



RPSTL12/24/48M

RemotePro[®]

Remote Power System

- Wireless Base Stations and Client Devices
- Surveillance Cameras
- Remote Sensors
- Remote Lighting
- Off Grid Electronics



Congratulations! on your purchase of the RemotePro[®] off-grid remote power system. Please take a moment to review this Qwik Install Guide before assembly or battery installation. Other instructions come with other components of this kit. Be sure to review all instructions.



**DANGER! Voltages in this system can exceed 65VDC and are very dangerous!
You Can Be Killed!**

When following the instructions in this guide take extreme care to avoid contact with output of solar panels. Only licensed electricians or those with experience working around high voltage should attempt to install.

Safety: For your own protection, follow these safety rules.

- **Perform as many functions as possible on the ground**
- **Do not attempt to install on a rainy, windy or snowy day or if there is ice or snow accumulation at the install site or if the site is wet.**
- **Make sure there are no people, pets, etc. below when you are working on a roof or ladder.**



Recommended Tools: Phillips & Flat Screwdriver, 17/13/10mm wrench, 8mm nut driver



Please help preserve the environment and return used batteries to an authorized depot. Most auto parts stores will pay for your used battery.

Qwik Install

STEP 0: Install mounting pole per separate instructions.

STEP 1: Prepare the enclosure: Install DIN rail (if required) to door using two phillips head screws. Install just the top mounting bracket to the enclosure using two 8mm bolts.

NOTE: It takes two people to mount the enclosure to a pole. The standard U-Bolt mounting accommodates a pole up to 4" diameter. Multiple pole straps can be used for extra strength. Pole straps are available for poles up to 11" diameter or larger.

STEP 2: Install the bottom bracket and stabilizer bracket to the pole using U-Bolt and Pole Straps. The stabilizer bracket is used as an aid to mounting and additional support when mounted.

STEP 3: Lift the enclosure and place it on the stabilizer bracket. Connect the top bracket to the pole using U-Bolt and/or Pole Straps.

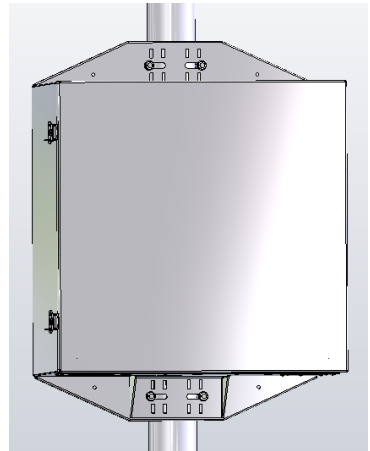
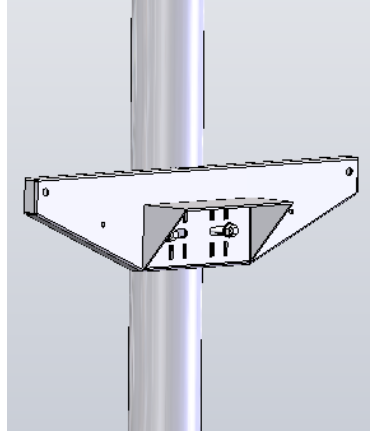
STEP 4: Attach the two 8mm bolts that hold the bottom bracket to the enclosure. Make sure all bolts are tight. (8-15 ft lbs)

STEP 5: Install the three wire feedthru cable glands in the holes in the bottom of the enclosure. If one or more of the cable glands will not be used, just cut a short piece of cable and tighten in the cable gland to seal it.

NOTE: The bottom plate can be removed from the enclosure if you need to add some additional feedthru. (ex; conduit connection)

STEP 6: Install the batteries in the enclosure. For 12VDC the batteries are connected in parallel, for 24VDC the batteries are connected in series pairs and for 48VDC the batteries are connected in series. (See wiring diagrams later in this guide).

NOTE: The enclosure has slot features that can be used to strap the batteries if desired. Tycon has velcro straps (#5700030) available. It takes two straps per battery.



STEP 7: Before attaching the battery cables to the batteries, first remove the battery cable fuse. This will prevent accidental short circuit.

Connect all battery minus (-) connections, then connect all battery plus (+) connections.

