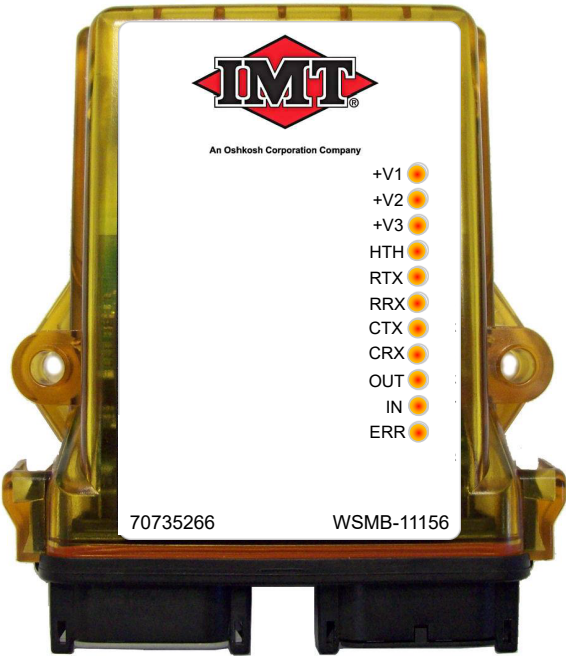
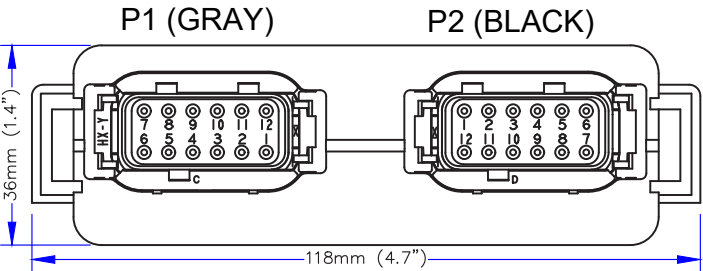
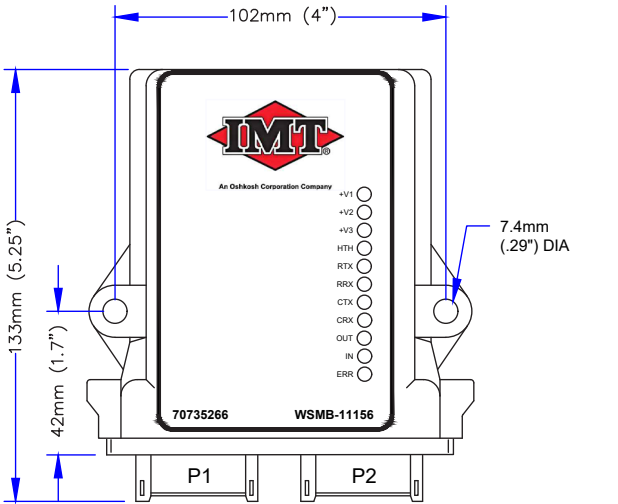
Observe proper polarity when placing batteries into the cradle. Improper battery placement can result in excessive heat, battery explosion, injury to the operator, and damage to the remote.

Section - 5

70735266 SII Base Receiver

70735266 - SII Receiver Radio Remote (Base Unit) - Electric Crane

BASE UNIT LEDs	
+V1, +V2, +V3	BASE UNIT VOLTAGE OK
1	HEALTH
2	RF TX
3	RF RX
4	CAN TX
5	CAN RX
6	OUTPUT ACTIVE
7	INPUT ACTIVE
8	ERROR



70735266
BU-2H20XF-11156

70735266 - Base Unit Configuration

CHANNEL	TYPE*	FUNCTION	ACTIVATED BY:	SETTINGS		PIN
M17					PLUG P1 (GRAY)	1
M18						2
-VDC		-VDC				3
M11						4
M12						5
+VDC						6
M13	LO-HS-M	BOOM UP	B1+			7
M14	LO-HS-M	BOOM DOWN	B2 + M4			8
M15	LO-HS-M	EXTEND OUT	B3 + M4			9
M16	LO-HS-M	WINCH UP	B5 + M4			10
M10	LO-HS-M	EXTEND IN	B4+			11
M9	LO-HS-M	WINCH DOWN	B6+			12
M5	LO-HS-M	ROTATE CW	B7+		PLUG P2 (BLACK)	1
M6	LO-HS-M	ROTATE CCW	B8+			2
M7	LO-HS-M	PUMP	B1 OR B2 OR B3 OR B4 OR B7 OR B8			3
M8						4
M19						5
M20						6
CAN H						7
CAN L						8
M1						9
M2						10
M3						11
M4	LI-NA-M	A2B / OVER LOAD	ACTIVE HIGH IN- PUT: +12VDC=A2B / OVERLOAD ACTIVE NORMAL STATE			12

