

ZAP Controls

Series 3 Technician's Installation and Service Training Manual

ZAP Controls

Series 3 Technician's Installation and Service Training Manual



ZAP Series 3 Defy All Other Logic

Zap Controls UK Ltd

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Series 3 Technician's Installation and Service Training Manual

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Understanding How ZAP Commercial Operators Work

Unlike traditional operators, ZAP operators do not have limit assemblies.



ZAP operators use a 21st century technology, that uses runtime calibration and current sensing technology to perform the functions of limit assemblies.

The limits of the door operator are physical in nature.

The floor being the down limit.
(Figure A)



Figure A

A physical stop for the upper limit.



Figure B

On standard lift and low headroom doors the physical stop is the track radius as the door can only rise so high into the radius before the torsion shaft would have to counter rotate to allow the door to go higher. (Figure B)

On high-lift and vertical lift doors it should be a bumper or pusher spring. (Figure C)



Figure C

The controller monitors the motor load current. It therefore becomes a sensor that automatically detects the door limits as well as obstructions that can occur without the use of an aftermarket safety edge. Because of its unique abilities it can detect an obstructions on any part of the door, not just the leading door edge.

Speed Change Point Calibration.

Calibration of slow speed change point is needed to determine an approximation of the physical limits. During the initial open calibration cycle, the controller is measuring the run time to the upper limit.

Approximately half way through the first open cycle of operation, note that the operator will slow down. This slow down is called a speed change point. After completing the first up cycle, the run time to the upper limit is stored into memory. The same thing occurs on the close calibration cycle. Approximately half way through the first close cycle of operation, the operator will again slow down. After completing the first close cycle, the close run time is stored into memory as well and is compared to the open run time.

During the second calibration run, the run times are verified against the first set of run times. If they match, they are stored into memory. It takes 2-3 complete cycles to fully calibrate the run time.

Once the operator has fully calibrated the run times, the controller moves the opening speed change point to within seconds of the end of the calibrated open run time. Likewise, the controller moves the closing speed change point to within seconds of the end of it's calibrated run time. This is how the controller knows where the limits are and where to stop.

Motor power and sensitivity potentiometer, obstruction sensing, automatic reversing and safety stop.

Picture if you will, current flowing to the motor.
(Figure D)

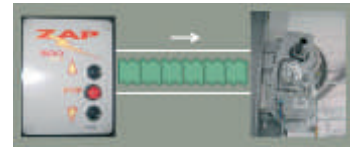


Figure D

If you increase power at the power potentiometer you open up the range of power that can be applied to the motor.
(Figure E)

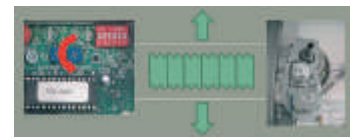


Figure E

If you decrease power at the power potentiometer it closes the range of power that can be applied to the motor. (Figure F)



Figure F

Inherent safety functions

Stop at limit, safety stop, and automatic reversing

The inherent safety and sensitivity function's monitor the system by mirroring the motor current. If the door meets an obstruction in either direction, the current spikes.
(Figure F)

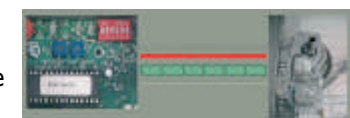


Figure F

Continued on next page.

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Understanding How ZAP Commercial Operators Work

If the resistance on the door is significant enough to cause the current demand to spike to the setting of the sensitivity

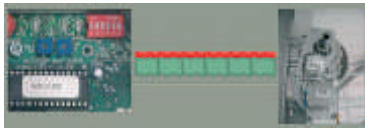


Figure A

Potentiometer (Figure A), it causes a certain function depending upon the direction of door travel and where the door is in its cycle of operation.

If the door is near the end of the calibrated run time in either the open or close direction, (after the speed change point), the operator knows it is at the limit of travel and to stop.

If the door is travelling in the open direction prior to the open speed change point and the door meets an obstruction on any part of the door, the operator knows to activate the safety stop feature.

If the door is travelling in closed direction prior to the close speed change point and meets an obstruction on any part of the door, the operator knows to activate the safety stop and reverse function and return the door to the fully open position.

The sensitivity is adjustable by incrementally increasing or decreasing the sensitivity potentiometer. (Figure B)

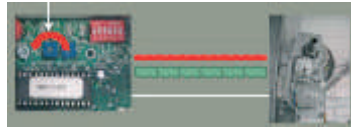


Figure B

If you decrease the sensitivity on the sensitivity potentiometer, it opens up the tolerances of the detection (Figure C).

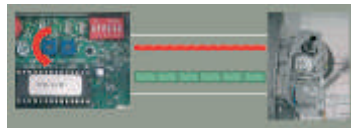


Figure C

Requiring a larger spike in current to reach the sensitivity setting, making the operator less sensitive to detection of obstructions. (Figure D)

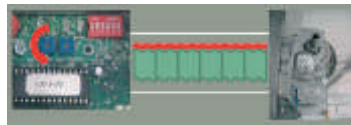


Figure D

If you increase the sensitivity on the sensitivity potentiometer it closes up the tolerances of the detection (Figure E).

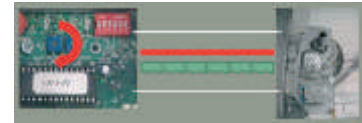


Figure E

This makes the operator more sensitive to detecting obstructions. Requiring much less of spike in current to reach the sensitivity setting. (Figure F)



Figure F

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Commercial Operator Standard Mounting on a solid torsion shaft

Materials Needed

Appropriate operator for door size. (See Brochure)

Tools required

3mm Allen Key, 10mm Wrench, drill, 1/4" Drill bit, Appropriate mounting fasteners.

Fully read all instructions provided with the operator.

Remove and separate all contents from the box.

It is important to follow the steps in order to prevent misalignment of the operator.

Locate the torque arm, torque arm bolt and spacer. Attach the torque arm and spacer to the operator into a position that you consider the approximate distance to an open bolt hole on the track assembly. (Figure A)

Slide the operator on the shaft and into position. (Figure B) and check that the positioning of the torque arm is correct. (Figure C)

If necessary, slide the operator off the shaft and adjust the position of the torque arm. Reposition operator back onto shaft. Note-the torque arm should always be positioned in a horizontal manner, never vertically. (Figure D)

Secure the torque arm to the track assembly through an existing bolt hole using either the provided fastener or one of suitable size to accommodate your needs. Tighten the bolt securely into place. (Figure E)

Tighten the bolt on the back of the operator holding the torque arm to the operator.

Using the provided key stock (feather key). Insert it fully into the keyway. (Figure F)

Tighten the set screw securely into place being careful not to over tighten. (Figure G)

Tighten the lock nut on the set screw. Repeat process for second set screw. (Figure H)

Locate the second set screw on the pulley and repeat the processes for tightening the set screw and lock nut. (Figure G & H)

To prevent accidental loss of key stock (feather key) should the set screws accidentally back out, Use electrical tape to wrap the key stock (feather key). (Figure I)



Figure A

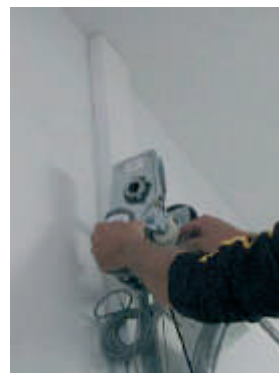


Figure B



Figure C



Figure D



Figure E



Figure F



Figure G



Figure H



Figure I

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Series 3 Technician's Installation and Service Training Manual

Commercial Operator Standard Mounting on a hollow torsion shaft

Materials Needed

Appropriate operator for door size. (See Brochure)

Tools required

3mm Allen Key, 10mm Wrench, drill, 1/4" Drill bit, Appropriate mounting fasteners.

Remove and separate all contents from the box.

It is important to follow the steps in order to prevent misalignment of the operator.

Locate the torque arm, torque arm bolt and spacer. Attach the torque arm and spacer to the operator into a position that you consider the approximate distance to an open bolt hole on the track assembly and secure finger tight. (Figure A)

Slide the operator on the shaft and into position. (Figure B)

Check that the positioning of the Torque arm is correct. (Figure C) If necessary, slide the operator off the shaft and adjust the position of the torque arm. Reposition operator back onto shaft. Note-the torque arm should always be positioned in a horizontal manner, never vertically. (Figure D)

Secure the torque arm to the track assembly through an existing bolt hole using either the provided fastener or one of suitable size to accommodate your needs. Tighten the bolt securely into place. (Figure E)

Using the 3mm Allen wrench, tighten one of the set screws into position creating a mark on the torsion shaft. (Figure G) Loosen the set screw and unbolt the torque arm from its track position. Slide the operator out of the way exposing the score mark.

Using the 1/4" drill bit and drill, drill a hole into one side of the torsion being careful not to drill all the way the way through the opposing wall of the shaft. (Figure E)

Slide the operator back into position and re-secure the torque arm to the track assembly. Tighten the bolt securely into place. (Figure F) Tighten the bolt on the back of the operator holding the torque arm to the operator.

Replace the set screw that is to be used in the drilled hole with the provided long set screw. Tighten the set screw into the hole being mindful not to over tighten. (Figure F) Tighten the lock nut on the set screw. (Figure G) Repeat the tightening process for second shorter set screw.

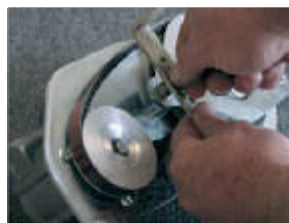


Figure A

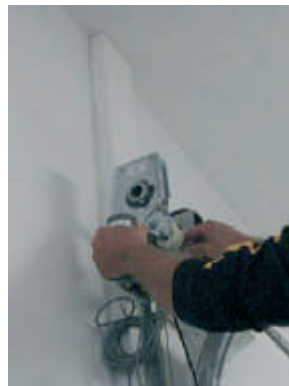


Figure B



Figure C



Figure D



Figure E



Figure F

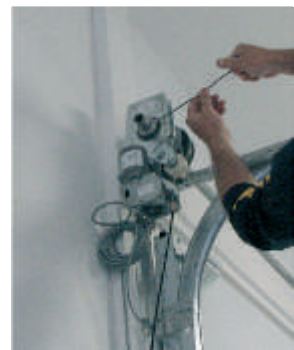


Figure G



Figure H

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Commercial Operator Inverted Mounting

Materials Needed

Appropriate operator for door size. (See Brochure)

Tools required

3mm Allen Key, 10mm Wrench, drill, 1/4" Drill bit,
Appropriate mounting fasteners.

Assembly and Mounting

Follow the assembly instructions and basic mounting techniques for standard installation on hollow and solid torsion shafts.

Inverted mounts may happen outboard or inboard of the cable drum. For mounts inboard of the cable drum, ensure there is clearance between the operator and the door at the point where the door passes the operator.

Bowden Cable

It will be necessary to loop the Bowden cable over either the jamb and track if mounted inboard of the cable drums and over the motor if mounted outboard of the cable drums. Using a cable clamp to hold the Bowden cable in place for this application is advisable, but it must not be so tight as the clamp, bind or compress the sleeve of the Bowden cable assembly. A heavy duty nylon wire tie will also suffice when there is sufficient access to secure the nylon wire tie.

Mounting inboard of the cable drum.

With the door in the closed position and the spring tension completely relieved by completely unwinding the torsion springs using the proper tools for accomplishing the task, remove the bearing plate and cable drum of the door.

Position the inverted operator in the direction for the side of the door that best suits mounting of the torque arm. (Figure A)

Never mount the torque arm into concrete or block work using a concrete anchor. Only mount to steel or to wood jambs that have been properly secured and will not work loose with the applied torque of the operator. (Figure B) If no mount to the wall or track is available for securing the torque arm, it is ok to develop your own mount using angle iron to mount otherwise as exemplified in Figure C.

Loop the Bowden Cable over the cable drum and track assembly and mount the Bowden cable mounting bracket located at the end of the Bowden cable sheath securely as described in the Bowden cable mounting instruction.

Mounting outboard of the cable drum.

Position the inverted operator in the direction for the side of the door that best suits mounting of the torque arm. (Figure A)

Never mount the torque arm into concrete or block work using a concrete anchor. Only mount to steel or to wood jambs that have been properly secured and will not work loose with the applied torque of the operator. (Figure B)

Loop the Bowden Cable over the operator and secure as described above in the Bowden cable section above.

Mount the Bowden cable mounting bracket located at the end of the Bowden cable sheath securely as described in the Bowden cable mounting instruction.

Continue with operator installation as per the normal installation and set up instructions.



Figure A



Figure B

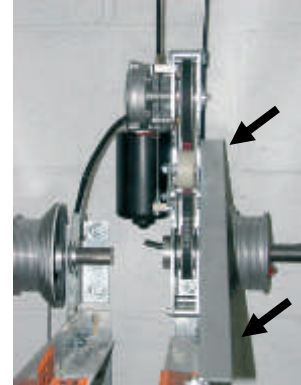


Figure C

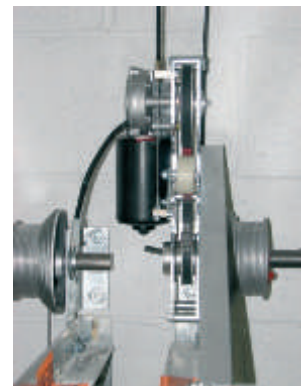


Figure D

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Commercial Operator Rear Mount Torsion Mounting

Materials Needed

Appropriate operator for door size. (See Brochure)

Tools required

3mm Allen Key, 10mm Wrench, drill, 1/4" Drill bit, Appropriate mounting fasteners.

Appropriate Bowden Cable for height of door (See Bowden Cable section Below)

Part# 900005 Additional Large offset torque arm.

Assembly and Mounting

Follow the assembly instructions and basic mounting techniques for standard installation on hollow and solid torsion shafts.

It may be necessary to reach around the cable drum if it is mounted to the outside of the torsion shaft bearing plate. To achieve this attach the additional torque arm to the torque arm that is attached to the operator as exemplified in (Figure A)

Follow the standard assembly instructions and basic mounting techniques for a standard installation on hollow and solid torsion shafts.

It will be necessary to change the Bowden to a longer Bowden Cable assembly to accomplish a rear mount torsion application. The following sizes of Bowden cables are available to accommodate different height doors:

Part# 501255 12.30 Feet

Fits low headroom doors to 10' High

Part# 501256 17.75 feet

Fits low headroom doors between 11' to 16' High

It will be necessary to attach the long Bowden cable to the horizontal track towards the header of the door. This can be typically achieved by drilling spaced hole into the horizontal angle iron attached to the horizontal track and utilizing a heavy duty nylon cable tie to secure the Bowden along the horizontal track. (Figure B)

Mount the Bowden cable mounting bracket located at the end of the Bowden cable sheath securely as described in the Bowden cable mounting instruction.



Figure A



Figure B

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Commercial Operator Offset Mounting

Offset mounting may be achieved in extreme close quarters mounting situations

An independently supported solid torsion shaft must be utilized.

Normal installations would utilize two separate toothed sprockets and appropriate roller chain to bridge the drive components. (Figure A)

A 1:1 ratio is typically used on the chain sprockets similar in diameter to the driven pulley on the operator. (Pulley that mounts on the shaft.)

Once a suitable mounting shaft is in place, install the operator as described on the standard mounting page for solid torsion shafts.



Figure A

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Commercial Operator Front Mount Low Head Room Torsion Mounting

Mounting:

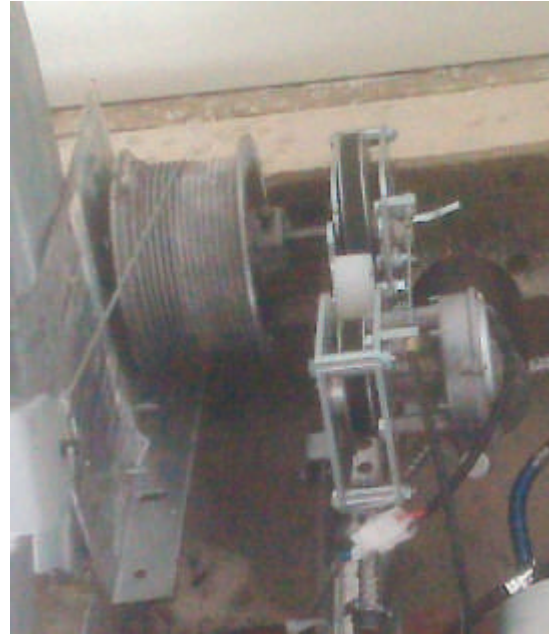
Front mount low head room mounting is feasible with the ZAP operator.

Depending upon the cable drum width and or diameter, it may require either a larger or additional torque arm to facilitate reaching around the cable drum to mount to the track assembly, developing a separate mounting point for the torque arm altogether.

If it is required to develop a separate mounting point it is important to note that the mounting should not be into a masonry wall. The push and pull torque of the operation of the operator will cause the mounting bracket to pull free from masonry over time.

Clearance:

If additional clearance is required in the opening it is feasible to reverse the cable drums and torsion springs to allow the cables to come off of the interior side of the cable drum. This will allow for additional door clearance in the opening. Consult you door manufacturer for proper methods on reversing your torsion springs and cable drums to gain this additional clearance.



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Commercial Dead Axle Sheet Door Operator Mounting

Materials Needed

Appropriate operator for door size. (See Brochure)

Tools required

4mm Allen Key, 10mm Wrench, drill, 1/4" Drill bit,
Appropriate mounting fasteners.

Remove and separate all contents from the box.

Verify the shaft diameter is the is 1-1/4"-1-5/16" in diameter. (Figure A) If it is 1" in diameter use adapter insert PN ZA0191.

Determine hole diameter in end of barrel and select appropriate tongue for the application.

Bolt the appropriate tongue for door to the Pulley (Finger tight) (Figure B)

For Installation on a new install door: Install operator before installing door by sliding operator over the shaft.

Align and insert the tongue into hole located on the end of the drum.

Mark the position and slide the operator out far enough to tighten the fasteners securely. (Figure B)

Slide the operator back into position.

Position operator so that it will be vertical when door is installed. (Figure C) Note: the flat spot on the bottom of the pulley boss is designed to rest on the door support bracket.

Tighten set screws being careful not to over torque. (Figure D)

Install the door in accordance with the manufacturers instructions.

For electrical operation, it is important that the door roll (curtain) is level.

For Retrofit Installation: With the door fully raised and secured to prevent its unrolling, remove spring tension per the door manufacturers instructions.

On the end of the door you wish to install the opener, unbolt the curtain shaft from its support bracket.

Using a mechanical lift raise that end of the door to a height sufficient to allow half the diameter of the operator driven pulley to pass over door support bracket.

Hold the operator 90 degrees to the wall and slide the operator over the shaft and into position.

Once on the shaft and passed over the door support bracket, rotate the operator to a vertical position.

Align and insert the tongue into hole located on the end of the drum.

Mark the position and slide the operator out far enough to tighten the fasteners securely.

Slide the operator back into position.

Position operator so that it will be vertical when door is installed. (Figure B) Note: the flat spot on the bottom of the pulley boss is designed to rest on the door support bracket.

Tighten set screws being careful not to over torque. (Figure C)

Lower the door back into position, secure and re-tension the counterbalance spring per the manufacturer's instructions.

Continue with installation and tensioning of the Bowden cable. (See Bowden cable installation and tensioning sections)

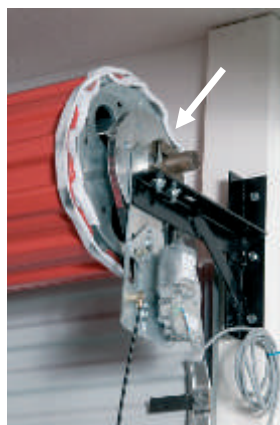


Figure A



Figure C



Figure D



Figure B

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Commercial Live Axle Sheet Door Operator Mounting

ZAP 825 SS Live axle sheet door operators are the same as the standard 825 commercial sectional door operator with the exception of a shorter Bowden cable.

Live Axle rolling sheet doors are typically 1" hollow axles. However, some manufacturers do use 1-5/6" axles. Typically these axles do not extend far enough to allow the installation of a ZAP operator without the addition of a shaft adapter.

ZAP Controls does not manufacture an adapter to accommodate the installation. For 1" door shafts, an adapter can be made from an 8" piece of solid torsion shaft. It will require that approximately 4" of the shaft be turned down for insertion into the hollow 1" shaft of the door shaft. After insertion it will be required to drill and through bolt the inserted shaft to the door shaft.

