

Electromotive Systems

PulseStar jr Series 2

TRANSMITTERS

RADIO

CONTROL

EQUIPMENT



Electromotive Systems

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Section 1 - Service Information

1-1. Service Information.

For questions regarding service or technical information or ordering replacement parts, ask for Electromotive Systems Service Department. Electromotive Systems' normal business hours are Monday through Friday 7:30 AM to 5:00 PM Central Standard Time. After hours emergency technical service is available.

Telephone: (262)783-3500
In the USA toll free: (800)288-2178

Website: <http://www.Electromotive.com>
Manuals for downloading are available for many products at the Electromotive Systems website.

**CAUTION**

- DO NOT ATTEMPT TO OPEN OR SERVICE THE *PULSESTAR JR SERIES 2* UNIT.
- ONLY TRAINED QUALIFIED INDIVIDUALS SHOULD DO SERVICING.
- STRICT ANTI-STATIC HANDLING PROCEDURES MUST BE FOLLOWED.
- FAILURE TO FOLLOW THIS CAUTION COULD RESULT IN SERIOUS DAMAGE TO EQUIPMENT AND/OR VOID THE WARRANTY.

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Section 2 – Radio Controlled Safety

2-1. Warnings, Cautions and Notes.

Throughout this document **WARNING**, **CAUTION** and **NOTE** statements have been deliberately placed to highlight items critical to the protection of personnel and equipment.

WARNING – A warning highlights an essential operating or maintenance procedure, practice, etc. which if not strictly observed, could result in injury or death of personnel, or long term physical hazards. Warnings are highlighted as shown below:



CAUTION – A caution highlights an essential operating or maintenance procedure, practice, etc. which if not strictly observed, could result in damage to, or destruction of equipment, or loss of functional effectiveness. Cautions are highlighted as shown below:



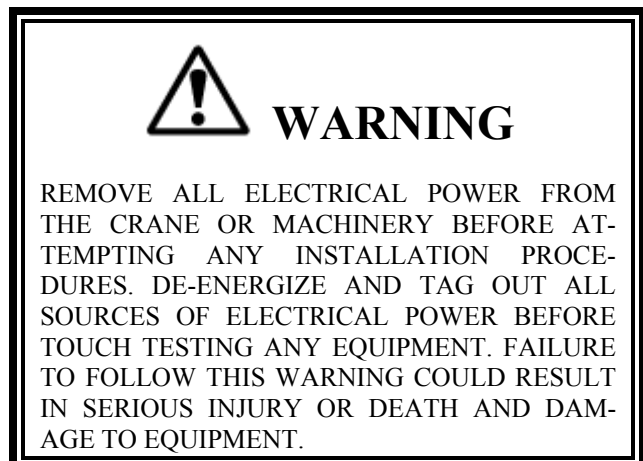
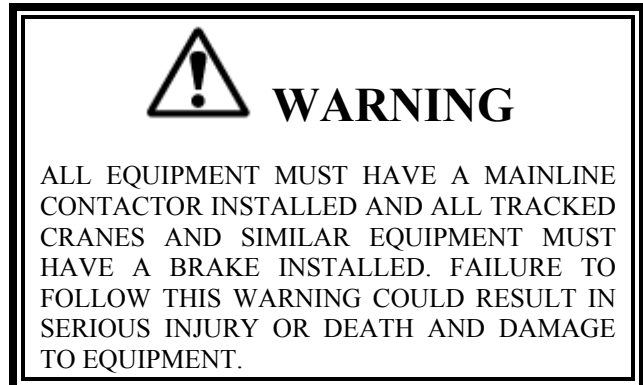
NOTE – A note highlights an essential operating or maintenance procedure, condition or statement. Notes are shown as below:

NOTE

WARNINGS, CAUTIONS AND NOTES SHOULD NEVER BE DISREGARDED.

The safety rules in this section are not intended to replace any rules or regulations of any applicable local, state, or federal governing organizations. The following information is intended to be used in conjunction with other rules or regulations already in existence. It is important to read all of the safety information contained in this section before installing or operating the Radio Control System.

2-2. Critical Installation Considerations.



Section 2 – Radio Controlled Safety (Continued)



WARNING

THE DIRECT OUTPUTS OF THIS PRODUCT ARE NOT DESIGNED TO INTERFACE DIRECTLY TO TWO STATE SAFETY CRITICAL MAINTAINED FUNCTIONS, I.E., MAGNETS, VACUUM LIFTS, PUMPS, EMERGENCY EQUIPMENT, ETC. A MECHANICALLY LOCKING INTERMEDIATE RELAY SYSTEM WITH SEPARATE POWER CONSIDERATIONS MUST BE PROVIDED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

2-3. General.

Radio controlled overhead cranes and other material handling equipment operate in several directions. They are large, bulky pieces of equipment that handle heavy loads efficiently at high speeds. Quite frequently, the equipment is operated in areas where people are working on the floor below. The crane operator must exercise extreme caution at all times. Workers must constantly be alert to avoid accidents. The following rules have been included to indicate how your careful and thoughtful actions may prevent injuries, damage to equipment, or even save a life. If radio controlled material-handling equipment is operated from the cab, special care must be taken to secure the transmitter. Refer to section titled Section 2-9. Boarding The Crane for specific safety rules.

2-4. Persons Authorized To Operate Radio Controlled Cranes.

Only properly trained persons designated by management should be permitted to operate radio-controlled cranes.

Radio controlled cranes should not be operated by any person who cannot read or understand signs, notices and operating instructions that pertain to the crane.

Radio controlled cranes should not be operated by any person with insufficient eyesight or hearing or by any person who may be suffering from a disorder or illness or is taking any medication that may cause loss of crane control.

2-5. Training Checklist for Crane Operators.

Anyone being trained to operate a radio-controlled crane should possess as a minimum the following knowledge and skills before operating the crane:

The operator should have knowledge of hazards peculiar to crane operation.

The operator should have knowledge of the safety rules for radio-controlled cranes.

The operator should have the ability to judge distance or moving objects.

The operator should have knowledge of the radio transmitter.

The operator should know the limit switch test procedure.

The operator should know, where authorized, instructions for plugging motions.

The operator should have knowledge of the use of crane warning lights and alarms.

The operator should have knowledge of observing crane signal lights.

