

Installation/Owners Manual

PATRIOT RSL

Vehicular Slide Gate Operator



MADE IN THE USA



Heavy Duty

Battery Powered

Solar or AC Charged

WARNING

TO REDUCE THE RISK OF INJURY OR DEATH

- 1. READ AND FOLLOW ALL INSTRUCTIONS**
- 2. Study the entire Safety Section paying particularly close attention to the entrapment zones and be aware of these areas not only during use but also during any adjustments to the unit.**
- 3. Do not attempt to enter the gate area while the gate is moving. Wait until the gate comes to a complete stop.**
- 4. Never let children operate or play with gate controls or any other activation device. Keep remote control away from children.**
- 5. DO NOT ALLOW CHILDREN TO PLAY IN THE AREA OF THE GATE.**
- 6. Do not allow anyone to ride on the gate.**
- 7. Always keep people and objects away from the gate.**
- 8. NO ONE SHOULD CROSS THE PATH OF A MOVING GATE.**
- 9. Operate the gate only when it is fully visible, free of persons or obstructions, and properly adjusted.**
- 10. Do not attempt to “beat the gate” while the gate is opening or closing. This is extremely dangerous.**
- 11. Test gate operator monthly. The gate must stop and reverse directions upon contacting a rigid object or when the monitored entrapment device is activated.**
- 12. After all adjustments have been made to the sensitivity (current sense) circuit, monitored entrapment devices and all other external devices installed, the monitored entrapment devices must be checked again. Failure to adjust and retest the gate operator can increase the risk of injury or death.**
- 13. Verify that the emergency release (manual release) knob can be pulled easily. This should only be checked when power is disconnected from the operator.**
- 14. KEEP GATES PROPERLY MAINTAINED. Tighten all bolts, grease wheels and lubricate chain.**
- 15. THE ENTRANCE IS TO BE USED BY VEHICLES ONLY. Pedestrians must use a separate entrance.**
- 16. Test the current sense feature and all safety devices regularly to insure correct operation.**
- 17. All control stations should be located at least 6 feet from any moving part of the gate or operator.**
- 18. Do not ever install any control device where a user will be tempted to reach through the gate or fence to activate a gate.**
- 19. SAVE THESE INSTRUCTIONS!!**



PATRIOT Series AUTOMATIC GATE OPERATORS

The Patriot Slide Gate Operator is intended to be installed on vehicular Class I, II, III or IV slide gates up to 32 feet in length and up to 600 pounds in weight as defined by the current UL 325 standard (the standard that regulates gate operator safety).

A monitored external entrapment device is required for UL compliant installation per UL325.

All USAutomatic control boards can identify the following external entrapment devices:

1. Contact edge 10K resistor presence
2. Photo Eye N/C contact switching

PLEASE READ THE ENTIRE MANUAL CAREFULLY PRIOR TO INSTALLATION.

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.

This type battery is commonly known as a lawn tractor or wheel chair battery. If the installation is located in an area that has frequent power outages (AC charged systems) or might experience weeks of no sun shine (solar charged systems in region 3) then a larger amp hour battery needs to be considered. A 70 amp hour battery minimum would be recommended for those locations.

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

The battery is charged using the 120V AC Powered Transformer (PN #520004) **OR** the Patriot Solar Panel Kit 6 Watt (PN 520025). Typically only one panel will be required. The Patriot gate operator is capable of a high number of cycles per day. For information on what you can expect from a solar charged system see the solar charging section of this manual (page 52). Accessories that are added to your gate operator must be solar friendly accessories and they will be identified as such. Visit www.usautomatic.com for more information.

PLEASE READ THE ENTIRE MANUAL CAREFULLY PRIOR TO INSTALLATION.

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USAutomatic Part # 720001



Understanding Current UL325 & ASTM F2200-14 Requirements

Effective January 12, 2016 a vehicular gate operator or vehicular barrier (arm) operator shall have provisions for, or be supplied with, at least two independent entrapment protection means 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.

USAutomatic control boards utilize Type A (Inherent entrapment protection system) as the first entrapment protection means identified. This is designed into the control boards for all USAutomatic operators. The second entrapment identified must be a monitored Type B1 or Type B2 device that is UL325 compliant and monitored.

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.

The entrapment zones illustration on page 3 defines the most common entrapment areas. It is the responsibility of the installer to identify these entrapment areas and install the UL325 compliant monitored entrapment device or devices to protect each area identified.



When installing a USAutomatic control board (part # 500002) in a system manufactured before Jan. 12, 2016 that is not being upgraded to meet the current UL325 standard the Pre 2016 jumper must be installed into J5 terminal block for proper operation.

USAutomatic recommends upgrading all systems to current UL325 standards

UL325 identifies four different classes of gate operators.

These classes are:

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.

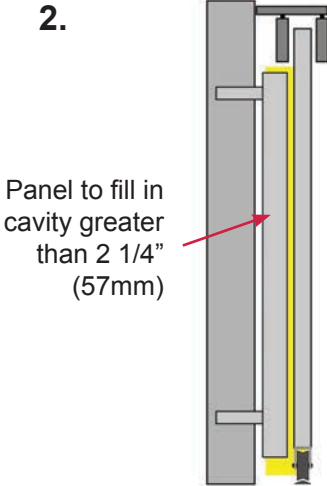
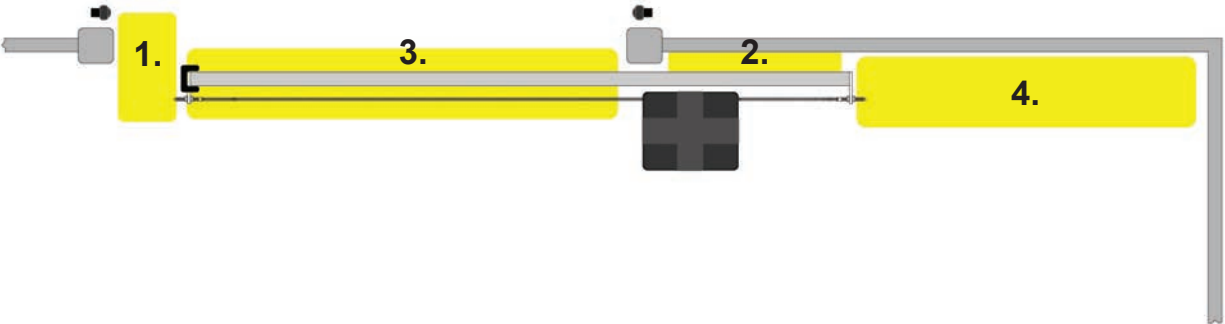
RESTRICTED ACCESS VEHICULAR GATE OPERATOR – CLASS IV

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.

Patriot slide gate operators are intended for use on Class I, II, III & IV vehicular slide gates.

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 B2 wireless contact sensor.

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 B2 wireless contact sensor.

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)

TABLE OF CONTENTS

INTRODUCTION

Entrapment Zones.....	3
Safety Installation Information	5
Patriot RSL Parts Inventory	6
Patriot RSL Hardware Inventory	7
General Tool Requirements	7

PREPARATION AND OVERVIEW

Gate Qualifications/Applications	8
Proper Gate Design	8

INSTALLATION STEPS

1. Mounting Site Review	11
2. Mounting Operator	12
2a. Post Mount Installation	13
2b. Pad Mount Installation	14
3. Install Chain Brackets to Gate	15
4. Connect Chain	15
5. Adjust Chain Tension	15
6. Install Patriot Control Board	16
7. Installing Receiver and Smart Charger / Charge Controller / Entrapment Siren	16
8. Install Battery	16
9. Installing Power Source	17
9a. AC Charge System	17
9b. Solar Charged System	17
10. Charge Controller Operation Check	17
11. Installing Monitored Entrapment Protection Devices	18
11a. Monitored Photo Eye (Type B1) Installation.....	18
11b. Monitored Contact Edge (Type B2) Installation.....	19
12. Connect Wire Harness Cable to Control Board	19
13. Verifying Photo Eye Installation	19
14. Patriot Control Board Information	20
15. Control Board Dipswitch Setting Verification.....	24
16. Optional Soft Stop for Retract or Extend Position	24
17. Operating Gate For The First Time	25
18. Limit Switches	25
19. Sensitivity Adjustment and Entrapment Alarm	26
20. Verifying Inherent Entrapment Protection System (Type A) Operation	26
21. Verifying Monitored Entrapment Protection Devices Operation	27
Verifying Monitored Photo Eye (Type B1)	27
Verifying Monitored Contact Edge (Type B2).....	27
22. Programming Transmitter and Receiver	28
23. Install Safety Signs	29
24. Install Cover	30
25. Emergency Manual Release	30

PERIODIC SERVICE	31
-------------------------------	----

ACCESSORIES	32-39
--------------------------	-------

TROUBLESHOOTING	40-51
------------------------------	-------

APPENDIX

A. The Patriot RSL Solar Charged System	52
B. Extending Charge Device Location.....	53
C. Charge Controller.....	54
D. Patriot RSL Brake Inspection and Removal.....	55
E. Installing Patriot RSL Control Board part # 500002 in Pre Jan. 12, 2016 operators.....	56

WARRANTY	57
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SAFETY INSTALLATION INFORMATION

INSTALLATION

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.
- Guarding is supplied for exposed rollers.
- All openings of horizontal slide gate are guarded or screened from the bottom of the gate to a minimum of 6 feet (1.83m) above the ground to prevent a 2-1/4 inch (57.2mm) 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 is a vehicular gate. Pedestrians must be supplied with a separate access opening.
- The gate is installed in a location where enough space is supplied between adjacent structures and the gate that when opening or closing the chance of entrapment is reduced.
- 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.
- Safety Signs are installed, one on each side of the gate and visible in the gate area.
- All hard wired sensors used for monitored entrapment protection devices and their wiring are installed in a manner which protects them from mechanical damage.
- All wireless sensors used for monitored entrapment protection devices are located so that the signal from the transmitter to the receiver is not interfered with by adjacent structures. All exposed wiring must also be protected from mechanical damage.

