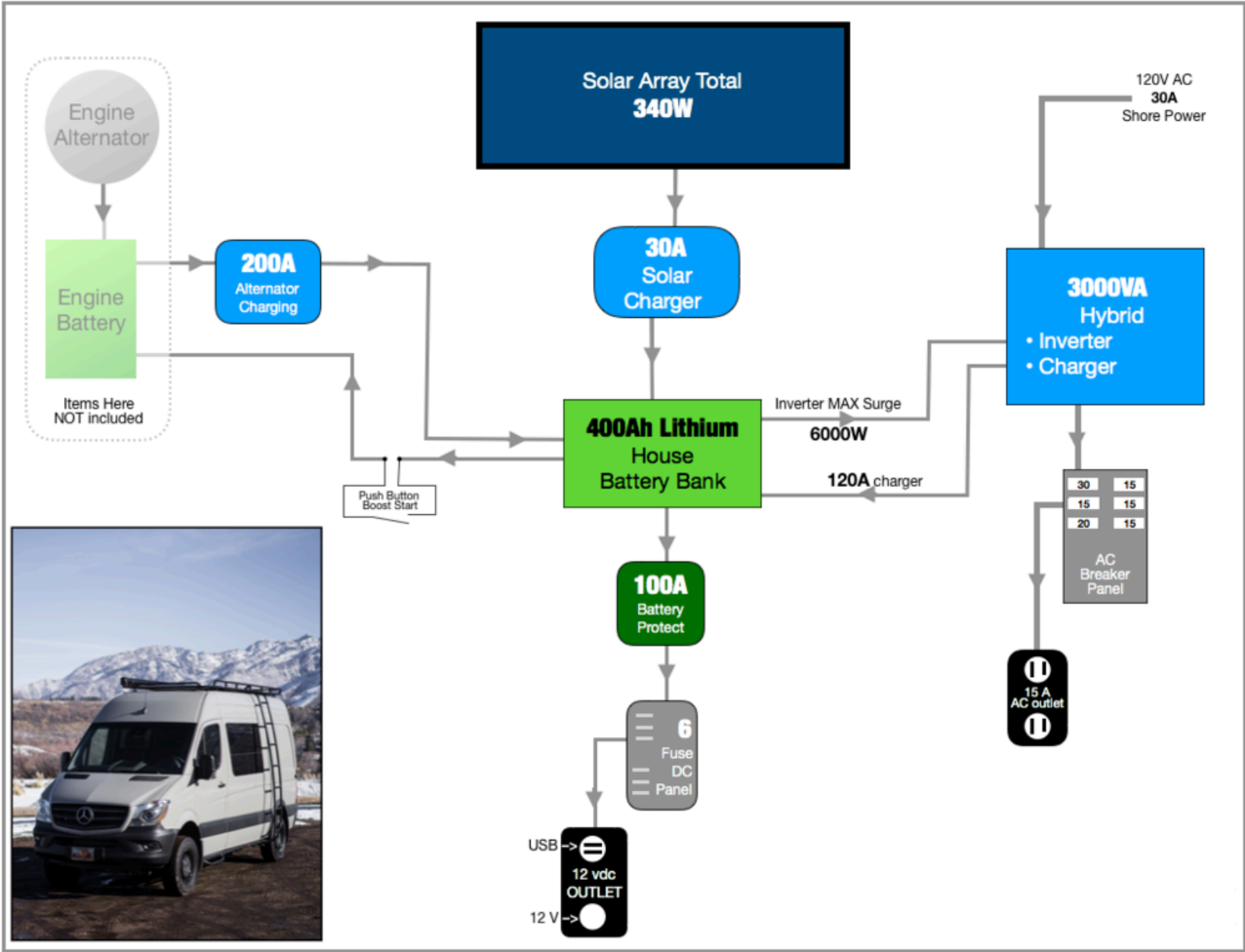




Installation Guide



Website Link



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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.