The operator should be trained to avoid striking any obstructions.

The operator should have knowledge of the proper clearance of lifts or hooks before moving bridge or trolley.

The operator should have knowledge of the proper storage space for radio control box when not in use.

The operator should be trained in transferring radio control box to another person.

The operator should be trained how and when to report unsafe or unusual operating conditions.

The operator should be trained how to exhibit caution in approaching bridge or trolley bumpers.

The operator should know equipment capacity.

The operator should be trained in making lifts below floor level.

The operator should be trained in making side pulls.

The operator should know how to keep himself and other people clear of lifts and to avoid "pinch" points.

Section 2 – Radio Controlled Safety (Continued)

The operator should know cable and hook inspection procedures.

The operator should know procedures for testing hoist, trolley, and bridge brakes.

2-6. Operating Area.

Aisles between equipment, stock, etc., should be free of obstructions so the crane operator can move freely. These aisles should be a minimum of three feet (one meter) wide, or meet local regulations.

Crane operators should always position themselves for the best view of the crane they are controlling. The crane should never be operated blindly. The operator should stay as close to the crane load as possible. Operators should never position themselves in a "pinch" point.

2-7. Transmitter Unit.

Transmitter switches should never be mechanically blocked ON or OFF for any crane motion. When not in use turn the transmitter OFF. A secure storage space should be provided for the transmitter unit and the transmitter unit should always be placed there when not in use. This precaution will prevent unauthorized people from operating the crane.

Spare transmitters should be stored in a secure storage space and only removed from the storage space after the current transmitter in use has been turned OFF, taken out of the service area and secured.

Before putting the transmitter in service the transmitter unit should be inspected for any damage or excessive wear. Units with, but not limited to, any of the following: broken housings, broken or sticking switches and levers or broken handles, missing battery doors, damaged or missing switch boots or damaged or missing switch knobs should be repaired before putting into service.

2-8. Operating the Crane.

2-8.1. Pre-operation Test.

At the start of each work shift, or when a new operator takes control of the crane, operators shall do as a minimum the following steps before making lifts with any crane or hoist:

Test the upper-limit switch. Slowly raise the unloaded hook block until the limit switch trips. When checking limit switches the hoist should be

centered over an area free of personnel and equipment.

Visually inspect the hook, load lines, trolley, and bridge as much as possible from the operator's station; in most instances, this will be the floor of the building.

The bridge and trolley brakes should be tested. On transmitter units equipped with two or more speeds, use the "lowest" speed when testing braking devices.

When lifting maximum loads, the crane operator should test the hoist brakes by raising the load a few inches from the floor. If the brakes do not hold, the load should immediately be lowered to the floor.

If provided, test the lower-limit switch.

Test all warning devices.

Test all direction and speed controls for both bridge and trolley travel.

Test all bridge and trolley limit switches, where provided, if operation will bring the equipment in close proximity to the limit switches.

Test the transmitter emergency stop.

Test the hoist brake to verify there is no drift without a load.

If any crane or hoist fails any of the above tests notify the supervisor and lock out and tag for repair.

2-8.2. General Rules for Operation.

Consult the crane manufacturer, local and governmental regulations for complete rules of operation. In general the following rules apply to remotely controlled cranes:

The limit switches should never be used as a regular stopping device. They are intended to be protective devices.

Do not make lifts in excess of the equipment rated capacity.

The bridge and trolley should be centered directly over the load when the load is raised to prevent swinging when making lifts.

A crane designed for this purpose and only with supervisor permission should make side pulls. When a lift is being made, the crane operator should not be

Section 2 – Radio Controlled Safety (Continued)

positioned in the line of travel. The crane or hoist should be operated from a position either to the side or opposite from the direction of travel.

When raising or lowering a load, proceed slowly and make certain the load is under control. Tag lines should be used for handling unusual lengths or bulky loads. Remove slack from chains or slings gradually. Make certain all personnel are clear before making a lift.

The crane operator should keep all body parts away from the lift and should never be positioned under the lift.

Do not make a lift or move a load if anyone is in a location where they could be struck by the crane or the load.

If the crane operator is being helped, the crane should not be moved until the helper signals they are clear of the crane and its load.

When a load is hanging from the crane hook and the crane is being moved, the crane operator should sound all warning devices frequently.

Loads should not be carried over workers heads. If a worker is in the path of crane travel, the crane operator should stop the crane and clear the area before proceeding.

Runway stops or other cranes should never be bumped into.

When moving the crane, the crane operator should be sure that the hook block and attachments or cables would not catch on nearby equipment. Slings, chains, or cables should never be dragged along the floor.

Unless required for operator safety, gloves should not be worn when operating the transmitter unit.

All loose materials or parts should be removed from the load before starting the lift.

The crane operator should always hoist lifts high enough to clear all equipment and workers.

The crane operator should never permit anyone to ride on the load or hook except when authorized by the supervisor.

When another crane on the same runway is stationary with a load hanging, the crane operator should maintain a safe distance between the stationary crane and the one under their control.

Never leave suspended loads unattended. In an emergency, if the crane is inoperative and a load suspended, notify the supervisor immediately, barricade and post signs on the floor beneath crane and load.

If power to the crane is removed, the crane operator should turn the transmitter unit OFF and keep it OFF until power is restored.

If the crane fails to respond properly, the crane operator should stop operation, turn the transmitter unit OFF and immediately report the condition to their supervisor.

Outdoor cranes, which are subject to movement by wind, should be securely anchored when left unattended. If the crane is equipped with bridge brakes, the parking brake should be set immediately.

2-9. Boarding the Crane.

The crane should not be boarded without permission of the supervisor.

The crane operator should turn off the transmitter and take it with them when boarding the crane.

If more than one person is boarding the crane, one person should be made responsible for ensuring all personnel are off the crane before the system is returned to operation.

2-10. Crane Maintenance and Repair.

Qualified personnel must maintain a regularly, i.e., such as monthly, scheduled crane inspection. During this crane inspection the functionality and safety of the crane remote control must also be tested. The inspection shall include, but be not limited to items listed in Section 2-12. Condition of the Radio Controlled Crane. Consult crane manufacturer, local and governmental regulations for recommended inspection intervals and proper inspection procedures. Problems noted during this inspection must be repaired before using the crane or the remote control.

