



# SOLAR STIK™

## FREQUENTLY ASKED QUESTIONS

Have a question regarding the Solar Stik™ System? See the categories below and you will likely find what you are looking for. If you can't find your answer here, please don't hesitate to contact us.

[General Questions](#) | [Operation Questions](#) | [Maintenance Questions](#)  
[Modification Questions](#) | [PowerPak/RV Pak Questions](#)  
[Installation Questions](#)

### **GENERAL:**

#### ***Do I need a permit to use the Solar Stik™ at my house?***

The Solar Stik™ is a portable solar generator that does not require any approvals for use. It is a self-contained, turn-key system that is ready to operate right out of the box.

#### **Are there any Tax-Rebates or government incentives to purchase a Solar Stik™?**

The answer to this question lies in the state in which you live. Check with the state and local authorities in your area to see if the Solar Stik™ qualifies for these programs.

***Why were rigid solar panels chosen for use on the Solar Stik™ instead of lighter or flexible panels?***

When compared to all other solar technologies on the market, rigid solar panels have the highest power output per square foot of panel surface area. During the initial Research and Development phase for the Solar Stik™ System, the BP panel's power-output routinely exceeded their power rating when pitched into direct sunlight. In addition, the clear anodized aluminum frame is the strongest available on the market. As a result of these qualities, the rigid BP solar panels were chosen to become an integral part of the Solar Stik™ System.

***Will my Solar Stik™ become obsolete in a few years if there is a new "high-efficiency" solar panel developed?***

The Solar Stik™ can be retrofitted easily with new panels when new technology warrants. If a new "high-efficiency" and "cost-effective" panel technology is introduced, we will immediately employ the new panel on future systems, and make the new panel technology available to older Solar Stiks™ as well. Any new solar panel technology will require the same direct sunlight exposure as today's existing solar panels, so the Solar Stik™ itself will not become obsolete for many years.

***Why is the Solar Stik™ Mast tapered?***

The Mast-top mount (for wind generator, radar or other equipment) and the solar panel connection fittings require structural welding on the inside of the Mast, therefore, a wedge is cut out to allow access for the internal reinforcement. When the welding is completed, the Mast is compressed into the shape of an airfoil instead of welding the wedge material back into place. This lessens the weight of the system by about 10 lbs. and gives the Mast a unique look.

***How will my Solar Stik™ be delivered?***

The Solar Stik™ system will be delivered in two boxes and a reinforced tube. Complete Packing lists are available for download from the [Technical Data](#) Page:

**Box #1** - mount of choice / MPPT charge control / battery temperature sensor / instructions

**Box #2** - Solar Panel Lifting Arm assemblies

**Tube** - Solar Stik™ Mast assembly

### ***What is the difference between a Solar Stik™ Terra model and a Solar Stik™ Marine model?***

The only differences between the Terra and Marine units are the mounts that are supplied with the units and the Mast receptacle plates. The Terra model has twin solar electrical outlets on the receptacle plate, and the Marine model has a single electrical outlet with a cover plate over the second hole. The second hole on the Marine Mast may be used for the installation of an electrical connection for a wind-generator, radar, or other device.

### ***Is the power output rating on a solar panel the maximum it can produce?***

Solar panel operating characteristics (watts, amps, volts) are rated at "STC", or "standard operating conditions", which are set and vary according to individual manufacturers. Current, voltage and wattage at STC are NOT "maximums", and these values can be higher or lower, depending on operating conditions and panel brand. A solar panel's output is affected by the angle of the cells to the sun's light rays and the cell operating temperatures. Solar panel output is usually rated at a nominal temperature of 25 degrees Celsius (77° F), and the output can be expected to vary as the ambient temperature rises or falls. An increase in temperature will usually cause the power output to decrease. For example, if panels are cool due to cloud cover, and the sun bursts through the cloud, the panel's power may exceed its rated output until the panel temperature rises.

## ***OPERATION:***

### ***Can I use the Solar Stik™ to power our house?***

The Solar Stik™ is a portable DC power generator, and not designed for direct connection to your home's AC electrical system without a grid-tie inverter. You could, however, power select appliances in your home using the Solar Stik™ and the Power Pak 50 or the heavier duty Power Pak 100. The Solar Stik™ & Power Pak work well for remote homes with no access to traditional power supplies, or supporting critical appliances after a hurricane when power may be disrupted for weeks. For example, you could operate a small refrigerator, television, radio, computer, and other devices. Visit the **SOLAR SCHOOL** section to learn more about appliance loads.

