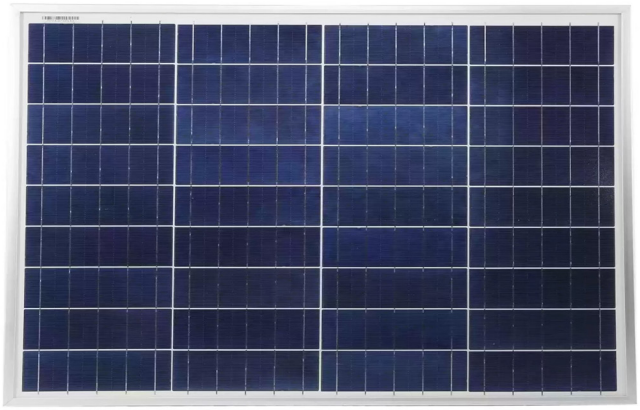
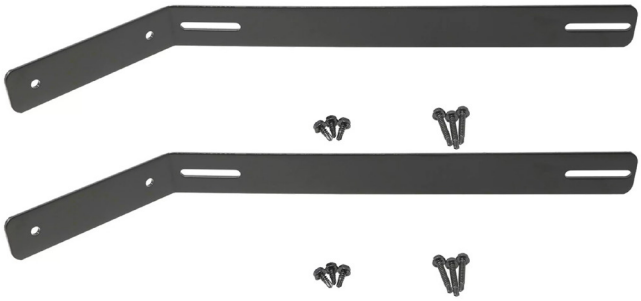
Solar Panel Parts Checklist

1. Solar Panel



Solar Panels come in all shapes and sizes, wattages, and cable types. It's best to purchase one that suits your electrical needs, typically around 30 watts on the upper end for things like gate openers.

2. Mounting Bracket



Mounting brackets typically are included with Solar Panels, though not all of them do so be sure to check if your solar panel kit does. These mounting brackets are crucial to ensuring that your solar panels can be exposed to the right amount of sunlight.

3. Solar Charge Controller/ Regulator

Solar Charge Controllers are responsible for controlling the amount of energy being used by your solar powered devices. It ensures that they don't receive too much power, preventing shortages from overpowering as well as battery issues from overcharging.

4. Solar Charge Battery

Though they look similar, Solar Charge Batteries are NOT the same as car batteries. These are special "deep cycle" batteries designed specifically for Solar devices and charging. It's important to keep these covered from the elements with a dedicated enclosure.

5. UV-Rated Solar Wire

Typically 10 or 12 AWG, UV-Rated Solar Wire is designed to not ware the same way other, typically enclosed wire does. Most solar panels come with a few feet pre-installed, however, extensions may be needed depending on your installation.

Please Note: *Your solar panel checklist may look slightly different depending on use case and kit. Refer to manufacturer's installation manual for special instructions.*

Step-by-Step Solar Panel Installation Guide

Step 1: Mounting the Solar Panel

First, find a spot where your solar panel can get *consistent* amounts of sunlight throughout the day. From here, install your mounting brackets to your mounting surface and then to your solar panel. Then you can adjust the solar panel by tilting it towards the sun (generally southern facing in the northern hemisphere), and angle it based on your latitude. (Ex. If you live at 35° Latitude, tilt your panel to ~35°)

Step 2: Wiring the Battery

First install an inline fuse within 18” of the Positive (+, Red) terminal on your battery before connecting it to the charge controller. Then, place the battery in its protective enclosure, ensuring that it has proper ventilation so that it doesn’t overheat in the sun.

