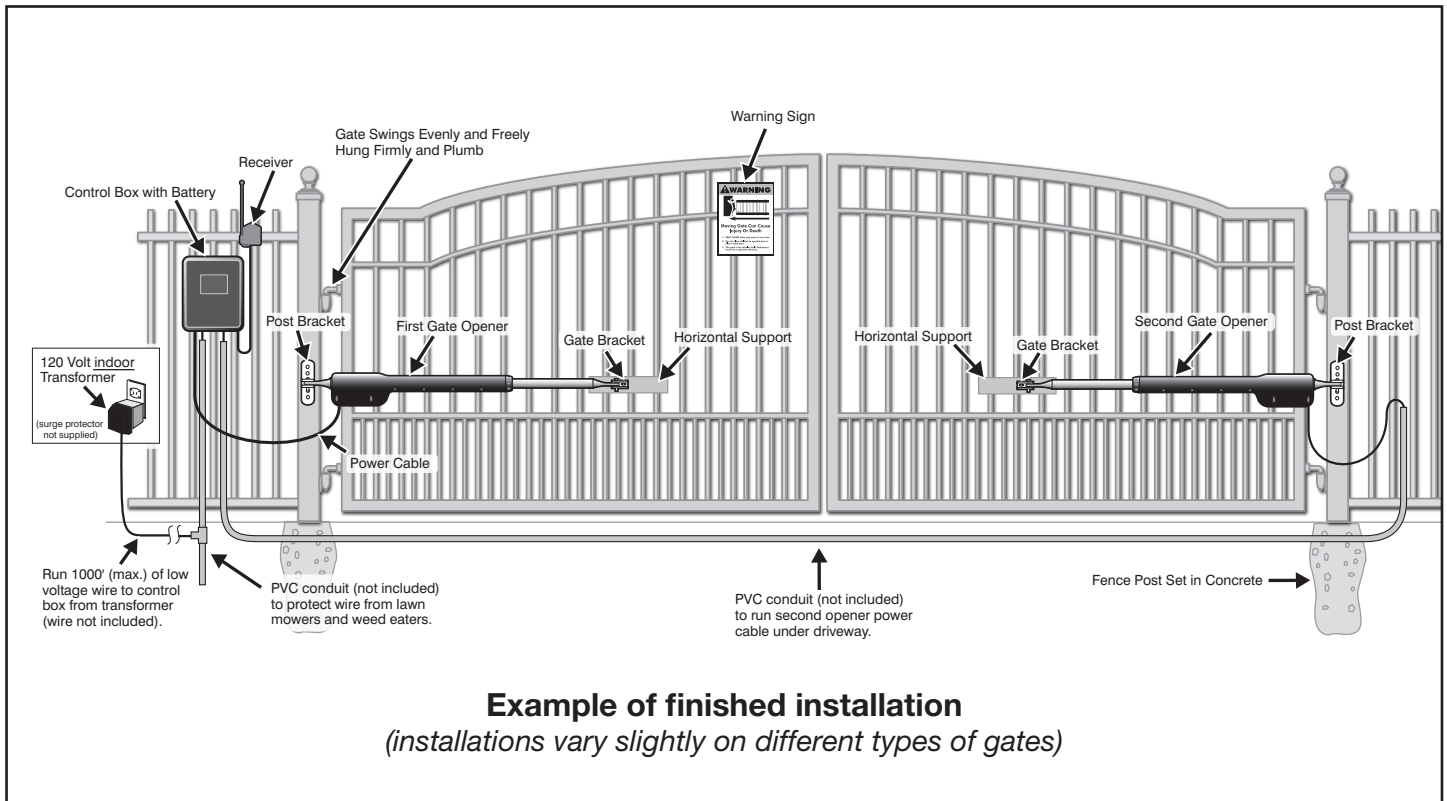


MIGHTY MULE MM562

Installation Manual



This product meets the requirements of UL325 6th Edition, 2016, the standard for gate operator safety.

GTO Sales: 800-543-4283 • Fax 850-575-8912

GTO Technical Service 800-543-1236

For 24 hour/day, 7 day/week Technical Service visit <http://support.gtoinc.com>
 For more information on Mighty Mule's full line of Automatic Gate Operators and Access Controls visit www.mightymule.com

Mighty Mule® is the retail brand of GTO Access Systems, LLC
 3121 Hartsfield Road • Tallahassee, FL 32303





WARNING

This equipment meets Underwriters Laboratory Standard 325 (UL 325). However, gate equipment has hazards associated with its use and therefore by installing this product the installer and user accept full responsibility for following and noting the installation and safety instructions. Failure to follow installation and safety instructions can result in hazards developing due to improper assembly. You agree to properly install this product and that if you fail to do so GTO Access Systems, LLC, shall in no event be liable for direct, indirect, incidental, special or consequential damages or loss of profits whether based in contract tort or any other legal theory during the course of the warranty or at any time thereafter. The installer and/or user agree to assume responsibility for all liability and use of this product releasing GTO Access Systems, LLC, from any and all liability. If you are not in agreement with this disclaimer or do not feel capable of properly following all installation and safety instructions you may return this product for full replacement value.

READ ALL INSTRUCTIONS CAREFULLY AND COMPLETELY before attempting to install and use this automatic gate operator. This gate operator produces a high level of force. Stay clear of the unit while it is operating and exercise caution at all times.

ALL AUTOMATIC GATE OPERATORS ARE INTENDED FOR USE ON VEHICULAR GATES ONLY.

Product Usage

The Mighty Mule Gate Operator meets all of the safety requirements of a **Class I** Residential Vehicular Gate Operator and is intended for use solely with vehicular swing gates in single-family residential applications that meet the Class I category listed in the table below.

Vehicular Gate Operator Class Categories

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 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.

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KEEP THESE INSTRUCTIONS FOR FUTURE REFERENCE

Please Read This First!

Thank you for purchasing a Mighty Mule Gate Operator—GTO's "do-it-yourself" automatic gate operator! When correctly installed and properly used, your Mighty Mule Gate Operator will give you many years of reliable service. Please read the following information and watch the enclosed video to ensure you have the correct system for your particular needs. Furthermore, this manual and the DVD will enable you to properly install your Mighty Mule Gate Operator.

The Mighty Mule Gate Operator is designed for installation on a pull-to-open single leaf gate (gates that open into the property). By purchasing an accessory bracket, the Mighty Mule Gate Operator can accommodate a push-to-open single leaf gate (gates that open out from the property). The gate must not exceed 18 feet in length or weigh more than 850 pounds (please see Technical Specifications on page 8). The Mighty Mule Gate Operator can be used on vinyl, aluminum, chain link, farm tube, and wrought iron gates. Use on solid surface gates is not recommended. Solid surface gates have a high resistance to the wind. If the wind is strong enough, the operator will obstruct and stop.

The Mighty Mule Gate Operator accommodates extra transmitters, digital keypads, solar panels, push buttons, automatic gate locks, and other access control products. These optional accessories (see the Mighty Mule Accessory Catalog) are available at most stores. Your store should be able to special order any accessory not in stock. If your store cannot special order accessories, please call the Mighty Mule Sales Department (800-543-GATE).

The Mighty Mule Gate Operator features Dual Sense Technology™. This feature makes the gate stop and reverse direction when it comes in contact with an obstruction. This is factory set to the most sensitive setting and must be adjusted during installation.

The Mighty Mule Gate Operator also has an adjustable auto-close feature. After the gate reaches the fully open position, it can be set to remain open up to 120 seconds before automatically closing. Pressing the transmitter button at any time after the gate opens fully will cause it to close immediately. OFF is the factory setting; meaning the gate will stay open until you press the transmitter (or keypad, etc.) again.

NOTE—If your application requires any of the following:

- Swing gates longer than 18 feet or weighing more than 850 pounds
- Slide gates
- Heavy duty or commercial uses
- Professional installation

Go to www.gtoaccess.com for a dealer or retailer near you or call (800) 543-4283 for information about our Linear PRO Access professional line of gate operators and accessories. Our Sales Department will be glad to give you the name and phone number of a Linear PRO Access dealer near you.

BEFORE YOU BEGIN TO INSTALL YOUR AUTOMATIC GATE OPERATOR:
watch the enclosed video and read these instructions carefully and completely to become familiar with all parts and installation steps. The video is only designed as an overview of the installation procedure. You must read the installation manual for detailed instructions on gate operator safety and proper use of the gate operator.




Important Safety Information

Because automatic gate operators produce high levels of force, consumers need to know the potential hazards associated with improperly designed, installed, and maintained automated gate operator systems. **Keep in mind that the gate operator is just one component of the total gate operating system.** Each component must work in unison to provide the end user with convenience, security, and safety.

This manual contains various safety precautions and warnings for the installer end user. Because there are many possible applications of the gate operator, the safety precautions and warnings contained in

this manual cannot be completely exhaustive in nature. They do, however, provide an overview of the safe design, installation, and use of this product. **CAREFULLY READ AND FOLLOW ALL SAFETY PRECAUTIONS, WARNINGS, AND INSTALLATION INSTRUCTIONS TO ENSURE THE SAFE SYSTEM DESIGN, INSTALLATION, AND USE OF THIS PRODUCT.**

 Warnings in this manual are identified with this warning symbol. The symbol identifies conditions that can result in damage to the operator or its components, serious injury, or death.

Because Mighty Mule automatic gate operators are only part of the total gate operating system, it is the responsibility of the installer and end user to ensure that the total system is safe for its intended use.

Manually Opening and Closing Gate

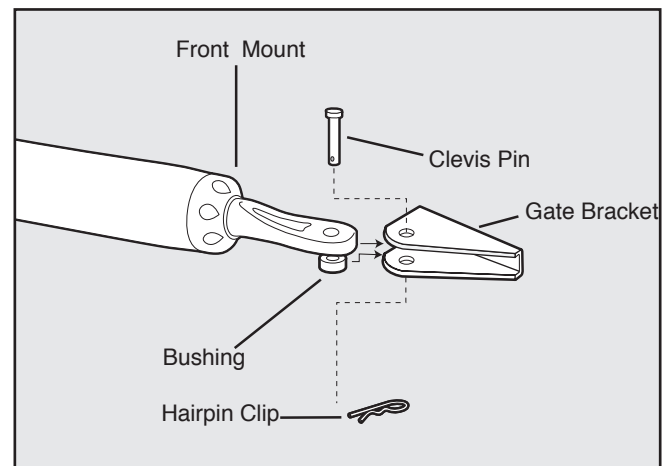
CAUTION

The gate will move freely and uncontrolled when the gate operator is removed from the gate. **ONLY** disconnect the operator when the control box power switch is **OFF** and the gate is **NOT** moving.

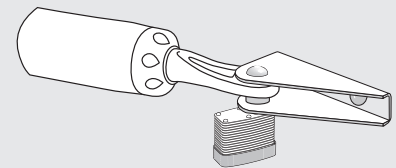
Disconnecting the Operator

1. Turn control box power switch OFF.
2. Remove hairpin clip, clevis pin, and bushing from either the front or rear mounting point.
3. Remove the operator from the mount.

The gate can be opened and closed manually when the operator is disconnected.



NOTE: Substitute a **Pin Lock** for the clevis pin on the front mount of the gate operator to prevent unauthorized removal of the operator from the gate (see accessory pages in back of this book).



Important Safety Information

For the Installer and End User

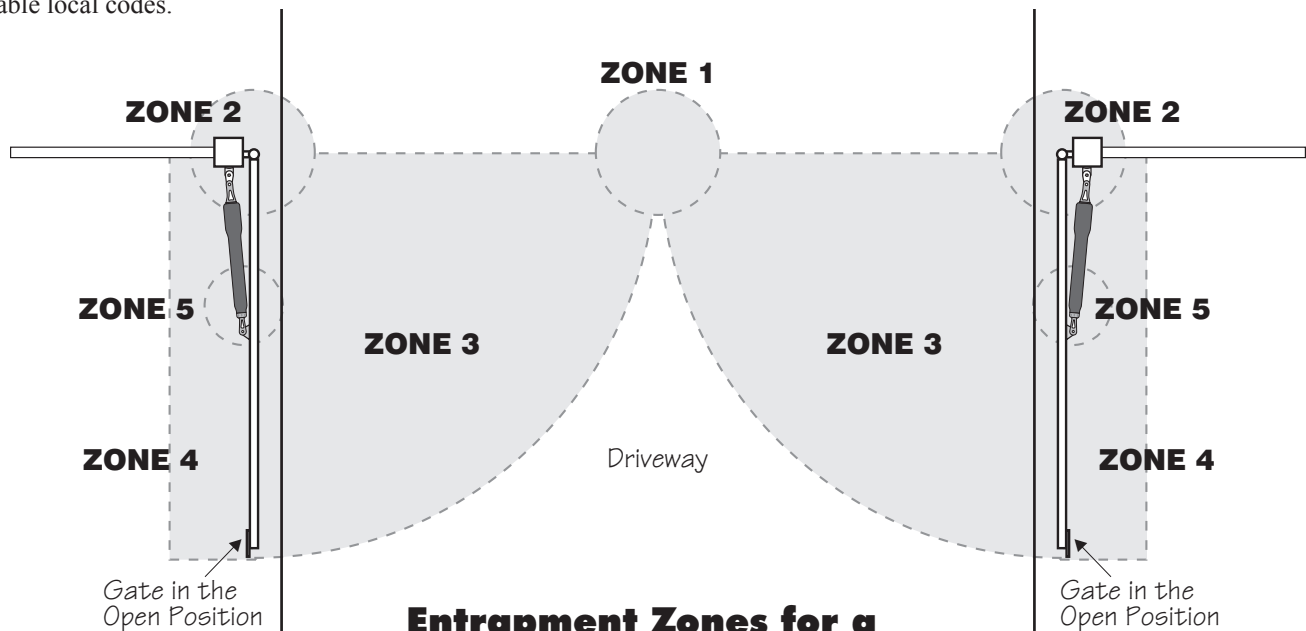
! WARNING

To reduce the risk of injury or death:

1. **READ AND FOLLOW ALL INSTRUCTIONS.**
2. Never let children operate or play with gate controls. Keep the remote control away from children.
3. Always keep people and objects away from the gate. **NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.**
4. Test the gate operator monthly. The gate **MUST** reverse on contact with a rigid object or stop when an object activates the non-contact sensors. After adjusting the force or the limit of travel, retest the gate operator. Failure to adjust and retest the gate operator properly can increase the risk of injury or death.
5. Use the manual/emergency release only when the gate is not moving.
6. **KEEP GATES PROPERLY MAINTAINED.** Read the user's manual. Have a qualified service person make repairs to gate hardware.
7. The entrance is for vehicles only. Pedestrians must use separate entrance.
8. The gate must be installed in a location that provides adequate clearance between it and adjacent structures when opening and closing to reduce the risk of entrapment. Swinging gates must not open into public access areas.
9. **SAVE THESE INSTRUCTIONS.**

I. Before Installation

1. Verify this operator is proper for the type and size of gate, frequency of use and class of the gate system.
2. Make sure the gate has been properly installed and swings freely in both directions. Repair or replace all worn or damaged gate hardware prior to installation. A freely moving gate will require less force to operate and will enhance the performance of the entrapment protection devices used with the system (see page 9).
3. Review the operation of the system to become familiar with its safety features. Understand how to disconnect the operator for manual gate operation (see page 1).
4. The gate and operator installation must comply with any applicable local codes.
5. This gate operator is intended for vehicular gates only. A separate entrance or gate must be installed for pedestrian use (see page 6).
6. Always keep people and objects away from the gate and its area of travel. No one should cross the path of a moving gate.
7. Identify all of the entrapment zones for the type of installation. An entrapment zone is an area around the automatic gate system where a person or object could be caught that increase the risk of injury. Entrapment zones must be eliminated, guarded or protected.
8. When designing a system that will be entered from a highway or main thoroughfare, make sure the gate system is placed far enough from the road to prevent traffic congestion.



Entrapment Zones for a Pull-To-Open Application

Important Safety Information

For the Installer and End User

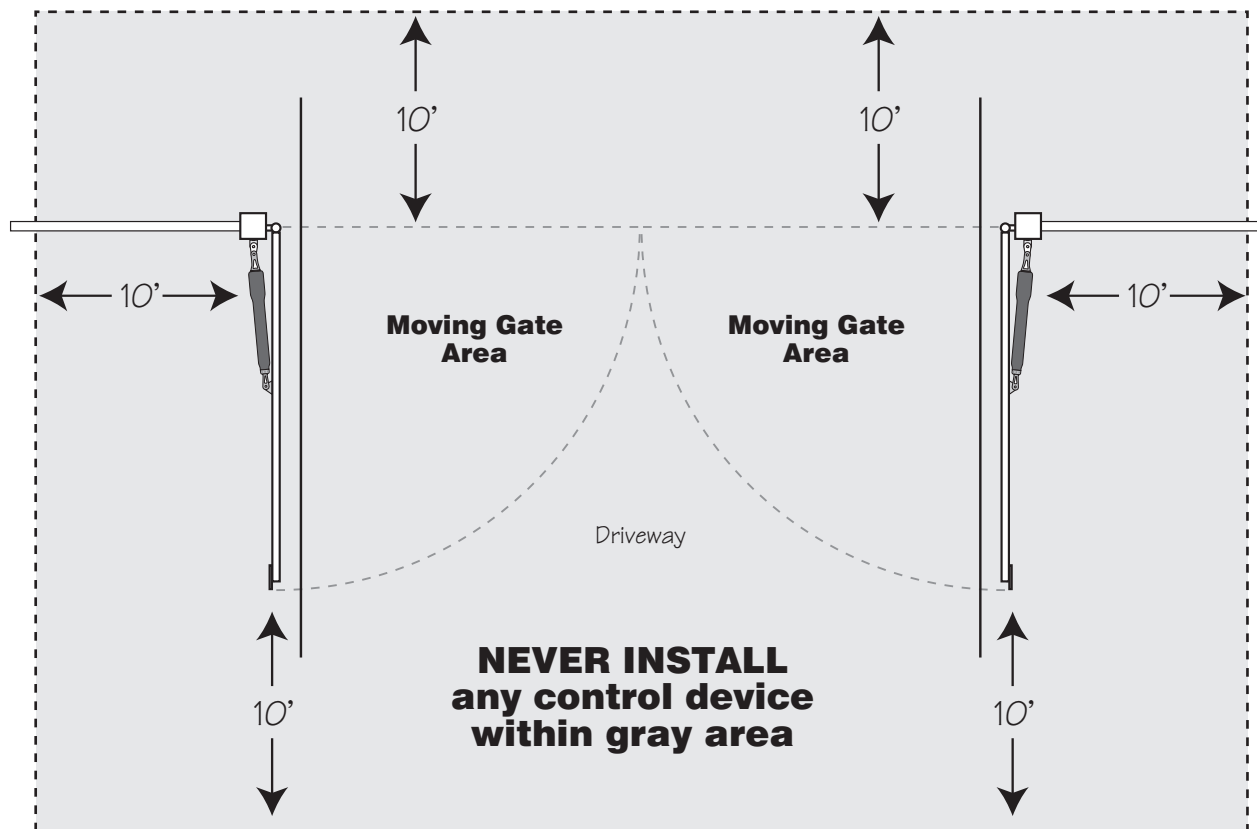
Typical Entrapment Zones are shown in the diagrams on page 2:

- Zone 1 – leading edge of the gate and the fence post.
- Zone 2 – between the gate and the gate post.
- Zone 3 – the path of the gate.
- Zone 4 – the space between the gate in the open position and any object such as a wall, fence, tree, etc.
- Zone 5 – pinch points between the operator and gate.

II. During Installation

1. Install the gate operator on the inside of the property and fence line. **DO NOT** install an operator on the outside of the gate where the public has access to it.
2. Be careful with moving parts and avoid close proximity to areas where fingers or hands could be pinched.
3. Devices such as contact sensors (sensing edges) and non contact sensors (photo beams) provide additional protection against vehicular damage.
4. If push buttons or key switches are installed, they should be within sight of the gate, located at least 10 feet from any moving part of the gate (see diagram below). **Never install any control device where a user will be tempted to reach through the gate to activate the gate operator.**
5. Do not activate your gate operator unless you can see it and can determine that its area of travel is clear of people, pets, or other obstructions. Watch the gate through its entire movement.
6. Secure outdoor or easily accessed gate operator controls in order to prohibit unauthorized use of the gate.