### ***How many persons does it take to setup a Solar Stik™?***

In most cases just one, and the Solar Stik™ is designed to be erected and functioning in less than five minutes. Disassembly is also less than five minutes by one person.

### ***How much power will the Solar Stik™ produce?***

On average, with a sunny day and proper solar panel orientation (2-3 adjustments per day), you can expect to harness about 80 Amp-hours per day with solar alone. If the Solar Stik™ Breeze is employed the output will be higher. There are exceptions to this because there are longer and shorter days during the calendar year. For example, during the summer months, one may see as much as 100 Amp-hours per day depending on operating conditions and geographic location.

### ***What can I power with my Solar Stik™?***

The Solar Stik™ is designed to operate with any 12 Volt battery bank. Since the Solar Stik™ stores power into batteries, appliance loads should not be placed on the system that will exceed the daily power production of the Solar Stik™. Go to the **SOLAR SCHOOL** section on the website to learn how to figure out the power requirements for your specific application.

### ***Where can I get a battery to use with the Solar Stik™?***

Battery banks are commonly found in boats, recreational vehicles, golf carts, and Power Paks.

### ***Can I connect a DC appliance directly to the Solar Stik™?***

This is NOT recommended. Damage to the appliance or Solar Stik™ could result from a direct connection. The solar panels are an UNREGULATED DC power supply, which has varying Voltage outputs, and can damage an appliance if the Voltage is higher or lower than the acceptable Voltage input. The Solar Stik™ is designed to work in conjunction with a 12 Volt DC battery bank only.

### ***Is there a "break-in period" for a new Solar Stik™?***

The mechanical parts of the Solar Stik™ may at first be a little difficult to operate or get used to. For instance, the rubber solar panel latches may be a little difficult to stretch when locking the panels into the "down" position, but they become easier to operate as you use them. Normal "break-in" periods range from 1-3 months of regular use.

***I have sometimes seen 8.8 amps registering on the Solar Boost™ control. Is this possible?***

The Solar Stik™ gives solar panels the two main ingredients that they need to operate at their "maximum" output: direct sunlight and sufficient cooling. Three axes of rotation mean direct aiming at the sun ALL day, and the high wing-like arms mean the panels get extremely good airflow against the panel, keeping the panel temperature low (which substantially aids in power output). By placing the panels in an environment where these two factors are optimally met, the Solar Stik's™ BP350J panels are able to operate at or even briefly above their STC rating for most of the day. Additionally, when a panel is operated at its maximum, MPPT technology is also at it's best. The Solar Stik™ maximizes ALL of the operating factors through a unique mounting system, and is complemented by the best MPPT technology available.

***How often should I change the position of the solar panels?***

In order to maximize the amount of solar energy produced, the panels should be facing east for the morning sun, straight up for the noon sun, and west for the afternoon sun. Remember, ***direct sunlight*** means ***more power!***

***What if we aren't present to change the solar panel tilt?***

We understand that someone may not always be available to tilt the panels, so in this instance, the panels should be left facing the "noon" sun. This will allow for the greatest amount of solar panel operation in a "fixed" position.

***Will the Solar Stik™ Mast or wind generator cast shadows onto the panels?***

Because of the Solar Stik's™ ability to rotate and pitch, any shadows should be ***behind*** the solar panels. The sun will only be directly overhead for a brief period during the course of a calendar year because of the earth's orbit around the sun. During 5 years of testing, any shadows from the wind generator or Mast were quickly fixed by rotating the Solar Stik™ until the panels faced the sun directly.

***What if the sun isn't shining, will the Solar Stik™ still produce power?***

If there is light, then the solar panels will function. They may produce less energy in reduced light conditions, but they will still function to the best of their ability.

***How could I prevent theft of the Solar Stik™ without removing the entire system?***

System removal is easy and the most desired method of avoiding theft; however, for temporary theft prevention, either the Stik™ Security Cable (accessory) or an ordinary bicycle chain/cable lock may be used. Simply intertwine the cable through the handles and solar panel frames and remove any slack from the cable. Be sure to connect the cable to a fixed structure.

