



# **RPSTL12M/24M**

## **RemotePro<sup>®</sup>**

### **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! Avoid Powerlines!**

### **You Can Be Killed!**

When following the instructions in this guide take extreme care to avoid contact with overhead power lines, lights and power circuits. Contact with power lines, lights or power circuits may be fatal. We recommend to install no closer than 20 feet to any power lines.

**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 Screwdriver, 13mm and 10mm Wrench, 5/16" nut driver, Flat Blade Screwdriver



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



# Qwik Install

**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/or 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.

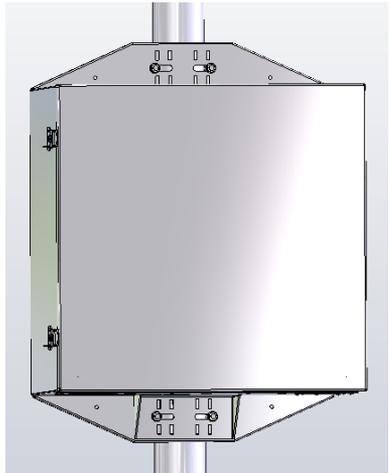
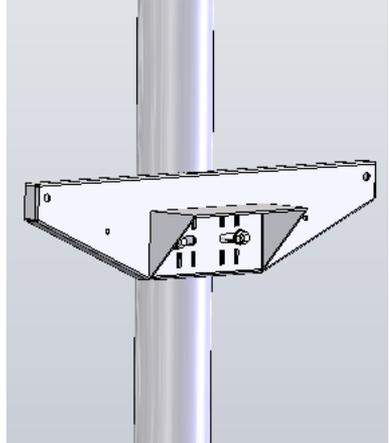
**STEP 4:** Attach the two 8mm bolts that hold the bottom bracket to the enclosure. Make sure all bolts are tight. (8-15 ft lbs)

**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 wire 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 and for 24V the batteries are connected in series pairs. (See wiring diagram later in this guide).

**NOTE:** The enclosure has slot features that can be used to strap the batteries if desired. Tycon<sup>®</sup> 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 - connections, then connect all battery + connections.

**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 DIN bracket up and over the top of the DIN rail.



**STEP 9:** Assemble the solar panel mount and set the correct tilt angle based on your Latitude. There is a useful tool to calculate optimum angle at <http://tyconsystems.com> If you will be using a fixed angle all year we recommend using the optimum angle for winter sun. You can also calculate winter tilt using:  $\text{Your\_Latitude} \times 0.9 + 30$ . Mount the solar panel mount to the pole using hose clamps provided. Be sure to mount high enough so the door of the enclosure clears the solar panel mount when opened. You can also mount the panel to a wall using lag bolts.



**STEP 10:** Attach the solar panel to the solar panel mount so that the wire junction box is towards the top or side.

If the solar panel is already connectorized, connect the solar panel MC-4 connectors to the included solar cable in series pairs configuration.

If the solar panel is not connectorized, remove the cover from the solar panel junction box by unscrewing or releasing the 6 snaps. Connect the included octopus cable wires to the + and - screws inside the junction

box. Replace the cover making sure it is fully snapped.

Solar panels are wired in series pairs for 12V or 24V battery configurations when using MPPT solar controllers.

Wiring of non connectorized panels at the right and connectorized panels below.

**STEP 11:** Connect the enclosure fan and battery cables to the Solar Controller. Be sure to observe proper polarity.

Black wire connects to battery negative terminal and BAT(-) terminal on the controller. 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.