Minor repairs include routine maintenance and repairs such as greasing, cleaning and control troubleshooting. All other repairs should be considered major. If the repair crew consists of more than one person, one person should be designated as the repair crew leader with the following responsibilities. If the repair crew consists of only one person, that person has the following responsibilities:

Section 2 – Radio Controlled Safety (Continued)

For minor repairs warning signs should be placed on the floor beneath the crane or suspended from the crane. For major repairs, the floor area below the crane should be roped off.

When major repairs are to take place, all persons operating other cranes on the same or adjacent runways, if any, must be notified prior to starting repairs. Notification should include the nature of the repair, safeguards provided, and movement limitations while repairs are in progress.

When practical, radio controlled cranes which cannot be moved during repairs must be protected against being bumped by other cranes on the runway. Bumpers should be installed on the exposed side or sides of the crane under repair. They should be placed as far away as possible. The location of these bumpers should be indicated by red lights placed so that they are clearly visible to other crane operators traveling on the same runway. When it is not possible to use bumpers, red lights must be placed so they are clearly visible to other crane operators traveling on the same runway to indicate the restricted travel zone. All crane operators on the same runway must be informed of the repair effort and thoroughly instructed to what their operations are limited to and informed they will be notified when repairs are completed.

If any hazard involving the repairmen exists when there is a runway adjacent to the crane under repair, the adjacent runway should be blocked off as described above. When it is necessary to continue crane operation on the adjacent runways warning lights must be installed and be visible to operators of cranes on those runways. All cranes should come to a complete stop prior to entering the restricted area and should proceed through this area only after receiving permission from a signal person designated for this purpose. Access of persons to and from the crane being repaired should be under control of the repair crew leader.

When boarding the crane, the transmitter should be turned OFF and the transmitter should remain with the repair crew leader. The leader should board the crane first, open and lock out the main switch, and then signal the other members of the crew it is safe to board the crane.

If work on the crane is to be done in areas not protected by standard handrails, the repair crew should wear approved safety belts.

All tools and equipment should be moved onto the crane by the use of hand lines. The tools and equipment should be adequately secured to the hand lines.

If it is necessary to have the crane control circuits energized, all power circuits for crane movement must be opened prior to energizing the control circuits.

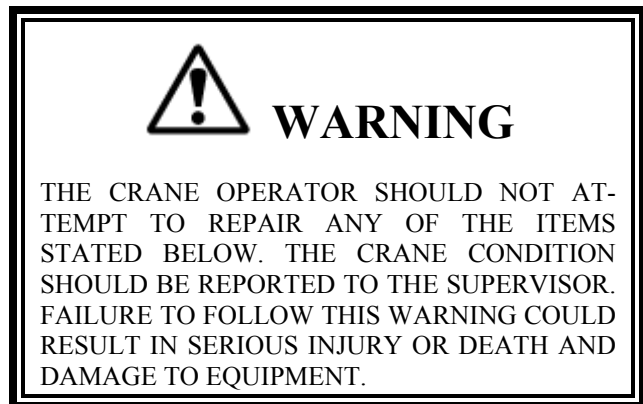
All personnel and tools should be moved to a safe spot before moving the crane during repairs.

Headroom is at a minimum in some crane cabs and on some crane walkways. Caution should be exercised when boarding or working on cranes. Hard hats should be worn whenever possible.

When repairs are finished, all personnel, tools and repair equipment should be removed before energizing the crane circuits.

2-11. Using the Crane as a Work Platform.

When the crane is to be used as a stationary work platform, follow all rules provided in Section 2-10. Crane Maintenance and Repair. When it is necessary for the crane to be moved from time to time, the crane operator should board the crane with the transmitter unit. The crane operator should ensure all personnel working on the crane are in a secure position before moving the crane to the next workstation. It should also be the crane operator's responsibility to ensure the main switch is open and locked down before work is resumed.



2-12. Condition of the Radio Controlled Crane.

If the crane fails to respond properly, the crane operator(s) should notify their supervisor. When serious conditions are noticed (conditions that make the crane unsafe to operate), the crane should be shut

Section 2 – Radio Controlled Safety (Continued)

down immediately and the supervisor notified. The following is a list of some of the items that should be included in the report. (See the crane manufacturer for specifics and possible additional items):

Condition of hoisting cable and hook block (broken strands, clipped sheave wheels, etc.).

Condition of brakes (hoist, trolley, and bridge). (No bluing, rivets on shoes showing, glazing, etc.).

Condition of trolley and rail stops.

Condition of bridge structure.

Condition of festoon system.

Broken welds in any part of the crane structure.

Proper fluid levels and lubrication.

Condition of bridge and trolley stops.

Carbon dust or signs burning on the covers of motors.

Indication of fluid, oil or grease leaks.

Condition of rail sweeps.

Walkways required handrails and ladders are in place, sturdy and not loose.

Protective guards are in place for all moving parts.

Alignment of bridge (screeching or squealing wheels indicate bridge is out of line).

Broken, cracked, or chipped rails on trolley or runway.

Condition of limit switches.

Condition of electrical and mechanical control (electrical or mechanical defects which cause faulty operation such as un-commanded stopping or starting of any crane motions, warning devices, lights, or auxiliary functions).

Condition of gears (grinding or squealing may indicate foreign materials in gear teeth or a lack of lubrication).

All controls especially E-STOPS are in place and in working order.

Frequent relay tripping of power circuits.

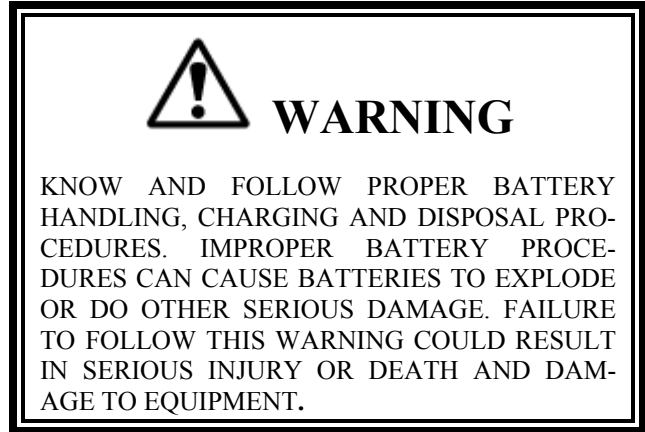
Mechanical parts loosened by vibration (loose rivets, covers, bolts, etc.).