***Should I remove the solar panels for inclement weather?***

The Solar Stik™ is completely weatherproof and designed to withstand the harsh marine environment, as it was originally designed for cruising sailboats. The solar panels are designed to lock in the "down" position for rough seas or inclement weather; however, in a high wind environment (greater than 50 miles per hour), it would be best if the panels were removed. For instance, tropical storms or hurricanes would warrant panel removal. We designed the Solar Stik for easy panel removal and it can be done in a matter of minutes. Removal of the Mast from the base socket is probably not necessary (although extremely easy if warranted) as it does not pose much wind resistance. The Tripod-mounted Solar Stik™ can handle inclement weather just as well, provided the legs are attached to the ground via stakes, or using the alternative methods as follows:

***Expanded Footprint:*** If the Tripod is placed on a hard surface during windy conditions, plywood (2'x2'x3/4" square pads) may be screwed to the bottom of each leg. This will aid in stabilizing the unit by giving it a lower center of gravity and a wider 'footprint'.

***Quick-Sand:*** If the Tripod is placed on a soft surface, such as on a sand dune, the Tripod may be deployed and then "buried" in the sand up to 16 inches deep, leaving at least 8 inches above the ground. The Solar Stik™ system is not affected by sand.

***What if we want to permanently attach the Tripod base mount to a structure?***

The feet and base of the Tripod base mount can be screwed to any surface using standard hardware. Simply adjust each leg independently to the correct orientation, and attach to the surface. Stainless steel hardware should be used for any permanent installation.

### ***How do I know when my boat's batteries are fully charged from the Solar Stik™?***

The Marine Solar Stik™ is sold as a complete package and includes a digital MPPT charge control. This control displays the battery voltage. If the supplied control is not to be used, it is still recommended that a charging regulator be installed into the charging system in conjunction with a voltage meter that displays battery voltage. This will give you "maintenance-free" operation when the Solar Stik™ is connected to the system. We recommend and supply the BLUE SKY ENERGY, INC. line of products as they perform both charge control and system display functions. Consult the battery manufacturer literature to find out what the rated battery voltages are for your particular battery.

### ***What would happen of the Solar Stik™ were submerged or dropped overboard?***

The Mast assembly would float for a few minutes, but the solar panels would definitely sink. Take care not to drop the Solar Stik™ overboard. If submersion in fresh water occurs, place the system in a well-ventilated area and allow to dry. If immersion in salt water has occurred, immediately flush all components of the Solar Stik™ with fresh water EXCEPT for the internal components of the solar panel junction box. In either case, open the junction boxes on the back of the solar panels and drain any water that may have intruded. Use a petroleum based spray to remove any water from the electrical connections or junction boxes. Allow adequate drying time before returning to service. Once submerged, electrical wiring and connections will degrade quickly, so frequent inspection and treatment is recommended.

### ***Can the Solar Stik™ System survive a NEMP (nuclear electromagnetic pulse) blast?***

There is no definitive answer to this question, and much of the answer lies in the intensity of the EMP. Tests were conducted a few years ago by the NBS (now NIST) on the resiliency of various devices to NEMP. Results were that a typical solar power system could withstand any probable NEMP event with little or no damage to the junctions of the crystal cells. The system charge controller, as well as any sensitive electronics connected to the system (radios, lights, etc.) would bear the brunt of any damage. The cells and batteries in the test were also immune from any disruptions. Placing over-voltage transient suppressors on the wires from the panels helped protect the controller and equipment during the test.

## **MAINTENANCE:**

### ***What should I do in order to maintain my Solar Stik™?***

In addition to regularly wiping the panel surfaces, we recommend periodic use of a silicone OR petroleum based corrosion-inhibitive lubricant on the Solar Stik™. Application should be made primarily at joints, hinges, and base socket as these are the areas that have the most potential for corrosion or abrasion. Occasionally check to make sure the mechanical handles' center screws are snug. Electrical connections should be checked on a regular basis to prevent corrosion and ensure good contact. All electrical connections should be regularly treated with a anti-corrosion treatment.

### ***How long will my Solar Stik™ last?***

The Solar Stik™ is designed to last the service-life of the panels which is 25 years. We have taken every measure to ensure that this is a high-quality American-made product and that you will not have to "upgrade" to keep functional. The Solar Stik™ Breeze will require maintenance on the wind generator about once every 10 years. Replacement parts are available, but with proper care, should seldom be needed.

