LEDS ON SWING GATES

INSTALLATION MANUAL

IMPORTANT SAFETY INFORMATION

IMPORTANT: Please read all safety and installation instructions prior to attempting installation.

Always disconnect 110V and 12V power from gate operator equipment prior to touching any wiring or installing anything.

Be highly cautious of overhead power lines!

Ask for assistance from another person to install gate arms. Removal and replacement of the gate arm pole is much simpler with two people.

Only use the gate arms and LED strips for intended use as described by the product literature and herein. Do not modify the gate arms or other components, or install differently than what is described in this installation manual.

Rev# 161017_R3.0

1. UNBOX—GET ORGANIZED

Items included in the boxes:

Stainless Steel Mounting screws (#6 x 1/2”)
Aluminum Track (5’ sections)
LED strip on reel
20’ Wiring Harness
Installation Manual
1 – Cable Strain Relief Fixture
110V to 12VDC Power Adapter
Gate LED Controller (if Red/Green needed)
Signal cable (4-wire 22AWG) (if Controller)
Press-on Headers (Dual LED – 4, Single – 3)

Tools Needed (not included):

Powered screw driver
Wire Stripper
Power Drill
5/8” Drill Bit (Metal Drilling – Dual LED)
1/2” Drill Bit (Metal Drilling – Single LED)
1/8” Drill bit (Metal Drilling)
Small Flat Screwdriver
Zip Ties
Voltmeter (AC & DC)
Rat-tail file (optional)

2. PROGRAM THE LED CONTROLLER

Some gates are wired with 12VDC applied constantly to the LED strip. In this configuration, the LEDs are generally white-colored continuously (24/7). The LED strip should last for several years in this configuration. The LED Controller is not needed for this configuration.

If the user desires for the LEDs to change color, the LED Controller is required. The Controller must be re-programmed for use in the swing-gate scenario (using a fully-open relay). In this profile, the gate arm will be:

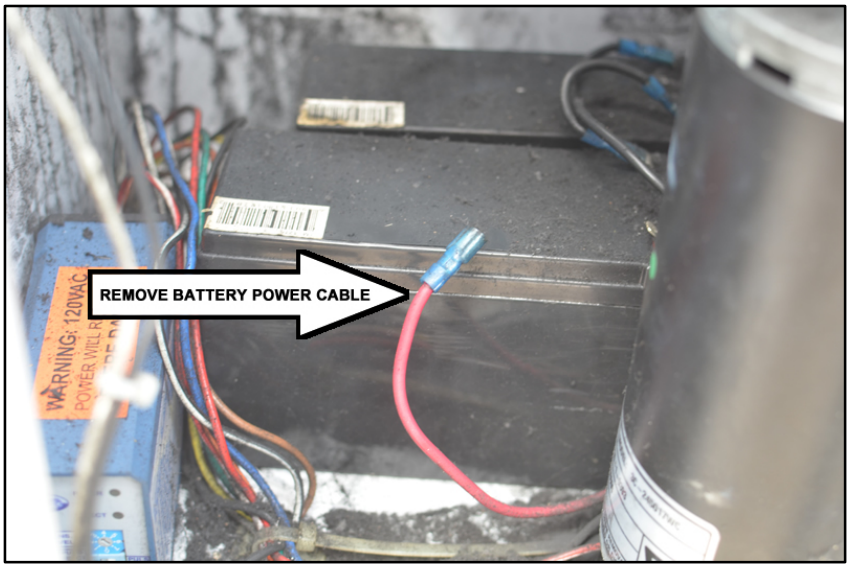
- closed - solid red
- opening - solid red
- fully open - solid green
- closing – solid red
- closed- solid red

See *Appendix A* for further instructions.

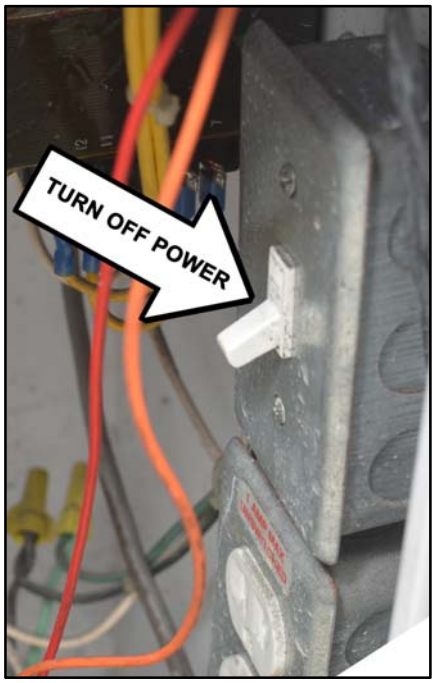
3. TURN OFF OPERATOR POWER

WARNING: Serious injury could occur if power is not disconnected prior to installation.

FIRST remove the red (positive) battery cable from the 12V battery.



THEN, turn off the 110V switch.



4. INSTALL NEW ALUMINUM TRACK

Attach the aluminum track to the swing gate by drilling through the mounting flange(s) and secure with screws.

