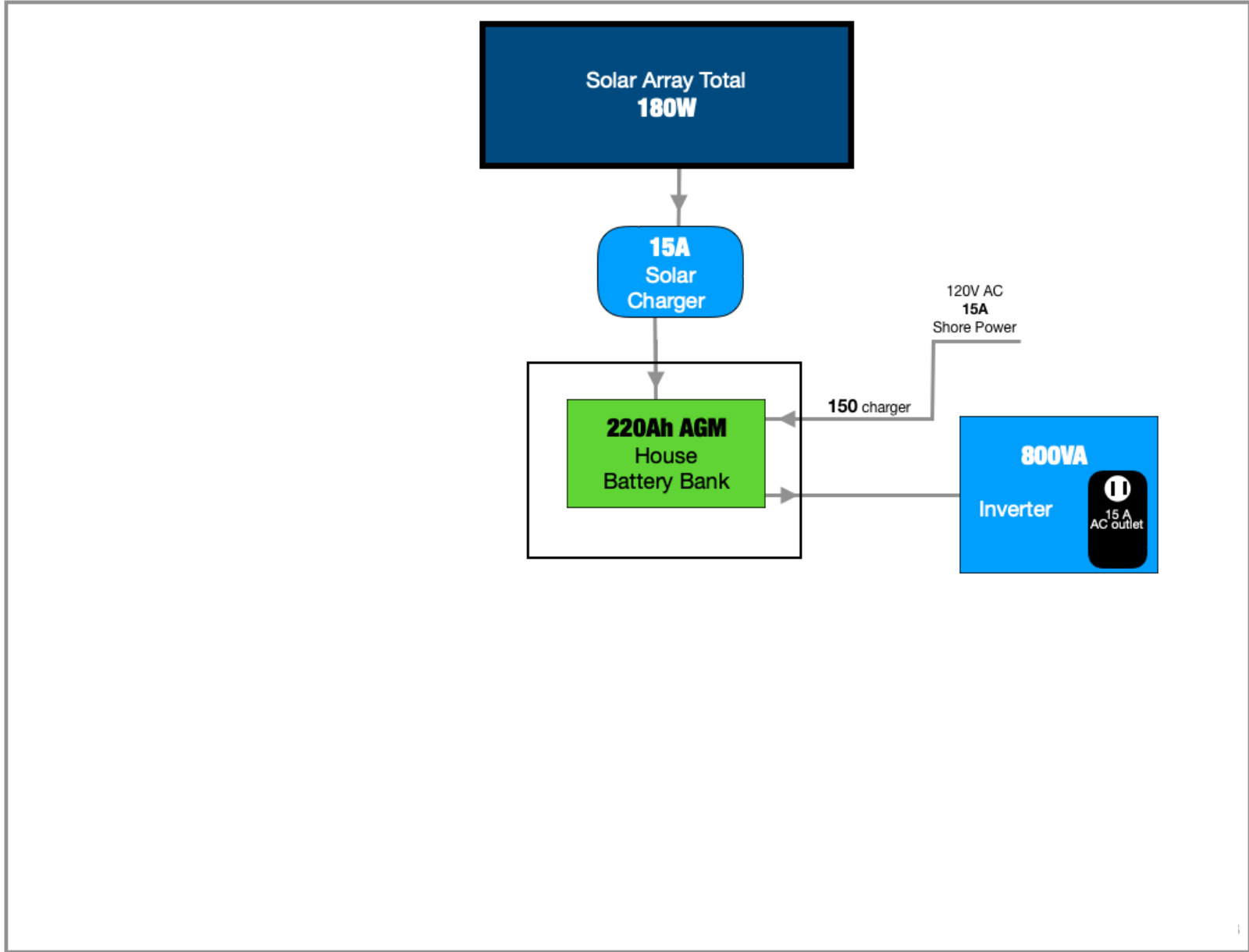




# Installation Guide



Online Guide



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## General Guidelines and Tips

Congratulations on your purchase of a power system designed by AM Solar! We have assembled this kit to take the guess work out of putting together a complete solar solution. Now the fun begins - It's time for installation. Please read the guidelines below to help ensure a smooth project completion.

