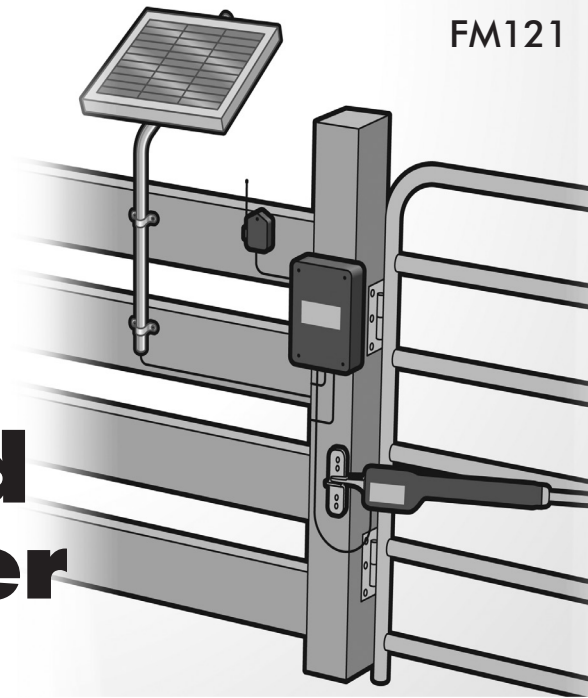




FM121



**5 Watt**

# Solar Powered Battery Charger Installation Manual

Compatible with Mighty Mule and GTO/ACCESS SYSTEMS DC Powered Gate Openers.  
**NOTE: Dual gate installations require a minimum of 10 Watts of solar charging power.**

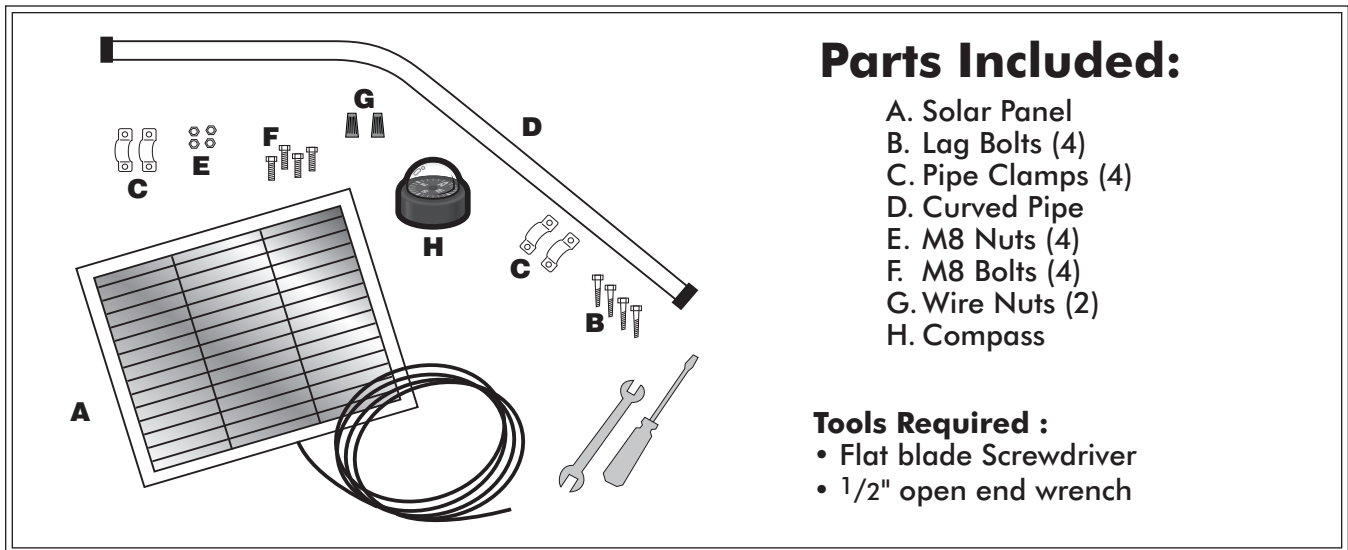
## GTO Limited One Year Warranty

Gates That Open, LLC ("GTO") gate openers and accessories are covered under warranty by the manufacturer against defects in materials and manufacturer workmanship for a period of one (1) year from date of purchase, provided the recommended installation procedures have been followed.