### ***Could the Solar Stik™ ever rust?***

No... however the Solar Stik™ can corrode. Depending on the environment, one may see a slight discoloration in the metals. This is indicative of corrosion on the surface of the metal. Aluminum will oxidize (especially in a marine environment); this is how it "protects" itself. It will often first appear as a very faint, chalky, white powder... and ultimately the aluminum will assume a darker appearance as it becomes "seasoned". The stainless components are "stain - less" and not "stain- proof". You may find an area of faint surface rust on the stainless steel components, but this is normal. Typically, one does not need to worry about these phenomena. The physical signs of concern are pitting, galling, and cracking. Great care was taken to insulate all of the stainless and aluminum parts from one another, but where screws and bolts are used, direct contact inevitably occurs. TEF-GEL™ was used at these contact points to prevent galvanic corrosion. Regular inspection is recommended.

### ***I see that two types of aluminum are used for the Solar Stik™ Mount and Mast... why?***

Aluminum is available in many grades, and should be chosen according to

the application. We have selected T6061 and T5052 in the construction of the Solar Stik™ and mounts. High grade T6061 is used for rigid structures and T5052 is used for structures that may require custom shaping. The support arms on the Marine Transom Mount are T5052 so that a custom installation can be performed and the arms modified in a bending machine. The socket and mast assemblies are constructed of T6061, and therefore are rigid, not bendable. There is no conflict when these metals contact with one another and both are very strong.

***What grade of stainless steel did you use?***

The stainless steel we used in the construction of the Solar Stik™ are marine grade 304L and 316. Stainless steel is found primarily in the Solar Panel Lifting Arms and supports, the Tripod leg supports, and the mechanical handles.

***The brushed aluminum on my Solar Stik™ is scratched. What can I do to repair the damage?***

Most light scratches in the surface of the brushed aluminum can be repaired with an abrasive or scrubbing pad. Simply rub the pad lightly over the damage until it disappears. Remember to rub the scratch in the direction of the existing brushed finish.

***MODIFICATION:***

***What if I want to install larger solar panels on my Solar Stik™?***

The arms designed for the Solar Stik™ are constructed for the specific panel to which they are attached. They are also designed to handle the loads imposed on the entire assembly by the supplied panels. We do not recommend installing a larger, heavier, panel in replacement of the stock unit as it will compromise the structural integrity of the system, and IT WILL VOID YOUR WARRANTY.

***Can I add additional solar panels to the Solar Stik™?***

The Solar Stik™ was designed to physically support only the two panels supplied with the unit. The Solar Boost™ charge controls however, will handle up to 25 amps of solar charging current. Therefore, if additional solar panels are desired, they may be added elsewhere and wired into the Solar Boost™ charge control with no problem.

### ***Can I paint my Solar Stik™?***

You can paint or powder-coat the aluminum structure of the Solar Stik™, but any painting should be done immediately after purchase, before the unit is put into service. We recommend having the paint applied professionally, as it will ensure proper procedure in preparing the aluminum. It is important NOT to paint the face of the solar panels.

### ***What other items can I attach to the Solar Stik™?***

The Solar Stik™ Mast will support items like antennas, television receivers, radar, GPS equipment, satellite equipment... etc.

### ***Which wind generator should I install on the Solar Stik™?***

The Solar Stik™ has a 1" outer diameter mount located at the top of the Mast and will handle a variety of wind generators. Solar Stik™ packages now include a variety of system [wind generator upgrades](#), and include all necessary mounting hardware. If using a different wind generator, select the wind generator based on blade-span clearance of the solar panels in all positions. Carefully consult the wind-generator literature and dimensions before purchasing a unit, to determine if it will be able to operate safely. Mast-Top Adapters are available as accessories to aid the installation of Mast-top-mounted equipment.

### ***The wind generator I have has a 1.5" mounting fixture and the Solar Stik™ has a one-inch diameter mount at the top. How do I make it fit?***

Some wind generators will not fit the Solar Stik™ unless an adapter is used. A Solar Stik™ Mast Top Adapter can be purchased for use with many wind-generators, or a custom wind-generator adapter can be made by a metal fabricator. When making an adapter, two dimensions will be needed: the length necessary for proper wind generator height and the wall thickness of the material so that the adapter may slip over the Solar Stik™ Mast-top mount and also inside the receiving mount on the wind generator. (NOTE: Be sure to determine the correct height for the wind generator blades so as to safely clear the solar panels during operation in all positions.)

