

Installation/Owners Manual

PATRIOT RSL

Vehicular Slide Gate Operator



MADE IN THE USA



Heavy Duty

Battery Powered

Solar or AC Charged

PATRIOT Series AUTOMATIC GATE OPERATORS

This Patriot Gate Operator is intended to be installed on the four different classes of gate operators identified in the UL325 Standards.

RESIDENTIAL VEHICULAR GATE OPERATOR – CLASS I

A vehicular gate operator (or system) intended for use in garages or parking areas associated with a residence of one-to four single families.

COMMERCIAL/GENERAL ACCESS VEHICULAR GATE OPERATOR – CLASS II

A vehicular gate operator (or system) intended for use in a commercial location or building such as a multi-family housing unit (five or more single family units), hotel, garages, retail store, or other buildings accessible by or servicing the general public.

INDUSTRIAL/LIMITED ACCESS VEHICULAR GATE OPERATOR – CLASS III

A vehicular gate operator (or system) intended for use in an industrial location or building such as a factory or loading dock area or other locations not accessible by or intended to service the general public.

RESTRICTED ACCESS VEHICULAR GATE OPERATOR – CLASS IV

A vehicular gate operator (or system) intended for use in a guarded industrial location or building such as an airport security area or other restricted access locations not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.

Solar Friendly

The Patriot system design and the accessories recommended are all Solar Friendly meaning that they require the least amount of energy possible to perform the job they were designed to do. The solar option allows you to install the gate operator in remote areas or in applications where you prefer to be solar charged. Solar charging provides additional isolation from lightning that might damage the unit via the AC power needed for the transformer.

BATTERY REQUIRED FOR OPERATION *(Battery not included)*

Recommended battery type:

Battery 12-volt, Group U-1; sealed (maintenance free); 30 amp hour minimum.

Using a smaller amp hour battery may cause damage to the charging system.

The wiring harness has two 1/4" ring terminals to connect to battery posts.

CAUTION: Do not install wet cell battery into control box; this type of battery usually has removable caps used for service and will vent into control box.

The battery is charged using the 120V AC Powered Transformer (PN #520004) **OR** the Patriot Solar Panel kit (PN 520025). Typically only one panel will be required. For information on what you can expect from a solar charged system see the solar charging section of this manual. Accessories that are added to your gate operator must be solar friendly accessories.

PLEASE READ THE ENTIRE MANUAL CAREFULLY PRIOR TO INSTALLATION.

Study the entire Safety Section paying particularly close attention to the entrapment zones and install monitored entrapment devices to protect all entrapment zones identified. Installation by a Qualified Technician is recommended to verify all safety concerns are addressed.

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USAutomatic Part # 720005



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Entrapment Devices Required and Approved for Operation

Effective August 1, 2018 a vehicular slide gate operator must have provisions for, or be supplied with, at least two independent entrapment protection means for each direction of travel as specified in current UL325 standard Table 31.1. At installation, both entrapment protection devices must be installed and operational before gate operation is allowed.

USA automatic control boards utilize type A (Inherent entrapment protection system) as the first entrapment protection means identified. The second entrapment device identified must be a monitored Type B1 or Type B2 device that has been tested and approved with the gate operator. These devices are listed below.

USA automatic control boards can monitor one photo eye (B1) for the open direction, one photo eye (B1) for the closed direction and one contact edge (B2) for the open/close direction. If additional entrapment devices are required the USA automatic expansion module (part # 500015) is required

Type B1 - Non-contact sensor (photoelectric sensor or the equivalent). Identified as Normally Closed N/C contact switching.

Type B2 - Contact sensor (edge device or the equivalent). Identified as 10K resistor installed for presence monitoring.

Type D - Actuating device requiring continuous pressure to maintain motion of the gate.

External entrapment devices approved for use are listed below

Wired Contact Edge Type B2 Devices

Manufacturer: ASO

Models: Sentir Edge 95.25, 92.20, 85, 35.55, 65, 25.30, 25.45, 15.10

Manufacturer: Miller Edge

Models: MGR20, MGS20, ME120, MG020, ME112, MG123

Wireless Contact Edge Type B2 Devices

Miller Edge Model: R Band RB-G-K10

Transmitter Solutions: IGAZE RE KIT-UL

EMX Model: WEL-200K

Non-Contact sensors (photoelectric sensor or the equivalent) Type B1 Devices

Manufacturer: USA automatic, LLC

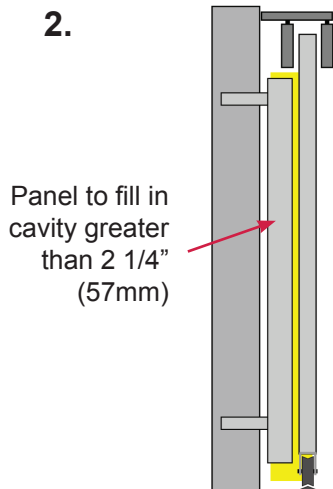
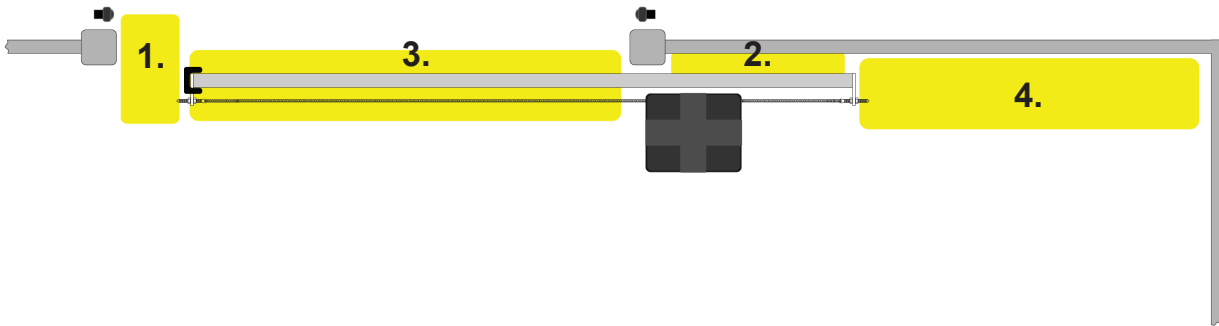
Models: 550011, 550014

The entrapment zones illustrations on the following page defines the most common entrapment areas. It is the responsibility of the installer to identify all entrapment areas and install the appropriate compliant monitored entrapment device or devices to protect each area identified.

USA automatic recommends upgrading all systems to current UL325 standards.

ENTRAPMENT ZONES

The illustrations below are a guide to help identify entrapment areas for slide gate installations that must be protected. Other entrapment areas may exist and must be identified by the installer and protected by the appropriate monitored entrapment protection device for the situation.



Zone 1 - Leading edge of gate where it meets a stop post, 2nd gate or other immovable object. Recommended monitored entrapment protection type B1 wireless contact sensor or type B2 photo eye or equivalent.

Zone 2 - A gap, measured in the horizontal plane parallel to the roadway, between a fixed stationary object nearest the roadway (such as a gate support post) and the gate frame when the gate is in either the fully open position or the fully closed position, shall not exceed 2 1/4 in. (57 mm).

Exception: All other fixed stationary objects greater than 16 in. (406 mm) from the gate frame shall not be required to comply with this section.

Zone 3 - The path the gate travels. Recommended monitored entrapment protection type B1 photo eye or equivalent.

Zone 4 - Gate opens toward an immovable object with less than 16 inches of clearance - recommended monitored entrapment protection type B1 photo eye or equivalent. If space is less than 16", entrapment protection in this area is required.
(ASTM F2200: 7.1.1.1 and 7.1.1.2)



IMPORTANT SAFETY INSTRUCTIONS

WARNING - TO REDUCE THE RISK OF INJURY OR DEATH

1. READ AND FOLLOW ALL INSTRUCTIONS
2. SAVE THESE INSTRUCTIONS!!
3. Always keep people and objects away from the gate. NO ONE SHOULD CROSS THE PATH OF A MOVING GATE.
4. Test gate operator monthly. The gate must stop and reverse directions upon contacting a rigid object or when the secondary entrapment device is activated.
5. After all adjustments have been made to the sensitivity (current sense) circuit, secondary entrapment devices and all other external devices installed, the safety devices must be checked again. Failure to adjust and retest the gate operator can increase the risk of injury or death. A Qualified technician should check these periodically for proper operation.
6. Use the emergency release ONLY when gate is not moving.
7. KEEP GATES PROPERLY MAINTAINED. Tighten all bolts, lubricate wheels and chain.
8. THE ENTRANCE IS TO BE USED BY VEHICLES ONLY. Pedestrians must use a separate entrance.
9. Never let children operate or play with gate controls or any other activation device. Keep remote control away from children.
10. The operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening. The pedestrian access opening shall be designed to promote pedestrian usage. Locate the gate such that persons will not come in contact with the vehicular gate during the entire path of travel.
11. The gate must be installed in a location so that enough clearance is supplied between the gate and adjacent structures when opening and closing to reduce the risk of entrapment.
12. Do not attempt to enter the gate area while the gate is moving. Wait until the gate comes to a complete stop.
13. DO NOT ALLOW CHILDREN TO PLAY IN THE AREA OF THE GATE.
14. Do not allow anyone to ride on the gate.
15. Operate the gate only when it is fully visible, free of persons or obstructions, and properly adjusted.
16. All controls are located at least six feet away from the gate to eliminate the chance of the person operating the gate from coming in contact with the moving gate. Do not install external buttons, which can be used to operate the gate within the reach of children.
**Exception: Emergency access controls only accessible by authorized personnel may be placed at any location in line-of-sight of the gate.*
17. Both Safety Signs are installed, one on each side of the gate and visible in the gate area.



SAFETY INSTALLATION INFORMATION

Install the gate operator when:

- Operator is appropriate for the construction of the gate and usage class is correct for the installation.
- All exposed pinch points are eliminated or guarded.
- One or more contact sensors shall be located where the risk of entrapment or obstruction exist, such as the leading edge, trailing edge and post mounted both inside and outside of a vehicular slide gate.
- The gate is properly installed and moves freely in both directions. Do not over adjust the sensitivity adjustment to compensate for an improper gate installation.
- All openings of a horizontal slide gate are guarded or screened from the bottom of the gate to a minimum of 72 inches (1.83m) above the ground to prevent a 2 1/4 inch (57.2m) diameter sphere from passing through the openings anywhere in the gate, and in that portion of the adjacent fence that the gate covers in the open position. The gate panel shall include the entire section of the moving gate, including any back frame or counterbalance portion of the gate.
- The Reset button must be located in the line-of-sight of the gate. Activation of the reset button shall not cause the operator to start.
- Guarding is supplied for all weight bearing exposed rollers below 8 ft. or less above grade.

Non Contact Sensors - Type B1 - Photo Eyes or equivalent

1. See entrapment zones for suggestions on placement of sensors.
2. Care shall be exercised to reduce the risk of nuisance tripping, such as when a vehicle trips the sensor while the gate is still moving.
3. One or more non-contact sensors shall be located where the risk of entrapment or obstruction exist, such as the area reachable by a moving gate.

Contact Sensors - Type B2 - Contact Edge or equivalent

1. See entrapment zones for suggestions on placement of sensors.
2. A hardwired sensor shall be located and its wiring arranged so that the wiring between the sensor and the gate operator is not subjected to mechanical damage.
3. A wireless device such as one that transmits (RF) signals to the gate operator for entrapment protection functions shall be located where the transmission of the signals are not obstructed or impeded by building structures , natural landscaping or similar obstruction. A wireless device shall function under the intended end-use conditions.
4. One or more contact sensors shall be located where the risk of entrapment or obstruction exist, such as at the leading edge, trailing edge, and post mounted both inside and outside of a vehicular horizontal slide gate.

Constant Pressure - Type D - Emergency switch or equivalent

1. The gate operator controls must be placed so that the user has full view of the gate area when the gate is moving.
2. An automatic closing device (such as a timer, loop sensor, or similar device) shall not be employed. and no other activation device shall be connected.
3. Placard required shall be placed adjacent to the controls.



PARTS INVENTORY

All Operators include:

- Part # 590010 Slider Frame
- Part # 590020 Slider Cover
- Part # 500017 Control Board



Emergency Release Access Cover

- Part # 590030
- 1 per



Battery Controller

- Part # 520001
- 1 per



DC Adapter

- DC output @20 vdc - 1 amp
- Part # 520009
- with Patriot AC Models



Solar Charging Kit - 10 Watt

- Part # 520026
- with Patriot Solar Models



Entrapment Siren

- Part # 530010
- 1 per



Charge Control Harness

- Part # 630100
- 1 per



Photo Eyes

- Part # 550010
- 2 set per



Operators purchased with LCR Radio Controls include:

2 Button Transmitter

- Part # 030210
- 2 per



LCR Radio Receiver and Wire Harness

- Part # 030205
- 1 per



Antenna

- Part # 030208
- 1 per



Safety Signs

- Part # 601025
- 2 per



Optional Accessories & LCR Items:

See accessories section (pages 32-39) for complete list and descriptions

4 Button Transmitter - Part # 030212

Push to Operate Button - Part # 030215

Wireless Keypad - Plastic - Part # 050500

Wireless Keypad - Metal - Part # 050550

Garage Door Receiver - Part # 030214

12/24 Receiver - Part # 030207

Electric Gate Lock - Part # 070510

7 Day Timer - Part # 550015

Exit Sensor - Part # 070310

Metal Photo Eye - Part # 550014

External Reset Button - Part #630060

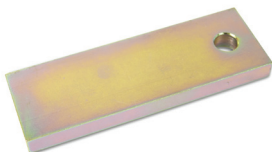
HARDWARE INVENTORY

BRACKETS

Chain Bolt Bracket

Part # 570010

2 per



1/2" Chain Bolt

Part # 570020

2 per



1/2" Adjustment Nuts

Part # 620070

4 per



Chain #41 - 10ft

Part # 640010

3 - 10' Boxes

4- Master Links



#41 Master Link

Part # 640020

4 per



1/4" x 1" Bolt

Part # 620012

4 per



1/4" SAE Washer

Part # 620013

4 per



Screwdriver

1 per



Warning Placard

Part # 601015

1 per



GENERAL TOOL REQUIREMENTS

- SAE Standard wrenches 7/16, 3/4
- Clamps
- Level
- 1/4 Inch Nut Driver
- Needle Nose Pliers
- Tape measure
- Chain Cutter
- Tape Measure
- Phillips Head Screwdriver

Your particular installation may require a welder, drill, or other hardware not included.



PREPARATION AND OVERVIEW

GATE QUALIFICATIONS/APPLICATIONS

This gate operator is rated for gates up to 32 feet in length and up to 600 pounds in weight. If your gate exceeds either one of these limits, please consult a qualified technician or the factory for application questions and advice.

USAutomatic is not responsible for failure to comply with the current UL325 standards, local building codes or improper installations.

Concrete pad mounting or post mounting by a qualified installer is the recommended method of securing the operator.

Note: High quality rollers with bearings will allow your gate to operate with minimal drag (minimal friction) and will decrease the load on the gate operator. Many type of slide gate designs exist. Choose a design that will decrease friction and required torque.