On doors with 1-5/16" shafts it is feasible to use an 8" piece of hollow or solid shaft. The inside diameter of the 1-5/16" axle is adequate to accept the insertion of the adapter into the door axle shaft. After insertion it will be required to drill and through bolt the inserted shaft to the door shaft.

Once the adapter shaft is installed proceed with the installation as described in the standard commercial operator instruction on wither hollow or solid shafts as your particular situation dictates.

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Series 3 Technician's Installation and Service Training Manual

Commercial Compact Dead Axle Sheet Door Operator Mounting

Installation

The 827 operator is designed to take the place of the door spacer that exists between the door and the axle mounting bearing plate. Currently the operator is verified as suitable for installation on the US Door Model 502 and Janus 1" dead axle mini warehouse rolling door.

During initial door installation, instead of installing the spacer on the right side axle, slide the 8271 Compact Operator onto the non winding side axle and engage the drive tongue on the large pulley into one of the holes in the door roll drum plate. If no hole suitable lines up or exists it will be necessary to mark and drill a 1/2" hole into the door roll drum plate.

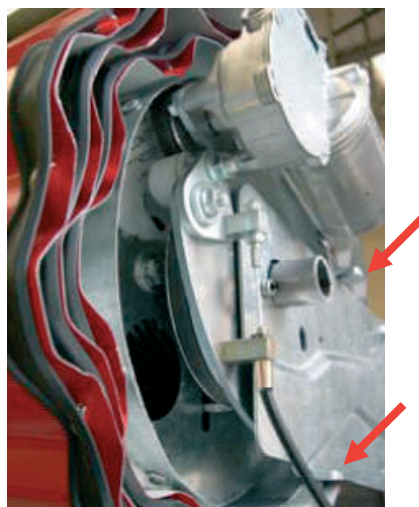
(Figure A)

Slip the brackets onto the axle ends rotating the 8271 Compact Operator until the operator plate ears sit either side of the axle bracket. (Figure B)

Now continue with the door manufacturers installation instructions.



(Figure A)



(Figure B)

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Bowden Cable and Over-Ride Lever Mounting

Tools required

Drill, 1/4" Drill bit, Appropriate mounting fasteners, Appropriate wrenches and screwdrivers.

Installation:

After the operator has been mounted properly, locate the mounting bracket on the end of the Bowden cable black sheath. (Figure A)

The Bowden cable may be mounted to either the Jamb or the track assembly. If mounting the Bowden cable bracket to the track assembly, you must mount the over-ride lever to the track assembly as well. If mounting the Bowden cable bracket to the door jamb, then the over-ride lever must be mounted to the door jamb as well. Never combine the two methods of mounting.

After locating the Bowden cable mounting bracket, bring it to the desired surface you wish to mount it to, either the track assembly or the door jamb. (Figure B)

Next, lift the bracket at least 6 inches to allow flexibility in the Bowden cable and mark for drilling or mounting. The flexibility created in the Bowden cable is necessary to ensure proper tensioning of the operator belt. This also allows enough flexibility in the Bowden cable to permit the removal of the operator in the event of the need to replace the operator belt after wearing out, without having to disassemble the Bowden cable assembly. (Figure B)

If track mounting, use the drill and 1/4" bit to drill the to marked holes in the track assembly. Using the provided flat head fasteners for mounting the Bowden Cable secure the Bowden cable bracket into place.

If mounting to the door jamb, use a fastener of appropriate size and design for the material to which you are mounting. (Figure C)

It is not advisable to mount the over-ride lever directly to the D shackle. Add an minimum of five lengths of the provided chain to the D shackle to facilitate future adjustment. If extra length is required to reach the desired mounting height of the over-ride lever, attach the provided extension chain to the "D" Shackle on the end of the Bowden Cable and cut the chain at the desired height. (Figure D)

Locate the over-ride lever and adjust the hook out to the fully extended position. (Figure E)

Insert the hook of the over-ride lever into the end link of the extension chain. Pull down on the lever to take up the belt slack on the operator. Position the over-ride lever in the desired location (Figure F) and mark for drilling or mounting. (Figure G)

Remove the over-ride lever from the chain or "D" shackle and mount the over-ride lever in the marked position. (Figure H)

Re-insert the hook into the extension chain and proceed to the Setting proper belt tension with the over-ride lever instruction page.

On the Chain hoist model operator (8826), note that the first push down of the over-ride lever is simply lifting the chain hoist off of the spur gear. A secondary push down on the lever is required to tension the belt.



Figure A



Figure E



Figure B

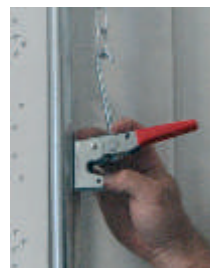


Figure F

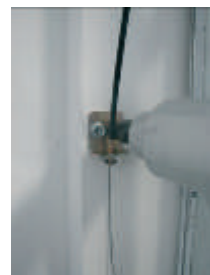


Figure C

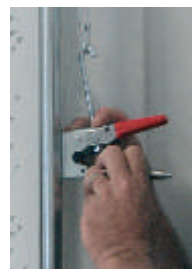


Figure G

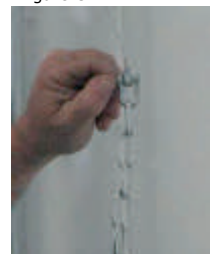


Figure D

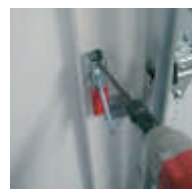


Figure I

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Setting Belt Tension with the Over-Ride Lever

Tools required
Appropriate wrench

Connect the over-ride lever hook to the chain attached to the D shackle on the end of the Bowden cable. (Figure A)

Press down on the over-ride lever until the belt feels fully tensioned without locking the lever down. (Figure B)

Looking at the handle of the lever as if it were the hand of a clock, it should be located just above the 3:00 o'clock or 9:00 o'clock position, depending upon how you are observing it. (Figure B)

If it is lower than the 9:00 or 3:00 o'clock position, adjust the hook tighter until the correct position is achieved when pressing down of the lever. (Figure C)

Once proper tension is achieved, lock the handle into place. (Figure D)

After completing operator the initial operator calibration cycles, recheck belt tension using the above methods. During initial tensioning the belt will have tensioned more on the side of the tensioning wheel than on the opposing side of the pulley. This will have evened out during the calibration cycle and will require a small amount of adjustment.



Figure A



Figure B

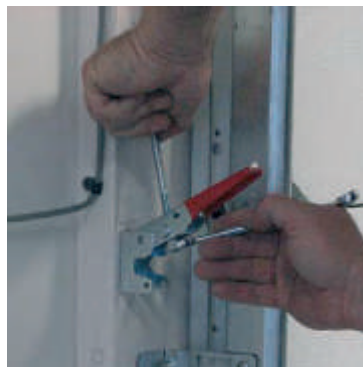


Figure C



Figure D

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Series 3 Technician's Installation and Service Training Manual

Controller Case Mounting Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Tools required

Slotted screwdriver, Drill, 6" long Phillips driver bit, Phillips screwdriver, Appropriate mounting fasteners.

Using a standard screwdriver, insert it into the cover retaining screws located in each corner of the controller (Figure A), and loosen the retaining screws to open the case lid. (Figure B)

Using a general purpose screw with a head diameter small enough to fit into the corner pillars of the controller, mount the controller a minimum of 5' above the ground. Do not mount through the back of the controller case by removing the circuit board as this may allow moisture to enter the controller or short circuit the control board if it touches the fastener used. Mounting through the back of the controller case will void the manufacturers' warranty if damage occurs. (Figure C & D)

Only mount the controller with the conduit access knock-out or pre-drilled access holes pointed down. Only use the knock-out hole to introduce conduit or wiring into the controller. Moisture can and will condense in conduit due to the warmth generated by the controller. If the controller is mounted upside down and conduit is not used, any liquid spilled on top of the controller can enter into the controller and drip the board causing a short circuit. Introducing conduit in any fashion other than from the bottom of the controller will void the manufacturers' warranty if damage occurs.

You are not limited to mounting the controller at the five foot height. The controller may be mounted high by the operator or remotely, as long as the distance away from the operator does not exceed the length of the provided motor cable. (Figure E)

A remote wall station control may then be run in a series from the controller. See remote wall station wiring page.



Figure A



Figure E



Figure B

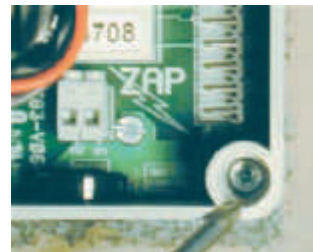


Figure C

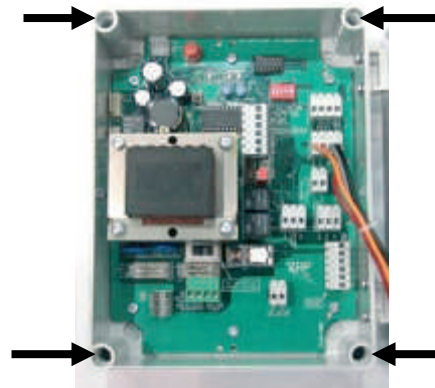


Figure D

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Series 3 Technician's Installation and Service Training Manual

115V 1 Phase Wiring Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Tools Required

Small technicians slotted screwdriver

ZAP Controller Power Wiring Instruction

ZAP Controllers are designed to accept 115VAC and 230VAC in North America. Note the voltage selector switch located on the main board in (Figure A), highlighted in yellow.

Please ensure this is set to the correct voltage prior to turning on power supply. Introducing 230VAC while set on 115VAC will damage the board and require the board to be replaced. No warranty is available for failure to follow the wiring instruction.

All wiring plugs are removable for easy wiring access with the exception of the grounding terminal.

Power wiring access on the control board is located at the green plug on the control board. (Figure B). The terminals are labeled on the board from Left to right as follows: Live In, Neutral, Neutral, Light Control. Use the two left hand terminals for power introduction.

The Gray grounding terminal strip is located to the left of the green power plug. (Figure C).

Molded knock outs or pre-drilled ingress holes are provided on the bottom of the controller for the introduction of conduit and wiring. Only use these knock outs for the introduction of wiring into the controller. Do not mount the controller case upside down to introduce conduit or wiring into the controller. This will void the manufacturers warranty.

Wiring Diagram: (Figure D)
115VAC 1 Phase

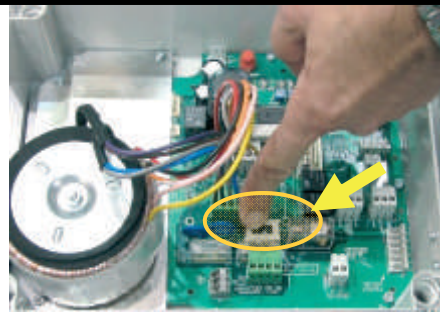


Figure A

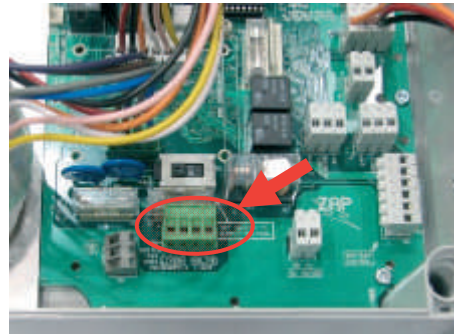


Figure B

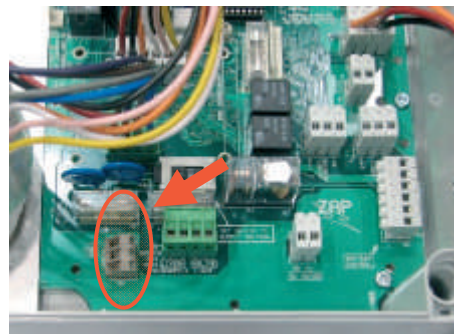


Figure C

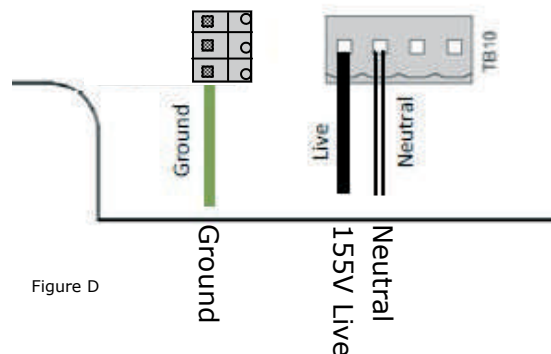


Figure D

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Series 3 Technician's Installation and Service Training Manual

208-230V 1 Phase Wiring Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Tools required

Small technicians slotted screwdriver

ZAP Controller Power Wiring Instruction

ZAP Controllers are designed to accept 115VAC and 230VAC in North America. Note the voltage selector switch located on the main board in (Figure A), highlighted in yellow.

Please ensure this is set to the correct voltage prior to turning on power supply. Introducing 230VAC while set on 115VAC will damage the board and require the board to be replaced. No warranty is available for failure to follow the wiring instruction.

All wiring plugs are removable for easy wiring access with the exception of the grounding terminal.

Power wiring access on the control board is located at the green plug on the control board. (Figure B). The terminals are labeled on the board from Left to right as follows: Live In, Neutral, Neutral, Light Control. Use the two left hand terminals for power introduction.

The Gray grounding terminal strip is located to the left of the green power plug. (Figure C).

Molded knock outs or pre-drilled ingress holes are provided on the bottom of the controller for the introduction of conduit and wiring. Only use these knock outs for the introduction of wiring into the controller. Do not mount the controller case upside down to introduce conduit or wiring into the controller. This will void the manufacturers warranty

Wiring Diagram: (Figure C)
230VAC 1 Phase

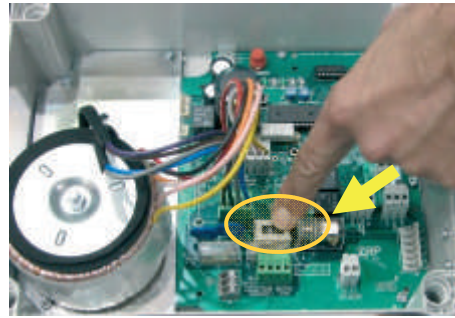


Figure A

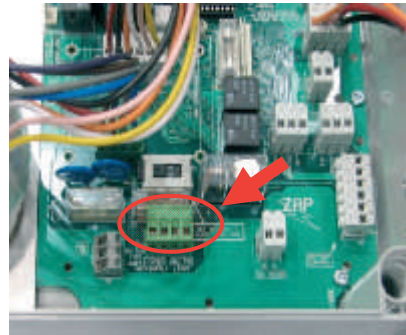


Figure B

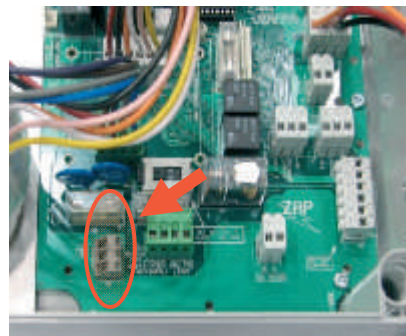


Figure C

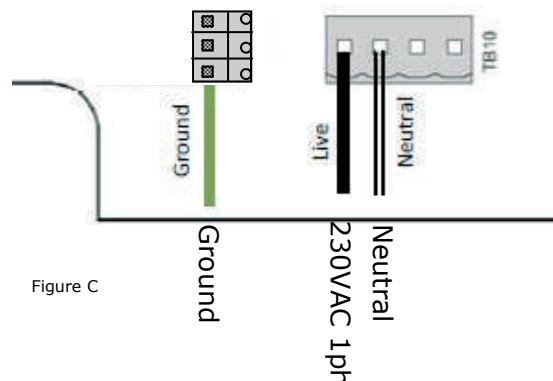


Figure C

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Series 3 Technician's Installation and Service Training Manual

480 3 Phase Wiring Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Tools Required

Small technicians slotted screwdriver

ZAP Controller Power Wiring Instruction

480 3 phase is only available as a special order on ZAP 8800 controllers.

There is no voltage selector switch on 480 3 phase 8800 Controllers.

All wiring plugs are removable for easy wiring access with the exception of the grounding terminal.

Power wiring access on the control board is located on a piggy back board in the area heightened in red (Figure A).

Molded knock outs or pre-drilled ingress holes are provided on the bottom of the controller for the introduction of conduit and wiring. Only use these knock outs for the introduction of wiring into the controller. Do not mount the controller case upside down to introduce conduit or wiring into the controller. This will void the manufacturers warranty.

Wiring requirement:

14AWG Maximum size wiring.

Wire Leg 1 of 480 3 ph to live connection 1 on 480 3 phase auxiliary connection board.

Wire Leg 2 of 480 3ph to live connection 2 on auxiliary connection board,

Wire Ground to Ground on main circuit board

Wiring Diagram: (Figure A)
480V 3 Phase

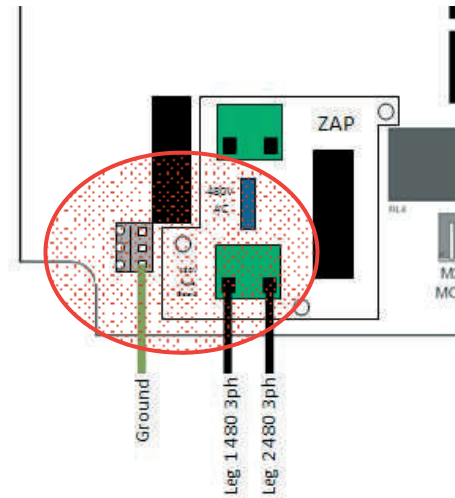


Figure A

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Series 3 Technician's Installation and Service Training Manual

Low Voltage Motor Wiring Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Tools required

Small technicians slotted screwdriver, Hammer, screw driver, appropriate fasteners.

Motor Wiring:

All wiring plugs are removable for easy wiring access with the exception of the grounding terminal.

Molded knock outs or pre-drilled ingress holes are provided on the bottom of the controller for the introduction of conduit and wiring. Only use these knock outs for the introduction of wiring into the controller. Do not mount the controller case upside down to introduce conduit or wiring into the controller. This will void the manufacturers warranty.

Remove the plug labeled M1 and M2 Dc Motor. (Figure A Highlighted in Orange)

Insert the motor wires into the plug and tighten the connections using the small technicians screw driver.

Plug the terminal back onto terminals M1 and M2. (Figure A Highlighted in Orange)

Working the cable up the jamb, secure cable to Jamb or track with wire ties or other cable securing devices being careful not cut or staple the wire. (Figure B)

Loop and secure the excess motor cable to the upper part of the jamb or wall leaving enough excess to plug the wire into the motor. (Figure C)

Plug the motor cable into the plug located on the motor in the case of the 800 series (Figure D) or onto the plug wire connector on the 8800 series. (Figure E)

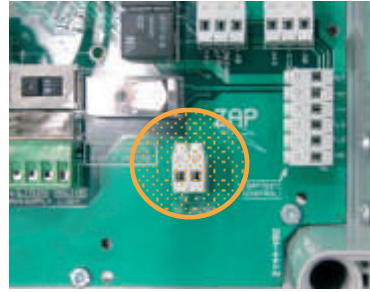


Figure A



Figure B



Figure C



Figure D



Figure E

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Appropriate wrenches and screwdrivers,
Appropriate mounting fasteners

Mount each bracket on opposing sides of the door 5-6" above the floor to the door jamb surface using provided screws.

Brackets are adjustable (Figure B)

Run provided wire along edges of Jamb, securing along the way, to the ZAP controller.



Figure A

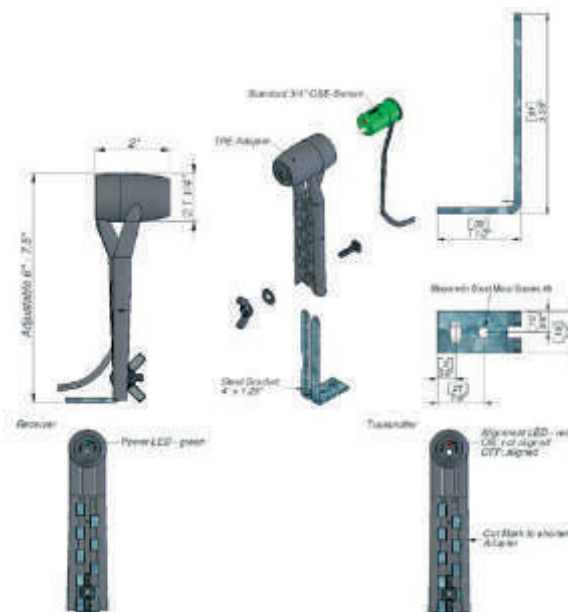


Figure B

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Series 3 Technician's Installation and Service Training Manual

401002 Photo Cell Wiring Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed
401002 Photo Cell

Tools required
Small technicians slotted screwdriver

Introduce photo cell wiring through provided knock out on bottom of ZAP Controller.