### **Stay safe**

Remember that you will be working with both AC and DC power, so whenever possible avoid working with "live" components. Always use caution when working with electricity. When this guide is followed, you'll have a safe and successful installation. Be careful, not frightful - The installation can be fun when following these instructions and not cutting corners.

### **Keeping a realistic time frame for installation is important**

This installation might take 4 to 5 days for an experienced AM Solar technician. So, establishing a realistic goal for completing the installation is helpful and avoids rushing aspects of the project. You'll want to stay consistent with your work beginning to end, without the need to rush.



### **Don't rush the layout and planning of component placement**

The design/layout part of your build is the most important thing you'll do. Skoolies, by design, are great since they start empty and give you many different installation options. Grab some chalk, cardboard, rope and a ball of string - We're going to make some component placement templates. Use chalk to outline spots for smaller items such as breakers and the fuse panel. Use the string to make the small wire runs, rope for heavy gauge, and label them (tape and stickers works well). Then layout the all the components that fit the interior of your rig to prepare for installation.

### **Keep it organized**

Stay organized by making your work tidy and well planned. Read the included product guides / instructions and **ABC** (Always Be Checking). If you are installing and find that something was missed during your layout and planning and can't be installed correctly or safely, don't worry! Just backtrack to that stage in your layout design, and find an alternative placement before moving forward.



### **Making it last**

No matter how long you plan on keeping this kit, it's only going to be useful and have value if it's in good order. This equipment doesn't react well to neglect or abuse. When planning and performing the installation, use proper technique and plan for the long run. Using duck tape to secure a part in place might be a good emergency fix, but you'll want to start as "clean" as possible from the beginning.



### **Component Proximity**

Always keep high current lines as short as possible. The battery to inverter cable should be under 10 feet, 5 feet would be ideal. If you are mounting all the equipment in a very small area, be aware of the distance between all "connection points" - If a component comes loose and shifts for any reason, you will want to ensure it will not result in components touching each other and possibly causing a short.



## Suggested Tools For Installation

Here is a list of some of the tools that might be needed for your installation. If you feel this list is too ambiguous or potentially intimidating, now would be a great time to schedule your installation work with the professionals at AM Solar.

- Sturdy Ladder
- Hammer Crimper
- Hammer
- Heat Gun
- Wire Crimper
- Wire stripper
- Cable Cutter
- Multimeter
- Screwdriver
- Smartphone
- PC
- Drill
- Box knife
- 91% Isopropyl Alcohol
- Cleaning rags
- Crescent wrench
- Safety glasses





# Bill Of Materials



SOLAR PANELS



PHOENIX INVERTER

	QTY	AMS PN	Description
SOLAR CHARGING	2	SOLAR-ZS90S	Solar Panel Z90 Short
	2	93C-ZCBNR	Zamp Plug & Strain relief for C-Box
	8	MOUNTA-35	Mount Adapter-35mm
	4	MOUNTL-3	L Foot-3 Hole
	4	MOUNTL-T3	L Foot-Tall 3 Hole
	8	FSTBLT-TKNOB	T Mount Knob
	2	FSTSET-ZAMP	Mnt Hardware for Zamp Panels, set of 4
	8	FSWASH-FLT-5/16	Flat Washer 5/8 OD- 5/16 ID S
	8	FSWASH-SPL-1/4	Washer-Split 1/4" SS
	16	FSTSCW-1034SS	Screw-#10x3/4" PHP SMS SS
	20	TAPE-VHB	3M VHB Tape-4950
	1	SEAL-SKF	Sikaflex 221
	1	20-ROOF	Roof Combiner Box
	1	CCTLR-VT-MPPS-7515	Victron BlueSolar Smart MPPT 75/15 (15A)
	30	CABLE-8GA-2-R&B	Duplex-8/2-R&B
	1	92C-INTR	Interior Wire Harness Acc. Kit
	1	93T-NEG-8GA	8ga Negative Terminal Kit
1	93T-POS-8GA	8ga Brkr Pos Term Kit	
1	93B-030A	30 Amp DC Brkr. w/Screws	
BATTERY	1	MONITOR-VTBMV-S	Victron Battery Monitor BMV-712 Smart
	1	TEMP-VTBMV	Victron Temperature sensor for BMV-700 series
	2	BATTAGM-06-220AH	AGM-GPL-4CT 6V 220Ah
	4	LUG-4/0-RING-3/8	4/0 Lug-3/8" Ring
	3	93H-B3/4	Heat Shrink Black 1.5" x 3/4"
1	93H-R3/4	Heat Shrink Red 1.5" x 3/4"	
2	CABLE-4/0-1-BLK	Cable-4/0	