Uneven riding (worn or damaged wheels).

Condition of collector shoes or bars.

Condition of warning or signal lights and horns. (Burned out or broken).

2-13. Batteries



2-13.1. Battery Handling.

Use only batteries approved by Electromotive Systems for the specific product.

Do not dispose of a battery pack in fire; it may explode.

Do not attempt to open the battery pack.

Do not short circuit battery.

Do not attempt to use a battery that is leaking, swollen or corroded.

Keep the battery pack environment cool during charging operation and storage, (i.e., not in direct sunlight or close to a heating source).

Do not submerge battery in water.

If battery leaks avoid contact with electrolyte.

Section 2 – Radio Controlled Safety (Continued)

2-13.2. Battery Charging.

For those transmitters equipped with battery chargers, please familiarize all users with the instructions of the charger before attempting to use.

Use only Electromotive Systems approved chargers for the appropriate battery pack.

Do not attempt to charge non-rechargeable battery packs.

Avoid charging the battery pack for more than 24 hours.

Do not charge batteries in a hazardous environment.

Do not short charger.

Do not attempt to charge a damaged battery.

Charger units are not intended for outdoor use. Use only indoors.

Always unplug the charger when not in use.

Do not store, place or use the charger where it could come into contact with water or moisture.

To reduce the risk of electric shock, unplug your charger from the wall outlet before cleaning.

2-13.3. Battery Disposal.

Before disposing of batteries consult local and governmental regulatory requirements for proper disposal procedures.

Section 3 – General System Information

3-1. General System Information.

The Electromotive Systems Radio Control System (system) provides remote control of overhead cranes using radio signals. The system consists of a hand held portable battery operated transmitter unit and a fixed station receiver unit.

A unique 16-bit code (Access Code) for each system is preset in every transmitter and receiver. The receiver considers any received signal, which does not match the receiver access code setting, invalid. The Access Code is made up of 16-bits (65,000 combinations) and no two similar codes are assigned to any two Electromotive systems.

3-2. Active E-Stop.

This feature causes the transmitter to send confirmation that the ESTOP is not being engaged via a periodic confirmation signal. Units will shut down the receiver when out of range.

3-3. Channel Designations:

- 00- 458.800 MHz
- 01- 458.825 MHz
- 02- 458.850 MHz
- 03- 458.875 MHz
- 04- 458.900 MHz
- 05- 458.925 MHz
- 06- 458.950 MHz
- 07- 458.975 MHz
- 08- 459.000 MHz
- 09- 459.025 MHz
- 10- 459.050 MHz
- 11- 459.075 MHz
- 12- 459.100 MHz
- 13- 459.125 MHz
- 14- 459.150 MHz
- 15- 459.175 MHz

3-4. Transmitter Specifications.

Transmitter housing: NEMA 4.

Operating Temperature: -22° F to +158° F (-30° C to +70° C) ambient.

Humidity: up to 95 % (non-condensing).

Typical Operating Range: 200 feet (70 meters).

3-5. Transmitter Unit.

The transmitter is battery operated, has an ON and OFF switch, E-STOP, motor controls and auxiliary controls used for such items as warning indicators.

LED's mounted on the front panel provide indication of battery voltage, ON/OFF, Modes and data transmission status.

A power down feature allows the transmitter and the receiver unit to turn OFF if no keys are pressed for predetermined number of minutes. The transmitter unit must again be turned ON. The unit uses pulsed operation for extremely long battery life. A configuration of the system is available without automatic timeout.

Housings are designed of high impact, chemical resistant, materials. The antenna for the unit is internal. A strap is provided for carrying the transmitter.

Section 4 – Operation

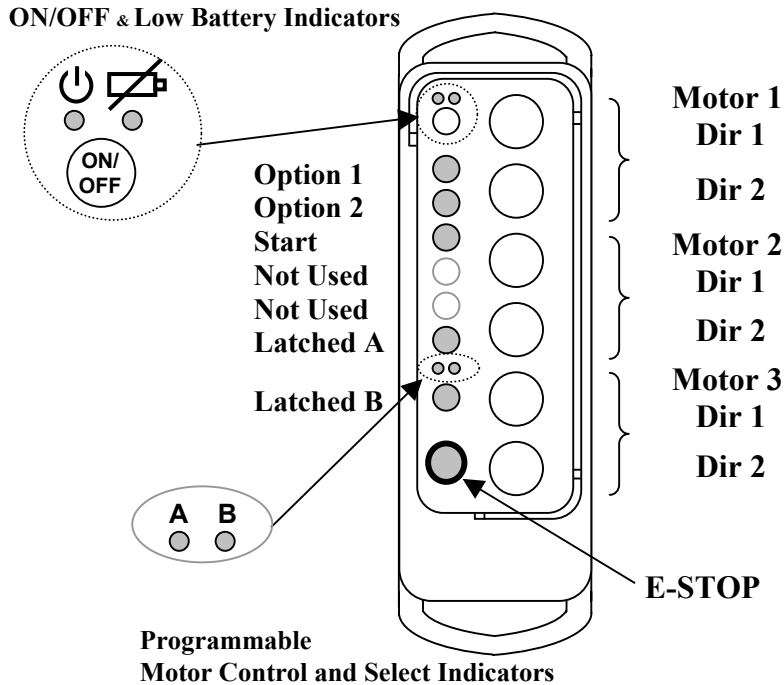


Figure 4-1. 2-Speed *PulseStar jr Series 2*

4-1. Transmitter Buttons.

ON/OFF On the *PulseStar jr Series 2* Transmitter, ON and OFF is the same button. This button toggles between turning the transmitter ON and then sending the ON command to the receiver and sending the OFF command to the receiver and then turning the transmitter OFF. Press and hold the button for one full second to turn the unit ON.

Labels are provided for the auxiliary buttons and the labeled pushbutton boots can be unsnapped and moved to reflect the desired labeling. Custom labels are available from Electromotive Systems.

NOTE

IN THE *PULSESTAR JR SERIES 2* THE TRANSMITTER DOES NOT TURN ON TILL THE ON PUSH BUTTON IS RELEASED AFTER BEING DEPRESSED FOR ONE SECOND. THE OFF FUNCTION IS IMMEDIATE UPON DEPRESSING THE ON/OFF PUSH BUTTON.