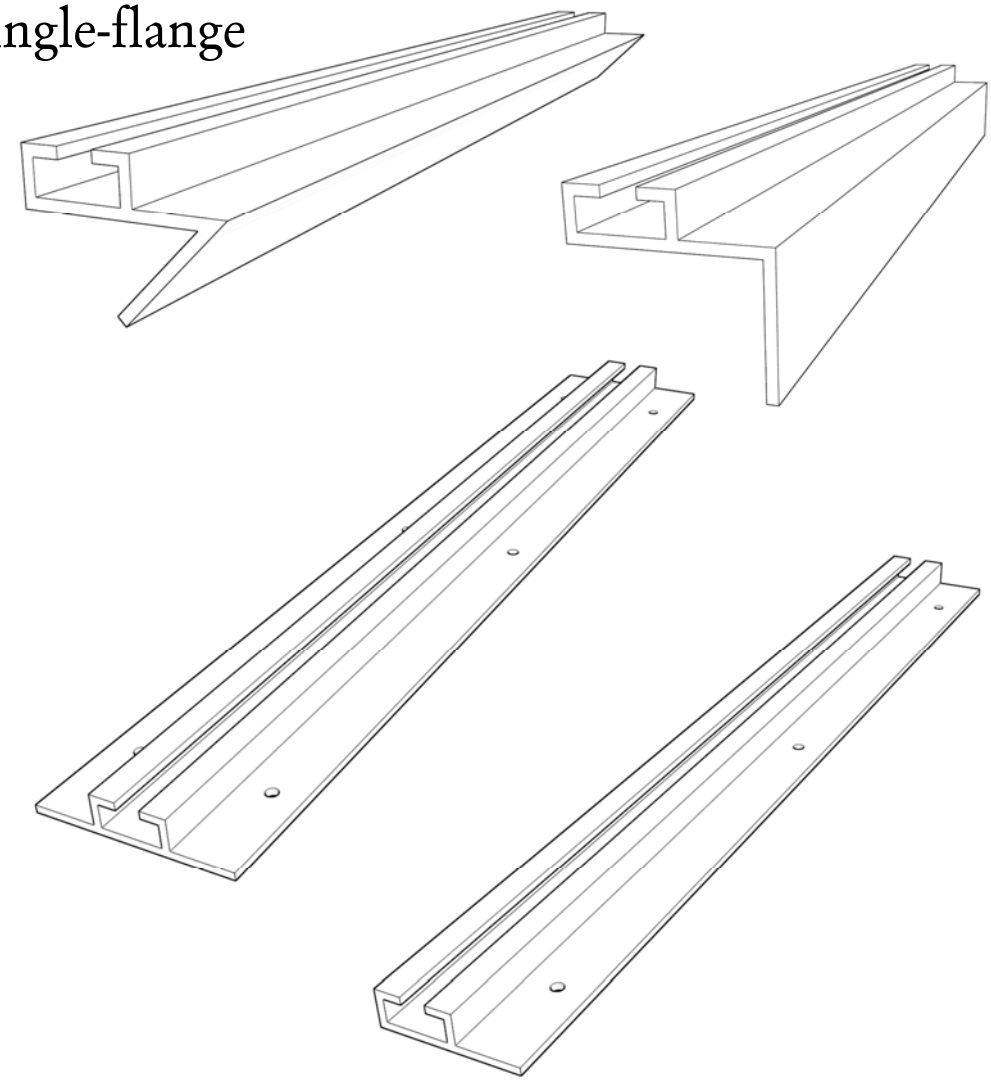
The track can be mounted in various directions:

- Facing road surface
- Facing driver (lower horizontal edge)
- Facing driver (non-hinge vertical edge)

LED strips must not be installed with sharp turns or bends. To install LEDs at a 90 degree turn (on horizontal and vertical edges, for example), you must install two separate LED strips with two separate harness wires.

There are four models of LED track available:

- 45° flange
- 90° flange
- Dual-flange
- Single-flange



5. PULL LED STRIP INTO TRACK

Starting at the farthest point away from the operator, use a pliers to flare-open the LED track. This makes it easier to fit the LED strip end-cap.

Gently pull the LED strip into the LED track. When the end-cap enters the flared-open section, push the cap into the LED track and use a pliers to crimp-down the end-cap so the LED strip doesn't move.

6. PLUG HARNESS INTO LED STRIP

Plug the harness wire into the LED strip's connector. There is a notch inside to enforce correct orientation. Match the two sides up. Ensure the O-rings are in place to keep the connector water-proof.

Note that there is dielectric grease inside the connector. Add more grease to female side in the future if the connector is unplugged.

7. DRILL HOLE FOR CABLE RELIEF FITTING

Decide how to route the harness wire to the operator chassis, and where to penetrate the operator. Position the hole so that the wire will be as hidden and as short as possible.

