IOWA MOLD TOOLING CO., INC.

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

Manual # 91728433

SII Hydraulic Crane Radio Remote

Revised: 05-18-2022

Iowa Mold Tooling Co., Inc. is an Oshkosh Corporation Company

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.

⚠ WARNING

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.

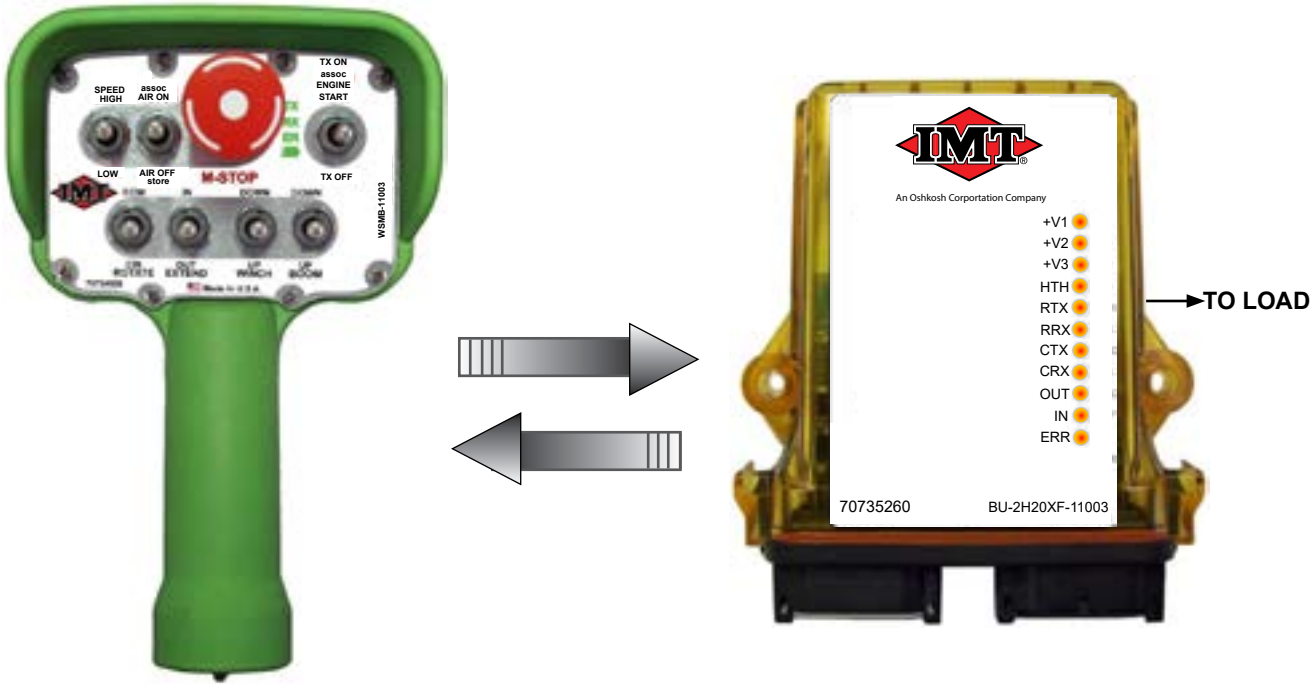
⚠ DANGER

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

70735259 & 70735260

PART NO.	DESCRIPTION	QTY.
70735259	TRANSM-RAD REM S2 HYDRAULIC	1
70735260	RECEIVER-RAD REM S2 HYDRAULIC	1



70735259
PG-2H14-11003

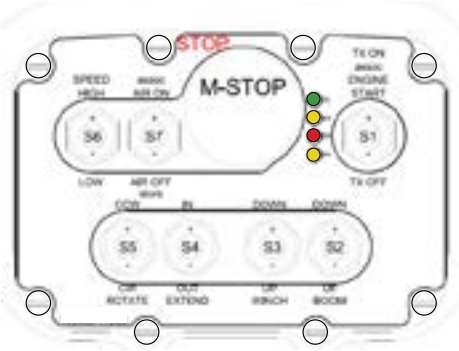
70735260
BU-2H20XF-11003

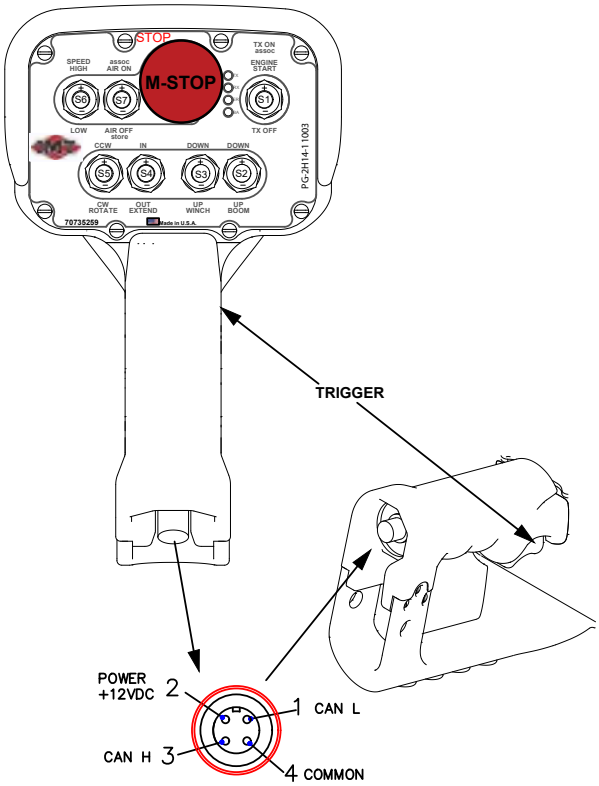
Section - 3

70735259 SII Handheld Remote

70735259 - SII Radio Remote (Handheld) Transmitter-Hydraulic Crane

LEDs		
LED 1	TX	GREEN
LED 2	RX	AMBER
LED 3	ERR	RED
LED 4	BATT	AMBER





SWITCH LOCATION	LABEL	SWITCH STYLE
STOP	MACHINE STOP	MAINTAINED
TRIGGER	(NONE)	MOMENTARY
SW1 UP	AIR ON / OFF	MOMENTARY
SW1 DOWN	RPM HI / LO	
SW2 UP	ENGINE START	MOMENTARY
SW2 DOWN	ENGINE STOP	
SW3 UP	HORN TX ON	MOMENTARY
SW3 DOWN	TX OFF	
SW4 UP	BOOM DOWN	MOMENTARY