E-STOP – Stops all equipment movement and disables all functions except Alarm. Reset the system for normal operation by turning the transmitter “OFF” then “ON”. Use for

emergencies only. (NOT FOR NORMAL SHUT DOWN).

NOTE

ON THE *PULSESTAR JR SERIES 2* TRANSMITTER, THE USER CAN CHOOSE AND CUSTOM LABEL THE FUNCTIONS FOR A SPECIFIC MOTOR. THE FUNCTIONAL DESIGNATIONS SHOWN BELOW ARE COMMON AND TRADITIONAL DESIGNATIONS.

Common Designations Listed Below:

Motor 1 Dir 1, UP – Selects hoist movement in the UP direction speed one (first switch position), speed two (second switch position).

Motor 1 Dir 2, DOWN – Selects hoist movement in the DOWN direction speed one (first switch position), speed two (second switch position).

Motor 2 Dir 1, NORTH or EAST – Selects the appropriate direction of the bridge or trolley (depending how unit is wired at installation) speed one (first switch position), speed two (second switch position).

Section 4 – Operation (Continued)

Motor 2 Dir 2, SOUTH or WEST – Selects the appropriate direction of the bridge or trolley (depending how unit is wired at installation) speed one (first switch position), speed two (second switch position).

Motor 3 Dir 1, EAST or NORTH – Selects the appropriate direction of the bridge or trolley (depending how unit is wired at installation) speed one (first switch position), speed two (second switch position).

Motor 3 Dir 2, WEST or SOUTH – Selects the appropriate direction of the bridge or trolley (depending how unit is wired at installation) speed one (first switch position), speed two (second switch position).

Programmable Select Indicators.

A B
○ ○

When the transmitter is programmed as a Model JRT-7 or JRT-8, the Latched A and Latched B buttons select the A or B or Both mode. When the A or B buttons are pressed, the corresponding indicator light will illuminate and the output will stay on until the transmitter is turned off, or the A or B button is pressed.

Option 1 and Option 2 – When the transmitter is programmed as a JRT-3, these single speed momentary buttons will operate the option relays (in the receiver).

Start Button - The Start Button is a momentary button, which is used to energize the start relay in the receiver. This button must be pressed to energize the mainline contactor.

ON/OFF LED Indicator.

Top left indicator on *PulseStar jr Series 2*. When the transmitter is ON the red LED flashes slowly. When the unit transmits, the red LED flashes rapidly. This LED also indicates Bank selected.

4-2. Low Battery Indication.

In the *PulseStar jr Series 2* transmitter there is a separate low battery indicator located to the right of the ON/OFF indicator. This is a yellow LED that turns ON solid when it is time to replace the batteries. See Section 4-5. Battery Replacement for battery replacement.



WARNING

BEFORE TURNING ON OR OPERATING THE CRANE, MAKE SURE ALL PERSONNEL ARE CLEAR OF THE OPERATING AREA AND NO ONE IS STANDING UNDER THE LOAD. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.



WARNING

WHEN OPERATING THE CRANE FOLLOW LOCAL AND GOVERNMENTAL RULES ON THE USE OF HORNS AND ALARMS. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

4-3. Operation.

Make sure that all personnel are clear of the crane movement and no one is under the crane or load.

Turn unit ON by pressing the ON/OFF (ON) button. The red LED ON/OFF indicator should flash rapidly for a few seconds indicating the ON command is being sent to the receiver. After the receiver is turned ON the red LED should flash slowly indicating the transmitter is now ready to send commands.

Perform whatever safety checks are required. See Section 2. Radio Controlled Safety. Operate any horns or alarms as required by local and governmental regulations.

To operate the crane, press and hold the desired function button to maintain operation. Press the directional buttons harder to second position to engage second speed for those cranes having 2-speed motors.

Always turn system OFF by pressing the ON/OFF (OFF) button on the transmitter when done with crane operation. Do not use the E-STOP button as an ON/OFF button.

Section 4 – Operation (Continued)

In an emergency always hit E-STOP (EMS) immediately. To clear the emergency condition, turn the transmitter OFF and ON again to resume normal operation.

Typically transmitters will time-out after approximately 15 minutes if there is no activity. This time period is adjustable and can be reprogrammed with a PDA.



4-4. Additional *PulseStar jr Series 2* Transmitter Operational Features.

***PulseStar jr Series 2* E-STOP Function.**

The E-STOP command will be repeatedly sent as long as the E-STOP pushbutton is depressed. The E-STOP is always live on the *PulseStar jr Series 2* transmitter. Upon pushing the E-STOP pushbutton the transmitter will send an E-STOP command even if the unit is in the OFF state. (Obviously, if the battery is dead this will not work).

***PulseStar jr Series 2* Self-Test Function.**

When the unit turns on, if any function key is depressed the unit will fault, not send a turn on command and not become operational. The red LED will stay ON solid briefly and then the unit will turn OFF. The unit will frequently scan the 2nd position of the motion switches while the transmitter is ON and if one of these is closed without the first position closed, the unit will fault as described above.

***PulseStar jr Series 2* Red LED ON/OFF Indicator.**



The red LED, at the upper most left hand side of the transmitter, operates as follows:

- Be OFF when the transmitter is OFF.
- Flash slowly when the transmitter is ON, but not transmitting. If the transmitter has Bank select enabled, there will be a number of quick flashes followed by a pause. The number of quick flashes indicates the Bank the transmitter is in.
- Flashes rapidly when the transmitter is transmitting, including E-STOP mode.
- Remains ON solid for a brief period, then turns off if a function switch is engaged upon turning the unit ON.

***PulseStar jr Series 2* Battery Yellow Indicator Light.**



The yellow LED to the right of the ON/OFF indicator operates as follows:

- Be OFF when the transmitter is OFF.
- Be OFF when the transmitter is ON and the battery is good.
- Remain ON continuously for a low battery needing replacement.

***PulseStar jr Series 2* Low Battery Shutoff Function.**

If the battery gets too low the unit will shut off and send an OFF command to the receiver as it turns OFF.