PROPER GATE DESIGN

IMPORTANT- A GATE OPERATOR CANNOT OVERCOME A POORLY DESIGNED GATE.

Since the gate is a major component of the system, great care and concern must be given to the gate design. USAutomatic, LLC is not responsible for any damage to a gate on which the gate operator is installed. A poorly installed or misadjusted gate could be damaged. It is the responsibility of the installer to verify proper gate installation prior to operator installation. As a general rule, a gate, which is to be automatically operated, must be stronger and smoother than one operated manually.

- Does the gate slide smoothly without binds or excessive resistance?
- Slide gates should slide level and plumb to prevent the operator from having to pull the gate up or down grade when opening or closing.
- Is the gate frame of substantial strength without excessive weight?
- Will the gate hit the catch correctly without being hand-guided or pushed into the catch?
- Are the bearings / wheels suited for the number of cycles expected per day?
- Is the track area designed to keep dirt and rocks from obstructing the gate movement?

If any of these problems exist, they must be corrected to achieve a reliable automatic gate system.

All Gates must have smooth bottom edges, no protrusions should exist. If gate hardware or sensors protrude, they must have smooth surfaces free of any sharp cutting edges that do not exceed ½ inch beyond the base of the gate. (ASTM F2200)

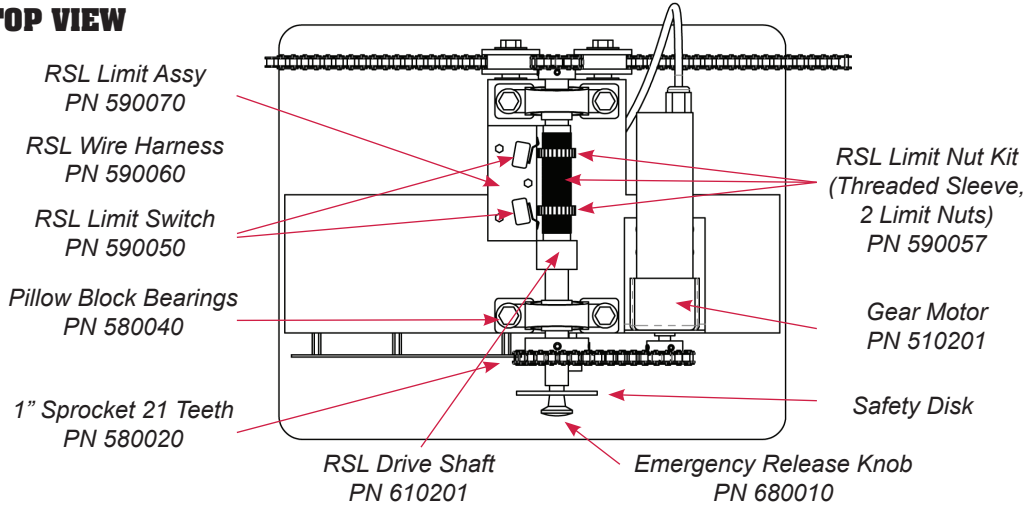
All weight bearing exposed rollers 8 ft (2.44 m), or less, above grade shall be guarded or covered.

Positive stops shall be required to limit travel to the designed fully open and fully closed positions. These stops shall be installed at either the top of the gate, or at the bottom of the gate where such stops shall horizontally or vertically project no more than is required to perform their intended function.

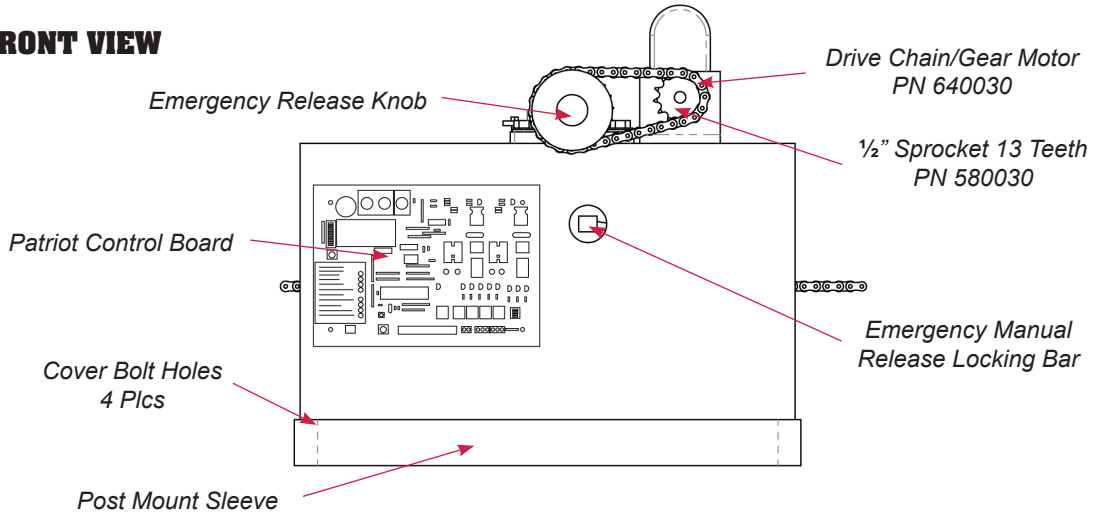
All gates shall be designed with sufficient lateral stability to assure that the gate will enter a receiver guide.

Operator Illustration and Descriptions

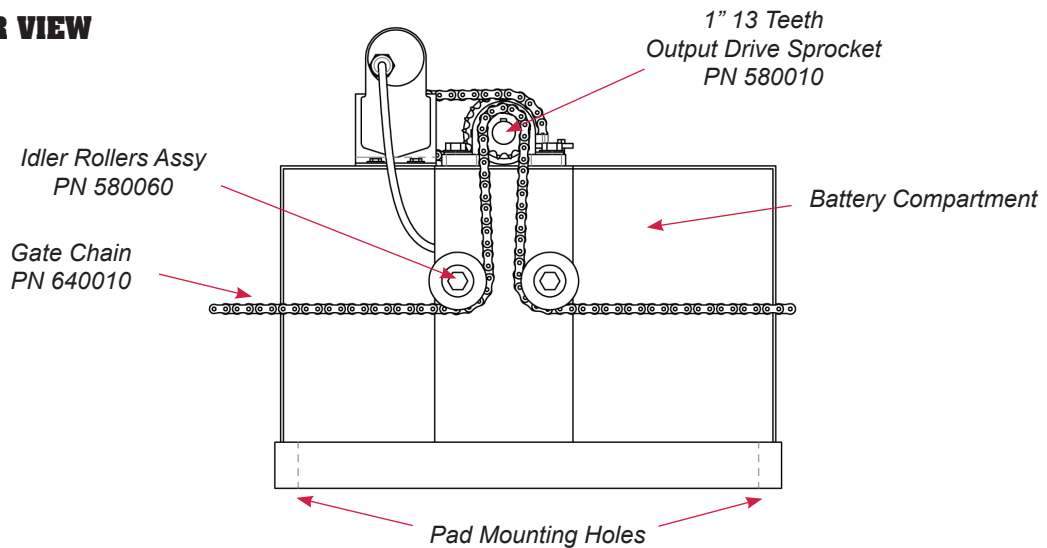
TOP VIEW



FRONT VIEW



REAR VIEW



I

Mounting Site Review

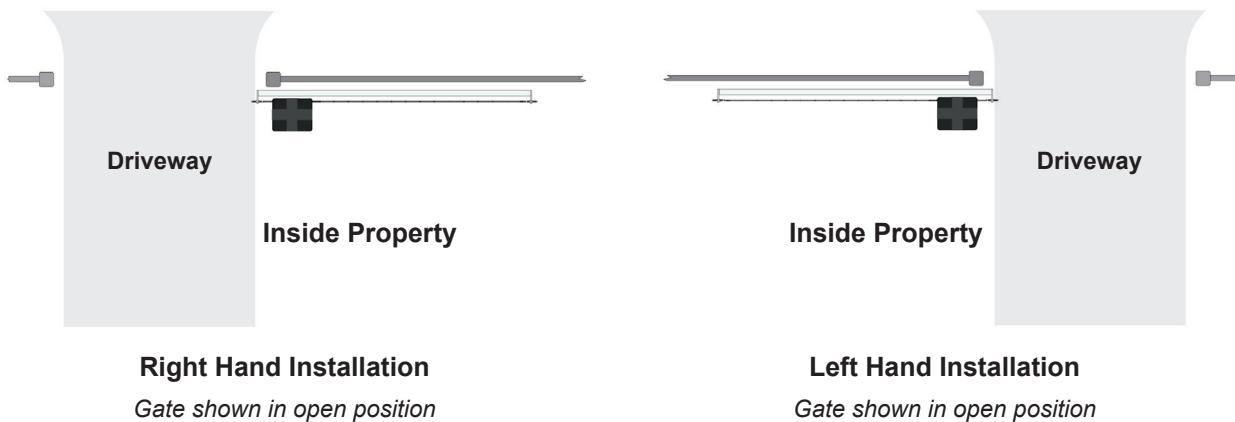
Review the following items prior to installation and predetermine the solution to any problems which may exist:

1. Will the unit open the gate by sliding to the left or the right?
Standing on the inside of the property looking out, an operator installed to the left of the drive is a left hand installation, an operator installed to the right is a right hand installation. See below.
2. How will the chain brackets attach to the gate? *See page 14 Step 3*
3. How will the operator be mounted (on a pad or on a post) *See page 11 Step 2.*
4. For AC Charged System - *See page 17 Step 10a*
5. For Solar Charged System - *See page 18 Step 10b*
6. How will accessory control wiring, if any, be brought to the control box? Knockouts are provided in operator base plate for conduit connections. *See page 13*
7. Have all entrapment areas been identified? *See page 3*

Do not mount in areas by automatic sprinklers, or flood prone areas. It is important that the control board, control devices, and the battery compartment stay dry.

NOTE: Regardless of mounting method, ensure that operator base does not extend into the driveway area, where damage from traffic could occur.

Right Hand - Left Hand Installation



2 Mounting Operator

PAD MOUNT

The operator base has four pre drilled holes and four access holes, which are covered with press in hole plugs. These holes are sized to accommodate 1/2 anchor bolts and the plugged hole will accept a standard size 3/4 inch socket. Keep the operator parallel with the gate while securing.



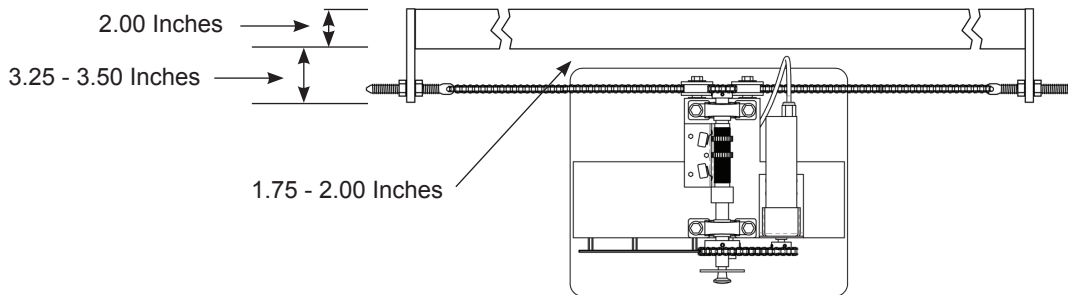
POST MOUNT

The operator base is equipped with a four-inch post receiver located on the bottom of the base. This receiver will accept a square or round four-inch post. Keep the operator parallel with the gate and level while securing in place.

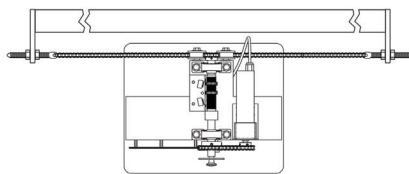


Set the operator in place (pad or post). Ensure that the chain bolts, once installed, will be properly aligned with the chain rollers. Once alignment is verified, secure operator in place using bolts for pad installation and welding for post installation. Keep the operator parallel with the gate while securing in place.

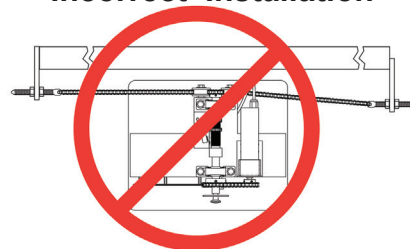
Correct dimensions for installed operator - Pad or Post mount



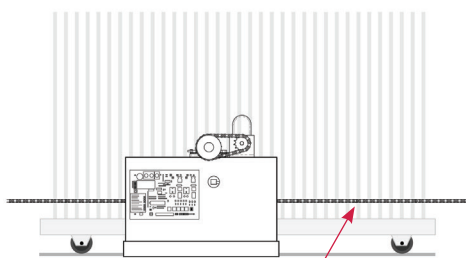
Correct Installation



Incorrect Installation



Correct Installation



chain will have a few inches of drop across the span of the gate

Incorrect Installation



2a Post Mount Installation

POST SPECIFICATIONS

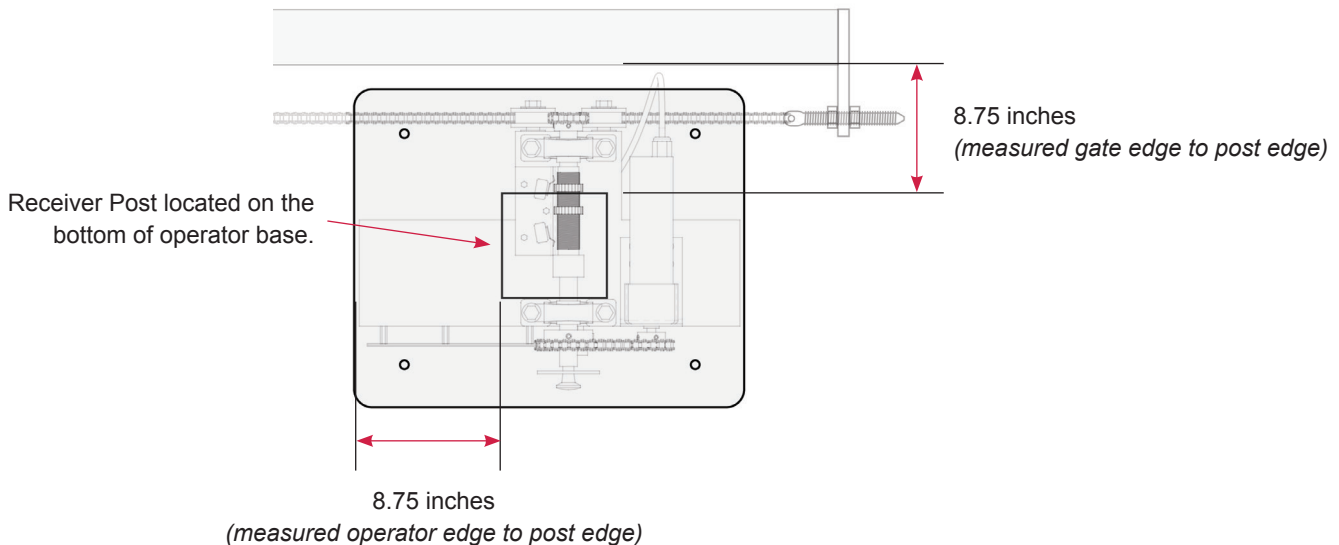
Steel post is an optional mounting method. The operator is designed to handle a 4-inch round or square thick wall post. The operator can be installed directly onto the post or a steel frame can be constructed on the top of post. If the method chosen is to construct a frame see dimensions in pad mount section (page 14) for bolt locations and size. If the direct post mount option is chosen, use the dimensions that follow to install. Also consider that additional bracing might be needed.