	QTY	AMS PN	Description
AC INPUT & OUTPUT	1	INV-VT-800	Phoenix Inverter 12/800-120V NEMA 5-15R
	4	FSTSCW-1034Z	Screw-#10x3/4" PHP SMS Z
	4	FSWASH-FLT-1/2	Flat Washer 1/2" OD- #10 ID Z
	5	CABLE-4GA-2-GRY	Duplex-4/2
	1	93T-NEG-4GA	4ga Negative Terminal Kit
	1	93T-POS-4GA	4ga Brkr Pos Term Kit
	1	93B-120A	120 Amp DC Brkr. w/Screws
1	CHGR-VT-IP65-15	Victron Blue Smart IP65 Charger 12V/15A 120V	



BATTERIES



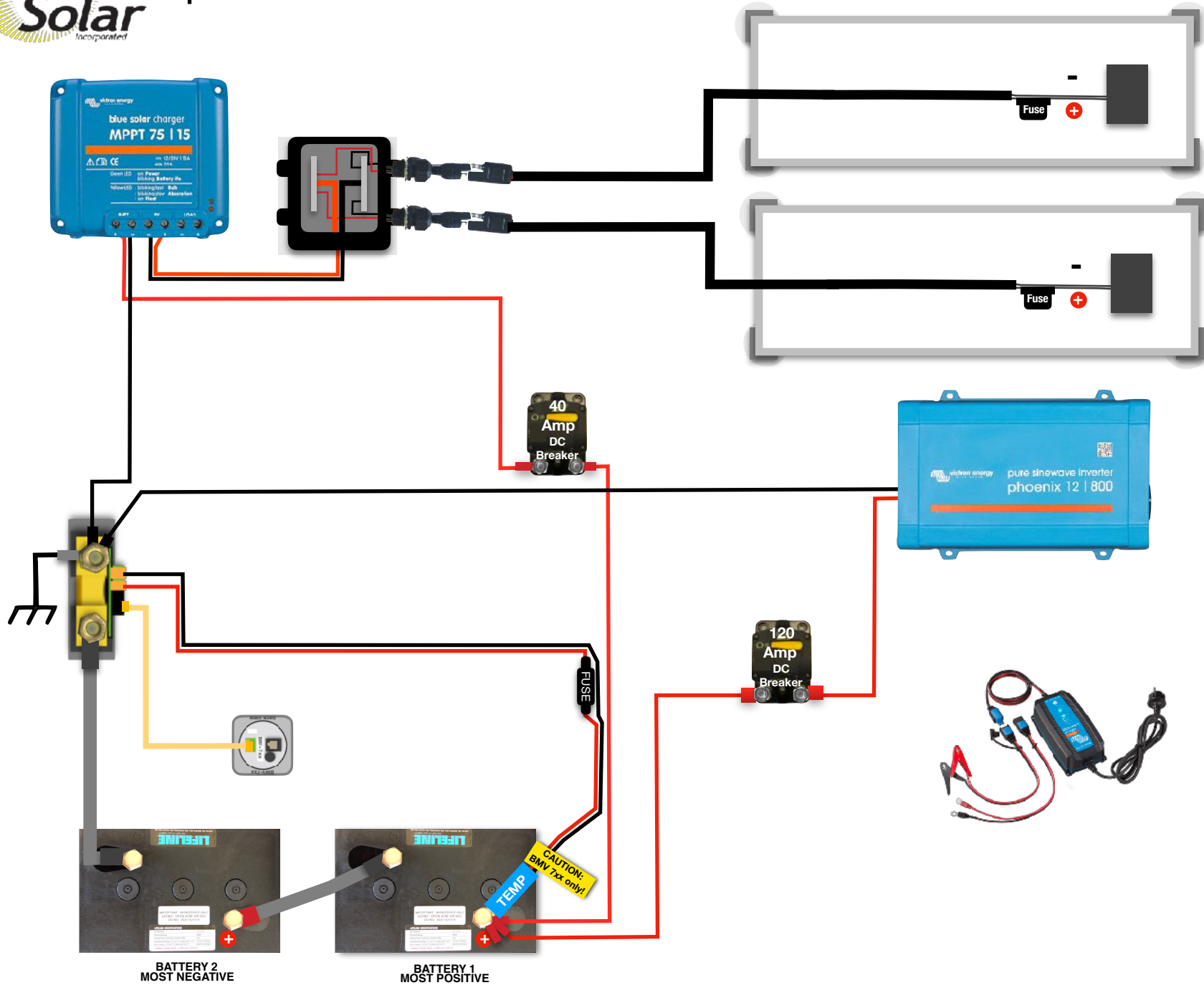
BATTERY MONITOR



IP65 CHARGER



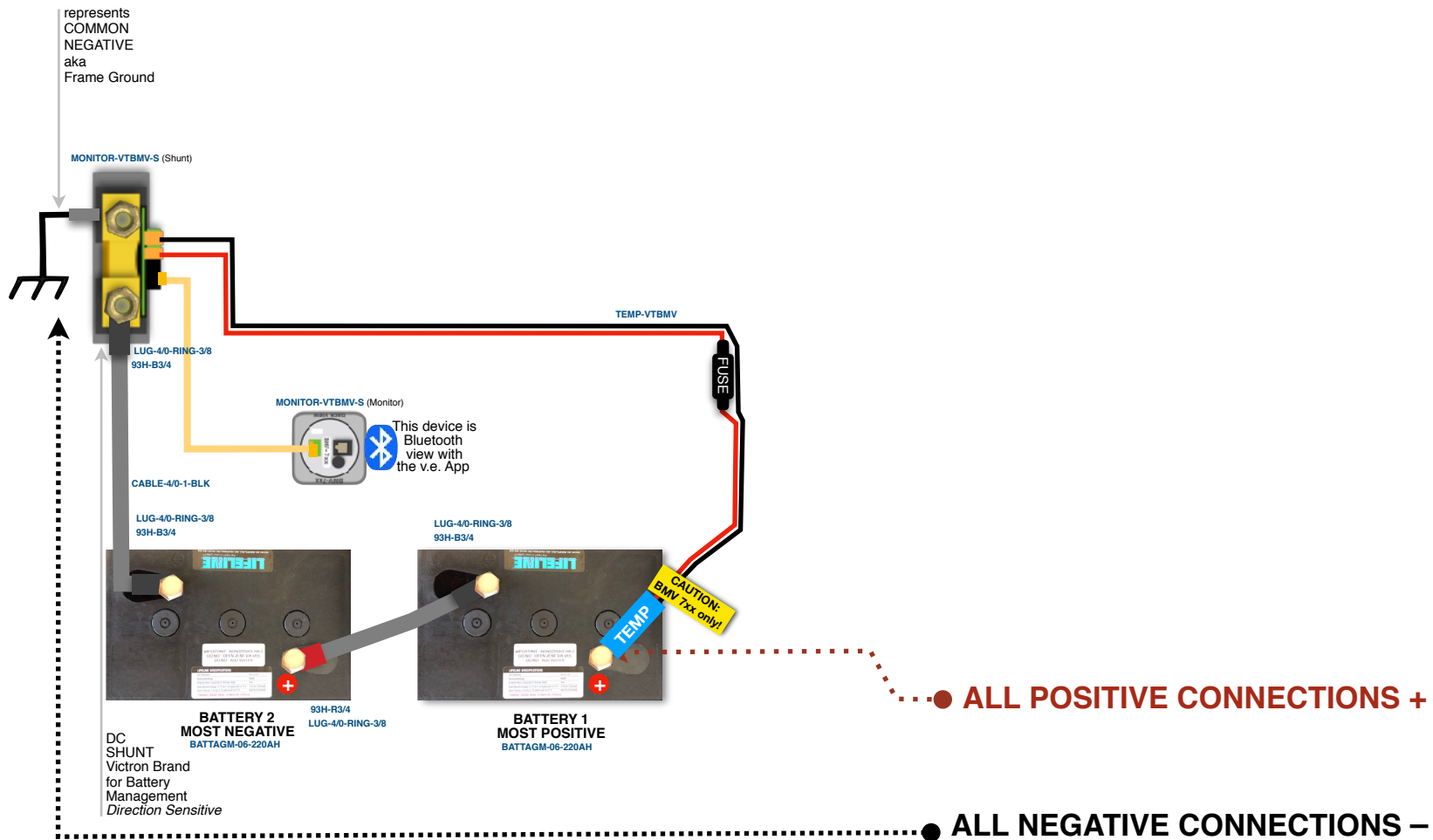
Complete Schematic

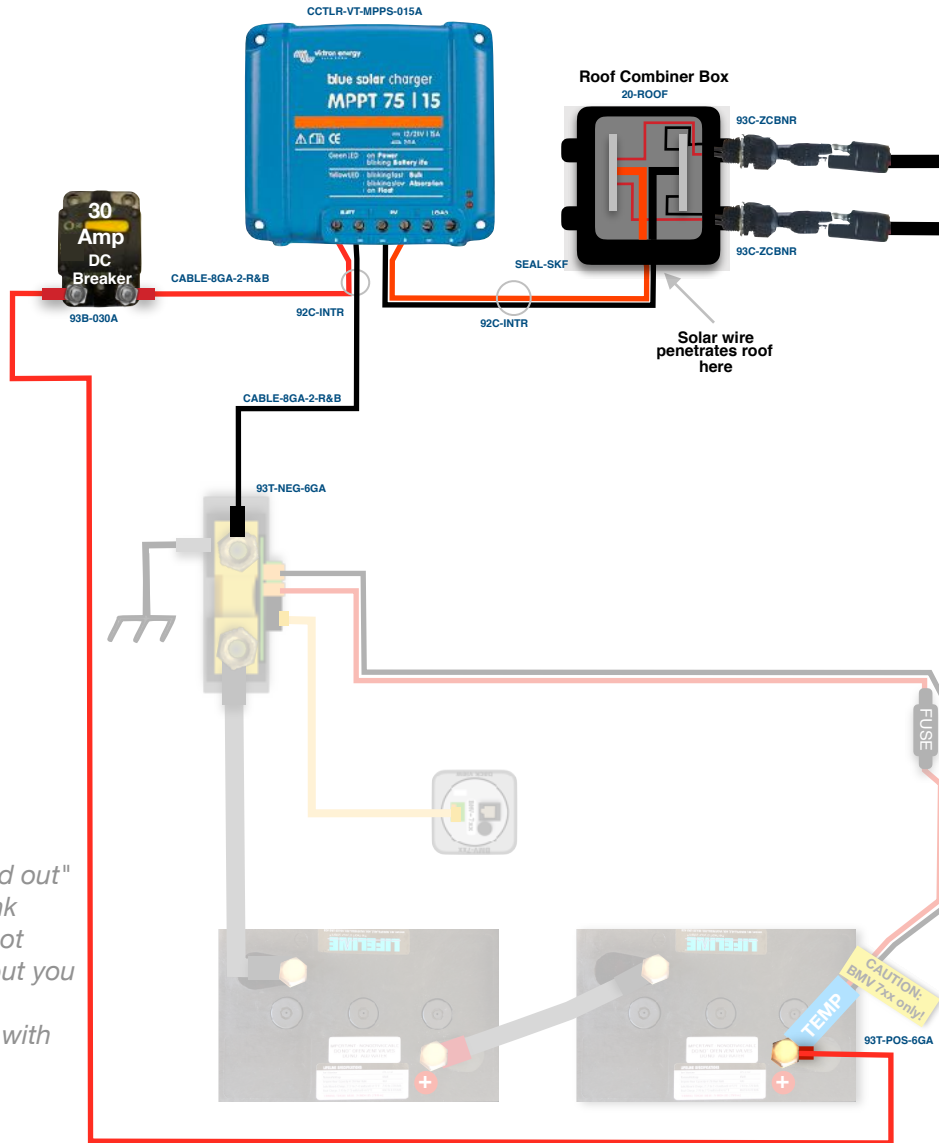




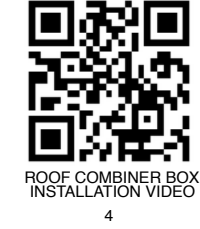
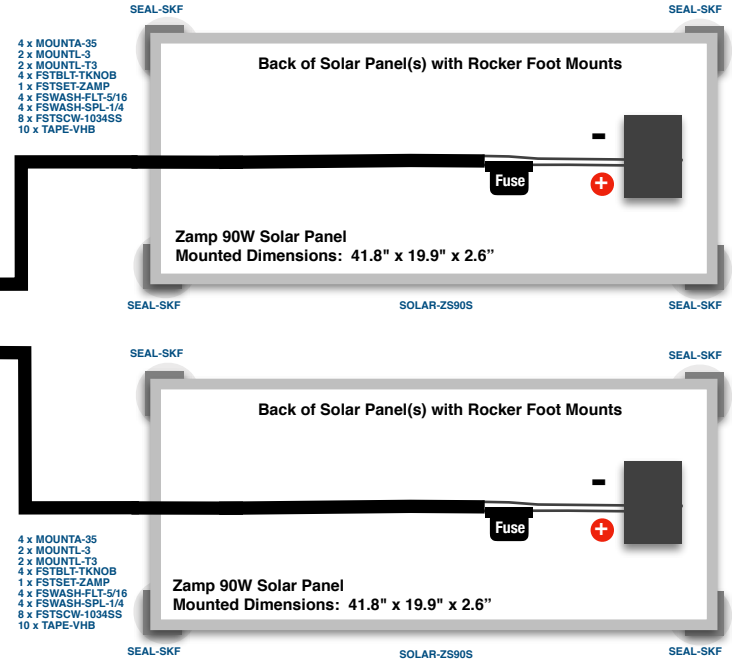
# Battery Bank

The battery bank is the heart of the system. Its components usually take up the most space and all other subsystems connect to it. That's why we recommend installing it first. This battery bank consists of two 200Ah AGM Batteries. The Bluetooth battery monitor reads all charging and discharging current through a shunt and is able to interpret that data to compute battery usage, remaining energy, percent charge, etc. When a shunt is used, the load side of the shunt becomes the new negative battery terminal and no negatives will connect to the actual battery.