SW4 DOWN	BOOM UP	
SW5 UP	WINCH DOWN	MOMENTARY
SW5 DOWN	WINCH UP	
SW6 UP	EXTEND IN	MOMENTARY
SW6 DOWN	EXTEND OUT	
SW7 UP	ROTATE CCW	MOMENTARY
SW7 DOWN	ROTATE CW	

Pistol Grip (Handheld) 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.

Power Up the Pistol Grip (Handheld) Remote

To activate (turn on) the pistol grip remote, twist the STOP button UP (clockwise) and then hold S1 UP until the LEDs flash and the TX begins to rapidly blink (approximately one-second). Release S1. Normal system operation is indicated by LEDs TX and RX rapidly blinking.

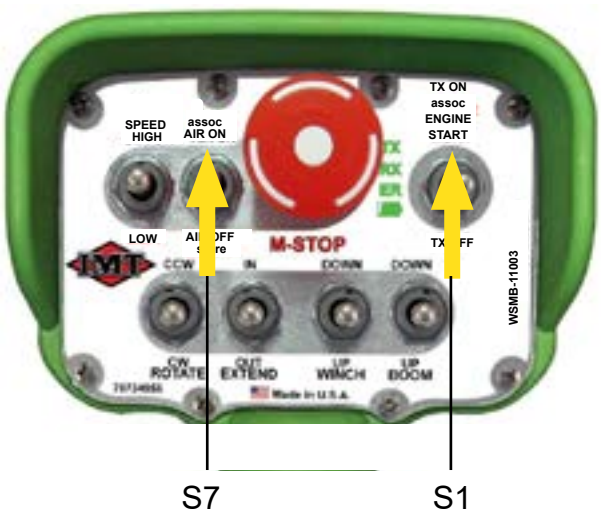
Associate Mode

The pistol grip (handheld) remote (70735259) allows 1-to-1 association to a receiver base unit (70735260). 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 S1 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 the Base Unit (in line of sight)
2. Twist the MACHINE STOP button clockwise to the UP position.
3. Hold simultaneously switches S1 UP and S7 UP
4. All four (4) LEDs will light. When all but the TX go out and is blinking, continue to hold S1 UP and S7 UP.
5. Power up the Base Unit.
6. Release S1 and S7.