POST LOCATION TO GATE EDGE AND HOLE PREPARATION

See illustration for operator base overall dimensions.

Post must be parallel to gate edge. Hole depth should be at least 36 inches and bell shaped to reduce operator movement to a minimum. **The post must be concreted in place.**

NOTE: Remember to mount the operator high enough above ground level so that the post and operator can be welded securely.



2b Pad Mount Installation

CONCRETE PAD CONSTRUCTION

The mounting foundation must be very stable and of sufficient strength to prevent any movement. Mounting site must be clear of flooding.

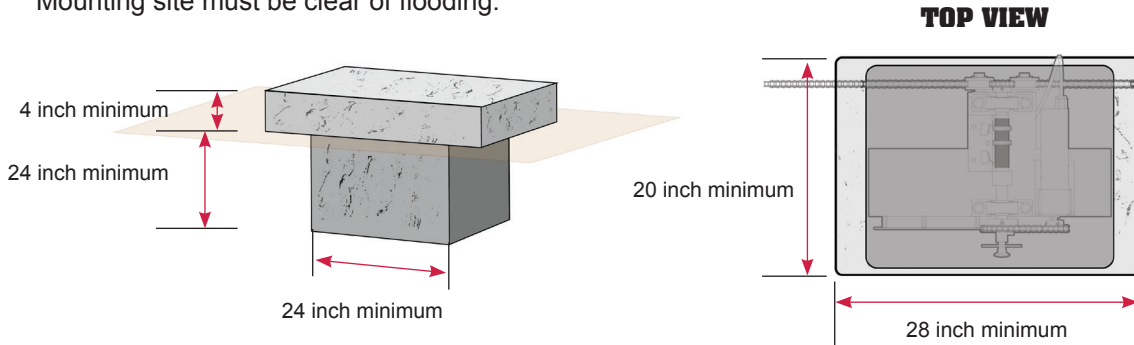
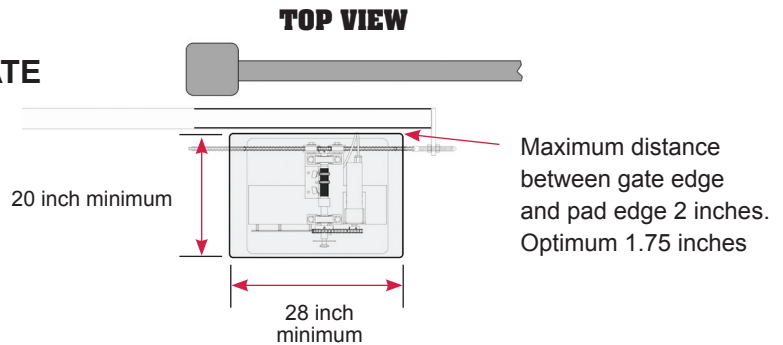


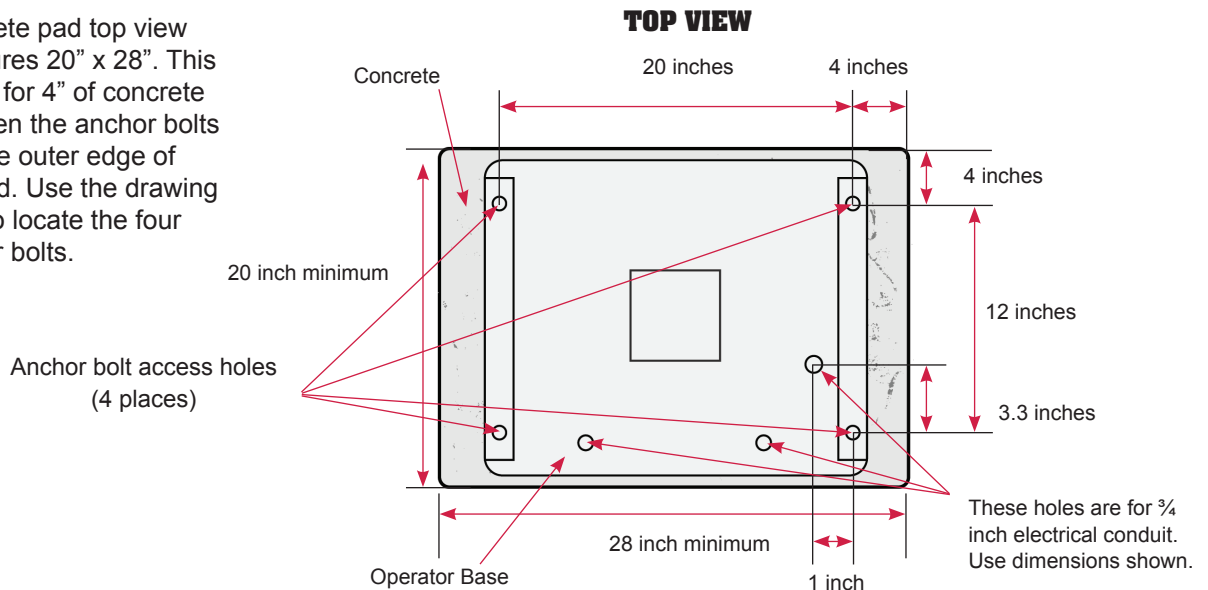
Illustration shown is for dirt surface area. Surface areas of different material may require different pad dimensions. When determining pad location, ensure that the operator's outer edge is a safe distance away from the driveway to avoid damage from traffic.

CONCRETE PAD LOCATION TO GATE



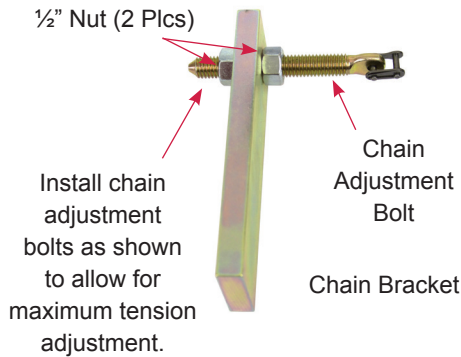
CONCRETE PAD ANCHOR BOLT LOCATION

Concrete pad top view measures 20" x 28". This allows for 4" of concrete between the anchor bolts and the outer edge of the pad. Use the drawing here to locate the four anchor bolts.



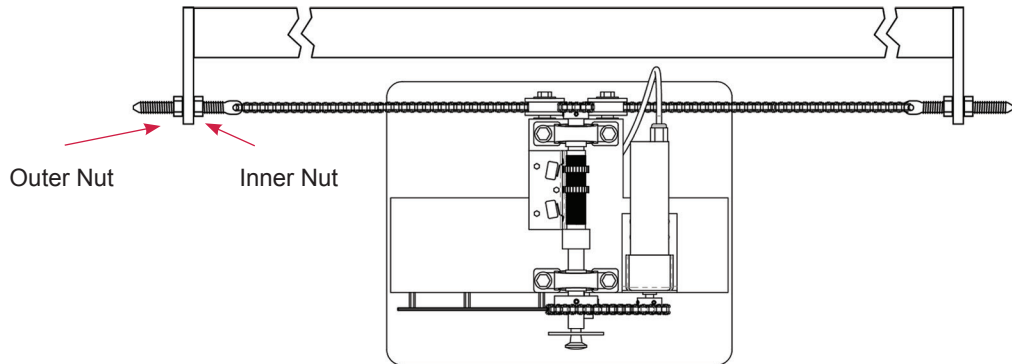
3 Install Chain Brackets to Gate

With the operator securely mounted, use the following procedure to locate and install gate brackets to gate ends.



Install the chain adjustment bolt into the chain bracket as shown.

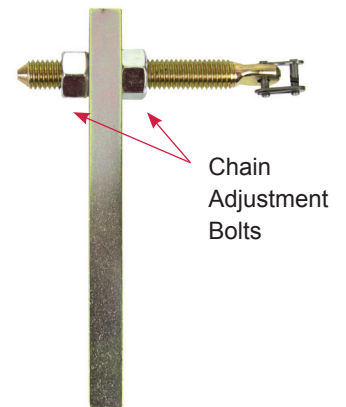
Slide the gate fully open. Using the diagram below locate the correct position for the gate bracket. Clamp the bracket in place and repeat for gate in the fully closed position. Before welding gate brackets in place, refer to page 11 to ensure correct installation. Once alignment is correct, weld chain brackets in place.



4 Connect Chain

Using the master links supplied connect one end of chain to one of the chain adjustment bolts. Use additional master links to connect chain together as needed to route chain through the operator.

In most installations, the chain will have to be cut to the desired length. To determine the desired chain length, loosen the chain adjustment bolts to allow for maximum adjustment. Pull the emergency release knob to allow the chain to roll freely through the operator. Pull the chain to mate up with the remaining chain adjustment bolt and mark link that needs to be cut. Once link is cut, install master link and connect to chain adjustment bolt.



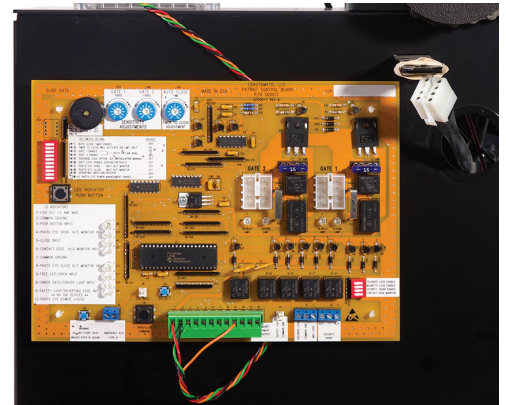
5 Adjust Chain Tension

The outer 1/2 inch nut on the chain adjustment bolt adjusts chain tension. It is important not to over tighten the chain or premature wear will result. It is also important not to allow the chain to be too loose. Once the chain tension is correct, secure the inner 1/2 inch nut by tightening it against the chain bracket. The chain will have a few inches of drop across the span of the gate when correct.

6 Install Patriot Control Board

Part # 500017

Remove Patriot Control Board from cardboard package and mount on nylon standoffs. Push lightly at each corner to lock board in place.



7 Installing Receiver, Battery Controller, and Entrapment Siren

- Connect the wiring harness to the charge controller.
- Using the 2 nylon nuts provided, install Charge Controller. Use a 1/4" nut driver to secure.
- Install the receiver on top shelf using the 2 phillips screws provided. Connect antenna to receiver.
- Plug the green terminal plug into the control board at J2 connector.
- Connect the Siren power leads to the J4 Terminal.

Black - COMMON GND

Red - OUTPUT 12V

Wiring Receiver to J2 accessory plug

Red - Pin 1 (+12 vdc)

Black - Pin 2 (Ground/Common)

Green - Pin 3 (P1 N/O)

Orange - Pin 9 (P2 N/O)



8 Installing Monitored Entrapment Protection Devices

When the installation requires more than 1 monitored contact edge or 2 monitored photo eyes, the Monitored Entrapment Device Expansion Modul must be installed. (USAutomatic Part# 500015)

8a Monitored Photo Eye (Type BI) Installation for Entrapment Protection ONLY. (page 3)

Connect wires per the table below or the [drawing on following page](#).

All wiring should be done with power disconnected from control board.

Installer must determine if the photo eye is being used for gate Open or Close direction protection from entrapment. This must be done to determine where the N/C contact wire is going to be connected. Once known use the chart below or diagram on following page for wiring.

The corresponding dipswitch must also be turned ON as indicated on page 31.

Closed direction dipswitch DS1 switch 8.

Open direction switch DS1 switch 7.

Photo Eye wiring for Entrapment Device Protection	
Photo Eye Connections	Patriot Control Board Connections
Power +12 vdc	J2 pin 12
Power ground / O	J2 pin 2 or pin 7
Common	J2 pin 2 or pin 7
N/C contact Closed Direction	J2 pin 8
N/C contact Open Direction	J2 pin 4

During installation +12 vdc power is required to align the photo eye beam.

Set control board DS1 dipswitches as follows for the installation:

Control Board Dipswitch Settings for Installation	
DS 1 switch 3	OFF – press down on the left hand side
DS 1 switch 4	OFF – press down on the left hand side
DS 1 switch 10	ON – press down on the right hand side

Install the photo eye at this time. Once power is applied to the system, verify alignment. Step 20.

Wiring Photo Eyes to the Control Board

Closed Direction Wiring

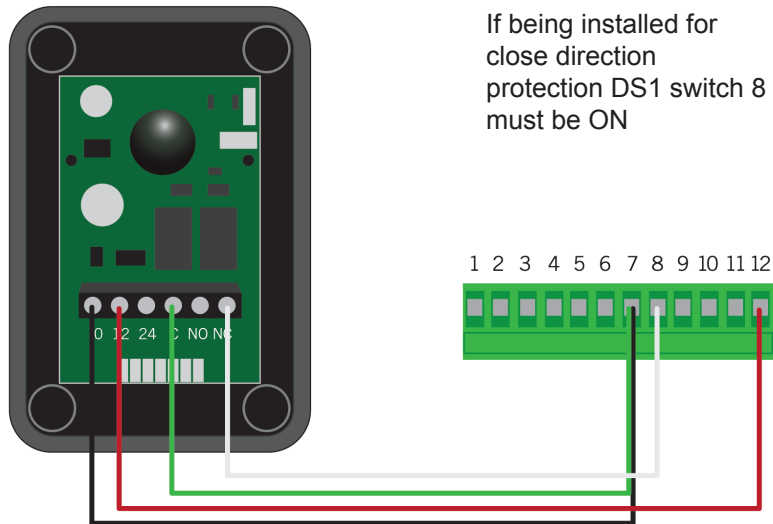


Photo eye "0" connects to J2 green plug pin 7.
Photo Eye "12" connects to J2 pin 12
Photo Eye "C" connects to J2 pin 7
Photo Eye "NC" connects to J2 pin 8

Open Direction Wiring

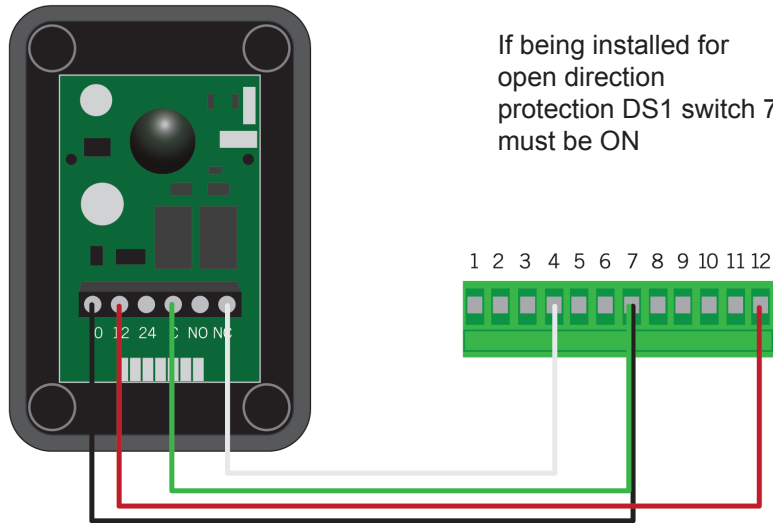


Photo Eye "NC" connects to J2 pin 4



8b**Monitored Contact Edge (Type B2) Installation** for Entrapment Protection ONLY.