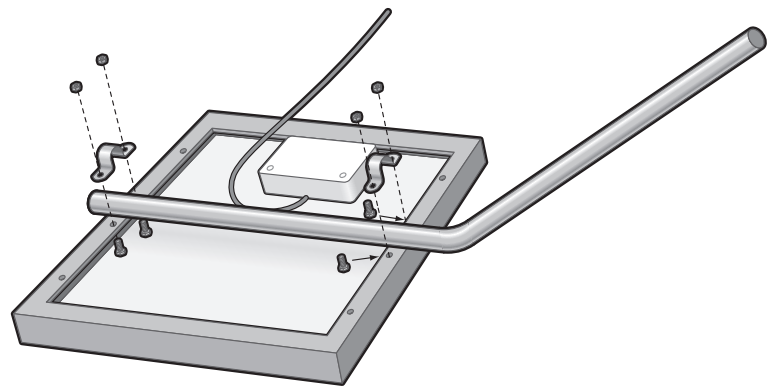
In the case of product failure due to defective material or manufacturer workmanship within the one (1) year warranty period, the product will be repaired or replaced (at the manufacturer's option) at no charge to the customer, if returned freight prepaid to GTO, 3121 Hartsfield Road, Tallahassee, Florida, USA 32303. **IMPORTANT: Call (800) 543-1236 for a Return Goods Authorization (RGA) number before returning accessory to factory.** Products received at the factory without an RGA number will not be accepted.

Replacement or repaired parts are covered by this warranty for the remainder of the one (1) year warranty period or six (6) months, whichever is greater. GTO will pay the shipping charges (equal to United Parcel Service GROUND rate) for return to the owner of items repaired under warranty. The manufacturer will not be responsible for any charges or damages incurred in the removal of the defective parts for repair, or for the reinstallation of those parts after repair. This warranty shall be considered void if damage to the product(s) was due to improper installation or use, connection to an improper power source, or if damage was caused by electrical power surge or lightning, wind, fire, flood, insects or other natural agent.

After the one (1) year warranty period, GTO will make any necessary repairs for a nominal fee. Call GTO at (800) 543-1236 for more information. This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state. This warranty is in lieu of all other warranties, expressed or implied. **NOTE: Verification of the warranty period requires copies of receipts or other proof of purchase. Please retain these records.**



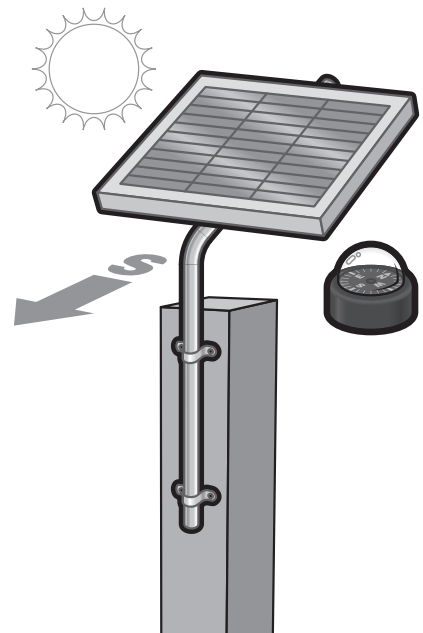
**STEP 1:** Slide the M8 bolts (F) through the bottom of each channel so threaded part of each bolt comes through top of frame. Position the curved pipe (D) between the bolts and place two pipe clamps (C) over the curved pipe onto the bolts. Secure with the M8 nuts (E).



**STEP 2:** Determine the installation site for the solar panel. **IMPORTANT:**

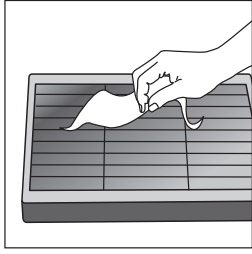
- Place the panel facing due south in the path of the sun.
- The solar panel must be placed in an open area away from shade.\*
- The solar panel should receive at least 8 hours of direct sunlight for a full charge.
- Mount the panel using the curved pipe provided to maintain the proper angle to the sun.

Secure the solar panel assembly to a wooden post or fence using two pipe clamps (C) and four lag bolts (B) as shown in the illustration. If your fence post is metal, you will need alternative hardware not provided, (e.g., U-clamps or metal screws).



\*If the solar panel must be placed more than 10 ft. from the control box in order to receive direct sunlight, you can use up to 250 ft. of multi-stranded, 16 gauge, direct burial, low-voltage wire [RB509]. **NEVER use telephone wire or solid core wire.**

**IMPORTANT:** To provide secure and moisture resistant splices for solar panels use a direct burial splice kit for underground splices and an above ground splice kit for above ground splices. These splice kits can be found at hardware and electrical supply stores.