**CAUTION:** Wiring with a reverse polarity will damage the equipment.

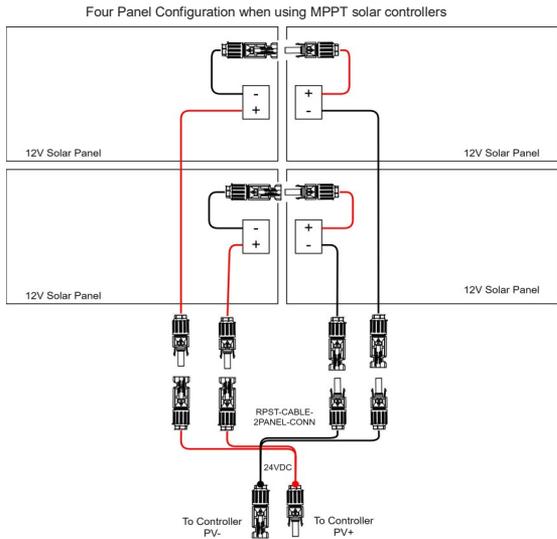
**Important Note:** The MPPT Controller ships with AUTO detection of battery voltage enabled. **We suggest changing this to a fixed 12V or 24V so that the system can recover automatically if, by chance, the batteries get drained completely.** See MPPT controller user manual for specific instructions.

**STEP 12:** Connect the solar panel cables to the Solar Controller solar inputs (PV). Red wire to PV+. Black wire to PV-. Route the solar panel cables out thru the feedthrus and connect to the solar panel weather-proof connectors. Be sure to connect in the proper polarity, red wire to + and black wire to -.

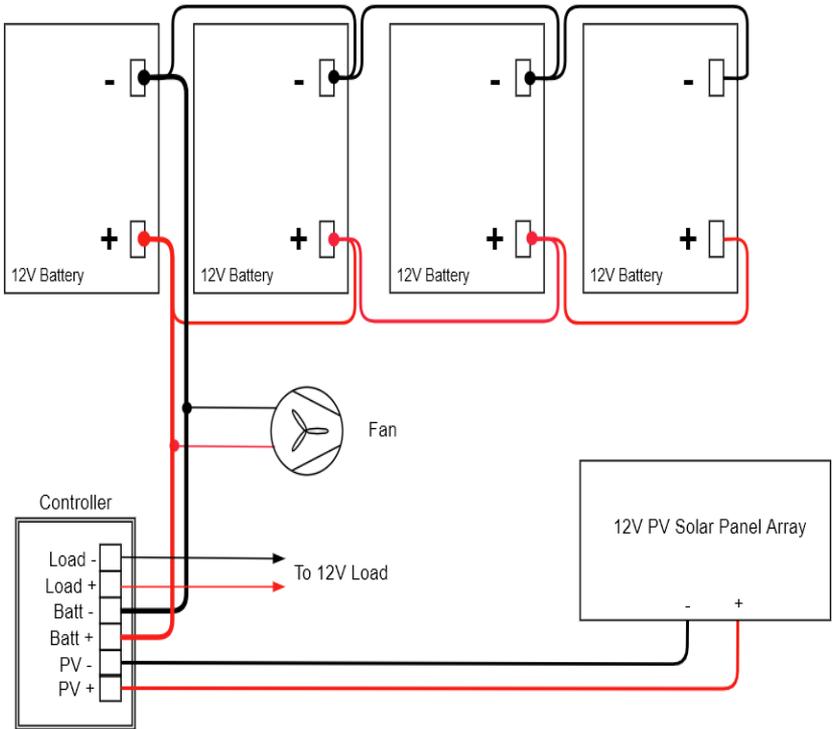
**NOTE:** You can lengthen the solar cable if desired. Use 12AWG or larger wire. Increasing cable length will increase loss.