Pull-To-Open Application



Important Safety Information

For the Installer and End User

III. After Installation

1. Attach the **warning signs** (included) to each side of the gate to alert the public of automatic gate operation. It is your responsibility to post warning signs on both sides of your gate. If any of these signs or warning decals becomes damaged, illegible, or missing, replace them immediately. Contact GTO for free replacements.
2. The gate is automatic and could move at any time, posing serious risk of entrapment. No one should be in contact with the gate when it is moving or stationary.
3. Do not attempt to drive into the gate area while the gate is moving; wait until the gate comes to a complete stop.
4. Do not attempt to “beat the gate” while the gate is closing. This is extremely dangerous.
5. Do not allow children or pets near your gate. **Never let children operate or play with gate controls.** Keep the remote control away from children and unauthorized users; store controls where children and unauthorized users do not have access to them.
6. **KEEP GATES PROPERLY MAINTAINED.** Always turn power to operator OFF before performing any maintenance. See page 33 for maintenance procedures.
7. To operate this equipment safely, YOU must know how to disconnect the operator for manual gate operation (see page 1). If you have read the instructions and still do not understand how to disconnect the operator, contact the Mighty Mule Service Department.
8. Disconnect the operator **ONLY** when the power is **TURNED OFF** and the gate is **NOT** moving.
9. Make arrangements with local fire and law enforcement for emergency access.
10. Distribute and discuss copies of the **IMPORTANT SAFETY INFORMATION** section of this manual with all persons authorized to use your gate.
11. **IMPORTANT: Save these safety instructions. Make sure everyone who is using or will be around the gate and gate operator are aware of the dangers associated with automated gate systems. In the event you sell the property with the gate operator or sell the gate operator, provide a copy of these safety instructions to the new owner.**

Should you need a replacement manual, a copy can be obtained by downloading one from the Mighty Mule web site (www.mightymule.com), by contacting GTO, at 3121 Hartsfield Road, Tallahassee, Florida 32303 or by calling 1-800-543-4283 and requesting a duplicate copy. One will be provided to you.

Important Safety Information

For the Installer and End User

Mighty Mule gate operators utilize Dual Sense Technology entrapment protection. Dual Sense Technology is built into every Mighty Mule and provides redundant methods of entrapment protection for open and close gate directions.

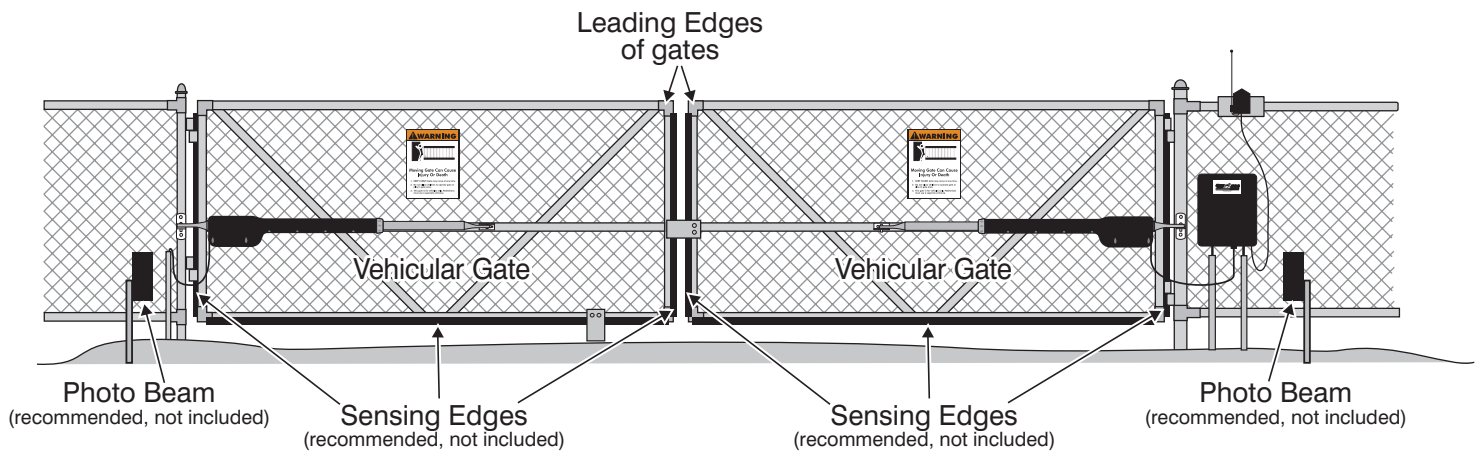
In addition to Dual Sense Technology, every Mighty Mule gate controller has provisions for the connection of additional obstruction detection devices such as sensing edges and photo beams.

These devices may be located where there is an increased risk of obstruction. Refer to the diagram below.

One or more edge sensors may be located at the leading edge, bottom edge, and post edge, both inside and outside of a vehicular swing gate system.

Wiring to sensors must be located and arranged so the wiring between the sensor and the gate operator is not subjected to mechanical damage.

A wireless sensor such as one that transmits radio frequency (RF) signals to the gate operator for obstruction protection functions shall be located where the transmission of the signals is not blocked or impeded by building structures, natural landscaping or similar objects.



Entrapment Protection

Mighty Mules's Dual Sense Technology™ provides entrapment protection, even when properly adjusted. Since all installations are different, you may need to add photo beams or sensing edges to help prevent damage to vehicle or other items that could be hit by a moving gate.

Entrapment Alarm

The Mighty Mule Automatic Gate Operator is designed to stop and reverse the gate when the gate comes in contact with an obstruction. Additionally, these operators are equipped with an audio entrapment alarm which will activate if the unit obstructs twice while opening or closing. This alarm will sound for a period of 5 minutes, or until the operator receives an intended signal from a hard wired entry/exit source (e.g. push button control or keypad) and the gate returns to a fully open or fully closed position. Turning the power switch on the control box OFF and back ON will also deactivate the alarm. Wireless controls such as transmitters and wireless keypads will not deactivate the alarm.

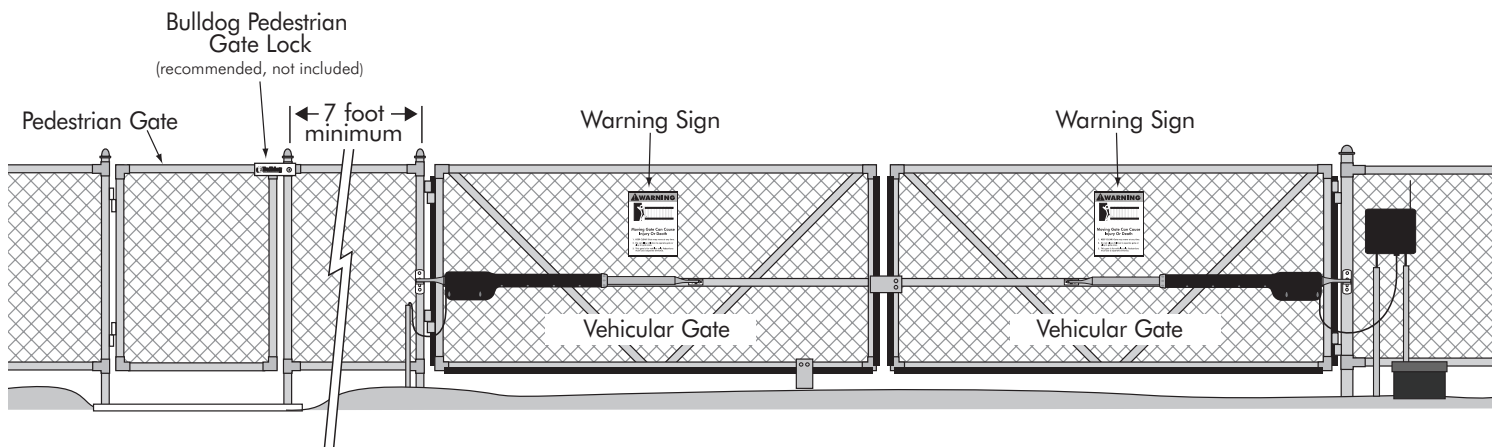
Important Safety Information

Installing Warning Signs and Pedestrian Gates

Warning signs alert people of automatic gate operation and are required when installing Mighty Mule Automatic Gate Operators. A minimum of two WARNING SIGNS must be installed in the area of the gate. Each sign is to be visible by persons located on the side of the gate on which the placard is installed.

The operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening. The pedestrian access opening shall be designed to promote pedestrian usage. Locate the gate such that persons will not come in contact with the vehicular gate during the entire path of travel of the vehicular gate.

We recommend using the GTO Bulldog Pedestrian Gate Lock (Call the GTO Sales Department at 800-543-4283) for controlled access.



Warning Signs

The gate operator is provided with 2 safety warning signs. The signs **MUST** be installed on the front and back of the gate where they will be visible in the area of the gate.

Permanently secure each warning sign to the gate.

Immediately replace a damaged or missing warning sign.



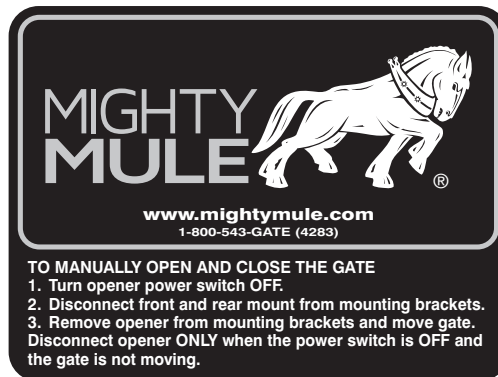
Important Safety Information

Required Safety Precautions for Gates

These warning labels should be found at the locations specified below. If any of them are missing, immediately contact GTO for replacements.

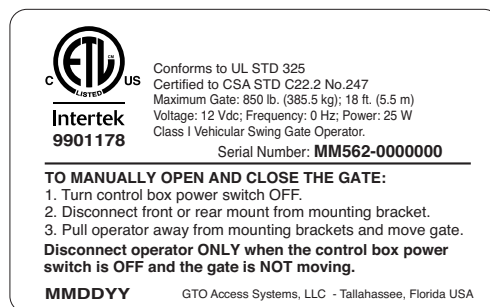


Logo and warning labels (4) installed on each side of the operator housings



Control Box label with Manual Open and Close instructions

MM500 SERIES DC Swing Gate Operator
P/N MM562



Product identification and manual operation instruction label installed on right hand side of control box.

Technical Specifications

MIGHTY MULE GATE OPENER

DRIVE

- Low friction screw drive (linear actuator) rated for -5 °F to +160 °F (-20 °C to +71 °C).
- Powered by a 12 V motor with integral case hardened steel gear reducer. Motor speed reduced to 260 rpm.
- Maximum opening arc of 110°. Approximate opening time (90°): 20 seconds, depending on weight of gate.

POWER

- The system is powered by two 12 Vdc, 7.0 Ah, sealed, rechargeable acid batteries.
- Battery charge is maintained by a 18 Vac output transformer or optional solar panel(s). One (1) blade-style control board fuse rated for 25 A.
NOTE: The transformer should not be directly connected to any battery. Do not replace fuses with higher ampere rated fuses; doing so will void your warranty and may damage your control board.
- Battery charge is maintained by GTO Solar Panel Charger kit (10 Watt minimum).

CONTROL

- **GTO** microprocessor-based control board is set for single leaf, pull-to-open gate installations. DIP switches can be adjusted to accommodate an optional kit for push-to-open gates (*see Accessory Catalog*).
- A circuit on the control board regulates charging. "Sleep draw" is 40 mA; "active draw" is 2 to 5 A.
- Auto-memorization of digital transmitter code.
- GTO remote-mounted RF receiver tuned to 318 MHz.
- Opener length with push-pull tube fully retracted is 40^{1/4}", mounting point to mounting point. Max stroke 20".
- Adjustable auto-close timer and Dual Sense Technology stall force.
- Power terminal block accommodates a transformer or solar panels.
- DIP switches simplify setup of gate opener.
- Accessory terminal block is fully compatible with push button controls, digital keypads, loops, etc.
- Control board allows connection of edge sensors and photoelectric sensors.
- Audio entrapment alarm sounds if the unit encounters an obstruction twice while opening or closing.

OPERATIONAL CAPACITY

- The Gate Capacity Chart shows approximate cycles, per day, you can expect from the Mighty Mule Automatic Gate Opener when powered with a transformer and 12V battery, prior to the battery depleting to a state where the unit will not function. Actual cycles may vary slightly depending upon the type and condition of gate and installation.

NOTE: "NR" indicates this size and weight combination is not recommended for the Mighty Mule gate openers.

IMPORTANT: BALL BEARING HINGES SHOULD BE USED ON ALL GATES WEIGHING OVER 250 Lbs.

Mighty Mule 562 Gate Capacity /Cycle Chart

Estimated number of daily cycles, based on use with a transformer and one(1) 12 Volt battery.

Number of Cycles Per Day

Gate Weight	850 lbs.	68	63	NR	NR	NR	NR	NR
	750 lbs.	73	68	63	NR	NR	NR	NR
	650 lbs.	78	73	68	63	NR	NR	NR
	550 lbs.	83	78	73	68	63	NR	NR
	450 lbs.	88	83	78	73	68	63	NR
	350 lbs.	93	88	83	78	73	68	63
	250 lbs.	98	93	88	83	78	73	68
	150 lbs.	103	98	93	88	83	78	73
	100 lbs.	108	103	98	93	88	83	78
	50 lbs.	113	108	103	98	93	88	83
		5' - 6'	8'	10'	12'	14'	16'	18'

Gate Length

NR = NOT RECOMMENDED

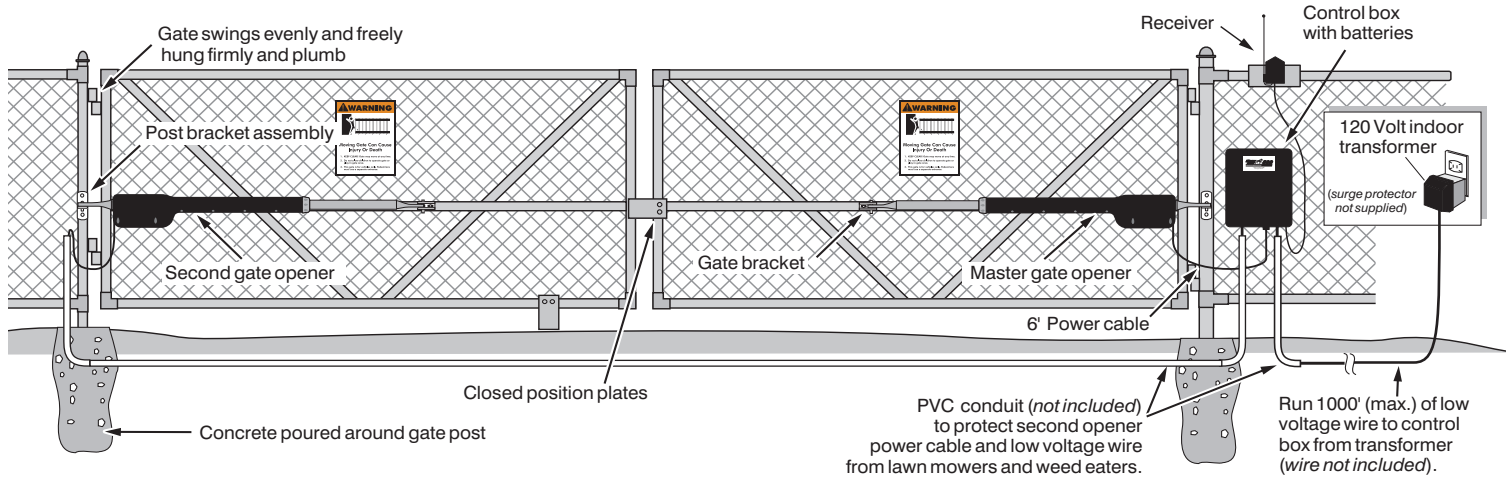
To determine the number of cycles the gate opener will perform using solar panels (see page 22)

These specifications are subject to change without notice.

Installation Overview

Pull-to-Open Gates (Gate Opens into the Property)

The diagram shown below is an example of a pull-to-open installation on a chain link fence and dual gates. Mounting the openers on a masonry column requires special procedures; see **Column Installation Information** on page 36 if you intend to mount the openers on columns. Furthermore, if you have push-to-open gates, you will need to purchase two (2) **push-to-open brackets** (see *Accessory Catalog*) to properly configure your system. See **Push to Open Installation** on page 30 before proceeding.



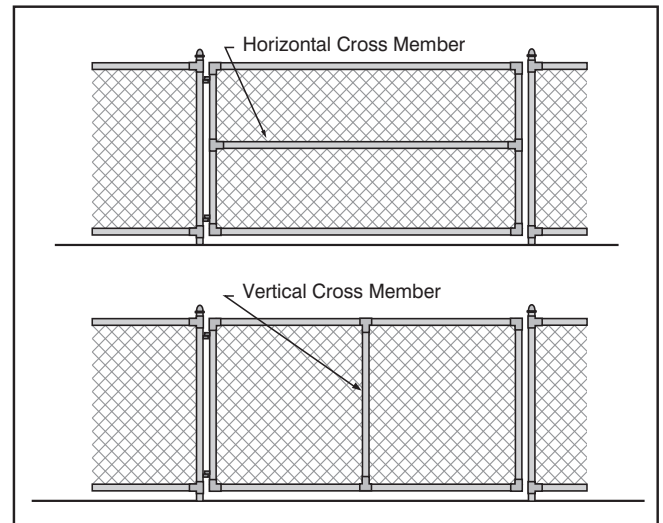
Preparation of the Gate

Step 1

The gates **must** be plumb, level, and swing freely on their hinges. Wheels must not be attached to the gates. The gates must move throughout their arc **without binding or dragging on the ground**. Note that gates over 250 lb. should have ball bearing hinges with grease fittings.

Step 2

The fence posts must be secured in the ground with concrete so they will minimize twist or flex when the openers are activated. We recommend you position the openers near the **centerline** of the gates to keep the gates from twisting and flexing and to avoid back splash from rainwater. The addition of **horizontal or vertical cross members** (if they are not already in place) to provide a stable area for mounting the gate brackets is also important.



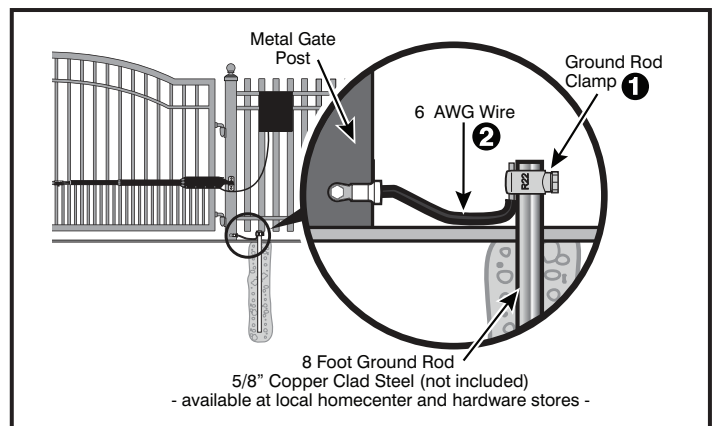
Gate Grounding

- Shorter wire (6 AWG) is better, 1 to 2 feet recommended.
- Bolt ring terminal at end of cable 4 - 6 inches above ground level.