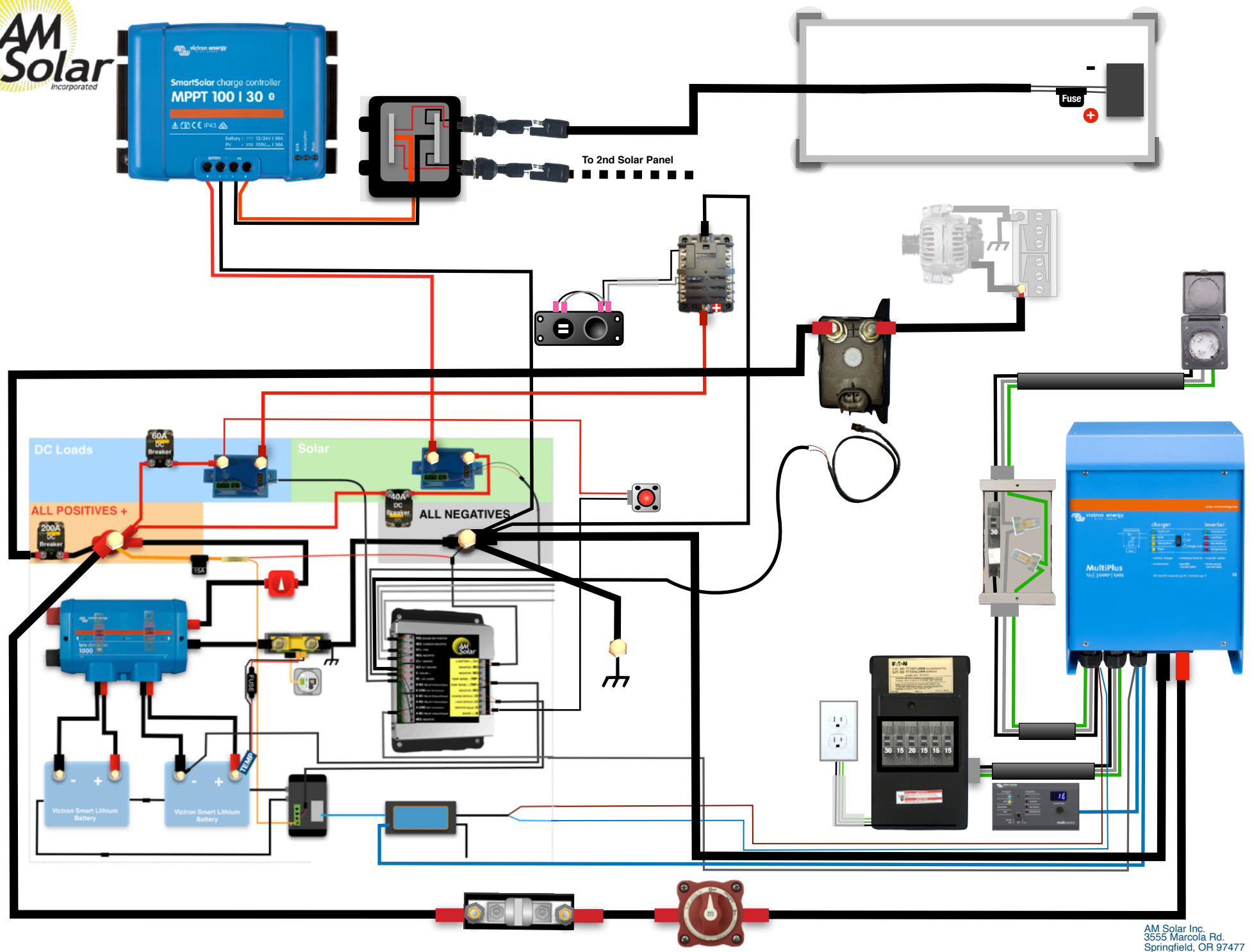


## Suggested Tools For Installation

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.

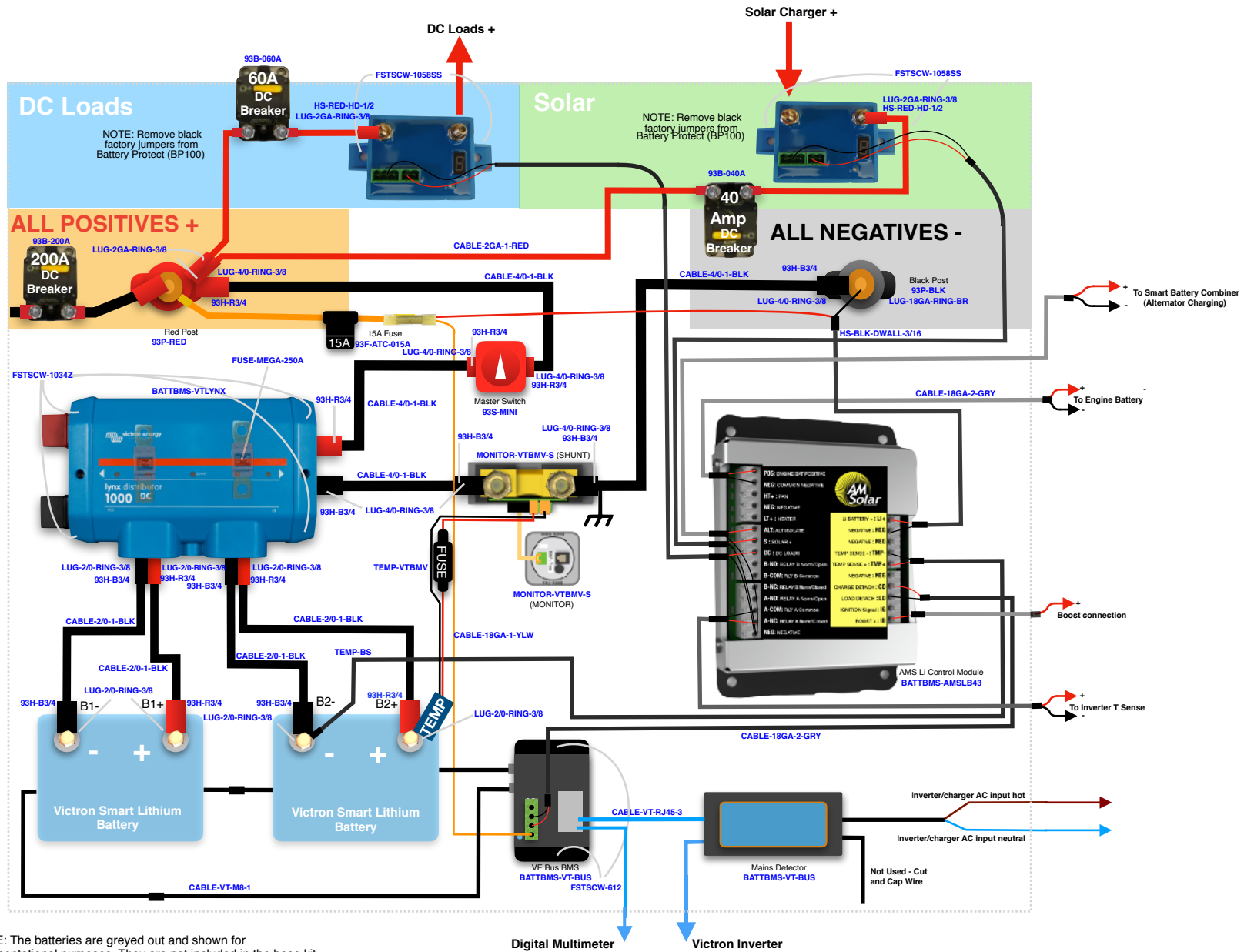
- Sturdy Ladder
- Hammer Crimper
- Hammer
- Heat Gun
- Wire Crimper
- Wire stripper
- Cable Cutter
- Multimeter
- Screwdriver
- Smartphone
- Drill
- Box knife
- 91% Isopropyl Alcohol
- Cleaning rags
- Crescent wrench
- Safety glasses