Remove 4 way connector plug from ZAP Controller Safety connection highlighted in red in (Figure A).

Connect wiring together as shown in (Figure B)

Insert safety wires into second terminal from right and secure using small technicians screwdriver. (Figure C)

Insert Common wires wire into right hand terminal and secure using small technicians screwdriver. (Figure D)

Plug 4 way connector back onto the ZAP Control board. (Figure E)

Check for alignment of photo cells.

On the ZAP Control board, the safety light will illuminate if the photo cells are not functioning or are misaligned. (Figure F)

On the photo cells the green light will illuminate if the photo cells are powered. The red light will illuminate if the photo cells are aligned properly. (Figure G)

For momentary contact operation of the operator, ensure DIP switch 1 is in the down position and DIP switch 2 is in the up position. (Figure H)

For Constant Pressure close operation while using 401002 photo cell, ensure both DIP switch 1 and 2 are in the up position. (Figure H)

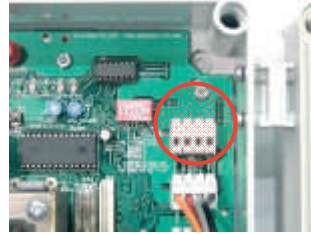


Figure A



Figure B



Figure C



Figure D



Figure E



Figure F

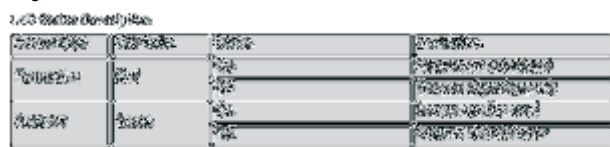


Figure G



Figure H

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Series 3 Technician's Installation and Service Training Manual

Initial Operator Set Up

Once the door operator is fully installed, release the over-ride lever and lift the door to a position approximately 2 feet off the ground. Re-engage the over-ride lever.

Press the open Button (Figure A) and observe that the open LED is illuminated. (Figure B) Verify the direction of door travel. Press stop. If the door traveled in the close direction. Remove the plug on terminals M1 & M2 and reverse the motor wires. Reconnect the terminals. (Figure C)

Release the over-ride lever and lower the door to the floor. Re-engage the over-ride lever.

Press open to begin the open calibration process. (Figure A) Observe that the open LED is illuminated. (Figure B) When the door has reached the fully open position and stopped, the open led should turn off immediately. If it does not consult trouble shooting section.

Press close to begin the close calibration process. NOTE: if the 401002 photo cells are not used, constant pressure on the close button is required. (Figure D) Observe the close LED is illuminated. (Figure E) When the door has reached the fully closed position and stopped, the close led should turn off immediately. If it does not consult trouble shooting section.

Repeat the above process a total of 2 more cycles. On the third cycle the operator should be calibrated and running at full speed.

After completing the calibration process, re-check the belt tension as described in the Bowden cable setting section as the belt may have tensioned more on one side than the other during initial set up.

If the door does not reach full height or closure during calibration, consult the trouble shooting section.

If the door does not reach the fully closed position during calibration, consult the troubleshooting section.

If the door stops midpoint during calibration, consult the trouble shooting section.



Figure A

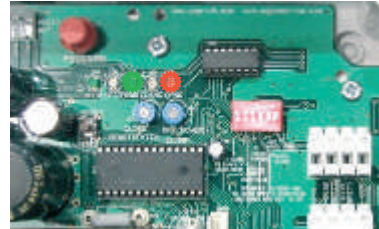


Figure B



Figure C



Figure D



Figure E

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Series 3 Technician's Installation and Service Training Manual

840 Internal Receiver Installation



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed

840 Receiver (Figure A)

2416 or 2414 Antenna

ZAP transmitter

Tools required

Small technicians slotted screwdriver

Locate the terminals labeled RX Socket indicated. (Figure B)

Align the 840 Receiver onto to the 3 pin RX Socket connection. (Figure C)

Press into place ensuring that the module seats firmly into place. (Figure D)

The module 840 receiver is now ready to program. (See programming instruction section)

After programming, install the antenna.

Remove the two position terminal from the receiver. (Figure E)

If using the 2416 internal antenna plug it onto the receiver. (Figure F)

On 800 models ensure that the antenna is positioned outwards against the inside of the case lid and runs in front of the transformer. (Figure G) If necessary bend the antenna outwardly so that it lays firmly against the case lid. (Figure H)

If using the 2414 external antenna, Mount the antenna outside and neatly route the wire in through the bottom of the controller case and plug onto the receiver. (Figure H)

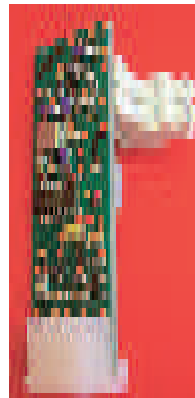


Figure A

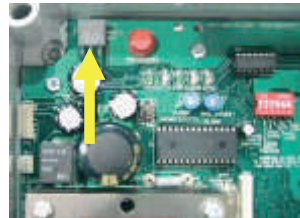


Figure B

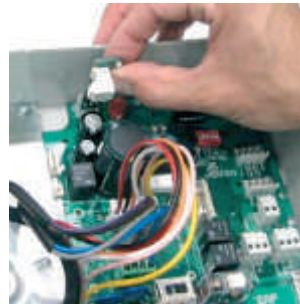


Figure C



Figure D



Figure E



Figure F

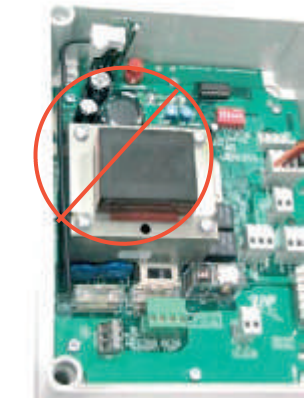


Figure G



Figure H

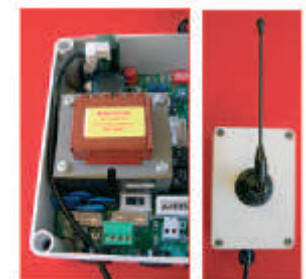


Figure H

ZAP Series 3 Simply Logical

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Series 3 Technician's Installation and Service Training Manual

ZAP Radio Transmitter Programming

Materials Needed

840 Receiver (Figure A)

Either the 2416 (Internal) or the 2414 (External) antenna

Tools required

Small Technicians screwdriver

Remove the antenna from the 840 receiver.
(Figure A)

Press and hold the required transmitter button.
(Figure B)

Notice that the LED light on the 840 receiver is illuminated indication the 840 receiver is reading the signal. (Figure C)

Hold the transmitter at arms length away from the control box to prevent the signal being transmitted from swamping the receiver.

Inside the controller, press and hold the Program button. (Figure D)

Release the program button after the first LED flash or beep if an 850 Beeper is installed. (Figure E)

Two flashes of the ACK LED or beeps from the beeper module , if installed will confirm that the code has been stored into memory.

Three flashes or beeps indicate that no code data was present in which case repeat the programming sequence.

Now release the transmitter button.

Erasing all transmitter codes.

Inside the controller, press and hold the Program button. (Figure D)

Release the program button after the 4th LED flash or beep if an 850 Beeper is installed. (Figure E)

Two flashes of the ACK LED or beeps from the beeper module , if installed, will confirm that the transmitter codes have been erased.

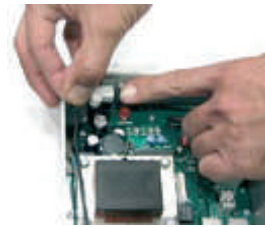


Figure A



Figure B



Figure C



Figure D



Figure E

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Series 3 Technician's Installation and Service Training Manual

® Linear Mega-code / Delta 3 Receiver Installation/Wiring Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials required

Linear receiver, Linear transmitter, 16-20 awg 3 conductor cable.

Tools required

Small technicians slotted screwdriver

Isolate the power supply before wiring any device into a ZAP Controller.

It is feasible to mount the Linear receiver inside the case lid of the ZAP Controller. Ensure it is positioned as shown in (Figure A). You may secure the receiver in place using double sided tape.

All wiring for the radio receiver onto the ZAP control board is connected to the radio wiring connections as indicated in (Figure B) and highlighted in red.

Terminal 1 (Common) on the Linear receiver (Figure C) is wired and terminated into the 0V connection on TB9. (Figure D)

If cyclic operation by radio control is desired, terminal 2 (Relay) on the Linear receiver (Figure C) is wired and terminated into the Radio connection on TB9. (Figure E)

If only an open function is required (If use of the auto-close timer is employed, it is recommended that only the open be used), wire terminal 2 of the Linear receiver (Figure C) to the open connection on TB3. (Figure F)

Wire terminal 3 (Radio Power) of the Linear receiver (Figure C) to the 24V Power supply, labeled 24V on TB9. (Figure G)

Restore the power supply and program your receiver per the radio control manufacturer's instructions.



Figure A

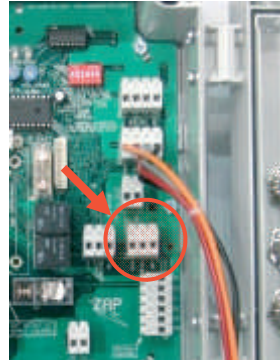


Figure B



Figure C

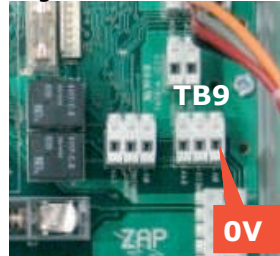


Figure D



Figure E

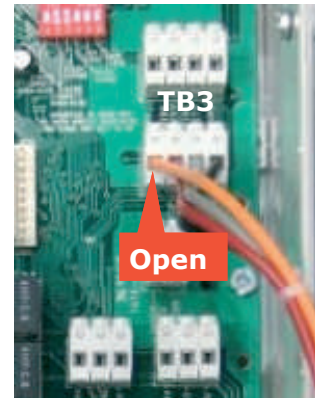


Figure F

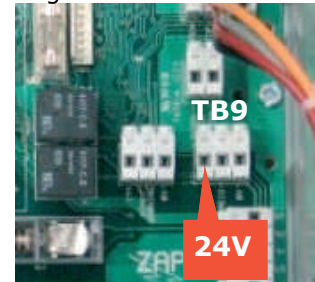


Figure G

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Series 3 Technician's Installation and Service Training Manual

® Chamberlain 355LM Receiver Installation and Wiring Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials required

Chamberlain 355LM receiver, appropriate Chamberlain transmitter, 16-20 awg 3 conductor cable.

Tools required

Small technicians slotted screwdriver

Isolate the power supply before wiring any device into a ZAP Controller.

It is feasible to mount the Chamberlain 355LM receiver inside the case lid of the ZAP Controller. Ensure it is positioned as shown in (Figure A). You may secure the receiver in place using double sided tape.

All wiring for the radio receiver onto the ZAP control board is connected to the radio wiring connections as indicated in (Figure B) and highlighted in red.

Terminal 1 (Common) on the Chamberlain receiver (Figure C) is wired and terminated into the 0V connection on TB9. (Figure D)

If cyclic operation by radio control is desired, terminal 2 (Relay) on the Chamberlain receiver (Figure C) is wired and terminated into the Radio connection on TB9. (Figure E)

If only an open function is required (If use of the auto-close timer is employed, it is recommended that only the open be used), wire terminal 2 of the Chamberlain receiver (Figure C) to the open connection on TB3. (Figure F)

Wire terminal 3 (Radio Power) of the Chamberlain receiver (Figure C) to the 24V Power supply, labeled 24V on TB9. (Figure G)

Inside the receiver, move the output duration jumper from P2 and M to P2 and C. (Figure H)

Restore the power supply and program your receiver per the radio control manufacturer's instructions.



Figure A

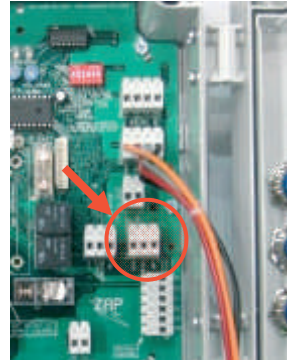


Figure B

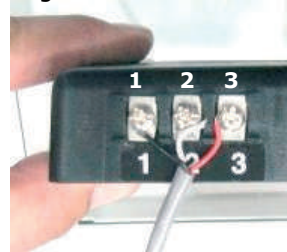


Figure C



Figure D



Figure E

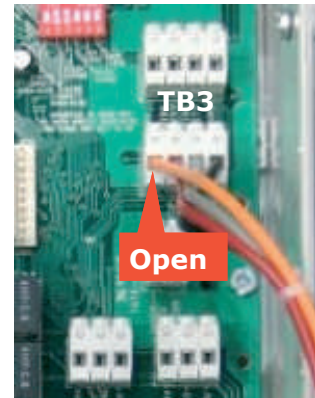


Figure F

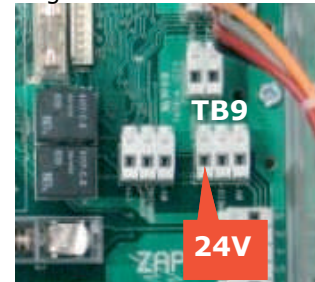


Figure G

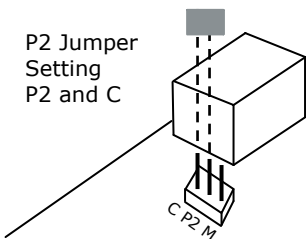


Figure H

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Series 3 Technician's Installation and Service Training Manual

® Chamberlain 312HM Receiver Installation and Wiring Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials required

Chamberlain 312HM receiver, appropriate Chamberlain transmitter, 16-20 awg 3 conductor cable.

Tools required

Small technicians slotted screwdriver

Isolate the power supply before wiring any device into a ZAP Controller.

It is not feasible to mount the Chamberlain 312HM receiver inside the case lid of the ZAP Controller. It will need to be mounted outside the enclosure of the ZAP controller case.

All wiring for the radio receiver onto the ZAP control board is connected to the radio wiring connections as indicated in (Figure A) and highlighted in red.

It will be necessary to place a jumper wire between terminals 1 and 3 of the 312HM receiver. (Figure B)

Terminal 1 (Common) on the Chamberlain receiver (Figure B) is wired and terminated into the 0V connection on TB9. (Figure C)

If cyclic operation by radio control is desired, terminal 4 (Relay) on the Chamberlain receiver (Figure B) is wired and terminated into the Radio connection on TB9. (Figure D)

If only an open function is required (If use of the auto-close timer is employed, it is recommended that only the open be used), wire terminal 4 of the Chamberlain receiver (Figure B) to the open connection on TB3. (Figure E)

Wire terminal 2 (Radio Power) of the Chamberlain receiver (Figure B) to the 24V Power supply, labeled 24V on TB9. (Figure F)

Inside the receiver, move the output duration jumper from P2 and M to P2 and C. (Figure G)

Restore the power supply and program your receiver per the radio control manufacturer's instructions.

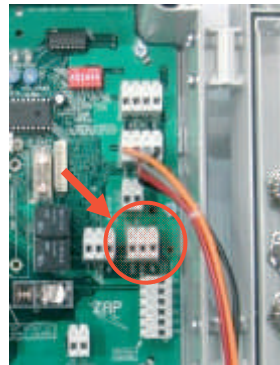


Figure A

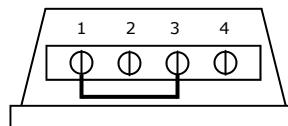


Figure B

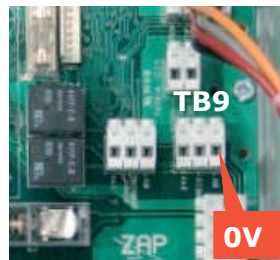


Figure C

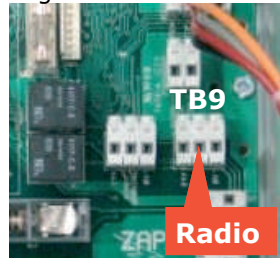


Figure D

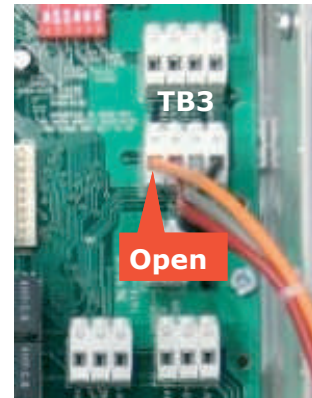


Figure E

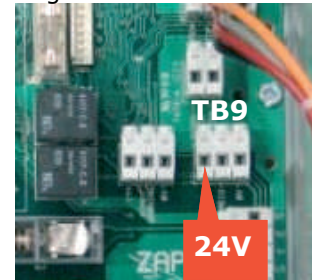


Figure F

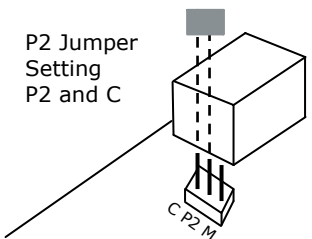


Figure G

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Series 3 Technician's Installation and Service Training Manual

® Chamberlain 365LM Receiver Installation and Wiring Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials required

Chamberlain 365LM Receiver (Figure A), appropriate Chamberlain transmitter, 16-20 awg 2 conductor cable.

Tools required

Small technicians slotted screwdriver

Isolate the power supply before wiring any device into a ZAP Controller.

All wiring for the radio receiver onto the ZAP control board is connected to the radio wiring connections as indicated in (Figure A) and highlighted in red.

Terminal 1 (Right) on the Chamberlain receiver (Figure C) is wired and terminated into the 0V connection on TB9. (Figure D)

If cyclic operation by radio control is desired, The relay terminal (Left) on the Chamberlain receiver (Figure C) is wired and terminated into the Radio connection on TB9. (Figure F)

If only an open function is required (If use of the auto-close timer is employed, it is recommended that only the open be used), wire the relay terminal (Left) on the Chamberlain receiver (Figure C) to the open connection on TB3. (Figure G)

Plug the receiver into a 115V power supply.

Restore the power supply and program your receiver per the radio control manufacturer's instructions. (Figure I)



Figure A

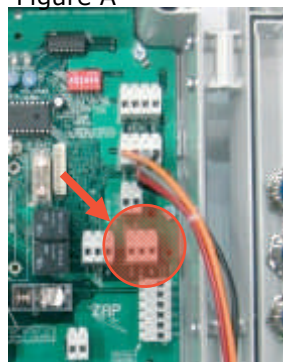


Figure B

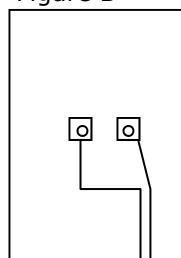


Figure C



Figure D



Figure F

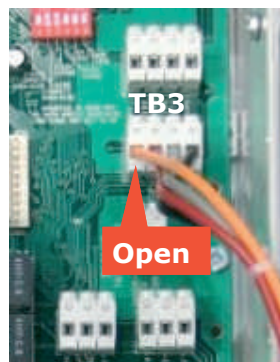


Figure G

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Series 3 Technician's Installation and Service Training Manual

® Marantec External Receiver Installation and Wiring Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials required

Marantec receiver (Figure A), appropriate Marantec transmitter, 16-20 awg 2 conductor cable.

Tools required

Small technicians slotted screwdriver

Isolate the power supply before wiring any device into a ZAP Controller.

All wiring for the radio receiver onto the ZAP control board is connected to the radio wiring connections as indicated in (Figure A) and highlighted in red.