IMPORTANT CAUTIONS

- Do not test or operate this unit without first ensuring that all hardware is correctly installed, limit nuts are securely locked in place with the limit locking plate and all objects are clear of sprockets and chain.
- Do not perform any welding with the control board or the battery connected. Serious damage to the control board and/or battery can occur if attempted.
- Loose clothing can get caught in chain and sprockets resulting in bodily harm.

MONITORED ENTRAPMENT DEVICES

USAutomatic designs all control boards with monitored entrapment device inputs. USAutomatic recommends installation of monitored UL325_2016 listed external entrapment devices for all installations. This is required for a compliant UL325_2016 installation.



PARTS INVENTORY

All Operators include:

- Part # 590010 Slider Frame
- Part # 590020 Slider Cover
- Part # 500002 Control Board



Emergency Release Access Cover

- Part # 590030
- 1 per



Smart charger

- 2 amp AC battery charger or Solar charge controller
- Part # 520006
- 1 per



AC Charging Transformer

- Part # 520004
- with Patriot AC Models



Solar Charging Kit - 6 Watt

- Part # 520025
- with Patriot Solar Models



Entrapment Siren

- Part # 530010
- 1 per



Charge Control Harness

- Part # 630100
- 1 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 # 070305
- Photo Eye - Part # 550010 & 550011
- Metal Photo Eye - Part # 550014

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



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 vehicular Class I, II, III or IV slide gates up to 32 feet in length and up to 600 pounds in weight as defined by UL-325. 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, LTD 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 openings shall be designed, guarded, or screened from the bottom of the gate to the top of the gate or a minimum of 6 feet (1.83 m) above grade, whichever is less, to prevent a 2 ¼ in. (57 mm) 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. (ASTM F2200)

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

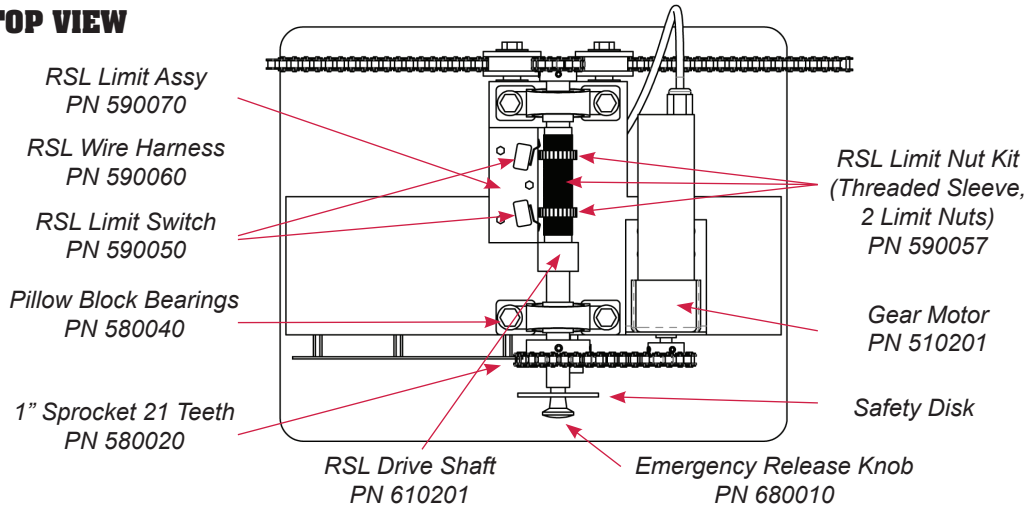
Positive stops shall be required to limit travel to the designed fully open and fully closed positions. These stops shall be installed at either the top of the gate, or at the bottom of the gate where such stops shall horizontally or vertically project no more than is required to perform their intended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

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

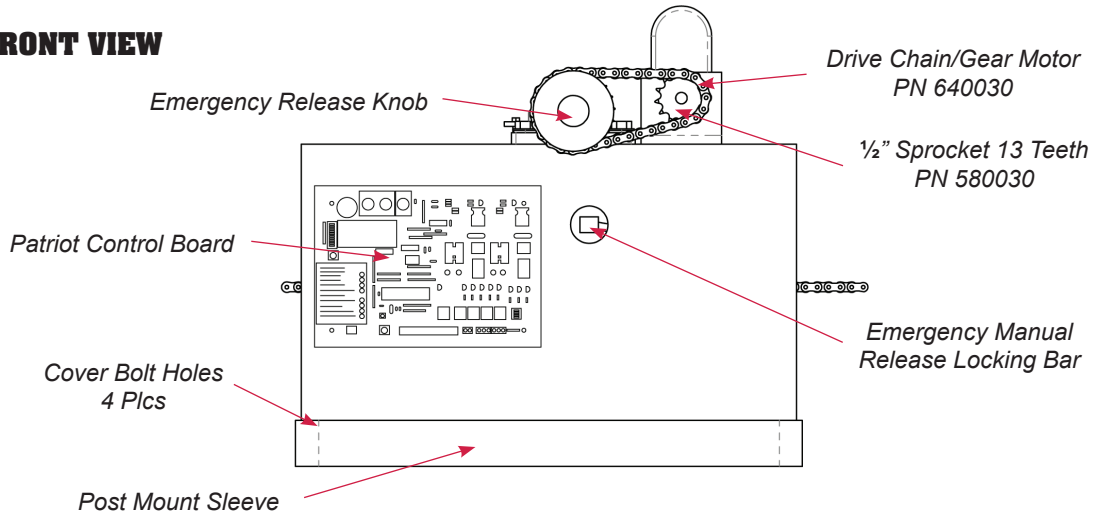


Operator Illustration and Descriptions

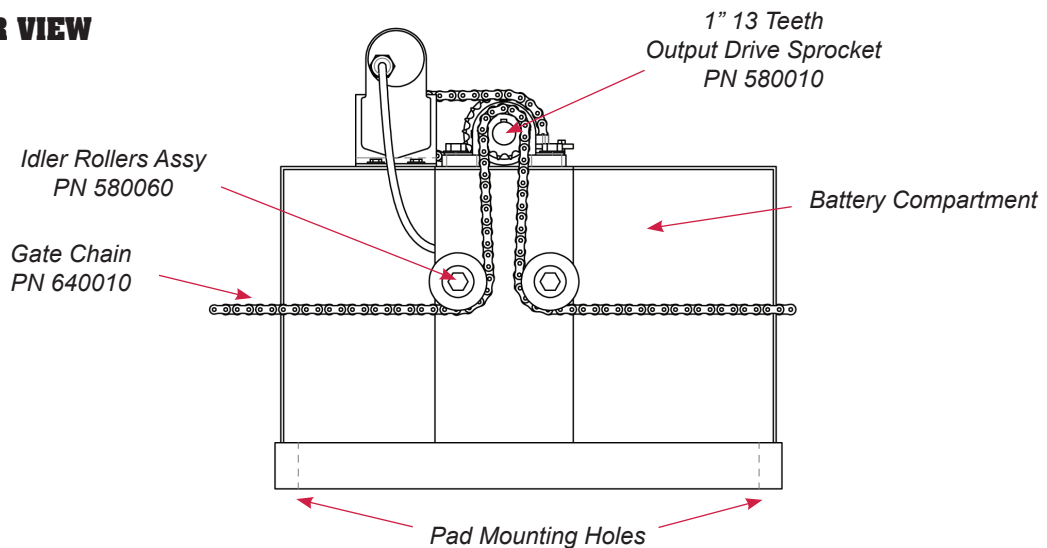
TOP VIEW



FRONT VIEW



REAR VIEW



I Mounting Site Review

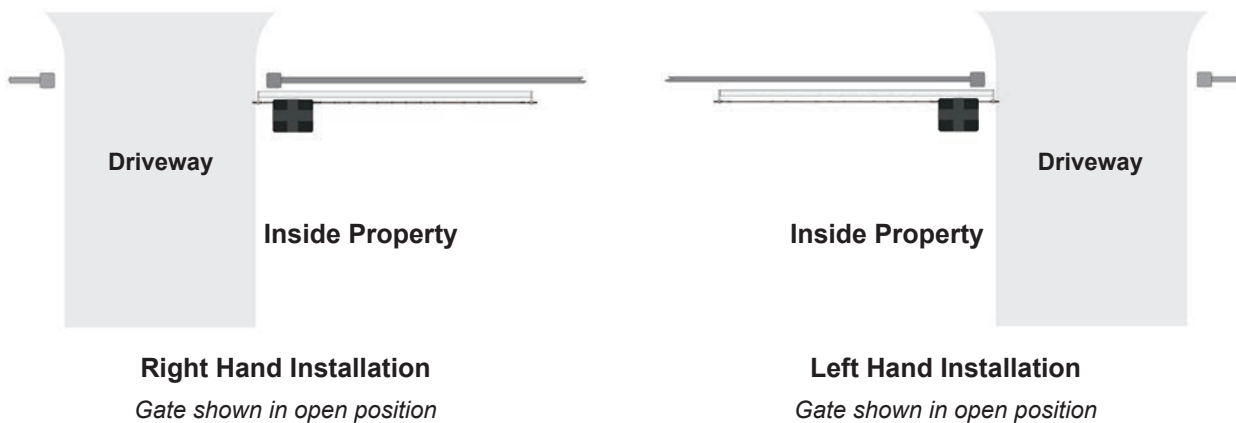
Review the following items prior to installation and predetermine the solution to any problems which may exist:

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 15 Step 3*
3. How will the operator be mounted (on a pad or on a post) *See below*
4. For AC Charged System - *See page 17 Step 9a*
5. For Solar Charged System - *See page 17 Step 9b*
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 14*
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.