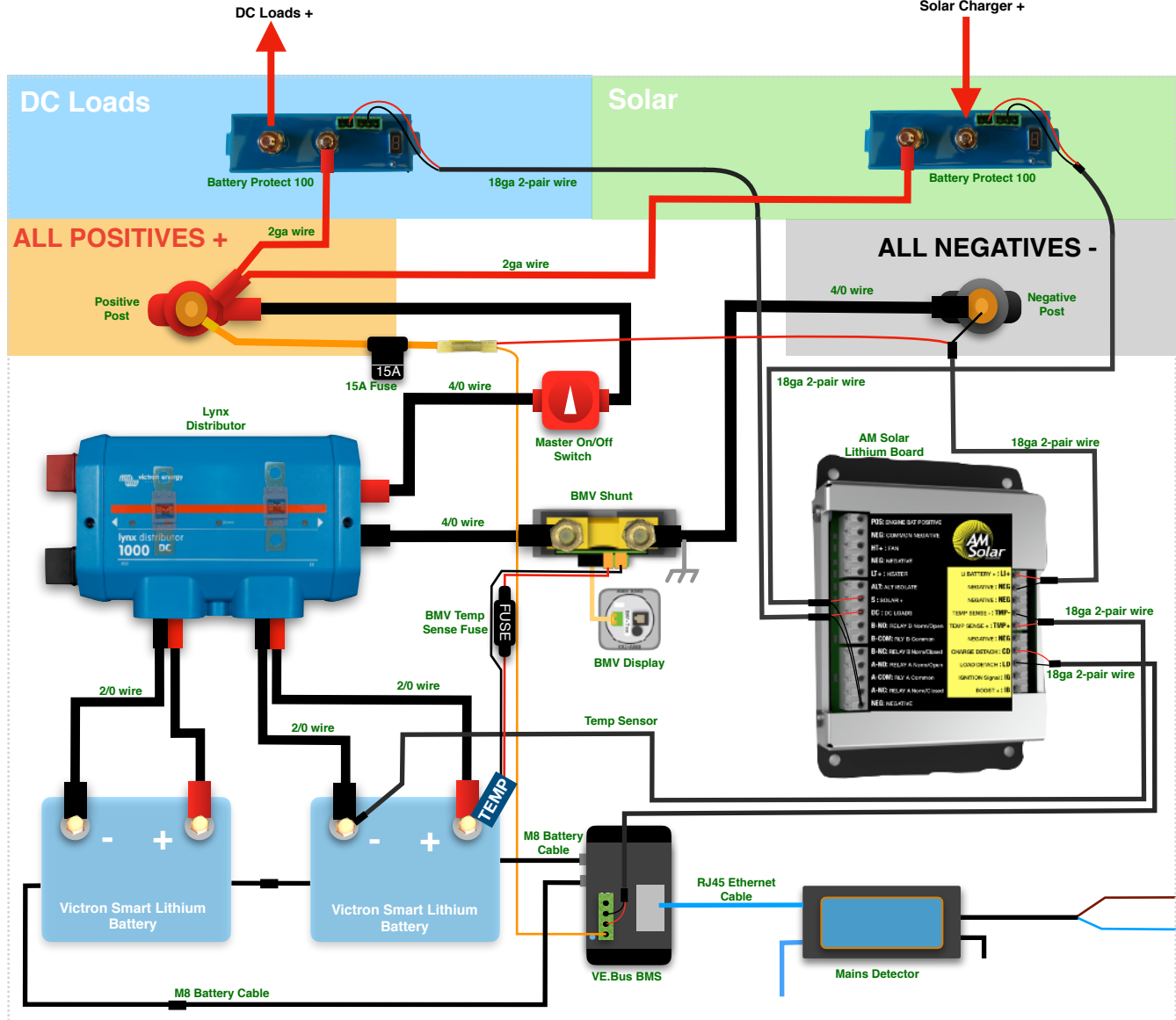


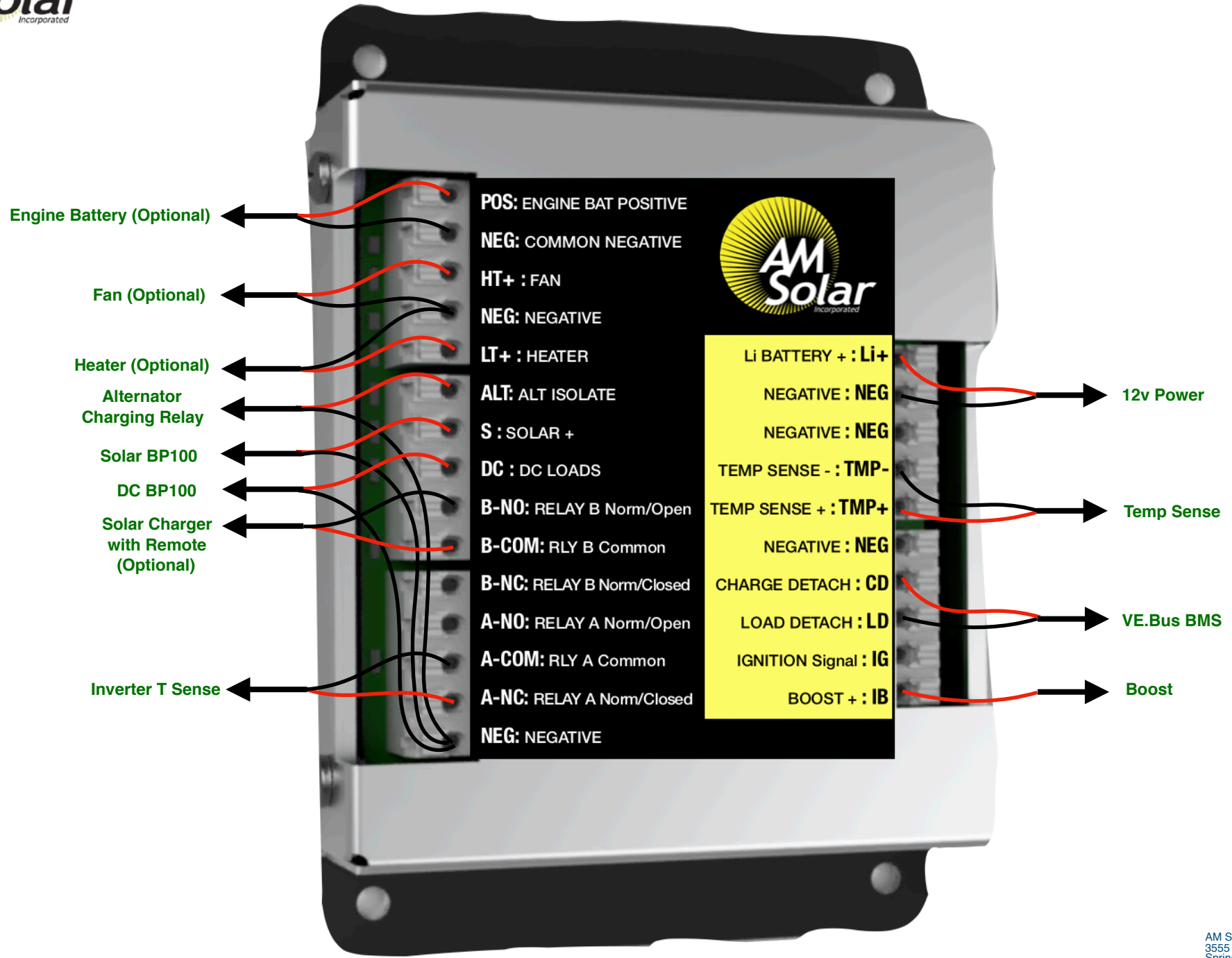