*TYPES

XX-XX-XX

- AI = ANALOG INPUT
- AO = ANALOG OUTPUT
- LI = LEVEL INPUT
- LO = LEVEL OUTPUT
- PWM = PULSE WIDTH MODE
- HS = HIGH SIDE
- LS = LOW SIDE
- NA = NOT APPLICABLE
- M = MOMENTARY
- LA = LATCHING
- UN = UNLATCHING

70735266 - Base Unit Hardware Specs / Base Unit Safety Link / Base Unit Hardware

BASE UNIT HARDWARE SPECIFICATIONS		
REQUIRED FIELDS	DESCRIPTION	DETAILS
CONTROL POWER	7-32VDC	BU MUST BE OPERABLE TO 32VDC
ANTENNA OPTION	INTERNAL	
DISCRETE CHANNELS	16	15 HIGH SIDE OUTPUTS: ONE (1) HIGH SIDE INPUTS
DIGITAL INPUT CHANNELS	1	
DIGITAL OUTPUT CHANNELS	9	(9) ON/OFF
ANALOG INPUTS	0	
ANALOG OUTPUT CHANNELS	0	
PROPORTIONAL CHANNEL	N/A	
CAN INFORMATION	J1939	REFER TO STANDARD EXTENDED CONFIGURATION FOR CAN MESSAGING BETWEEN PG AND BU

BASE UNIT SAFETY LINK	
WHEN ANY OF THE FOLLOWING OCCURS:	
<ul style="list-style-type: none"> MACHINE STOP IS PRESSED HANDHELD UNIT GOES OUT OF RANGE HANDHELD UNIT DE-ACTIVATES DUE TO LOSS OF POWER, INACTIVITY TIME-OUT, OR DELIBERATE DEACTIVATION (OFF SWITCH) 	
X	
ENABLED	DISABLED
<p>ALL LATCHED OUTPUTS UNLATCH AND ALL MOMENTARY OUTPUTS THAT ARE ACTIVE DE-ACTIVATE WHEN MACHINE STOP BUTTON IS DEPRESSED. LATCHED COMMANDS REMAIN ACTIVE IF UNIT IS POWERED DOWN DUE TO INACTIVITY OR S1- IS OPERATED.</p> <p>BEFORE OPERATION NO OUTPUTS ARE ALLOWED TO BE ACTIVATED UNTIL ALL SWITCHES ARE FIRST CENTERED OR RETURNED TO THEIR NEUTRAL STATE.</p>	<p>ALL LATCHED OUTPUTS REMAIN LATCHED, BUT ALL MOMENTARY COMMANDS THAT ARE ACTIVE DE-ACTIVATE.</p> <p>NOTE: IF HANDHELD UNIT IS POWERED ON AND A MOMENTARY COMMAND THAT WAS DE-ACTIVATED DUE TO RANGE IS STILL ACTIVE WHEN THE HANDHELD RETURNS IN RANGE, THE OUTPUT WILL IMMEDIATELY BE ACTIVE AGAIN</p>

BASE UNIT HARDWARE (70735266)		
ITEM	DESCRIPTION	
POWER	VIN:	+ 7 TO +28 VDC
ENVIRONMENT	OPERATING TEMP:	-20°C TO 55° C (-4°F TO 131° F)
	STORAGE TEMP:	-40° C TO 85° C (-40° F TO 185° F)
	HUMIDITY:	0 TO 100%
	VIBRATION/SHOCK:	IEC60068-2-8
		10 Hz to 150Hz @ 1.0 g PEAK ACCELERATION 10.0 g PEAK SHOCK ACCELERATION
RADIO	FREQUENCY:	2405-2480MHz
	RF POWER:	100 mW (MAX)
	LICENSE:	LICENSE-FREE
	MODULATION:	DSSS FREQUENCY HOPPING TECHNOLOGY
ENCLOSURE	ANTENNA:	INTERNAL
	DIMENSIONS:	MM: 133 X 118 X 36 (INCH: 5.25 X 4.7 X 1.4)
	DURABILITY:	HIGH IMPACT POLYMER CASE
LED INDICATORS	1 HEALTH:	BLINKS 1X/SEC WHEN ACTIVE
	2 RF TRANSMIT:	FLASHES WHEN ACTIVE
	3 RF RECEIVE:	FLASHES WHEN ACTIVE
	4 CAN TRANSMIT:	FLASHES WHEN ACTIVE
	5 CAN RECEIVE:	FLASHES WHEN ACTIVE
	6 OUTPUT:	SOLID WHEN ACTIVE
	7 INPUT:	BLINKS 1X/SEC WHEN ACTIVE
	8 ERROR:	SOLID WHEN ERROR IS PRESENT
OUTPUTS / INPUTS	20	FET-OPEN DRAIN
	CURRENT	2 A PER CHANNEL
		8 A MAX @ 55° C / 131° F