WARNING! The fan supplied with the system operates on 12VDC or 24VDC. It is thermostatically controlled to turn on if temperature exceeds 45C. **It cannot be connected to 48V battery voltage.** You can connect it across one or two of the batteries in the array.

STEP 8: Attach the DIN Rail adapters to the charge controller using the screws provided. Clip the controller to the DIN rail by putting the bottom of the DIN bracket into the bottom of the DIN rail, then push up and over the top of the DIN rail.

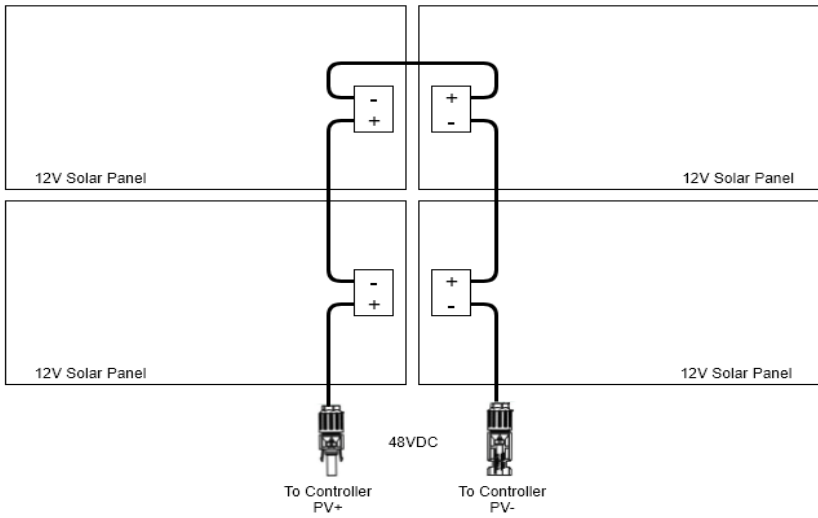


STEP 9: Attach the solar panels to the solar panel mount so that the wire junction box is towards the inside. For the 320W array, remove the cover from the solar panel junction box by releasing the snaps with a small flat blade screwdriver. Connect the wires to the + and - screws inside the junction box. Clean the gasket and replace the cover making sure it is fully snapped in place. For the 650W and 1300W arrays the solar panels are equipped with integrated cables with solar connectors.

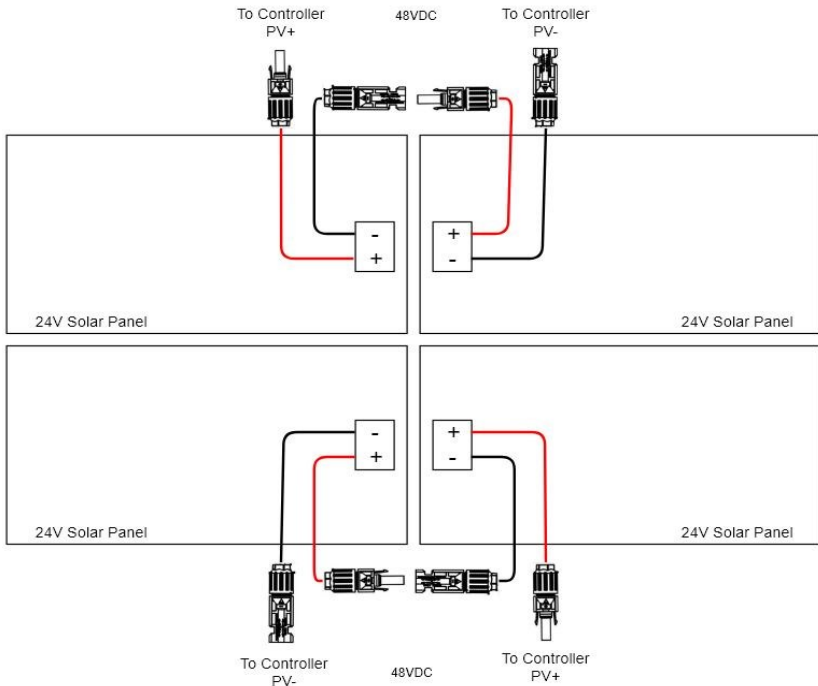
STEP 10: Wire the solar panels in a 24V or 48V configuration, depending on your model. (12V Battery uses 24V Solar Config)

For the 320W system, wire for 48V with panels in series configuration using the RPST-CABLE-4PANEL(included).