**STEP 13:** 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.

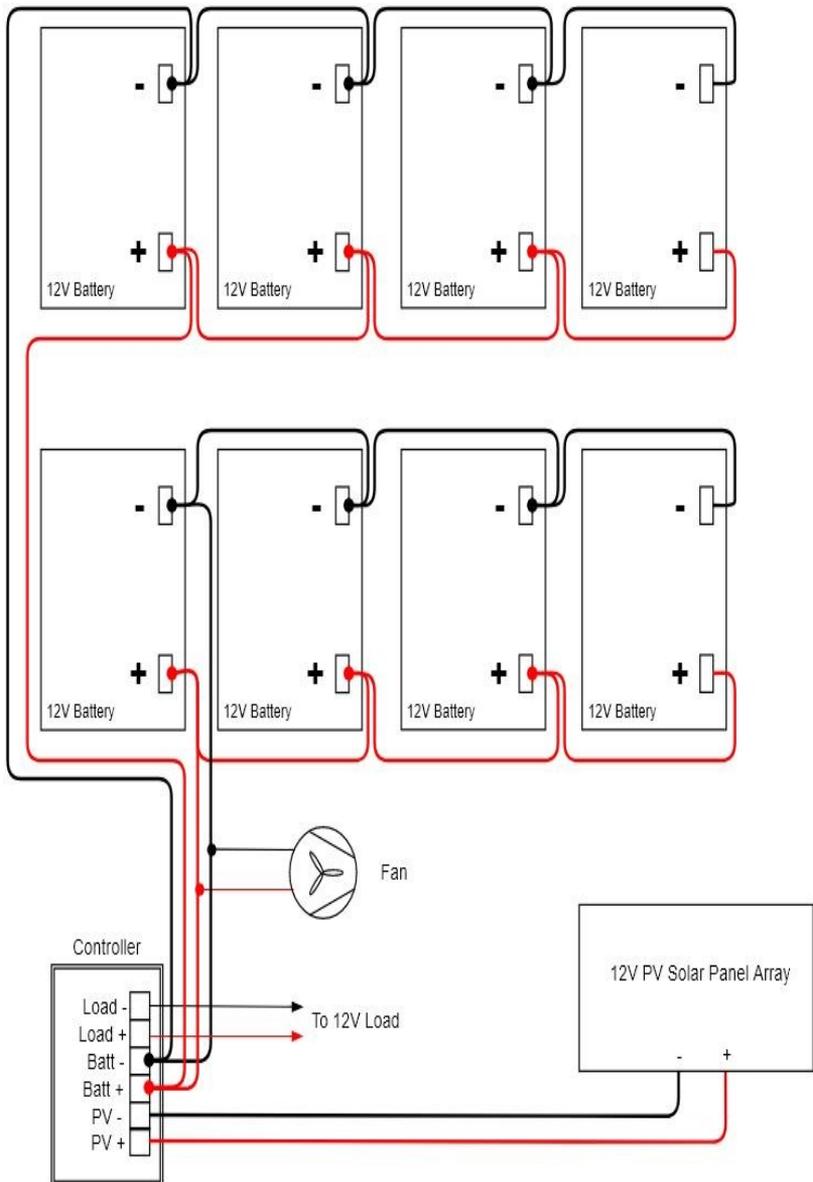
**STEP 14:** Make sure lid gasket is clean and free from any particles, then carefully close the cover, making sure that wires are clear of the seam and hinge area. Close the two cover locks. You can use standard padlocks for securing the enclosure.