Terminal 1 (Right) on the Marantec receiver (Figure C) is wired and terminated into the 0V connection on TB9. (Figure D)

If cyclic operation by radio control is desired, The relay terminal (Left) on the Marantec receiver (Figure E) is wired and terminated into the Radio connection on TB9. (Figure F)

If only an open function is required (If use of the auto-close timer is employed, it is recommended that only the open be used), wire the relay terminal (Left) on the Marantec receiver (Figure E) to the open connection on TB3. (Figure G)

Plug the receiver into the 115V power supply. (Figure H)

Restore the power supply and program your receiver per the radio control manufacturer's instructions. (Figure I)



Figure A

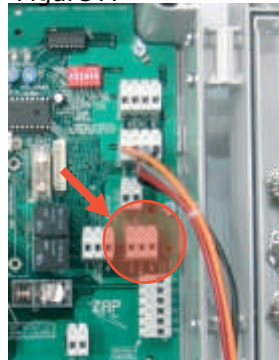


Figure B



Figure C



Figure D



Figure E



Figure F

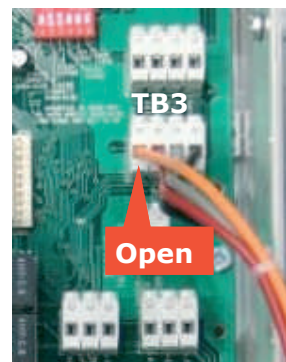


Figure G



Figure H



Figure I

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ZAP Series 3 Technical Manual

®Blue Guard VK/FE Wiring



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed

Blue Guard VK for function as a virtual key pad
Blue Guard FE to function as a key switch or free entry device.

Read and follow all instructions provided with the device.

Isolate the power supply before wiring any device into a ZAP Controller.

After introducing the wiring cable into the controller case through the provided predrilled holes or knockouts on the bottom of the controller and mounting the device to the bottom of the ZAP controller or on an interior or exterior wall,

Wire the power wire to the 24V connector on TB9. (Figure B)

Wire the power common wire to the 0V connector on TB 9. (Figure C)

To function as a Virtual Keypad causing cyclic operation using the BGVK, wire the N/O wire to the Radio Connection on TB9 (Figure D), and the N/O common to the 0V on TB9. (Figure C)

To function as a Virtual Keypad causing only an open function using the BGVK, wire the N/O wire to the OPEN connection on TB3 (Figure E), and the N/O common to the Com on TB3. (Figure F)

To function as a virtual card reader enabling motor operation to function using the BGFE, wire the N/C wire to the interlock connection on TB4 (Figure G), and the N/C common to the Com on TB4. (Figure H)
Turn DIP Switch 3 OFF.

Restore the power supply.

Program and test the device per the manufacturer's instruction.



Figure A

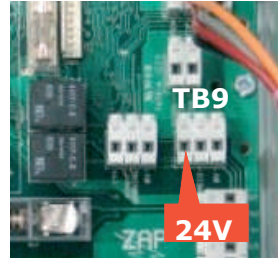


Figure B



Figure C



Figure D

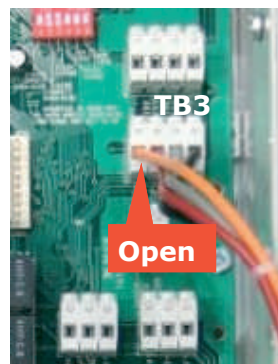


Figure E



Figure F

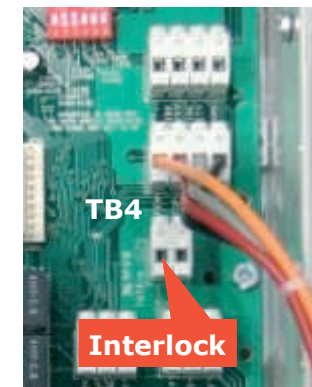


Figure G

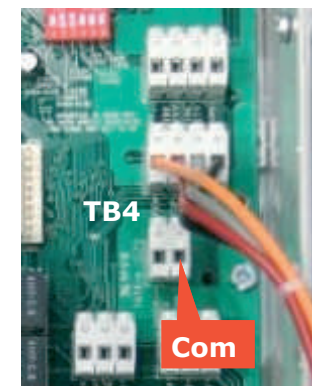


Figure H

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Series 3 Technician's Installation and Service Training Manual

850 Beeper Module Installation



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials required

850 Beeper Module (Figure A)

Locate the terminals labeled buzzer inside the controller. (Figure B)

Align the 850 Beeper module connector onto to the 3 pin buzzer connection.

Press into place ensuring that the module seats firmly into place. (Figure C)

The module 850 Beeper is now ready to use.



Figure A

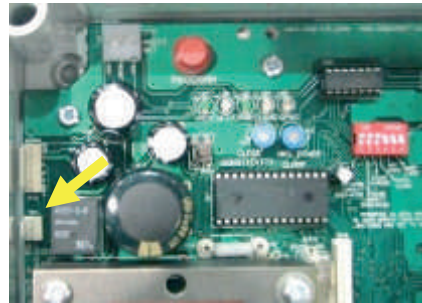


Figure B



Figure B

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Series 3 Technician's Installation and Service Training Manual

8070 Auto-Lock Installation



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials required
8070 Auto-Lock Kit

Tools required

Drill, 1/4" and 7/16" Drill bit, Appropriate wrenches and screwdrivers, Appropriate mounting fasteners

Isolate the power supply before wiring any device into a ZAP Controller.

Do not remove the rubber band holding the shoot bolt in the solenoid until installation is complete. (Figure A)

Position the shoot-bolt assembly on the door track above a roller ensuring there is at least 3/8" distance between the bottom of the shoot bolt and the top of the desired roller. Mark the center position of the shoot bolt.

Drill a 7/16" hole to allow the shoot bolt to pass through the track. Reposition the Solenoid assembly with the shoot bolt aligned in the center of the drilled hole and mark the U-Bracket mounting holes. Using a 1/8" Drill Bit, drill pilot holes from the out-side of the track. After drilling the pilot holes, use a 1/4" drill bit to drill the mounting holes from the inside of the track. Using the provided flat head screws or track bolts, bolt the solenoid bolt assembly to the track ensuring the shoot bolt is centered in its hole allow free travel. Once bolted into place, remove the rubber band holding the shoot bolt in the solenoid. Remove the securing pin from the bolt and test to see that the bolt travels freely by pushing it in and releasing from the inside of the track with your finger. (Figure B)

Take the provided wiring cable and connect the female spade terminals to the solenoid. Secure the cable neatly along the track and wall and introduce it into the inside of the ZAP Controller through the pre-drilled wiring access located on the bottom of the controller.

Taking the 8067 Auto-Lock module in hand (Figure C), insert the two provided wires from the Auto-Lock solenoid into the two terminals on the 8067 Module as indicated in figure C and highlighted in red. (Figure D)

With wiring of the Auto-Lock completed and the power supply isolated so there is no power to the controller, plug the 8067 Auto-Lock Module onto the 10-pin socket connector as shown (Figure E), ensuring that all 10 pins are properly seated.

Plug the operator back into the power supply.

Cycle the door open, while listening and observing that the shoot bolt was activated and withdrew enough to allow the roller to pass. After ensuring that all rollers freely clear the shoot bolt and that it fully extended itself back into the track after the open cycle was completed, cycle the door closed and observe the same.



Figure A

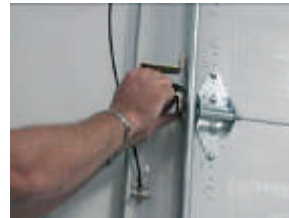


Figure B

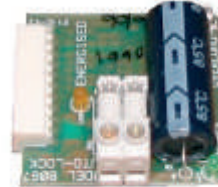


Figure C



Figure D



Figure E

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Series 3 Technician's Installation and Service Training Manual

8830 Battery Backup Installation









Warning Electrical Shock Hazard
To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Required
8830 Battery Backup System (Figure A), 14-18 awg 6 conductor cable
Tools required
Drill, 6" Phillips Driver bit, Appropriate mounting fasteners

After properly mounting the 8830 Battery Backup through the corner pillar mounting holes, next to the ZAP Controller, ensure that you plug the four batteries onto the battery backup circuit board as highlighted in yellow (Figure A)

After isolating the power supply to the ZAP Controller, run a six conductor cable between the 8830 Battery Backup (Figure B) and the ZAP Controller (Figure C) using the pre-drilled case wiring outlets.

Using the two six terminal connectors provided with the 8830 Battery Backup, wire and terminate the 6 conductor cable as indicated by the following chart and highlighted colors indicated in (Figures B & C)

Controller		Battery Backup	
MOT	to	MOT V+	
24V	to	+24V	
V1+	to	+16V	
RL5	to	CNTRL 5	
RL6	to	CNTRL 6	
GND	to	COMMON	

Restore power to the controller. The "on charge" led should illuminate.

The battery backup system should remain on charge for a minimum of 24 hours before attempting its use.



Figure A

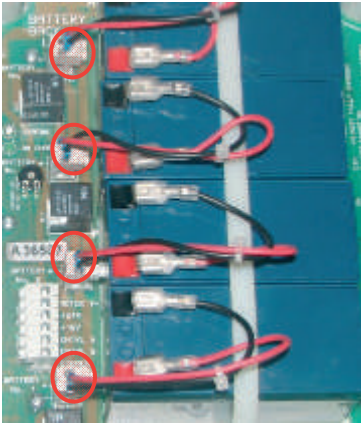


Figure B

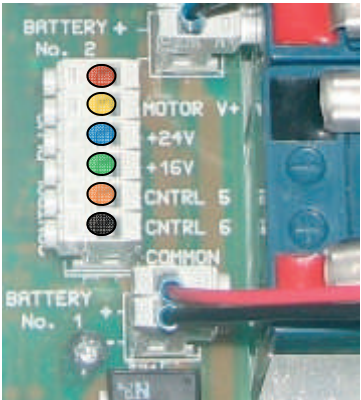


Figure C

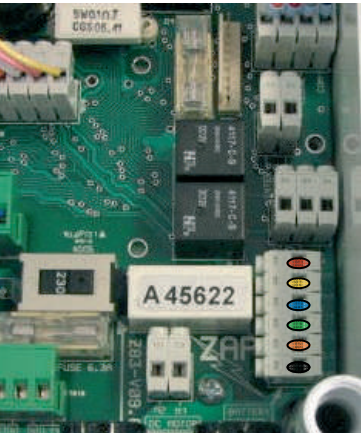


Figure D

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Series 3 Technician's Installation and Service Training Manual

Truck Restraint Wiring Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials required

82-DTLM , 16-20 awg 2 conductor cable

Tools required

Small technicians screwdriver.

Isolate the power supply before wiring any device into a ZAP Controller.

Wiring the interlock

The common terminal of the truck restraint interlock relay switch to be wired is terminated into the TB4 terminal labeled COM. (Figure A)

The contact (relay) terminal of the truck restraint interlock switch is wired and terminated into the TB4 terminal labeled interlock. (Figure A)

Once the terminals are wired, Turn DIP Switch number 3 to the off (down) position. (Figure B)

Restore the power supply to the operator.

It will then be required for the truck restraint interlock relay circuit to be closed before door operation can be possible.



Figure A

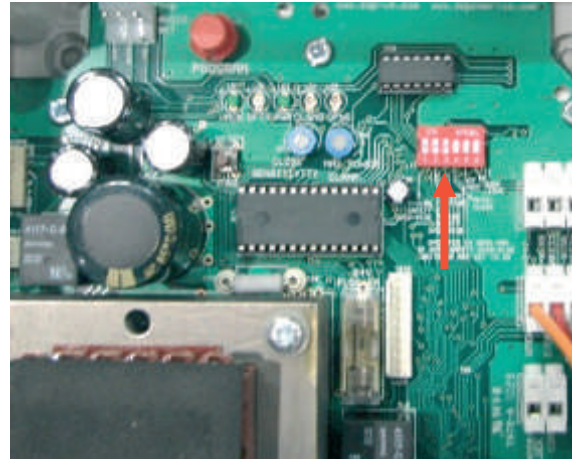


Figure B

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Series 3 Technician's Installation and Service Training Manual

Dock Leveler Interlock Installation



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials required

82-DTLM , 16-20 awg 2 conductor cable

Tools required

Small technicians screwdriver.

Isolate the power supply before wiring any device into a ZAP Controller.

The 82-DTLM provides a pair of contacts that close when the door has reached the fully open position.

The common terminal of the Dock interlock relay device is wired and terminated into one of the terminals labeled Interlock on the 82-DTLM. (Figure A)

The contact (relay) terminal of the device to be interlocked is wired and terminated into one of the terminals labeled Interlock on the 82-DTLM. (Figure A)

Carefully align the 82-DTLM socket connector with the 10 Pin socket connector on the main controller board and plug the 82-DTLM onto the 10 pin connector. (Figure B)

Ensure the socket connector is fully seated (Figure C)

Restore the power supply to the operator and test.



Figure A

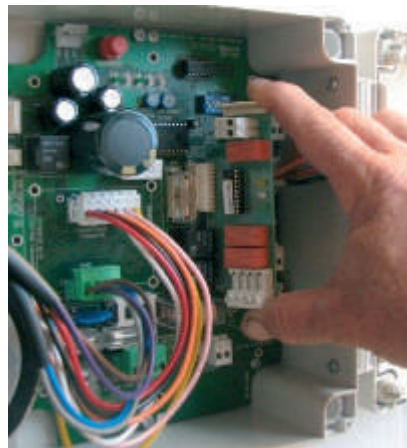


Figure B



Figure C

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Driver Communication Light Control Installation



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed

Appropriate operator for door size. (See Brochure)
82-DTLM, 16-20 awg 2 conductor cable, Red Green Traffic Light

Isolate the power supply before wiring any device into a ZAP Controller.

The 82-DTLM Provides a 24V, Common, Red and Green connection. The relay for the red light will close to activate the red light when the door is any position other than fully closed. The green light relay will close when the door is the fully open position.

24V Traffic Light

Wire the red light wire to the red light connection on DTLM. (Figure A)

Wire the traffic light green light wire to the green light connection on DTLM. (Figure A)

Wire the traffic light common wire to the 0V connection on TB7 on the ZAP Control board. (Figure B)

Place a jumper wire between the 24V terminal on the DTLM to common terminal of the DTLM. (Figure C)

115V/208-230V Traffic Light

Wire the red light wire to the red light connection on DTLM. (Figure A)

Wire the traffic light green light wire to the green light connection on DTLM. (Figure A)

Wire the traffic light common wire to the Neutral mains connection the ZAP Control board. (Figure D)

Carefully align the 82-DTLM socket connector with the 10 Pin socket connector on the main controller board and plug the 82-DTLM onto the 10 pin connector. (Figure E)

Ensure the socket connector is fully seated (Figure F)

Restore the power supply to the operator and test.

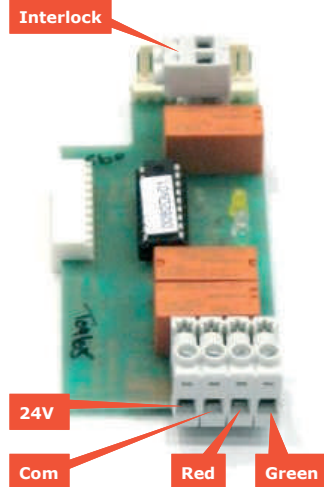


Figure A



Figure B

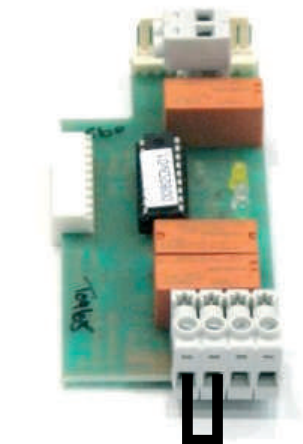


Figure C

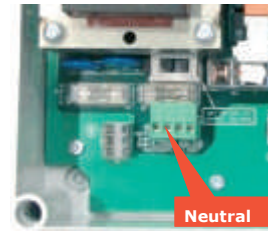


Figure D



Figure E



Figure F

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Slave Relay for 115V Dock leveler control circuit interlock



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed

Appropriate operator for door size. (See Brochure)
82-DTLM , 16-20 awg 2 conductor cable, Red Green Traffic Light

Isolate the power supply before wiring any device into a ZAP Controller.

The 82-DTLM Provides a 24V, Common, Red and Green connection. The relay for the red light will close to activate the red light when the door is any position other than fully closed. The green light relay will close when the door is the fully open position.

24V Traffic Light

Wire the red light wire to the red light connection on DTLM. (Figure A)

Wire the traffic light green light wire to the green light connection on DTLM. (Figure A)

Wire the traffic light common wire to the 0V connection on TB7 on the ZAP Control board. (Figure B)

Place a jumper wire between the 24V terminal on the DTLM to common terminal of the DTLM. (Figure C)

115V/208-230V Traffic Light

Wire the red light wire to the red light connection on DTLM. (Figure A)

Wire the traffic light green light wire to the green light connection on DTLM. (Figure A)

Wire the traffic light common wire to the Neutral mains connection the ZAP Control board. (Figure D)

Carefully align the 82-DTLM socket connector with the 10 Pin socket connector on the main controller board and plug the 82-DTLM onto the 10 pin connector. (Figure E)

Ensure the socket connector is fully seated (Figure F)

Restore the power supply to the operator and test.

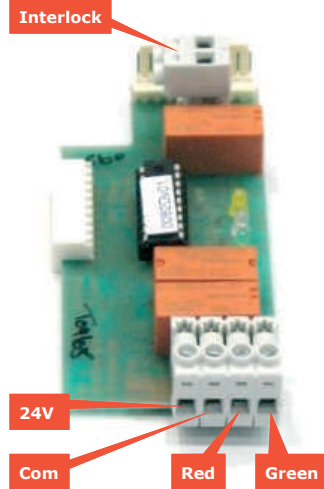


Figure A



Figure B

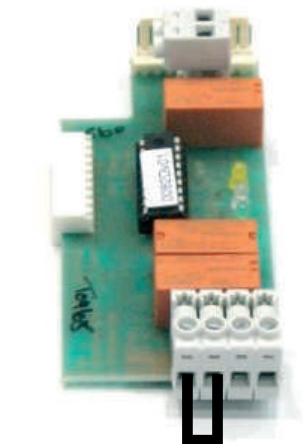


Figure C

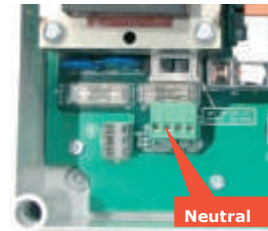


Figure D



Figure E



Figure F

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822 with Advance Warning of Door Closure



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed

Appropriate operator for door size. (See Brochure)
822 ,16-20 awg 4 conductor cable, 16-20 awg 1 conductor cable, 115V-208-230V Red Green Traffic Light, 115V Revolving warning light, or 115V audible warning device.

Isolate the power supply before wiring any device into a ZAP Controller.

The 822 is designed to function similarly to the 82DTLM with exception of the 822 being able to provide advance warning if pending door closure.

For dock interlock function consult the Dock interlock wiring page for the 82DTLM.

For driver communication light wiring consult the driver communication light wiring page for the 82DTLM.

For interlocking 2 doors in the open position consult the Interlocking 2 ZAP Controllers in the door open position page

115V, 208-230V revolving warning light or audible warning device wiring

Ensure light or audible warning device is same voltage as the power supply provided to ZAP controller.

Wire the light or audible warning device primary wire to the red light connection on DTLM. (Figure A)

Wire the light or audible warning device common wire to the Neutral mains connection the ZAP Control board. (Figure B)

Wire the light or audible warning device ground wire to the ground connection the ZAP Control board. (Figure C)

Wire the warn terminal on the 822 (Figure A) to the start warning terminal on TB7 on the ZAP Control board. (Figure D)

Set the flash DIP Switch to Off. Set the function DIP Switch to On.

Carefully align the 82-DTLM socket connector with the 10 Pin socket connector on the main controller board and plug the 82-DTLM onto the 10 pin connector. (Figure E)

Ensure the socket connector is fully seated (Figure F)

Restore the power supply to the operator and test.