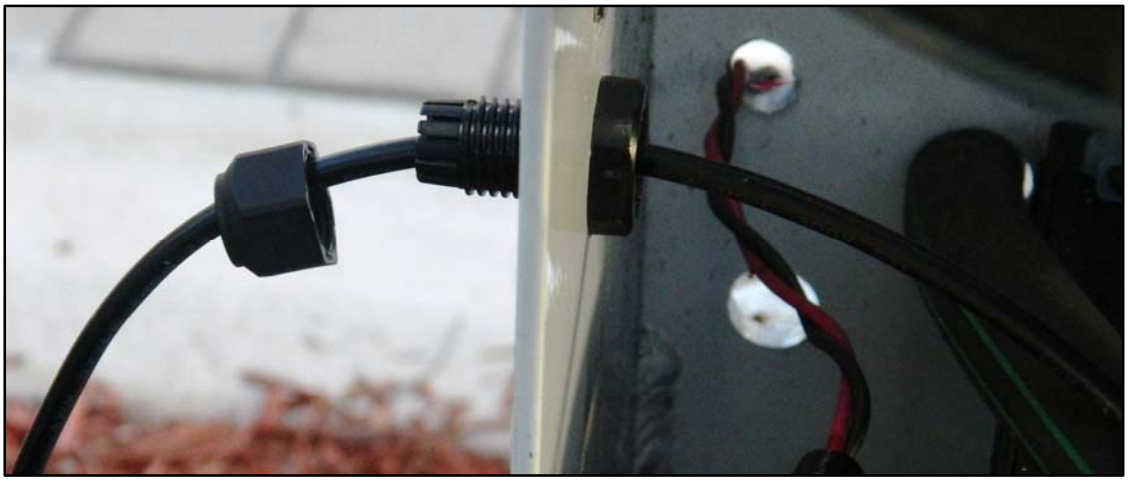
Drill hole in operator chassis (Single LED – 1/2”, Dual LED – 5/8”).

Deburr hole with the drill bit or a metal file.

8. INSTALL CABLE RELIEF FITTING

Remove outer (tension) nut from cable relief fitting, then insert fitting into the new hole.

Tighten the Back Nut onto the fitting inside the operator housing. This nut holds the fitting to the operator wall.



9. PULL HARNESS CABLE(S) INTO OPERATOR

Slide the raw wire end of the LED wiring harness through the cable relief Tension Nut, entering the narrowest side. If Dual LED, slide both cables through the fitting.

Leave enough cable outside of the operator to account for the gate swing. It is essential that the cable always has some slack in it, regardless of the position of the gate, or the LED strip may be damaged.

10. ROUTE HARNESS CABLE(S) TO LED CONTROLLER

Route Harness Cable through the inside of the gate operator chassis until the end is conveniently located near where the LED Controller and/or 12V power supply will be positioned.

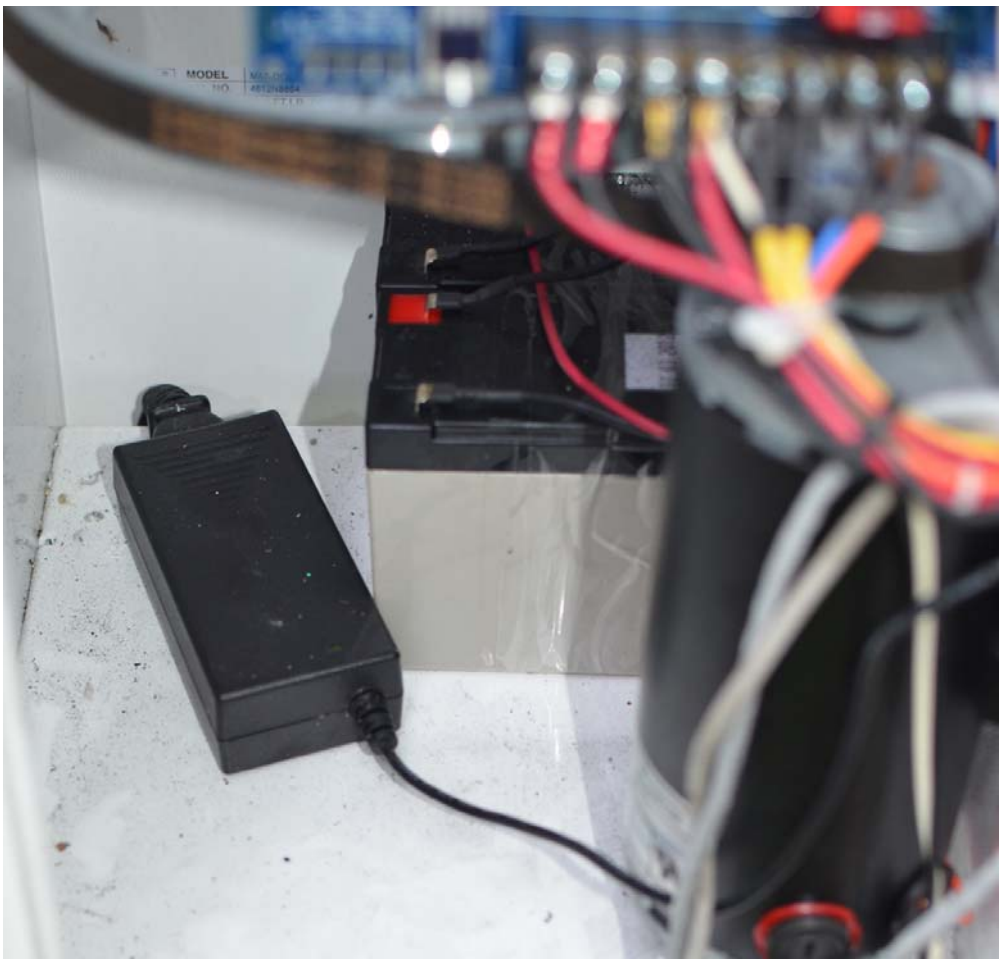
Be sure the Harness Cable will always avoid the pulley and any moving parts or sharp edges.