Connect wires per the table below: All wiring should be done with power disconnected from control board. Contact edge must have 8.25K or 10K ohm resistor built into device.

Contact Edge #1 wiring for Entrapment Device Protection	
Contact Edge Connectons	Patriot Control Board Connections
N/O connection	J2 pin 6
Common	J2 pin 2 or pin 7
Contact Edge #2 wiring for Entrapment Device Protection	
Contact Edge Connectons	Patriot Control Board Connections
N/O connection	J7 pin 3
Common	J7 pin 2 or J2 pin 2 or pin 7

Installing Wireless Contact Edge (Type B2) Receiver

Contact Edge #1 wiring for Entrapment Device Protection	
Contact Edge Connectons	Patriot Control Board Connections
N/O connection	J2 pin 6
Common	J2 pin 2 or pin 7
Contact Edge #2 wiring for Entrapment Device Protection	
Contact Edge Connectons	Patriot Control Board Connections
N/O connection	J7 pin 3
Common	J7 pin 2 or J2 pin 2 or pin 7

8c**Constant Pressure (Type D) Installation**

Connect wires per the table below: All wiring should be done with power disconnected from control board. The included warning placard must be installed by the control switch.

Type D wiring for Emergency / Constant pressure Operation	
Constant Pressure Switch N/O type	Patriot Control Board Connections
N/O connection	J5 pin 1
Common	J5 pin 2



9 Install Battery

The charge controller harness and the operator wiring harness both must be connected to the battery.

Connect both red wires to the battery positive post.

Connect both the black wires to the battery negative post.

NOTE: DO NOT PLUG WIRE HARNESS INTO CONTROL BOARD AT THIS TIME.



10 Install Battery Controller Power Source (AC or Solar)

The USAutomatic battery controller can be powered by an DC transformer supplied with AC Models OR a solar panel supplied with Solar models. The DC Transformer and the Solar Panel are equipped with a DC plug for easy connection to the battery controller.

10a AC Charged System

The AC model gate operator comes with a DC Adapter (low voltage transformer) which plugs into the battery controller and can easily provide 575 cycles of operation a day without decreasing the battery charge. In the event AC power goes out the operator will operate for weeks on the battery (if cycles per day are below 20) before needing service. Accessories connected to the operator are critical. Always use Solar Friendly accessories to help avoid premature battery failure in cases of power outages.



The unique design of the charging system allows the transformer to be installed away from the gate area if needed. This means that on AC charged systems, the transformer's low voltage wire can be extended avoiding the expense of having an electrician install 120 VAC at the gate area.

Refer to the AC power source cable extension chart in Appendix B for wire size.

NOTE: All splices should be made in a dry enclosure or outdoor box.

NOTE: USAUTOMATIC RECOMMENDS A SURGE PROTECTOR ON ALL AC CHARGED INSTALLATIONS.



10b Solar Charged System



The solar option allows you to install the gate operator in remote areas or in applications where you prefer to be solar charged. Solar charging provides isolation from lightning that might damage the unit via the AC power needed for the DC Adapter. The use of solar friendly accessories will help prevent premature battery failure.

The Solar model Patriot gate operator comes with a 10 watt solar panel and is designed to provide enough cycles a day for most installations without needing more than one solar panel. Care must be taken to ensure the solar panel has full sun throughout the day; partial sun will give partial results. If no sun is present then a solar system is not practical no matter how many panels might be installed. The solar panel must be kept clean and in full sunlight.

The location of the solar panel is critical for proper battery charging. The panel needs to face a South to Southwest direction and be installed at the angle of the supplied solar panel bracket. For proper operation the panel must have unobstructed sun. Even a small amount of shade will cause the Solar Panel to cease charging. Something as tiny as a fingertip shadow will affect the Solar Panel.

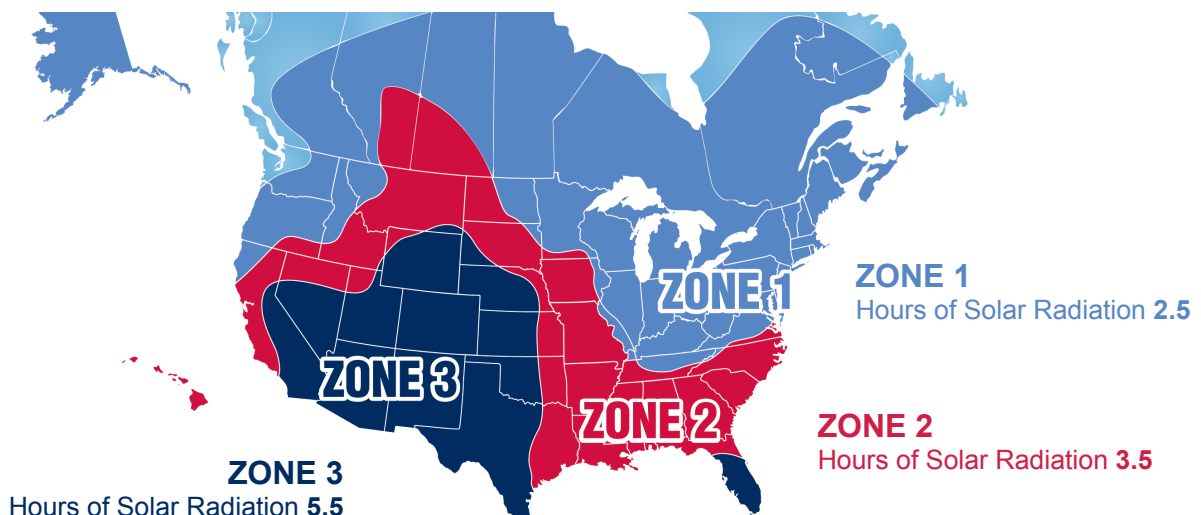
Solar panel may be moved up to 200 feet from the control box to achieve adequate sunlight. See power source cable extension chart Appendix B for proper wire size. For convenience use the USAutomatic 75' Cable Kit Part #520016.

See Region Map below to determine cycles that can be expected. These numbers are based on a basic system with the standard 10 watt solar panel. Adding solar friendly accessories will not have any great affect on the numbers stated. Using other accessories can cause premature battery failure.

GATE CYCLES PER DAY SOLAR CHARGED SYSTEM (Optional Solar Kit PN #520026)

Patriot RSL	REGION 1	REGION 2	REGION 3
10 Feet Travel Distance	22 cycles per day	35 cycles per day	60 cycles per day
20 Feet Travel Distance	10 cycles per day	17 cycles per day	30 cycles per day
30 Feet Travel Distance	7 cycles per day	11 cycles per day	18 cycles per day

Region 1 covers the area of the country receiving the least amount of solar radiation. On average the amount of charge time is 2.5 hours in region 1, 3.5 hours in region 2 and 5.5 hours in region 3.



11 Connect Power Source to Battery Controller

(DC Adapter or Solar Panel Kit)

The battery controller accepts inputs from either the DC transformer or the solar panel. The DC Adapter and solar panel come with a DC plug for easy installation. Once the power source is selected and installed connect the DC plug into the battery controller.



12 Install Safety Signs

Install the 2 warning placards in the gate area where they are visible from the inside and outside of the gate. These are required per UL 325 to make persons aware of the possible danger of an automated gate.

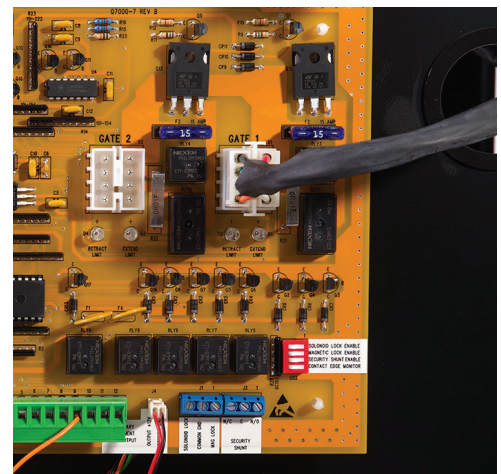


13 Connect Wire Harness Cable to Control Board

Before connecting the wire harness cable to the control board check the following:

- Verify that all previous steps were performed.
- Verify that the battery connections are correct red lead to positive and black lead to negative.
- Verify that nothing is in the path of the gate. If by chance it begins to move when power is applied, be prepared to disconnect the actuator cable.

The 8 pin plug on the wire harness cable must connect to either the Gate 1 or Gate 2 connector on the control board. Once cable is connected verify that the corresponding control switch for Gate 1 or Gate 2 is turned ON.



14 Photo Eye Alignment

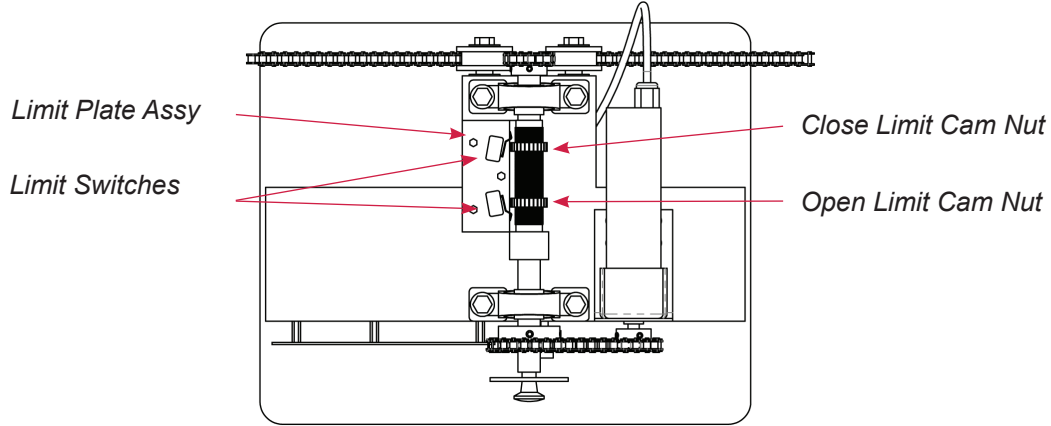
With power now applied the photo eyes can be aligned, Verify alignment and adjust as necessary



15 Operating Gate for the First time

Before operating the gate for the first time please verify the following items:

1. Pull manual release knob and slide gate in mid travel position.
2. Reengage manual release knob by pushing it inward and slowly rolling gate until knob slides in place.
3. Adjust limit cam nuts so that they are within 1 inch of the limit switches (see diagram)



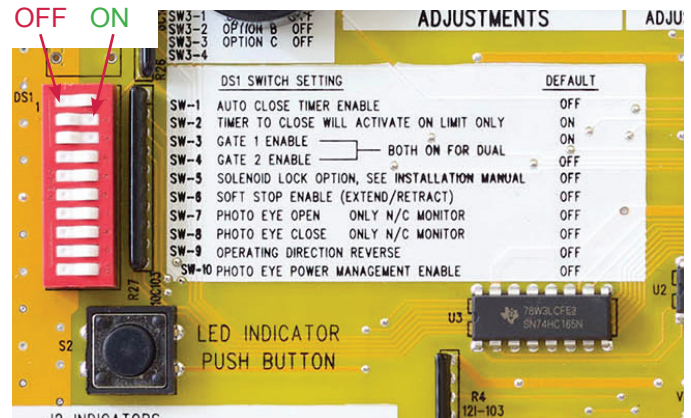
NOTE: This check must be performed before operating the gate for the first time. Failure to do so may damage the gate operator.

Before operating the gate lets make sure the Patriot RSL control board dipswitches are set correctly for your installation. Locate the dipswitches on the Patriot RSL control board.

Factory default dipswitch settings are 2 and 3 on.

ON - Down on right

OFF - Down on left



Identify your installation below and verify the standard dipswitch settings.

			Closed Direction Monitored Photo Eye	Open Direction Monitored Photo Eye	W/ Monitored Contact Edge
PATRIOT I	Right Hand	Dipswitches 2, 3 should be in the ON position	DS1 switch 8 and 10 ON	DS1 switch 7 and 10 ON	DS2 switch 4 ON
PATRIOT I	Left Hand	Dipswitches 2, 3, 9 should be in the ON position	DS1 switch 8 and 10 ON	DS1 switch 7 and 10 ON	DS2 switch 4 ON



16 Optional Soft Stop for Open and Close Position

The Patriot RSL control board is equipped with a selectable soft stop feature if desired. Understanding how this feature operates is required before turning ON any control switches or possible control board or gate damage may occur.

This feature reduces the gate speed when turned ON for approximately the last 18 inches of gate travel.

IMPORTANT: Before turning this feature ON, the gate open and close positions must be adjusted so that the gate is stopping about 24 inches short of the fully open and fully closed positions.

Once adjusted set DS1 switch 6 to ON.

17 Limit Switch Final Adjustment

1. **Locate the Open/Close command button on the Patriot control board.** This button will start the gate when pressed once, pressing it again will stop the gate.
2. **Press the Open/Close command button.** The gate should begin to open and allow gate to travel to open stop position.
3. **Press the Open/close command button the gate should begin to close allow gate to travel to close stop position.**
4. **At this time adjust open and close limit cams to allow gate to fully open and close.**
5. **Always adjust limit cam nut in mid travel position to avoid damaging limit switches.**

The limit switch adjustments are located on the top shelf of the operator. To adjust limits, press down on the limit plate assembly. This will release the limit plate from the limit adjustment cams and allow the cams to turn. Turn the limit adjustment cam which corresponds to the direction you want to adjust.

NOTE: WHEN THE LIMIT ADJUSTMENT CAM DEPRESSES THE LIMIT SWITCH ACTUATOR THE GATE WILL STOP.

DO NOT ADJUST THE LIMIT CAM NUTS PAST THE LIMIT SWITCH ACTUATOR ARM. THIS MAY RESULT IN DAMAGE TO THE LIMIT SWITCH. ENSURE THE LIMIT PLATE ASSEMBLY SNAPS INTO THE GROOVES ON THE LIMIT CAM NUTS PRIOR TO RESUMING OPERATION.



18 Sensitivity Adjustment and Entrapment Alarm and Auto Close Setting

The Patriot control board has 2 sensitivity adjustment dials located in the upper left corner of the control board. These adjustments control the amount of current the control board will allow the motor to draw from the battery to operate your gate. Minimum force is the least amount of current allowed. This circuit is inactive for the first second of gate operation.

A typical adjustment setting is between 4 to 7 on the adjustment dial. If a setting above 8 is required for proper operation without just cause, you should check the gate, gate hinges or linear actuator for possible problems.

Both sensitivity settings should be individually adjusted on dual gate systems. On single gate systems, adjust the setting for the actuator plug being utilized (Gate 1 or Gate 2) and then match the setting on the other sensitivity adjustment.