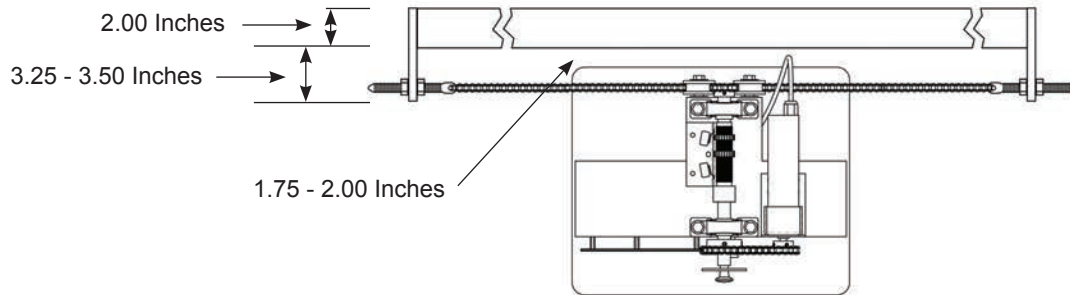
POST MOUNT

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.

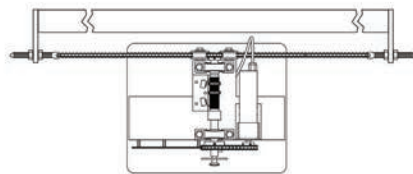


Set the operator in place (pad or post). Ensure that the chain bolts, once installed, will be properly aligned with the chain rollers. Once alignment is verified, secure operator in place using bolts for pad installation and welding for post installation. Keep the operator parallel with the gate while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

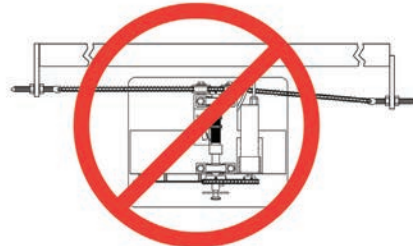
Correct dimensions for installed operator - Pad or Post mount



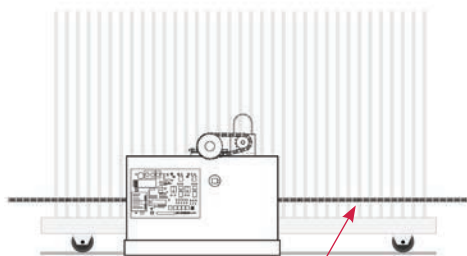
Correct Installation



Incorrect Installation



Correct Installation



Incorrect Installation



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

2a Post Mount Installation

POST SPECIFICATIONS

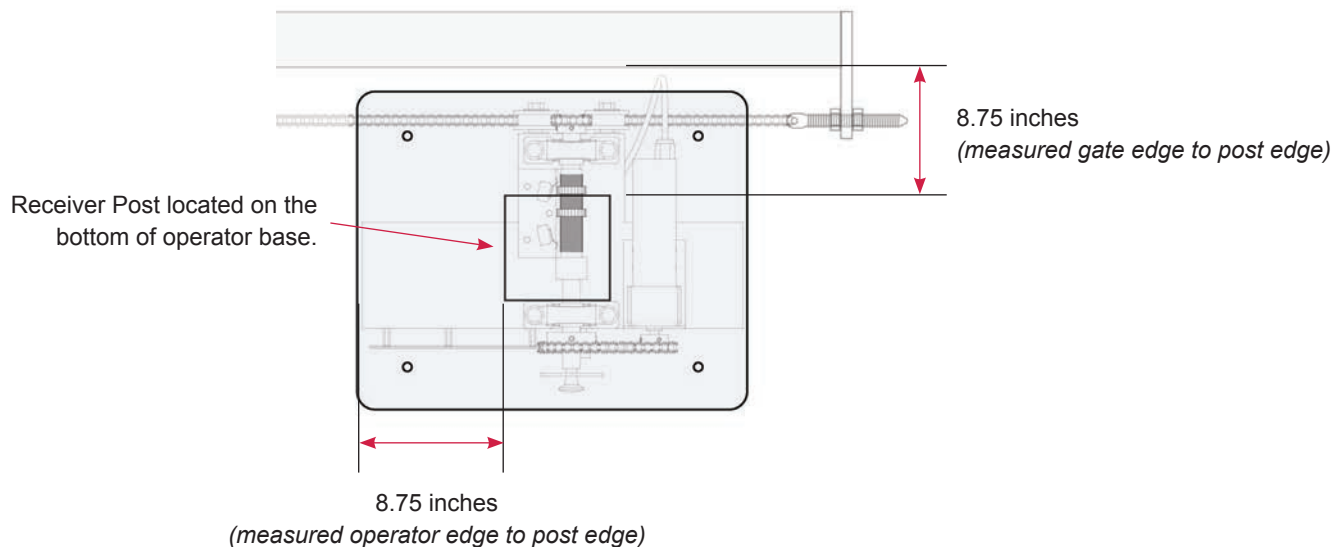
Steel post is an optional mounting method. The operator is designed to handle a 4-inch round or square thick wall post. The operator can be installed directly onto the post or a steel frame can be constructed on the top of post. If the method chosen is to construct a frame see dimensions in pad mount 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.

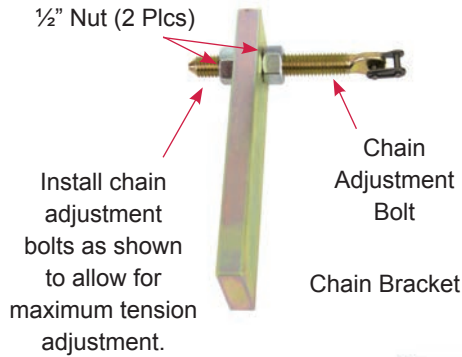
Post must be parallel to gate edge. Hole depth should be at least 36 inches and bell shaped to reduce operator movement to a minimum. **The post must be concreted in place.**

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



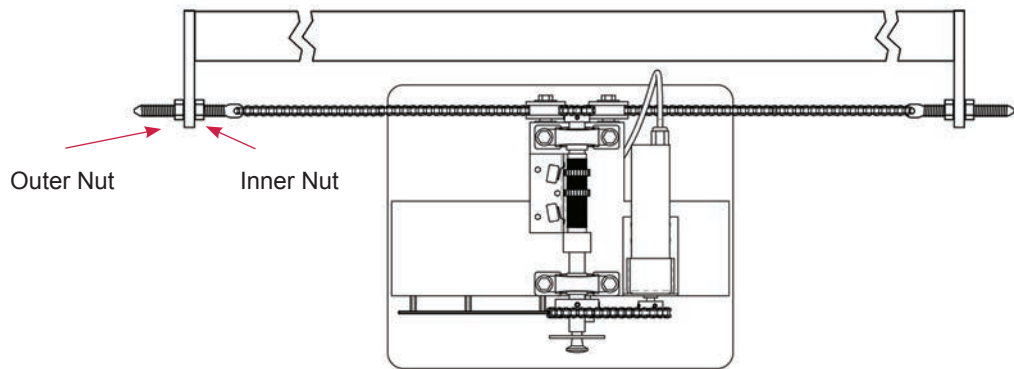
3 Install Chain Brackets to Gate

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.

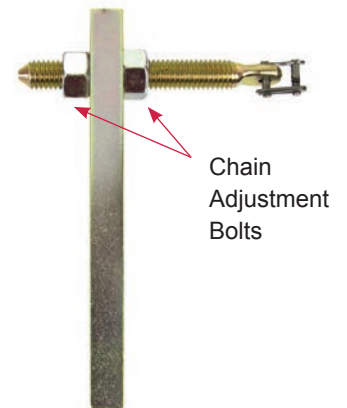
Slide the gate fully open. Using the diagram below locate the correct position for the gate bracket. Clamp the bracket in place and repeat for gate in the fully closed position. Before welding gate brackets in place, refer to page 11 to ensure correct installation. Once alignment is correct, weld chain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

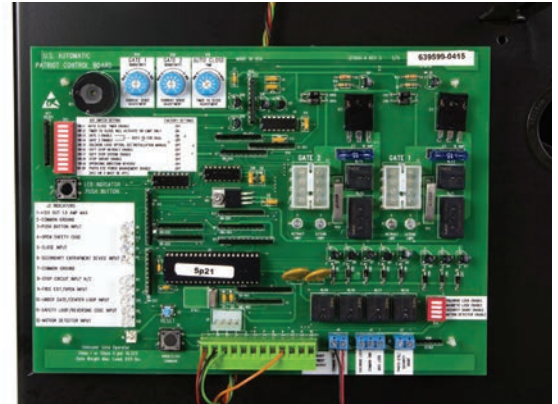
The outer 1/2" nut on the chain adjustment bolt adjusts chain tension. It is important not to over tighten the chain or premature wear will result. It is also important not to allow the chain to be too loose. Once the chain tension is correct, secure the inner 1/2 inch nut by tightening it against the 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 # 500002