11. INSTALL 12VDC POWER ADAPTER

This version of the LED Controller can only accept 12V DC power. Place the 12V power supply inside the gate operator chassis where it will remain safe and dry.

Do not plug the 110V plug into the outlet yet!

Ensure wiring does not interfere with the motor or pulleys. Mount or place the 12V power supply where it will not get wet. Do not put it on the ground.



IF NOT INSTALLING LED CONTROLLER, SKIP TO SECTION 17

12. INSTALL LED CONTROLLER

Place the LED Controller inside the gate arm operator chassis where it will remain safe and dry. Do not put it on the ground.

Do not plug the power wiring into the Controller yet!

Ensure wiring does not interfere with the motor or pulleys.

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13. CONNECT SIGNAL CABLE TO LED CONTROLLER

The Installation Kit includes a 4-wire Signal Cable for connecting to signal wire posts on the gate operator control board.

Remove the upper-right 4-pin press-on wire header from LED Controller. Note that it must be inserted vertically, with screws facing outwards.

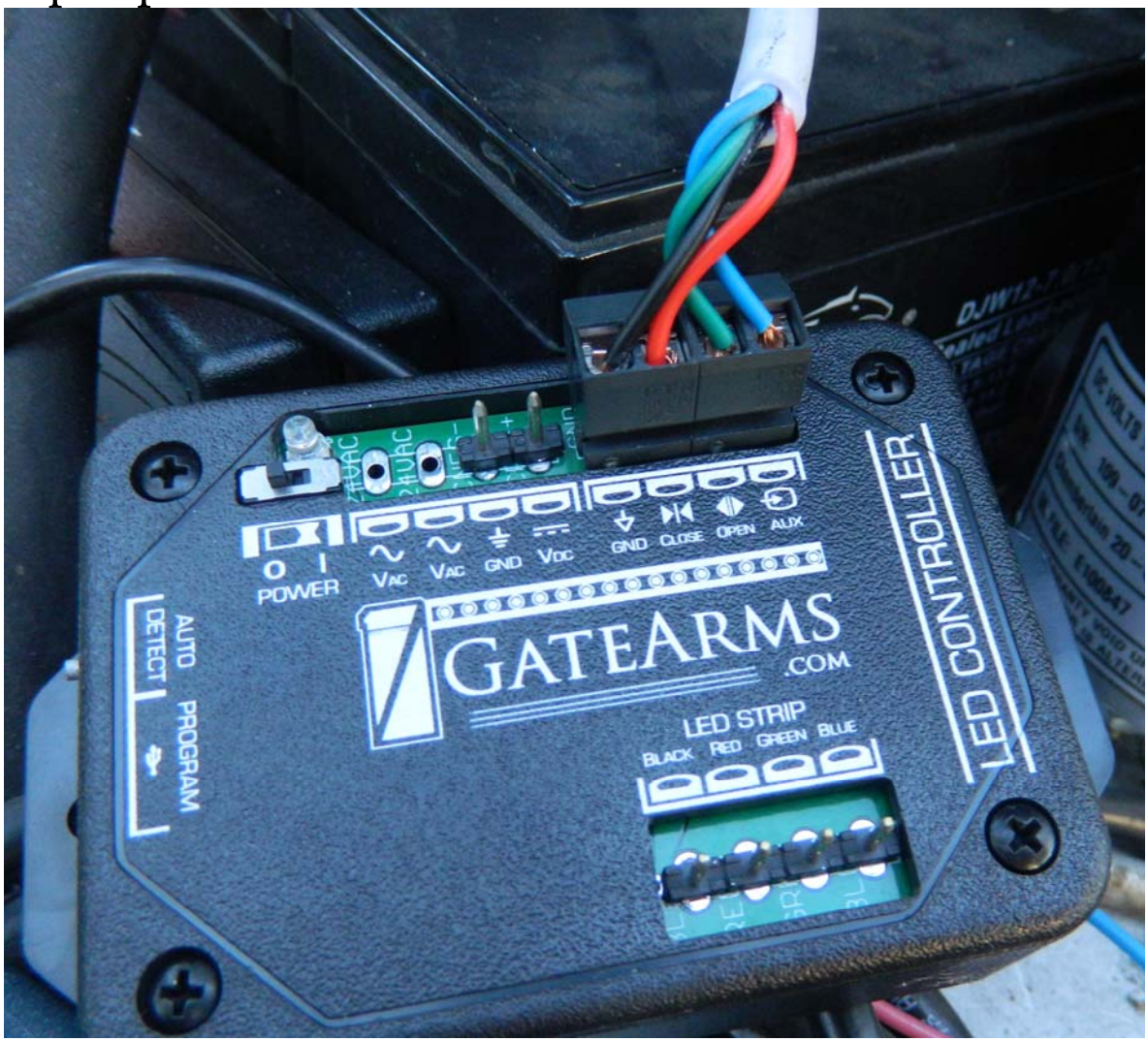
Connect one end of the Signal Cable's wires to the press-on header. Note the pin definitions on the LED Controller cover.

- Black = Ground

- Green = Open
- Red = Close
- Blue = Aux (Auxiliary Open)

Plug the press-on header into the LED Controller. Wires must face UP, and tightening screw heads face OUT.

Route the Signal Cable from the LED Controller to the gate operator control board, where the standard input posts are located.