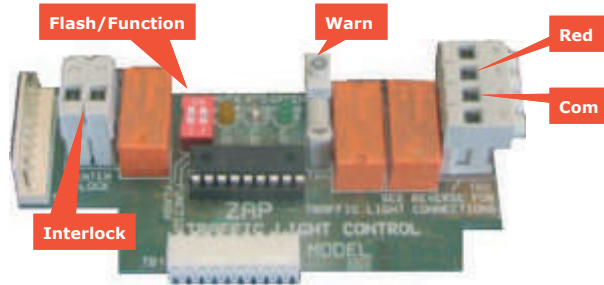


Figure A

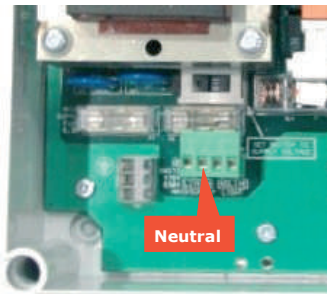


Figure B

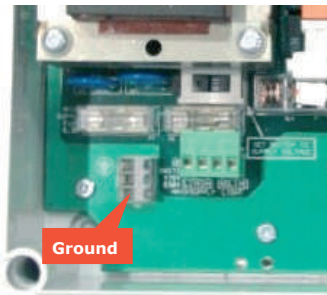


Figure C



Figure E



Figure F

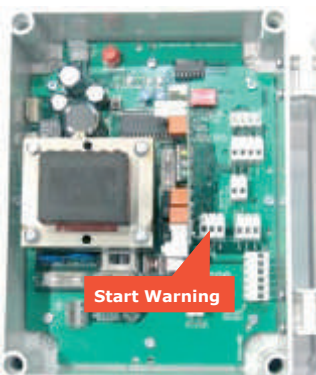


Figure D

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Interlocking 2 ZAP Controllers in the door open position



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials required to accomplish task:
Appropriate operator for door sizes. (See Brochure)
2 ea 82-DTLM , 16-20 awg 4 conductor cable,
Small technicians screwdriver.

Isolate the power supply before wiring any device into a ZAP Controller.

This wiring requires 2 ZAP operators to be in use on two individual doors sharing the same track system.

Use of auto-close timer should not be used in this application.

Both ZAP Controllers should be mounted beside each other.

Wiring door open interlocks of 2 ZAP controllers

The 82-DTLM provides a pair of contacts that close when the door has reached the fully open position. (Figure A)

The ZAP Controller provides a pair of contacts that require a relay on the other end of the wiring be closed to enable operation of the ZAP Controller. (Figure B)

The common terminal of the interlock on the main ZAP Control Board A (Figure B) is wired and terminated into one of the terminals labeled Interlock on the 82-DTLM into ZAP Controller B. (Figure A)

The interlock terminal of the main ZAP Control Board A (Figure B) is wired and terminated into the other terminal labeled Interlock on the 82-DTLM into ZAP Controller B. (Figure A)

The common terminal of the interlock on the main ZAP Control Board B (Figure B) is wired and terminated into one of the terminals labeled Interlock on the 82-DTLM into ZAP Controller A. (Figure A)

The interlock terminal of the main ZAP Control Board B (Figure B) is wired and terminated into the other terminal labeled Interlock on the 82-DTLM into ZAP Controller A. (Figure A)

Once the terminals are wired, ensure the power supply is disconnected from the operator.

Carefully align both of the 82-DTLM's socket connector with the 10 Pin socket connector on the each of the main controller boards and plug the 82-DTLMs onto the 10 pin connectors. (Figure C)

Ensure the 82-DTLMs are fully seated (Figure D)

Turn Dip Switch number 4 to the off (down) position in both controllers. (Figure E)

It should now be required for both operators to be in the fully open position and turned off before either operator will function closed.

Restore the power supply to the operator and test.



Figure A



Figure D

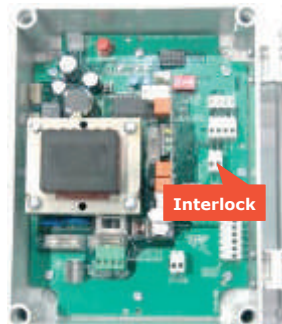


Figure B

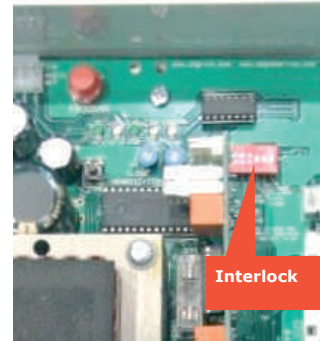


Figure E



Figure C

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82DTLM to Control Accessory ON/OFF Wiring Instruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Isolate the power supply before wiring any device into a ZAP Controller.

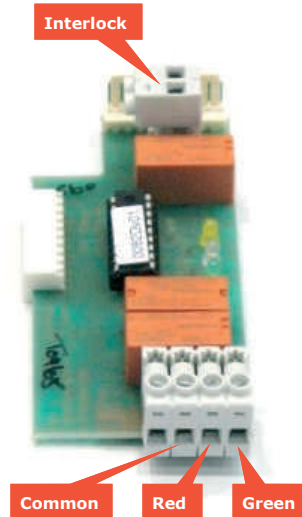
The 82-DTLM provides a series of relays that will close a contact to send a signal to cause an accessory to turn on in the following scenarios:

Upon the door entering it's open cycle- Relay Close (Red) When fully closed the relay is open,

Upon fully opening- Relay Close (I-lock)
When not fully open the relay is open

Upon fully closing- Relay Close (Green)
When not fully closed the relay is open

Relays are rated for voltages up to 250V and 6 amps.



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Door Closed Interlock



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials required

82-TLM , 16-20 awg 2 conductor cable

Tools required

Small technicians screwdriver.

Isolate the power supply before wiring any device into a ZAP Controller.

The 82-TLM provides a pair of contacts that close when the door has reached the fully closed position.

The common terminal of the device to be interlocked is wired and terminated into one of the terminals labeled Common on the 82-TLM. (Figure A.)

The contact terminal of the device to be interlocked is wired and terminated into the other terminal labeled Interlock on the 82-TLM. (Figure A.)

Carefully align the 82-TLM socket connector with the 10 Pin socket connector on the main controller board and plug the 82-TLM onto the 10 pin connector as shown. (Figure B)

Ensure the socket connector is fully seated as shown. (Figure C)

Restore the power supply to the operator.

.



Figure A



Figure B



Figure C

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Interlocking 2 ZAP Controllers in a Sally Port Configuration



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials required to accomplish task:
Appropriate operator for door sizes. (See Brochure)
2 ea 82-DTLM , 16-20 awg 4 conductor cable,
Small technicians screwdriver.

Isolate the power supply before wiring any device into a ZAP Controller.

This wiring requires 2 ZAP operators to be in use on two individual doors sharing the same track system.

Wiring door closed interlocks of 2 ZAP controllers in a sally port configuration

The 82-TLM provides a pair of contacts that close when the door has reached the fully closed position. (Figure A)

The ZAP Controller provides a pair of contacts that require a relay on the other end of the wiring be closed to enable operation of the ZAP Controller. (Figure B)

The common terminal of the interlock on the main ZAP Control Board A (Figure B) is wired and terminated into one of the terminals labeled Interlock on the 82-TLM into ZAP Controller B. (Figure A)

The interlock terminal of the main ZAP Control Board A (Figure B) is wired and terminated into the other terminal labeled Interlock on the 82-TLM into ZAP Controller B. (Figure A)

The common terminal of the interlock on the main ZAP Control Board B (Figure B) is wired and terminated into one of the terminals labeled Interlock on the 82-TLM into ZAP Controller A. (Figure A)

The interlock terminal of the main ZAP Control Board B (Figure B) is wired and terminated into the other terminal labeled Interlock on the 82-DTLM into ZAP Controller A. (Figure A)

Once the terminals are wired, ensure the power supply is disconnected from the operator.

Carefully align both of the 82-TLM's socket connector with the 10 Pin socket connector on the each of the main controller boards and plug the 82-DTLMs onto the 10 pin connectors. (Figure C)

Ensure the 82-TLMs are fully seated (Figure D)

Turn Dip Switch number 4 to the off (down) position in both controllers. (Figure E)

It should now be required for both operators to be in the fully open position and turned off before either operator will function closed.

Restore the power supply to the operator and test.



Figure A



Figure D

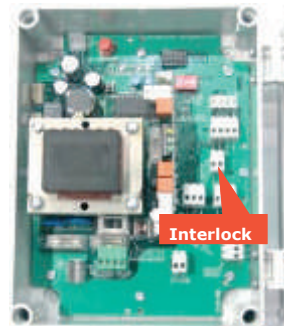


Figure B

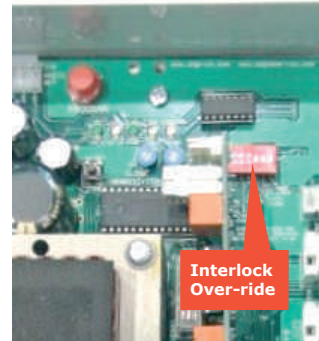


Figure E



Figure C

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Series 3 Technician's Installation and Service Training Manual

Through Traffic Light Control Wiring



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed

Appropriate operator for door size. (See Brochure)
82-DTLM , 16-20 awg 2 conductor cable, Red Green Traffic Light

Isolate the power supply before wiring any device into a ZAP Controller.

The 82-TLM Provides a 24V, Common, Red and Green connection. The relay for the red light will close to activate the red light when the door is any position other than fully closed. The green light relay will close when the door is the fully open position.

24V Traffic Light

Wire the red light wire to the red light connection on DTLM. (Figure A)

Wire the traffic light green light wire to the green light connection on DTLM. (Figure A)

Wire the traffic light common wire to the 0V connection on TB7 on the ZAP Control board. (Figure B)

Place a jumper wire between the 24V terminal on the DTLM to common terminal of the DTLM. (Figure C)

115V/208-230V Traffic Light

Wire the red light wire to the red light connection on DTLM. (Figure A)

Wire the traffic light green light wire to the green light connection on DTLM. (Figure A)

Wire the traffic light common wire to the Neutral mains connection the ZAP Control board. (Figure D)

Carefully align the 82-DTLM socket connector with the 10 Pin socket connector on the main controller board and plug the 82-DTLM onto the 10 pin connector. (Figure E)

Set DIP Switch 1 to OFF for red light to remain on at all times when door is not fully open. Set to On to enable light to off after 3 minutes when door is closed.

Set DIP Switch 2 to On to enable light to flash while door is moving.

Ensure the socket connector is fully seated (Figure F)

Restore the power supply to the operator and test.

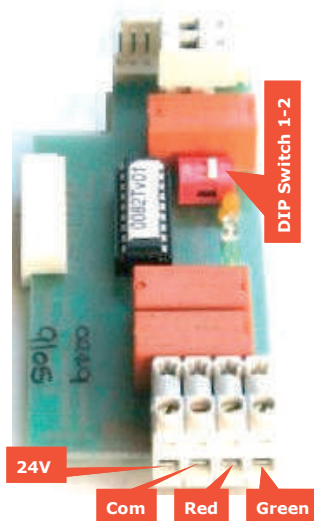


Figure A

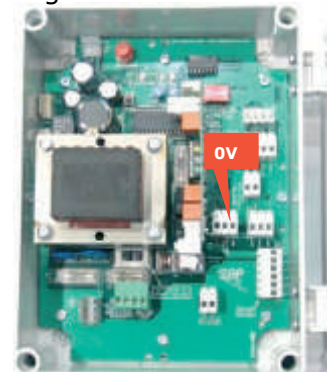


Figure B

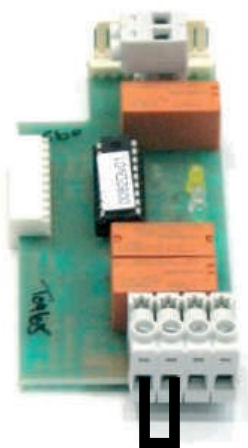


Figure C

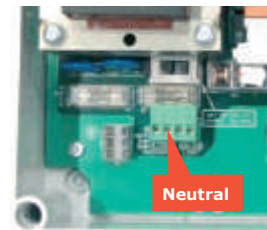


Figure D



Figure E



Figure F

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Series 3 Technician's Installation and Service Training Manual

821 Through Traffic Light Control with Advance Warning of Door Closure



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed

Appropriate operator for door size. (See Brochure)
821 ,16-20 awg 4 conductor cable, 16-20 awg 1 conductor cable, 115V-208-230V Red Green Traffic Light, 115V Revolving warning light, or 115V audible warning device.

Isolate the power supply before wiring any device into a ZAP Controller.

The 821 is designed to function similarly to the 82-TLM with exception of the 821 being able to provide advance warning if pending door closure.

For door closed interlock function consult the Door closed interlock wiring page for the 82-TLM.

For through traffic light wiring consult the through traffic light wiring page for the 82-TLM.

For interlocking 2 doors in the closed (Sally Port) configuration consult the interlocking 2 doors in the closed (Sally Port) configuration page.

115V, 208-230V revolving warning light or audible warning device wiring

Ensure light or audible warning device is same voltage as the power supply provided to ZAP controller.

Wire the light or audible warning device primary wire to the red light connection on DTLM. (Figure A)

Wire the light or audible warning device common wire to the Neutral mains connection the ZAP Control board. (Figure B)

Wire the light or audible warning device ground wire to the ground connection the ZAP Control board. (Figure C)

Wire the warn terminal on the 821 (Figure A) to the start warning terminal on TB7 on the ZAP Control board. (Figure D)

Set the flash DIP Switch to Off. Set the function DIP Switch to On.

Carefully align the 82-TLM socket connector with the 10 Pin socket connector on the main controller board and plug the 82-DTLM onto the 10 pin connector. (Figure E)

Ensure the socket connector is fully seated (Figure F)

Restore the power supply to the operator and test.

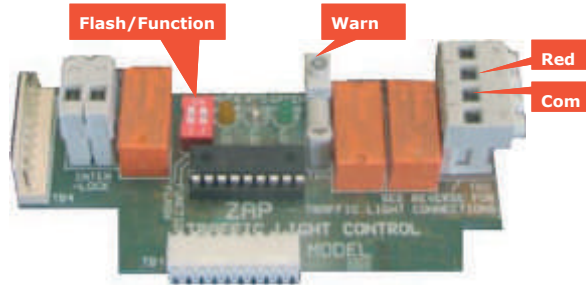


Figure A

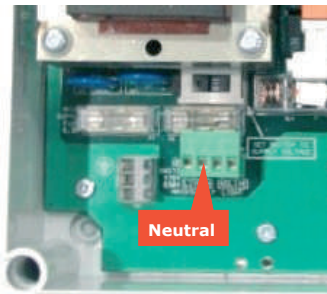


Figure B

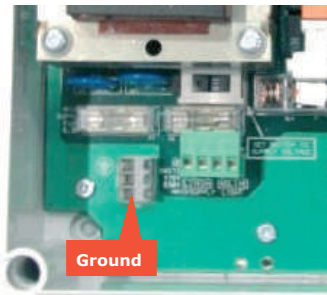


Figure C

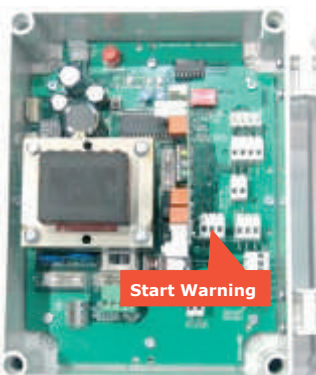


Figure D



Figure E



Figure F

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Series 3 Technician's Installation and Service Training Manual

Additional 3 Button Wall Station



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed

16-20 awg 4 conductor cable, 3 Button Wall Station.

Isolate the power supply before wiring any device into a ZAP Controller.

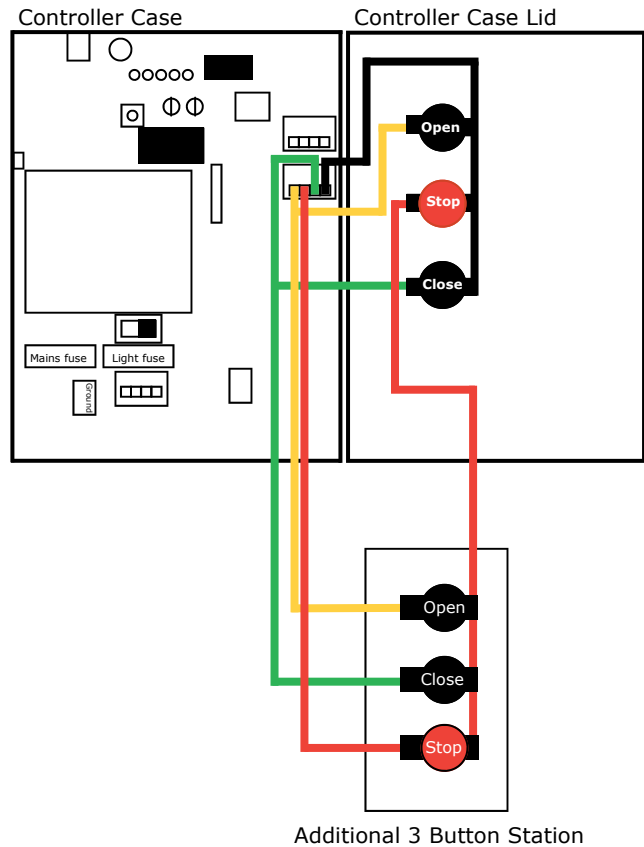
Unplug the case lid plug from TB 3 and remove the red wire from the plug-in terminal.

Using your 4 wire cable, insert a wire into the stop position of the plug-in terminal and terminate the other end of that wire into the external 3 button controller stop terminal. (red wire diagram)

Attach another wire to the red wire that was removed by means of a wire nut and terminate the other end of the wire onto the common strip of the external 3 button controller, thereby creating a loop through both the external 3 button station stop button and the ZAP Case lid stop button circuit. (red wire diagram)

Wire in parallel from the open connection on the case lid plug to the open button connection on the 3 button station. (orange wire diagram)

Next, wire in parallel from the close connection on the case lid plug to the close button connection on the 3 button station. (green wire diagram)



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Series 3 Technician's Installation and Service Training Manual

Single Contact Device to Cause Cyclic Operation



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed

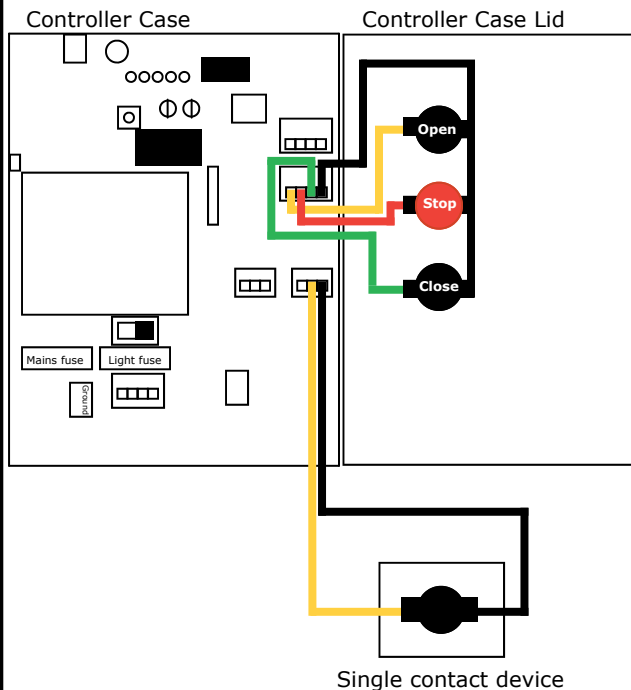
16-20 awg 2 conductor cable, Single contact device such as a Single Button wall station, microwave sensor, loop detector, treadle, SPST Ceiling Pull, etc.

Note: This function will cause a cyclic operation. It will open with the first input. If it receives another input before reaching the fully open position it will stop, after stopping another input will cause a close function.

Isolate the power supply before wiring any device into a ZAP Controller.

Using your 2 wire cable, insert one wire into the Radio position of TB9 and terminate it into one side of the one button station. (red wire diagram)

Next, insert the other wire into the 0V position of TB9 and terminate it into the other side of the one button station. (black wire diagram)



Series 3 Technician's Installation and Service Training Manual
Additional One Button Wall Station on 3 button controllers

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Series 3 Technician's Installation and Service Training Manual

Wiring a single contact device to cause an open function



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

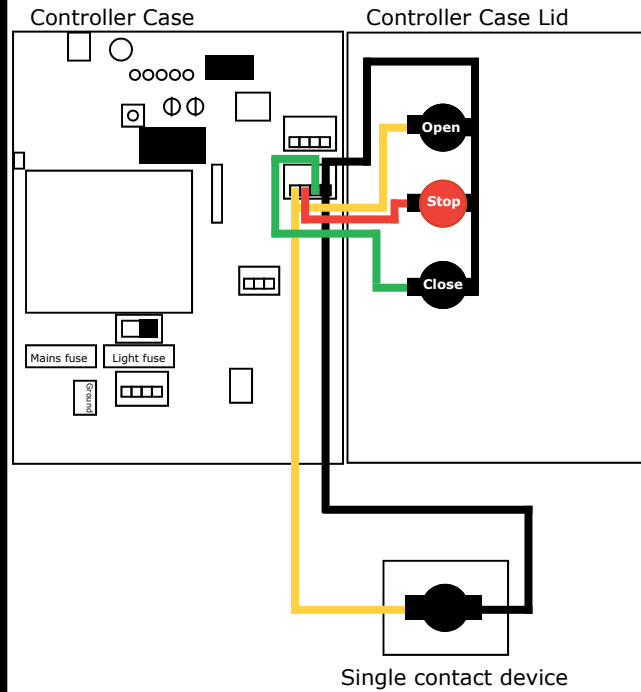
Materials Needed

16-20 awg 2 conductor cable, Single contact device such as a Single Button wall station, microwave sensor, loop detector, treadle, SPST Ceiling Pull, etc.