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

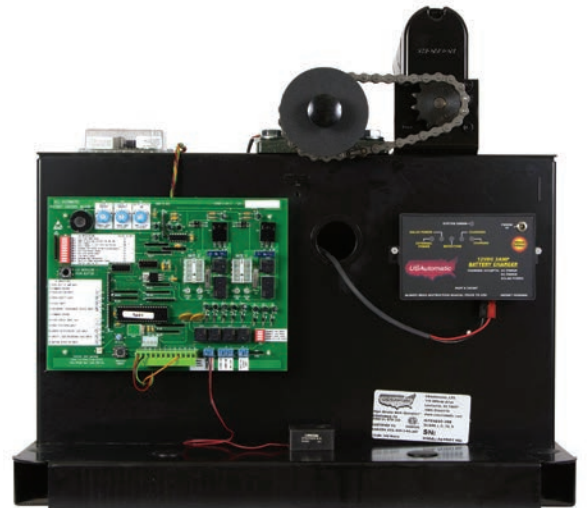
**Installing part # 500002 in pre 2016 system see appendix D page 56.*



7 Installing Receiver, Smart Charger / Charge Controller, and Entrapment Siren

- a. Connect the wiring harness to the charge controller.
- b. Using the 2 nylon nuts provided, install Charge Controller. Use a 1/4" nut driver to secure.
- c. Install the receiver on top shelf using the 2 phillips screws provided.
- d. Plug the green terminal plug into the control board at J2 connector.
- e. Install entrapment siren connect wires to J4 connector on control board.

Black - COMMON GND
Red - OUTPUT 12V



8 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.



9 Installing the Power Source (AC or Solar)

The USAutomatic smart charger / charge controller can be powered by a low voltage transformer (120vac in / 18vac output) part # 520004 or Solar panel 6 watt (17.2vdc load voltage) part # 520025. The transformer and Solar Panel are equipped with a low voltage power plug for easy connection to the charger "Power In" input.

9a AC Charged System

The low voltage transformer is equipped with 12 feet of cable. It can be installed up to 1000 feet away from the gate area if required (see Page 53).

ATTENTION: The AC Power GFI receptacle should be installed by a qualified technician.

Once transformer is installed connect low voltage power plug into the charger "Power In" input shown below.



9b Solar Charged System

The Solar panel is equipped with 15 feet of cable. It can be installed up to 500 feet away from the gate area if required (see Page 52).

IMPORTANT: Solar panel must be installed facing South/Southwest direction. Full sun is required any shading of the solar panel MUST be eliminated. Failure to do so will result in battery charging problems.



Once solar panel is installed connect low voltage power plug into the charger "Power In" input.

10 Charge Controller Operation Check

Once the power source is plugged into the charge controller verify the following:

1. Charge light flashes for 3 seconds and goes off
2. External power and detection lights come ON
3. Detection light stays on for 3 seconds, then charging light comes ON

ATTENTION: If AC or Solar power and Detection lights are ON. Verify that Charge Control Harness is connected to the battery and charger.

When using a solar panel, the charger is designed to turn OFF when there is not sufficient sun to produce a positive battery charge. If transformer is installed lights should be operational at all times.



Power Source plugs in here



11 Installing Monitored Entrapment Protection Devices

Effective January 12, 2016 A vehicular gate operator or vehicular barrier (arm) operator shall have provisions for, or be supplied with, at least two independent entrapment protection means 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.

USAutomatic control boards utilize Type A (Inherent entrapment protection system) as the first entrapment protection means identified. This is designed into the control boards for all USAutomatic operators. The second entrapment identified must be a monitored Type B1 or Type B2 device that is UL325 2016 listed.

SYSTEM MANUFACTURED AFTER JAN. 12, 2016 WILL NOT OPERATE WITHOUT 1 OF THE 2 FOLLOWING TYPES OF MONITORED ENTRAPMENT PROTECTION DEVICES CONNECTED AND OPERATIONAL.

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

11a Monitored Photo Eye (Type B1) Installation for Entrapment Protection ONLY.

Connect wires per the table below: All wiring should be done with power disconnected from control board.

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	J2 pin 8

The energy saving design of the control board will only apply 12 vdc to the photo eye when the gate is in operation. 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

11b 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.

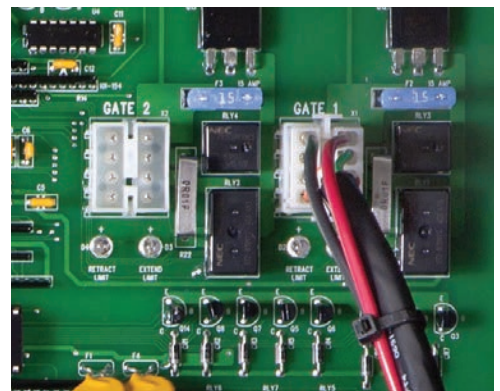
Contact Edge wiring for Entrapment Device Protection	
Contact Edge Connections	Patriot Control Board Connections
N/O connection	J2 pin 6
Common	J2 pin 2 or pin 7

12 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.



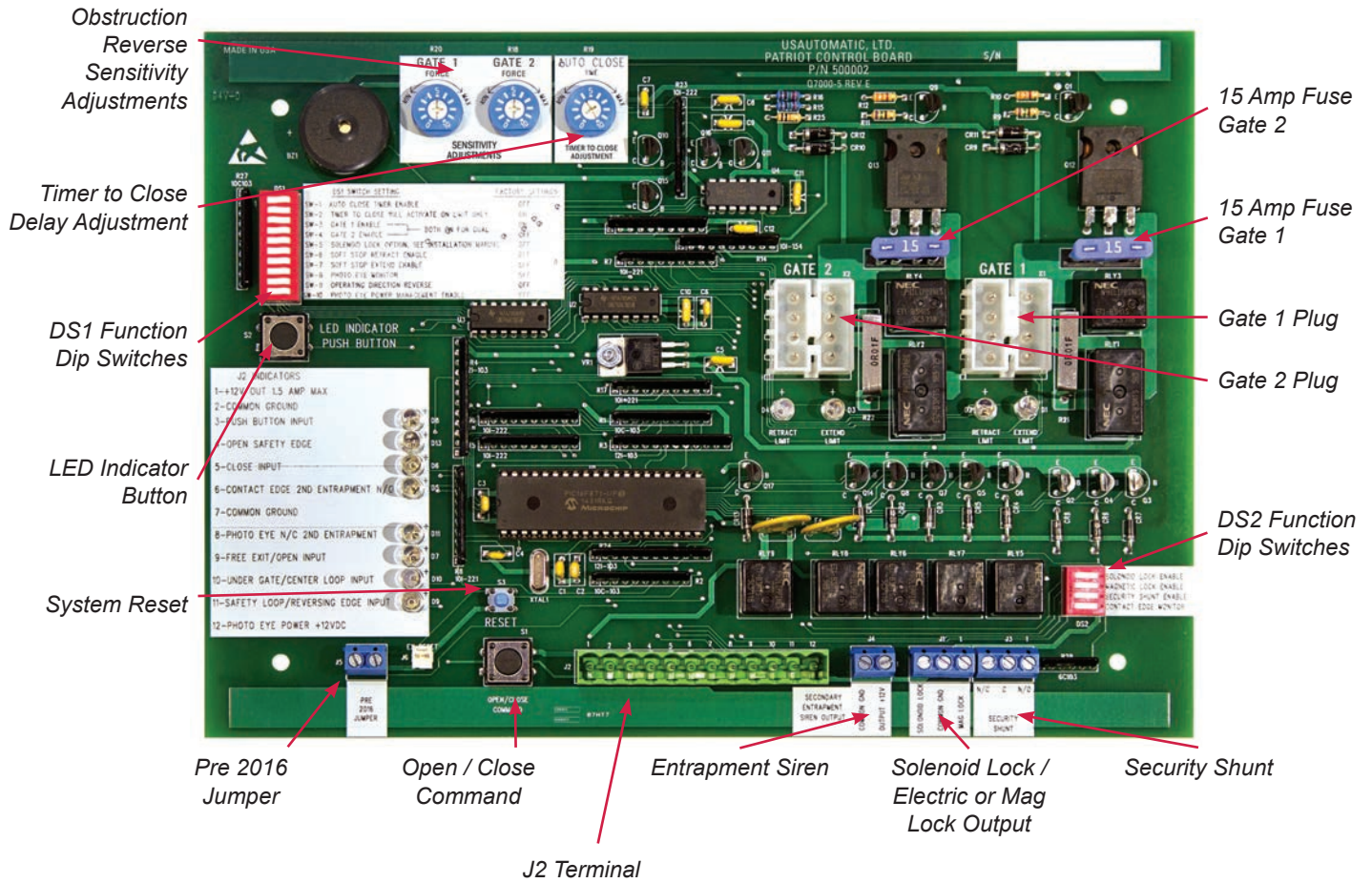
13 Verifying Photo Eye Installation

With power now applied to the system, the photo eye can now be installed and tested for proper alignment. Refer to the photo eye installation instructions for information about alignment. Typically the photo eye will have lights of different colors to indicate beam is aligned or not aligned.