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



LED	ACTION	INDICATIONS
TX TRANSMIT GREEN LED 1	STEADY LIT	SWITCH ACTIVE
	BLINK	TRANSMITTING
RX RECEIVER AMBER LED 2	BLINK	RECEIVING
ERR (ERROR) RED LED 3	STEADY LIT WHEN STOP IS PUSHED IN OR RELEASED	STUCK SWITCH, CONTACT IMT TECHNICAL SUPPORT
	FLASHING WHILE STOP IS RELEASED (UNIT TURNED ON)	SWITCH CONFLICT; SWITCH IS BEING HELD BY THE USER
BATT (BATTERY) AMBER LED 4	CYCLE ON / OFF	CHANGE BATTERIES

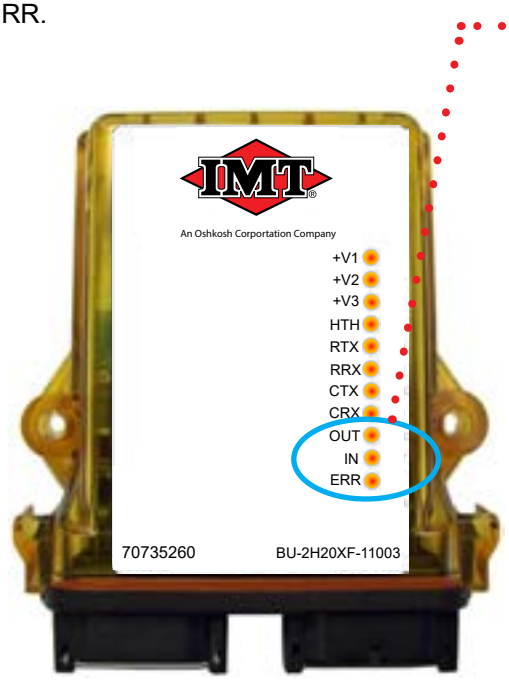
MIN / MAX Adjustment Fundamentals

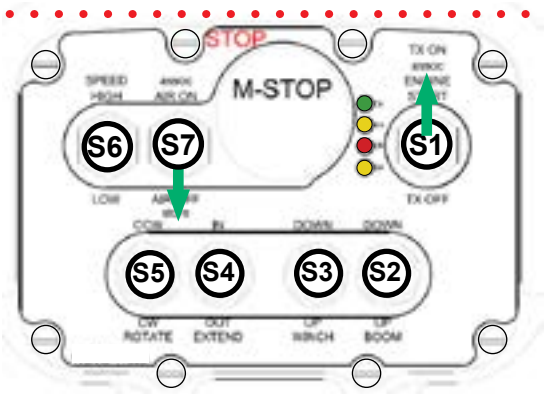
Before performing dynamic MIN and MAX adjustments, make sure that the area around the controlled machine is safe to operate.

- Power the Base Unit for dynamic adjustment.
- Ensure that the Base Unit LEDs and displays are close enough to be easily read.
- Adjust Mode time-out 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 10 seconds each time a switch or the trigger is operated while in Adjustment Mode.
- Exist 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.

MIN / MAX Adjustment Procedure for 70735259 & 70735260

1. Turn the controller on by twisting the red STOP button clockwise until the button releases (pops UP).
2. Move Switch S1 UP and allow it to return to center.
3. Enter Adjust Mode by first holding switch S7 DOWN. Then, while still holding switch S7, hold switch S1 UP for four (4) seconds. Adjust Mode is indicated when the bottom three base unit LEDs begin flashing: OUT, IN & ERR.





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

LED LIGHTS		
1		TX
2		RX
3		ERR
4		BATT

4. Release switches S7 and S1
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 (ERR) lights solid indicating MIN Adjust Mode. LEDs OUT & IN 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, move switch S7 DOWN to the STORE position. The MIN value is stored. Base Unit LED (OUT) activates.
8. Release all switches including the trigger. The Base Unit LED (ERR) goes out, and the LED (IN) 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, move switch S7 DOWN to the STORE position. The MAX value is stored. Base Unit LED (OUT) activates.
11. Release all switches, including the trigger. The system returns to MIN Adjust Mode.
    NOTE:
    Activating switch S7 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 time-out.
- Pressing the red M-STOP button, which powers down the handheld remote.