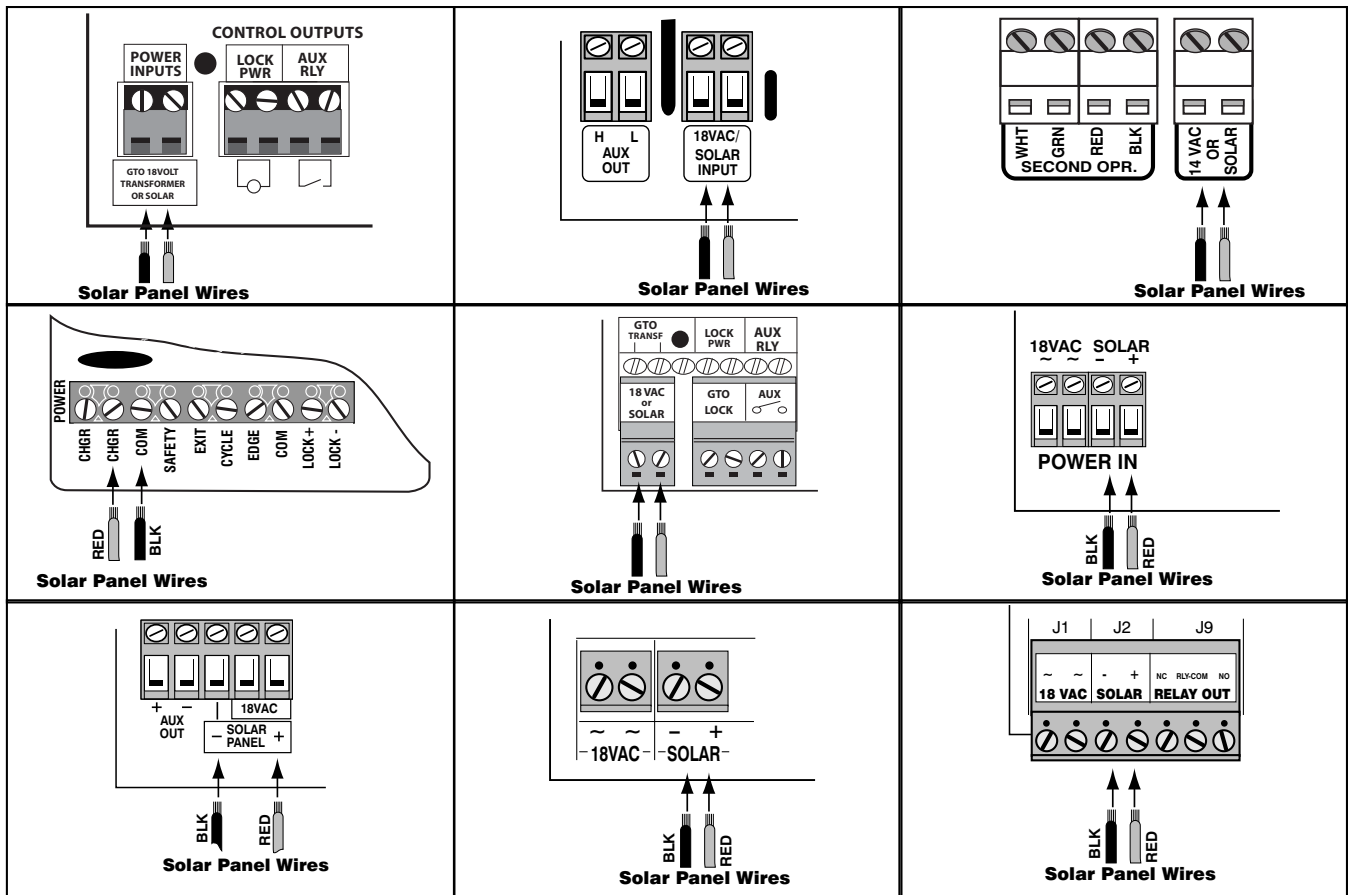
For optimal efficiency, wipe the face of the panel frequently with a soft, damp cloth.

The output of the Solar Panel is variable during the day depending on the intensity of the sun and the angle of the rays striking the panel. The output may vary from a few millivolts to as much as 22 volts. To check the output, simply disconnect the solar panel leads from the control board and connect them directly to a dc voltmeter. In bright sunlight the panel output should read at least 18 volts dc at approximately 300mA.