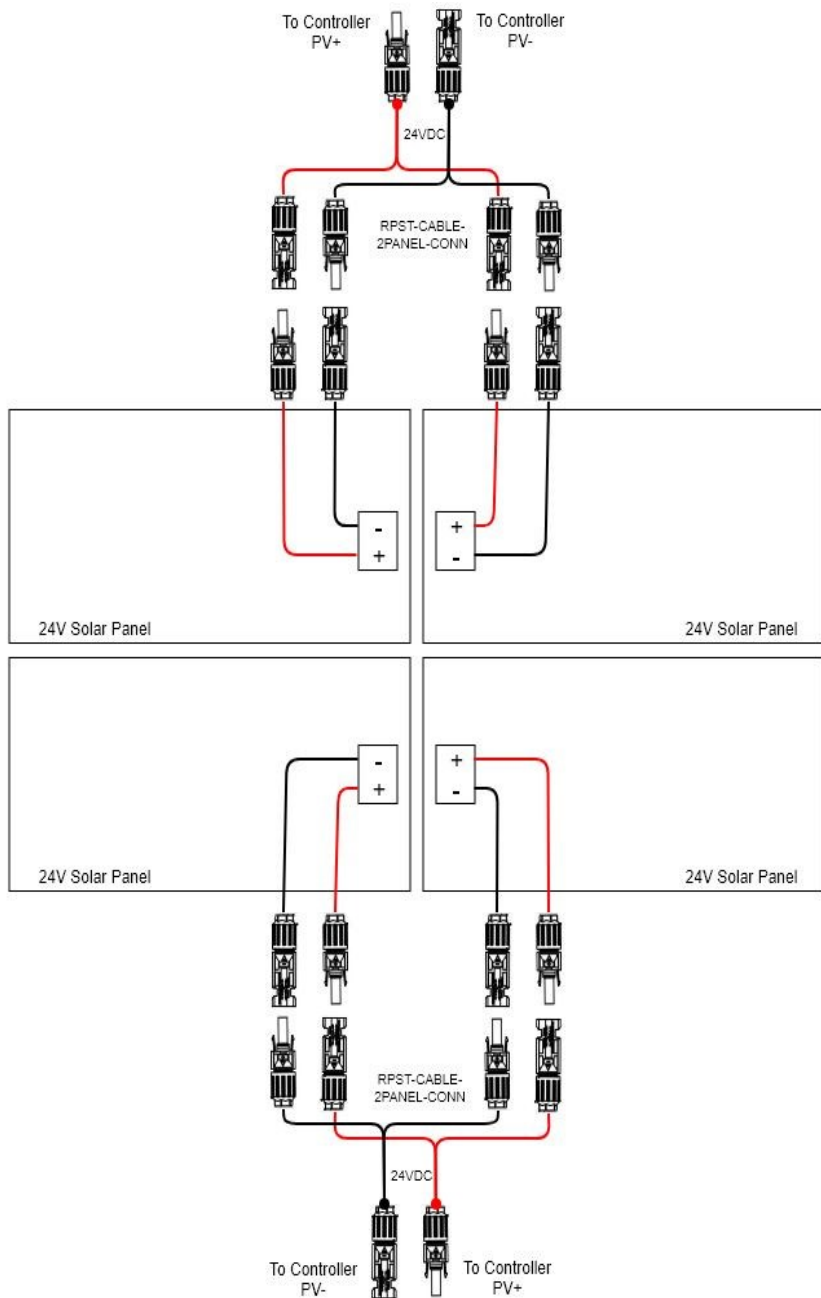
NOTE: In the 320W configuration there will be two unused wires on the cable assembly. Just tape the ends or use wire nuts to avoid any shorting.