R4196 Kit Includes:

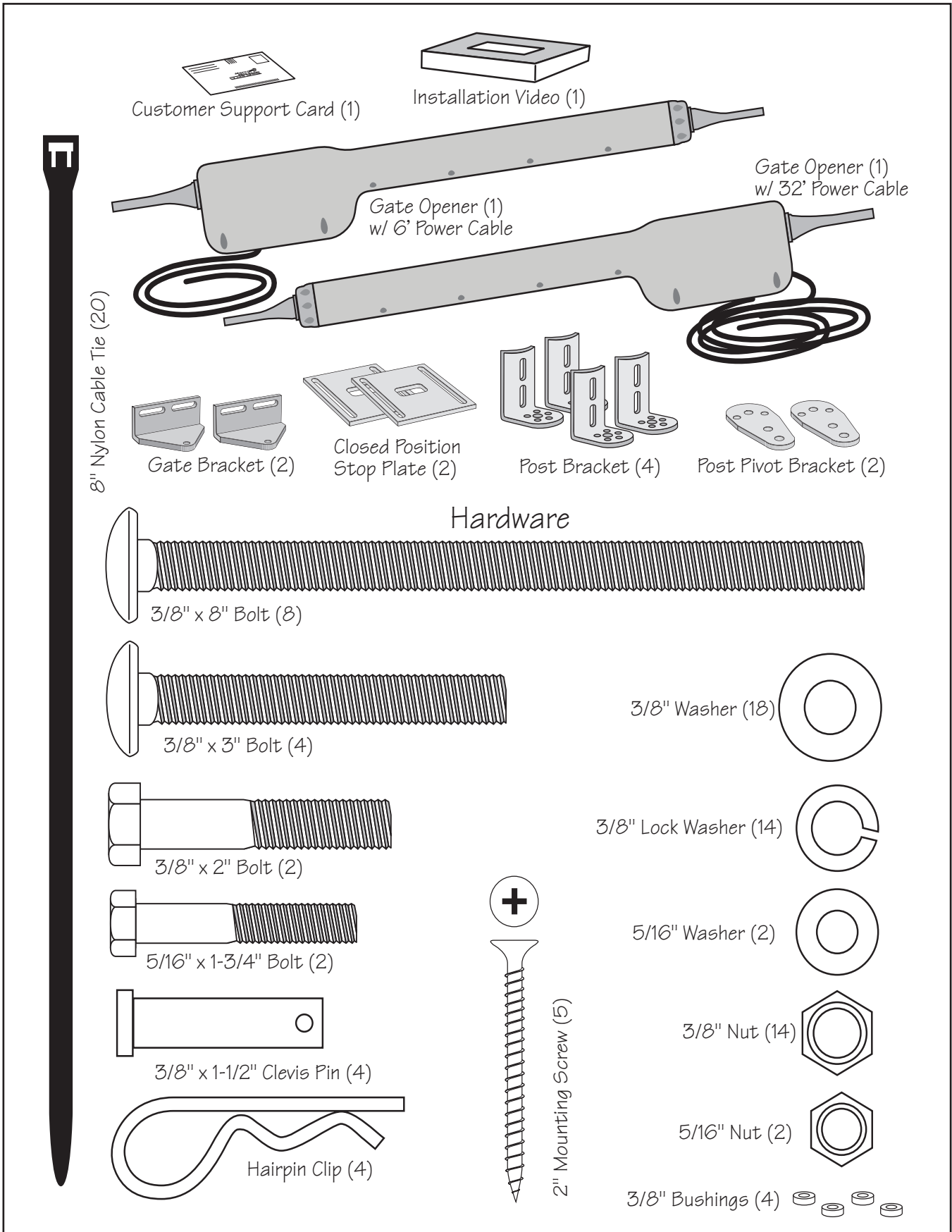
- Ground Rod Clamp
- 6 AWG Wire (3 feet)

NOTE: No grounding system absolutely protects against lightning strikes. If installed correctly, a grounding system will help minimize damage to your gate opener.



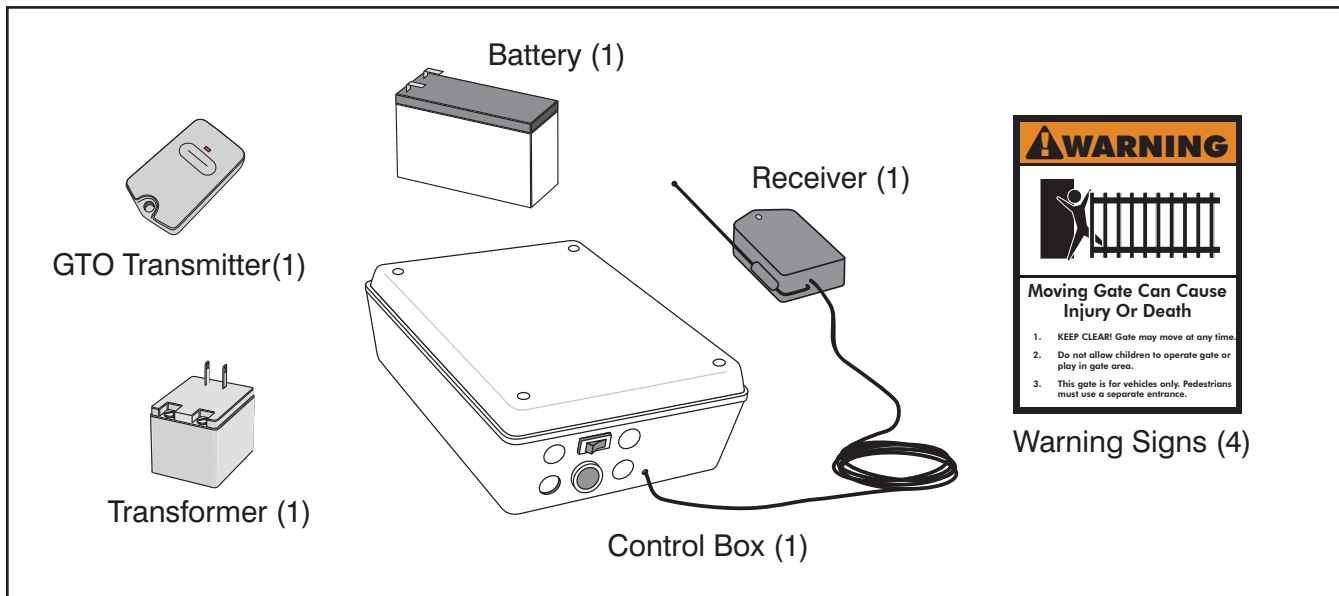
Dual Gate Opener Parts List

Opener and Mounting Hardware



Dual Gate Opener Parts List (continued)

Control Box and Electrical Components



Tools Needed

- Power Drill
- Open End Wrenches — 9/16" and 1/2"
- Long 3/8" and 5/16" Drill Bit
- Hacksaw or Heavy Duty Bolt Cutters
- Small (Flat Bladed) Screwdriver
- Phillips Screwdriver
- Tape Measure
- Level
- Wire Strippers
- C-Clamps — small, medium, and large
- Center Punch
- An extra person will be helpful

YOU MAY ALSO NEED THESE ITEMS BEFORE YOU BEGIN THE INSTALLATION

(Some of these items can be found in the *Accessory Catalog* page 37):

- **Low voltage wire** will be needed to run from the transformer to the control box; length depends upon the distance between the transformer power supply and the control box. See **Powering the System** on page 21, and the *Accessory Catalog*.
- If your gate is more than 1000' away from an ac power source you will need to use at least 10 to 30 Watts of solar charging power to trickle charge the battery. See the *Accessory Catalog*.
- If your fence post is made of wood and is less than 6" in diameter or 6" square, see page 12.
- If your fence post is larger than 6" in diameter you will need **threaded rods or carriage bolts longer than 8"**. See page 15.
- PVC conduit.
- If you have thin walled tube or panel gates, see **Recommended Reinforcement Examples** on page 12.
- Depending on the type of gate, a **horizontal cross member or mounting plate may be needed** to mount the front of the opener and gate bracket to the gate. See page 11, step 2; page 15, step 11.
- Surge protection for transformer.
- Some types of installations require U-Bolts.
- If the gate is a push-to-open refer to page 30
- Additional washers or a metal plate may be needed for wooden post.
- Weatherproof outlet and cover if transformer is plugged into an outside outlet.

Installation of Mounting Hardware

POST BRACKET

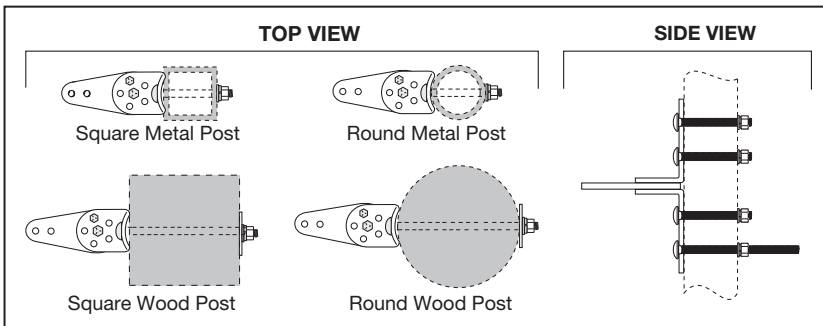
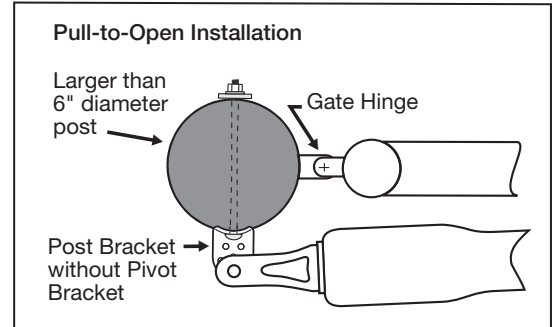
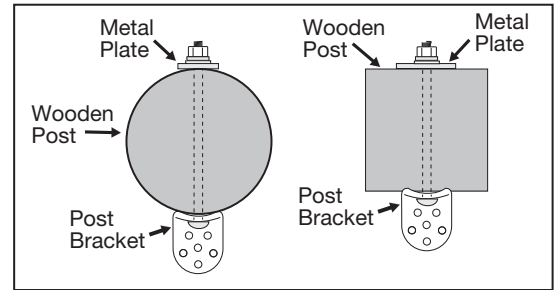
The position of the post bracket determines the leverage and efficiency of the opener. The post bracket position also sets the clearance between the opener and gate in the open and closed positions (minimum 2 inches).

The curved design of the post bracket works well for installations on round and square fence posts. Because the post bracket carries the entire thrust of the active opener, **bolts that completely penetrate the fence post must be used.**

On wooden posts, place a metal plate or washer (*not supplied*) between the nuts and the fence post to prevent the thrust of the opener from pulling the bolts and washers through the wood.

On round posts of 6" diameter or larger, the post pivot bracket may not be necessary for the installation. In this instance, the two post brackets are mounted by themselves.

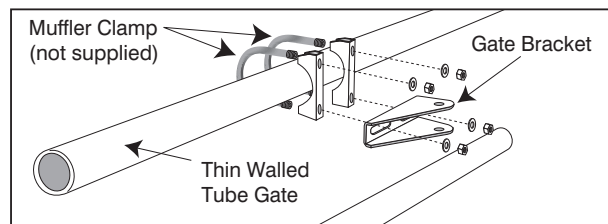
NOTE: A fence post smaller than 6" in diameter or 6" square should be made of metal instead of wood so that it will remain stable while the opener is moving the gate. **See examples below.**



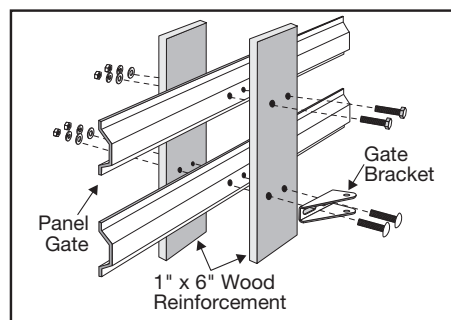
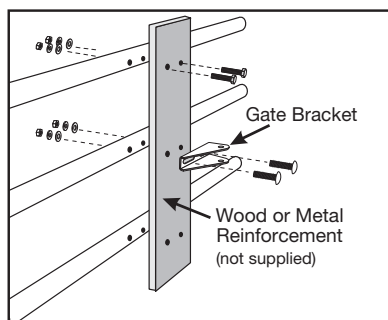
GATE BRACKET

IMPORTANT: We **strongly recommend** using steel pipe, wood or metal to reinforce thin walled tube gates or wood to reinforce panel gates as shown. These reinforcement methods will prevent damage to the opener and gate when the opener is installed.

Example using muffer clamp for installation of gate bracket on **thick walled** tube gate (does not require drilling and is adjustable)



Example using wood or metal to reinforce installation of gate bracket on **thin walled** tube gate.

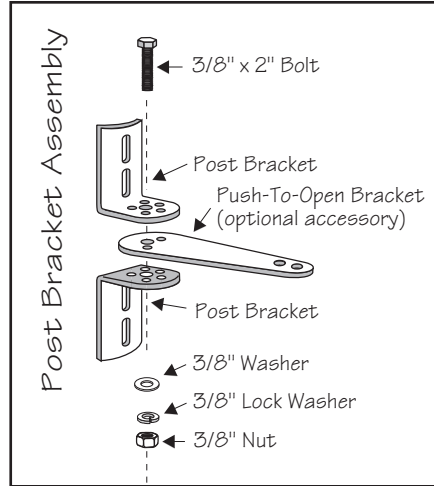


Example using wood or metal to reinforce installation of gate bracket on **panel gates.**

Determining the Mounting Position of the Post Bracket Assembly and the Gate Bracket

Step 1

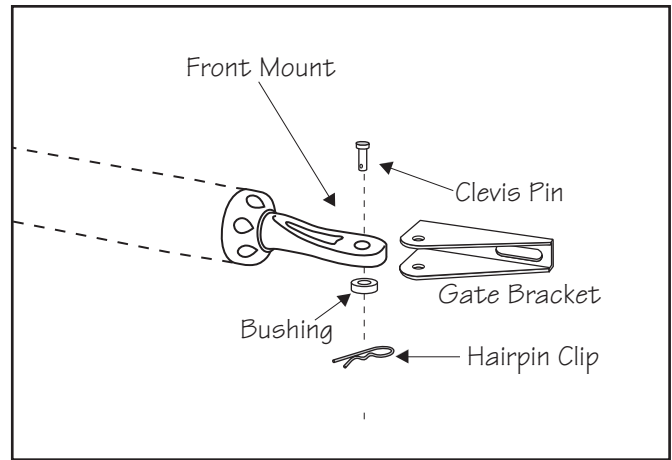
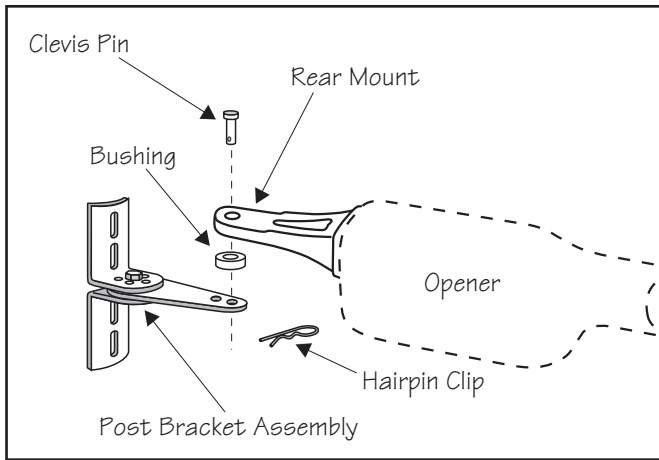
Insert the 3/8" x 2" bolt through the center hole of the post brackets and post pivot bracket as shown. Fasten a 3/8" lock washer, 3/8" washer and 3/8" nut on the end of the bolt. **DO NOT overtighten** the nut because the post pivot bracket will have to be adjusted later.



NOTE: The following steps are intended for **pull-to-open** gate installations. If you are mounting your gate openers on a push-to-open gate (e.g., a gate on a sloped driveway) you will need to purchase two **Push To Open** brackets (see *Accessory catalog*). Also, see **Push-to-Open Installation** beginning on page 30.

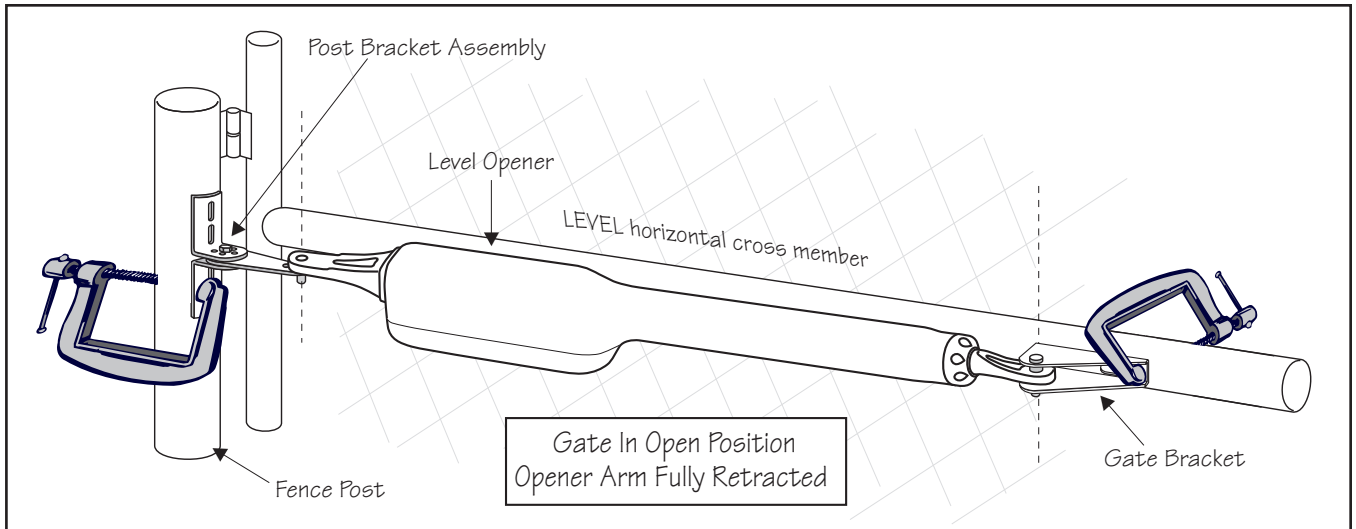
Step 2

Attach post bracket assembly and gate bracket to the opener with the clevis pins and bushings. Secure the clevis pins with hairpin clips.



Step 3

With the gate in the open position (up to 110° from its closed position) and the gate opener arm fully retracted, adjust the post bracket assembly and gate bracket until the opener is level. While holding the opener level, use C-clamps to **temporarily** secure the post bracket assembly and gate bracket to the fence post and gate.

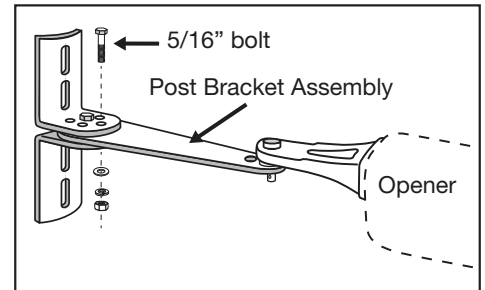


IMPORTANT: While determining the mounting point for the post pivot bracket assembly, be sure that the position allows for minimum 2 inches of clearance between the gate and the opener in both the open and closed positions, as shown in the diagrams below. This clearance will give the opener the most efficient leverage point for opening and closing the gate and more importantly provides the least possible pinch area.

Step 4

When you feel that you have the best position for the post pivot bracket in the open position, insert the 5/16" x 1-3/4" bolt through the aligned holes of the post bracket and post pivot bracket to hold it in place. Remove the clevis pin from the front mount and while supporting the gate opener, swing the gate and gate opener to the closed position. With the gate and gate opener in the closed position check the clearance (see diagram below) and be sure that the gate opener is not binding at the post pivot bracket.

If you don't have 2 inches of clearance or the gate opener is binding on the post pivot bracket, remove the 5/16" x 1-3/4" bolt and readjust the pivot bracket until you can achieve these important clearances. Reinstall the bolt and related hardware as shown.