HANDHELD REMOTE SPECIFICATIONS (70735259)		
ITEM	DESCRIPTION	
POWER	VIN	+1.6V TO +3.2VDC
	BATTERIES	FOUR (4) AA ALKALINE
	BATTERY LIFE	100 HOURS
	LOW V SHUTDOWN 1.6VDC	1.6VDC
	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
	RF POWER	100mW (MAX)
	LICENSE	NONE REQUIRED
	MODULATION	DSSS
	ANTENNA	INTERNAL
ENCLOSE	DIMENSIONS	INCH: 9.1 x 5.3 x 5.8 *(230.6 x 133.9 x 146.9 mm)*
	TOTAL WEIGHT	3 LBS
	DURABILITY	HIGH IMPACT POLYMER CASE
	FACEPLATE	ALUMINUM OR POLYCARBONATE
LED INDICATORS	TX (GREEN)	BLINKING - TRANSMITTING, NO SWITCH ACTIVITY
		SOLID - TRANSMITTING, SWITCH ACTIVE
	RX (AMBER)	BLINKING - RECEIVING, NO OUTPUT OF INTEREST ACTIVITY
	ERR (RED)	INDICATES ERROR WITH HANDHELD REMOTE
	BATT (AMBER)	LOW BATTERY INDICATION
CONTROL SWITCHES	TOGGLE	SEVEN 3-POSITION SPRING RETURN TO CTR
	TRIGGER	SPRING RELEASE
	MUSHROOM	PROFESSIONAL STOP

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Section - 4 Battery Installation

Battery Installation / Replacement

1. The handheld remote unit is powered by four-size AA 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 form the handheld.
3. 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.
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

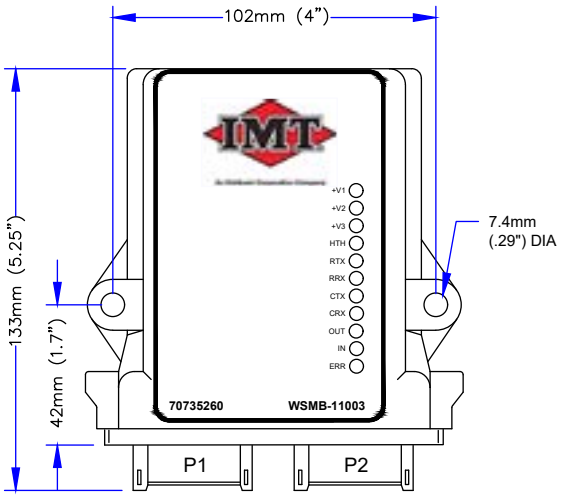
Observe proper polarity when placing batteries into the cradle. Improper battery placement can result in excessive heat, battery explosion, injury to the operator, and damage to the remote.

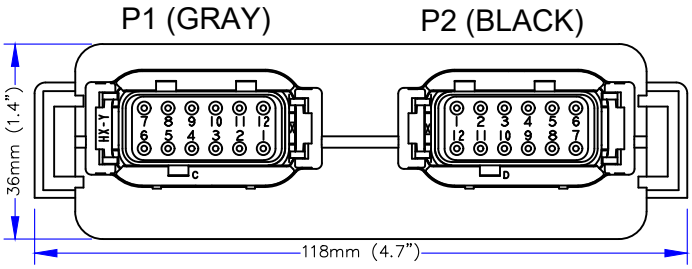
Section - 5

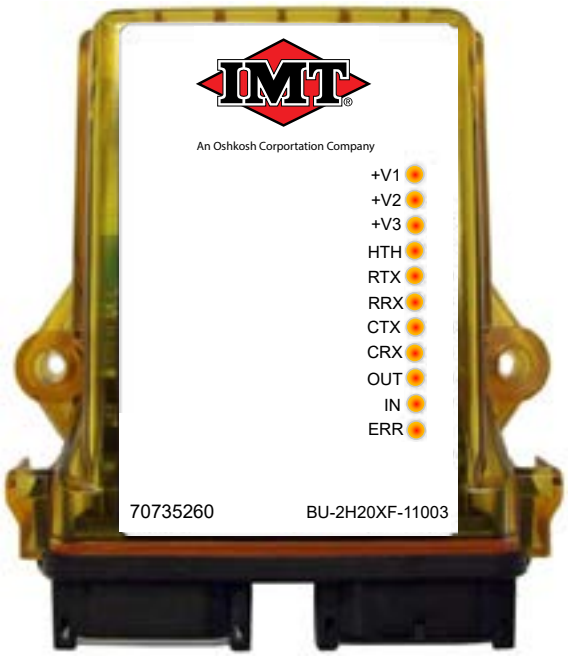
70735260 SII Base Receiver

70735260 - SII Receiver Radio Remote (Base Unit) - Hydraulic 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	OUPUT ACTIVE
7	INPUT ACTIVE
8	ERROR