14. CONNECT SIGNAL CABLE TO OPERATOR

Connect the other end of the Signal Cable to the gate operator control board where the operator's fully-open relay wires are located. *IMPORTANT:* The Controller can accept any signal voltage from 2.5-30 VDC. Higher voltage may irreversibly damage the Controller. **THIS WILL VOID WARRANTY.**

14.1. STANDARD FULLY OPEN RELAY

Connect Black wire to Relay side A

Connect Red wire to Relay side B.

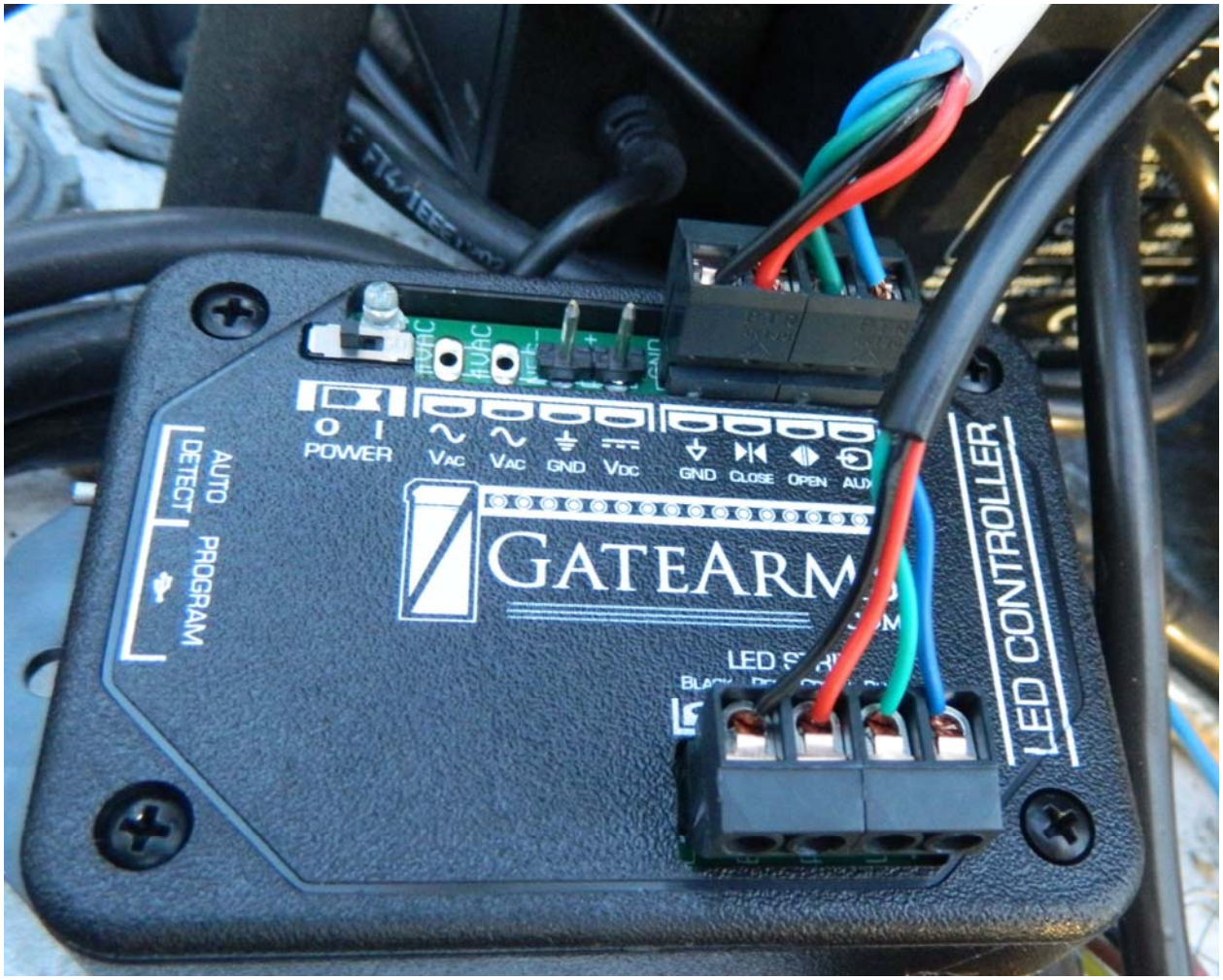
Connect Green wire to Relay side B.

Do not use the fourth wire.

15. CONNECT HARNESS CABLE(S) TO LED CONTROLLER

Connect the Harness Cable's wires to the press-on header, matching wire color to light color. Note the pin colors on the LED Controller cover.

Push the press-on headers onto the LED Controller pins. Note that it must be inserted vertically with screw heads facing outwards.



16. CONNECT POWER ADAPTER TO LED CONTROLLER

Plug the DC power plug from the 12V power supply into the power port on the LED Controller, located on the side near the USB port.

IMPORTANT: The Controller can only accept power voltage of 12 VDC. Higher voltage may irreversibly damage the LED Controller. THIS WILL VOID WARRANTY.