14 Patriot RSL Control Board Information

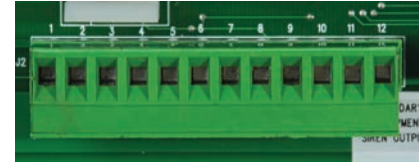
The Patriot RSL control board is capable of operating two gates. If your installation is a single gate you can operate the gate on the Gate 1 or Gate 2 connector. Set control switch "ON" for the connector being used.

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

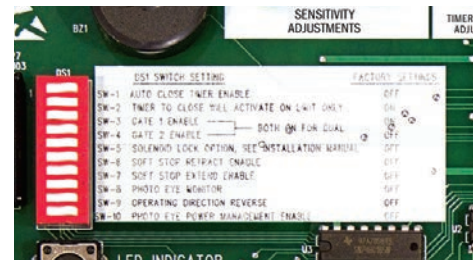
Place finger below connector and pull out to remove.

Terminal	
1	+12 vdc Output <i>(Maximum current output 1.5 amp - 1500 milliamps)</i>
2	Common Ground Input -12 vdc
3	Push Button Input <i>(normally open contacts)</i> <i>(Push button, radio control, keypad, etc.)</i>
4	Open Safety Edge <i>(normally open contacts)</i> <i>(Stops gate when opening)</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 or when</i> <i>*Secondary Entrapment Input is connected when in pre 2016 configuration</i>
7	Common Ground Input -12 vdc
8	Photo Eye N/C connection monitored entrapment <i>DS1 switch 8 must be on when monitored eye is connected</i> <i>*Not used in pre 2016 configuration</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)</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

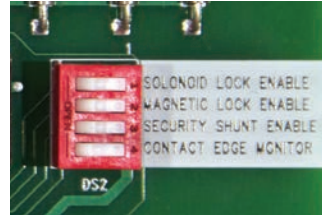


Switch		Setting	Factory Settings are shown in bold type
1	Automatic Close Timer Enable <i>(Not recommended unless safety devices are installed)</i>	ON	Timer to close is activated
		OFF	Timer to close is disabled
2	Timer to Close Function	ON	Timer to close activates only if open limit is activated
		OFF	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 <i>(see accessory wiring page 47)</i>	ON	DS2 SW 1 must be on, output +12vdc when gate is operating
		OFF	No function. See DS 2 SW 1 Pg 23
6	Soft Stop Retract Enable	ON	Enables soft stop for retract position
		OFF	Disables soft stop for retract position
7	Soft Stop Extend Enable	ON	Enables soft stop for extend position
		OFF	Disables soft stop for extend position
8	Photo Eye Monitor <i>(Must be ON when a monitored photo eye is installed at J2 pin 8)</i>	ON	Monitored photo eye installed
		OFF	No monitored photo eye installed
9	Operating Direction Reverse <i>(Must be on for left hand installations to operate correctly)</i>	ON	Left Hand Installation - see page 12
		OFF	Right Hand Installation - see page 12
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 - see page 37
		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	To enable one of the following functions: <ul style="list-style-type: none"> 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. (<i>Solenoid Lock Output = +12 vdc / 1.5 amp max while gate is in motion</i>) Gate Leaf Delay (<i>gate 2 delays 2 seconds</i>)
		OFF	Solenoid lock / gate in operation indicator / gate leaf delay is inactive
2	Magnetic Lock Enable	ON	Magnetic lock output energizes on Close Limit and releases half second before gate begins to open. (<i>Energizes = +12 vdc output 1.5 amp max</i>)
		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 3 seconds after gate reaches a closed limit
		OFF	Security shunt circuit relay is inactive (open circuit)
4	Contact Edge Monitor <i>(must be ON when in pre 2016 mode for secondary entrapment device operation connected at J2 pin 6.)</i>	ON	Monitored contact edge is installed
		OFF	No monitored contact edge installed

15 Control Board Dipswitch Setting Verification

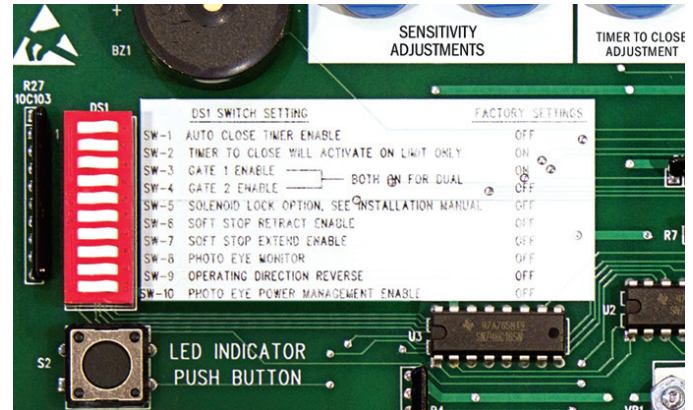
NOTE: This check must be performed before operating the gate for the first time. Failure to do so may damage the gate operator.

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 on page 12 and verify the dipswitch settings.

Patriot RSL	Standard Switch Settings	W/ Monitored Photo Eye	W/ Monitored Contact Edge
Right Hand Installation	Dipswitches 2, 3 should be in the ON position	DS1 switch 8 and 10 ON	DS2 switch 4 ON
Left Hand Installation	Dipswitches 2, 3, 9 should be in the ON position	DS1 switch 8 and 10 ON	DS2 switch 4 ON

16 Optional Soft Stop for Open or Close Position

The Patriot RSL control board is equipped with a selectable soft stop feature for open, close or both directions, 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, close or both stop positions must be adjusted so that the gate is stopping about 24 inches short of the fully open, close or both desired stop positions.

Once adjusted as stated above identify the installation type and use chart below for dipswitch settings.

Patriot RSL	Open Gate Soft Stop	Close Gate Soft Stop	Open & Close Soft Stop
Right Hand Installation	DS1 switch 6 ON	DS1 switch 7 ON	DS1 switch 6, 7 ON
Left Hand Installation	DS1 switch 7 ON	DS1 switch 6 ON	DS1 switch 6, 7 ON

17 Operating Gate for the First time

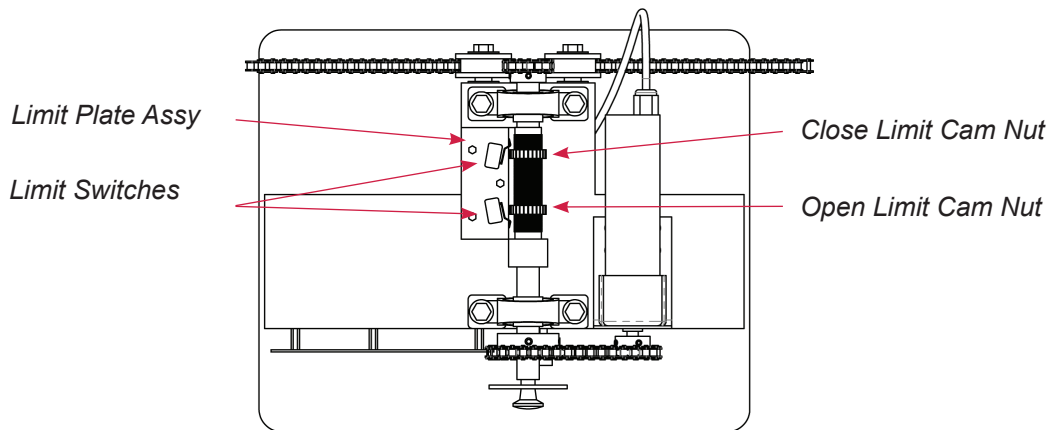
Before operating the gate for the first time please verify the following items:

1. Verify that all dipswitches are set correctly for the installation using chart on page 24 step 15.
2. Pull manual release knob and slide gate in mid travel position.
3. Reengage manual release knob by pushing it inward and slowly rolling gate until knob slides in place.
4. Adjust limit cam nuts so that they are within 1 inch of the limit switches (see diagram)

18 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.



NOTE: 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.

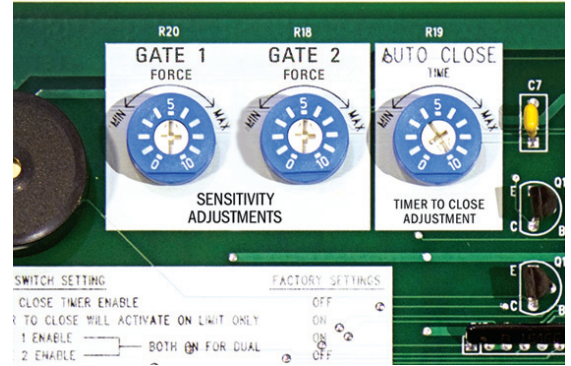
1. **Locate the Open/Close command button on the Patriot control board.** This button will start the gate when pressed once, pressing it again will stop the gate.
2. **Press the Open/Close command button.** The gate should begin to open and allow gate to travel to open stop position.
3. **Press the Open/close 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.**

19 Sensitivity Adjustment and Entrapment Alarm

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 rollers and gate track for possible problems.

Both sensitivity dials should be set to the same setting on a single gate installation.



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.

For example, the gate is closing and is stopped by some object, it will then reverse direction. If the gate encounters a second object before reaching the fully open position it will stop again and enter a hard shutdown, which will set off the entrapment alarm. The alarm will sound for 5 minutes or until the reset button on the control board is pressed and released. The hard shutdown will require the reset button to be pressed to place the gate operator back into operation.

20 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.