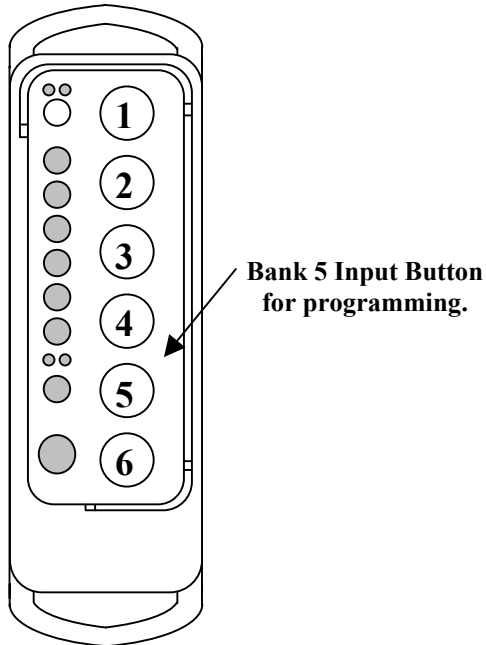
***PulseStar jr Series 2* Bank Select**

The fifth bank is used for programming. This Bank is not password protected.

To select Bank 5, The ON/OFF push button is pressed and held down while the fifth upper most motion push buttons is pressed. While the Bank button is held down release the ON pushbutton and then the Bank button. (The sequence is important). The transmitter red LED ON/OFF

Section 4 – Operation (Continued)


indicator flashes 5 times indicating that Bank 5 is selected.



PulseStar jr Series 2 Time-Out-Timer Function.

The transmitter has a time-out timer and the default condition is 15 minutes. Upon timing out the transmitter will send an OFF command to the receiver if Auto Turn Off is active. The transmitter time-out-timer function is programmable in minute increments to up to and including 15 minutes. After that it is programmable in five-minute increments up to and including one hour. Infinite time-out (none) is also selectable. The time-out-timer measures the time since the last pushbutton stroke and is continuously reset by any pushbutton activation.

4-5. PulseStar jr Series 2 Battery Replacement.

On the *PulseStar jr Series 2* if the yellow battery indicator light  starts to flash replace the battery at the earliest opportunity. If the light is on solid replace the battery immediately.

NOTE

THERE IS NO NEED TO RUSH BATTERY REPLACEMENT. THE PROGRAMMING IN THE *PULSESTAR JR SERIES 2* WILL NOT BE LOST BY REMOVAL OF THE BATTERY OR PROLONGED LOSS OF POWER.

Turn the transmitter OFF, loosen the two coin-screws on the bottom of the unit with a small coin and remove the bottom door. (See below). Pull out the battery holder until the batteries can be accessed. Do not pull hard on the battery holder as it is attached to the board by a cable.

For a **battery carrier with two “AA” cells**, replace the two “AA” cell batteries with new batteries, noting the polarity for “AA” cells marked on the holder. (Best life can be obtained if the two “AA” batteries used are new, a good quality alkaline type, both cells of the same type and from the same manufacturer). Accidentally putting the batteries in the wrong direction will not damage the unit.

For **battery packs**, unlatch the battery cable by pressing or squeezing the locking tab on the battery connector and pulling apart, pulling on the connector housings, not the wires. (See Figure 4.4 below). Slide the new battery pack connector into place until the connector latches.

After replacing the battery(s) place the battery back inside the transmitter, replace the battery door and tighten the thumbscrews. See Section 6 – Spare Parts, for battery part numbers.

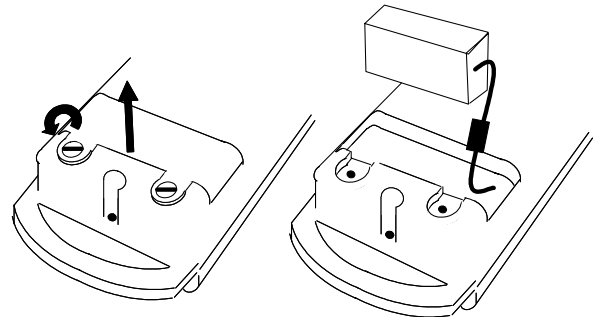


Figure 4-3. PulseStar jr Series 2 Battery Replacement.

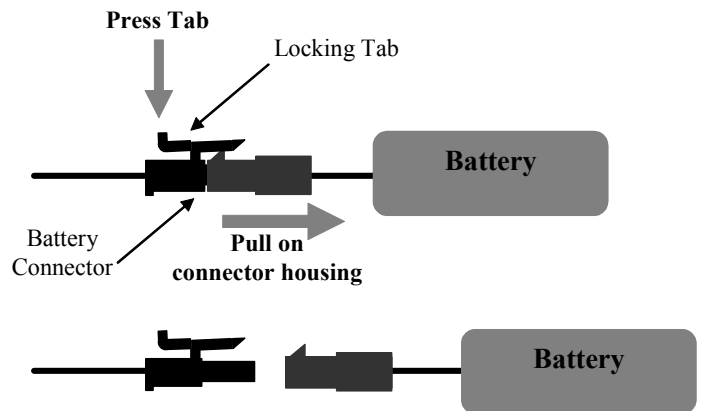


Figure 4.4 Disconnecting the battery.

Section 5 - Programming

5-1. Transmitter Programming Options.

5-1.1. **The following parameters are programmable in the transmitter:**

- Timer-out-timer operation.
- Modes – Single speed switch grouping.
- A – B – Both Select
- Frequency
- Access Code

5-2. PulseStar jr Series 2 Programming.

Read Section 4-4. Additional *PulseStar jr Series 2* Operational Features to familiarize you with the features listed below. The *PulseStar jr Series 2* transmitter remote unit for programming uses a PDA (Personal Digital Assistant). Such products as Palm Pilot® or many other products using Palm OS® version 4.X or less can be used to run the *PulseStar jr Series 2* programming software. If unsure if your PDA will work or for a recommended product contact the appropriate Electromotive Systems representative or check our website. The software for the PDA is available on a disk shipped with your unit, and can be emailed from your Electromotive Systems representative.