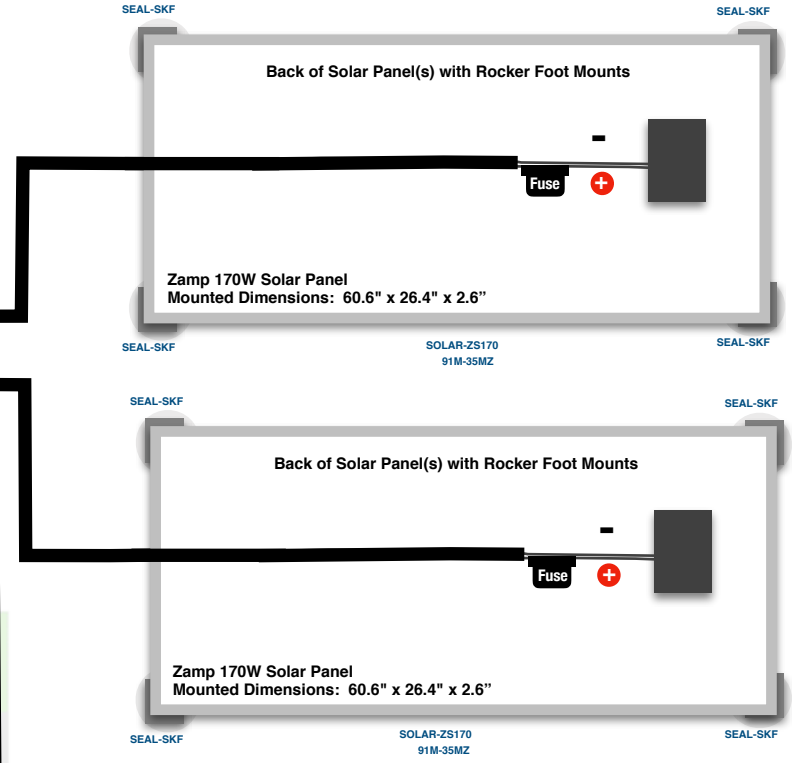
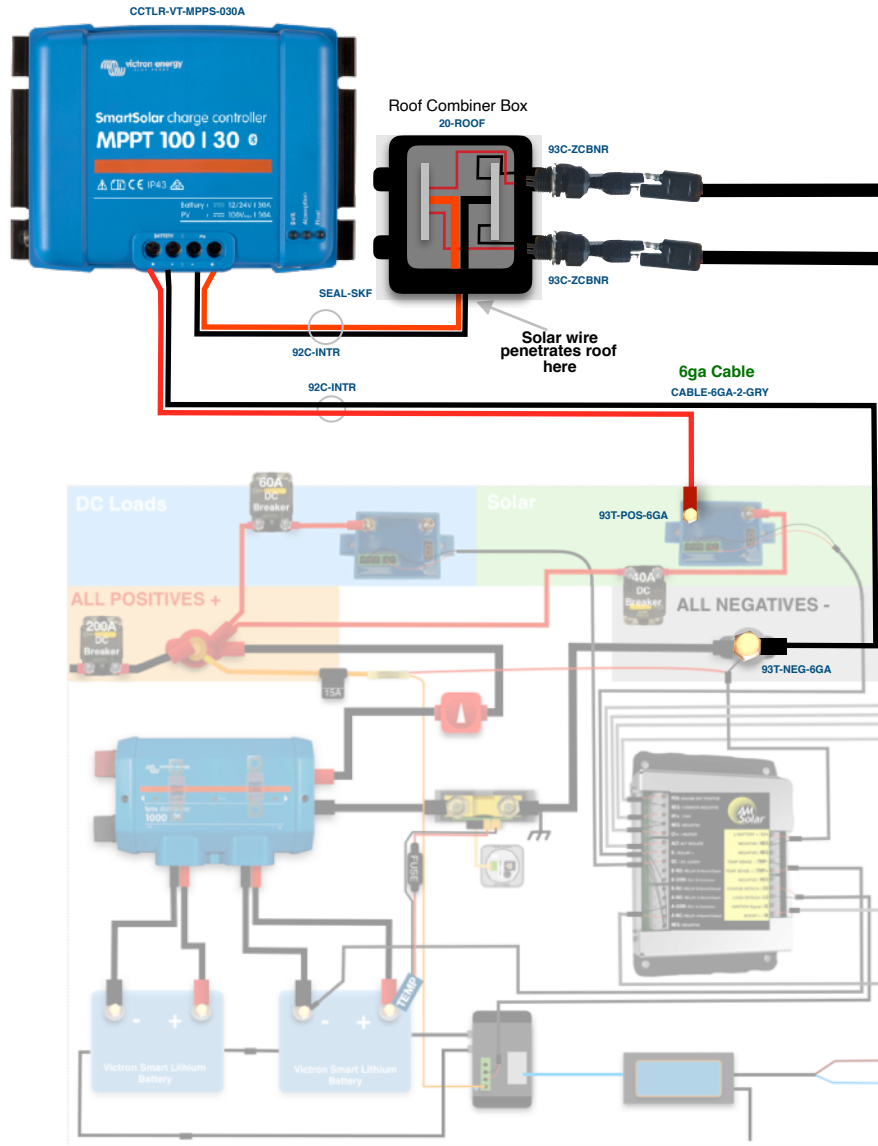
## Battery Bank