48V 320W Configuration using 12V Solar Panels



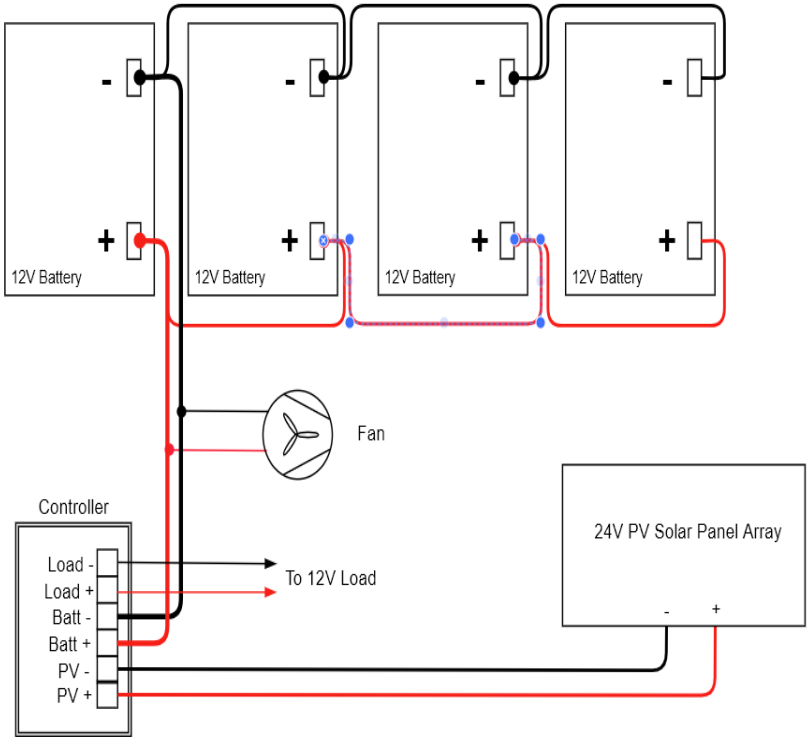
*48V 650W and 1300W Configuration using 24V Solar Panels.
Note: For 650W use 1/2 of above configuration.*



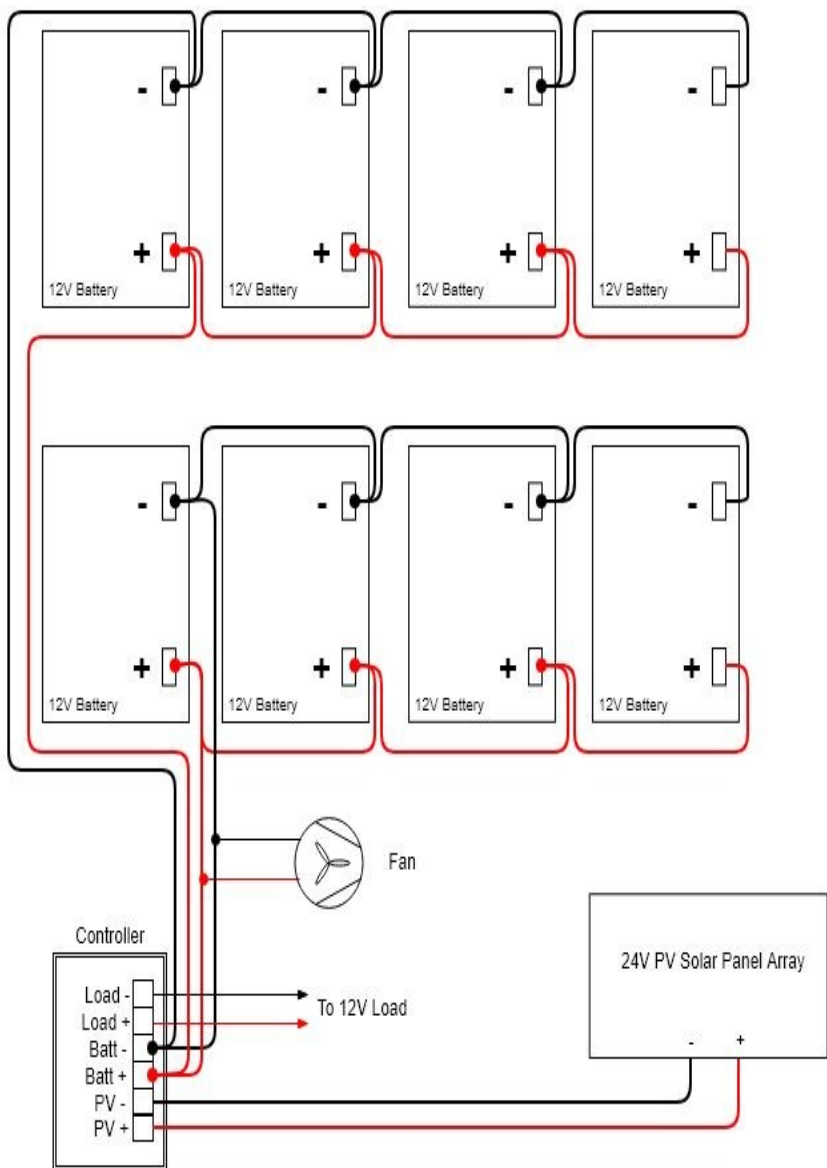
24V 650W and 1300W Config using 24V Solar Panels.