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

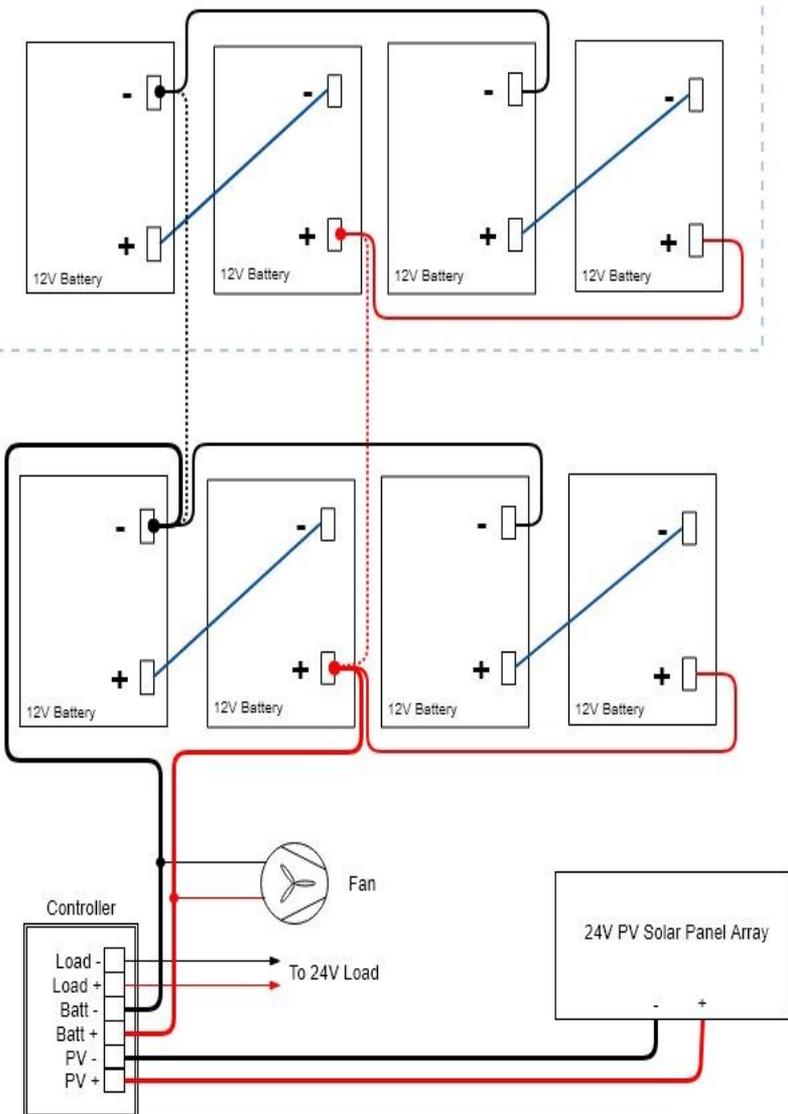


**RPSTL 12V 4 Battery Wiring Diagram**



**RPSTL 12V 8 Battery Wiring Diagram**

For 8 Batteries: duplicate the 4 battery arrangement and add two connecting jumpers represented by dotted lines.



**RPSTL 24V Battery Wiring Diagram**

# TECH CORNER

## *Additional Information you may find useful*

1. **CONTROLLER:** The 12V controller turns off power to the load at 11V and reconnects when the battery reaches 12.5V. The 24V controller turns off power at 22V and reconnects at 24.5V. The 48V controller disconnects at 44V and reconnects at 49V. This protects battery from overdischarge and increases battery life and performance.

2. **Controller LEDs:** There are 4 LED's; Solar, Battery, Load and Error for quick status check.

3. **Fuse:** There is a fuse in the battery cable. The fuse is in-line with battery power. 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-Blow fuse.

4. **CAPACITY:** The RemotePro<sup>®</sup> RPSTL is rated at 50W to 80W continuous power output with 6 hours of peak sun per day. (Depending on the purchased configuration).

5. **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.

6. **BATTERY MAINTENANCE:** The batteries used in the RemotePro<sup>®</sup> 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 will kill the battery.**

7. **RS232:** There is an RS232 port on the controller. This port is a special port to interface to the Tycon **TP-SC-BT1** Bluetooth adapter and Tycon **TP-SC-USB-RS232** cable and software. The Bluetooth adapter allows for remote monitoring and control of the controller up to 15m distance. The cable and software allow connection to a PC.

8. **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 or face North if you are in the Southern Hemisphere.

9. **BATTERY OVERDISCHARGE:** We highly recommend hooking all equipment loads to the controller load output. This output will disconnect the load if the battery voltage drops below 11V (12V battery) or 22V (24V battery) and this will protect the battery from over-discharge. If batteries get completely discharged (<10V) because the equipment was connected directly to the battery, you will reduce the battery life and you will most likely need to recharge them with a good quality

10A automotive battery charger. Avoid charging for longer than 24hrs to avoid battery damage. Once they are back to a normal operating range, the integrated charge controller will maintain the charge.