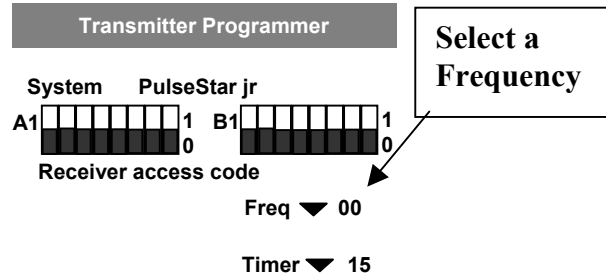
PulseStar jr Series 2 PDA software is quite user friendly and is intended to mimic the dip switch settings used in other Electromotive Systems products without the inconvenience of having to open the transmitter case. The PDA software allows you to select frequency, access code, time-out-timer settings, and crane configuration.

Load PDA Program.

Load the *PulseStar jr Series 2* programming software into your PDA, refer to your PDA manual or contact Electromotive Systems for the appropriate procedure. Once loaded, look for the target and hook logo labeled JRT jr for the appropriate application. Select this application icon to begin programming.



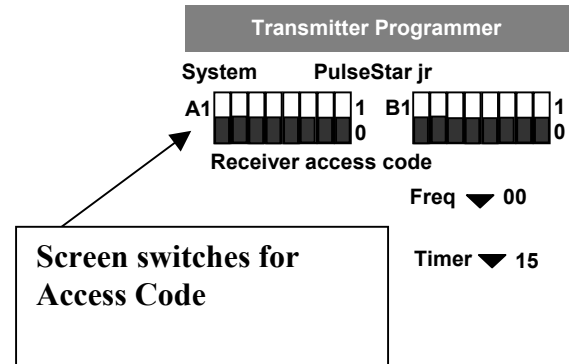
Step 1. Select a Frequency (must be inputted for system to work). There should be a label either on the receiver or the transmitter being replaced listing frequency, it should be a channel number between 00 to 15. Find this number and tap the “Freq” arrow and select that channel number.



Select ▼ JRT-3

PulseStar jr Series 2 Frequency Programming.

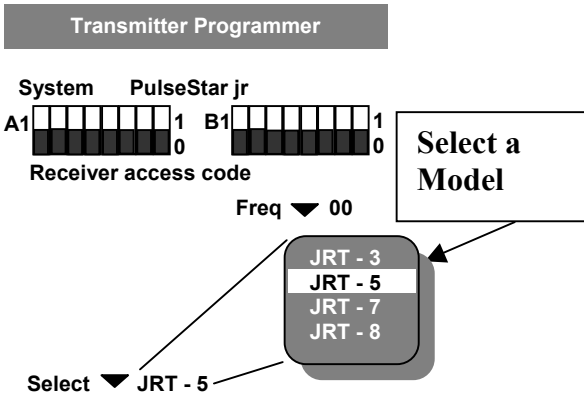
Step 2. Enter the Access Code (must be inputted for system to work). Screen switch operation. The screen switches are labeled from left to right “A”, and “B”. They are numbered from left to right 1 to 8. The darkened rectangle to the bottom is “OFF” or “0” the darkened rectangle to the top is “ON” or a “1”. Tapping the lightened rectangle will cause the switch to toggle. Match the dip switch settings in the transmitter or receiver in the same order with “ON” being up.



PulseStar jr Series 2 Access Code Programming.

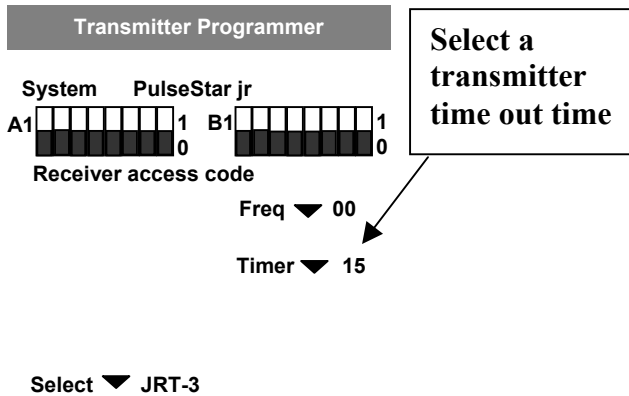
Step 3. Select a Model (must be inputted for system to work properly). There should be a label either on the transmitter being replaced listing the model type. It should be a model number JRT- 3, 5, 7 or 8. Find this model number and tap the “Select” arrow and select that model number.

Section 5 – Programming (Continued)



PulseStar jr Series 2 Model Programming.

Step 4. (Optional) Transmitter time out time can be changed using the “Timer” select feature. Tap the arrow and select the number of minutes till time out.



PulseStar jr Series 2 Time Out Timer Programming.

This completes the *PulseStar jr Series 2* programming.

Go to Section 5-2. Saving, Downloading, Reading the Programs and Other PDA Functions.

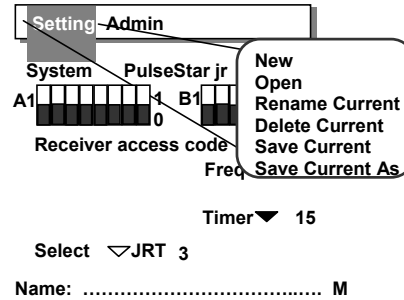
5-2. Saving, Downloading, Reading The Programs and Other PDA Functions.

NOTE


TO PROGRAM OR READ DATA FROM THE *PulseStar jr Series 2*, THE TRANSMITTER MUST BE TURNED ON AND IN BANK FIVE (5).

Saving the Programming File.

With the initial *PulseStar jr Series 2* screen displayed, tap in the lower left corner of your PDA. The title bar at the top of the screen will show a menu or tap on the word “*PulseStar jr Series 2*”. Choose the way you wish to save the file. Tap on your choice and follow the instructions on the PDA to complete file saving. Old files can be deleted, called up, modified and renamed by this same menu.



Sending a Program to the *PulseStar jr Series 2*.