70735260
BU-2H20XF-11003

70735260 - Base Unit Configuration

CHANNEL	TYPE*	FUNCTION	ACTIVATED BY:	SETTINGS		PIN
M17	LI-NA-M	DOMINATOR SELECT INPUT		ACTIVE HIGH IN-PUT. +12VDC = DOM SELECT	PLUG P1 (GRAY)	1
M18		NOT USED				2
-VDC						3
M11	PWM	PROPORTIONAL OUTPUT	TRIGGER+ S2+/- ,or S3+/- or S4+/-,or S5+/-	TOGGLE SWITCH OPERATED BEFORE TRIGGER DEPRESSED		4
M12		NOT USED				5
+VDC						6
M13	LO-HS-LA LO-HS-UN	SPEED OUT-PUT HIGH SPEED OUTPUT LOW	S6+ S6- OR M-STOP	DIGITAL OUTPUT WILL REMAIN ACTIVE IF TRANSMITTER S1 IS USED TO TURN OFF SYSTEM. M-STOP WILL DE-ACTIVATE OUTPUT		7
M14						8
M15	LO-HS-M	ROTATE CCW	S5+	DIGITAL		9
M16	LO-HS-M	LOWER BOOM DOWN	S2+ + M4	DIGITAL		10
M10	LO-HS-M	ROTATE CW	S5-	DIGITAL		11
M9	LO-HS-M	LOWER BOOM UP	S2-	DIGITAL		12
M5	LO-HS-M	WINCH DOWN	S3+	DIGITAL	PLUG P2 (BLACK)	1
M6	LO-HS-M	WINCH UP	S3- + M4	DIGITAL		2
M7	LO-HS-M	EXTEND SYSTEM IN	S4+	DIGITAL		3
M8	LO-HS-M	EXTEND SYSTEM OUT	S4- + M4	DIGITAL		4
M19	LO-HS-M	ENGINE START	S1+	DIGITAL		5
M20	LO-HS-M	ENGINE KILL	M-STOP	DIGITAL		6
CAN H		TETHER CABLE CONNECTION				7
CAN L		TETHER CABLE CONNECTION				8
M1	LO-HS-LA LO-HS-UN	COMPR ON COMPR OFF	S7+ S7- OR M-STOP	DIGITAL OUTPUT WILL REMAIN ACTIVE IF TRANSMITTER S1- IS USED TO TURN OFF SYSTEM. M-STOP WILL DE-ACTIVATE OUTPUT.		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

70735260 - Base Unit Hardware Specs / Base Unit Safety Link / Base Unit Hardware

BASE UNIT HARDWARE SPECIFICATIONS		
REQUIRED FIELDS	**DESCRIPTION**	**DETAILS**
CONTROL POWER	7-28VDC	USING 12VDC
RF FREQUENCY	2400MHz	2405-2480MHz @ 100 mW
ANTENNA OPTION	INTERNAL	
DISCRETE CHANNELS	16	15 HIGH SIDE OUTPUTS: ONE HIGH SIDE INPUTS
PROPORTIONAL CHANNEL	1	PMW OUTPUTS
ANALOG CHANNEL	1	4-20mA
MESSAGE PERIODICITY	10x/s	ONE MESSAGE EVERY 100ms
ON AIR TIME	2S	8 OR 16 BYTE PAYLOAD
LINK LOSS CRITERIA	0.5S	5 CONSECUTIVE MESSAGES
VALVE INFORMATION		PMW FREQ: 150Hz; DUTY CYCLE: 20-80%; LOAD: 4.7Ω
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: • 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
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. BEFORE OPERATION NO OUTPUTS ARE ALLOWED TO BE ACTIVATED UNTIL ALL SWITCHES ARE FIRST CENTERED OR RETURNED TO THEIR NEUTRAL STATE.	ALL LATCHED OUTPUTS REMAIN LATCHED, BUT ALL MOMENTARY COMMANDS THAT ARE ACTIVE DE-ACTIVATE. **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

BASE UNIT HARDWARE (70735260)		
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
	ANTENNA:	INTERNAL
ENCLOSURE	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		• CHECK CAN WIRING. • CHECK THAT THE REMOTE UNIT IS ACTIVE. • RE-ASSOCIATE THE REMOTE UNIT TO THE BASE UNIT.
OUT LED NOT ACTIVE		• CHECK THAT THE REMOTE UNIT LEDs ARE ACTIVE WHEN THE APPROPRIATE BUTTONS ARE PUSHED.
ERR LED ACTIVE	OVER-TEMPERATURE OR OVER-CURRENT CHANNEL INDICATION	• CHECK THE OUTPUTS FOR LOOSE WIRING, ETC. • 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-11003
Contains:
FCC ID: LOBSRF305
IC: 7955A-SRF305

Input: 9-365
3A per channel
8A Max Total

Cervis SmaRT
2.4 GHz 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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P.O. Box 189 Garner, IA 50438
Tel: 641.923.3711
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