**NOTICE:**  
The "greyed out" battery bank items are not included, but you will be interacting with them.



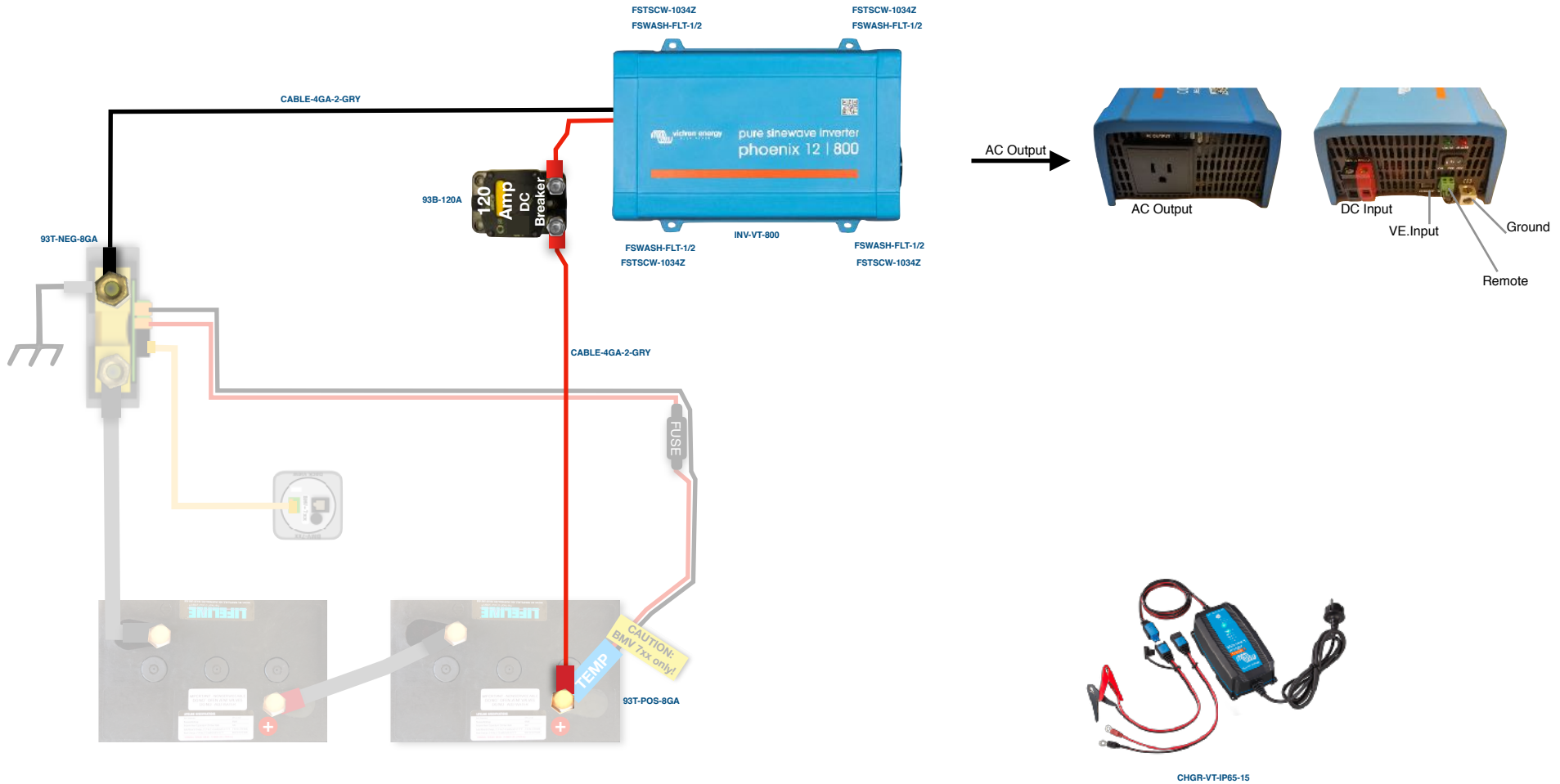




# AC Input & Output

The AC Input/Output system is capable of plugging into a standard 30A shore power outlet. (Note: Adapters from 30A to 15A outlets can be purchased at hardware or RV supply stores). The shore power charges the battery bank and can also be passed through the inverter to the AC loads. If the loads draw more current than the shore power connection can provide, the inverter can meet the demand up to the rating of the inverter by simultaneously drawing from the battery bank. When not plugged into shore power, the inverter will draw from the battery bank to power the AC loads. When not in use, save energy by turning off the inverter via Digital Multicontrol included in the kit.

**CAUTION:**  
Household alternating electricity (AC) is dangerous. Use care and common sense.



### IMPORTANT NOTICE:

ALL the "greyed out" items are not included. You will need to interact with them.