Isolate the power supply before wiring any device into a ZAP Controller.

Using your 2 wire cable, insert one wire into the Open position of TB3 and terminate it into one side of the one button station. (Orange wire diagram)

Next, insert the other wire into the 0V position of TB3 and terminate it into the other side of the one button station. (black wire diagram)



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Wiring a single contact device to cause an open function

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Wiring a single contact device to cause a close function



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

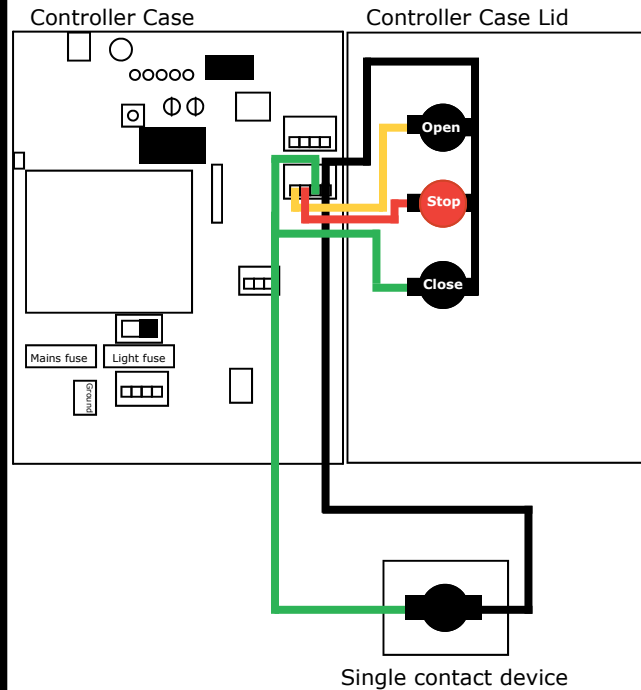
Materials Needed

16-20 awg 2 conductor cable, Single contact device such as a Single Button wall station, microwave sensor, loop detector, treadle, SPST Ceiling Pull, etc.

Isolate the power supply before wiring any device into a ZAP Controller.

Using your 2 wire cable, insert one wire into the Close position of TB3 and terminate it into one side of the one button station. (Green wire diagram)

Next, insert the other wire into the 0V position of TB3 and terminate it into the other side of the one button station. (black wire diagram)



Series 3 Technician's Installation and Service Training Manual

Wiring a single contact device to cause a close function

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Series 3 Technician's Installation and Service Training Manual

871 Interface Expansion Module Installation



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed

16-20 awg 2 conductor cable, Single contact device such as a microwave sensor, loop detector, treadle, etc.

Isolate the power supply before wiring any device into a ZAP Controller.

The 871 Interface expansion module is used to facilitate the need for additional wiring space for multiple control wiring functions.

If an extra Cyclic operation input is required, wire your contact device relay to the cycle and common terminal of the 871 Expansion Module (Figure B)

If an extra Open input is required, wire your contact device relay to the open and common terminal of the 871 Expansion Module (Figure B)

If an extra Close input is required, wire your contact device relay to the close and common terminal of the 871 Expansion Module (Figure C)

A 24V power supply is available on the 871 Module. Wire any extra device capable of running on a strict 24V supply to the 24V and common terminals on the 871 Expansion Module (Figure D)

Before plugging the 871 Module onto the control board, ensure the power supply is isolated.

Align the 871 Module with all 10 pins of the 10 pin socket header. (Figure E)

Ensure the 871 is seated completely onto the socket header. (Figure F)

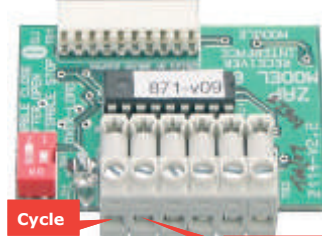


Figure A

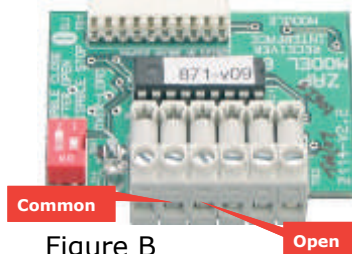


Figure B

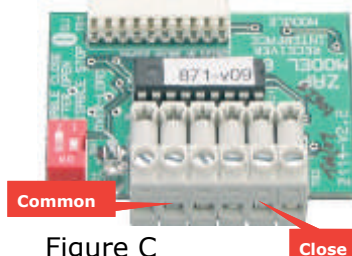


Figure C

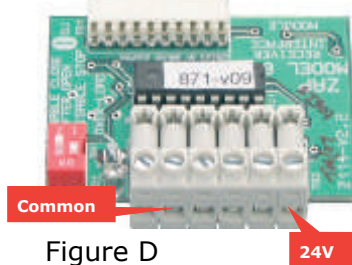


Figure D



Figure E

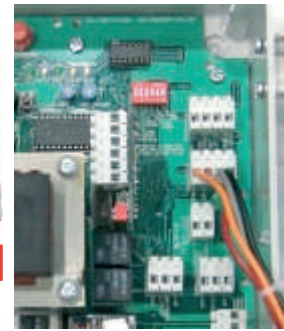


Figure F

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Series 3 Technician's Installation and Service Training Manual

871 Fire Station Module Installation



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed

401002 photo eye, 401001 photo eye, 871-FS Module, 16-20 AWG 3 wire cable.

The 871-FS is a special variant of the 871 Interface Module which uses a photo eye connected to the COM and Cycle inputs to inhibit the auto-close function until a vehicle has passed through the photo eye.

You must employ the UL325-2010 approved photo eye PN (401002) wired to TB7 as a standard safety photo eye to utilize the 871FS. ZAP Part number 401001 through beam photo eyes are best suited for use with the 871 FS module. However, other 4 wire, N/C, Non monitored photo eyes may be used. The photo eyes used with the 871-FS may act as a safety device, however they are not intended to be used as the primary UL325-2010 photo eye. Retro-reflective photo cells should not be used with the 871-FS as reflective tape is often used on vehicles where this device is employed.

Wiring the photo cells used with the 871-FS

Isolate the power supply before wiring any device into a ZAP Controller.

Mount the photo cells in a position where a vehicle will break the beam as a vehicle leaves the facility. It should be at a height where a person will not break the beam as they walk through or near the door opening.

Terminate both N/C safety wires (Black) of the 401001 photo-eye to the Cycle inputs of the 871-FS. (Figure A)

Terminate both N/C safety common wires (White) of the 401001 photo-eye to the COM inputs of the 871-FS. (Figure A)

Terminate the power wire of the 401001 photo-eye into the 24V terminal on TB7. (Figure B)

Terminate the power common wire of the 401001 photo-eye into the 0V terminal on TB7. (Figure B)

Unplug the terminal block from TB3. Remove the close wire from the terminal block (Figure B) and wire to the close terminal on the 871-FS (Figure C)

When the door is opened fully the 871 Module will continue to drive the open signal to the control panel which will stop the door from closing. Moving the close wire to the close input of the 871-FS will enable the close button to operate normally.

Before plugging the 871-FS Module onto the control board, ensure the power supply is isolated.

Align the 871 Module with all 10 pins of the 10 pin socket header. (Figure E)

Ensure the 871 is seated completely onto the socket header. (Figure F)

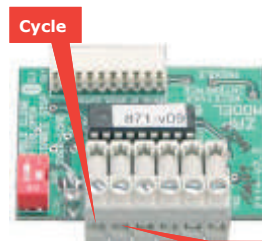


Figure A Common

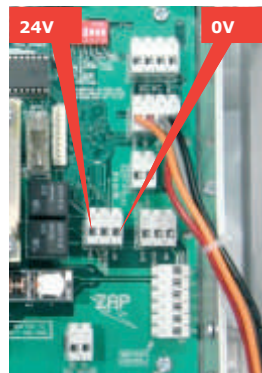


Figure B

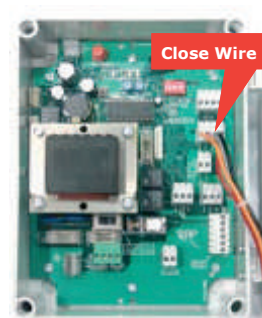


Figure C

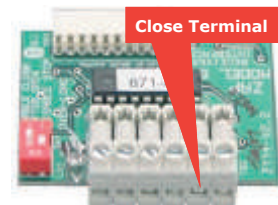


Figure D



Figure E



Figure F

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Series 3 Technician's Installation and Service Training Manual

872 Adapter Module Installation



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

The 872 Adapter module is designed for use when either the 8070 Auto Lock is to be used with the 871 Expansion Module or the 871 Fire Station Module.

Isolate the power supply before wiring any device into a ZAP Controller.

Note the positions of the connector plugs on the Auto-Lock card (Figure A)and the 871 Modules. (Figure B)

Plug the 871/871-FS Module onto the 872 adapter module where indicated. (Figure C)

Install and wire the devices to be installed prior to plugging the 872 Module onto the 10 Pin socket header.

For wiring of the 8070 Auto-Lock, 871 Expansion Module, or 871 Fire Station Module consult the specific wiring page for these devices.

Plug the 8070 Auto Lock Module onto the 872 Adapter Module where indicated. (Figure C)

Ensure you have isolated the power supply and align the 872 Adapter Module with the 871 Interface Module or the 871-FS Module and 8070 Auto Lock Module in place on the 872 Adapter. Plug the 872 Module onto the 10 pin socket connector located on the main ZAP Controller Board. (Figure D)

Restore the power supply and test the devices by cycling the door.



Figure A

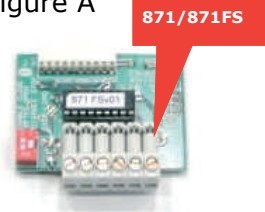


Figure B

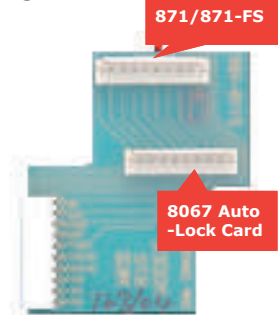


Figure C



Figure D

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Series 3 Technician's Installation and Service Training Manual

Photo Cell Installation for Constant Pressure Close with Photo Cell to Stop Upon Obstruction



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed

Either the 401000 or 401001 Photo Cell.

Isolate the power supply before wiring any device into a ZAP Controller.

Mount the required photo cells at a position 5-6" above the ground on each side of the opening.

Terminate the power wire of the photo eye to the 24V connector on TB7 of the ZAP Control Board. (Figure A)

Terminate the power Common wire of the photo eye to the 0V connector on TB7 of the ZAP Control Board. (Figure A)

If using the 401000 Retro-reflective photo eye, terminate the N/C safety wire (Black) into the I-Lock terminal on TB4 of the ZAP Control Board. (Figure B)

Terminate the safety common wire (White) into the COM terminal on TB4 of the ZAP Control Board. (Figure B)

If using the 401001 through beam photo eye, terminate both N/C safety wires (Black) into the I-Lock terminal on TB4 of the ZAP Control Board. (Figure B)

Terminate both safety common wires (White) into the COM terminal on TB4 of the ZAP Control Board. (Figure B)

Set DIP Switch three to the OFF position.

Restore the power supply.

Inspect the photo eyes to ensure alignment.

Test the devices by cycling the door and interrupting the photo cell during the close cycle.

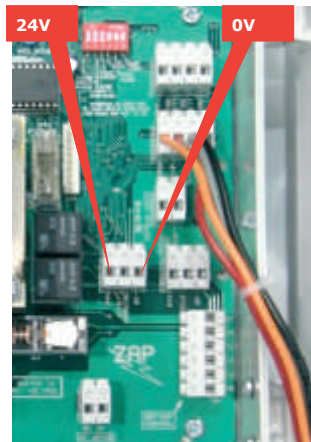


Figure A

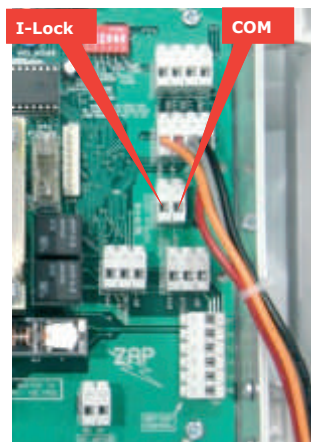


Figure B

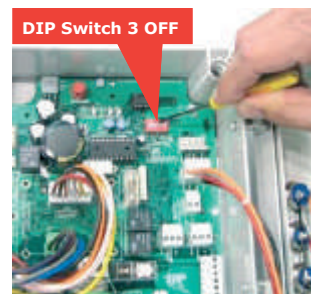


Figure C

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ZAP Series 3 Technical Manual

Dock Light Wiring



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Materials Needed
120V Dock Light

Isolate the power supply before wiring any device into a ZAP Controller.

After mounting desired light in desired position, introduce the light's wiring cable into the controller case through the provided knockouts or conduit connected through the knock outs in the bottom of the controller.

Wire the ground, neutral and live wires as indicated. (Figure A)

Set mode selector (DIP switch 6) to the ON position. (Figure B)

Restore the power supply.

Test the light for function by cycling the door.

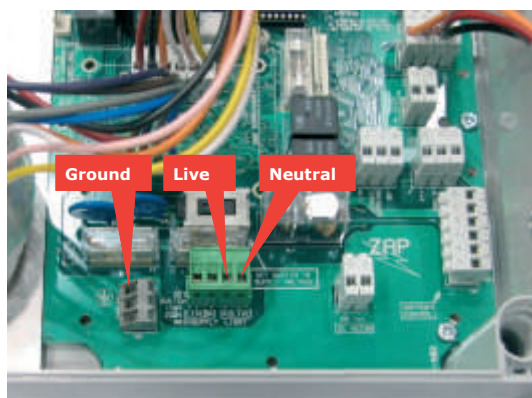


Figure A

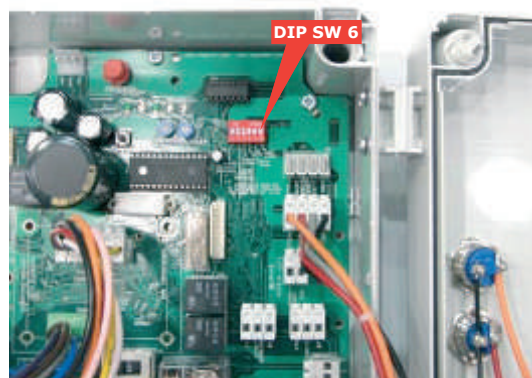


Figure B

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ZAP Series 3 Technical Manual

Auto-Close Timer Programming



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

Note that the door will not auto close unless the 401002 photo eye system is employed. See 4010002 phot eye installation page.

Start with the door in the fully closed position.

Enable the Auto-Close timer by setting DIP switch No. 4 to ON. (Figure A)

Press and hold the program button. (Figure B)

Release the button after the 2nd flash of the ACK LED or beep if the 850 beeper module is installed. (Figure C)

Next press the OPEN push button.

After the door has fully opened and the operator open LED has turned off. Begin timing on your watch the desired close delay. Maximum is 4 Minutes.

When the desired time delay is reached, press the CLOSE push button twice. The desired delay is now stored into the memory and will be retained during any power interruptions.

The programming process pressing the button twice will ensure the door closes regardless of obstruction for security reasons.

If you prefer that the door should reopen and stay open following an obstruction strike, then only press the close button once, instead of twice, as described above.

If you wish to change programmed delay, simply repeat the programming function.

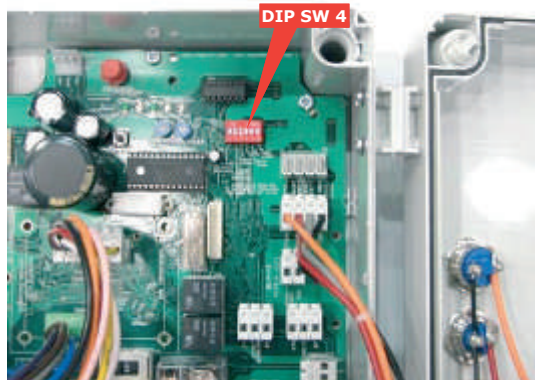


Figure A

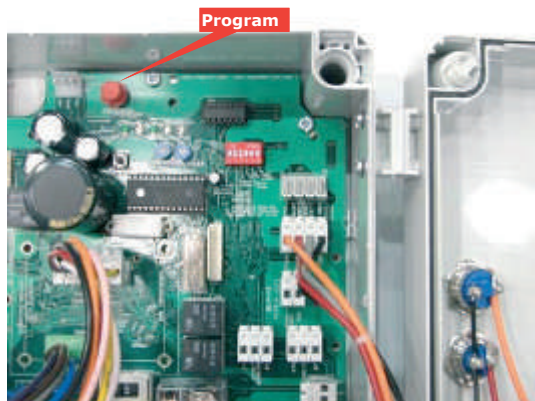


Figure B

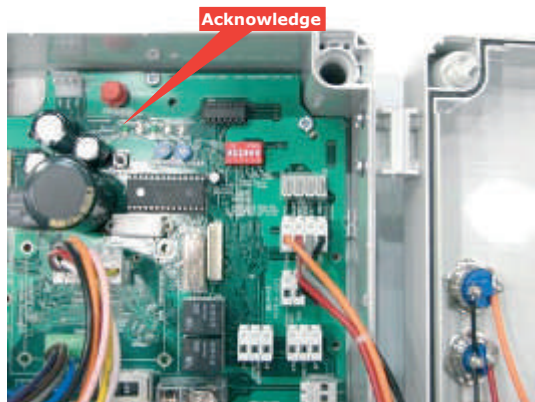


Figure C

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ZAP Series 3 Technical Manual

Auto-Close Timer Temporary Defeat



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

To achieve the simplest method of defeating the auto-close timer it is best to install an 850 Beeper module.

Consult the 850 Beeper module page for installation instructions.

This function is only to be used to temporally de-activate the auto-close timer when it is necessary to defeat the auto-close timer from timing out and closing the door for one particular cycle. This function is used for example, when it is necessary for the door to not close automatically after opening to receive a delivery or to hold the door open for ventilation purposes.

Note:

If the beeper module is not installed it will be necessary to open the case lid of the controller to view the acknowledge light. (Figure A)

To Defeat the auto-close timer for 1 cycle:

After the door has reached the fully open position and the operator has turned off.

Press and hold the STOP push button. (Figure B)

Next, press and hold the Close push button. (Figure B)

Release both buttons simultaneously after the 1st beep or flash of the acknowledge light.

To resume normal auto-close function:

Close the door by pressing the close push button.

The auto close function will automatically resume on the next operation.



Figure A



Figure B

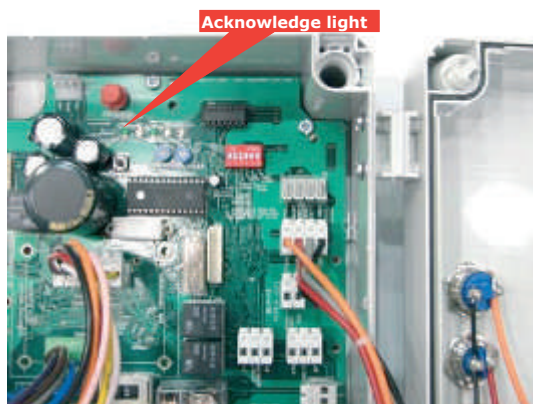


Figure C

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Series 3 Technician's Installation and Service Training Manual

Delay Close Programming



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

This programming function is required for use of modules 822 and 821, when requiring an advance warning of pending door closure.

Note:

To program this function it is necessary to open the case lid of the controller to access the program button and to view the acknowledge light if the beeper module is not installed. (Figure A)

To program in a close time delay:

Start with the door in the fully open position. Press the open button on the controller to allow the door to open fully.