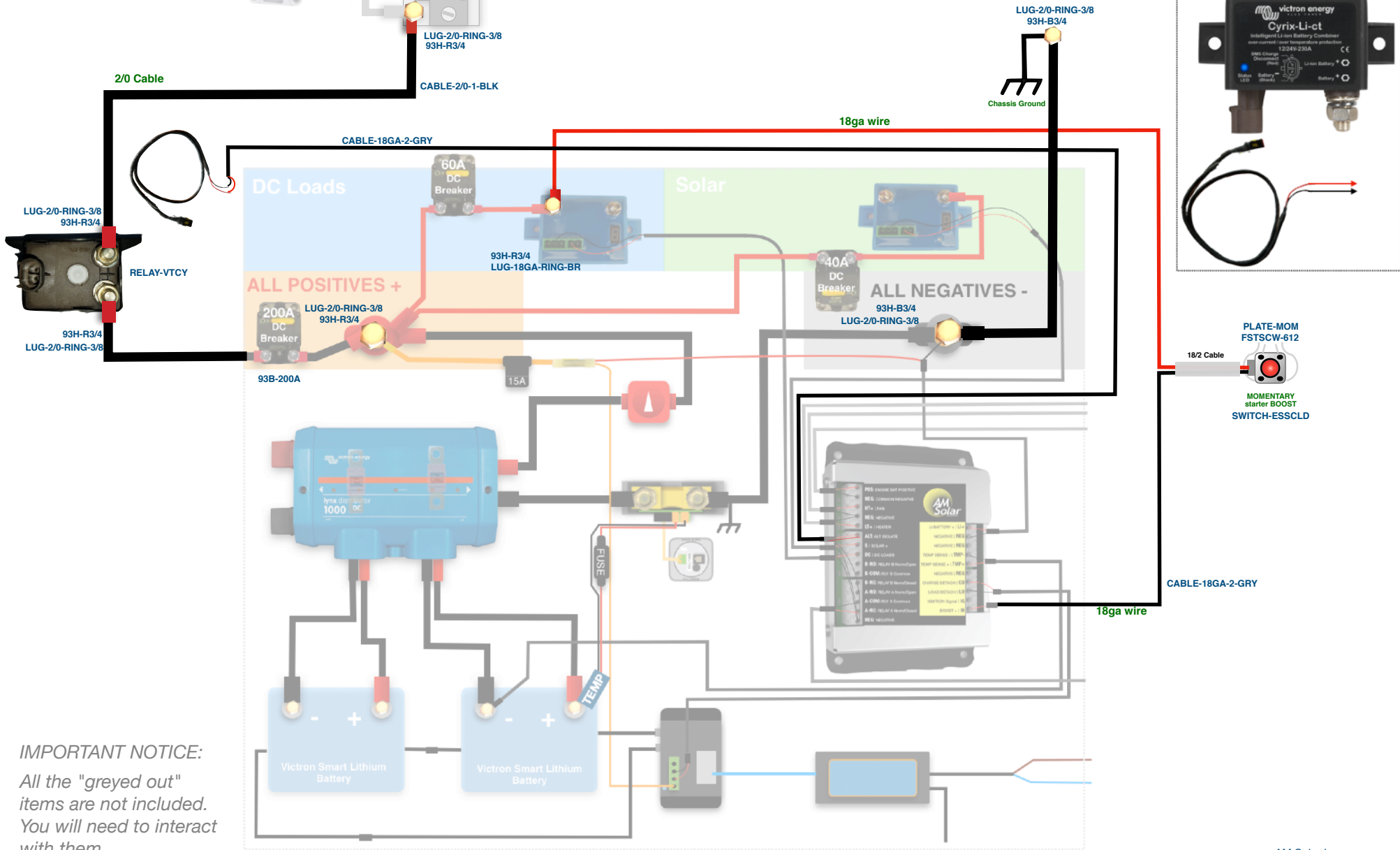
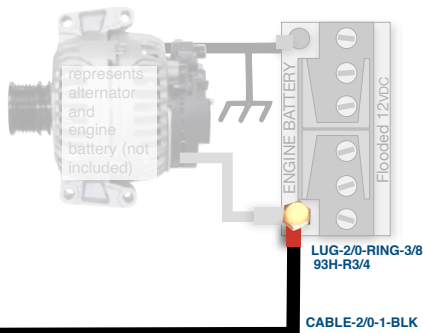