## Programming Your BMV-712 Smart Battery Monitor for AGM Batteries



### Program Settings for AGM Batteries

- **Battery Capacity:** Enter the total battery capacity in Amp Hours.
- **Charged Voltage:** 14.1
- **Tail Current:** 2%
- **Peukert Exponent:** 1.12
- **Charge Efficiency Factor:** 97%
- **Aux Input:** "Temperature"
- **Temperature Unit:** "Celsius" or "Fahrenheit"

### Programming on the BMV-712 Battery Monitor in the Victron Connect App:

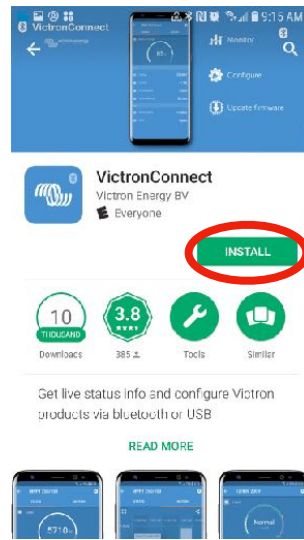
1. Download "VictronConnect" from the Google Play Store (picture 1).
2. Turn on your Phone's Bluetooth, and get as close as possible to your Victron Component(s).
3. Open the Victron Connect app, and after it takes a moment to scan it will recognize your BMV-712.

NOTE: If your device is not shown, it is probably signal interference. Try closing the app and moving to a different location before re-entering the app in a location that can pick up the BMV's signal.