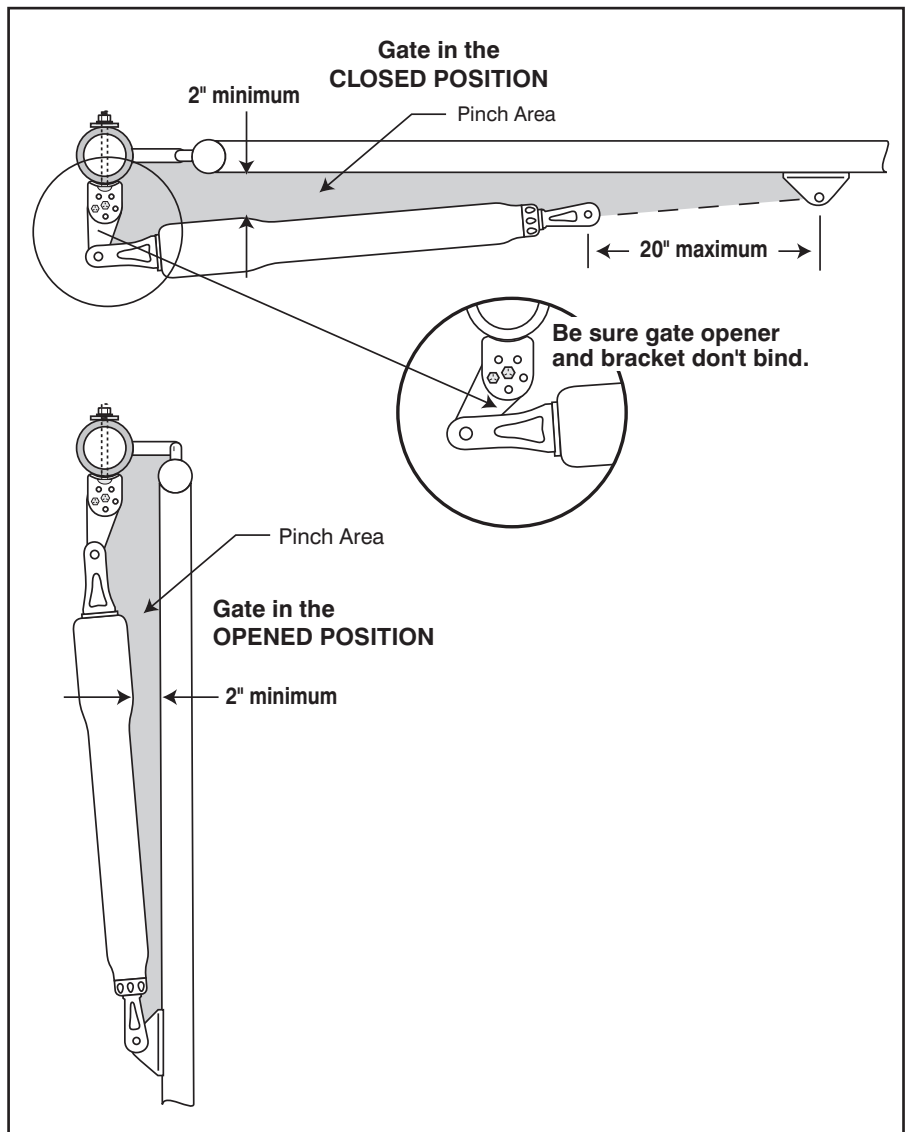
With the post pivot bracket in the optimum position for clearance and freedom of movement while maintaining 19 inches or less on the stroke. Reattach the opener to the gate bracket in the open position and recheck the gate opener level and make sure the brackets are clamped securely.

If you are mounting to a post or column larger than 8" or you can not achieve the mentioned clearances, you can:

- 1) eliminate the post pivot to try and achieve the proper clearances.
- 2) install the unit as a push to open (bracket not included).
- 3) re-hang the gate within 4" inches of the back corner of the column.

NOTE: Re-hanging the gate, depending on the construction of a column, may require additional expertise and tools/materials.

TIP: Turning the pivot bracket over gives more hole alignment options for the post pivot bracket assembly. You can also move the entire post pivot bracket assembly to different positions on the gate post to help achieve the proper clearances.



Installing the Post Bracket Assembly and Gate Bracket

Step 1

Mark reference points for bolt holes on the fence post through middle of bracket slots. Mark reference points for bolt holes on the gate cross member through middle of gate bracket slots. After marking your reference points, remove the opener and brackets from the fence and gate.

Step 2

Drill $\frac{3}{8}$ " holes into fence post as marked.

Step 3

Fasten post bracket assembly to the fence post using (4) $\frac{3}{8}$ " x 8" bolts, washers, lock washers, and nuts (provided).

NOTE: In cases where the fence post has a diameter larger than 6", **threaded rods or carriage bolts longer than 8"** (not supplied) must be used.

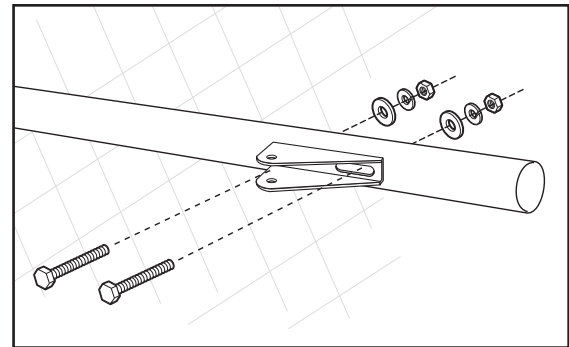
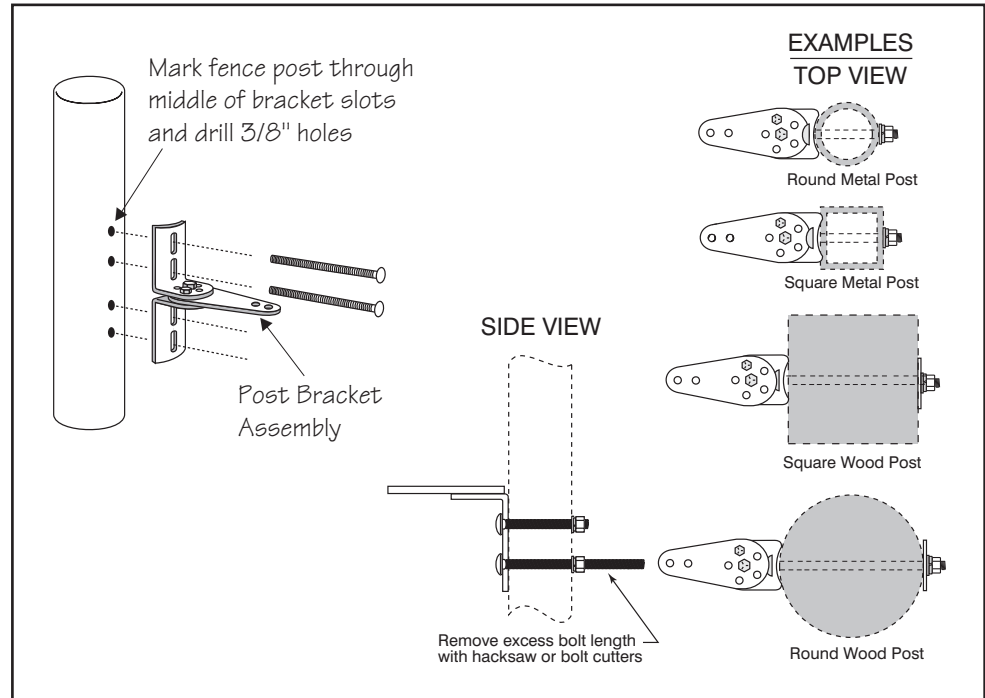
Step 4

Drill $\frac{3}{8}$ " holes into the gate cross member as marked.

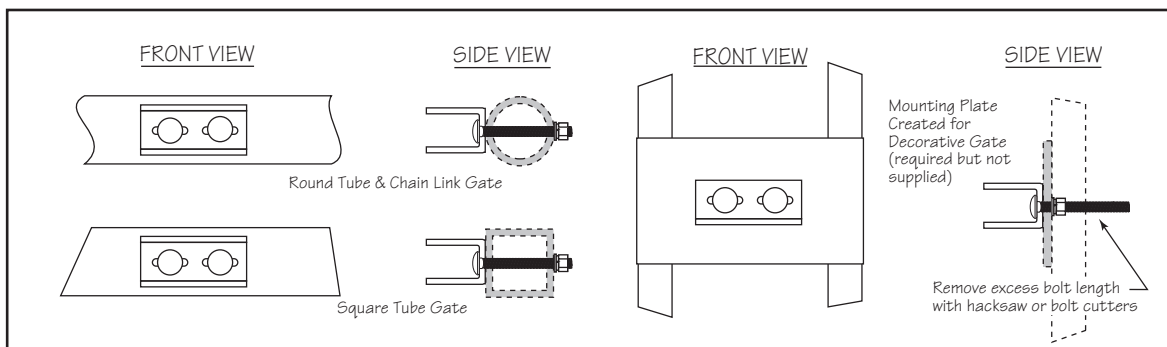
Mount gate bracket using (2)

$\frac{3}{8}$ " x 2-3/4" bolts, washers, lock washers, and nuts (provided).

NOTE: After the gate opener installation is complete and operation of the opener system has been tested, you should remove excess bolt length extending beyond the tightened nuts with a hacksaw or bolt cutters.

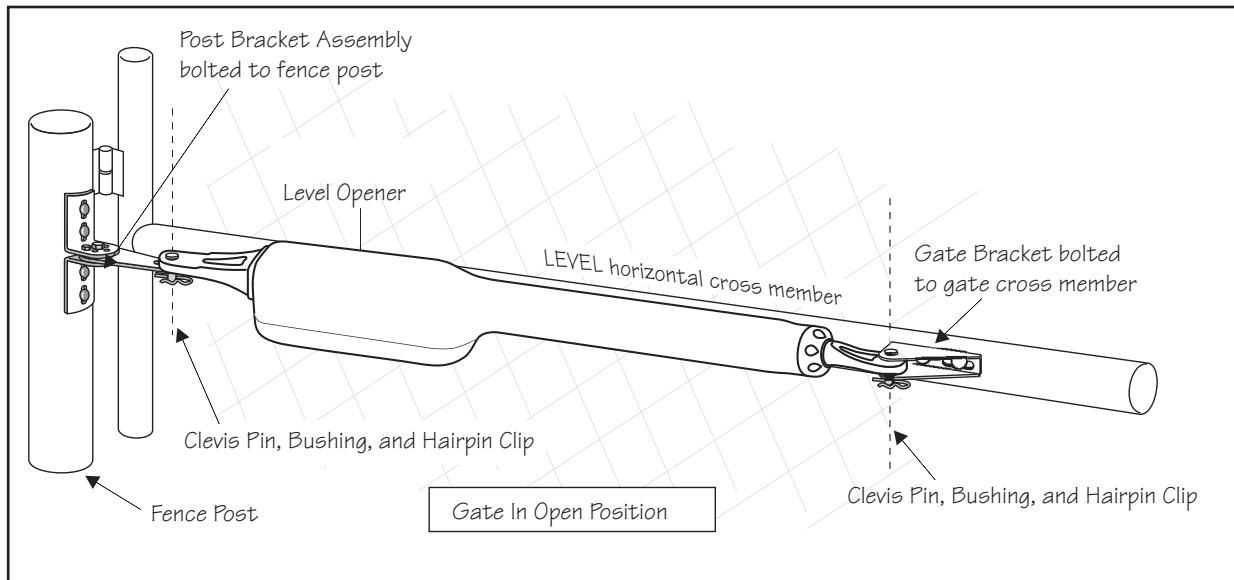


Gate Bracket Mounting Examples



Mounting the Master Opener

Attach the opener to the securely bolted post bracket assembly and gate bracket using clevis pins, bushings, and hairpin clips, or the optional Pin Locks (FM133). Verify that the opener is level and adjust the post bracket assembly if necessary.



Installing the Second Opener

Install the second opener on the remaining gate leaf by repeating the same process for installing the Master Opener starting on page 12 through page 16.

NOTE: You will need to run the Second Opener power cable and any hard wired sensor or photo beam wires under the driveway to the control box.

After you have mounted the second opener, proceed to **Installation of the Closed Position Stops** on the next page.

Installation of the Closed Position Stops

The Mighty Mule Gate Openers firmly hold the gates in the closed position using positive stops. The positive stops help stabilize the gate leaves in the closed position. To further enhance stability and security, we strongly recommended using an optional **Mighty Mule Automatic Gate Lock** with your dual gate (*see Accessory Catalog*).

IMPORTANT: The gate and gate opener on the same side as the control box will be referred to as the **MASTER** gate and gate opener. The gate and gate opener on the opposite side of the driveway from the control box will be referred to as the **SECOND** gate and gate opener.

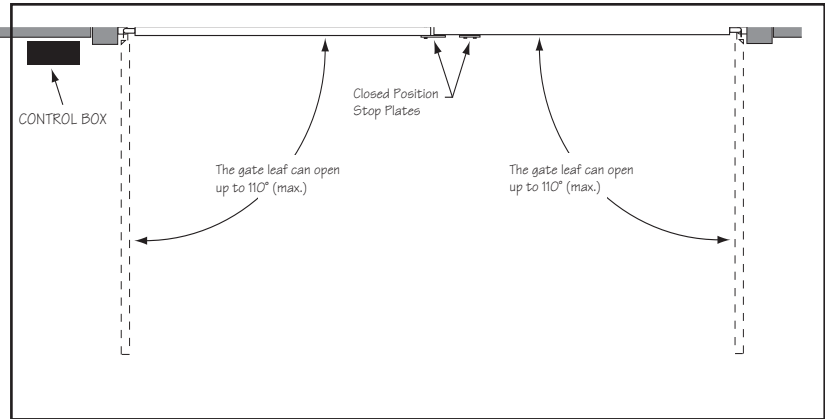


Illustration A

Step 1

Attach the horizontal closed position stop plate to the **MASTER** gate leaf.

Detach the gate operators from the gates and move the gates to their closed position (*Illustration A*). Using appropriate hardware for your type of gate (U-bolts for tube or chain link; screw or bolts for wood or metal, not included) attach the *closed position stop plate* (**horizontally**) about mid height on the **MASTER** gate frame. **Do not** tighten it completely at this time. Slide the stop plate toward the frame of the **SECOND** gate leaf until they touch (*Illustration B*). Once you have moved the stop plate to the correct position, tighten its hardware completely.

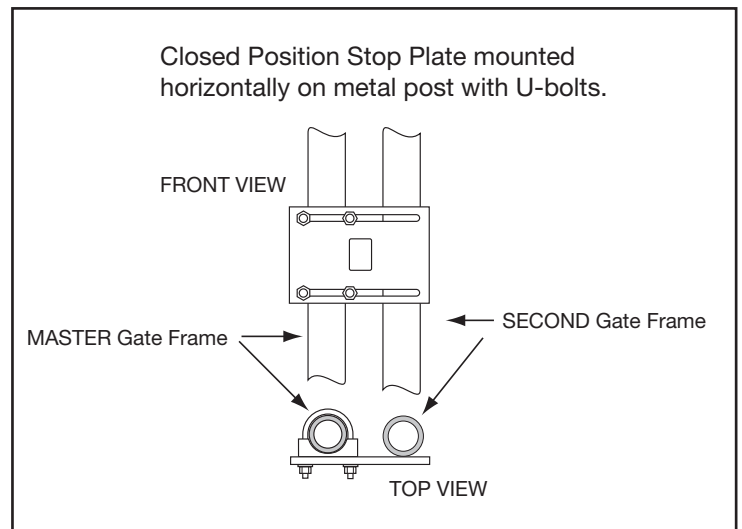


Illustration B

NOTE: The optional ground stop post is used to provide a secure point for the **SECOND** gate to close against. If you will be using the **Mighty Mule Gate Lock** accessory with your gate opener system, the closed position ground stop is **REQUIRED**, as shown in Steps 2 and 3 on the next page.

Step 2

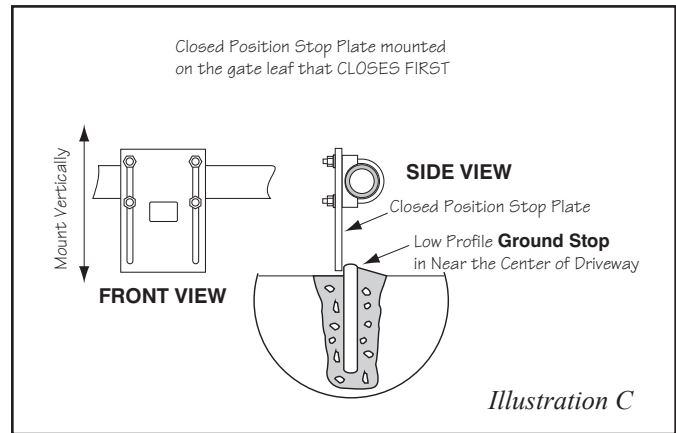
Install a low profile ground stop (*not provided*) beneath the SECOND gate stop plate.

The ground stop needs to be positioned near the end of the gate as shown in *Illustration A* and may be made of metal or concrete and should be firmly secured in the ground (we recommend setting it in concrete).

Step 3

Attach a vertical closed position stop plate to the SECOND gate.

Using appropriate hardware for your type of gate attach the vertical *closed position stop plate* to the SECOND gate frame at the point where it will come in contact with the ground stop post.. **Do not** tighten it completely at this time. You must slide the closed position stop plate toward the *ground stop* until they touch (*Illustration C*). Once you have moved the stop plate to the correct position, tighten its hardware completely.

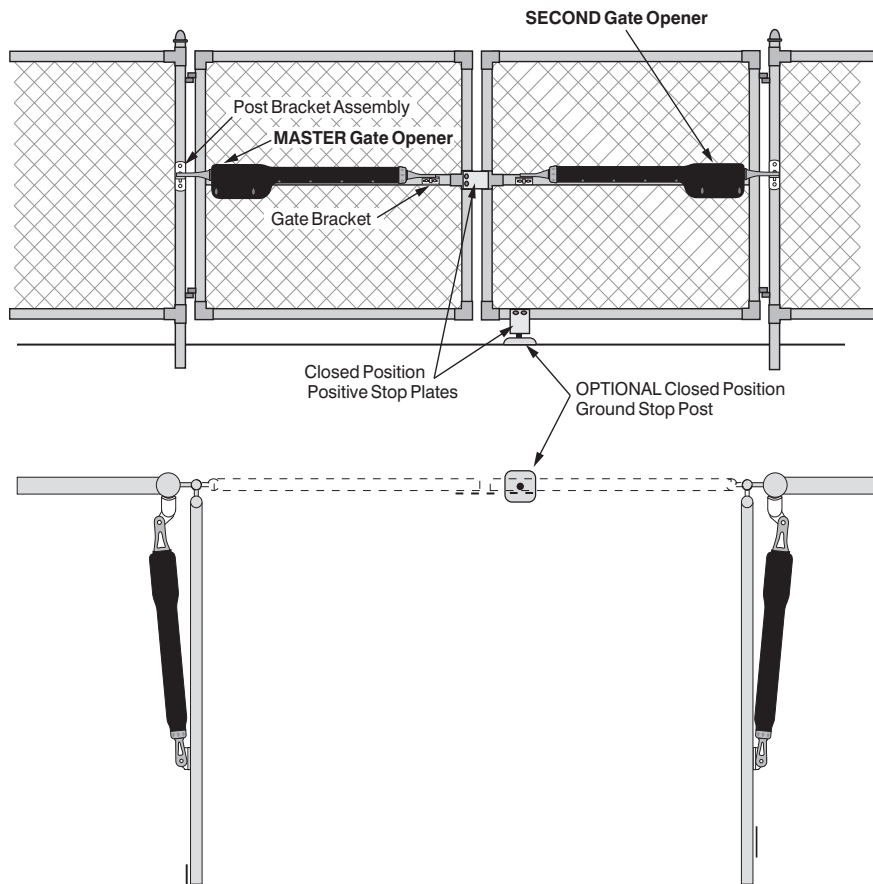


Step 4

Reinstall the master gate operator (6 foot cord) on the side of the gate where you plan to install the control box. Reinstall the second gate operator (32 foot cord) on the opposite side.

NOTE: For a push-to-open installation (gate opens *out* from the property) attach the closed position stop plate to the **outside** of the gate.

At this stage of the installation, the openers should be installed on the gate leaves and the open and closed position stops should be in place.



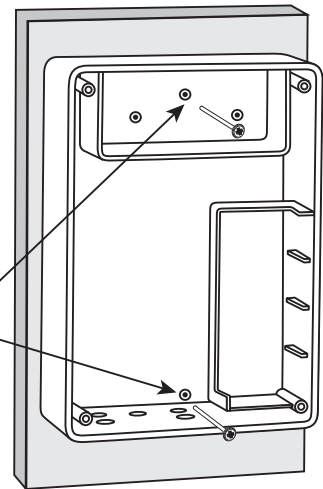
Mounting the Control Box

Step 1

Mount the control box using the screws (*provided*) or another secure mounting method. The control box must be mounted at least **3 feet above the ground** to protect it from rain splash, snow, etc., and at least **3 feet from an AC power source** to prevent electrical interference.