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Section - 6

LED Troubleshooting

LED Diagnostic Troubleshooting

INDICATION	CAUSE	SOLUTION *
+V1, +V2, +V3 POWER LED NOT ACTIVE	ELECTRICAL SIGNALS NOT ACTIVATING THE LEDs	• IS +VDC INPUT POWER PRESENT.
		• CHECK INPUT POWER POLARITY.
RTX / RRX NOT ACTIVE		• CHECK FOR OBSTRUCTIONS PREVENTING LINE-OF-SIGHT.
		• CHECK THAT REMOTE UNIT IS ACTIVE.
		• RE-ASSOCIATE THE REMOTE UNIT WITH THE BASE UNIT.
CTX / CRX NOT ACTIVE	OVER-TEMPERATURE OR OVER-CURRENT CHANNEL INDICATION	• CHECK CAN WIRING.
OUT LED NOT ACTIVE		• CHECK THAT THE REMOTE UNIT LEDs ARE ACTIVE WHEN THE APPROPRIATE BUTTONS ARE PUSHED.
		• CHECK THE OUTPUTS FOR LOOSE WIRING, ETC.
ERR LED ACTIVE		• ACTIVE CHANNEL CURRENT CONSUMPTION LESS THAN 1 A TYPICAL. (THIS IS NOT A PROBLEM IN CASES WHERE LESS THAN 1 A DRAW IS A NORMAL CONDITION.)
HEALTH LED BLINKING RAPIDLY	INDICATES AN INTERNAL PROBLEM.	• CONTACT IMT TECHNICAL SUPPORT

* IF THE RECOMMENDED SOLUTIONS DO NOT RESOLVE THE ISSUE, CONTACT IMT TECHNICAL SUPPORT DEPARTMENT.

Section - 7

**Identification/
Locations / Exposure**

Exposure to Radio Frequency Energy

The handheld remote control and base units contain radio transceivers. When active, handheld remotes and base units send out radio frequency (RF) energy through either internal (remote/base unit) or external (base unit only) antennae. The handheld remote and base units comply with limits set by the United States Federal Communications Commission (FCC) for operating distance from human tissue.

RF Exposure Considerations

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

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

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

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

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

Mobile Applications

Equipment **must** be located at least 8" (20 cm) away from areas likely to be occupied by an unaware person.

Transmitter Applications

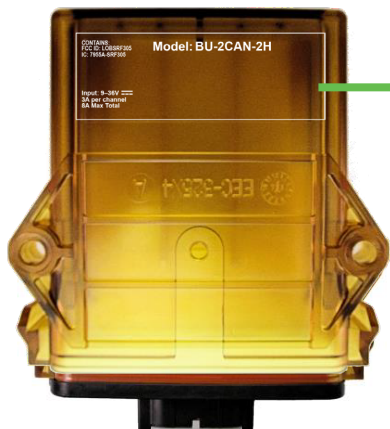
All operators of transmitter equipment with any type of antenna require proper equipment operation training, and such training must include RF exposure safety instructions. They are then considered to be "aware" persons once training is completed.

If the portable operating position is on the hand or arm, a 1" (5 mm) separation is required between the radiating part of the antenna and nearby human tissue.

Required Training

All installers and operators of host applications that include an SRF305 FT module must be trained to use proper RF safety precautions as presented in this Appendix.

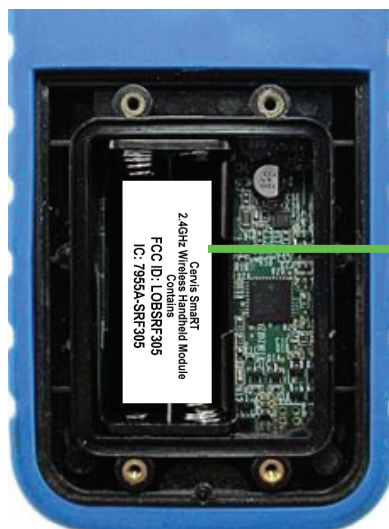
Identification Label Locations



Model: BU-2H20XF-11156

Contains:
FCC ID: LOBSRF305
IC: 7955A-SRF305

Input: 9-36V
3A per channel
8A Max Total



Cervis Smart
2.4GHz Wireless Handheld Module
Contains

FCC ID: LOBSRF305
IC: 7955A-SRF305

NOTE:

THE BASE UNIT AGENCY LABEL POSITION IS IDENTICAL FOR ALL INTERNAL ANTENNA AND EXTERNAL ANTENNA BASE UNITS

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Tel: 641.923.3711

Fax: 641.923.2424

www.imt.com



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