SKIP TO SECTION 18

17. CONNECT POWER ADAPTER DIRECTLY TO LED STRIP

When not using the LED Controller, users prefer the LED lights to remain on continuously without changing color. The LED strip has 4 wires: Black, Red, Green, Blue. The Black wire is the power wire for receiving positive 12VDC. The 3 colored wires are each ground wires. When the user grounds a colored wire, that color LED chip turns on. When the user grounds all 3 colored wires together simultaneously, then all 3 LED chips turn on giving the effect of white light. This is the brightest mode possible since all 3 LED chips are turned on.

Cut off the DC power plug from the 12V power supply. Strip the 12V wires and check them with a multi-meter to determine which is Positive (+) and which is Negative (-).

Connect the LED strip Black wire to the 12VDC power supply's Positive wire (+).

Connect the LED strip colored wires to the 12VDC power supply's Negative wire (-).

18. CONFIRM WIRING

Take a moment to reconfirm all connections on each of the cables.

Check both sides of the power cable.

Check the operator's signal wire posts where the Signal Cable is connected. Ensure you are tied into the right circuits for open and close. Ensure Common (Ground) is well-connected.

Check the LED strip(s) to ensure the wire colors correspond correctly to the colors printed on the LED Controller.

Ensure all wiring is well out of the way of moving parts, including pulleys and belts.

19. REVIEW WIRE MANAGEMENT

Using zip ties, secure all wiring inside the lift-arm operator housing so the pulley and belt will never touch any wires.

Make the wiring look neat and professional.

Zip-tie the harness wire to other wires just inside the operator (or to the operator housing) to provide additional strain relief (in case the harness is yanked hard).

20. TURN ON OPERATOR POWER

FIRST, turn on the 110v switch.

SECOND, wait 10 seconds, then plug in the DC power cable to the 12V battery (if battery backup is present). The gate will close if open. Reversing order may cause arcing.

Immediately disconnect if you sense any problems.

Ensure gate(s) is in fully closed position.

21. TURN LED CONTROLLER POWER-SWITCH TO "ON"

Turn LED Controller switch on. The LED by the switch should immediately illuminate as solid amber. If it doesn't turn on, turn switch off and re-check power connections. LED strip should turn on (red) after 2-3 seconds. If not, immediately turn off Controller and review wiring.

22. TEST LEDS—GATE FULLY OPEN

Open gate using an access control device such as a barcode or ID Card.

The Red LED lights should transition to Green when gate is fully open.

23. TEST LEDS—GATE CLOSING

Close the gate.

The Green lights should transition to Red immediately when the gate begins to close. Lights should be solid Red when gate is closed and resting.

24. FINALIZE

Close and secure operator case.

Clean your workspace, removing all wire cuttings or evidence you were there.

If necessary, clean off greasy finger marks on the operator housing.

25. PROBLEMS?

Call or email us. The LED Controller is extremely versatile, and can probably be configured to work for your unique situation. There are many subtle configuration settings that can be tweaked to get your project working. We're happy to help you!

APPENDIX A:
PROGRAMMING LED CONTROLLER FOR SWING GATE WITH FULLY-OPEN RELAY

If your swing gate uses a simple fully-open relay, which closes to ground when the gate is fully-open, you can program the LED Controller to recognize dry-contact signals (floating when open, grounded when closed). If your relay closes to voltage instead of ground, adjust settings accordingly.

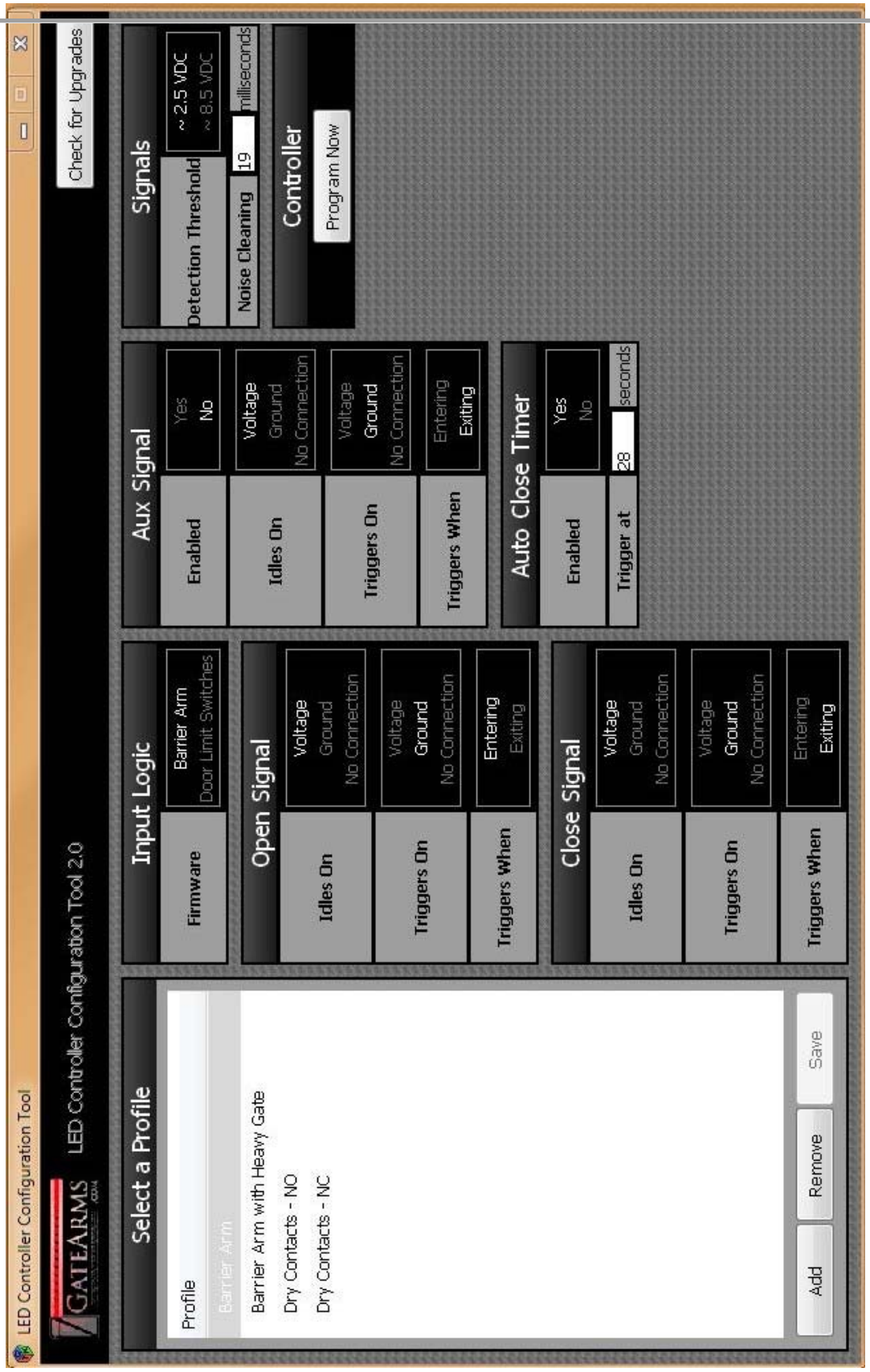
N/O relay (closes when gate is fully open)