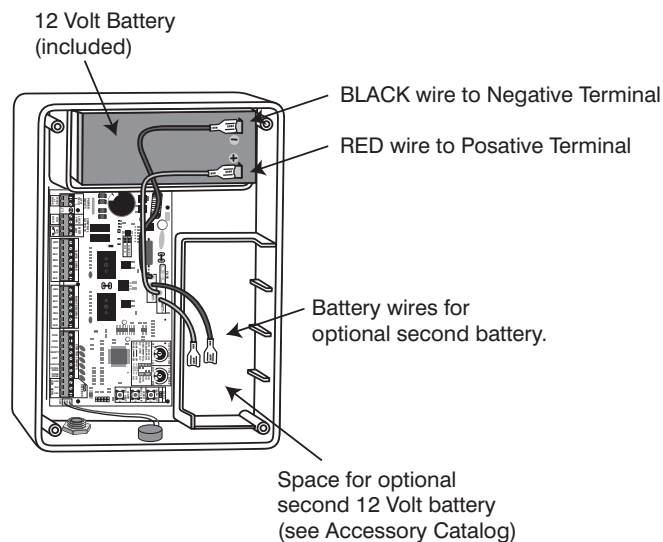
NOTE: The batteries that came with your gate opener, **MUST** be placed in the top (horizontal) battery slot with the terminals on the **RIGHT**. The extra (vertical) battery slot is for the second battery.

Use mounting holes and screws provided to mount control box to a secure surface.



Step 2

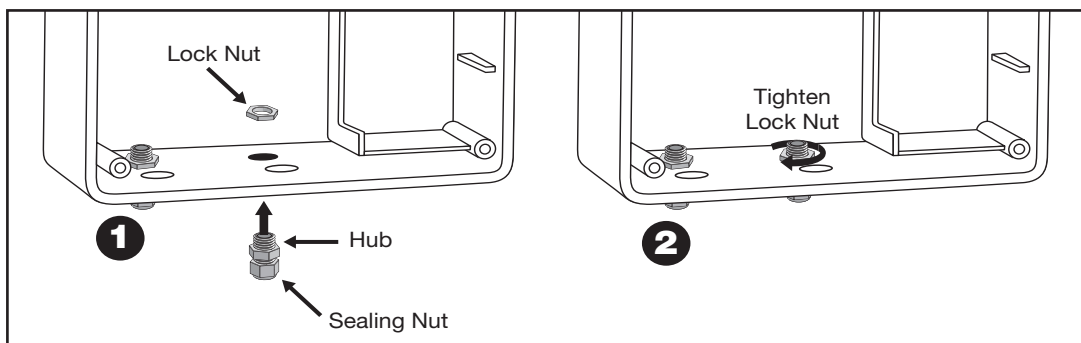
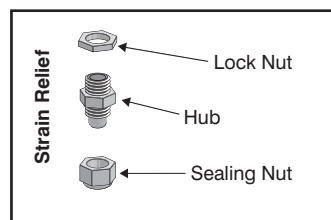
Make sure the control box power switch is in the **OFF** position. The ON/OFF Switch is located on the bottom of the control box. Remove the control box cover and slide the battery into position with its terminals to the **RIGHT** (*see illustration*). Connect the **BLACK** battery wire to the **NEGATIVE** (-) battery terminal. Connect the **RED** battery wire to the **POSITIVE** (+) terminal. *Pay close attention to the color of the wires. If the wires are connected incorrectly, the control board will be damaged. NEVER insert the battery with the terminals to the left.*



Step 3

The control box comes with one Strain Relief Bushing installed. For dual gate applications you need to remove the second strain relief knock out and install the second strain relief (included).

Remove lock nut from strain relief hub, insert hub in knock out hole and secure with lock nut as shown below. Leave sealing nut attached for now.

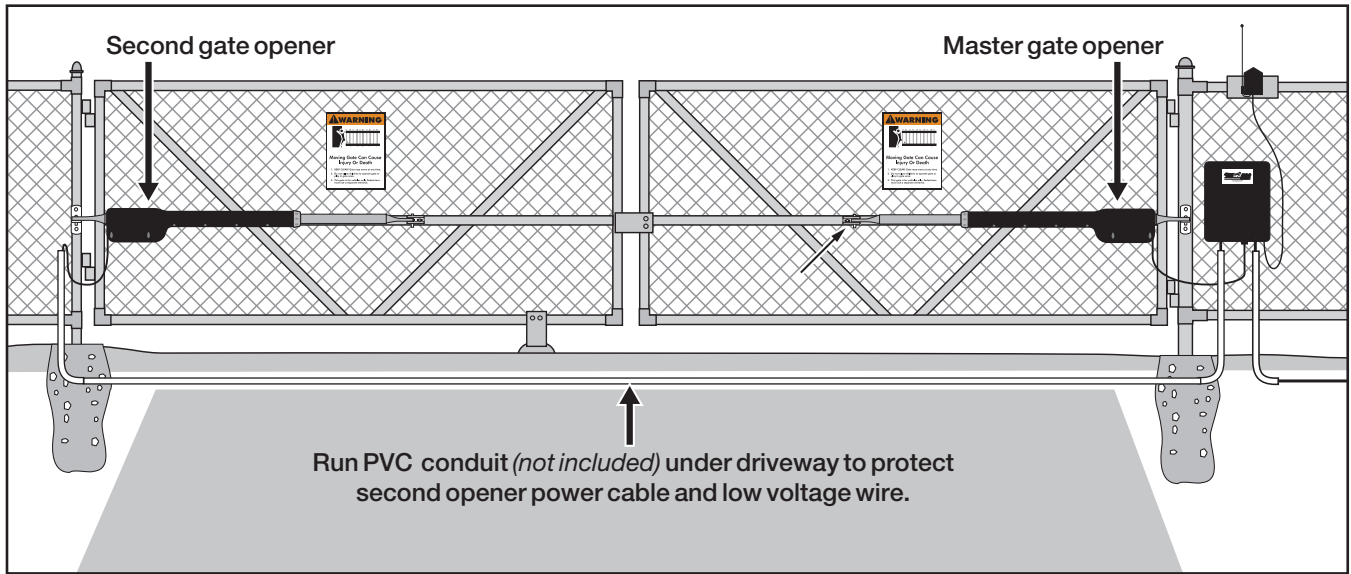


Running Power Cables Into Control Box

Step 4

Review the **Installation Overview** illustration on *page 9* before proceeding.

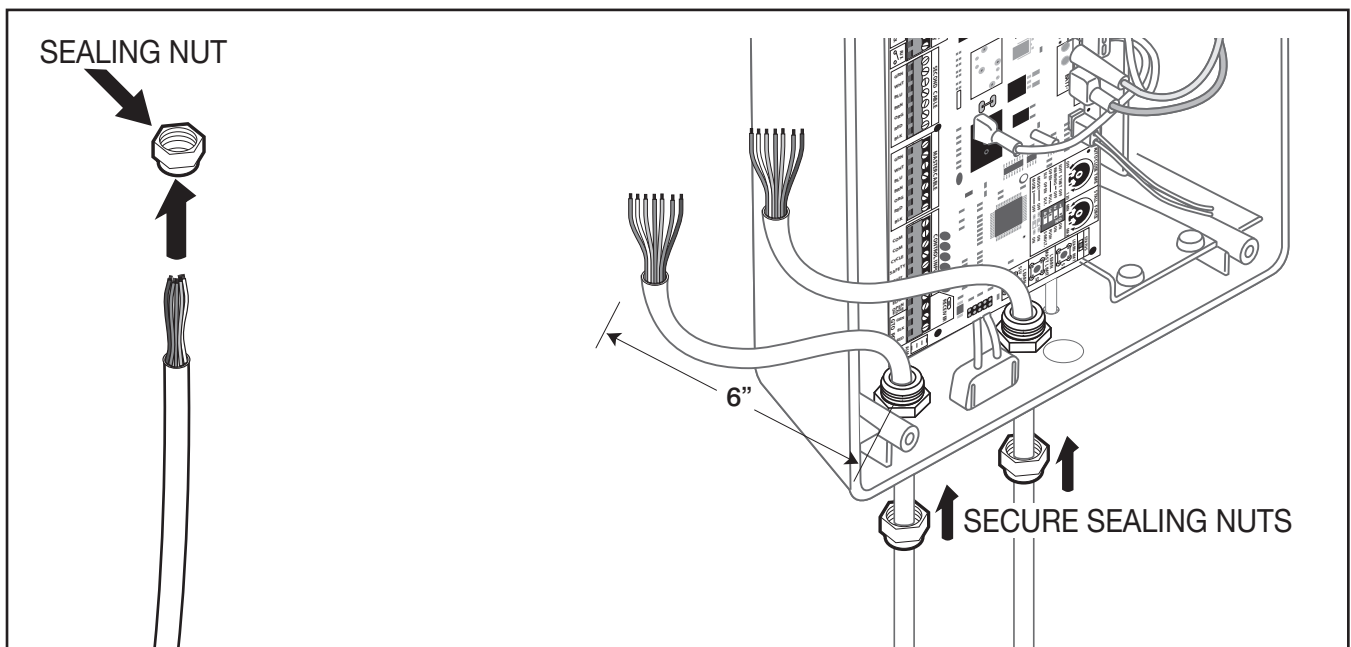
Cut a 6" deep slot into the driveway to accommodate PVC conduit (*not provided*) for the power cable coming from the Second opener to the control box. The buried conduit will protect the 32 foot power cable from automobile tires, lawn mower blades, weed eaters, and grazing animals. Pull the second opener power cable through the conduit and secure them into the slot in the driveway.



Step 5

Twist each end of the gate opener power cable's 7 colored wires. Feed cables through strain relief sealing nuts.

Feed cables through the strain relief bushing into control box. Pull enough cable into the control box to easily reach the Master and Second Operator terminals (6" or so). Secure cables by tightening the sealing nut.



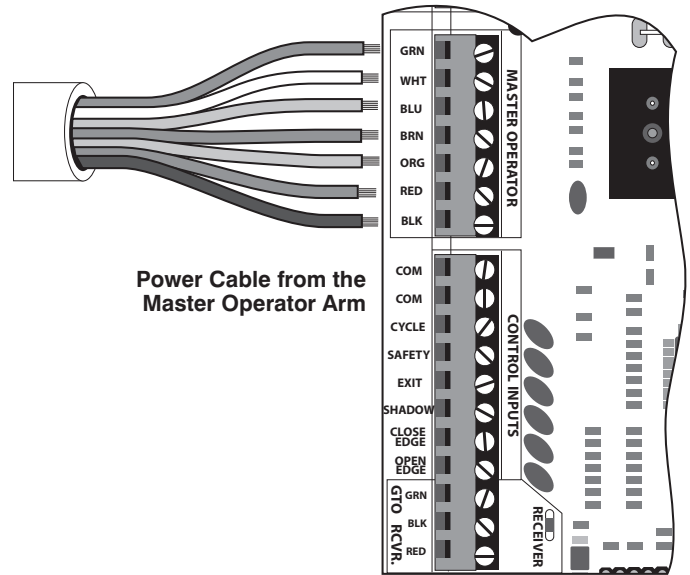
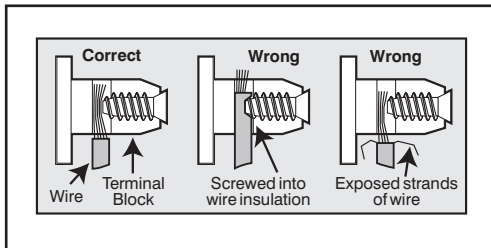
Connecting Opener Power Cables

MASTER Operator

Step 6

Insert the stripped power cable wires into the appropriate terminals on the **MASTER OPERATOR** terminal block. The green wire should be inserted into the **GRN** terminal, the white wire into **WHT**, the blue wire into **BLU**, brown wire into **BRN**, the orange wire into the **ORG**, the red wire into the **RED**, and the black wire into the **BLK** terminal.

Tighten the set screws against the end of the wires.

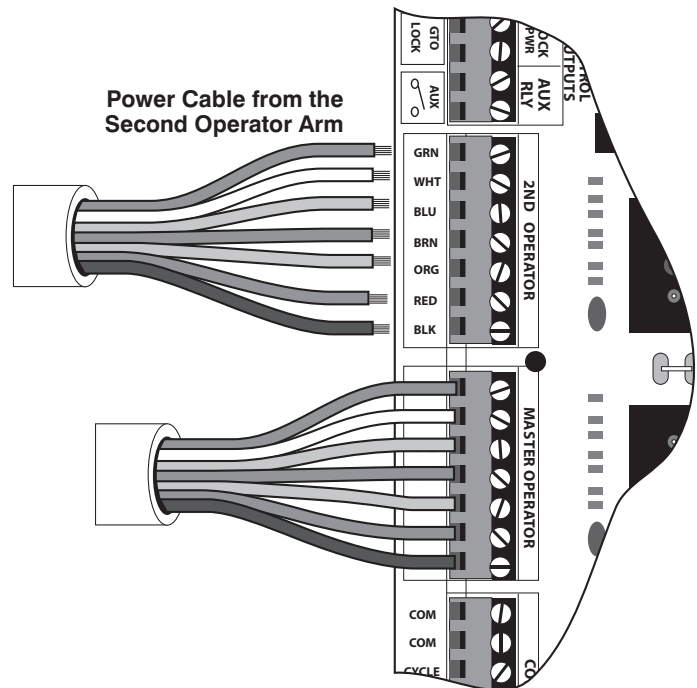


SECOND Operator

Step 7

Insert the stripped wires of the power cable into the appropriate terminals on the **2ND** operator terminal block. The green wire should be inserted into the **GRN** terminal, the white wire into **WHT**, the blue wire into **BLUE**, brown wire into **BRN**, and the orange wire into the **ORG** terminal, red wire into **RED**, and black wire into **BLK**.

Tighten the set screws against the end of the wires.



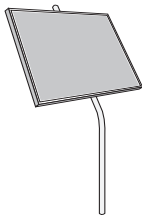
Powering the System

Installation of the Transformer

IMPORTANT:

- Never connect the transformer and a solar panel to the opener control board at the same time. It will damage the control board.
- The transformer is designed and intended for indoor use. If the transformer can be plugged only into an outside electrical outlet, a weatherproof cover or housing (available at local electrical supply stores) **must** be used.
- All low voltage wire used with the Mighty Mule Gate Opener must be 16 gauge dual conductor, stranded, direct burial wire (*see page 22 and the accessory pages*). **Do not run more than 1000 feet of wire.**
- If your gate is more than 1000 ft. from an ac power source, you will need to use at least one 10 watt Solar Panel to charge the battery (*see the accessory pages*). Refer to the **Solar Panels and Gate Activity** chart below.

OPTIONAL Solar Panels and Gate Activity

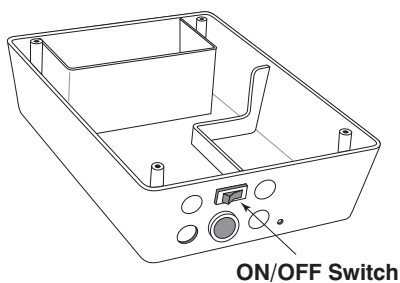
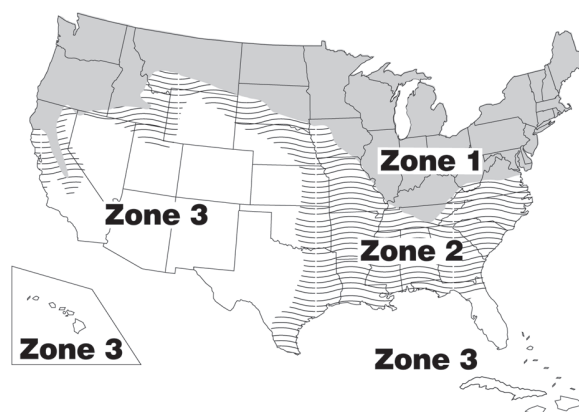


The table and map illustrate the maximum number of gate cycles to expect per day in a particular area when using from 10 to 30 watts of solar charging power, prior to the battery depleting to a state where

the unit will not function.. (*see Accessory Catalog*). The figures shown are for winter (minimum sunlight) and do not account for the use of any accessory items. *Accessories connected to your system will draw additional power from the battery.*

NOTE: A maximum of 30 watts of solar charging power can be connected to the Mighty Mule Gate Opener. Consult *Solar Panel Installation Instructions* for further information.

Winter Ratings	Zone 1	Zone 2	Zone 3
12 v dual gate (10 watts) solar charger	4	8	13
12 v dual gate (15 watts) solar charger	7	13	20
12 v dual gate (20 watts) solar charger	10	18	27
12 v dual gate (25 watts) solar charger	13	23	34
12 v dual gate (30 watts) solar charger	16	28	41



Step 1

Make sure the power switch is **OFF** before proceeding to the next step.

Step 2

Select the electrical outlet into which you will plug the transformer. Measure the distance from this outlet to the control box following the path where the wire will be laid. After you have measured how much wire is needed, cut the wire to the appropriate length.

IMPORTANT INFORMATION ABOUT LOW VOLTAGE WIRE

The only wire acceptable for use with GTO products is 16 gauge stranded, low voltage, PVC sheathed wire. This particular gauge enables the transformer to provide an adequate charge through the control board to the battery at distances up to 1000 ft.

DO NOT use telephone wire or solid core wire. Unlike stranded wire, these types of wire are not appropriate for use with your gate opener system.

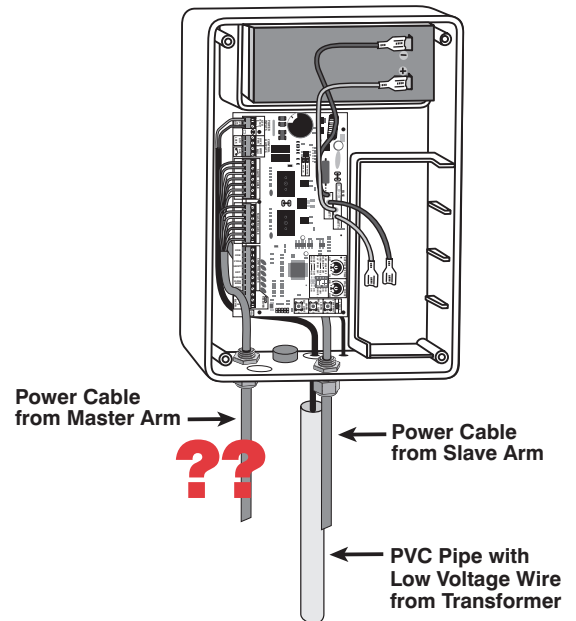
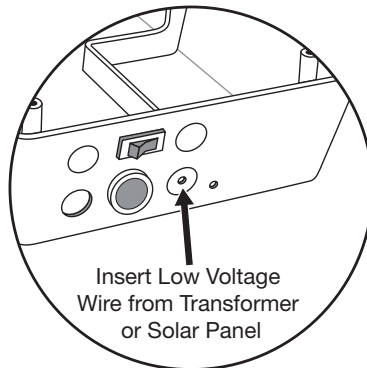
AVOID splicing wires together. Splicing permits corrosion and seriously degrades the wire's ability to carry an adequate current.

Step 3

Lay the measured length of low voltage wire in a trench following a path from the selected electrical outlet to the control box. Wires coming up from the ground should be run through PVC conduit to protect them from lawn mower blades, weed eaters, and grazing animals. Be sure to bury the wire laid in the trench.

Step 4

Feed the low voltage wire upward through the pre-drilled hole in the knock out on the bottom of the control box. Pull 6" to 8" of wire into the control box, enough to reach the Power Input on the control board.



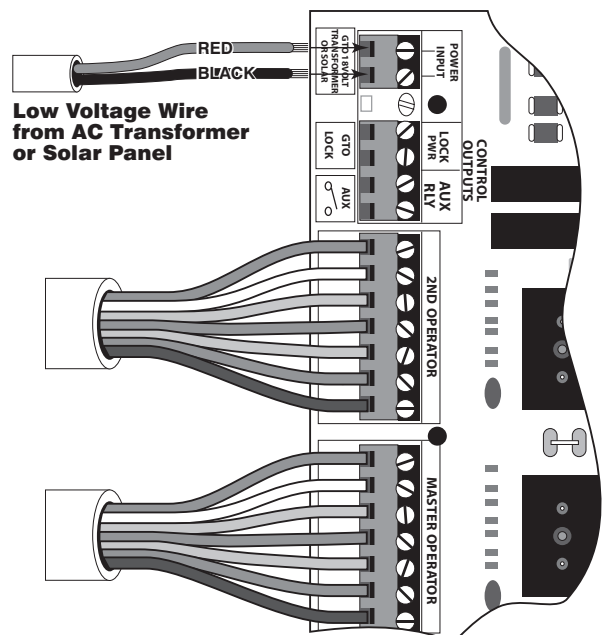
⚠ WARNING! DO NOT PLUG THE TRANSFORMER INTO AN OUTLET DURING THIS STEP! THE TRANSFORMER MUST ONLY BE PLUGGED INTO AN OUTLET DURING STEP 7!