Note: For 650W use 1/2 of above configuration

CAUTION: Be sure to connect the battery first and disconnect it last. Connecting solar panels to the controller without the battery connected could damage the controller.

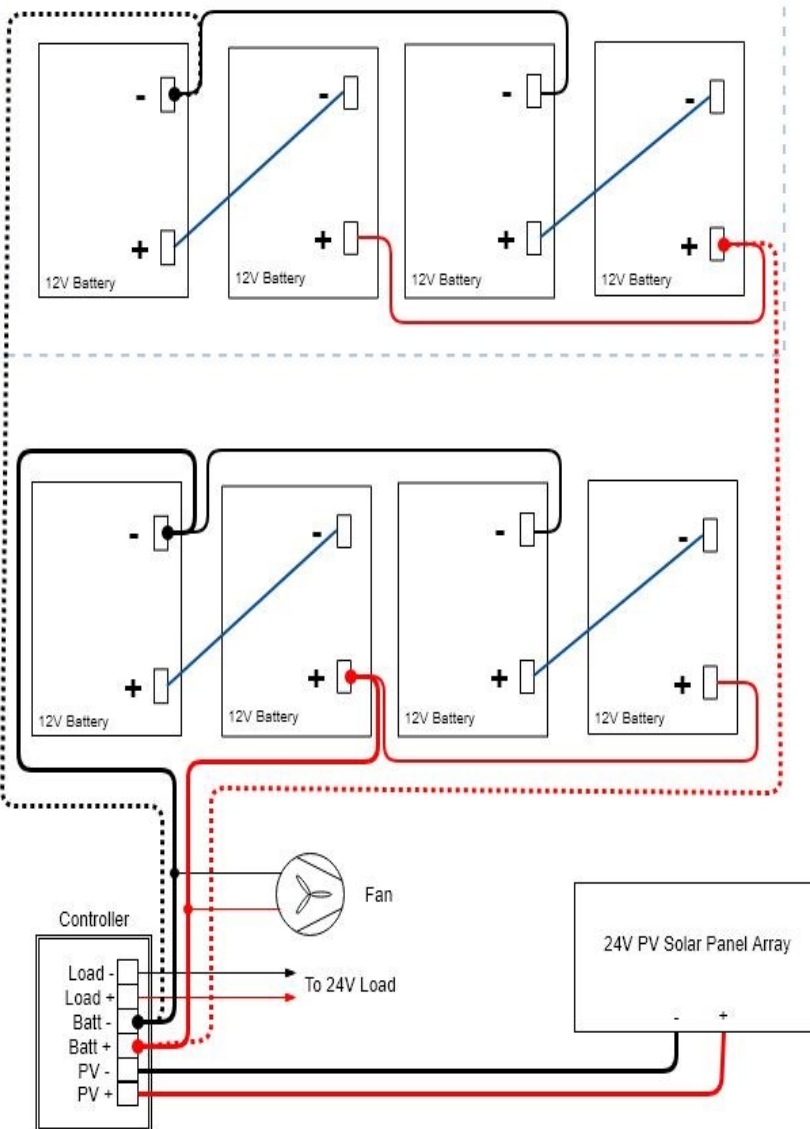


RPSTL 12V 4 Battery Wiring Diagram



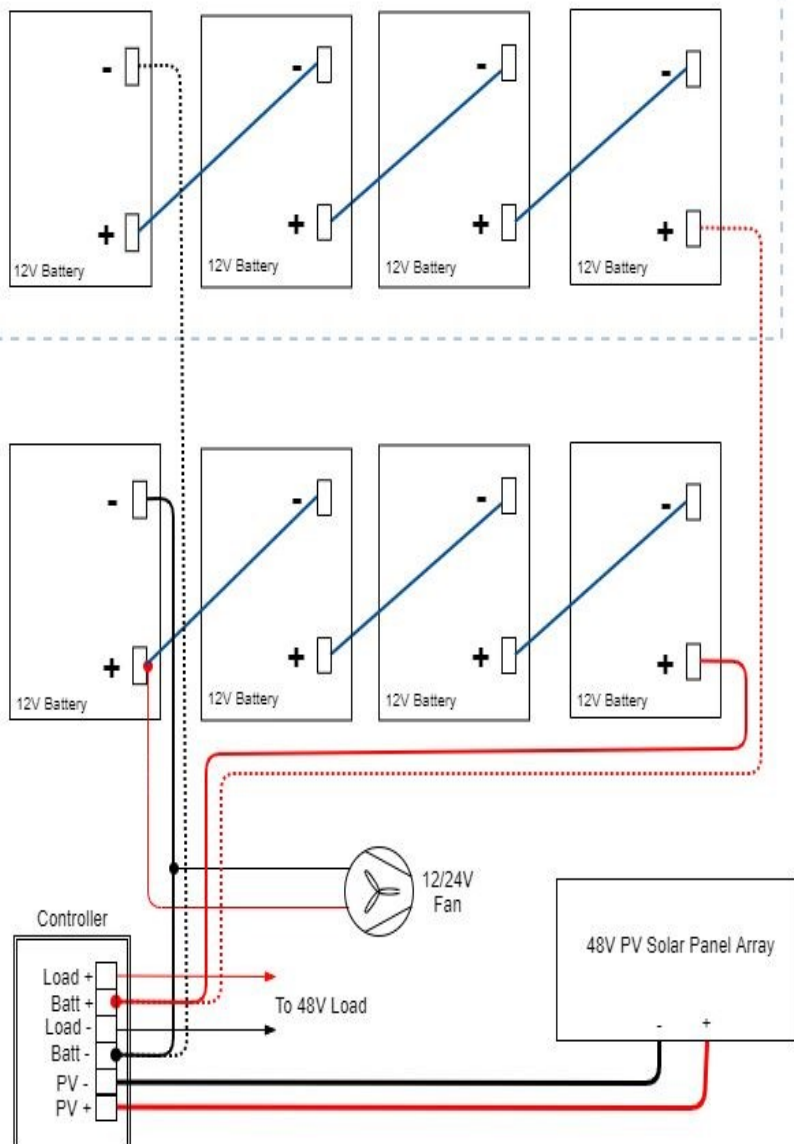
RPSTL 12V 8 Battery Wiring Diagram

For 8 Batteries: duplicate the 4 battery arrangement and add a second battery cable represented by dotted lines.



RPSTL 24V Battery Wiring Diagram

For 8 Batteries: duplicate the 4 battery arrangement and add another battery cable represented by dotted lines.



RPSTL 48V Battery Wiring Diagram

WARNING: 60A MPPT Controller is Positive Ground. Do Not Connect Battery Minus to Chassis Ground. Batteries should be floating. OK to connect controller ground screw to chassis ground.

STEP 11: Connect the battery wires to the solar controller BAT inputs. Be sure to pay strict attention to polarity. **CAUTION: Wiring with a reverse polarity will cause equipment damage. Wiring solar panels to BAT input can cause equipment damage.**

Double check wiring and then install the fuse in the battery cable to energize the system. When a fully charged battery is connected, the battery light should light on the controller and the controller should power up.

STEP 12: Route the long solar panel cable(s) through one of the feedthru in the bottom of the enclosure. This cable can be cut to length. The shorter the cable, the lower the cable losses. Connect the cable - wire to the Solar Controller PV - input. Connect the cable + wire to the solar controller PV + input. Be sure to pay strict attention to polarity.