Open:	Idles on:	No Connection
	Triggers on:	Ground
	Triggers When:	Entering
Close:	Idles on:	Ground
	Triggers on:	No Connection
	Triggers When:	Entering

N/C relay (opens when gate is fully open)

Open:	Idles on:	Ground
	Triggers on:	No Connection
	Triggers When:	Entering
Close:	Idles on:	No Connection
	Triggers on:	Ground
	Triggers When:	Entering

APPENDIX B: LED CONTROLLER CONFIGURATION TOOL



PROGRAMMING THE LED CONTROLLER

INSTALL PROGRAM

1. Using a computer Internet browser, visit the website address: http://gatearms.com/download
2. Download a version of the LED Controller Configuration Tool appropriate for your computer.
3. Open (run) the downloaded file to install it.

CONNECT CONTROLLER TO PC

1. Use a Type-B (printer) USB cable (not included) to connect the LED Controller to a computer.
2. The PC should immediately recognize that the device was connected, although it will not install any supporting driver software.

3. If device is NOT RECOGNIZED, you need to manually connect the driver file to the program:
    a. Open Device Manager
        i. Right-click “Computer”, then choose “Manage”
        ii. Or, click “Start Button”, then “Administrative Tools”, then “Computer Management”, then “Device Manager”
    b. Find “LED Driver” with a alert mark on it, probably in “Unknown Devices” group
    c. Right-click that item, then choose “Update Driver Software”
    d. Click “Browse...”
    e. Click “Browse” again if necessary, and search your computer C: drive
    f. Open “Program Files (x86)”
        i. WinXP folder = “Program Files”
    g. Find folder “GateArms.com”, then “Configurator”, then “Driver”. Click the “Driver” folder, then click “OK” button
    h. Click the “Next” button and “Close”

RUN “Configuration Tool”

1. Run the newly-installed program.
2. Click “Check for Upgrades” to get enhancements.
3. Confirm that LED Controller is plugged in. If Controller is not connected, try another USB port on the computer.
4. Select desired profile from the left-hand grid.
5. If no appropriate profile already exists, click “Add” button create a new one. Click the profile’s name to change the name. Click settings to change them. Click “Save” button to save profile changes. Note that default profiles are read only.

APPENDIX C:
LED PROGRAMMING FEATURES

"Idles On": (Voltage / Ground / No Connect):

This setting asks "What is the state of the input when there is no activity at the gate?" In other words, this defines the input's default state.

Voltage: The signal input will idle on voltage higher than the "Signals – detection threshold " voltage in the configuration tool.

Ground: The signal input will idle on ground or at least a voltage lower than the "Signals – detection threshold " voltage in the configuration tool.

No Connect: The signal input will idle on a disconnected circuit typically to an open relay circuit. The other side of the relay must be connected to Common (Ground field shared by LED Controller).

Not Used: This can be set on the Auxiliary signal input if you are not planning on wiring anything to it.

"Trigger On": (Voltage / Ground / No Connect):

This setting asks "What causes a signal to fire?"

Voltage: The signal input will trigger on voltage higher than the "Signals – detection threshold" voltage in the configuration tool.

Ground: The signal input will trigger on ground or at least a voltage lower than the "Signals – detection threshold " voltage in the configuration tool.

No Connect: The signal input will trigger when the disconnected circuit (typical of an open relay circuit) has continuity to ground/common.

"Triggers When" (Entering / Exiting):

This setting indicates whether the signal fires at the beginning of a signal's duration ("Entering") or when the signal terminates ("Exiting").