### ***I want to use the Solar Stik™ Mast Top Adapter (the adapter changes the 1-inch Mast top mount into a 1.5-inch pipe) but my wind-generator/radar platform requires a 2-inch pipe. How do I meet the size requirement for my application using the Solar Stik™ Mast Top Adapter?***

Pipe is sized according to a national standard, so PVC pipe fittings will

often fit aluminum pipe. As many wind generators, radar platforms, and other devices may require a two-inch pipe for installation, so a standard 1.5" to 2" PVC pipe bushing may be used. (PVC fittings are widely available at many hardware and plumbing supply stores.) The PVC fitting may have to be cut so that it will "clamp" down against the Mast Top Adapter.

***Can I connect a wind-generator's wiring to the existing Solar Stik™ wiring?***

This is not recommended. The preferred method of installing a wind generator to a vessel's electrical system is through an independent circuit. The MPPT charge control supplied with the Marine Solar Stik™ is designed to handle solar power only. Electrical connections can be added to the Mast for a wind generator.

***How do I choose a plug and receptacle assembly for the Solar Stik™ mast when installing a wind generator?***

The Marine Solar Stik™ has a cover plate over a hole bored into the receptacle plate. This hole and plate can support a number of options that best suit the application. For example, there are many commercially available MARINCO plug and receptacle assemblies (such as Marincos Trolling Motor Plug and Receptacle part number "12VCP") that will fit the existing hole with no modification. If a wire is to be fed through the Mast wall, (such as a coax cable), many gasketed cord holders or grommets may be installed through the cover plate.

***Can I get a motor for the arms so that it will "auto-track" the sun?***

This system is designed for manual operation only. Tracking systems require power to operate and are extremely expensive. If motors were to be added to automatically "track" the sun, the motors' power consumption would greatly reduce the amount of power that is harnessed for the battery bank. Tracking systems are useful in large systems where the amount of energy harnessed is great enough to overcome the loss, but these systems typically generate several thousand watts per hour. Additionally, should a tracking system fail, the effectiveness of the entire system could be greatly impaired. We do not recommend an auto-track system under any circumstances.

***Can I attach other manufacturer's accessories to the Solar Stik™?***

Yes, just be sure manufacturer's instructions are followed during the process. Great care should be exercised if drilling is necessary, as

damage to internal wiring can result. It is NOT recommended that holes greater than 3/4" be drilled into the Solar Stik™ Mast .

***Can I make a longer leash to use between the Solar Stik™ and my RV?***

This is NOT recommended. The length of the leash was determined by the size of the wire and the associated voltage loss. If the leash is longer than 30 feet, the voltage loss will exceed 3%.

***Can I vary the height of my Solar Stik™ in the mount?***

Yes. PVC pipe or fittings can be purchased from any plumbing supply store that will fit inside the base socket. Simply remove Mast from the base or mount, slide in the PVC pipe or fittings, and re-install Mast when complete. It is recommended that the height adjustment NOT EXCEED 6 INCHES. Height adjustment greater than 6 inches may result in an unsafe condition. If greater height is needed, then purchase of the Height Adapter Kit should be considered. Visit the [Marine Galleries](#) to see examples of height modification.

***The Solar Stik™ is too tall. Can it be shortened?***

The Solar Stik™ Mast-top mount was designed to hold an accessory item, but if it isn't needed, it may be cut off and this will shorten the Mast by 5 inches. For example, this may be necessary if the Solar Stik™ is being stored in the lower bay of an RV. Most RV bays are 7 feet across and the Solar Stik™ measures 7'3" with the top-mount in place. The Solar Stik™ may also be shortened from the bottom, but it is recommended that the removal of the Mast base NOT exceed 3 inches. This modification should only be done by a qualified metalworker. In cases where the Height Adapter kit was installed, The 24" extension may be cut to help achieve the correct solar panel operating height. For example, if an additional 10 inches is required to achieve correct operating height, then 14 inches of the Height Adapter extension may be removed.

***My Transom Mounted Solar Stik™ is shaky. What can I do to strengthen it?***

When the Transom Mount is installed to a vessel and the support arms are left at or near full length, the arms may need additional bracing. The Solar Stik™ Bracing Kit is available as an accessory and will help strengthen the overall transom mount installation. It will stiffen the Transom Mount if it is attached to an area where the stern material is thin or flexes, or if the Solar Stik™ is supporting extra weight like a lifting davit, radar, or windgen.