**NOTICE:**

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

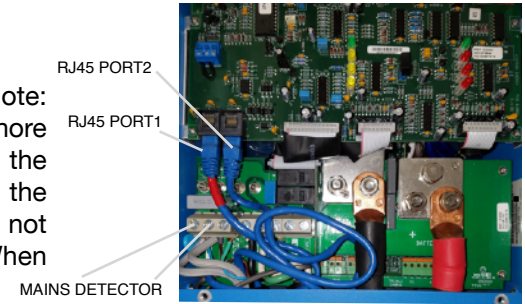


**IMPORTANT NOTICE:**  
 All the "greyed out" items are not included. You will need to interact with them.

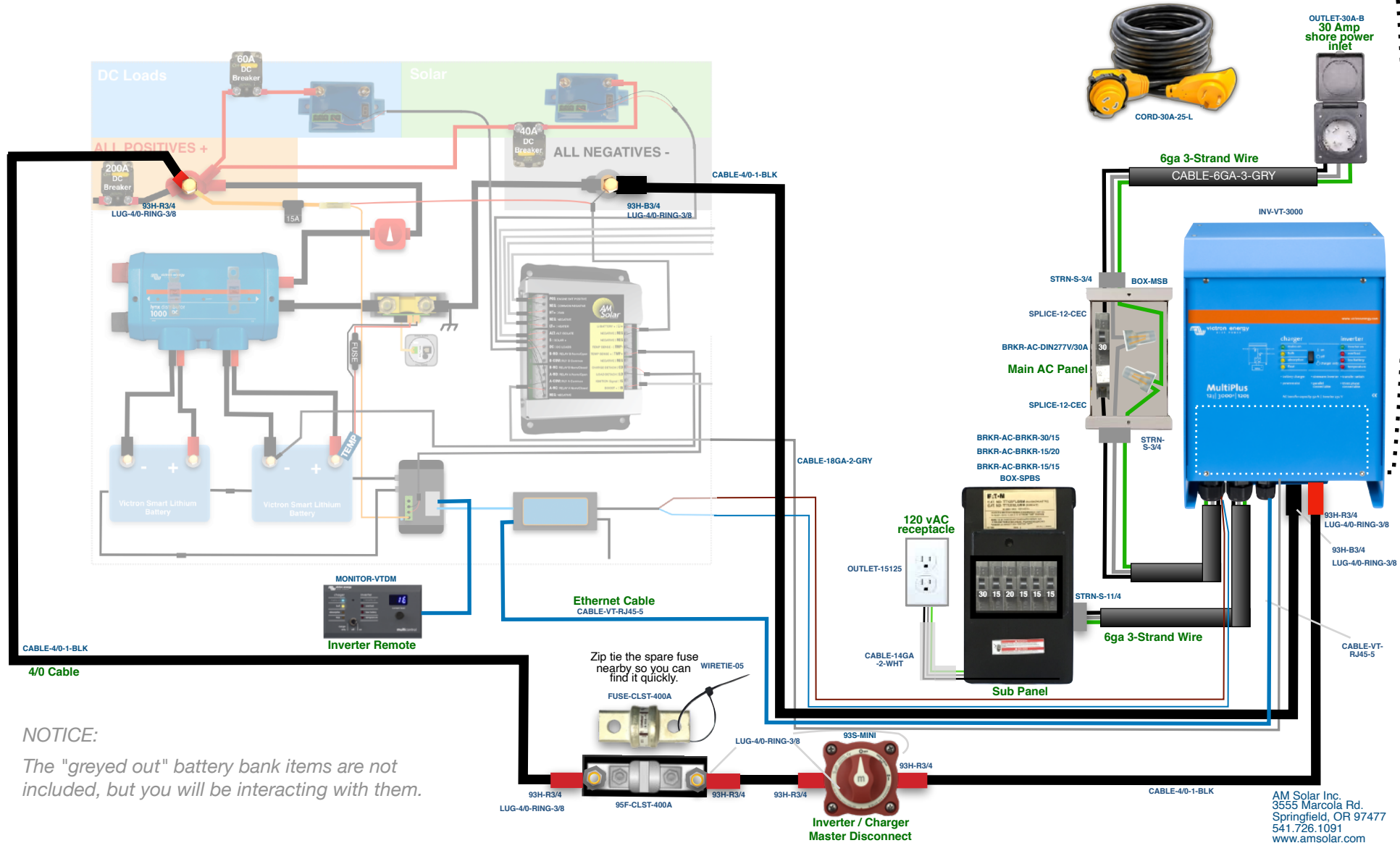


## AC Input & Output

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.



NOTE: The RJ45 ports are universal.



**NOTICE:**

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

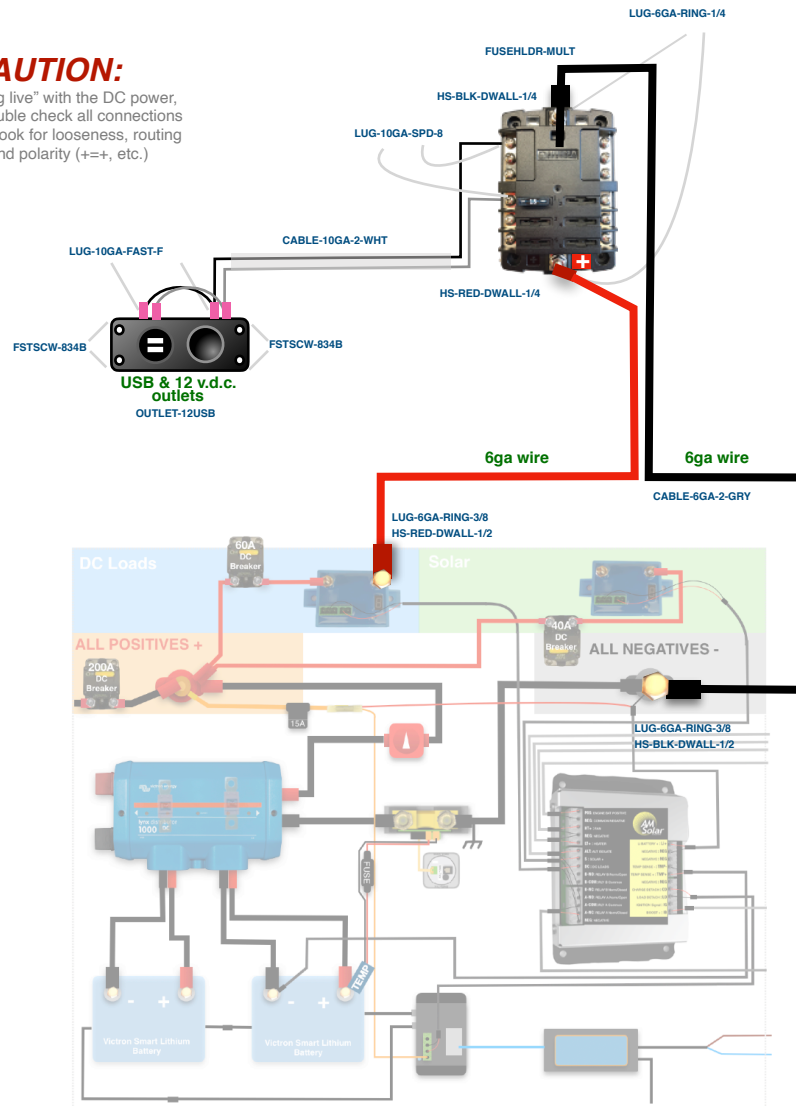


## DC Distribution

One DC outlet with dual USB and standard 12V is included. Additional outlets can be connected to the fuse block or wired in parallel to the existing outlet.

### CAUTION:

Before "going live" with the DC power, check and double check all connections and fittings. Look for looseness, routing issues and polarity (+, -, etc.).



1. **Position the components** so cable routes can be planned.
2. **Install the negative cable** from the load side of the shunt to the negative post of the DC fuse block.
3. **Connect the positive cable** from the positive side of the DC fuse block to the BP65 as shown.
4. **Install the outlet** and connect it to the fuse block. A parallel connection between the two sets of outlet posts will have to be made by fitting two sets of cable into a positive and a negative female spade lug.
5. **Verify the connections** to make sure that they are correct and tight.
6. **Activate the system** by turning the DC breaker to ON. If the DC loads do not work, toggle the DC load master switch.

### NOTICE:

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



## Programming / Commissioning Your System - The BMV-712 Smart Battery Monitor

We recommend you interface with the BMV-712 through the Victron app on your phone, and change the settings from there. The app is named "VictronConnect". Ensure your Bluetooth is enabled before entering the app. Once inside the app you will see your BMV-712 displayed, click on it to change the applicable settings:

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

1. Exit the Setup Screen from the BMV monitor (see right).
2. Download "VictronConnect" from the Google Play Store (picture 1).
3. Turn on your Phone's Bluetooth, and get as close as possible to your Victron Component(s).
4. Open the Victron Connect app, and ensure your Bluetooth is enabled on your phone/tablet.