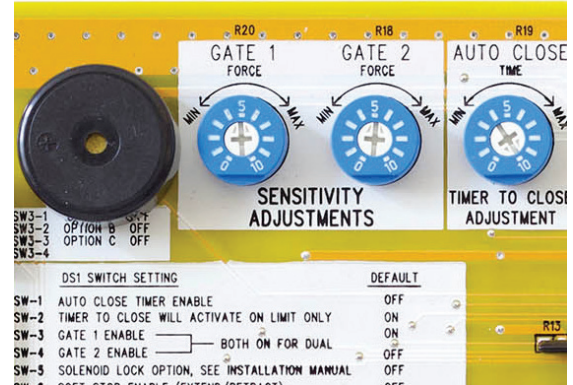
Entrapment alarm:

The entrapment alarm installed gives an audible alert whenever the gate sensitivity feature is activated twice before gate reaches an open or close limit. See chart step 19 for operation.

Auto Close Setting:

Important: Auto close should not be utilized unless safety devices are installed to prevent automatic operation in case an object is in the path of the gate.

The adjustment dial controls the auto close time from approximately 2 seconds to 150 seconds. A setting of 0 will be the fastest auto close time.



19 Verifying Inherent Entrapment Protection System (Type A) Operation:

Once the gate operator is installed use the table below to determine correct operation.

It is recommended that the current sensitivity adjustment for the gate being tested be set at a setting no greater than 5 for this test.

<p>Gate Opening - Gate is stopped by an object after 1 second of operation</p> <ul style="list-style-type: none"> Gate stops and reverses for ~ 2 seconds. Auto close if turned ON is disabled. Requires a Push Button, Close, Open or Reset input before normal operation resumes. 	<p>Gate Closing - Gate is stopped first time by an object after 1 second of operation</p> <ul style="list-style-type: none"> Gate stops and reverses to full open. Auto close if turned ON is disabled. Requires a Push Button, Close, Open or Reset input before normal operation resumes.
<p>Gate Closing after above obstruction – If Gate is stopped a second Time Before Reaching the Close Limit</p> <ul style="list-style-type: none"> Gate stops. Alarm sounds for 5 minutes until Reset is pressed. Requires a Reset input before normal operation resumes. 	<p>Gate Opening after above obstruction – If Gate is stopped a second Time Before Reaching the Open Limit</p> <ul style="list-style-type: none"> Gate stops. Alarm sounds for 5 minutes until Reset is pressed. Requires a Reset input before normal operation resumes.

20a Verifying Monitored Photo Eye (Type B1) Entrapment device Operation Only:

Operate the gate and verify entrapment protection devices are working properly.
Use the table below to determine correct operation.

Type B1 - Photo Eye 2 nd Entrapment - N/C input J2 pin 4 - Open Direction If DS1 switch 7 is OFF this input is ignored. If ON, functions as described below	Type B1 - Photo Eye 2 nd Entrapment - N/C input J2 pin 8 - Closed Direction If DS1 switch 8 is OFF this input is ignored. If ON, functions as described below
Gate Opening Photo Eye Activated	Gate Closing Photo Eye Activated
Gate stops	Gate stops and reverses to full open
Auto close if turned ON is still active	Auto close if turned ON is still active
Return to normal operation when the sensor is no longer activated.	Return to normal operation when the sensor is no longer activated.

20b Verifying Monitored Contact Edge (Type B2) Entrapment device Operation Only:

Contact Edge (Type B2) Monitored Entrapment N/O input J2 pin 6 If DS2 switch 4 is OFF then gate will not move. If ON, functions as described below.	
Gate Opening Edge Activated 1st time	Gate Closing Contact Edge Activated 1st Time
Gate stops and reverses for ~ 2 seconds	Gate stops and reverses to full open
Auto close disabled	Auto close if turned ON is still active
Requires a Push Button, Close or Open input before normal operation resumes.	If while opening after reversal above, a 2nd sequential input is received, gate must stop
If while closing after reversal above a 2nd activation occurs before the 2 seconds then	Requires a Push Button, Close or Open input before normal operation resumes.
Gate stops	Gate Closing Edge Activated 2nd Time before the close limit then
Auto close disabled	Gate stops
Requires a Push Button, Close or Open input before normal operation resumes.	Auto close disabled
	Requires a Push Button, Close or Open input before normal operation resumes.

20c Verifying Constant Pressure (Type D) Operation Only:

IMPORTANT: Verify the gate path is clear before pressing the S4 button.

The S4 push Button (N/O) requires constant pressure to operate gate. When pressed and held the gate will run until the limit is reached or the button is released. If the button is released in mid travel the gate will stop and the next press of the button will run the gate in the opposite direction.

IF gate is closed and emergency switch is activated the gate will open and remain open until deactivated.



21 Programming Transmitter and Receiver

Operating frequency 433.92 MHz.

Receiver can store up to 42 unique transmitter dipswitch code settings.

Transmitter Setup:

(It is recommended that the dipswitch code be changed from the default factory setting)

1. Open the battery compartment door and locate the dipswitches.
2. Change the dipswitches to the settings you prefer, record for future reference in the table below.

Switch Position	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6	Switch 7	Switch 8	Switch 9
+									
0									
-									

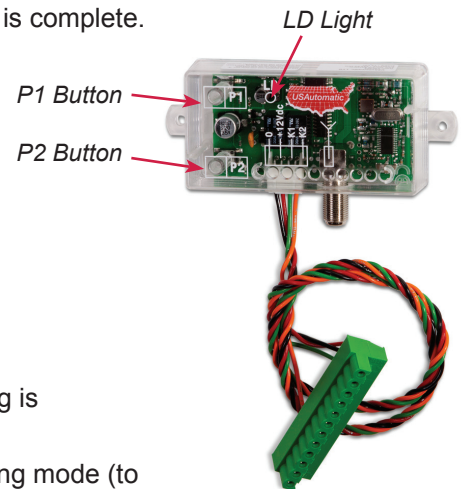


Transmitter Left Button to Receiver Programming: (standard Open/Stop/Close function)

1. Press and hold the left transmitter button down. Red light on transmitter should be on.
2. On the receiver, push the P1 push-button until the green LD light comes on.
3. Release both buttons. Transmitter left button to receiver programming is complete.

Transmitter Right Button to Receiver Programming: (Hold-Gate-Open) (Only if auto close timer is enabled)

1. The 2-channel receiver allows for programming the P2 relay from momentary mode (default) to latching mode. Transmitter right button can be programmed to hold gate open, over-riding the auto-close feature if activated.
2. Press and hold the right transmitter button down. Red light on transmitter should be on.
3. Press the P2 push-button until the green LD light comes on.
4. Release both buttons. Transmitter right button to receiver programming is complete.



Receiver Programming: Relay P2 programming from momentary to latching mode (to hold gate open)

See Receiver Programming on page 45 to complete Hold-Gate-Open programming.

Erasing Single Transmitter from Receiver Memory:

The dipswitch settings of the transmitter to be deleted must be known. If known follow the steps below.

1. Set the dipswitches in a transmitter to match the switch settings of the transmitter code to delete.
2. Press and hold the left transmitter button.
3. On the receiver, push the P1 push-button until the green LD light comes on. Then release both.
4. Press and hold the right transmitter button.
5. On the receiver, push the P2 push-button until the green LD light comes on. Then release both.
6. Transmitter is now erased from receiver memory.

Erasing all Transmitters from Receiver Memory:

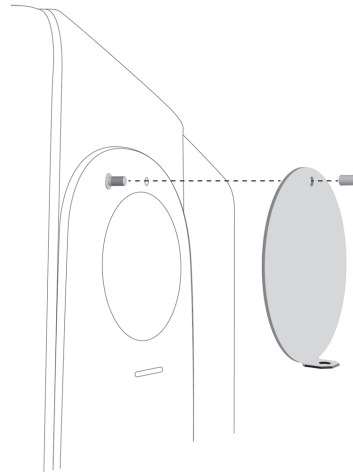
1. Press the P2 button on the receiver until the green LD light comes on. Then release P2 button.
2. While LD light is on press the P1 and P2 buttons simultaneously and hold until the green LD light begins to blink slowly. It should blink 4 times then all transmitter codes are erased.

22 Install Emergency Release Access Cover

Install Emergency release access cover as shown here.

Install cover and secure in place using the 4 provided 1/4 inch bolts and washers.

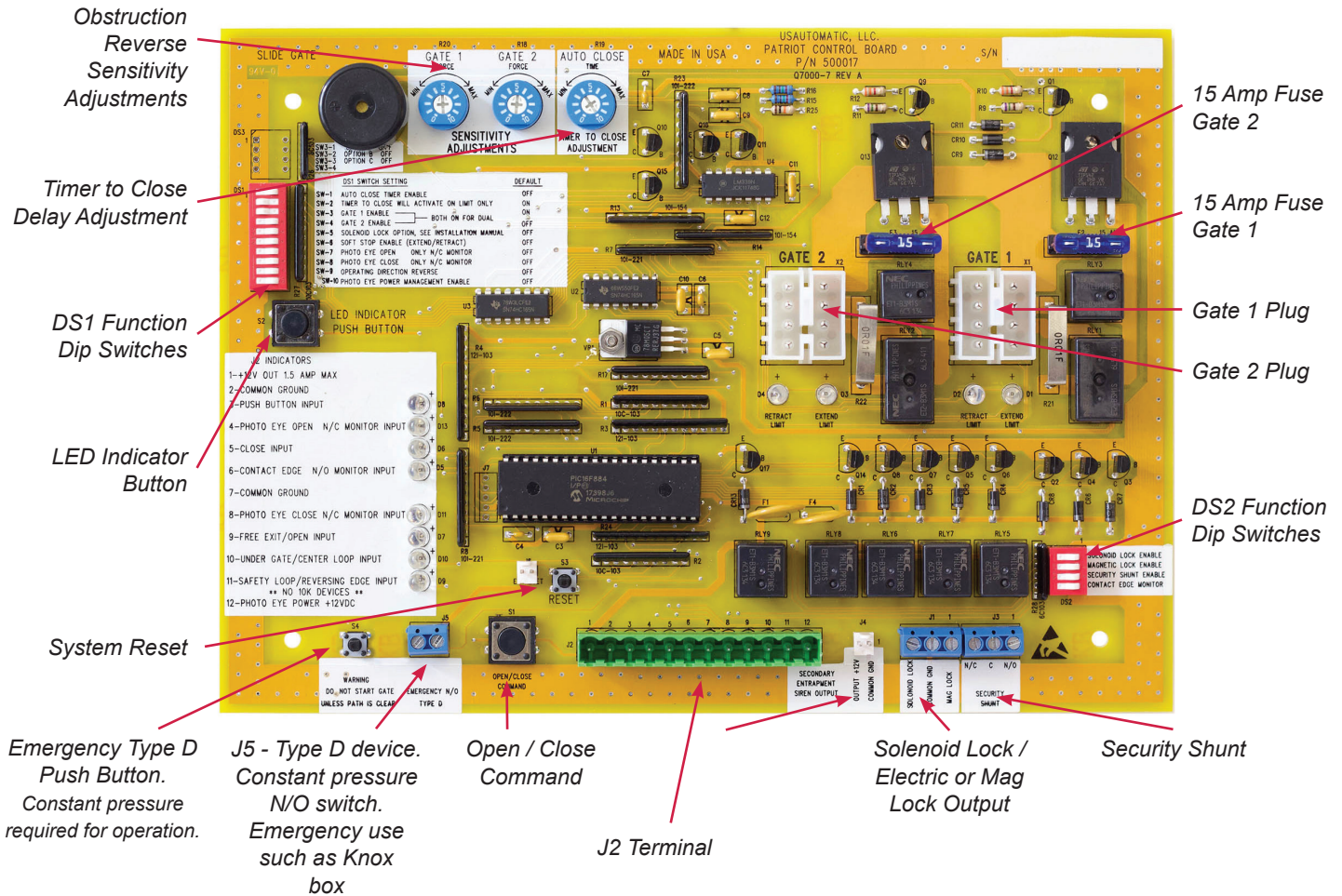
Slide locking bar through slot in front cover.



23 Patriot Control Board Information

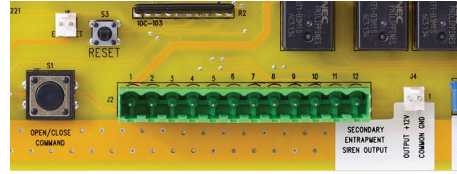
The Patriot RSL control board is capable of operating two gates. If your installation is a single gate you can operate the gate on the Gate 1 or Gate 2 connector. Set control switch "ON" for the connector being used.

Patriot RSL Control Board



J2 Terminal Description

The accessory connector is a plug which can be removed from the control board for ease of wiring and troubleshooting purposes.



J2 Terminal

Place finger below connector and pull out to remove.

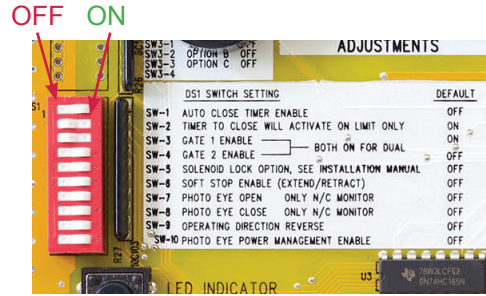
Terminal	
1	+12 vdc Output <i>(Maximum current output 1.5 amp - 1500 milliamps)</i>
2	Common Ground Input
3	Push Button Input <i>(normally open contacts)</i> <i>(Push button, radio control, keypad, etc.)</i>
4	PhotoEye Open Direction N/C Input <i>DS1 Switch 7 must be on. No 10K resistor.</i>
5	Close Input <i>(normally open contacts)</i>
6	Contact Edge N/O connection monitored entrapment <i>DS2 switch 4 must be ON when monitored edge is connected</i>
7	Common Ground Input
8	PhotoEye Closed Direction N/C Input <i>DS1 Switch 8 must be on. No 10K resistor.</i>
9	Free Exit / Open Input <i>(normally open contacts)</i> <i>Loop input or any hold open input such as a 7-day timer, telephone access unit, or maintain contact switch (normally open contacts). These devices open the gate and will prevent the gate from closing if the contact is maintained. Once the contacts have been released, the gate can be closed with a closed signal device or the automatic close timer feature. Receiver relay2 pre-wired for latching open.</i>
10	Center Loop or Under Gate Loop Input <i>(normally open contacts)</i>
11	Safety Loop / Photo-eye / Reversing Edge Input used for vehicular protection devices. <i>(normally open contacts) *NO 10K DEVICES</i>
12	Photo Eye Power +12 vdc output 1 amp max current <i>Only present when DS1 switch 10 is ON and gate is moving or DS1 switch 3 and 4 are OFF and DS1 switch 10 is ON used for installation.</i>