### ***Where can I find a Lifting Davit System or Radar/Antenna Platform that is suitable for use with the Solar Stik™?***

Edson International is a marine manufacturing company that makes many products that will work on the Solar Stik™. Their products can be found at their website [www.EdsonMarine.com](http://www.EdsonMarine.com).

## **POWER PAK / RV PAK:**

### ***Can I jump my car from the Power Pak 12 Volt terminals?***

This is not recommended. Heavy loads that require large current draw (for example: automobile starter motors) should use a larger battery with greater output capacity. Depending on the condition of the automobile battery, the high current draw could trip the 100 Amp breaker or damage the internal components of the Power Pak. It is preferred that the Solar Stik™ and Power Pak be used to recharge the automobile battery over a period of time before attempting to start an automobile, unless it is an emergency.

### ***Can I plug any household appliances into the Power Pak inverter?***

Not all household appliances can be plugged into the Power Pak AC inverter. Only loads requiring less than the 100 Amp Master Breaker or the rated inverter output can be plugged into the Power Pak. For example, if an inverter continuous output capacity is rated at 400 Watts, then you can safely plug in two appliances that consume 200 Watts each. Some examples of acceptable appliances are a small television set, fan, light, small stereo or radio, computers and printers, small power tools, and SOME battery re-chargers. Consult the individual product power ratings (usually found somewhere on the appliance itself) to determine the power consumption. It can then be determined how much of the inverter's output is available for additional loads. Visit the [SOLAR SCHOOL](#) section to learn more about appliance loads.

### ***Why isn't the inverter built into the Power Pak?***

There are many types of power models in use throughout the world. The Power Pak stores 12VDC power and that power is then transformed through the use of inverters and converters to power the appliances. For example, if the Power Pak is being used in Europe, then a standard AC appliance requires 230VAC/50Hz. The same appliance in America will require 120VAC/60Hz. Inverters should be chosen according to the appliances that they will provide power for.

### ***Can I use a different inverter with the Power Pak than the one it comes with?***

Absolutely! The Power Pak has a 100 Amp master circuit breaker and can handle inverters up to about 1200 Watts (maximum continuous). It should be noted that the included Xantrex Micro-inverter is only a small utility inverter, and may not be suitable for larger power draws or sensitive equipment. The inverter should be sized properly and provide the correct waveform to the designated load. Please consult the Xantrex Micro Inverter literature for more details.

### ***Can I operate sensitive electronic equipment from the Power Pak?***

The Power Pak batteries are perfect for operating sensitive DC electronics, but if sensitive AC electronics are to be operated from the Power Pak, then a pure sine wave inverter should be used. The Xantrex utility inverter supplied with the Power Pak uses a modified wave, which is good for most electrical equipment, but may not be suitable for some AC electronics.

### ***Can I recharge the Power Pak from my car, or the DC connections on a generator?***

Yes, but **ONLY IF** the connection on the Power Pak is made at the 12 Volt post terminals and not at the Solar Stik™ leash receptacle. For example, you may recharge the Power Pak batteries by connecting a set of jumper cables to the Pak's 12 volt posts, and then to an external 12 Volt charging source such as your car battery. Don't forget to activate the DC terminal by rotating the "Terminal Selector" switch until it is pointing to the terminal you are using. You can determine the Power Pak's battery voltage by the display on the Solar Boost™ control.

### ***How can improve the daily performance of my Solar Stik™ and Power Pak?***

Turn off electrical appliances when they are not in use. This will save power and allow more to be available when it is needed. Also, make sure that your solar panels are aimed at the sun whenever possible.

### ***Why does the Power Pak have a "twin battery" bank?***

The Power Pak 50 & 100 were designed to operate in remote environments where repairs and spare parts may not be convenient. Although failure is highly unlikely, the "twin battery" design ensures continued operation should one of the batteries fail. In addition, the Power Pak can be rewired to \*provide 24 Volts if necessary. (\*Note: Solar Boost™ charge control only operates at 12 Volts.)

### ***Can I add batteries to the Power Pak?***

The Power Pak "Terminal 2" posts can be used to connect additional Power Paks or other external batteries using ordinary jumper cables or a custom wire harness. Charging additional batteries or Power Paks would allow for more energy storage when conditions warrant. Refer to the Power Pak section for additional details including operation examples.