Press and hold the program button. (Figure A)

Release the button after the 3rd flash of the ACK LED or beep if the 850 beeper module is installed. (Figure C)

Press the Close push button to begin the delay close programming. (note that the door will not close)

Begin timing the desired delay with your watch. (up to 15 seconds)

After reaching the desired delay timing, Press the close push button.

The door will now close.

After the door has fully closed, cycle the door open and test the close delay function.

Changing the programmed delay:

Simply repeat the programming function.



Figure A



Figure B

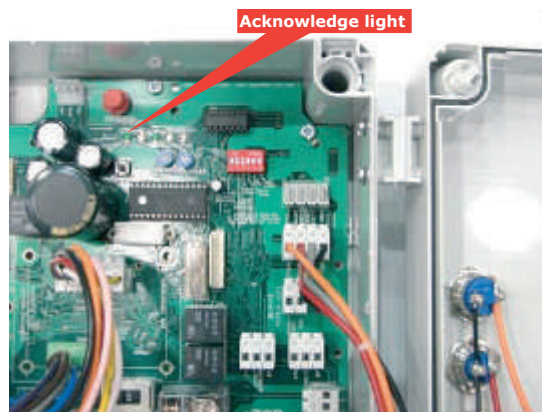


Figure C

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Series 3 Technician's Installation and Service Training Manual

Part Open Programming



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

To program this function it is necessary to open the case lid of the controller to access the program button and to view the acknowledge light if the beeper module is not installed. (Figure A)

Start with the door fully closed.

Press and hold the program button. (Figure B)

Release the button after the 5th flash of the ACK LED or beep if the 850 beeper module is installed. (Figure C)

Now, press the open button; the door will now start opening.

At the required open position, press Stop.

You will then receive two ACK LED flashes or beeps from the 850 Beeper (if installed) will confirm successful programming. (Figure C)

The door will now open to this programmed position and stop.

After the door stops at the programmed height, if it is required to have the door to continue to the fully open position, press the Open button again and the door will open fully.

To erase the part open position:

Press and hold the program button. (Figure B)

Release the button after the 6th flash of the ACK LED or beep if the 850 beeper module is installed. (Figure C)

You will then receive two ACK LED flashes or beeps from the 850 Beeper (if installed) will confirm successful programming.



Figure A



Figure B

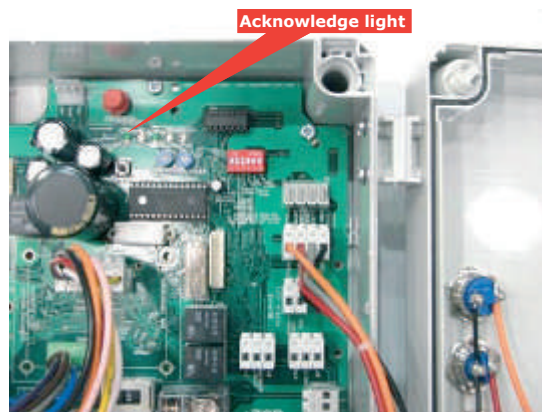


Figure C

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Series 3 Technician's Installation and Service Training Manual

Close Slow/ Close Fast Programming



Warning Electrical Shock Hazard

To prevent serious injury or death always ensure power is disconnected when wiring anything into the ZAP Controller.

To program this function it is necessary to open the case lid of the controller to access the program button and to view the acknowledge light if the beeper module is not installed. (Figure A)

ZAP Commercial controllers have the ability to select the speed of door closure. A slow close may be requested for doors as a safety feature.

To change the programming from normal fast speed close to slow close:

Press and hold the program button. (Figure B)

Release the button after the 7th flash of the ACK LED or beep if the 850 beeper module is installed. (Figure C)

You will then receive two ACK LED flashes or beeps from the 850 Beeper (if installed) will confirm successful programming.

The door is now programmed to close slow.

To revert back to normal speed operations:

Repeat the above process

You will then receive two ACK LED flashes or beeps from the 850 Beeper (if installed) will confirm successful programming.



Figure A

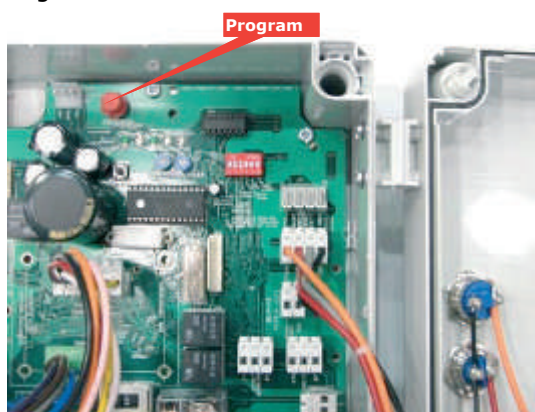


Figure B

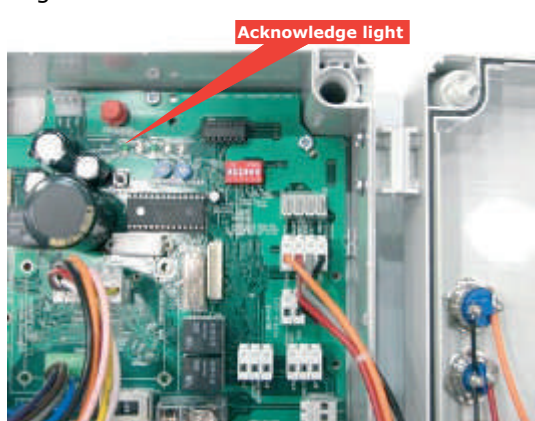


Figure C

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Series 3 Technician's Installation and Service Training Manual

Service Due Reminder

A service due reminder is incorporated in the control unit. It is not enabled during manufacture.

If you choose to employ the service due reminder it is recommended that the 850 Beeper Module be added to add an audible announcement that service is due. (See 850 Beeper module installation page). However, it is not required. Once employed, the operator will automatically alert the end user that service is due. This occurs at 19,200 operations or 9,600 cycles.

The ZAP operator is designed to require the drive belt to adjusted at approximately 10,000 cycles. Further, standard torsion springs are typically designed for 10,000 cycles. The service due reminder will activate at 9,600 cycles to alert the end user that door and operator service is due in time to adjust the belt and to replace the torsion springs. If higher cycle springs are used, tracking the cycle life of the springs is made simple by tracking the number of service due alerts made. For example if the door has 50,000 cycle springs installed, then on the fifth service due alert it be prudent to replace the torsion springs to prevent the operational down time if the door due to spring breakage.

Enabling the service due reminder:

If the 850 Beeper module is not employed it will be required to open the case lid of the controller to observe the acknowledge LED. (Figure A)
Press and hold the STOP button.(Figure B)
Press and hold the OPEN button.(Figure B)
Release both buttons after the second beep or flash of the acknowledge LED. (Figure C)
Two beeps or flashes of the ACK LED confirms the reminder is enabled.

Alerting the customer that service is due is accomplished by two methods. First, after the door has 19,200 operations or 9,600 cycles (open+close=1cycle). The service due reminder becomes active and delays the close cycle by 10 seconds, If the 850 beeper module is installed it will sound 10 times during this delay. This audible alert, plus the physical delay is the alert that prompts the end user that service is due. It is advisable to notify the end user of this process so that he is aware of the alert process and does not confuse this notification with an operator malfunction.

To reset the service due reminder after servicing the door and the operator, repeat the enable sequence.

If it is required to disable the service due reminder:
Press and hold the STOP button.
Press and hold the OPEN button. Release both buttons after the second beep or flash of the acknowledge LED.



Figure A



Figure A

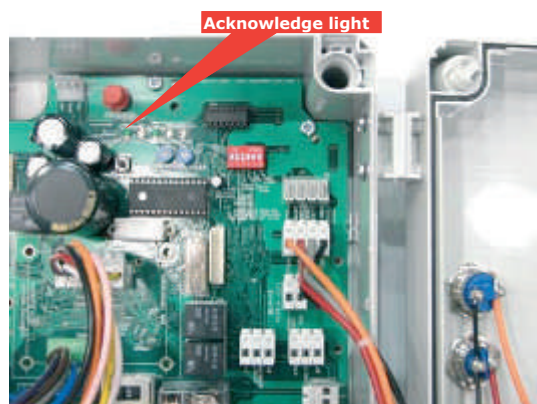


Figure B

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Operations Counter

A door operations counter is a standard feature on all ZAP Series 3 operators. Every door operation is stored into memory for interrogation at any point by a service technician. It IS always enabled and counts each operation as an individual number (1open+1close=2operations)
The maximum operations the unit can store is 65,000. After it reaches 65,000 operations it rolls over to zero.

If the 850 Beeper module is not employed it will be required to open the case lid of the controller to observe the acknowledge LED.
(See 850 Beeper module installation page).

When interrogating the operations counter the acknowledge LED will flash long flashes to indicate 1000's of operations and short flashes for 100's of operations. If the 850 Beeper is employed, you will hear long beeps for 1000's of operations and short beeps for 100's of operations.

Example:

2 long flashes/beeps and three short flashes/beeps indicates the operator has completed 2300 operations or 1150 cycles. $2300/2=1150$

Interrogating the operations counter:

Open Case lid if Beeper Module is not employed.
(Figure A)

Press and hold the stop Button. (Figure B)

Press and hold the open button. (Figure B)

Release both buttons after the first beep or flash of the acknowledge LED. (Figure C)

Observe the long and short flashes

If no flashes or beeps are heard the unit has had less than 100 operations.



Figure A



Figure B

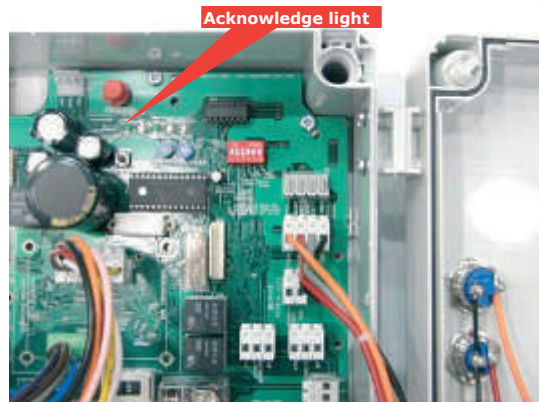


Figure B

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Basic Troubleshooting Symptom Diagnosis

1. Door does not fully open before turning off.	<p>Verify proper operator is installed. Verify operator is properly installed. Check to see if door binding at that position. Check door spring balance in the up position to see if door is too heavy and adjust. Verify track radius not too tight. Verify horizontal tracks are not too tight to door. Increase power clamp potentiometer slightly. (See adjusting potentiometers page)</p>
2. Door does not fully close before turning off.	<p>Verify proper operator is installed. Verify operator is properly installed. Verify door balance is correct and spring tension is not too high. Verify top section seal is not too tight against header or section too tight against seal. Verify vertical tracks not too tight against door. Verify door is not too tight against jamb or seal. Increase power clamp potentiometer slightly. (See adjusting potentiometers page) Decrease close sensitivity slightly. (See adjusting potentiometers page)</p>
3. Door opens slightly and stops or sets back down on floor	<p>Check for broken torsion spring. Verify door is unlocked if slide lock is used. Verify auto-lock is disengaging if used. Verify proper operator is installed. Verify operator is properly installed. Verify door balance and adjust if necessary Verify door is not too tight against door jamb. Verify that the door operates freely. Increase power clamp potentiometer slightly. (See adjusting potentiometers page)</p>
4. Door attempts to close but reverses in the radius of track	<p>Verify proper operator is installed. Verify operator is properly installed. Verify door balance and adjust if necessary Verify door operates freely through the radius. Verify horizontal tracks are not too tight to door. Verify vertical tracks not too tight against door. Decrease close sensitivity slightly. (See adjusting potentiometers page) Increase power clamp potentiometer slightly. (See adjusting potentiometers page) Release door and lower to a position below the obstruction point and re-engage and cycle down.</p>

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Basic Troubleshooting Symptom Diagnosis

5. Operator does not turn off when fully cycled Up or Down	Verify proper operator is installed. Verify operator is properly installed. Verify Bowden cable is installed properly. Verify proper belt tension is applied. Decrease power potentiometer slightly (See adjusting potentiometers page) Increase close sensitivity slightly if problem occurs in the close cycle. (See adjusting potentiometers page)
6. Door will not open Open LED does not turn on when open pressed	Verify Case lid cover plugged into main board. Consult basic controller troubleshooting section.
7. Door will not open Open LED does turn on when open pressed	Verify proper voltage setting. Verify Motor properly terminals plugged into TB12. Verify no breakage in motor wires. Verify motor wires are plugged in at motor. Consult basic controller troubleshooting section.
8. Door will not close Close LED does not turn on when close pressed	Verify Case lid cover plugged into main board. Consult basic controller troubleshooting section.
10. Door always running slow.	Verify proper voltage setting. Consult basic troubleshooting for motor and controller sections.
11. Door running slow in close direction.	Consult close slow/Close fast programming section
12. Door pauses 10 seconds before closing.	Consult service due reminder programming page.
13. External Radio controls or other external device does not function	Check 24V circuit. See 24V trouble shooting section. Check Single contact device troubleshooting.

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Basic Troubleshooting Commercial Operator (Motor Head)

Inspect the operator to verify proper installation.

Locate the torque arm and verify that it is installed in a horizontal manner and that all fasteners are properly tightened. (Figure A)

Verify the key stock is in place and that the set screws are properly tightened with the lock nuts tightened securely.

Inspect the operator alignment and verify that the pulleys are in proper alignment. If not refer to operator motor installations pages.

Inspect the back of the drive pulley to verify that the pulley retaining cir-clip is in place or the screw or set screw is tight.

Inspect the V Belt for signs of excessive wear. Replace as necessary.

Inspect bearings on the pulley for excessive wear. Replace as necessary.

Inspect the mounting of the Bowden cable to ensure that it has been mounted correctly. It should have a loose looking appearance and show a bowing of the cable. Refer to Bowden cable mounting page for reference.

Inspect the Bowden cable and all its components and connections to verify they in proper operating order.

Inspect both the male and female motor plugs, terminals, and wiring six inches in either direction of the plug for damage.

Verify the motor cable is properly plugged into the motor.

Inspect the motor cable as it travels back to the controller to verify there is no damage to or staples through the motor cable.

Release the over-ride lever from its locked position.

Raise and lower the door manually to verify that the door functions properly with no restrictions and is well balanced. Inspect all components of the door to ensure proper service levels are achieved. Service the door as necessary to achieve.

Reconnect the over-ride lever to the tensioning system.

Check for proper belt tensioning. Refer the Setting Belt Tension page.

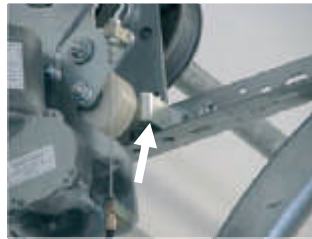


Figure A

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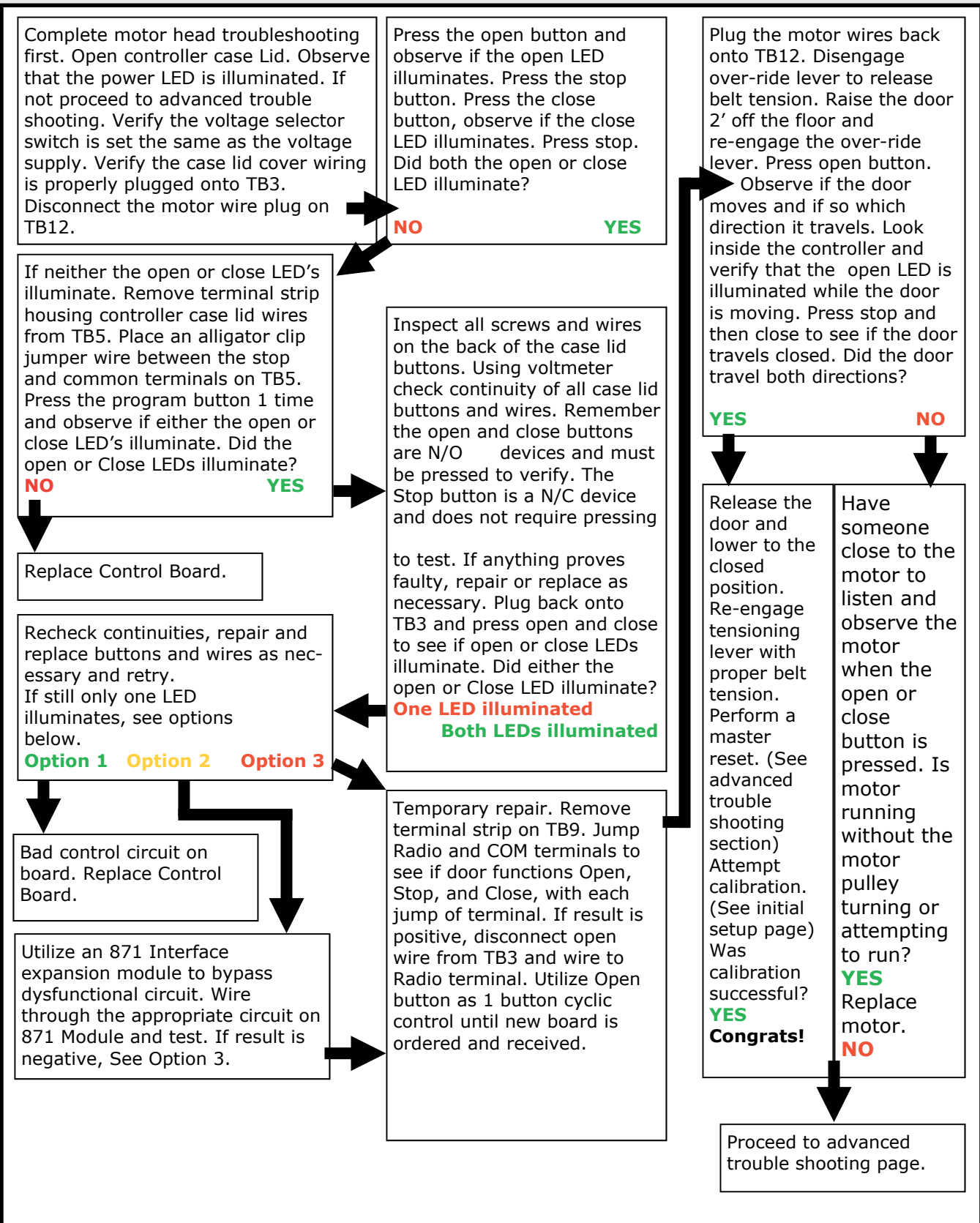
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Series 3 Technician's Installation and Service Training Manual

Basic Troubleshooting Commercial Operator (Controller)



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Series 3 Technician's Installation and Service Training Manual

Advanced Troubleshooting Commercial Operator (Controller)



Warning Electrical Shock Hazard

If the problems are not solved in the basic motor head or controller troubleshooting, it will be necessary to do the following to effectively source the issues in an orderly fashion in the shortest time frame.

Open controller case Lid.

Isolate power from the controller.

Disconnect all accessories, accessory modules, photo cells and the case lid from the controller.

Disconnect the DC Motor wires from the control board.

Inspect the controller to verify the following and take corrective action if necessary:

Is the controller mounted through the corner pillars of the controls box. If not, inspect to see if has been mounted through the back of the controller. If so, refer to the controller mounting page and rectify.

Is the wiring ingress into the controller through the bottom of the control box. If not, refer to the controller wiring page and rectify.

Restore the power supply to the controller. Verify the power indicator LED is illuminated. If not, verify power supply.

Check the mains supply. Set your voltmeter to Volts AC. Place the red lead in the Left hand LIVE terminal of the green plug. Place black lead in the left hand neutral terminal of the green plug. Verify you have a suitable power supply of at least 100VAC.

If good, check the mains fuse. Isolate the power supply. Remove mains fuse cover. Remove mains fuse. Set voltmeter to Ohms and test fuse.

If it is bad, replace fuse with 3A 5X20mm 250V fuse. Reinstall fuse, Restore power. If fuse blows, replace board. If not, verify the power indicator LED is illuminated. If not, replace board. If good proceed to next step.

Verify the potentiometers and their settings.

Look at the left hand potentiometer. (Close Sensitivity) On one end of the screwdriver slot there is an arrow indicator. Insert a small slotted technicians screwdriver into the slot.