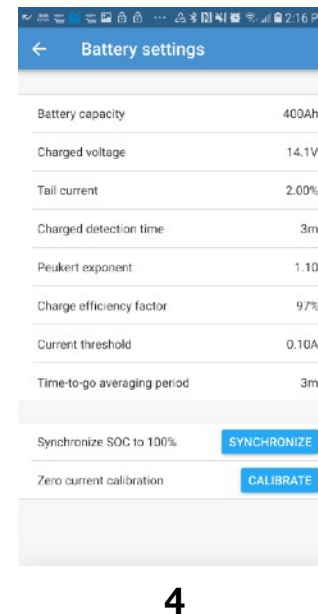
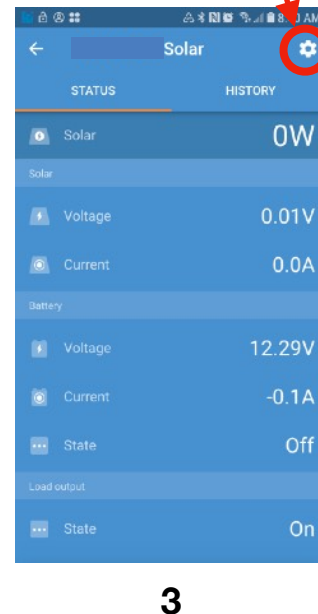
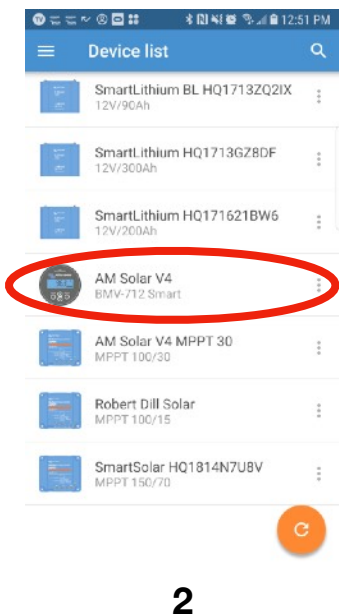
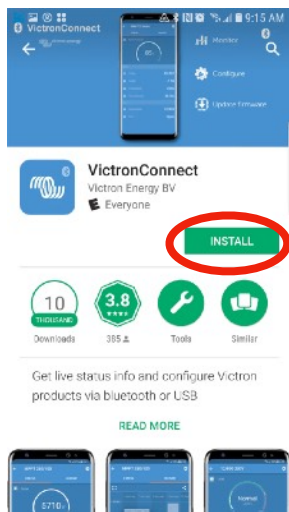


NOTE: If your device is not shown, it is probably signal interference. Try closing the app and moving to a different location before re-entering the app in a location that can pick up the BMV's signal.

5. Select the BMV-712 on the Device List (picture 2).
6. Press the gear icon in the top right corner (picture 3).
7. Enter "Battery" and change the values to match the colored box at the top right (screen shown on picture 4):
8. **Changing Battery Capacity:** Enter the number of Ah of your entire battery bank
9. **Charged Voltage:** 13.9
10. **Tail Current:** 2%
11. **Peukert Exponent:** 1.1
12. **Charge Efficiency Factor:** 98%
13. Go back to Settings, enter "Misc"
14. **Aux Input:** Select "Temperature"
15. **Temperature Unit:** Select "Fahrenheit"
16. **Temperature Coefficient:** 0.5
17. Go back to Settings, enter "Alarm"
18. Enable SOC Alarm

Set Value: 20 / 21

19. Exit from settings, you have finished.



### Program Settings for Lithium Batteries

- **Battery Capacity:** Enter the total battery capacity in Amp Hours.
- **Charge Voltage:** 13.9
- **Tail Current:** 2%
- **Peukert Exponent:** 1.05
- **Charge Efficiency Factor:** 98%
- **Temperature Unit:** "CELC" (Celsius) or "FAHR" Fahrenheit
- **Aux Input:** Temperature

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".

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



## Programming / Commissioning Your System - The Charge Controller

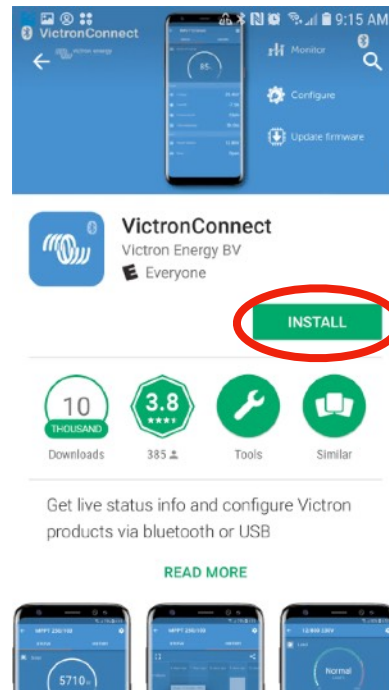


*Victron Blue Solar MPPT with Bluetooth or MPPT Control*

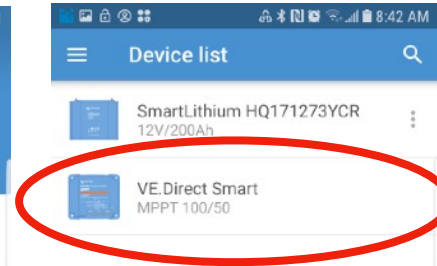
### Charge Control Settings for Lithium Batteries:

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: 50A (In this example)
  - Use default charge settings: OFF
  - Charger: ON
  - Absorption voltage: 14.20 V
  - Absorption Time Limit: 01:00
  - Float voltage: 13.50 V
  - Equalization voltage: 14.20 V
  - Auto Equalization: DISABLE (OFF)
  - Temperature compensation: OFF

Victron Lithium	
Absorption Voltage	14.20V
Absorption Time limit	1:00
Float Voltage	13.50V
Equalization Voltage	14.20V
Auto Equalization	OFF
Temperature Compensation	OFF
Temperature Compensation	OFF