Step 3: Connecting the Charge Controller

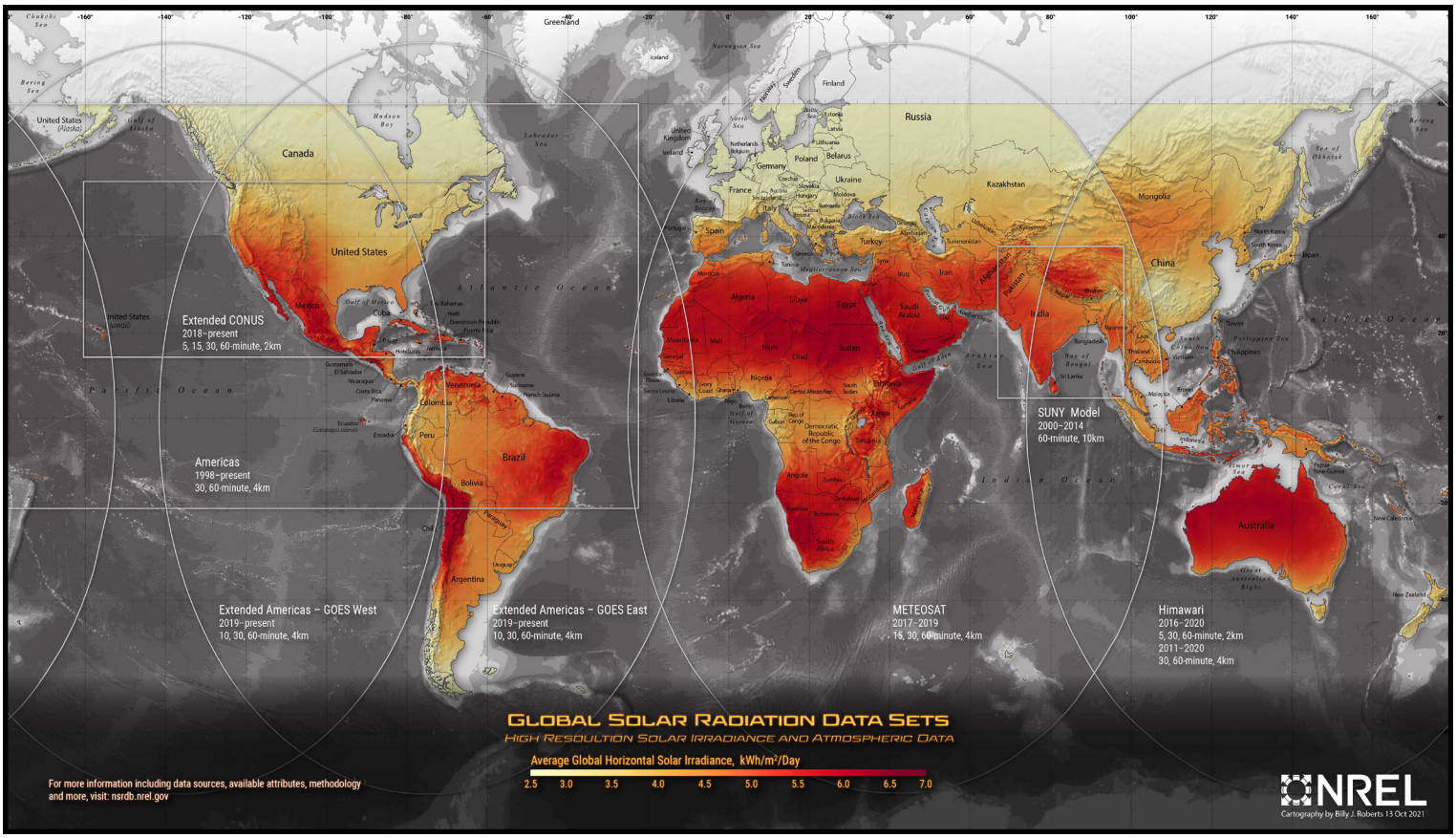
Place the charge controller in a dry, ventilated area near the battery, then connect the battery to the controller after ensuring that your fuses are in place. Then, after ensuring that the polarity is correct (Red = +, Black = -), connect your solar panel to your battery.

Step 4: Final Connections & Testing

Once all connections are made to your gate opener control board (see control board manual for more information), ensuring that they are tight, weather proofed, and not overly bent, use a multimeter to check battery voltage. Ensure that the panel is producing a meaningful amount of power in the sunlight, watching the charge controller for proper operation.

Proper Solar Panel Installation Paired with an Automatic Swing Gate Opener

Step-by-Step Solar Panel Installation Guide



The National Renewable Energy Laboratory (NREL) and the National Climatic Data Center (NCDC) have updated the National Solar Radiation Database (NSRDB). Region 1 covers the area of the country receiving the least amount of solar radiation. On average, the amount of charge time is 1.5 hours in region 1 and 3 hours in region 2 and 5 hours in region 3.

Installation Checklist:

- ☐ **Solar panel mounted securely**
- ☐ **Charge controller connected**
- ☐ **Solar panel connected**
- ☐ **All fuses installed**
- ☐ **Battery in ventilated enclosure**
- ☐ **Panel facing south, tilted correctly**
- ☐ **System tested with multimeter**

Please Note: *Your solar panel installation may look slightly different depending on use case. Refer to manufacturer's installation manual for special instructions.*

Installation Tips:

- Face your Solar Panel true south (not magnetic south) in Northern Hemisphere
- Panel Tilt Angle should be your approximate latitude (Ex. If you live at 35° Latitude, tilt your panel to ~35°)
- Adjust Panel seasonally (Summer & Winter)

What to Avoid:

- Shading from trees or buildings
- Flat mounting (unless near equator)
- North-facing orientation (in Northern Hemisphere)
- Obstructions that block morning or afternoon sun