## 10. TROUBLESHOOTING:

- A. ***There is no load output from the controller ?*** If battery voltage is too low the charge controller will turn off the load outputs. On a 12V battery system the load will turn off if battery is <11V. On a 24V battery system the load will turn off at <22V. Also make sure the controller is set to Mode 15 then press SET to turn load on or off.
- B. ***Why is my solar panel voltage so high?*** Open circuit voltage on a 12V panel is around 23V and about 40V on a 24V panel. Once you connect to the MPPT charge controller the panel voltage will be reduced.
- C. ***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 capacity.
- D. **Can I charge my batteries from AC power?** Tycon offers AC/DC battery chargers that can be used in parallel with the solar controller to charge batteries from AC.

## Replacement Parts

**Solar Controller:** TP-SC24-20-MPPT, TP-SC24-40-MPPT

**Batteries:** TPBAT12-52

**Solar Mount:** TPSP-80X4-UNI (2-4panels)

**Solar Panel:** TPS-12-80W

# SPECIFICATIONS

Subject to change without notice

	12V Config	24V Config
<b>Battery Capacity (12V)</b>	100Ah or 200Ah	
<b>Reserve Power @ Rated Load</b>	>24 hours	
<b>Load Output</b>	12V 20A — Unregulated	24V 20A — Unregulated
<b>Battery Voltage (DC)</b>	12V	24V
<b>Battery Type</b>	Valve Regulated Sealed Lead Acid AGM	
<b>Battery Life</b>	5 Years	
<b>Controller Type</b>	MPPT—Temperature Compensated	
<b>Over-Voltage Protection</b>	16V	32V
<b>Bulk Charge</b>	14.4V	28.8V
<b>Float Charge</b>	13.8V	27.6V
<b>Over-discharge protection</b>	11.1V	22.2V
<b>Over-discharge recovery voltage</b>	12.6V	25.2V
<b>Controller Self Consumption</b>	<1W	
<b>Enclosure Type</b>	Powder Coat Steel	
<b>Wind Survivability</b>	90MPH	
<b>Operating Temperature</b>	-30°C to +60°C	

**Note:** Maximum solar panel size for the TP-SC24-20-MPPT and TP-SC24-40-MPPT controllers.

	20A MPPT	40A MPPT
<b>12V Battery</b>	260W	520W
<b>24V Battery</b>	520W	1040W

## 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



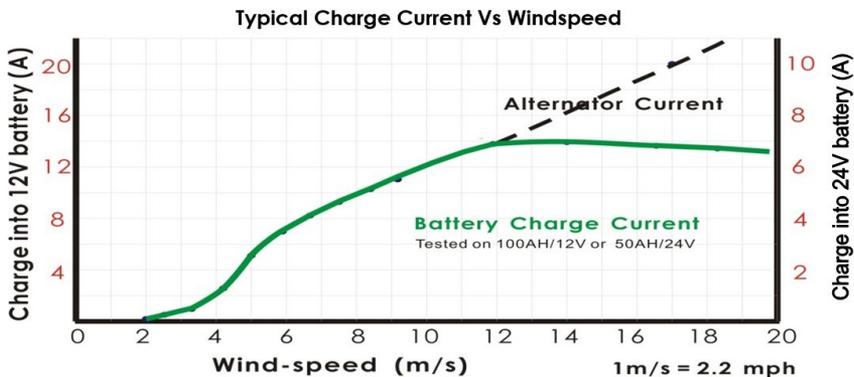
## Wind Turbine

*A wind turbine is an excellent back-up 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.*



### 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 compatibility
- Shunt compatible for measuring very high currents
- Email Alerts
- Programmable functionality



## 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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