Gate Opening - Gate is stopped by an object after 1 second of operation	Gate Closing - Gate is stopped first time by an object after 1 second of operation
<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. 	<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.
Gate Closing after above obstruction – If Gate is stopped a second Time Before Reaching the Close Limit	Gate Opening after above obstruction – If Gate is stopped a second Time Before Reaching the Open Limit
<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. 	<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.

21 Verifying Monitored Entrapment Protection Devices Operation

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 2nd Entrapment - N/C input J2 pin 8 If DS1 switch 8 is OFF this input is ignored. If ON, functions as described below	
Gate Opening Photo Eye Activated 1 st time	Gate Closing Photo Eye Activated 1 st Time
Gate stops and reverses for ~ 2 seconds	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.
If while closing after reversal above a 2 nd activation occurs before the close limit then	If while opening after reversal above a 2 nd activation occurs before the open limit then
Gate stops	Gate stops
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 actuated.	Return to normal operation when the sensor is no longer actuated.

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

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

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 1 st time	Gate Closing Contact Edge Activated 1 st 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 2 nd sequential input is received, gate must stop
If while closing after reversal above a 2 nd 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 2 nd 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.



22 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:

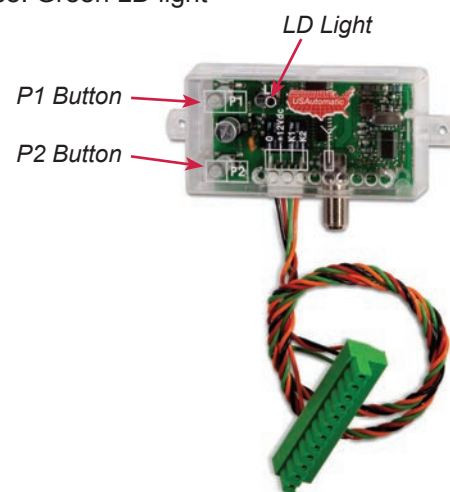
(Hold-Gate-Open) (Only if auto close timer is enabled)

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)

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

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.

23 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.

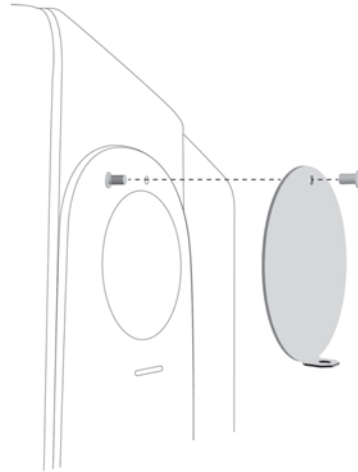


23 Install Cover

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.



24 Emergency Manual Release

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

Pull manual release knob out (about 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.



PERIODIC SERVICE

All gate operators require periodic checking and adjustments of the control mechanism for force (load), speed and sensitivity.

Monitored 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, clean with baking soda solution.
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 motorcycle or bicycle 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.**



Accessories

Wireless Keypad

Part Number 050500

PUK code _____

Metal Wireless Keypad

Part Number 050550

PUK code _____

This tamper-resistant, weatherproof, programmable Wireless Keypad can be mounted outside your gate and offer convenient access without having to carry a transmitter.

Terms to understand:

Access Code – The 2 to 5-digit code used to operate 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.

On the metal keypad, A and B replace * and #.

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 OPERATE GATE.

Relay 1 – The receiver has 2 relays. P1 (relay 1) is pre-wired to the J1 connector to open and close the gate.

Relay 2 – The receiver has 2 relays. P2 (relay 2) is pre-wired to the “Open/Free Exit” on J1 connector to OPEN only.

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.

“ * ” 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.

Metal Keypad - 5 Key Flashes Blue

Note: Do not install keypad until “Learning Keypad to Receiver” has been completed.

PROGRAMMING WIRELESS KEYPAD

Programming the Keypad for Operation

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

1. Enter the Master Password “11111”.
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, “#” is required.
4. Enter “9”
5. Enter the new Access Code again to verify.
6. Enter 1, 2, 3 or 4 to select a different frequencies for the access code created.

(EX. If you have 2 gates and want to have different access codes for each gate from the same keypad or two different keypads use a different number 1-4 in this step for each access code. This way the access codes do not send the same frequency.)



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.

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

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, "#" 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.

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
#	X				X		X		
0		X						X	
*			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
#									
0									
*									

1. Enter the Master Password.
2. Enter "6" 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 "#"
5. Enter "6"
6. If correct, 2 short beeps (if 1 long beep is heard, start over with step 1).



Learning Keypad to Receiver:

Create Communication with Receiver Relay P1: (Security Code/Dip Switches)

For open, close, stop functions.

1. Carry keypad to receiver location for programming.
2. Enter the Access Code for 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.

Create Communication with Receiver Relay P2: (Security Code/Dip Switches)

Not required unless using Relay 2.

For open only function:

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

For Hold gate open function:

**The receiver P2 channel must be changed from momentary to latch mode to hold gate open.*

LD light when it first comes ON steady = momentary mode

LD light when it first comes ON flashing = latching mode

Receiver Programming:

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 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.

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.
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).

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-USAutomatic 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 negative (12vdc-) wire from the magnetic gate lock to J1 Common Gnd terminal. Connect the positive (12vdc+) wire from the magnetic gate lock to J1 Solenoid Lock terminal.

Exit Sensor (Solar friendly device)

Preferred Technologies CP-3-3W

Part Number 070305

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')

It is recommended to install this sensor and cable in PVC conduit.

Wire as follows: Red wire – connect to J2 pin 1
Shield (braided wire) – connect to J2 pin 2
Black wire – connect to J2 pin 9



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 (Wire not included):

- 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



Photo Eye - Vehicular Protection Only

Part Number 550010 - wired

Part Number 550011 - battery

Part Number 550014 - metal photo eye

Wiring Photo Eye to Patriot RSL Control board

(Control Board part #500002 only)

Photo eyes are recommended for all systems. This provides protection against the gate closing on objects that may be in the gate path.



#550010 and #550011

Photo Eye #550010

- The primary unit (Receiver) should be installed close to the control box.
- It requires 4 wires to be installed from the unit to the control box (Wire not included).
- The second unit (Transmitter) should be installed on the opposite side of the drive.
- It requires 2 wires to be installed from the unit to the control box. (+12v and Gnd)
- The two units must face each other to establish the beam (maximum distance 40 feet).



#550014

Photo Eye #550011 - Battery Powered Transmitter or Hard wired same as above. (Wire not included)

Photo Eye #550014 (Metal)

- The primary unit (Receiver) should be installed close to the control box.
- It requires 4 wires to be installed from the unit to the control box (Wire not included).
- The second unit (Transmitter) should be installed on the opposite side of the drive.
- It requires 2 wires to be installed from the unit to the control box. (+12v and Gnd)
- The two units must face each other to establish the beam (maximum distance 40 feet).

When utilizing the PEPM software the photo eye will only be powered up when the gate is operating. The PEPM software allows the gate to be held open without battery drain and does not require any additional solar panels.

Installing Photo Eye For Vehicular Protection Only

The photo eye must be wired as shown and the correct dipswitches must be turned on for the PEPM software to work correctly. Detailed instructions are below with illustration.

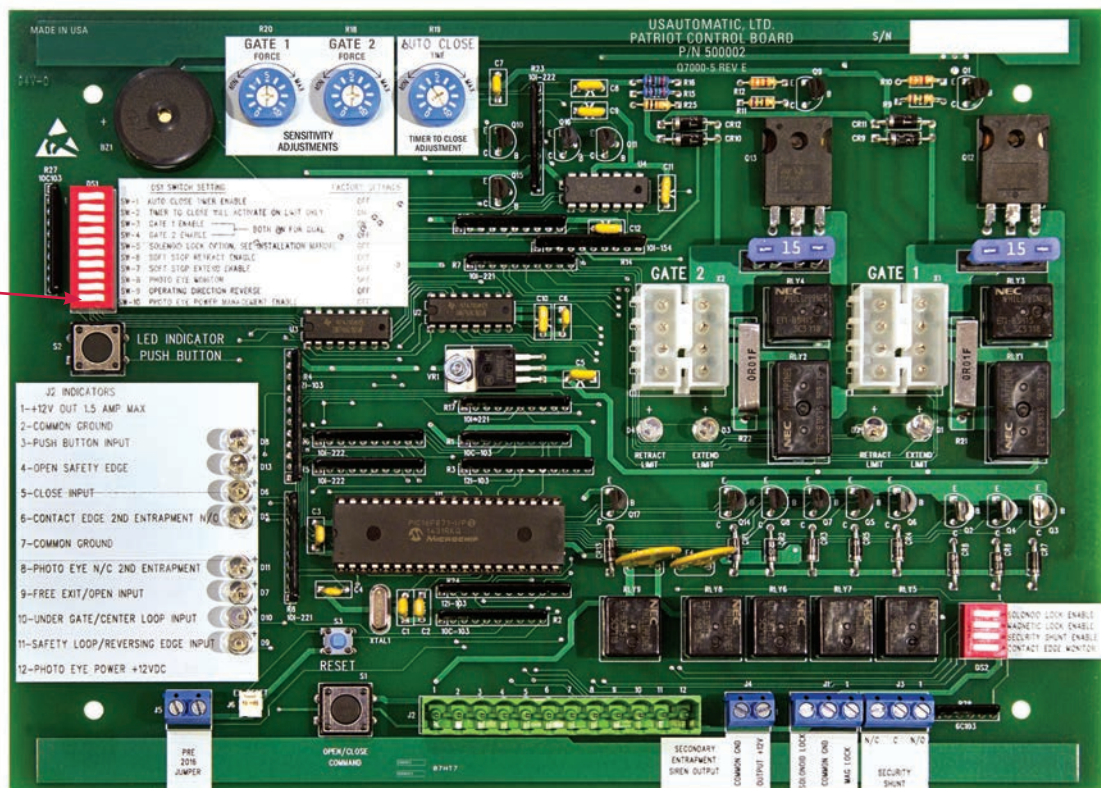
NOTE: Monitored UL325 photo eye installation instructions refer to page 18 step 11a.