DSI Function Dip Switches

ON - Down on right

OFF - Down on left

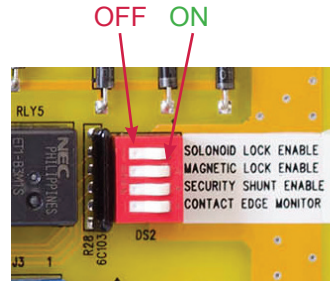


Switch		Setting	Factory Settings are shown in bold type
1	Automatic Close Timer Enable <i>(Not recommended unless safety devices are installed)</i>	ON	Timer to close is activated
		OFF	Timer to close is disabled
2	Timer to Close Function	ON	Timer to close activates only if open limit is activated
		OFF	Timer to close works from any point the gate is stopped
3	Gate 1 Enable	ON	Gate 1 operator enabled to function
		OFF	Gate 1 operator disabled
4	Gate 2 Enable <i>(both gates on for dual)</i>	ON	Gate 2 operator enabled to function
		OFF	Gate 2 operator disabled
5	Solenoid Lock Option	ON	DS2 SW 1 must be on, output +12vdc when gate is operating
		OFF	No function. See DS 2 SW 1
6	Soft Stop Enable <i>Extend and Retract</i>	ON	Enables soft stop
		OFF	Disables soft stop
7	Photo Eye Open Only N/C Monitored Entrapment	ON	Monitor Photo Eye open direction only
		OFF	No monitored Photo Eye open direction installed
8	Photo Eye Closed Only N/C Monitored Entrapment	ON	Monitor Photo Eye closed direction only
		OFF	No monitored Photo Eye closed direction installed
9	Operating Direction Reverse <i>(Must be on for push to open installations to operate correctly)</i>	ON	Push to Open
		OFF	Pull to Open
10	Photo Eye Power Management Enable <i>*when ON 12 vdc will be present at J2 pin 12 whenever gate is in motion.</i>	ON	Enables PEPM
		OFF	Disables PEPM

DS2 Function Dip Switches

ON - Down on right

OFF - Down on left



DS2 Switches

Switch		Setting	Factory Settings are shown in bold type
1	Solenoid Lock Enable / Gate in Operation Indicator / Gate Leaf Delay	ON	Solenoid lock output energizes half second before gate begins to move and releases 3 seconds after the gate begins to move. For gate in operation indicator to operate DS1 SW 5 must also be ON. (Energizes = +12 vdc output 1.5 amp max/ / Gate leaf delay/gate 2 delays 2 seconds) Gate Leaf Delay
		OFF	Solenoid lock / gate in operation indicator / gate leaf delay is inactive
2	Magnetic Lock Enable	ON	Magnetic lock output energizes on Master Limit and releases half second before gate begins to open. (Energizes = +12 vdc output 1.5 amp max)
		OFF	Magnetic lock output is inactive
3	Security Shunt Circuit Enable / Open Gate Indicator	ON	Security shunt circuit relay is active (closed circuit) (wire in parallel) Relay activates half second before gate begins to open and stays activated until 4 seconds after gate reaches a closed limit
		OFF	Security shunt circuit relay is inactive (open circuit)
4	Contact Edge Monitor (must be ON if monitored contact edge is installed)	ON	Monitored contact edge is installed. Contact Edge must have 8.25K or 10K resistor.
		OFF	No monitored contact edge installed



Programming Your Wireless Keypad

**050520 or
050500** (plastic)



PUK code

050550
(metal)



PUK code

Terms to Understand

Access Code – The 2 to 5-digit code used to open the gate (24 unique codes are possible). If access code is less than 5 digits it requires the # sign after code is entered. Example: “2 #.” If code is 5 digits the # sign is not required. Metal keypad uses A or B in place of * and #.

ACCESS CODE CAN NOT BE THE SAME AS THE MASTER PASSWORD.

Master Password – The 5-digit code used to access programming features. Factory default is “11111”. This should be changed for security reasons.

NOT USED TO OPEN GATE AND CAN NOT BE THE SAME AS THE ACCESS CODE.

Relay 1 – The receiver has 2 relays. P1 (relay 1) is pre-wired to the J2 connector - pin 3.

Relay 2 – The receiver has 2 relays. P2 (relay 2) is pre-wired to the J2 connector - pin 9.

Keypad Security Code (Dip Switch Code) – This code makes your keypad unique to your installation. Keypad does not have dip switches like the transmitter; instead it has virtual dip switches which must be programmed.

PUK Code – “Password Unblocking Key.” The PUK code is located inside the keypad and is needed when the master password has been lost. Record in space above for future reference. Must be 5 digits long.

“ * ” or “A” Key – located on the keypad is used to cancel last command entered.

Red Light Blinks – When blinking, the keypad is sending a signal to the receiver. Valid access code was entered. This is the Blue 5 key on the metal keypad.

NOTE: Do not install keypad until “Create Communication with Receiver P1 (relay 1)” has been completed.

Keypad Programming

Create Access Code: (Code you use to operate the gate)

***CAN NOT BE THE SAME AS THE MASTER PASSWORD!**

1. Enter the Master Password “11111”. (this is the factory default master password).
2. Enter “9” If correct, 2 short beeps (if 1 long beep is heard, start over with step 1).
3. Enter the new Access Code (up to 5 digits), if less than 5 digits, “# or B” key is required.
4. Enter “9”
5. Enter the new Access Code again to verify.
6. Enter “1”. If this access code is for P1 (relay 1) Enter “2” if this access code is for P2 (relay 2).
7. If correct, 2 short beeps (if 1 long beep is heard, start over with step 1).
8. Continue with “Create Communication with Receiver” to complete programming.

NOTE: Step 6 above allows you to select a unique frequency (1, 2, 3, 4) for the access code you are creating. Keypad can be programmed with 4 different access codes each having a unique frequency. This is used when multiple gates are within range of the keypad. Create an access code using 1 in step 6 for one gate. Create an access code using 2 in step 6 for the second gate. This allows one keypad programmed with 2 access codes to operate 2 different gates within range or two keypads can be installed on 2 different gates without interfering with each other. If 4 gates were involved then 3 and 4 could be used in step 6. Also used to create a unique access code to activate the hold open feature offered with P2 (relay 2).

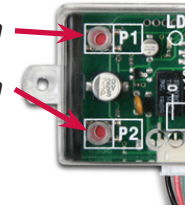
Create Communication with Receiver: *for P1 (relay 1) access code:

1. Carry keypad to receiver location for programming.
2. Enter Access Code for P1 (relay 1) on the keypad and continue to press the last key entered (red light blinks).
3. Press P1 (learn button) on the receiver until LD (green light) comes on and relay clicks.

Receiver

P1 Button

P2 Button



Create Communication with Receiver: *for P2 (relay 2) access code:

1. Carry keypad to receiver location for programming.
2. Enter Access Code for P2 (relay 2) on the keypad and continue to press the last key entered (red light blinks).
3. Press P2 (learn button) on the receiver until LD (green light) comes on and relay clicks.

Programming New Master Password: Once created record here for reference _____

NOTE: The Master Password is NOT an access code. This is a MASTER programming code used to access the programming of the keypad. It is not used to operate the gate.

1. Enter the Master Password "11111".
2. Enter "8" If correct, 2 short beeps (if 1 long beep is heard, start over with step 1).
3. Enter the Master Password (up to 5 digits), if less than 5 digits, "# or B" is required.
4. Enter "8"
5. Enter the Master Password again to verify.
6. Press "8" If correct, 2 short beeps - New Master Password is set (If 1 long beep is heard, start over with step 1).

Programming Master Password Back to Factory Default: (11111)

1. Enter "11111".
2. Press "8" (long beep).
3. Enter PUK code. (PUK must be 5 digits).
4. Press "8".
5. Enter PUK code to confirm.
6. Press "8" (2 beeps) Master password reset complete.

Deleting Single Access Code:

1. Enter the Master Password.
2. Press the "7" key. If correct, 2 short beeps (if 1 long beep is heard, start over with step 1).
3. Enter the Access Code to be deleted.
4. Press the "7" key. (cont. next page)
5. Reenter the Access Code to be deleted.
6. Press the "7" key. If correct, 2 short beeps (if 1 long beep is heard, start over with step 1).

Deleting All Access Codes:

1. Enter the Master Password.
2. Press the "7" key. If correct, 2 short beeps (if 1 long beep is heard, start over with step 1).
3. Reenter the Master Password.
4. Press the "7" key.
5. Reenter the Master Password.
6. Press the "7" key. If correct, 2 short beeps (if 1 long beep is heard, start over with step 1).



Changing Keypad Security Code:

This keypad has a virtual dipswitch used to create your Security Code. The virtual dipswitch contains nine 3-position switches. To ensure neighboring keypads do not interfere with each other, the virtual switches should be positioned in a random pattern, using the following procedure.

Example of random positioning of the virtual dipswitches to create a Security Code is shown below. To enter the Security Code, enter the dipswitch number, followed by the dipswitch position character.

The Security Code would be entered as: 1# 20 3* 4* 5# 6* 7# 80 9*

Dipswitch Position	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6	Switch 7	Switch 8	Switch 9
# or B	X				X		X		
0		X						X	
* or A			X	X		X			X

Use table below to create your random security code and follow steps below to program your keypad.

Dipswitch Position	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6	Switch 7	Switch 8	Switch 9
# or B									
0									
* or A									

1. Enter the Master Password.
2. Enter "0" If correct, 2 short beeps (if 1 long beep is heard, start over with step 1).
3. Enter the Security Code created in the previous table. If correct, 2 short beeps after each switch number and switch position combination is entered.
4. Enter "# or B"
5. Enter "0"
6. If correct, 2 short beeps (if 1 long beep is heard, start over with step 1).

Receiver Programming - Hold Gate Open

Relay P2 programming from momentary to latching mode (to hold gate open)

1. Press the P2 push-button until the green LD light comes on, then release.
Green LD light should be steady. If flashing latch mode is set.
2. If not flashing release P2 immediately and press P1 once.
3. Green LD light should be flashing. Latching mode is already set.

Verifying Receiver P2 relay is programmed to latching mode:

1. Press the P2 push-button until the green LD light comes on, then release.
2. Green LD light should be flashing. If green LD light is steady, redo the Receiver Programming section above.

Resetting receiver P2 relay to momentary mode:

1. Press the P2 push-button until the green LD light comes on, then release. Green LD light should be flashing.
2. While the LD light is flashing, push the P1 push-button down and release. Green LD light should be steady. Momentary mode is set.



PERIODIC SERVICE

All gate operators require periodic checking and adjustments of the control mechanism for force (load), speed and sensitivity. These checks should be made by a qualified technician to verify proper adjustment and operation of all safety related components including those mentioned above.

All accessories and monitored safety devices must be checked. Monitored entrapment protection devices need to be checked at least once a month for proper operation.

Periodic checking is also advised for the following:

1. Battery terminals for corrosion.
2. Check Wheels and Gate Rollers for wear - grease if necessary.
3. Mounting bolts and sprocket set screws for correct tightness.
4. Inspect weld points for cracks or other defects.
5. Inspect wiring for cuts, nicks or other defects.
6. Inspect drive chain and sprockets for tension and wear. Adjust or replace as necessary.
7. As needed use chain lube to keep chain properly maintained.
8. Verify proper operation of charging system, refer to charge controller operation check.
9. Verify monthly that the inside of the operator remains clean and free of insects. **Do not spray control board with bug spray or oil based products.**

Emergency Manual Release

Remove lock and rotate emergency manual release cover to the up position.

Pull manual release knob out (about $\frac{3}{4}$ inch)

Once knob has been pulled, the gate can then be pushed by hand.

If knob cannot be pulled, the gate may need to be agitated left or right.

To reset the knob, push in on knob and roll gate until knob snaps in place. It may be necessary to tap the knob inward to fully lock in place.

WARNING: Only insert hand into access hole as far as needed to grip the release knob. Trying to insert hand farther can result in injury.



Electric Gate Lock

Part Number 070510

Suitable for solar and AC charged systems.

The Patriot Control Board will energize and release a 12 vdc electric gate lock or de-energize and release a magnetic gate lock 1 second before the gate or gates begin to open.

To activate the electric gate lock delay circuit

Turn DS2 switch 1 on. This also activates the Gate Delay Feature on Dual Gate systems.

Connect the ground wire from the gate lock to the negative battery post.

Connect the positive (+12vdc) wire from the gate lock to J1 Solenoid Lock terminal.



Magnetic Gate Lock

(Non-USA Automatic product)

Not suitable for solar charged systems. Suitable for AC charged systems.

To activate the magnetic lock delay circuit, turn DS2 switch 2 on. Connect the ground wire from the magnetic gate lock to J1 Common Gnd terminal. Connect the positive (+12vdc) wire from the magnetic gate lock to J1 Mag Lock terminal.

Exit Sensor *(Solar friendly device)*

Preferred Technologies CP-4

Part Number 070310

The driveway exit sensor is a magnetic device that installs below ground beside the drive. A magnetic field is established which when interrupted by a moving metal object will send a signal to open the gate. This sensor is supplied with a 100 foot cable and is typically installed inside the property beside the drive to automatically open the gate when a car passes. This type of sensor is not a safety device.

Sensor can be ordered with longer cable lengths that fit the installation. (Standard 100')

Install cable in PVC conduit.

Wire as follows: Red wire – connect to J2 pin 1

Black wire – connect to J2 pin 2 or pin 7

White wire – connect to J2 pin 2 or pin 7

Blue wire - connect to J2 pin 9 (Free Exit / Open Input)



Push to Operate Wireless Button

Part Number 030215 (white)

Part Number 030215 (black)

The Push to Operate transmitter is designed for indoor or outdoor wireless installation. Install to allow operation of the gate or garage by simply pressing the pad. The button is a pressure sensitive pad. Press the pad and an audible tone is generated. Programming is identical to transmitter programming. Installation hardware is included. Compatible with all USAutomatic receivers.



Programming Push to Operate

1. Install Battery.
2. Place hand on face plate. - Unit should beep while hand is in place.
3. While beeping, press the P1 button on receiver for open and close operation.
4. Hold P1 button about 2 seconds. When gate moves, programming is complete.

2 Button LCR Transmitter

Part Number 030210

Standard Transmitter for all USAutomatic operators

Operating Frequency 433.92 MHz



4 Button LCR Transmitter

Part Number 030212

Operating Frequency 433.92 MHz



12/24 Vdc Receiver AC/DC

Part Number 030207

- Ideal for gate operators with 12 or 24 VDC/VAC supply power. Not recommended for solar applications.
- Dual channel NO and NC contacts.
- Two relays - Primary relay momentary, monitored relay has momentary or latching mode.
- Standby current consumption 15ma.



Monitored Entrapment Device Expansion Module

Part Number 500015

The expansion module is designed to monitor for the connection and proper operation of multiple monitored external entrapment devices.

If the installation requires more than 1 monitored contact edge or 2 monitored photo eyes, the expansion module must be installed.

Monitors up to 5 monitored contact edges (10K resistor) and up to 4 monitored photo eyes (N/C contact) for a total of 9 devices.