### ***Where can I get accessory cables for connecting external batteries to the Power Pak?***

Automotive stores often carry pre-made battery cables and they are available in many different lengths and sizes. Simply connect the battery cables between the external battery bank and the Power Pak "Terminal 2" posts.

### ***Does the Power Pak have a low voltage disconnect?***

There is no disconnect-device of any kind in the Power Pak. Most inverters and appliances already have a low-voltage disconnect device that prevents them from being used in the event of a low battery, however, it is still incumbent upon the operator to determine if the Power Pak battery bank is too low for safe operation.

### ***The RV pak has no digital display. How do I know the voltage of my RV battery?***

We recommended that a digital battery voltage meter be installed in the RV.

### ***The Solar Boost™ display only shows 4 amps of "output charge current" during the middle of the day when we normally see 7.5 amps. Is this an indication of a problem?***

The Solar Boost™ charge control is a multi-stage battery charger and operates in three modes: "bulk", "acceptance" and "float" (see Solar Boost™ manual for additional details). The amount of current the batteries can take are affected by things such as temperature, battery state of charge, and more. The Solar Boost™ compensates for these factors when giving the batteries charge current, therefore, even during the middle of the day when your Solar Stik™ is capable of producing 8 Amps, the Solar Boost™ display will only show what is actually being put into the batteries.

***I need to use my Power Pak 24 hours a day for 2 weeks at my home. How do I ensure that the Power Pak will last that long with multiple appliances continuously operating?***

The Power Pak works in conjunction with the Solar Stik™ to support continuous power draw for multiple days. The Solar Stik™ will produce as much as 80 to 100 Amp-hours daily, so if an appliance is operating 24 hours a day from the Power Pak, it should not consume more than 40-50 Amp-hours of energy in a 12 hour period. This will ensure that the Solar Stik™ will be able to "keep up" with the appliances connected to the Power Pak in a 24 hour cycle. Consult the [SOLAR SCHOOL](#) in the "Education" section to learn more about determining a specific appliance's power consumption.

***When I try to run heavy-duty loads from the inverter, it makes noise and sometimes won't work. Why?***

The supplied inverter has a "low-battery-alarm" feature that will sound at about 11.0 Volts DC, and that it will completely shut down when the supply voltage from the PAK drops below 10.5 Volts. If the load that is placed on the inverter is more than it is rated output, it will sound an alarm and cease providing power.

***The Power Pak Voltage reading fluctuates when operating heavy duty loads from the Power Pak. Is this normal?***

Yes, a fluctuating reading is normal. If you monitor the current and voltage in a battery-based DC system, you will see that current and voltage appear inversely related. The higher current flow from the battery, the more the voltage will naturally drop. This is because of the drop in Electromotive Force when a load is placed on a battery. Electromotive Force (Voltage) is the amount of "push" behind electrical current flow. Think of the battery as a steam kettle. The heat of the water represents the battery state of charge, and the steam pressure represents the voltage. The heat and pressure are directly linked. As the temperature (state of charge) rises, so does the steam pressure (voltage) within the kettle. When a load is placed on the battery, it is like opening a valve through which the steam flows, and naturally the steam pressure (voltage) inside the kettle will drop and the heat is reduced in the kettle.

***Why is the run time for heavy loads shorter than if I were operating light loads from the Power Pak?***

It is important to remember that a battery holds a certain amount of power. The time duration for operating heavy loads from the batteries is shorter

than operating light loads from the Power Pak. A combination of finite power storage and a drop in the battery's Electromotive Force both play a role in the duration of load operations. Lighter loads will naturally operate for extended periods as it allows the battery voltage to remain higher as the battery is discharged. For Example, if the Power Pak battery voltage is at 11.5 volts, the operator can only run a heavy load for a few minutes, where as a light load could run for hours.

**OPERATING TIP:** When heavy loads are placed on the PAK, the supplied inverter can be left connected to the active "Terminal 2" posts with the inverter power switch in the "on" position. This will notify the operator when the PAK's batteries are low by sounding the inverter "low battery" alarm. Consult the respective inverter manual for operating information and safety information.

***In light of evolving battery technologies, why was a lead-acid battery chosen instead of a more exotic battery such as a lithium-ion cell?***

The primary reason for the selection of a AGM lead acid battery is the versatility. A lead-acid AGM battery will operate successfully in a much wider range of temperatures, and it will also accept a much wider range of charging conditions. Additionally, the lithium-ion battery has an extremely high cost. While there are many new battery technologies emerging in the marketplace, the operating parameters and the cost of using the new technologies does not currently render it "effective" for employment with the Solar Stik™ System.