1. Connect photo eye power wire +12 vdc to J2 pin 12.
2. Connect photo eye power ground to J2 pin 2 or pin 7.
3. Wire the RX relay N/O contact from the photo eye to J2 pin 11.
4. Wire the RX relay common from the photo eye to J2 pin 2 or 7.
5. Turn OFF DS1 switch 3 and 4 (temporarily to provide power for installation)
6. Turn on dipswitch DS1 switch 10 photo eye power enable.
7. Install Photo eye and adjust beam – verify proper operation.
8. Once installed turn ON DS1 appropriate dipswitches for gate 1 or gate 2 or both for dual gates.

Test photo eye for proper operation, when gate is closing and beam is broken gate should stop and reverse to full open. If gate is open and beam is broken gate will not close.

NOTE: Power is applied to photo eye just before gate operation begins and turns off when gate stops.

DS1 dip switch 10 -
Photo Eye Power
Management Enable



Garage Door Receiver

Part Number 030214

The receiver provided with the Patriot RSL gate operator operates at 433 MHz and might or might not be compatible with your garage door. If receiver frequency is not compatible the optional "Garage Door Receiver kit" can be easily installed in the garage.

The kit contains receiver, transformer and a wire harness that easily installs to the existing garage door. One receiver will be needed for each garage door. All existing transmitters used for garage door will continue to operate. They are not being disconnected. Mounting hardware included.

To program open receiver box cover. Place small screw driver in slot to open. Press the learn button. Then press the transmitter button that will be used to open the garage. See garage operator for connecting the 2 wires supplied.

If needed, 4 button transmitters are available.



Push to Operate Wireless Button

Part Number 030215

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.



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 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.



External Reset Button

Part Number 630060

Plugs into Patriot RSL Control Board and provides an external system reset option. (not waterproof)



Charge Cable Extension Pigtaills

Part Number 630038

Provides easy splicing of charging device cable. Works with AC Transformer and Solar Panel.



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 1 monitored photo eye 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.



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 - Three 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.

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 22-23) for more information.

Sensitivity adjustments - Located on the control board (see page 26). 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. Dual gate will not operate.
3. My single or Dual gate will not operate. Monitored entrapment devices are installed.
4. Emergency release knob cannot be pulled.
5. My gate opens/closes slowly.
6. My Gate will not automatically close.
6. Gate begins to open or close, but stops and reverses after a couple of seconds.
7. Gate begins to open or close but stops and reverses after a couple of seconds
8. Gate opens or closes correctly, then immediately reverses direction.
9. Control board 15 amp fuse blows when "Open / Close Command" is given.
10. Transmitter (Remote control) will not operate the gate.
11. Photo-eye being used for vehicular protection will not reverse the gate when closing or hold the gate open
12. Pressing the "RESET" button only, causes the gate to operate.
13. Gate opens with the transmitter but will not close with the transmitter.
14. Charger / Charge controller "External Power or Solar Power Light & Detection Light are ON.
15. Gate Open and Close Stop Position is Changing (not consistent).
16. Battery (AC or Solar Charged) will not stay charged
17. Verifying Charge System Is Operating correctly.

<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>	<ol style="list-style-type: none"> 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). 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>NOTE: DO NOT ATTEMPT TO MODIFY ANY SCREWS ON THE DRIVE SHAFT.</p>



**4. My gate opens/
closes slowly:**

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.

1. Determine which situation your operator falls into below:

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.

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.

If none of the above check bad, then remove battery and have it load tested at a battery shop. Replace if bad.

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.

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.

2. If none of the above check bad then remove battery and have it load tested at a battery shop. Replace if bad.



<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. Charger / Charge controller “External Power or Solar Power Light & Detection Light are ON.</p>	<ol style="list-style-type: none"> 1. This indicated that the battery is not connected to the charger / charge controller. 2. Verify that the 2 wire harness going to the battery is connected to the battery and also connected to the charger / charge controller.
<p>14. 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.



15. 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 charger / charge controller part # 520006 and is AC charged (not solar) verify the charger / charge controller is properly working. The "external Power" light should be ON and either the "Charging or Charged" light should be ON.
- B. If the "external power" light is not ON then check the 120 VAC outlet the transformer is plugged into for the correct voltage and correct problem if necessary.
- C. If the 120 VAC power checks good then disconnect the transformer from the charger / charge controller "Power In" plug and using a volt meter check the transformer output. The transformer should read about 18 VAC, if the transformer output is incorrect the transformer needs to be replaced with USAutomatic part # 520004.

Solar Charged Systems ONLY

1. If your system is equipped with the USAutomatic charger / charge controller part # 520006 and is solar charged (not AC) verify the charger / charge controller is properly working. The "Solar Power" light should be ON and either the "Charging or Charged" light should be ON. This can only be verified when the sun is directly on the solar panel.
2. If the "solar power" light is not ON 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 charger / charge controller “power In” plug 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 “solar power” light does not come ON when connected to the charger / charge controller then it is bad, replace with USAutomatic part # 520006.</p>
<p>16. 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. If charger shows External power or Solar power and detection after connected 5 seconds then the fuse in the meter is blown. 6. Meter reading expected for solar is about 250 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. 7. Meter reading expected for AC is about 500 milli amps up to 2 amps depending on the battery condition.



Appendix

A The Patriot RSL 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 transformer.

The Patriot RSL gate operator 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. Solar Panel must be kept clean and in full sunlight.

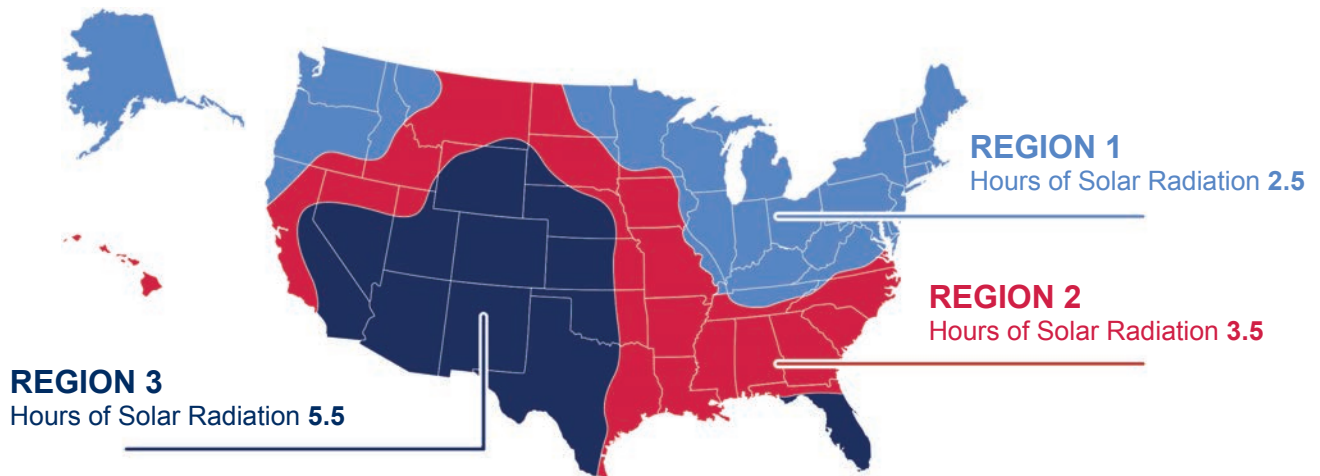
The design of the system must pay particular attention to any accessories that might be added, use only Solar Friendly accessories to help avoid premature battery failure. For a complete list of accessories please visit www.usautomatic.com.

GATE CYCLES PER DAY SOLAR CHARGED SYSTEM (Optional Solar Kit PN #520025)

Solar charged systems should not exceed the cycles listed in the chart below. These numbers are based on a single 6 watt solar panel installation. If additional panels are installed additional cycles will be available.

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.



These are conservative numbers and the Patriot RSL operator should have no problem performing as stated in the chart above. See Region Map above to determine cycles that can be expected. These numbers are based on a basic system with the standard 6 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.

B Extending Charge Device Location (AC or Solar)

If charge device cable needs to be extended to reach the charge controller use "Patriot Charge Cable Extension Pigtails" Part Number 630038 (see figure). These DC plug pigtails connect to each end of a customer provided extension cable. Connections should be made in customer provided 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.



Do not modify the transformer or solar panel cable, this will void the product warranty.

Charge Cable Extension Cable Selection Chart				
Transformer Extension Wire Size Chart				
0 to 100 ft	101 to 250 ft	251 to 500 ft	501 to 750 ft	750 to 1000 ft
18 gauge wire	16 gauge wire	14 gauge wire	12 gauge wire	10 gauge wire
Solar Extension Wire Size Chart				
	15 to 100 feet	100 to 250 feet	250 to 500 feet	
	18 gauge wire	16 gauge wire	14 gauge wire	

The wire used must be rated for Direct Burial use, unless in conduit. Wire ran in conduit must be rated for outdoor use. The above Table lists the recommended wire gauge per application length. Using a smaller gauge may impede performance or cause system to malfunction

C

CHARGE CONTROLLER

L.E.D. DESCRIPTIONS

EXTERNAL POWER ADAPTOR - Illuminates continuously while power from A.C. Power Supply Adaptor is sensed.