7 Day Timer (Solar friendly device)

Part Number 550015

The optional 7 day timer can be used to open the gate at a preset time and if the auto close feature of the gate operator is being used the gate can then close automatically at a preset time. The timer is supplied with 3 spade terminals for easy connection. Connect wires from timer to control board J2 connector as follows:

- J2 Pin 1 (+12vdc) connect to pin 1
- J2 Pin 2 (Gnd) connect to pin 2
- J2 Pin 9 (Normally Open) connect to pin 4



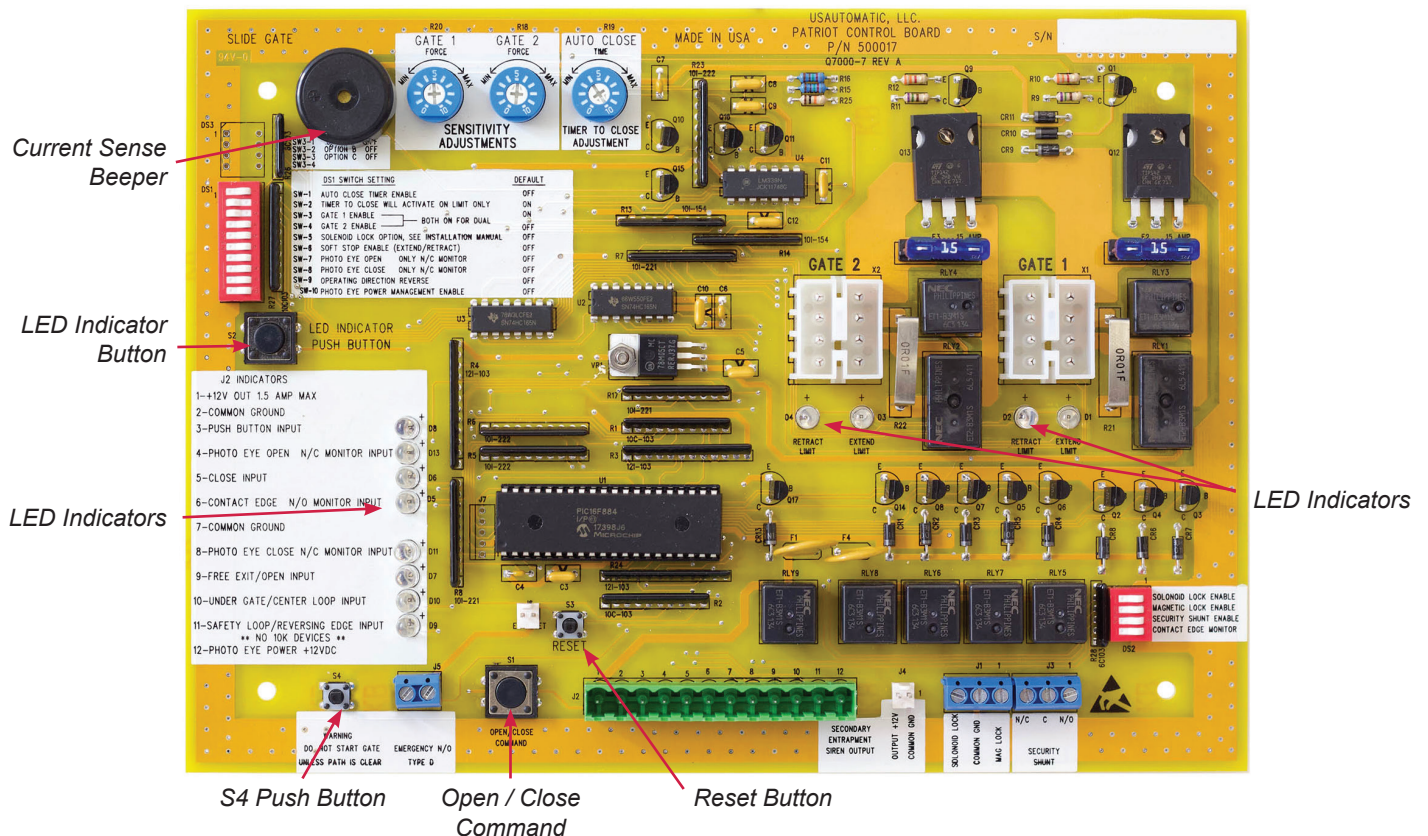
Troubleshooting Guide

Introduction

The Patriot control board is equipped with four unique features to assist in troubleshooting a gate system.

1. The first and most helpful is the series of LED indicating lights. These lights will help to identify problems with the actuator limit switches and all control circuits. To use the indicators, press and hold the “LED Indicator” button on the control board. (The LED’s are not active unless the LED indicator push button is pressed and held to save battery life). Any circuits or limit switches that are activated will be obvious by the illumination of the adjacent LED.
2. The second feature to assist in troubleshooting is the current sense beeper. The beeper will sound anytime the current sense circuit is activated. This is useful in detecting a false reverse due to an improper or too sensitive current sense setting, or a gate, which is requiring excessive force to move
3. The third feature to assist in troubleshooting is the on board “Open / Close Command” pushbutton.
4. The fourth feature is the S4 push button - Type D protection - This button makes it possible to operate the gate with the J2 Accessory plug removed. Type D button will bypass all entrapment devices allowing gate operation. Verify gate path is clear before pressing button. Must hold button for gate operation.

Patriot Control Board
(Part #500017)



Terms and Definitions

LED - Light Emitting Diode - small red lights on control board.

Control board - Refers to Patriot control board.

Receiver - Located on top shelf of the operator.

Remote/Transmitter - Hand held unit with 2 buttons, used to operate the gate, sends signal to receiver when button is pressed.

Connector - Refers to inputs and outputs on control board where wires may be connected.

Push Buttons - Four are located on the control board. "Open / Close Command" used to operate the gate, "LED Indicator" used to activate the LED's and "Reset" used to reset the control board after current sensing twice before a limit is reached and "Type D" constant pressure for gate operation.

Dip Switches - Small switches, which are located on the control board in two places. The primary set DS1, is located in the upper left corner and the monitored set, DS2, is located in the lower right corner of the control board with functions listed beside each. See manual (page 26-27) for more information.

Sensitivity adjustments - Located on the control board (see page 22). These adjustments are the primary safety feature. If the gate comes in contact with an object it will stop and reverse. These adjustments control the amount of pressure applied to an object before reversing the gate.

Charge Controller - Located inside the control box in upper left corner (see page 16). This is the battery charger. The input power for this device can be either from a transformer or from a solar panel.

Transformer - This device connects to a 110 VAC electrical outlet and converts it to a low AC voltage that can be connected to the charge controller to provide continuous charging of the battery.

Entrapment Siren - If the control board sensitivity circuit senses an obstruction it will reverse the gate and if a second obstruction is detected before the gate reaches a fully open or close limit the control board will shut down the operator and sound the entrapment alarm for five minutes or until the "Reset" button is pressed.

Limit Plate Assembly - Located on top of the operator; holds the two limit switches and also holds the limit cam nuts in their adjusted position.

Limit Cam Nut - Two limit cam nuts are located on the top of the operator; the limit plate assembly is spring-loaded and must be depressed before adjusting the limit cam nut. After limit cam nut has been adjusted, make certain that the limit plate assembly fully engages the limit cam nut to keep it from rotating.

Gate Chain - This is the long chain connected to the gate and travels through the operator.

Drive Chain - This is the short chain that connects the gear motor to the manual release shaft.



Summary of Symptoms Included in This Guide

1. Single gate will not operate.
2. My single or Dual gate will not operate. Monitored entrapment devices are installed.
3. Emergency release knob cannot be pulled.
4. My gate opens/closes slowly.
5. My Gate will not automatically close.
6. Gate begins to open or close, but stops and reverses after a couple of seconds.
7. Gate opens or closes correctly, then immediately reverses direction.
8. Control board 15 amp fuse blows when "Open / Close Command" is given.
9. Transmitter (Remote control) will not operate the gate.
10. Photo-eye being used for vehicular protection will not reverse the gate when closing or hold the gate open
11. Pressing the "RESET" button only, causes the gate to operate.
12. Gate opens with the transmitter but will not close with the transmitter.
13. Gate Open and Close Stop Position is Changing (not consistent).
14. Battery (AC or Solar Charged) will not stay charged
15. Verifying Charge System Is Operating correctly.



<p>* IMPORTANT FIRST STEP</p>	<p>First thing to verify is that no monitored entrapment devices are creating the problem.</p> <ol style="list-style-type: none"> 1. Press the Open/Close button on the control board. If gate does not operate proceed to step 2. 2. Press the S4 push button and hold to operate the gate. 3. If gate operates while pressing the S4 button then a monitored device is preventing normal operation. Proceed to step 5. 4. If gate does not operate while pressing the S4 push button proceed to the troubleshooting step which describes your problem and installation. 5. Identify monitored devices connected and check for proper operation.
<p>1. My single gate will not operate: (Patriot I)</p> <p>Verify monitored entrapment device switches are set correctly see page 24 step 15.</p>	<ol style="list-style-type: none"> 1. Remove control box cover locate the “Open/Close Command” push button and press it to operate the gate. 2. Press the “Reset” push button located above the “Open/Close Command” button, then push the “Open/Close command” push button to operate the gate. 3. When pressing the “Open/Close Command” push button, listen for a clicking sound, if click is heard then verify: <ul style="list-style-type: none"> Wire harness is connected to the gear motor cable in the battery compartment. The 15-amp fuse located on the control board is good if not replace it using the spare located on the control board. Also check the dipswitches (3 and 4) for correct switch settings based on where the actuator is connected to the control board (Gate 1 or Gate 2). If switches are correct, fuse is good, and harness is connected and clicking sound is heard, then the battery needs to be load tested to determine its condition. Charge or replace the battery depending on results. 4. Press and hold the “LED Indicator” push button and observe all of the red LED’s <ul style="list-style-type: none"> If the two limit LED’s located below the actuator plug connector are both on the operator will not operate. You must adjust the limit switch.



<p>2. My gate will not operate. Monitored entrapment devices are installed.</p> <p>Identify the monitored entrapment device/ devices installed - Photo Eye or Contact Edge.</p>	<p>Contact Edge with 10K resistor monitoring -</p> <ol style="list-style-type: none"> 1. Verify that dip switch DS2 switch 4 (contact edge monitor) is ON pressed down on the right hand side.. 2. Press and hold the LED indicator on the control board. 3. Verify the D5 LED (Contact edge 2nd entrapment) located bottom left corner of the control board is ON dimly. 4. If not using a DC voltmeter measure the voltage on J2 pin 6 to ground reading should be approx. 2.5 Vdc. 5. Activate the contact edge by depressing it and verify the D5 LED is ON bright now or the voltage drops to 0 Vdc. 6. If reading is 5 Vdc then check wire connections from contact edge for proper connection. See page 19. 7. If wire connections are correct then disconnect the contact edge wires from the J2 connector. 8. Using an ohm meter verify the resistance measured between the 2 contact edge wires, should be 10K. 9. If not contact edge is bad.
	<p>Photo Eye N/C contact monitoring -</p> <ol style="list-style-type: none"> 1. Verify that DS1 dip switch 10 is ON press down on the right hand side. 2. Verify that dip switch DS1 switch 8 (photo eye monitor) is ON press down on the right hand side. 3. Turn dip switch DS1 3 and 4 OFF. Allows power to be applied to photo eye. 4. Press and hold the LED indicator button located on the control board. 5. Verify that D11 LED (Photo eye N/C 2nd entrapment) located bottom left corner of the control board is ON. 6. If not verify alignment between photo eye transmitter and receiver. Correct if necessary. 7. If not then check wire connection from photo eye for proper connection. See page 18. 8. If D11 is ON verify that the D11 Led goes OFF when photo eye beam is broken. 9. If D11 does not turn OFF when beam is broken then photo eye is bad.



<p>3. Emergency release knob cannot be pulled.</p>	<p>1. If the emergency release knob cannot be pulled, first verify that it is not already pulled by trying to roll the gate. If gate will not move, try to pull the emergency release knob while agitating the gate (shake gate in direction of travel).</p> <p>2. Emergency release knob that is difficult to pull represents something is in a bind. Check the gate wheels and guide rollers. Verify the chain is on all the rollers and not twisted or overly tight.</p> <p>NOTE: DO NOT ATTEMPT TO MODIFY ANY SCREWS ON THE DRIVE SHAFT.</p>
<p>4. My gate opens/ closes slowly:</p>	<p>NOTE: When the gate is running slow the reason is most likely low battery voltage. Two things need to be considered. Battery condition (replace or charge) and what caused the battery to become discharged. Bad motor in actuator is also possible but not common.</p> <p>1. Determine which situation your operator falls into below:</p> <p>Solar charged: If accessories are connected (keypads, loop detectors, any device powered by the battery) verify that the current draw needed to power them does not exceed the charging power of the solar panel. Verify that the charger is operating correctly; panel is facing a Southwestern direction and is not located in a shaded area. Inspect panel surface and wires for damage.</p> <p>Test solar panel on a sunny day for correct voltage and current output. Remove solar panel plug from charge controller. Using a DC voltmeter, measure the DC voltage (should measure about 22 volts) and the DC current (should read about 300 ma) in the peak sun period. If either of these readings is incorrect the panel maybe defective please call the factory.</p> <p>If none of the above check bad, then remove battery and have it load tested at a battery shop. Replace if bad.</p> <p>AC charged: If accessories are connected (keypads, loop detectors, any device powered by the battery) verify that the current draw needed to power them does not exceed the charging power of the charger. Not likely on AC charged system. Verify that charger is working correctly and inspect charger and wires for damage.</p> <p>NOTE: The USAutomatic charger does not output any voltage or current when disconnected from the battery. You cannot check charger by disconnecting from battery and measuring voltage output. To check charger refer to Charge controller operation check for details.</p> <p>2. If none of the above check bad then remove battery and have it load tested at a battery shop. Replace if bad.</p>



<p>5. My gate will not automatically close</p>	<p>NOTE: If DS1 switch 1 is on and switch 2 is off then the gate should automatically close from any position. If switch 2 is also on the gate will only automatically close if the “retract limit” for right hand installation or “extend limit” for left hand installation is ON.</p> <ol style="list-style-type: none"> 1. Locate the “Open/Close Command “ push button. Press the button to verify that the gate will close. If gate closes correctly then proceed to the steps below. 2. Verify that DS1 switch 1 is on. If not, turn it on and recheck gate operation. If gate remains open, continue with step 3. 3. If your installation is a single gate, then only DS1 switch 3 or 4 can be on. If both are on the gate will not automatically close. Turn off the one that is not being used and recheck gate operation. 4. Locate the “LED Indicator” push button and depress and hold. While pushing the button observe the LED indicators located just below the Gate 1, Gate 2 (X1, X2) actuator plugs. Note which LED’s are on. Read note below. 5. Locate the “LED Indicator” push button and depress and hold. While pushing the button inspect the LED indicators located on the control board (lower left corner) and note which LED’s are on. If any LED’s are on disconnect the green J2 connector from the control board. Press the “Open/Close Command “ push button to close the gate. Press the button again to open the gate fully and verify the automatic close is working. 6. If gate automatically closes correctly, then the accessory connected to the J2 connector that is activated (LED is on) needs to be repaired. 7. Verify entrapment devices are connected and working properly.
<p>6. Gate begins to open or close but stops and reverses after a couple of seconds</p>	<ol style="list-style-type: none"> 1. Remove control box cover and locate the Patriot control board. Locate the sensitivity adjustment (see page 26) potentiometer located on the control board. The white center is adjustable and needs to be turned in a clockwise direction to increase force. 2. Normally a setting of 5 will operate most gates; if your gate requires a setting above 8 there is a good chance that your gate has a problem, which needs to be corrected. Possible causes are track debris, gate is in a bind, operator chain is too tight. Pull manual release knob and roll gate by hand it should move easily if not identify cause and correct.