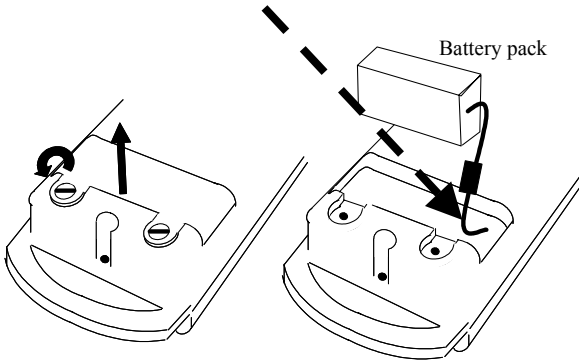
WARNING

AFTER EVERY PROGRAMMING OF THE TRANSMITTER, TEST THE UNIT BY TURNING IT ON AND OFF NEAR THE APPROPRIATE RECEIVER. IF THE RECEIVER DOES NOT RESPOND, DO NOT ACTIVATE A FUNCTION BUTTON! THE TRANSMITTER MAY HAVE INCORRECT PROGRAMMING, WHICH COULD MOVE ANOTHER CRANE. RE-CHECK THE PROGRAMMING IN THE TRANSMITTER AND RETEST. AFTER ACTIVATION OF RECEIVER, FUNCTIONALLY TEST ALL COMMANDS ON THE TRANSMITTER BY INITIALLY JOGGING THE BUTTONS, THEN WITH A FULL MOVEMENT BEFORE RETUNING TO SERVICE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

To send a program file to a *PulseStar jr Series 2* Transmitter:

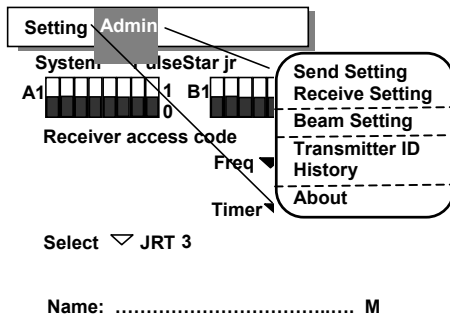
1. Line up the PDA’s infrared port with the transmitters infrared port (remove battery door on the back and pull battery pack back and expose the *PulseStar jr Series 2*’s infrared port. See figure below: *PulseStar jr Series 2* Infrared Port Access).

Section 5 – Programming (Continued)



PulseStar jr Series 2 Infrared Port Access.

- Turn transmitter unit ON. Note that the Tx Red LED is ON.
- Switch the unit to Bank 5. Note that the Tx Red LED is flashing quickly five times then pausing.
- From the application file's main menu click on the PDA a dropdown menu icon located at bottom left corner or tap on the word "Programmer" at the top of the screen. Select "Admin."
- Under "Admin." select "Send Setting."



- Select a name you want for the *PulseStar jr Series 2* unit being programmed and tap "OK".
- Wait for confirmation text on PDA screen.
- After programming, always operationally test all the functions of the transmitter by using the appropriate receiver with the MR relay disabled before retuning transmitter to service.

Receiving (Reading) the *PulseStar jr Series 2* Programming.

To read a program file from the *PulseStar jr Series 2* Transmitter:

- Line up the PDA's infrared port as sets 1 to 3 above, with the transmitter ON. Select "Admin".
- Select "Receive Setting."
- PDA will confirm reception and automatically display current programming in the *PulseStar jr Series 2* unit.

Reading the *PulseStar jr Series 2* ID.

To read an identity (an identity is the name that was programmed in by step 5 of Sending a Program To The *PulseStar jr Series 2*, listed above) from the *PulseStar jr Series 2* Transmitter:

- Line up the PDA's infrared port as sets 1 to 3 above, with the transmitter ON. Select "Admin".
- Select "Transmitter ID."
- PDA will read: Name, Serial/Job Number, and Manufacturing information of the *PulseStar jr Series 2* unit.

Reading the *PulseStar jr Series 2* History.

To read Service information from the *PulseStar jr Series 2* Transmitter:

- Line up the PDA's infrared port as sets 1 to 3 above, with the transmitter ON. Select "Admin".
- Select "History".
- Unit will read: Past Service Orders of the *PulseStar jr Series 2* unit.

Reading the PDA Transmitter Software Version.

To read PDA Software Version from the *PulseStar jr Series 2* Transmitter:

- Select "Admin".
- Select "About".
- Unit will read: Transmitter Programmer Software Version number.

Beaming (Sending) the Configuration(s) to another PDA.

To send a configuration setting to another PDA:

- Line up the PDA's infrared port as, with the other PDA, which is turned ON.
- Select "Beam Setting."
- Select the item(s) you wish to send.
- Wait for confirmation text on PDA screen.

Error Statements and Codes.

Tx Type Mismatch: If while attempting to program a *PulseStar jr Series 2* you receive an error code such as

Section 5 – Programming (Continued)

“Error AAAB” you have selected a different style transmitter in the PDA then you are attempting to program.

NOTE

TO PROGRAM OR READ DATA FROM THE *PulseStar jr Series 2*, THE TRANSMITTER MUST BE TURNED ON AND IN BANK FIVE (5).

Section 6 – Spare Parts

PulseStar jr Series 2 TRANSMITTER

PART NUMBER	DESCRIPTION
Call Factory	MAIN CIRCUIT BOARD 2- SPEED (Please contact Electromotive Systems with Job Number to assure exact replacement).
H1212-0	#4 x 3/8" SELF TAPPING SCREWS, PC BOARD MOUNTING (2)
H1147-0	NEOPRENE WASHER, PC BOARD MOUNTING (4)
H1976-0	STEEL FLAT WASHER, PC BOARD MOUNTING (2)
N10705-1	LABELS (AUXILIARY FUNCTION)
MP10620-0	SHOULDER STRAP
MP10709-0	BELT LOOP ASSEMBLY
A10737-0	BATTERY DOOR ASSEMBLY
S1088-102	PUSH BUTTON SWITCH 2-SPEED ASSEMBLY (3)
H1151-0	PUSH BUTTON SWITCH SCREWS (6)
S1085-0	MEMBRANE SWITCH PACK
WA1055-0	SWITCH RIBBON CABLE
A10743-0	TOP HOUSING ASSEMBLY
MP10734-0	TOP HOUSING ONLY
MP10735-0	BOTTOM HOUSING
H1240-0	HOUSING SCREWS (8)
MP10742-0	BOOTS/RING/LENS ASSEMBLY
MP10705-2	BATTERY, "AA" HOLDER ASSEMBLY
BT111-0	BATTERY, LITHIUM DISPOSABLE
BT111-1	BATTERY, RECHARGEABLE LITHIUM ION
A10723-0	BATTERY CHARGER, RECHARGEABLE LITHIUM ION FOR BT111-1