Step 5

Strip $\frac{3}{16}$ " off the ends of the low voltage wire and twist tightly. Attach these ends to the 18VAC terminals located on the **POWER IN** terminal block (see illustration at right). **Be certain not to let the exposed wires touch each other!**

Insert one transformer wire into an 18VAC terminal. Insert the other transformer wire into the remaining 18VAC terminal. The transformer wires can be connected to the 18VAC terminals regardless of polarity or color.

Tighten set screws against exposed end of wires.

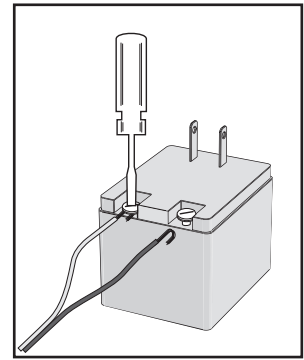


Step 6

Strip 1/2" of insulation from the ends of the low voltage wire. Attach these stripped ends to the transformer terminals.

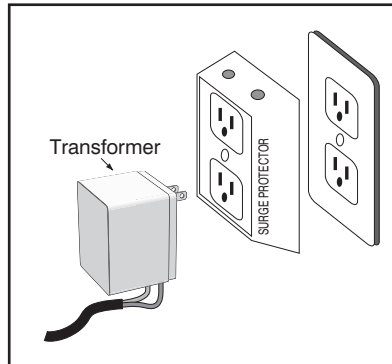
A dab of household petroleum jelly on each terminal will help prevent corrosion.

Make sure the exposed wires do not touch each other!



Step 7

Plug the transformer into the electrical outlet. (Use of a surge protector with the transformer is strongly recommended.)



HINT: Keep a few mothballs in the control box to discourage insects from entering it and damaging the control board.

NOTE: If transformer will be located outside be sure to enclose in a weatherproof cover (not included).

Solar Panel Connection

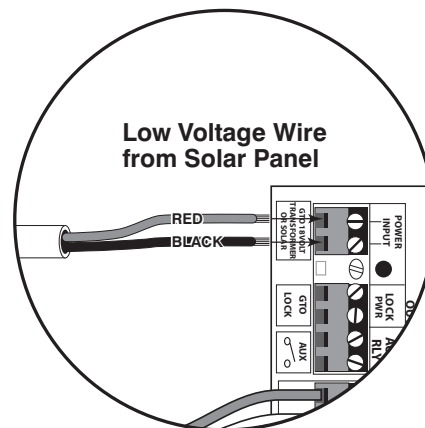
IMPORTANT: Never connect the transformer and a solar panel to the opener control board at the same time. It will damage the control board.

If you are using the transformer included with the Mighty Mule Gate Opener to charge the opener battery, skip this section and go to "CONTROL BOARD SETTINGS" below.

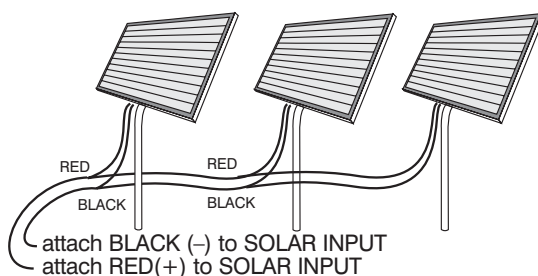
Strip 3/16" off the ends of the low voltage wire from the solar panel and twist tightly. Insert these ends to the **18 VAC** terminal block located on the control board (see illustration at right). The wires can be inserted into either terminal regardless of color. **Be certain not to let the exposed wires touch each other!**

Tighten set screws against exposed end of wires.

NOTE: For multiple panels wire the panels in parallel as shown in this diagram.



Solar Panels connect in PARALLEL



CONTROL BOARD SETTINGS

DIP Switches

DIP Switch Settings (MODES)

DIP Switch #1 - Soft Start/Stop

ON - Soft start enabled (factory preset).

OFF - Soft start disabled.

The Soft Start/Stop feature slowly starts the gate as it begins to open and slows the gate as it comes to the closed position. This saves wear and tear on the gate and gate opener system.

DIP Switch #2 - Warning Buzzer

ON - Buzzer warning enabled (factory preset).

OFF - Buzzer warning disabled.

The Warning Buzzer alerts you when the gate opener is beginning to either open or close the gate. It sounds for the first 2 seconds in each direction. It also sounds a warning when the gate obstructs two times in one cycle. Switching this to OFF disables the open and close warning not the obstruction warning.

DIP Switch #3 - Push/Pull-to-Open

ON - Push to open.

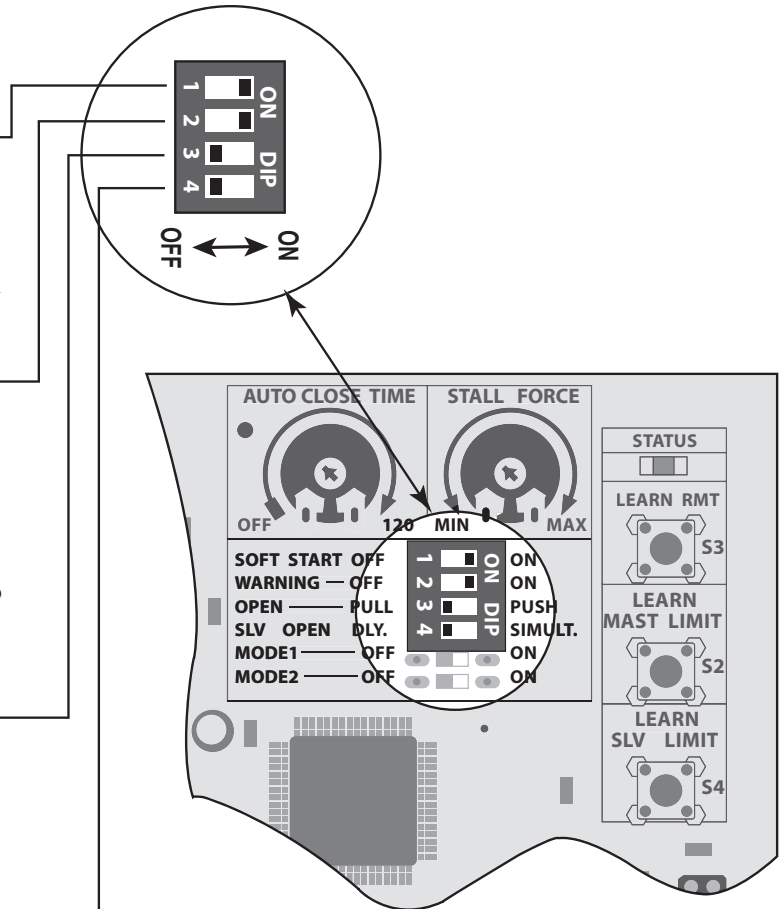
OFF - Pull to open (factory preset).

If your gate opens into the property the DIP Switch is set to the OFF position (factory setting). If your gate opens out from the property the DIP Switch must be set to the ON position. NOTE: if you have a Push-to-Open gate application you will need a Push-to-Open bracket (see Push-to-Open Instructions on page 30).

DIP Switch #4 - Delay/Simultaneous operation

ON - Second opens simultaneously with master.

OFF - Second opens after master (factory preset).



Setting the Closed Position Limits for Pull to Open Applications

TURN CONTROL BOX ON

NOTE: The OPEN limit is when the opener is fully retracted and the gate is in the full open position. The open limit setting can only be adjusted by moving the gate bracket. To achieve the optimum closed position, you must adjust the CLOSED limit setting:

Step 1

Confirm that the power switch is in the ON position, and the gates are in the OPEN POSITIONS.

Step 2

Activate your openers by pressing the entry transmitter button. Your gates should now be moving from the fully open positions toward their closing position. Prepare to STOP gate that reaches the desired closed position first by pressing the entry transmitter button again. This step may be repeated until desired close position is achieved. Once the desired CLOSED position has been achieved, proceed to step 3.

Step 3

Note which gate has reached the desired closed position (typically it's the Second gate), program the closed limit setting for that gate by pressing and holding the corresponding 'LEARN MAST LIMIT' or 'LEARN 2ND LIMIT' for 5 seconds.

Step 4

Press the transmitter button and allow the gates to return to the fully open position. YOUR FIRST GATE'S CLOSED POSITION LIMIT IS NOW PROGRAMMED.

Step 5

Activate your openers again by pressing the entry transmitter button. Your gates should now be moving from the fully open positions toward their closing position. The gate programmed in Steps 3 & 4 will stop at the spot you just programmed and the other gate will continue to close until you press the transmitter button again. The optimum CLOSED POSITION for the second gate is when it closes firmly, without excess tension, against the first gate. This step may be repeated until desired close position is achieved. Once the desired CLOSED position has been achieved, proceed to step 6.

Step 6

Repeat Steps 3 & 4 for the other gate that has not been set in step 3.

Step 7

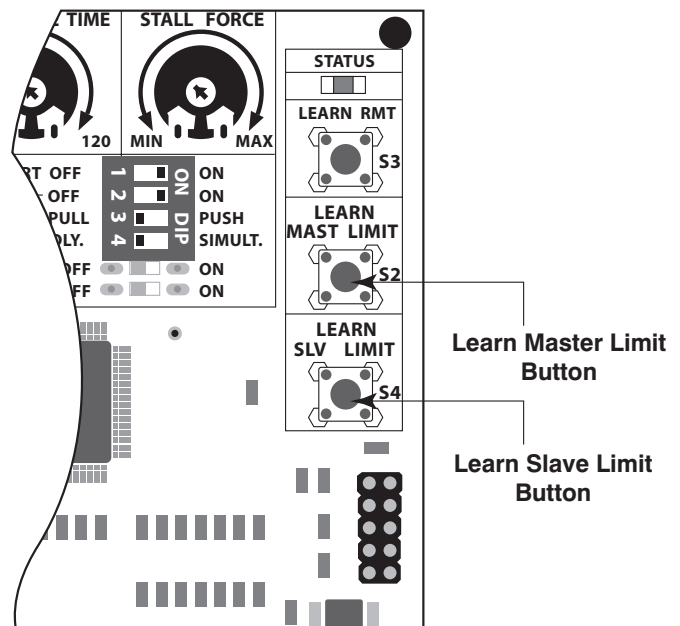
Press the transmitter button and allow the gates to return to the fully open position. BOTH YOUR MASTER AND SECOND GATE'S CLOSED POSITION LIMITS ARE NOW PROGRAMMED.

TESTING YOUR CLOSED LIMIT SETTING:

Press your entry transmitter and allow your gates to close. If CLOSED positions are not correct or need to be changed, you will need to CLEAR your CLOSED LIMIT settings and follow Steps 1-7 again.

CLEARING PROGRAMMED CLOSED LIMIT SETTING:

If you make a mistake and set the limit at the wrong position – press your transmitter to return the gates to their fully opened positions, then press and hold the 'LEARN MAST LIMIT' or 'LEARN 2ND LIMIT' button for 5 seconds. This will clear the memory for the closed limit positions. Follow Steps 1-7 again.

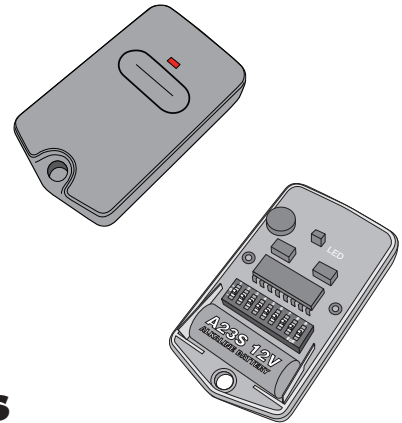


Setting Your Personal Transmitter Code

All GTO transmitters are set to a standard code at the factory and are ready to operate your GTO® Gate Opener®. For your safety and security, however, we **strongly recommend** that you replace the factory setting with your own personal code. Follow the directions below:

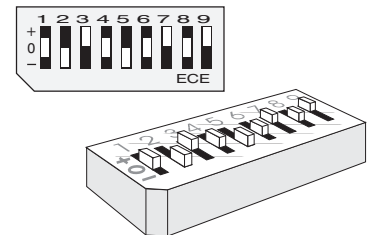
1. Remove the Transmitter Cover

On the back of the transmitter use a small phillips head screw driver to remove the two screws on the sides of the visor clip and separate the front cover from the transmitter. With the front cover removed, the battery and the DIP switches will be exposed. To set a new code, use a small screwdriver to move the switches.



2. Set the transmitter DIP Switches

There are nine (9) transmitter DIP switches; each can be placed in three different positions (+, 0, -). **DO NOT** set all the switches in the same position, such as all +, all 0, or all -. Once the DIP switches have been set to a personal code, replace front cover.

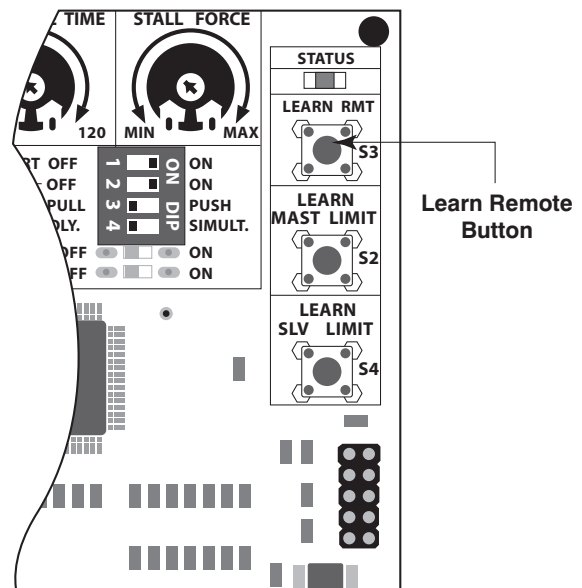


WARNING: No other adjustments should be made inside the transmitter.

3. "Teach" the New Code to Control Board Memory

- A. Press and hold transmitter button.
- B. Press and hold the **LEARN RMT (Learn Remote)** button on the control board until the buzzer sounds.
- C. Release transmitter button. The new code is stored in control board memory.
- D. Release the **LEARN RMT (Learn Remote)** button.

NOTE: For any additional transmitters you may have purchased, match the DIP switch settings and they will work with the transmitter you just programmed.



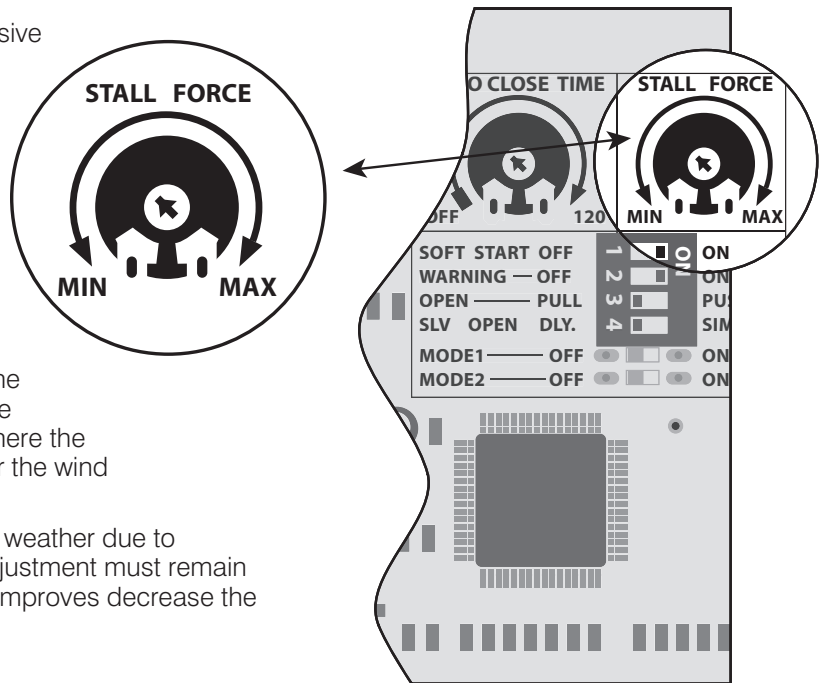
Setting Dual Sense Detection

Do not use the Dual Sense Stall Force adjustment to compensate for a gate that is sticking or binding. Excessive Stall Force may cause damage to the gate operator or gate system or Injury or Death.

The Stall Force adjustment controls the amount of force the opener will apply against an obstruction before it stops and reverses direction. The adjustment on the control board operates like a volume control on a radio. It controls the amount of force the opener will apply to an obstruction before it automatically reverses direction.

The Stall Force adjustment is located on the control board. Turn the "STALL FORCE" arrow in the center of the potentiometer with small flat head screwdriver. Adjust the sensitivity from the MINIMUM position up to the point where the gate operates without obstructing from its own weight or the wind conditions in your area.

NOTE: You may need to increase the stall force in cold weather due to increased resistance from gate hinges. However, the adjustment must remain as near to minimum as possible and when the weather improves decrease the setting to the appropriate position.



CAUTION

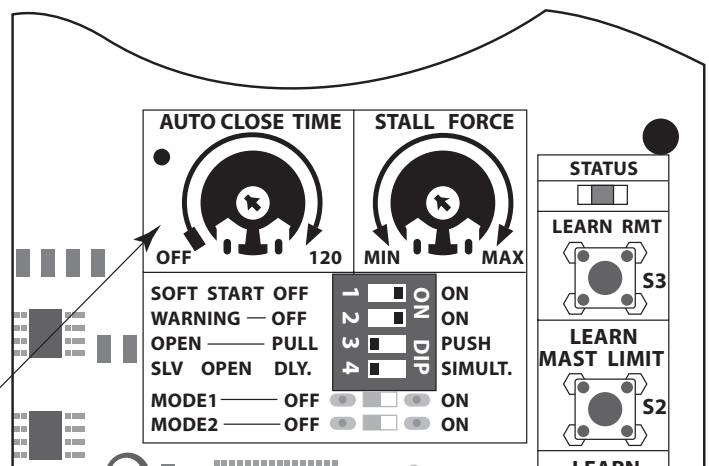
For safety reason the Dual Sense Stall Force setting on the Mighty Mule control board comes from the factory set at MIN (minimum). This setting may need adjustment depending on the size and weight of the gate.

ALWAYS KEEP SAFETY AT THE TOP OF YOUR LIST WHEN ADJUSTING OR SERVICING YOUR GATE SYSTEM.

Setting Auto Close Timer

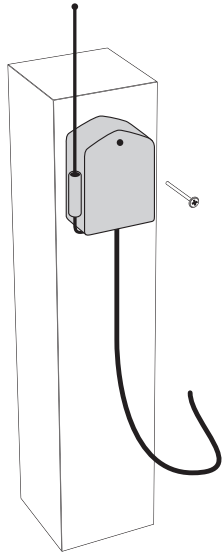
Turning the pot all the way counter-clockwise will turn auto close feature off. The minimum time is 3 seconds. The maximum (turn the pot all the way clockwise) time is 120 seconds.

Auto Close Time Pot



Installing the Receiver

Use the transmitter to check the range of the receiver *before permanently mounting it*.



Consider the following when mounting the receiver:

- Standard receiver cable length is 10 feet (receivers with a longer cable are available as special order items; call the *Mighty Mule Sales Department*). NEVER splice receiver cable!
- **Run the cable through PVC conduit to protect it from damage.**
- DO NOT run cable in conduit containing ac wiring.
- DO NOT mount receiver on a metal fence or post; doing so will decrease signal range.
- The receiver range can vary from 50 to 100 feet depending upon weather, topography, and external interference.
- DO NOT mount upside down.
- MOUNT so that you have line of sight between remote and antenna.
- MOUNT 3 feet away from AC voltage.
- MOUNT as high as possible for optimum range.

FCC Regulation

This device complies with FCC rules Part 15. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept an interference that may cause undesired operation.

Transmitter distance may vary due to circumstances beyond our control. **NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.**

WARNING: Changes, modifications or adjustments not expressly approved by GTO Access Systems, LLC could void the user's authority to operate this equipment. There Are No User Serviceable Parts.

NOTICE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 the FCC. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Connecting Additional Devices

Mighty Mule strongly recommends the use of additional obstruction detection devices however we do not endorse any specific brand names. Only use products that are listed to be in compliance with any applicable UL safety standards and national and regional codes.

PLEASE NOTE: Contact sensors, non-contact sensors, shadow loops, etc. are not included with the Mighty Mule. Refer to the sensor manufacturer's instructions for information about installing accessory devices.

The Mighty Mule ONLY accepts accessory devices with normally open dry contact outputs.