The Solar Stik™ System produces 12VDC power ranging from 8-25 amps in "Single" or "Expanded" configurations. Additionally, the adaptability of the system may require that it be subjected to recharging from vehicles or AC battery chargers. Exotic battery cells often require special charging conditions, which prevent them from being used as a good 12VDC battery for operations requiring versatility and adaptability often found during "real-world" conditions. Additionally, the operating environment (temperature) is much more confined when using exotic batteries, making them more prone to failure when used in extreme heat or cold.

***INSTALLATION:***

***I've seen the Solar Stik™ and it looks too big and heavy to fit on my boat.***

The Solar Stik™ weighs a maximum total of about 80 lbs. when fully

assembled, roughly the equivalent of a ten year old child. The "footprints" of the installed Transom Mount system and Deck Mount system are small, and when the Solar Stik™ is deployed for use, the solar panels will be above the "operational" area of the deck. The system was originally designed for sailboats in the 25' range, but has since been used successfully on 60'+ boats.

### ***How long does a typical installation of the Marine Solar Stik™ take?***

The Transom Mount System installation is basically a "bolt-on" process and usually takes 3-4 hours to complete. The installation of the Deck Mount System is a more complicated process, often requiring fiber-glass work or welding, and will take longer.

### ***Do I need a charge controller for my Marine Solar Stik™?***

We HIGHLY recommend that the supplied charge controller be installed to regulate the power to your batteries. Direct connection to the battery bank from the Solar Stik™ could severely damage your batteries by overcharging, leading to battery leakage, reduced life, and reduced panel efficiency.

### ***How do I drain the Solar Stik™ Deck Mount system below the deck level?***

The Deck Mount comes with a single drain hole in the middle of the bottom. If this hole is not to be used for drainage, then caulk the hole shut. We recommend that a drain be placed in the bottom of the mounting socket, whether it is at the side or off-center on the bottom. The wall thickness of the Deck Mount will allow for placement of a hose-barb fitting so that it may be drained overboard.

### ***Who can install a Solar Stik™ on my sailboat?***

We recommend that the Solar Stik™ be professionally installed by a licensed marina or boatyard. However, it is in the realm of ability of many sailors to install this unit correctly. A careful and detailed installation of this unit is ABSOLUTELY NECESSARY. If you are not capable of performing a proper installation yourself, please seek professional help from the shop of your choice. Solar Stik™ instruction manuals are available for download from this website and will help in finding a qualified installer by allowing you to review the installation process with them directly from the manual before any work is performed.

***Once the Solar Stik™ Transom Mount is fitted to my boat, can I weld the arms together rather than drilling and pinning them together?***

Absolutely! Although the "drill and pin" method is strong and safe, welding will give the mount a true "custom" finish. All marine materials are brushed, anodized T5052 aluminum and additional metalwork can be added to suit the vessel-owner's specific needs.

***Can I install a marine Transom Mount Solar Stik™ on my RV?***

This is NOT recommended.

***Can I use the same Solar Stik™ for my boat and my RV?***

The Solar Stik™ can "multi-task" by adapting to any of the mounting systems available for it. For example, the same Solar Stik™ can be used for your boat and your RV. Both a marine mount and a tripod must be purchased for use with the system, which can easily be transferred between the two mounts as needed.

***What size wire and fuse do I need to use when installing the Solar Stik™?***

The Solar Stik™ produces about 8 amps when it is operating, and therefore we recommend that it should be wired to the battery bank as a 10 amp circuit with a 15 amp in-line fuse. Consult a "wire-sizing" gauge to determine the proper wire size that corresponds to the wire harness length between the Solar Stik™ and the batteries (including the location of the charge control).

***Do I need to install blocking diodes into my system?***

The solar panels come factory-equipped with blocking diodes. No additional diodes are necessary.

EDUCATIONAL MATERIALS AVAILABLE FOR DOWNLOAD FROM  
[WWW.SOLARSTIK.COM](http://WWW.SOLARSTIK.COM):

**SOLAR SCHOOL** – the basics of a DC electrical system

**BATTERY SCHOOL** – all about lead-acid batteries

**A SYNOPSIS OF THE SOLAR STIK™** – how the Solar Stik™ works

**FREQUENTLY ASKED QUESTIONS** – all about the system & how it operates