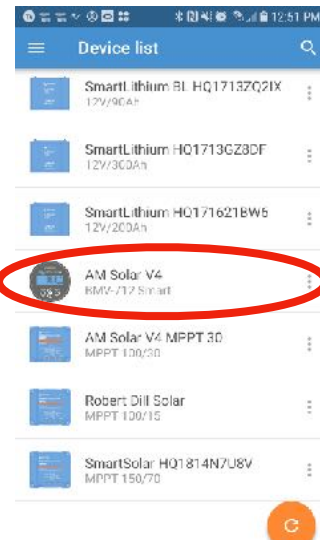
4. Select the BMV-712 on the Device List (picture 2).
5. Press the gear icon in the top right corner (picture 3).
6. Enter "Battery" and change the values to match the colored box at the top right (screen shown on picture 4):

7. **Changing Battery Capacity:** Enter the number of Ah of your entire battery bank
8. **Charged Voltage:** 14.1
9. **Tail Current:** 2%
10. **Peukert Exponent:** 1.12
11. **Charge Efficiency Factor:** 97%
12. Go back to Settings, enter "Misc"
13. **Aux Input:** Select "Temperature"
14. **Temperature Unit:** Select "Fahrenheit"
15. Exit from settings, you have completed programming.

NOTE: Only one phone can be connected to each device at a time. Be sure to completely disconnect and close the app to log out.



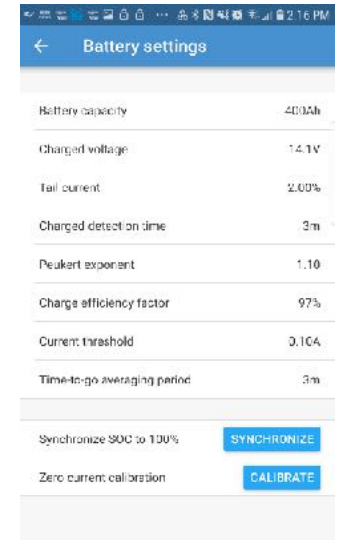
1



2



3



4

NOTE: To change the PIN code from the app, go back to the device list page in the app. Click on the three circles to the right of your device, and select "Reset PIN code".



Programming / Commissioning Your System - The Charge Controller



Charge Control Settings for AGM Batteries:

1. Download the "VictronConnect" App to your phone.
2. Open the App.
3. You'll see a selection for your SmartSolar MPPT Charger, select it.
4. Type **000000** to login for the first time.  
NOTE: To change the PIN code, go back one step to the main screen. Click on the 3 buttons to the right of the controller image, and select "Reset PIN Code".
5. Click on the **gear** in the top right corner.
6. Click on "Battery".
7. Click on the settings and adjust them accordingly to match below:
  - Battery voltage: 12V
  - Max charge current: 15A
  - Use default charge settings: OFF
  - Charger: ON
  - Absorption voltage: 14.40 V
  - Absorption Time Limit: 02:00
  - Float voltage: 13.30 V
  - Equalization voltage: 15.20 V
  - Auto Equalization: DISABLE (OFF)
  - Temperature Compensation: ON
  - Temperature Compensation: -20.00

**Victron BMV-702 & BMV-712**

- 02. Charge Voltage
- 03. Tail Current
- 05. Peukert Exponent
- 06. Charge Efficiency Factor

	Flooded	Lifeline AGM	Victron Lithium
02. Charge Voltage	14.2V	14.1V	13.9V
03. Tail Current	4%	2%	2%
05. Peukert Exponent	1.25	1.1	1.1
06. Charge Efficiency Factor	94%	97%	98%

**Victron Blue Solar MPPT with Bluetooth or MPPT Control**

- Absorption Voltage
- Absorption Time limit
- Float Voltage
- Equalization Voltage
- Auto Equalization
- Temperature Compensation
- Temperature Compensation

	Flooded	Lifeline AGM	Victron Lithium
Absorption Voltage	14.60V	14.40V	14.20V
Absorption Time limit	2:00	2:00	1:00
Float Voltage	13.40V	13.30V	13.50V
Equalization Voltage	15.20V	15.20V	14.20V
Auto Equalization	OFF	OFF	OFF
Temperature Compensation	ON	ON	OFF
Temperature Compensation	-20.00mV/°C	-20.00mV/°C	

**Victron Blue Solar MPPT Dial Setting (not preferred)**

Dial	Flooded	Lifeline AGM	Victron Lithium
Dial	7	2	7