Gently turn the arrow on the potentiometer counter-clockwise until the indicator arrow is to the 7 o'clock position.

At the 7 o'clock position verify that the internal physical stop in the potentiometer is present at the 7 o'clock position by noticing the resistance. Do not turn potentiometer past this point.

Now turn the arrow on the potentiometer clockwise to the 4 o'clock position and again verify the potentiometer has a in internal physical stop present at the 4 o'clock position.

If both are present, turn the arrow back the 12 o'clock position (Factory setting). If either of the internal stops of the potentiometers are not present, the potentiometer is broken and you must replace the board.

Look at the Right hand potentiometer. (Max power clamp) Repeat the above process to verify the potentiometer. If good, set to the factory setting.

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Series 3 Technician's Installation and Service Training Manual

Advanced Troubleshooting Commercial Operator (Controller)



Warning Electrical Shock Hazard

Examine the DIP switches and verify they in the following positions:

DIP1 Down, DIP2 Up, DIP3 Up , DIP4 Down, DIP5 Down, DIP6 Down.

Place an alligator clip jumper wire between the stop and common terminals on TB3 to complete the stop circuit. The stop circuit must be present for the operator to function.

Verify the power indicator LED is illuminated.

Perform a master reset by pressing and holding the reset button. While holding the reset button down, press and hold down the red program button. Release the reset button only and wait for the acknowledge light to flash once. Then release the program button. After releasing the program button you will receive 2 confirming flashes of the acknowledge LED. For more detailed instruction on master reset, See Performing a master reset.

Press the program button 1 time and release. The open LED should illuminate. If it does not, verify your connection between stop and common on TB3. Retry. Replace the control board if open LED does not illuminate.

If it does press the program button once more the open LED should turn off.

Press the program button again to turn on the close cycle. The Close LED should illuminate. If it does not, verify your connection between stop and common on TB3. Retry. Replace the control board if close LED does not illuminate. Press the program but once to turn off the close cycle.

Set your voltmeter to VDC 200. Located TB6. It is the vertical strip of six terminals located on the bottom right corner of the control board. Place your black lead on the GND terminal on TB6. Place your red lead on the terminal labeled MOT on TB6.

Voltage reading should read approximately 54VDC. If it reads excessively high or low more than 5VDC either way, replace the board.

Next verify the voltage output on the terminal labeled 24V on TB6 by placing the black lead on the GND terminal on TB6. Place your red lead on the terminal labeled 24V on TB6. Your reading should read 31VDC. If it reads excessively high or low more than 5VDC either way, replace the board.

Next verify the voltage output on the terminal labeled V1+ on TB6 by placing the black lead on the 0V terminal on TB 9. Place your red lead on the terminal labeled V1+ on TB6. your reading should read 15.7VDC. If it reads excessively different contact technical support.

Next verify the voltage output on the terminal labeled RL5 on TB6 by placing the black lead on the GND terminal on TB6. Place your red lead on the terminal labeled RL5 on TB6. Your reading should read 5VDC. If it reads excessively different, contact technical support.

Next verify the voltage output on the terminal labeled RL6 on TB6 by placing the black lead on the GND terminal on TB6. Place your red lead on the terminal labeled RL6 on TB6. Your reading should read 5VDC. If it reads excessively different, contact technical support.

Perform a master reset by pressing and holding the reset button. While holding the reset button down, press and hold down the red program button. Release the reset button only and wait for the acknowledge light to flash once. Then release the program button. After releasing the program button you will receive 2 confirming flashes of the acknowledge LED. For more detailed instruction on master reset, See Performing a master reset.

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Series 3 Technician's Installation and Service Training Manual

Advanced Troubleshooting Commercial Operator (Controller)



Warning Electrical Shock Hazard

Next verify the voltage output on TB12. Set your voltmeter to VDC 200. Place your black lead on M1 and your red lead on M2. Press the program button one time and verify the Open LED is illuminated. Check your volt reading. It should read either + or — 54VDC. Press the program button again to turn off the open LED. If it reads excessively high or low, + or— 5VDC, Replace the board.

Leave your leads on M1 and M2. Press the program button one time and verify the Close LED is illuminated. Check your volt reading. It should read opposite + or — 54VDC of the test of the open cycle test. Press the program button again to turn off the open LED. If it reads excessively high or low, + or— 5VDC, Replace the board.

Verify motor cable does not have a short. Unplug the motor cable from the motor head. Set voltmeter to Ohms. Place the black lead on one of the wires in the motor cable and the red on the other. You should read zero ohms. If it ohms out. Replace motor cable.

Once everything has checked out or been repaired and before any accessories are wired into the controller, perform a master reset by pressing and holding the reset button. While holding the reset button down, press and hold down the red program button. Release the reset button only and wait for the acknowledge light to flash once. Then release the program button. After releasing the program button you will receive 2 confirming flashes of the acknowledge LED. For more detailed instruction on master reset, See Performing a master reset.

Cycle the operator through its calibration process. See initial controller set up page.

Once the operator is fully calibrated, you may begin the process of verifying and installing accessories per the respective pages of instruction.

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Adjusting potentiometers

There are two adjustable potentiometers on the control board that allow you to adjust the power to the motor and closing sensitivity of the close cycle. (Figure A)

The screwdriver slot of each potentiometer adjusting screw slot has an arrow on the end to indicate its position.

It only rotates clockwise to approximately the 4 o'clock position indicator and counter-clockwise to the 8 o'clock position indicator.

Turning past the internal stops at these points will break the potentiometer and require circuit board replacement.

Use only a small slotted technicians screwdriver, no larger than the slot provided to avoid damaging the potentiometer. (Figure B)

The factory setting for this device is with the arrow at the end of the screwdriver slot pointing at the 1:00 o'clock position

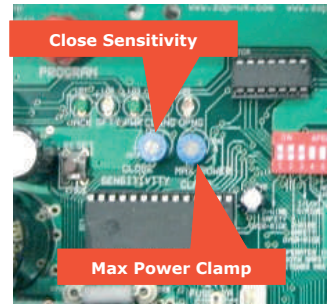
Only make small incremental turns equivalent to 1 clock position at a time.

The close sensitivity adjusts counter-clockwise to reduce the sensitivity (increase the closing force) of the operator or clockwise to increase the sensitivity (decrease the closing force) of the operator.

The Max Power Clamp adjust the overall power output to the motor. It adjust counter-clockwise to increase the power output, and clockwise to decrease the power output to the motor.

You should never have to turn the potentiometers past the 9 o'clock position indicator to cause proper functioning of the operator. If so, there is problem with either you operator sizing requirement or with the door itself.

Contact tech support with any questions.



(Figure A)



(Figure B)

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Performing a Master Reset

To perform a Master reset

Locate the program button. (Figure A)

Locate the reset button. (Figure A)

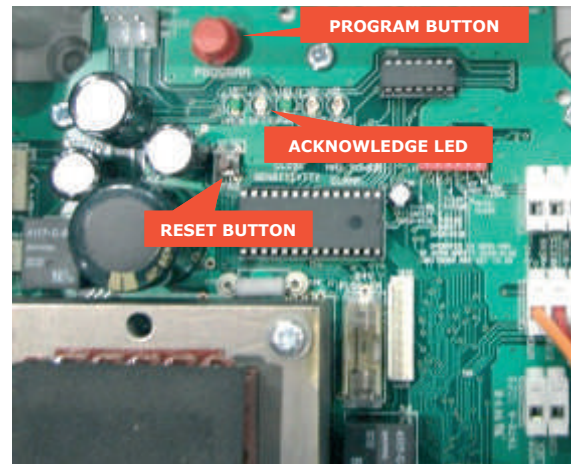
Press and hold down the reset button.
(Figure A)

While holding the reset button down, press and
hold down the red program button.
(Figure A)

Release the reset button only and wait for the
acknowledge light to flash once.

Then release the program button.

After releasing the program button you will
receive 2 confirming flashes of the acknowledge
LED.



(Figure A)

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Performing a Factory Reset

To perform a Factory reset

Disconnect the power supply for 5 minutes.

Restore power supply.

Locate the program button. (Figure A)

Locate the reset button. (Figure A)

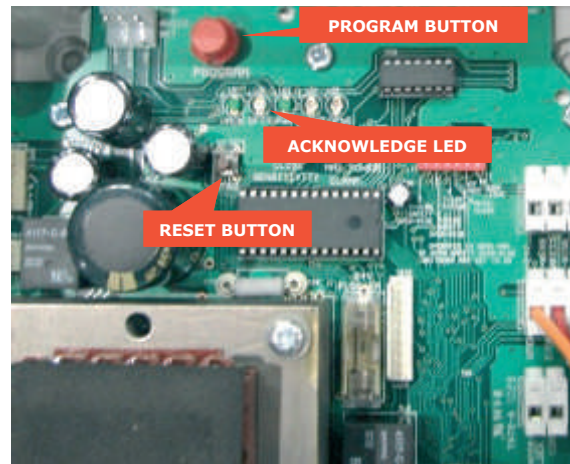
Press and hold down the reset button.
(Figure A)

While holding the reset button down, press and
hold down the red program button.
(Figure A)

Release the reset button only and wait for the
acknowledge light to flash once.

Then release the program button.

After releasing the program button you will
receive 2 confirming flashes of the acknowledge
LED.



(Figure A)

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Series 3 Technician's Installation and Service Training Manual

24V Troubleshooting



**Warning Electrical
Shock Hazard**

Ensure Power led is illuminated (Figure A)

Set voltmeter to VDC 200.

Locate TB9. (Figure B)

Insert black lead into 0V terminal of TB9.
(Figure C)

Place Red lead onto 24V power terminal of TB9.
(Figure C)

It should read 31-33VDC

If voltage is excessively high or low, replace
control board

If no voltage, See next step.

Remove cover of 24v fuse with a small
screwdriver or needle nose pliers.(Figure C)

Leave black lead of voltmeter in 0V of TB9

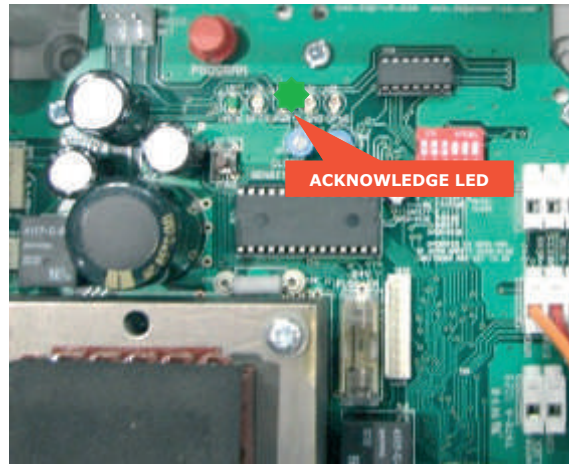
Place Red lead onto bottom of 24V Fuse. It
should read approx. 31-33VDC.

If voltage is excessively high or low, replace
control board

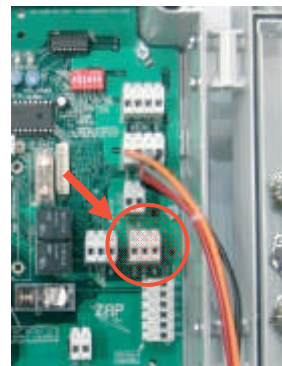
Place red lead onto top of the 24V fuse. If fuse
is good, it should read approx. 31-33VDC as
well.

If no voltage is present at top of fuse replace
fuse 5x20mm 2 amp 250V fuse

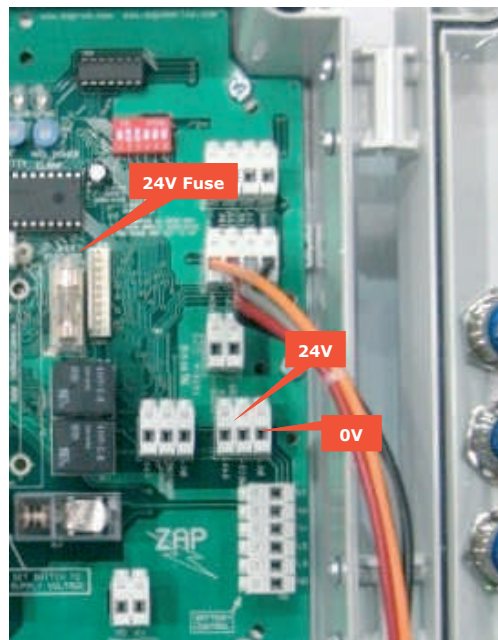
To replace fuse:
Isolate power supply
Ensure fuse clamps close firmly around fuse
Restore power supply



(Figure A)



(Figure B)



(Figure C)

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Series 3 Technician's Installation and Service Training Manual

Single Contact Control Device Trouble Shooting



**Warning Electrical
Shock Hazard**

Cyclic Operation Device

Locate Radio Control accessory terminal (Figure A)

Check to see if wiring and plug on TB9 is securely connected to TB9 and test. If no function, completely disconnect device at the plug terminals

Using a small technicians screwdriver jump the terminals labeled radio and common.

The door should function.

If not, check to ensure case lid is plugged on correctly to TB3

Re-try.

If no operation, consult basic controller trouble shooting.

If door operates and stops with each jump of these two terminals trouble shoot device per it's manufacturers instructions.

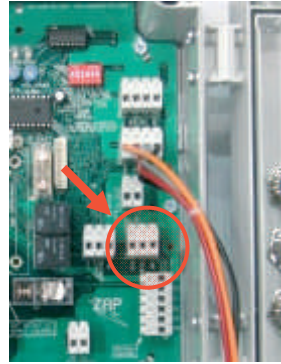
Open Only Single Contact Device

Locate TB3 on the control board. (Figure B)

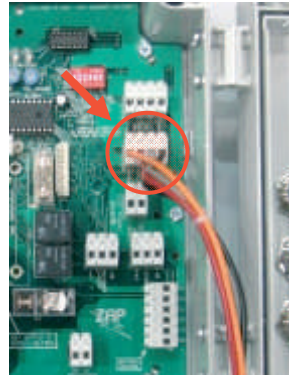
Check to see if wiring and plug is securely connected to TB3 and test by pressing the Open button on controller.

If door does not function consult basic controller trouble shooting page.

If door functions OK, disconnect device and troubleshoot per the device manufacturer's instruction.



(Figure A)



(Figure B)

ZAP Series 3

Simply Logical

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Series 3 Technician's Installation and Service Training Manual

Additional 3 Button Station Control Device Trouble Shooting



**Warning Electrical
Shock Hazard**

Ensure plug on TB3 is connected securely.
(Figure A)

Inspect all wiring for control station and verify
there are no loose connections.

Test by pressing the open button on the ZAP
Controller.

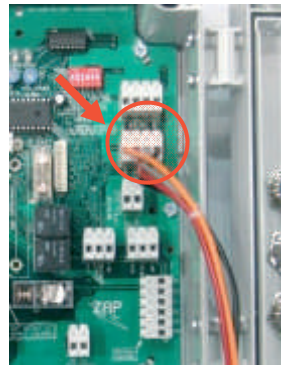
If no function, disconnect all wiring for the extra
three button device and verify original ZAP
wiring is in place as follows. (Figure B)

Orange Wire to Open
Red Wire to Stop
Grey Wire to Close
Black Wire to Common.

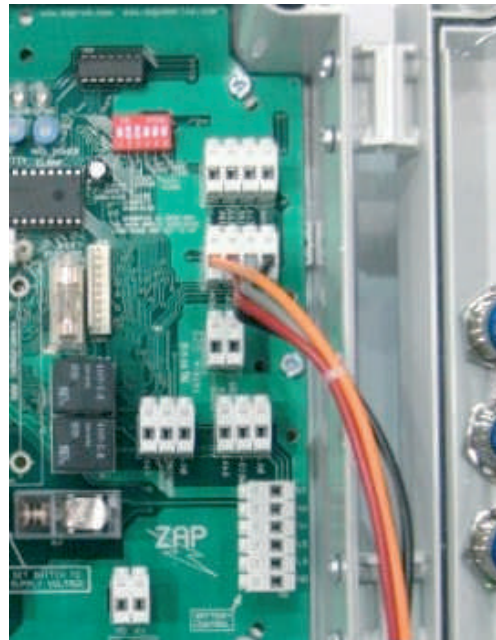
Ensure plug on TB3 is connected securely.

If no operation , consult basic controller trouble
shooting.

If door operates from controller case lid, use a
volt meter to check continuity if extra three
button station wiring circuits. Remember the
stop circuit is a N/C circuit when testing and the
open and close circuits are N/O. Consult wiring
Extra 3 button Station page to verify wiring of
extra 3 button station and or trouble shoot
device per it's manufacturers instructions.



(Figure A)



(Figure B)

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ZAP Motor Assembly Service (Belt and Bearing Replacement)

Belts and bearings are designed for replacement every 20-30k cycles.

After removing the operator from the torsion shaft locate the three nuts on the back plate of the operator. (Figure A) Use a 10mm socket wrench and a 10mm open wrench to loosen the nuts and set aside where they will not be lost.

Remove the back plate. (Figure B)

Grasping the pulley, lift the pulley, bearings and belt from the motor frame. (Figure C)

Remove the belt from the pulley.

Remove the rear bearing, this is the bearing facing you as you removed the pulley from the operator. (Figure D)

Turn the pulley over and remove the set screws from the pulley boss and set aside where they will not be lost. (Figure E)

Remove the front bearing. (Figure F)

Place the new bearing on the front side of the pulley (Figure G)

Re-install the set screws. (Figure H)

Now replace the back bearing. (Figure I)

Ensuring you have the proper belt, place the belt on the large pulley with the bearings.

Slip the belt onto the lower (smaller) pulley ensuring you feed the belt to the interior side of the tensioning pulley and the bolt to the just offset from the drive pulley. (Figure J)

Now slip the bearing into the circular hole of the motor frame. (Figure J)

Ensure all three spacers bushings are in place and replace the back plate. (Figure K)

Secure in place with the three nuts. (Figure L)

Re install the motor head on the torsion shaft.



Figure A



Figure B



Figure C



Figure D



Figure E



Figure F



Figure G



Figure H



Figure I



Figure J



Figure K



Figure L

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ZAP Motor Assembly Service (Bowden Cable Replacement)

Release the belt tension from the operator by lifting the over-ride lever. Disconnect the adjusting chain from the D shackle.

On the bracket connecting the override lever to the track or jamb of the door, remove the retaining c-clip and place the c-clip in a place where it will not be lost.

It is not necessary to remove the operator from the torsion shaft to complete the following.

Using a pair of pliers or a 8mm wrench. Loosen the nut on the end of the Bowden Cable on the operator head. Set the nuts and lock washers in a place where they will not be lost. (Figure A)

Ensure you remove the nut and washer on the lower end of the connecting rod as well. (Figure B)

Remove the C clip that connects the Bowden cable to the lower bracket on the operator. (Figure C)

Remove the Bowden cable by sliding it through the bottom bracket on the operator. (Figure D)

Slide the new Bowden cable into the bottom bracket on the operator. (Figure D)

Replace the c-clip onto the Bowden cable above the bottom bracket on the operator. (Figure E)

Replace the lower nut and lock washer onto the end of the Bowden cable lug and ensure it is screwed all the way to the bottom of the threaded shank. (Figure F)

Insert the lug fully into the upper bracket and secure in place with the lock washer and nut. (Figure G)

Reconnect the Bowden cable to the bracket connecting the override lever to the track or jamb of the door.

Reconnect the adjusting chain from the D shackle and the over-ride lever. Adjust belt tension and lock the over-ride lever down.



Figure A



Figure G



Figure B



Figure C



Figure D



Figure E



Figure F

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ZAP Motor Assembly Service (Motor Replacement)

Remove the back plate, driven pulley and belt per the belt and bearing replacement instructions.

On 8825 Models, a snap ring must be removed to remove the drive pulley on the motor. Using a pair of snap ring pliers, remove the snap ring and put in a place where it will not be lost. (Figure A)

On 825 models, a retaining screw must be removed to remove the drive pulley. Using a Phillips screwdriver, remove the snap ring and put in a place where it will not be lost. (Figure B)

Remove the drive pulley, (Figure C)

Remove the key stock (8825) or woodruff key (825) from the drive shaft of the motor. (Figure D)

Remove the 3 motor mounting bolts that secure the motor to the mounting plate. (Figure E)

To install the new motor, reverse the above steps, ensuring the motor is mounted in the same mounting holes and that the key stock or woodruff key is installed.



Figure A



Figure B



Figure C



Figure D



Figure E

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Notes:

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