For Open, this should generally be "Entering" since it goes Green immediately when an open signal is received.

For Close, this should generally be "Exiting" since it should fire only after a close (loop) event is no longer being received.

Timer: When the Timer is enabled, it will reset the Green light to Red after the given time expires. This is to ensure the LEDs return to red regardless of the type of vehicle that passes though the gate. Pedestrians and bicycles do not trigger loop devices, so if a gate operator times out and lowers the gate arm it does not send a close signal to its own signal posts. This results in the LEDs remaining green until another car passes through. The LED timer is like a secondary close event.

NOTE 1: If the arms are kept in a "locked open" position for extended periods you should disable the timer to maintain Green LED state.

NOTE 2: In heavy gate + barrier arm scenarios, you often need to disable or extend the time-out since the heavy gates are slow to open.

"Signals – Detection Threshold" (8.5V / 2.5V):

This setting indicates the voltage threshold at which a signal is considered to be triggered. Default is 2.5V.

"Signals – Noise Cleaning":

The Controller is extremely sensitive to voltage changes, so it only will consider a voltage change significant if it persists for longer than the noise cleaning milliseconds. Anything less is ignored.

Programming Multiple Controllers:

Once you select a profile, click "Program Now" and "OK" to confirmation pop-up. Then replace the Controller with another one, and again click "Program Now" and "OK". A batch of controllers can be configured this way relatively quickly.

APPENDIX D: INSTRUCTIONS FOR USING SWITCHES OR DRY CONTACT RELAYS

You may have situations where there is no voltage change. Perhaps you're using a relay that is triggered when the gate is fully open or fully closed. Electric eye or laser triggers are other typical relay-driven examples where there is no voltage change in a circuit, only the opening or closing of a relay.

1. Use the LED Configuration Tool to set up the dry contact relay connections.
2. Consider how the Open circuit's relay works.
   a. If the relay you are interfacing with is Normally Open, set "idles on" to "No Connection" and "triggers on" to "Ground".
   b. If the relay you are interfacing with is Normally Closed, set "idles on" to "Ground" and the "triggers on" to "No Connection".
   c. If the Auxiliary input is not used, set "idles on" to "Not Used".
3. The Close circuit can be handled with a ground loop, using the same settings as Barrier Arm (Idles on Voltage, Triggers on Ground)

4. Connect the signal wire from the LED Controller to one side of your relay.

5. Connect the other side of your relay to the COMMON or GROUND. This must be the same ground field that the LED ground posts are sharing, so there is continuity for the signal wire when the relay is closed.

APPENDIX E: TROUBLESHOOTING

No Gate Lights On

Possible issue: Power Supply Problems

- Check LED Controller. Is its amber LED on?
- Is 12V power header reversed on LED Controller? Unplug power header and confirm polarity. Use multimeter to check for 12V at LED Controller power header.
- Is the 110V power adapter LED on? Check 110V power wiring at operator power source. Trace wire from LED Controller.
- Check Press-on Headers. Are their wires well-secured? Are they pressed in vertically all the way? Screws facing outwards?
- Ensure the external connector mating the Harness to the LED Strip is fully connected and screwed together 50% of the way.
- Check the LED strip header. Is it reversed? Screws facing outwards? Match wire colors with the words on the case cover.

Red Lights stay on, No Green when gate opens

Possible Issue 1: Open Signal Wire or LED Green wire disconnected

- Check the LED strip header. Is the green wire disconnected?
- Check (green) Open signal wire connection at the Signal Press-on Header.
- Check the Open signal wire connection at the gate operator control board post. Ensure LED Controller's green wire is well-connected (piggybacked) to the same open post used on the operator. Use a multimeter to ensure voltage is changing momentarily as expected when the gate opens.
- Are you using multiple posts for Open devices (i.e., post 1 for guard, post 2 for RFID, post 3 for clicker)? You must tie all 3 open posts together with wire jumpers so the LED Controller will sense the voltage changes on all posts.

Red Lights stay on, No Green when gate opens

Possible Issue 2: Controller Misprogrammed

- Ensure your controller is programmed correctly for your particular gate scenario. Controllers are factory-set for a standard barrier gate arm profile that has Open and Close signal voltages of 5V or higher when arm is stationary down. When triggered, the voltage drops below 2.5V. If your stationary Open or Close signal voltages are higher than 10V, try programming the LED Controller's "Detection" to use 8.5V instead of 2.5V.

LEDs change from Green back to Red while vehicle is still in the gate

Possible Issue 1: Controller "Close" set to Entering

- Use the LED Controller's Configuration Tool and set Close to trigger on "Exiting"

Possible Issue 2: LED Controller's timer is set too low for your scenario

- Use the LED Controller's Configuration Tool and set the Timer to Disabled or to a higher value.

Driver won't install correctly

Possible Issue: Driver must be installed manually

1. Right-click "My Computer", choose "Manage"
2. Click "Device Manager", then find "LED Driver" in "Human Interface Devices" or "Other Devices"
3. Right-click "LED Driver" and choose "Update Driver Software".
4. Browse to the GateArms.com installation folder, probably located in C:/Program Files or C:/Program Files (x86)
5. Choose Folder: C:\Program Files (x86)\Gatearms.com\Configurator\Driver
6. Click OK to Update Driver Software
7. Try Configuration Tool again

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