CAUTION: Wiring with a reverse polarity will cause equipment damage.

Important Note: The MPPT Controller ships with AUTO detection of battery voltage enabled. We suggest changing this to a fixed 12V or 24V or 48V so that the system can recover automatically if, by chance, the batteries get drained completely. See MPPT controller user manual for specific instructions.

NOTE: You can lengthen the solar cable if necessary. Use 12AWG or larger cable. Increasing cable length will increase cable loss.

STEP 13: Connect the Solar Panel cable from the solar controller to the connectors from the solar panel. Connect - first and + second.

STEP 14: Tighten all wire feedthrus. If they don't tighten on a small diameter wire, you can wrap some electrical tape around the wire in the seal area to increase its diameter and make a better seal.

STEP 15: Make sure the enclosure door gasket is clean, then close the door making sure all wires are clear. The enclosure can be locked using a standard combination or keyed padlock.

TECH CORNER

Additional Information you may find useful

1. **CONTROLLER:** The TP-SC24-40-MPPT controller is designed for use with 12V or 24V battery systems. The TP-SC48-60-MPPT is designed for 12V, 24V or 48V battery systems. Maximum load out from either controller is 20A Max.

2. **Fuse:** There is a fuse in-line in the battery cables. If fuse is blown there was some sort of short in the battery connection and the controller will appear dead. Replace with 3AG 6.3 x 32mm 30A Slo-Blo fuse.

3. **VENTING:** The enclosure is vented thru a thermostatically (45C) controlled fan and top and bottom vents. The vents are covered with dust/insect filters. You should add the checking/cleaning of the filters during any routine maintenance cycle but at least annually.

4. **BATTERY MAINTENANCE:** The batteries used in the Remote-Pro[®] systems don't require any maintenance. They should last up to 5 years in normal use. **Note: Never store batteries for any length of time in a discharged state or it may kill the battery. Always fully charge before storage.**

5. **SOLAR PANEL TILT:** There is a solar panel tilt calculator at our website <http://tyconsystems.com>. We recommend using a fixed tilt and setting to optimize for winter sun. The panel should face South if you are in the Northern Hemisphere and face North if you are in the Southern Hemisphere. Some typical winter tilt angles are as follows:

<i>Place</i>	<i>Optimum Winter Tilt</i>
Houston / Cairo	56 deg
Albuquerque / Tokyo	60.5 deg
Denver / Madrid	65 deg
Minneapolis / Milano	69.5 deg
Winnipeg / Prague	74 deg

6. **BATTERY OVERDISCHARGE:** We highly recommend hooking all equipment loads to the controller load outputs. This output will disconnect the loads if the battery voltage drops below the preset low voltage disconnect level. This will protect the battery from over-discharge. If batteries get completely discharged because the equipment was connected directly to the battery, you will reduce the battery life and you will most likely need to supercharge them with a good quality 10A automotive battery charger. Once they are back to a normal operating range, the integrated charge controller will maintain the charge. Don't charge batteries using an automotive charger for longer than 24hrs or you may damage the battery.

7. TROUBLESHOOTING:

- A. ***The lights on the solar controller look fine but the batteries aren't charging?*** The solar voltage must match or exceed the battery voltage. Check to make sure Solar Panels are wired correctly.
- B. ***There is no voltage output?*** If battery voltage is too low the charge controller will turn off the load outputs. This typically happens when battery voltage falls below 11V for 12V systems, 22V for 24V systems and 44V for 48V systems.
- C. ***Why is my solar panel voltage so high?*** Open circuit voltage on a 24V panel is around 40V and 80V for a 48V panel. Once you connect to the charge controller the panel voltage will be reduced.
- D. ***My system turns off at night and comes back on in the morning?*** This is a sure sign that the solar panels and/or battery capacity can't support the load. You should measure your actual load and recalculate to make sure you have adequate solar and battery capacity. Make sure there is no shading of solar panels during the day.
- E. ***There is no power at the solar controller?*** Check the battery cable fuse. Measure battery voltage at the solar controller it should be >10V. If less than 10V then batteries will need to be charged with an external charger to bring the voltage up to normal operating range of the controller. When batteries are in an array, need to charge each battery individually. A 12V battery will measure 12V or higher when adequately charged.