WARNING

Make sure the operator power switch is turned OFF before connecting ANY device wiring to the terminals of the controller. Unplugging the transformer does not turn power to the operator off.

Input Connections

- All control inputs are dry-contact, normally open, inputs. DO NOT apply external voltage sources to these inputs.
- All inputs are connected with respect to COMMON terminal.
- The status LED will blink once when any input is activated.

- 1 COM:** Circuit common (reference for all logic input)
 - Two (2) terminals to provide extra common connection point.

- 2 CYCLE/CLOSE:** (Typically for use with push button or hard-wired keypad)
 - Each activation at this input will cycle the operation as follows:
OPEN–STOP–CLOSE–STOP–OPEN

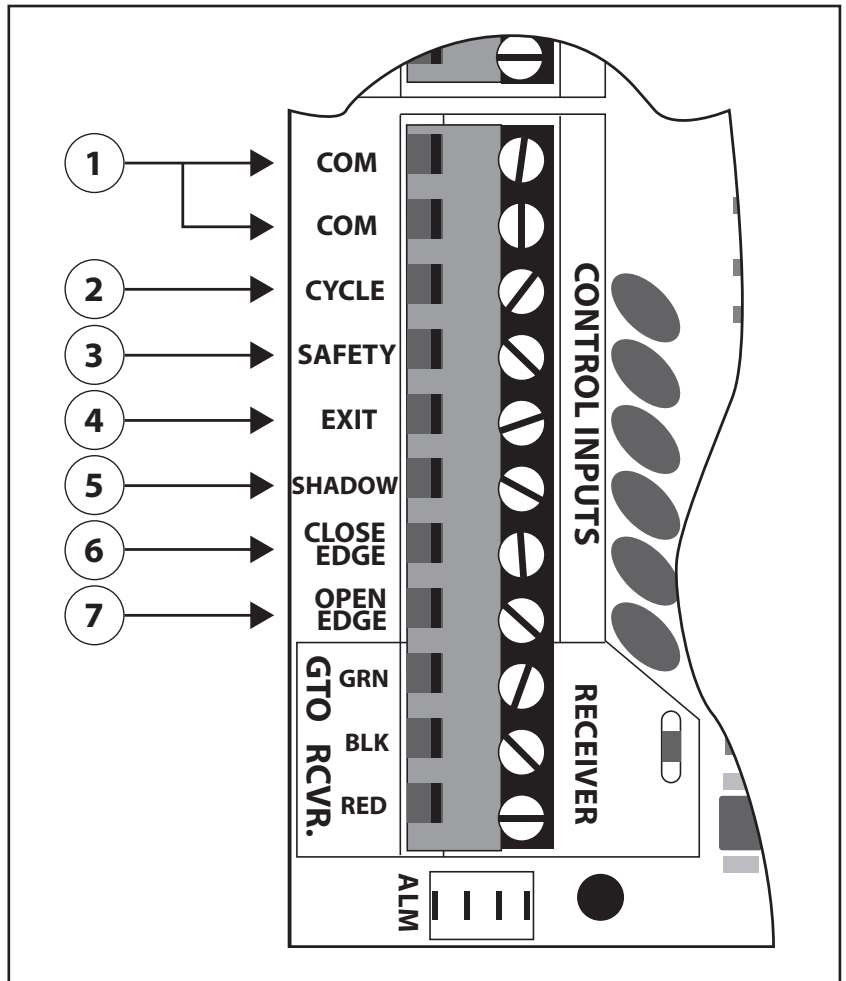
- 3 SAFETY:** (Typically for use with photo beam device, loop detector or other non-contact sensors)
 - Activation of this input while the gate is closing will cause the gate to stop and return to the opened position.
 - Activation of this input while the gate is opening has no effect (gate will continue to open).
 - Activation of this input while gate is idle will prevent gate from closing.

- 4 EXIT/OPEN:** (Typically for use with exit loop or wand)
 - Activation of this input will open the gate if it's not already at the open position
 - Activation of this input while at open limit will restart the auto close time (if enabled).

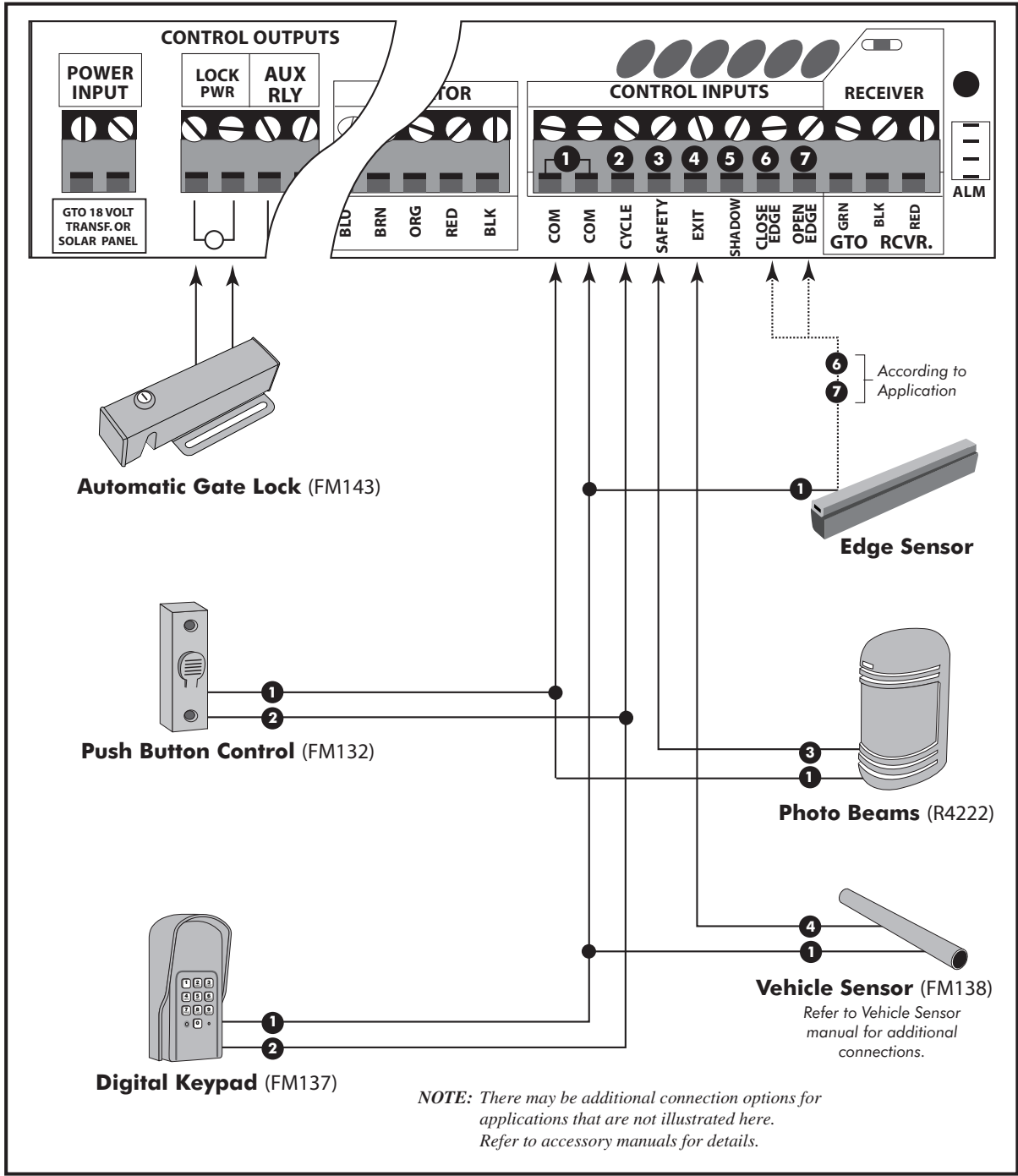
- 5 SHADOW LOOP:** (Typically for use with loop detector)
 - This input is only monitored when the gate is at the fully open position. At any other position, activation of this input has no effect on gate operation.
 - Activation of this input while gate at the fully open position will prevent gate from closing.

- 6 CLOSE EDGE:** (Typically for use with safety edge device)
 - Activation of this input while the gate is closing will cause the gate to stop and reverse direction for approximately 2 seconds.
 - Activation of this input while the gate is opening has no effect (gate will continue to open).
 - Activation of this input while gate is idle will prevent gate from closing.

- 7 OPEN EDGE:** (Typically for use with safety edge device)
 - Activation of this input while the gate is opening will cause the gate to stop and reverse direction for approximately 2 seconds.
 - Activation of this input while the gate is closing has no effect (gate will continue to close).
 - Activation of this input while gate is idle will prevent gate from opening.

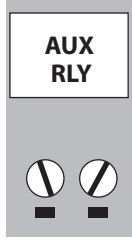


Wiring Accessories



Connecting Other Auxiliary Devices (Sirens, Lights, etc.)

- These 2 terminals are normally open “dry-contact” (no voltage) relay output.
- Relay is closed when the gate is in motion; Relay is open when the gate is not in motion.
- These 2 terminals maximum rating is 24Vdc, 1 Amp.



PUSH-TO-OPEN INSTALLATION INSTRUCTIONS

PUSH-TO-OPEN gates open out from the property (opener arms *extend* to open). A Push-To-Open Bracket is required for this type of installation. In a Push-To-Open installation, the opener is installed while the gate is **in the closed position and the opener fully retracted**.

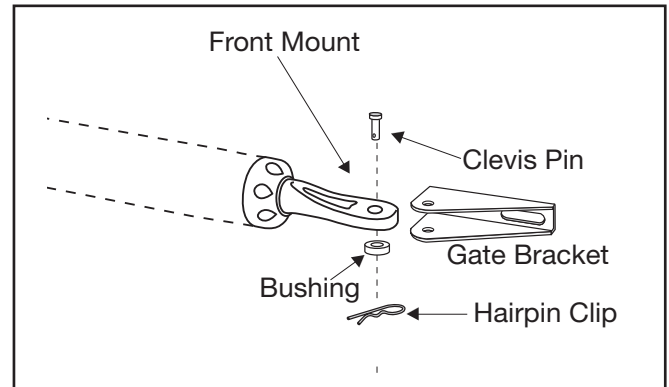
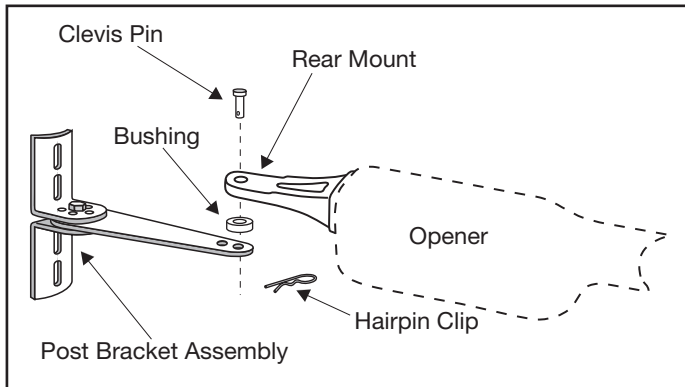
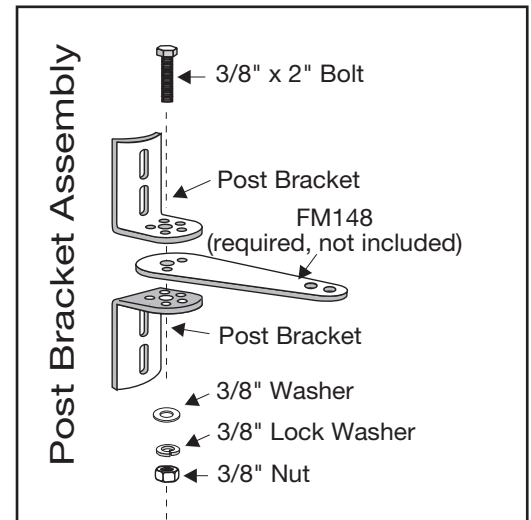
Swinging gates **MUST NEVER** open into public access areas!

Step 1

Insert the 3/8" x 2" bolt through the center hole of the post brackets and post pivot bracket as shown. Fasten a 3/8" lock washer, 3/8" washer and 3/8" nut on the end of the bolt. **DO NOT over tighten** the nut because the post pivot bracket will have to be adjusted later.

Step 2

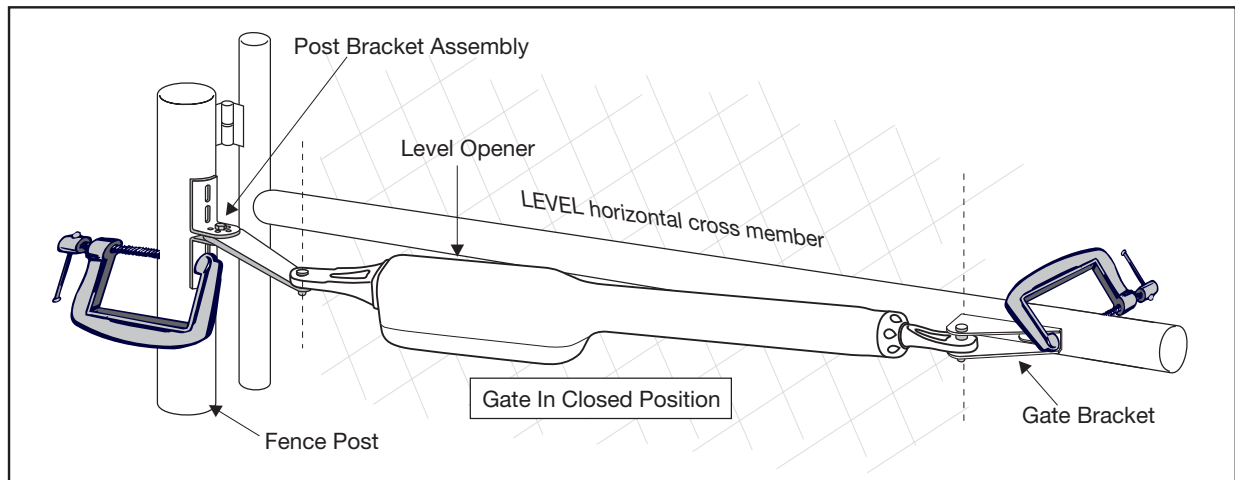
Attach post bracket assembly and gate bracket to the opener with the clevis pins and bushings. Secure the clevis pins with hairpin clips.



Step 3

With the gate in the closed position (up to 110° from its open position), **and the opener fully retracted**, adjust the post bracket assembly and gate bracket until the opener is level. While holding the opener level, use C-clamps to **temporarily** keep the post bracket assembly and gate bracket in their respective positions on the fence post and gate.

IMPORTANT: While determining the mounting point for the post pivot bracket assembly, be sure that the position allows for minimum 2 inches of clearance between the gate and the opener in both the open and closed positions, as shown in the CLEARANCE diagram on the next page. This clearance will give the opener the most efficient leverage point for opening and closing the gate and more importantly provides the least possible pinch area.

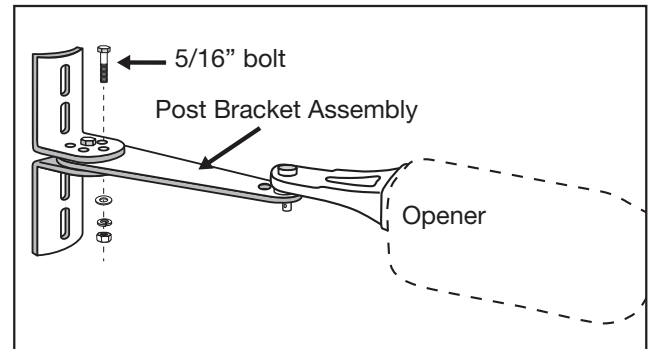
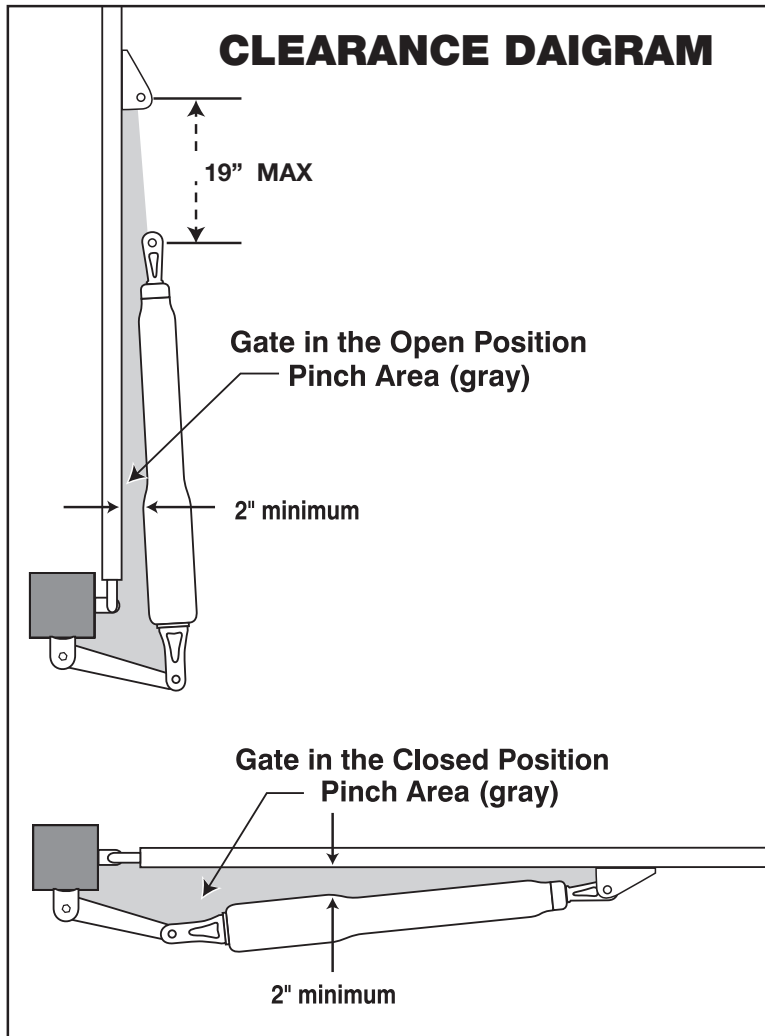


Step 4

When you feel that you have the best position for the post pivot bracket in the closed position, insert the 5/16" bolt through the aligned holes of the post bracket and post pivot bracket to hold it in place. Remove the clevis pin from the front mount and while supporting the gate opener, swing the gate and gate opener to the open position. With the gate and gate opener in the open position check the clearance and be sure that the gate opener is not binding at the post pivot bracket.

If you don't have 2 inches of clearance or the gate opener is binding on the post pivot bracket, remove the 5/16" bolt and readjust the pivot bracket until you can achieve these important clearances. Make sure to reinstall the bolt and related hardware as shown in step 1.

With the post pivot bracket in the optimum position for clearance and freedom of movement while maintaining 19 inches or less on the stroke. Reattach the opener to the gate bracket in the open position and recheck the gate opener level and make sure the brackets are clamped securely.

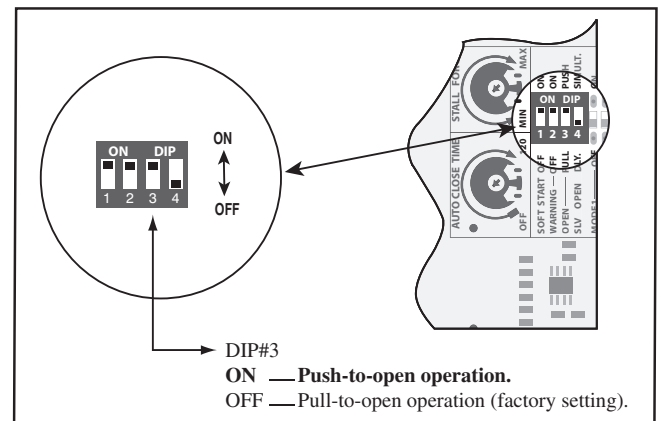


Step 5

Make sure the control box power switch is **OFF**. Use a small screwdriver to move the **Number 3** DIP switch from the factory setting (OFF / Pull-To-Open) to **ON for Push-To-Open**. Turn power switch **ON**. The control board is now configured to *push* the gate open.

Step 6

Install the second gate opener on the other gate in the same manner. Then refer to the **CONTROL BOARD SETTINGS** on page 25 for gate sequencing and other programming steps before proceeding.



Setting the Open Position Limit

Step 1

Confirm that the power switch is in the ON position, and the gates are in the CLOSED POSITIONS.