**STEP 3:** Make sure control box is OFF. Feed the free end of the solar panel wires into the control box and attach them to the appropriate terminals on the control board. The RED solar panel wire goes to the (+) POSITIVE Solar terminal and the BLACK solar panel wire goes to the (-) NEGATIVE Solar terminal. Improper installation of these wires will damage the opener's control board.

Below are examples of solar terminals on various Mighty Mule and GTO/ACCESS SYSTEMS control boards. **If you do not see an illustration of your control board below, please refer to your gate opener Installation Manual for instructions on wiring the control board.** Or you may call GTO's Technical Service Department at (800)543-1236 or (850)575-4144 for assistance.

**NEVER USE THE SOLAR PANEL AND THE AC TRANSFORMER AT THE SAME TIME!** It will damage the control board.



# Solar Zones and Gate Activity

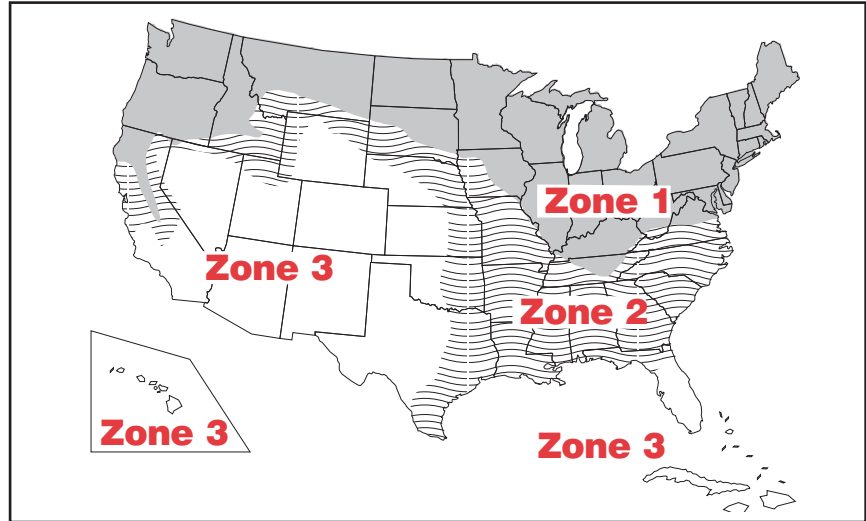
Use the table and map to determine the number of operational cycles\* per day to expect in your area, using 5 to 30 Watts of charging power. Figures are shown for winter (minimum sunlight) and do not account for the use of any accessory items.

**Accessories will draw additional power from the battery;** the more accessories you connect, the more power your system will require. If you have a gate opener that will accommodate an additional battery (see gate opener Installation Manual for specifications), we recommend that you purchase an extra 12V, 7 amp hour battery [RB500].

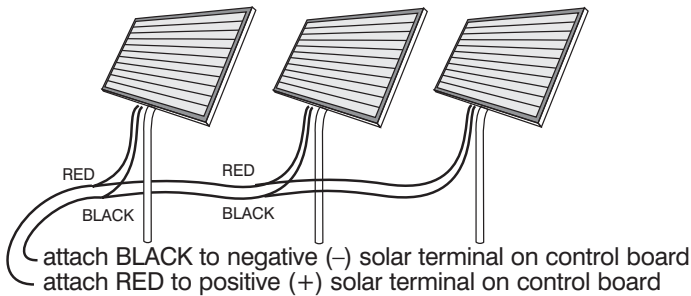
\*An operational cycle is one full opening and closing of the gate. Number of openings per day will depend on the length, weight, hardware and environmental conditions.

**Estimated Gate Openings Per Day**

Winter Ratings	Zone 1	Zone 2	Zone 3
Single gate installation with 5 Watts of charging power	4	8	13
Single gate installation with 10 Watts of charging power	8	16	26
Single gate installation with 20 Watts of charging power	14	28	38
Single gate installation with 30 Watts of charging power	20	44	54
Dual gate installation with 10 Watts of charging power	4	8	13
Dual gate installation with 20 Watts of charging power	10	18	27
Dual gate installation with 30 Watts of charging power	16	28	41



## Solar Panels connect in PARALLEL



*All connections should be made weatherproof using weatherproof splice kits available at hardware and electrical supply stores.*

**For more information on Mighty Mule's full line of automatic gate openers and access controls visit our website at [www.mightymule.com](http://www.mightymule.com)**



**GATES THAT OPEN**, LLC

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 Technical Service: 1-800-543-1236 or (850) 575-4144 • Fax (850) 575-8950  
[www.gtoinc.com](http://www.gtoinc.com) • [www.mightymule.com](http://www.mightymule.com)

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