Replacement Parts

Solar Controller: TP-SC24-40-MPPT, TP-SC48-60-MPPT

Batteries: TPBAT12-52

Solar Mount (320W): TPSM-80X4-UNI (2-4panels)

Solar Mount (650/1300W): TPSM-250x4-TP

Solar Panel (320W): TPS-12-80W

Solar Panel (650/1300W): TPS-24-325W

SPECIFICATIONS

Subject to change without notice

	RPSTL-12M	RPSTL-24M	RPSTL-48M
12V Battery Capacity	200Ah or 400Ah	200Ah or 400Ah	200Ah or 400Ah
Max Load Output	20A	20A	20A
Battery / Load Voltage (DC)	11-15V	22-29V	44-58V
Over-Voltage Protection	16V	32V	64V
Bulk Charge	14.4V	28.8V	57.6V
Float Charge	13.8V	27.6V	55.2V
Over-discharge protection	<11V	<22V	<44V
Over-discharge recovery volts	>12.5V	>24V	>48V
Battery Type	Valve Regulated Sealed Lead Acid / AGM		
Battery Life	5 Years		
Controller Type	MPPT—Temperature Compensated		
Controller Self Consumption	<1W Typical		
Enclosure Type	Powder Coat Steel		
Wind Survivability	90MPH		
Operating Temperature	-30°C to +60°C		

Note: Maximum solar panel size for the TP-SC24-40-MPPT and TP-SC48-60-MPPT controllers.

	40A MPPT	60A MPPT
12V Battery	550W	800W
24V Battery	1100W	1600W
48V Battery	<i>Not Supported</i>	3200W

Accessories

TP-SC-BT1 RS232 to Bluetooth adapter.

- Allows for wireless monitoring and control of the MPPT solar charge controller up to 15m.
- Uses a smartphone app available for Android and IOS devices
- Completely weatherproof for outdoor mounting
- Low Cost



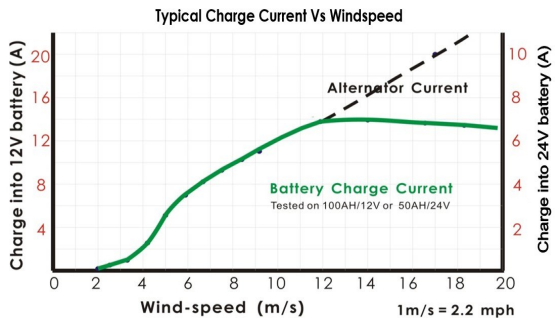
Wind Turbine

*A wind turbine is an excellent backup power source for solar powered remote power systems. When it's cloudy and stormy there is usually wind. A wind turbine can harness the power from this wind and help keep the batteries charged. The wind turbine connects to the batteries in parallel with the solar controller. **Not Compatible with 48V Battery Systems.***



TPW-400DT-12/24 400W 12V/24V Wind Turbine

- Includes Integrated Controller with Dump Load
- Good low wind performance
- Self braking in high wind
- 110MPH survivability
- Sealed and maintenance free



Remote Station Monitor

TPDIN-Monitor-WEB3

- Connects to Tycon MPPT controllers with Modbus interface cable for automatic data collection of PV, Battery and Load parameters.
- Qty 4: Voltmeters and current meters
- Web Based: allows station monitoring over the internet.
- Qty 4:10A relays for controlling power to devices, starting a generator, etc.
- Measures internal and external temperatures
- Intuitive user interface and graphical setup
- SNMP compatability
- Shunt compatible for measuring very high currents
- Email Alerts
- Programmable functionality



Notes

Limited Warranty

The RemotePro® products are supplied with a limited 36 month warranty which covers material and workmanship defects. This warranty does not cover the following:

- Parts requiring replacement due to improper installation, misuse, poor site conditions, faulty power, etc.
- Lightning or weather damage.
- Physical damage to the external & internal parts.
- Products that have been opened, altered, or defaced.
- Water damage for units that were not mounted according to user manual.
- Usage other than in accordance with instructions and the normal intended use.

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