Step 2

Activate your openers by pressing the entry transmitter button. Your gates should now be moving from the closed positions toward their open position. Prepare to STOP gates by pressing the entry transmitter button again when the first gate reaches the desired open position. This step may be repeated until desired open position is achieved. Once the desired OPEN position has been achieved, proceed to step 3.

Step 3

Note which gate has reached the desired open position (typically it's the SECOND gate), program the open limit setting by pressing and holding the corresponding 'LEARN MAST LIMIT' or 'LEARN 2ND LIMIT' button for 5 seconds.

Step 4

Press the transmitter button and allow the gates to return to the closed position. The gate programmed in Step 3 has now learned its limit.

Step 5

Activate your operators again by pressing the entry transmitter button. Your gates should now be moving from the fully close positions toward their opening position. The gate programmed in Step 3 and 4 will stop at the spot you just programmed and the other gate will continue to open until you press the transmitter button again. This step may be repeated until desired open position is achieved. Once the desired OPEN position has been achieved, proceed to step 6.

Step 6

Repeat steps 3 & 4 for gate that has not been programmed yet.

Step 7

Press the transmitter button and allow the gates to return to the closed position. BOTH YOUR MASTER AND SECOND GATE'S OPEN POSITION LIMITS ARE NOW PROGRAMMED.

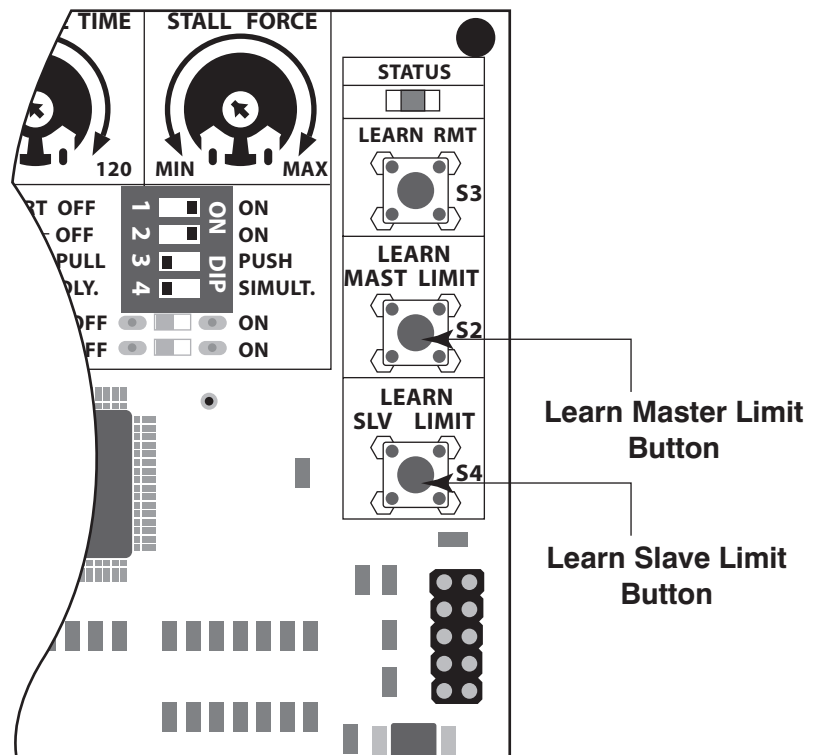
TESTING YOUR OPEN LIMIT

SETTING:

Press your entry transmitter and allow your gates to open. If OPEN positions are not correct or need to be changed, you will need to CLEAR your OPEN LIMIT settings and follow steps one (1) to seven (7) again.

CLEARING THE PROGRAMMED OPEN LIMIT SETTING:

If you make a mistake and set the limit at the wrong position – press your transmitter to return the gates to their closed positions, then press and hold the 'LEARN MAST LIMIT' or 'LEARN 2ND LIMIT' button for 5 seconds. This will only clear the memory for the open limit positions for the selected gate. Follow steps one (1) to seven (7) again.



Troubleshooting Guide

If your gate opener does not function properly after it is installed, use this guide before calling the GTO Service Department.

VOLTAGE READINGS

18 Vac Transformer 18.0 to 22.0 Vac, 2200 mA

5 W Solar panel (single) 18.0 to 22.0 Vdc, 300 mA

** measure voltage at panel and control box in full sun; this will increase by approximately 300mA for each additional solar panel.*

Two 12 V, 7 amp hour Batteries 12.5 to 13.5 Vdc 7.0 Ah

**measure voltage at battery terminals with battery disconnected from circuit board*

Charging circuit 13.3 to 14.8 Vdc

**measure voltage at battery terminals with battery connected to circuit board and GREEN "POWER IN" LED is ON.*

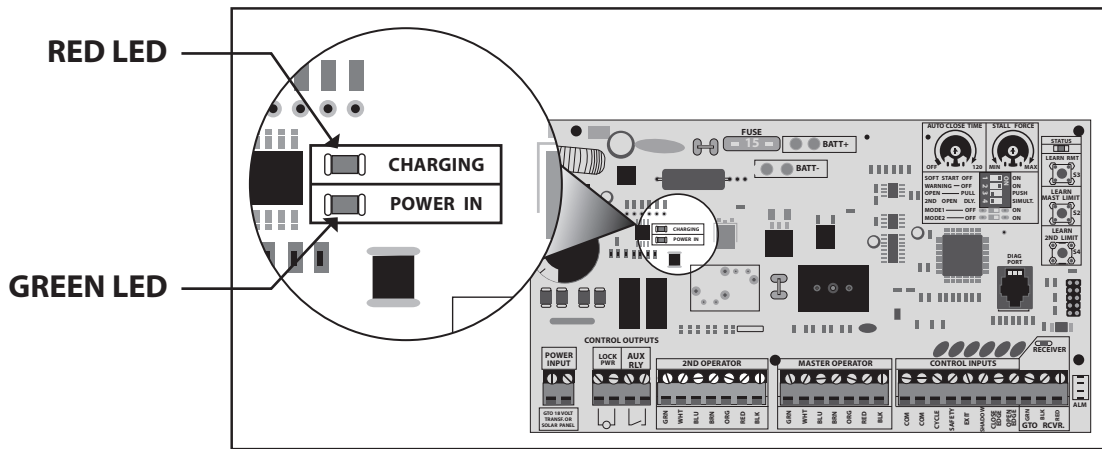
Audible Feedback

Indication	Possible Diagnosis	Check
1 short beep upon activation	Blown Fuse Low or Bad Battery Loose Battery Connection	<ul style="list-style-type: none"> • Fuse • Battery Under Load • Battery Harness Connections
A series of beeps that stop and do not repeat after power-up	Circuit Board Powered Up & Ready	<ul style="list-style-type: none"> • Normal Operation
Continuous Uninterrupted Alarm	Circuit Board Senses an Obstruction	<ul style="list-style-type: none"> • Path of Gate • Gate for Level and Plumb • Stall Force Adjustment • For diagnostic purposes, temporarily disconnect the external obstruction detection devices • Rev Counter
1 beep with 10 seconds off	Low Battery Condition	<ul style="list-style-type: none"> • Fuses • Battery Harness Connections • Battery Under Load
1 beep then 2 beeps, then pause and repeats	Master Motor Terminals Shorted	<ul style="list-style-type: none"> • Connections to Master Inputs • Master Arm Power Cable • Motor • Circuit Board
1 beep then 3 beeps, then pause and repeats	Second Motor Terminals Shorted	<ul style="list-style-type: none"> • Connections to Second Inputs • Second Arm Power Cable • Motor • Circuit Board
1 beep with 2 seconds, then pause and repeats	Master Arm Limit Switch Error	<ul style="list-style-type: none"> • Connections to Master Inputs • Master Arm Power Cable
2 beeps with 2 seconds, then pause and repeats	Second Arm Limit Switch Error	<ul style="list-style-type: none"> • Connections to Second Inputs • Second Arm Power Cable
3 beeps with 2 seconds, then pause and repeats	Master Arm Rev Counter Error	<ul style="list-style-type: none"> • Connections to Master Inputs • Master Arm Power Cable • Rev Counter
4 beeps with 2 seconds, then pause and repeats	Second Arm Rev Counter Error	<ul style="list-style-type: none"> • Connections to Second Inputs • Second Arm Power Cable • Rev Counter

Visual Feedback

Indication	Possible Diagnosis	Check
Status (clear) 1 blink	Cycle Terminal Shorted	Disconnect the push button, keypad, intercom keypad, or any other accessory wired to this terminal. Try the remote. If the remote works, then the problem is the accessory.
Status (clear) 2 blinks	Safety Terminal Shorted	Disconnect the loop detector, photo beam, or any other accessory wired to this terminal. Try the remote. If the remote works, the problem is the accessory.
Status (clear) 3 blinks	Exit Terminal Shorted	Disconnect exit wand, loop detector, photo beam, Knox box, or any other accessory wired to this terminal. Try remote. If the remote works, the problem is the accessory.
Status (clear) 4 blinks	Shadow Terminal Shorted	Disconnect the loop detector, photo beam, or any other accessory wired to this terminal. Try remote. If the remote works, the problem is the accessory.
Status (clear) 5 blinks	Close Edge Terminal Shorted	Disconnect the edge sensor, photo beam, or any other accessory wired to this terminal. Try the remote. If the remote works, the problem is the accessory.
Status (clear) 6 blinks	Open Edge Terminal Shorted	Disconnect edge sensor, photo beam, or any other accessory wired to this terminal. Try the remote. If the remote works, the problem is the accessory.
RF (yellow) Flickers	Receiving 318 MHz RF	Normal operation when remote or wireless keypad is used.
RF (yellow) does not flash when remote is pressed	No 318 MHz RF Received	<ul style="list-style-type: none"> • Battery in Remote • Program Remote • Antenna Receiver Connections • Antenna Receiver
Power (green) ON	AC or Solar Power Present	Normal Operation
Power (green) OFF	No AC or Solar Power	<p>Transformer:</p> <ul style="list-style-type: none"> • Breaker or GFI • Power at AC outlet. • Output of Transformer. • Voltage on wire at 18 VAC Input <p>Solar:</p> <ul style="list-style-type: none"> • Weather • Solar Panel Placement • Output of Solar Panel • Voltage on wire at Solar Input
Charge (red) ON and FLASH	Unit in fast, soak or float charge	Battery voltage increasing slowly or steady at approx 13.8 -14.1. Normal condition.
Charge (red) OFF	Battery Not Being Charged	AC power Transformer Solar Panel Charging Circuit

Battery/Power Troubleshooting



POWER IN LED	CHARGING LED	
ON	Steady ON	Battery Charging
ON	Blinking	Battery Fully Charged
ON	OFF	Test charging circuit, check battery
OFF	OFF	No AC/Solar Power, check battery
OFF	Blinking	Check battery, incoming AC transformer or solar
OFF	Steady ON	Test charging circuit and check incoming AC transformer or solar and check battery

MAINTENANCE

Monthly, test the obstruction and entrapment protection systems.

Monthly, service the gate operator (make sure the power switch is OFF). Clean extended operator arm with a soft, dry clean cloth. After cleaning, apply a high quality silicon spray to a soft dry cloth and wipe the push/pull tube. DO NOT directly spray the tube!

On all gates weighing 250 lb. or more, routinely grease the ball bearing hinges at least 4 times a year; more frequently if the gates are near a coastal area.

Monthly, turn off the power switch and disconnect the Mighty Mule and move the gate to make sure the gate is moving freely without sticking or binding. Lubricate the hinges or repair the gate as required before reattaching the Mighty Mule.

Monthly, check the gate system for potentially entrapments from new landscaping or construction. Eliminate or guard as required.

Monthly, check that the warning signs are mounted on each side of the gate and clearly visible. Replace the signs if they are missing or damaged.

Replace batteries every 2-3 years and properly recycle old batteries.

Repair Service

If your Gate Operator is not operating properly, please follow the steps below:

1. First use the procedures found in the Troubleshooting Guide (see page 25).
2. Use the 24/7 Troubleshooting Wizard at <http://support.gtoinc.com>.
3. If you are unable to solve the problem, call the GTO Service Department at (800) 543-1236, or (850) 575-4144. Refer to the serial number (located on the right side of the control box) and date of purchase when calling for assistance.
4. If repair or replacement of your gate operator is necessary, the Service Department will assign a Return Goods Authorization (RGA) number to you.
5. Securely pack the component(s) authorized for return to the factory. Include a copy of your sales receipt for the purchase of the product(s). Write the RGA number issued to you on the outside of the package in LARGE BOLD PRINT.

Ship the package(s) freight prepaid to: GTO, 3121 Hartsfield Road, Tallahassee, Florida, USA 32303.

NOTE: Products returned to GTO without a Return Goods Authorization (RGA) number in LARGE BOLD PRINT on the outside of the package WILL NOT be accepted. Also, items returned to GTO freight collect WILL NOT be accepted.

GTO Technical Service and Installation Assistance

8:00am–7:00pm • Monday–Friday (EST)

Toll Free Support: 800-543-1236 • Local Support: 850-575-4144 • Fax: 850-575-8950

24/7 Troubleshooting Wizard: <http://support.gtoinc.com>



Accessories

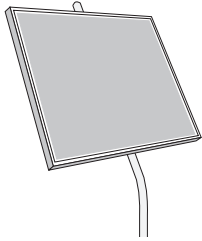
Please visit www.mightymule.com for photos and detailed descriptions of accessories. Or call 1-800-543-4283.

POWERING ACCESSORIES



Low Voltage Wire [RB509]

The 16 gauge, stranded, dual conductor low voltage Wire is for connecting the AC powered transformer, solar panel or wired accessories to the system's control board. This specially designed wire is UV treated, PVC coated, and ready for direct burial.



Solar Panel Kits [FM121/FM123]

If your gate operator is more than 1000 ft. away from an AC power outlet, you can choose to maintain the battery charge with the GTO Solar Panel Kit.

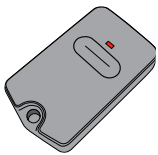
- 10 Watt Solar Panel Charging Kit [FM123]
- 5 Watt Solar Panel Charging Kit [FM121]



Additional/Replacement Battery [FM150]

For additional battery power or replacement.

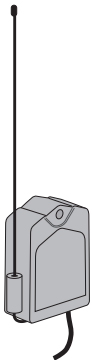
"FROM VEHICLE" ENTRY AND EXIT ACCESSORIES



Transmitters [FM135/FM134]

Purchase an additional transmitter for each vehicle in your family. The Two-Button Transmitter can be programmed to operate both your gate operator and a garage door opener using the Universal Receiver. Or it can be programmed to open two gate operator systems.

- Single Button Transmitter [FM135]
- Dual Button Transmitter [FM134]



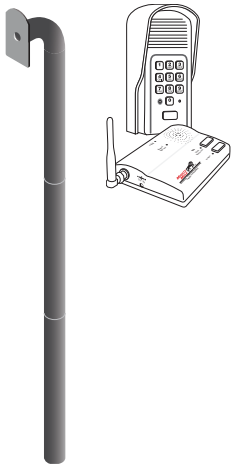
Universal Receiver [RB709U-NB]

The Universal Antenna Receiver gives you the ability to use one remote to activate your gate operator and your garage door opener. Connects to any brand garage door opener. Up to 100 ft. range. This receiver only uses Mighty Mule transmitters.



Digital Keypad [FM137]

Allow friends access to your property using an identification code that you provide. Program up to 25 entry codes for added security. Powered by three "AA" batteries (not included).



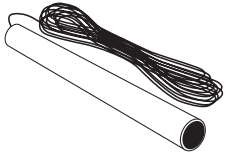
Residential Wireless Entry Intercom [FM136]

Designed for added security to your automated gate with the ability to “speak to” and “screen” visitors safely from inside your home. Ideal for securing gate entrances while providing controlled access.

Gooseneck Pedestal [FM100]

Designed to mount digital keypads, wireless intercom systems, and other access control devices for your gate automation system.

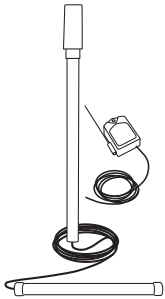
“HANDS FREE” Entry & Exit Accessories



Driveway Vehicle Sensor [FM139]

Automatically activates gate operator “Hands-Free” when a vehicle exits the property. Electromagnetic sensor detects vehicles in motion.

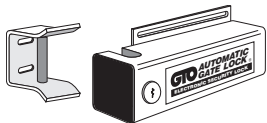
- 50 ft. [FM139]
- 100 ft. [FM140]
- 150 ft. [FM141]



Wireless Vehicle Sensor [FM130]

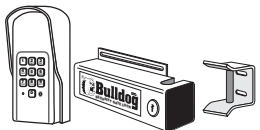
Automatically activates gate operator “Hands-Free” when a vehicle exits the property. 100 ft. range between transmitter and receiver. Easy installation.

LOCKING & SECURITY Accessories



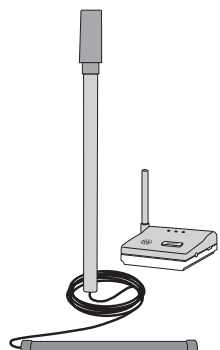
Automatic Gate Lock [FM144/FM142]

The #1 Accessory For Swing Gate Operators! Designed for added security in conjunction with GTO Automatic Gate Operators. The gate lock unlocks and locks automatically when the gate opens and closes. The perfect solution for high wind conditions.



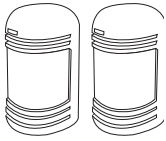
Bulldog Pedestrian Gate Lock [FM145]

Designed to mount on horizontal swing “walk through” wood, chain link, and metal pedestrian gates opening in or out. Ideal for securing pools, condominiums, schools and any pedestrian gate.



Wireless Driveway Alarm [FM231].

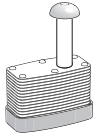
This device alerts you of vehicles entering your driveway (with or without an automated gate). The indoor base station signals you with a door chime when a vehicle passes the driveway sensor.



ADDITIONAL Accessories

Photo Beams [R4222]

Primary “through beam” photo beam device. Provides “non-contact” obstruction protection.



Pin Lock [FM345]

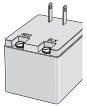
Use as a substitute for the clevis pin at the front mount of the gate opener to prevent theft of the operator.

- Pin Lock 10-pack: ten Pin Locks keyed alike [FM345KA].



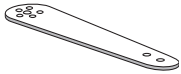
Push Button Control [RB101]

Wire this unlit push button directly to your gate operator for simple open/close/stop operation from up to 1000 ft. away. Use 16 gauge low-voltage wire.



Replacement Transformer [RB570]

Standard 18 volt, 2200 mA AC transformer included with the gate operator to maintain battery charge.



HARDWARE Accessories

Push To Open Brackets [FM148]

Required when the gate operator must push a gate open (arm extends to open), such as away from a sloping driveway or where space prevents gate from opening into the property (pull to open). Order two brackets for a dual swing gate installation.

**If you have a question about any special order item,
just call 1-800-543-GATE!**

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Gate Operator Installation Checklist

- 1. The gate has been checked to make sure it is level and moves freely in both directions.
- 2. Potential pinch areas have been guarded so as to be inaccessible OR have sensing edges and/or photo beam obstruction detection devices installed.
- 3. The installer has installed one or more contact or non-contact obstruction sensing devices, if required for this installation.
- 4. If pedestrian traffic is expected, a separate pedestrian gate has been installed, a minimum of seven feet from the gate systems. All pedestrian traffic must use the pedestrian gate.
- 5. Warning signs have been installed on each side of the gate in highly visible locations. These signs must remain at all times.
- 6. There are no controls installed on the gate operator, or within 10 feet of the gate.
- 7. The Dual Sense Technology feature has been properly adjusted and tested to make sure that the gate stops and reverses a short distance with minimal resistance applied.
- 8. Reviewed and understand all of the operational functions, obstruction sensing devices, warning beeper and reset, etc.
- 9. Review and understand the proper use of the operator's manual disconnect feature. The manual disconnect must never be used while the gate is in motion. The power switch must be turned off before using the manual disconnect and disengaging the operator.
- 10. Reviewed all safety instructions, and keep the safety instructions and owner's information sheets for reference.
- 11. Review and understand the maintenance schedule for both the gate and the gate operator.



For sales call toll free:

1-800-543-4283

The **Sales Department** is open Monday – Friday 8:00 A.M. – 5:00 P.M. (Eastern Time)

For technical service Call toll free:

1-800-543-1236

The **Technical Service Department** is open Monday – Friday 8:00 A.M. – 7:00 P.M. (Eastern Time)