SOLAR PANEL - Illuminates continuously while power from Solar Panel is sensed.

DETECTION - If illuminated for longer than 3 seconds check connection on battery.

CHARGING - Continuous or flashing indicates charging – refer to Charge Algorithm Section, for further details.

CHARGED - On continuously when input power is present and battery fully charged. Flashes when battery capacity is low.

SYSTEM ERROR - If flashing, the charger has entered Failure Mode. Disconnecting power will reset charger, but if source of failure is not corrected, Failure Mode will occur again.- refer to the following Table to Decode the Error Type:

	L.E.D.s (First 4 L.E.D.s from Left)			
	1st	2nd	3rd	4th
Wrong Battery Voltage	Off	Off	Off	Flash
Reverse Battery Connection	Off	Off	Flash	Off
Thermal Runaway Condition	Off	Flash	Off	Off
Charge Time Monitor - 1	Off	Flash	Flash	Off
Charge Time Monitor - 2	Off	Flash	Flash	Flash
Excessive Battery Drain	Flash	Off	Off	Off
Failed Pre-Qualification Test -1	Flash	Off	Off	Flash
Failed Pre-Qualification Test -2	Flash	Off	Flash	Off

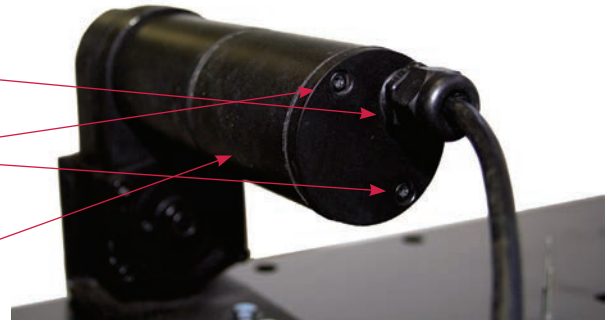
NOTE:

- If External power and Detection lights are ON then the battery is not connected to the charger.
- If Solar power and Detection lights are ON then the battery is not connected to the charger.

Verify that the wiring harness is connected to the charger output located on bottom side of the charger.

D Patriot RSL Brake Inspection and Removal

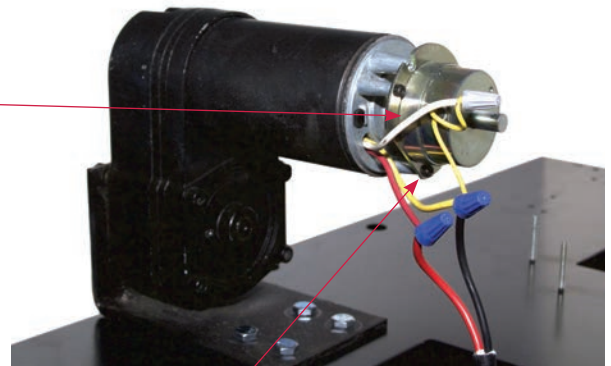
1. Loosen the plastic cable strain relief nut.
2. Remove the 2 screws holding the back plate on.
3. Remove the back plate pushing the cable into the strain relief nut as you slide the plate away.



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

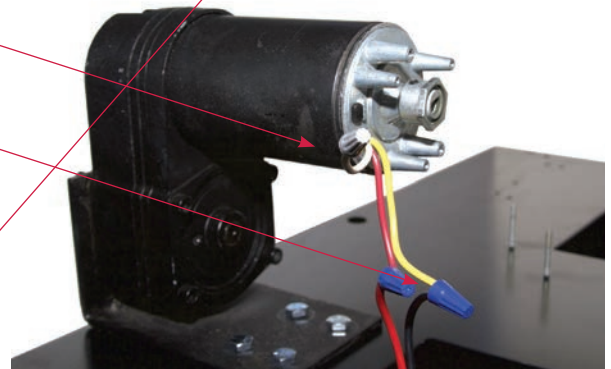
5. The brake is the piece which has the 2 yellow wires

6. Verify the 2 wire nuts connecting the brake wires to the other wires. 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.

E

Installing Patriot Control Board part # 500002 in Pre Jan. 12, 2016 operators

Effective January 12, 2016 all vehicular gate operators manufactured are required to have provisions for and to monitor for at least two independent entrapment protection means. Both are to be installed and operational to meet the standards defined in UL325 6th edition dated October 13, 2013.

UL325 assumes that every slide gate installation has an entrapment area. Requiring all operators to have an external secondary entrapment device installed and monitored before gate operation is allowed.

Automated gate operator systems installed before Jan. 12, 2016 are not required by the UL325 standard to be upgraded to the current standard when service is being performed. It is recommended that these systems be upgraded to the current UL325 standard.

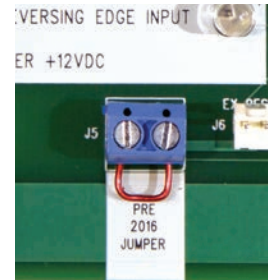
NOTE: It is the responsibility of the installer to identify entrapment areas and install the UL325 compliant entrapment protection device or devices to protect each area identified.

What is Entrapment?

The condition of being caught or held in a position that increases the risk of injury. ASTM F2200

NOTE: Patriot control board part # 500002 has been designed to meet both current and past UL325 standards. When installing in a pre-2016 system that is not being upgraded to the current UL325 standard the pre-2016 jumper must be installed.

The secondary entrapment input J2 pin 6 required for pre-2016 systems is labeled on the control board as contact edge 2nd entrapment N/O. The J2 pin 6 input has not changed and re-wiring of existing secondary entrapment devices is not required.



For this input to operate in pre-2016 mode you MUST turn on DS2 dipswitch 4.

Once installed, use the logic chart below to verify proper operation of the secondary entrapment device installed.

Secondary Entrapment Input J2 pin 6			
Gate Opening Edge Activated 1 st time	ver	Gate Closing Edge Activated 1 st Time	ver
Gate stops and reverses to full close		Gate stops and reverses to full open.	
Auto Close Disabled.		Auto close if turned ON is disabled.	
Requires a Push Button, Close or Open input before normal operation resumes.		Requires a Push Button, Close or Open input before normal operation resumes.	
If while closing after above reversal a 2nd activation occurs before the close limit then		If while opening after reversal a 2nd activation occurs before the open limit then	
Shut down		Shut down	
Require reset before normal operation resumes		Require reset before normal operation resumes	

Important: USAutomatic strongly recommends that all pre-2016 systems be upgraded to the current UL325 standard to provide maximum protection against entrapment.



Patriot RSL Slide Gate Operator

LIMITED WARRANTY

USA Automatic, LTD warrants this product to be free of defects in materials for a period of 3 YEARS following purchase USAUTOMATIC, LTD will repair or replace the product free of charge, including parts, shop labor, return shipping and handling to customer.

The Patriot RSL control board warranty is for a period of 5 years. It does not cover damage caused by weather, natural disasters or severe acid damage from a battery.

CONSUMER AFTER INSTALL:

If you have operation questions or are in need of warranty service, please contact our Product Support department by email at www.usautomatic.com or call 888-204-0174 Monday-Friday. If the issue is not resolvable, a manufacturer's warranty repair order may be issued. To have the product(s) sent for warranty service, a Return Authorization number (RA#) will be issued which must be written on the outside of the package. Packages without RA # may not be accepted. Packages for warranty service may be sent to the address below.

All repairs or replacements are at the discretion of the Manufacturer. This warranty excludes items that have been abused, altered, incorrectly installed, and damaged by weather or other acts of God. Changes or modifications not expressly approved by the Manufacturer could void the warranty. This warranty is limited to the product only. No consequential damages are covered.

USA Automatic, LTD
118 Hillside Drive
Lewisville, TX 75057
888-204-0174

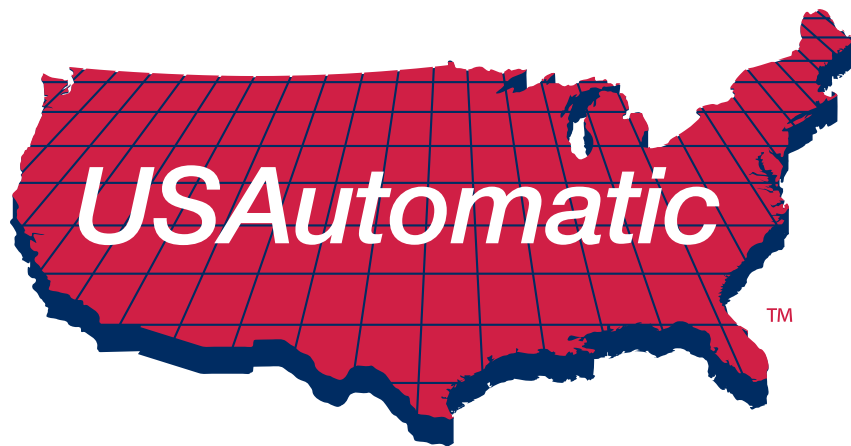
Keep this information for your records

Model: _____ Serial Number*: _____

Date of Purchase: ____ / ____ / ____ Purchased from: _____

**Serial number can be found by opening cover and looking on the control board.*





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