<p>7. Gate opens or closes correctly, then immediately reverses direction.</p>	<ol style="list-style-type: none"> 1. Gate is opening or closing to far identify the limit switch which is out of adjustment and adjust so that gate stops earlier. The limit switches are located on the limit plate assembly on top of the operator. 2. If limit switches are adjusted correctly and gate is not stopping when switch is depressed verify limit switches and wires are good. Press the LED indicator and observe the retract and extend limit lights. Press the limit switch closest to the gate (white wire connected to it) and verify the extend limit light comes ON. Press the other limit switch (orange wire connected to it) and verify the retract limit light comes ON. If either one does not work verify wires are good if so replace limit switch.
<p>8. Control board 15 amp fuse blows when Open/Close command is given.</p>	<ol style="list-style-type: none"> 1. Fuses blow primarily for one reason, the gate cannot move. Causes might be something keeping the gate from moving, the gate is trying to move in the wrong direction due to incorrect limit switch setting or there might be a wiring problem. A wiring problem is most likely in a splice that might have been made during installation. 2. Another possible cause is the brake inside the gear motor. If the brake is not releasing the motor cannot run. <i>See appendix D page 55 for brake remedies.</i>
<p>9. Transmitter will not operate the gate. <i>(LCR radio equipment only)</i></p>	<ol style="list-style-type: none"> 1. Open the control box and locate the Patriot control board. Locate the “LED Indicator” push button and the “Push Button Input” LED. Push and hold the “LED indicator” push button, then press the transmitter button and observe the “Push Button Input” LED. The LED should come on while the transmitter button is depressed. 2. If the “Push Button Input” LED did not come on in step 1 then make sure that the green J2 connector on the control board is securely connected, replace the battery in the transmitter and verify that the transmitter is programmed to operate the receiver (refer to page 28 “programming receiver and transmitter”). 3. If the “Push Button Input” LED in step 1 did come on and the gate did not operate then locate the “Open/Close Command” button located at the bottom center of the Patriot control board. Press the “Open/Close Command” button and note gate operation. 4. If the gate did not operate in step 3, verify the 15-amp fuse on the Patriot control board adjacent to the actuator plug being used is not blown, (a fuse can be blown and look good) replacing is the best way to verify fuse is good. 5. If the gate did not operate in step 3 and the fuse was good in step 4, most likely a safety accessory connected to the green J2 connector is active. Verify this by depressing the “LED Indicator” push button and observe the LED’s located in the lower left corner of the Patriot control board. If an LED is on, identify the accessory connected to the corresponding J2 connector pin and correct the problem.



<p>10. Photo-eye being used for vehicular protection will not reverse the gate when closing or hold the gate open</p>	<ol style="list-style-type: none"> 1. The first thing to check is the accessory wiring. The accessory needs power (+12 vdc) wired to battery positive terminal or to J2 pin 1 on the Patriot control board. It also needs ground, which can be wired to the battery or to J2 pin 2 or 7 on the Patriot control board. The other two connections are the "N/O (Normally Open) and Common ground". The common ground can be connected to the battery or to J2 pin 2 or 7 on the Patriot control board. The N/O connection must be connected to J2 pin 11 "Safety Loop / Reversing Edge Input". If the accessory is connected as described above it should reverse a closing gate or hold a gate open if the accessory is activated. 2. To determine if the accessory is working correctly and that the Patriot control board is receiving the signal, locate the "LED Indicator" push button and the "Safety Loop / Reversing Edge Input" LED (located in the lower left corner of the Patriot control board). 3. Press and hold the "LED indicator" push button and observe the "Safety Loop / Reversing Edge Input" LED. Activate the accessory in question (if photo-eye break the beam.) If the accessory is working properly, the LED light should come on when the device is activated. If the device does not turn on the LED light, check the wiring on the J2 connector and check J2 connector connection to the Patriot control board. If wiring is good, then the accessory is not operating correctly. Repair. 4. If the "Safety Loop / Reversing Edge Input" LED comes on and the gate does not reverse direction when closing, call the factory for other possible causes and return information.
<p>11. Pressing the "RESET" button only, causes the gate to operate</p>	<ol style="list-style-type: none"> 1. This problem is probably due to a bad receiver. First locate the "LED Indicator" push button on the Patriot control board. Then locate the "Push Button Input" LED located in the lower left corner of the Patriot control board. 2. Press the "LED Indicator" button and observe the "Push Button Input" LED. If the LED comes on then the receiver relay is stuck closed and needs to be repaired or replaced. 3. If the "Push Button Input" LED does not come on, call the factory for further troubleshooting and return information.



<p>12. Gate opens using transmitter, but will not close using transmitter. <i>(LCR receiver only)</i></p>	<ol style="list-style-type: none"> 1. The problem is most likely the programming of the LCR receiver (P2 relay is programmed to latch mode) 2. On the Patriot control board locate press and hold the “LED Indicator” push button. 3. Look in the lower left corner of the Patriot control board and note any LED’s that are on. 4. If the “Free Exit/Open Input” is on then the receiver (P2) is programmed to latch mode. 5. Go to page 14 “Resetting receiver P2 relay to momentary mode” 6. If this does not correct the problem return to troubleshooting section 4 and perform steps 1-6. 7. If problem is not corrected, call the factory for further troubleshooting.
<p>13. Gate Open and Close Stop Position is Changing (not consistent).</p>	<ol style="list-style-type: none"> 1. Limit switch lever has been bent and is not contacting limit cam nut at the correct location. The limit cam nut leading edge should depress the limit switch lever well before reaching the peak of the limit switch lever. Adjust limit switch lever gently so that limit cam nut depresses limit switch lever before reaching peak of limit switch lever. 2. Limit cam nut is possibly jumping threads on the drive shaft. This would be possible if the limit cam nuts had been cross threaded onto the drive shaft and the threads on the limit cam nuts have been damaged. Replace limit cam nuts and possibly drive shaft threaded collar.



14. Battery (AC or Solar Charged) will not stay charged

1. The most common reason for this type of problem is a bad battery. It is highly recommended that the battery be load tested at a battery store to verify that it is good. The load test is the only sure way to know if we have a good battery.
2. If the battery load test good then other items need to be checked such as system design, installation or possible charging problems with the system charger / charge controller.

System design and Installation

1. Verify the solar panel is facing in a South to Southwest direction and that the panel surface is not shaded by some object.
2. System design refers to the accessories connected to the system. Accessories connected to the system cannot use more energy than the charging system can provide. Not all accessories are created equally and some manufacturers use much more energy than others to perform the same function. These concerns are minimized in an AC charged system where the charger has power connected to it continually.

AC Charged Systems ONLY

- A. If your system is equipped with the USAutomatic battery controller part # 520001 and is AC charged verify the battery controller is properly working. The “arrow” between the panel and battery picture on the controller should be visible, see appendix D.
- B. If the “arrow” is not visible then check the 120 VAC outlet the DC Adapter is plugged into for the correct voltage and correct problem if necessary.
- C. If the 120 VAC power checks good then disconnect the DC Adapter from the battery controller plug and using a volt meter check the transformer output. The transformer should read about 20 Vdc, if the transformer output is incorrect the transformer needs to be replaced with USAutomatic part # 520009.

Solar Charged Systems ONLY

1. If your system is equipped with the USAutomatic battery controller part # 520009 and is solar charged verify the “arrow” is visible between the solar panel and battery pic on controller display. This can only be verified when the sun is directly on the solar panel.
2. If the “arrow” is not visible then using a voltmeter check the output of the solar panel for the proper voltage.

(continued on next page)



	<p>3. Remove the solar panel plug from the battery controller input and measure the DC voltage from the solar panel it typically should be about 19 to 22 VDC. This reading must be taken when the skies are clear and the sun is up directly on the panel.</p> <p>NOTE: This reading does not guarantee the solar panel is outputting the correct current to keep the battery charged, but it is a good first check.</p> <p>4. If the solar panel DC voltage checks good and the “arrow” is not visible between the solar panel and battery picture on controller when connected the controller is bad, replace with USAutomatic part # 520009. See appendix D</p>
<p>15 . Verifying Charge System Is Operating correctly.</p> <p><i>NOTE: The one test that will verify that the charger and Power source is working properly is a DC current reading between the charger and battery.</i></p>	<ol style="list-style-type: none"> 1. Disconnect the black lead from the battery. 2. Set multi meter up to read DC current. 3. Connect red meter lead to the black wire from the charger. 4. Connect black meter lead to the neg battery post. 5. Meter reading expected for solar is about 500 milli amps when solar panel is in full sun. *This test should be performed mid day when sun is in front of solar panel with no shading at all on panel. Any shading of the panel is a problem and must be removed. 6. Meter reading expected for AC charged system is about 500 milli amps up to 1 amp depending on the battery condition.



Appendix

A Installing the APP receiver to the Control Board

The USAutomatic NEXXGATE receiver module connects to the J2 plug on the control board. Follow the instructions included with the NEXXGATE receiver for setup.

For solar charged systems a 20 watt panel is recommended part #520030

B Extending Power Source Cable Length (AC or Solar)

If the power source cable needs to be extended to reach the battery controller wire connections should be made in a water tight box. Use charts below to determine wire size needed for the distance to be extended. The cable must be a 2 conductor cable, stranded wire recommended.

For solar systems the USAutomatic 75' cable kit part # 520016 can be used to replace the standard solar panel cable.



DC Adapter or Solar Extension Wire Size Chart

0 to 100 ft	101 to 250 ft
18 gauge wire	16 gauge wire

The above Table lists the recommended wire gauge per application length. Using a smaller gauge may impede performance or cause system to malfunction.

C USAutomatic Battery Controller

Battery controller is designed to charge 12 vdc batteries of various types using either solar panel or DC transformer part # 520009. It also capable of charging 24 vdc battery if using a 24-volt solar panel. The package includes Power source input adapter plug.

Recommend battery types: SLA (Sealed Lead Acid), FLD (Flooded Lead Acid), GEL and AGM are all ideal choices. We do not recommend using Lithium-ion batteries with this controller.

Controller Features		
12 / 24 vdc battery detection	Charge current reading active	PWM charging mode
Battery reverse connection protection	Battery voltage reading active	USB power outlet
LCD display	Battery reverse discharge protection	Plug N Go connections
Controller Specifications		
10-amp solar charger	6.2 in x 2.9 in x 1.06 in	Weight 4.2 oz
DC adapter 20vdc @ 1.2 amps max	Float charging 13.8 / 27.6 vdc	Max solar panel 130 watts
Self-consumption < 9ma	USB max current 1.5 amps	Automatic cutoff under 10.8 vdc

Installation

The controller is fully automatic for easy and quick installation.

1. Connect battery to the controller.
2. Controller LCD screen will display current battery voltage.
3. Connect Power Source to controller (solar panel or DC transformer)

Operation

- Charging Indication Symbol when steady indicates that the power source is charging the battery.
- No symbol indicates power source is not supplying enough energy to charge.
- No symbol indicates power source polarity is reversed, verify power source polarity.

**If the symbol is flashing, the battery is fully charged and has entered float charging state.*

Diagnostics

1. Controller LCD screen is blank:
 - A. Battery voltage below cutoff voltage. Load test battery replace or charge as necessary.
 - B. Reverse battery connection indication. Verify battery polarity connection to controller.
2. Battery symbol is flashing – indicates the battery voltage exceeds the rated input voltage of the charger. Disconnect the external battery charger from battery or choose appropriate battery.
3. E11 displayed – Battery needs to be removed, charged and load tested.

Warning

Risk of explosion! Never install the controller in a sealed enclosure with flooded batteries.

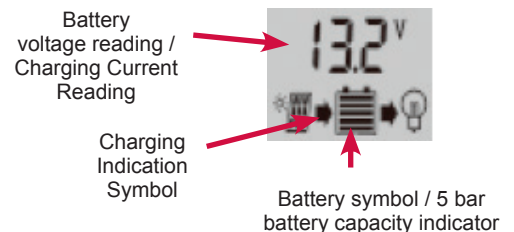


Power Source Inputs:

1. DC power plug 2.5mm
2. Direct wire leads 14-18 gauge

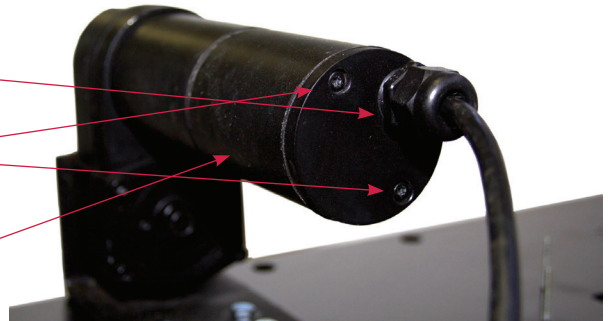
Battery Connections:

1. Anderson Power Plug
2. Direct wire leads 14-18 gauge



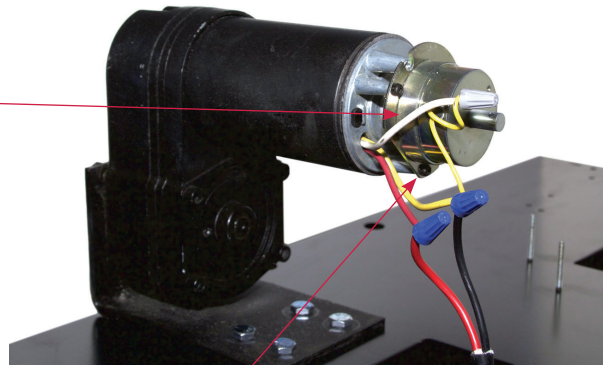
D Patriot RSL Brake Inspection and Removal

1. Loosen the plastic cable strain relief nut.
2. Remove the 2 screws holding the back plate on.
3. Remove the back plate pushing the cable into the strain relief nut as you slide the plate away.

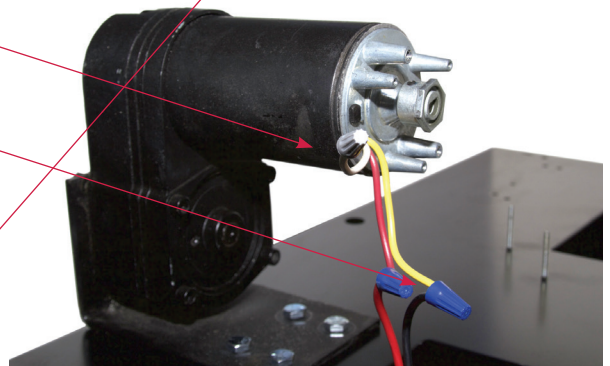


4. Now remove the round cover exposing the brake as shown

5. The brake is the piece which has the 2 yellow wires
6. Verify the 2 wire nuts connecting the brake wires to the other wires are making a good connection.



7. If connection is good then remove the brake by following the steps below:
 - A. Remove wire nut from the white and yellow wire
 - B. Reinstall the wire nut on the white wire only
 - C. Remove the wire nut from the black and 2 yellow wires.
 - D. Reinstall the wire nut on the yellow and black wire only.
 - E. The brake wires should now be disconnected from the other wires.
 - F. Remove the 3 screws holding the brake to the gear motor housing.
 - G. Now the brake is removed and the back housing can be reinstalled.



***Note:** The inside of the housing should be clean if signs of dirt or dark dust are observed then this might indicate the brake has been dragging and possibly causing the unit to blow fuses. Removing the brake will verify if this is the case. The brake is not necessary for proper operation.