Download VictronConnect In App Store



Device List within VictronConnect

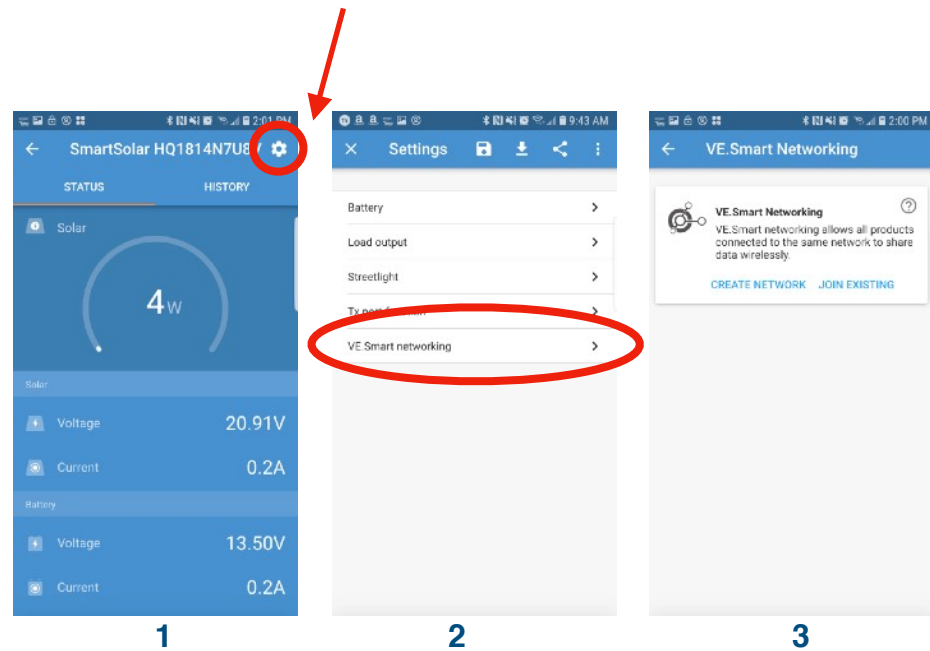


MPPT Charge Controller Screen



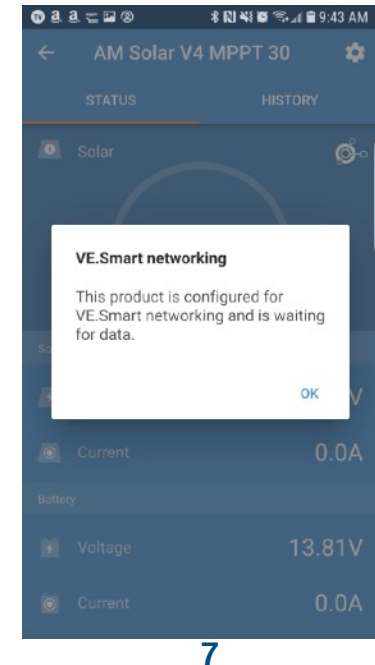
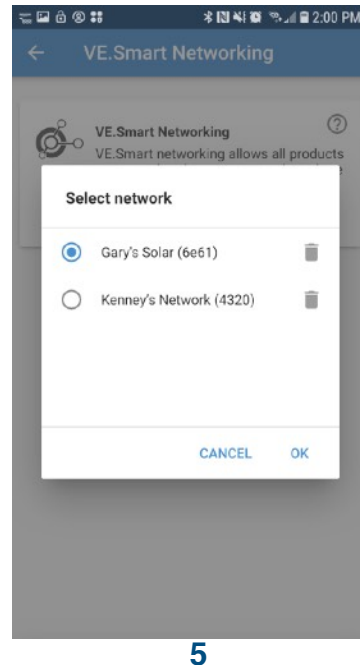
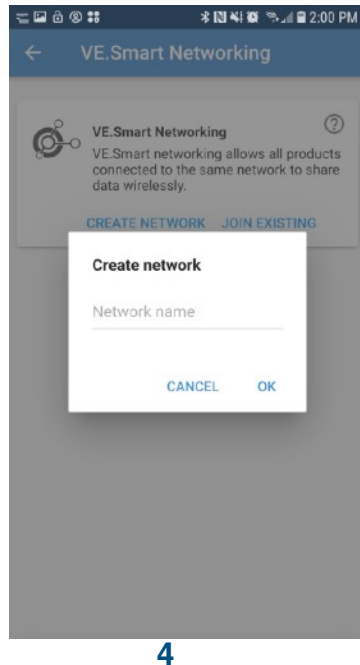
## Creating The Network

1. When in the Victron Connect App, click on one of your devices.
2. Go to “Settings” (shown as a gear symbol in the top right, picture 1).
3. Go to “VE.Smart networking” (picture 2).
4. Go to “Create Network” (picture 3).
5. Enter a name for your network (picture 4).



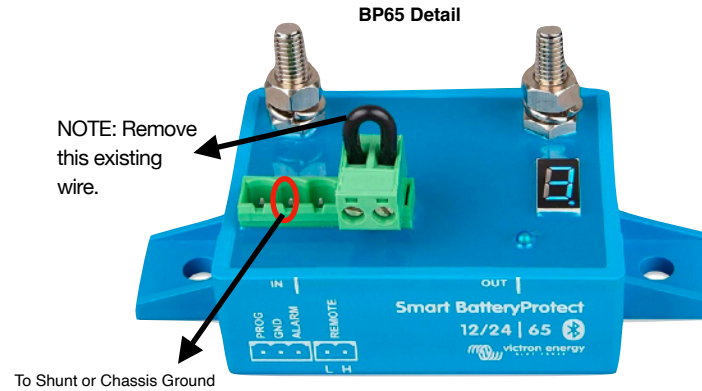
## Linking Each Device:

1. Enter the Victron Connect App and click on a device.
2. Go to “Settings” (shown as a gear symbol in the top right, picture 1).
3. Go to “VE.Smart networking” (picture 2)
4. Go to “Join Existing Network” (picture 3)
5. Select the network you just created (picture 5).
6. This device is now joined to the network (picture 7). Repeat this step for every other bluetooth enabled device.



## Programming / Commissioning Your System - The Smart BP-65 Battery Protection

1. Supply 12V power to the BP (+ to IN post, - to GND pin).
2. Open VictronConnect and select the Battery Protect.
3. The first screen has a switch to manually toggle the relay.
4. Click the gear in the top right to enter Settings.
5. Select "user defined" from the Preset menu.
6. Enter the following values:  
Shut down: 11.5v  
Restart: 12.1v
7. Mode: Leave on "B"
8. Alarm output: Select "Relay" from the menu.



4. Select the gear icon

5. Select "User defined" from the Preset menu

7. Mode should be set to "Relay mode"

8. Alarm output: Select "Relay"

**NOTE:** These settings were chosen on the conservative side, but can be adjusted depending on your needs. Do not lower the shut down voltage until you are very familiar with your system, since dropping below 12v may result in battery degradation.

2. Select BatteryProtect from VictronConnect

If your battery protect shuts down your loads, it's important you recharge your batteries up to a full charge as soon as possible.





## Troubleshooting Steps

### Steps to take before calling AM Solar:

1. Get a voltmeter and test the voltage of the batteries directly to ensure they aren't drained.
  - If you aren't familiar with how to operate your voltmeter, test it on a known power source like your car starter battery to ensure you are reading it correctly.
2. If your problem is related to solar:
  - Perform a system reset on the solar side. First disconnect the panels from the controller, usually done with an on/off switch. Then disconnect the battery from the controller. After 10 seconds, reconnect the battery to the controller and give it 15 seconds to boot up. Then reconnect solar.
  - Download the latest version of the VictronConnect App to your device, and attempt to reconnect
3. If you problems is related to the inverter:
  - Power cycle the inverter by powering it off and back on.
  - Check the display(s) to ensure it isn't remotely powered off, or the current limit is set too low to not allow enough power from shore.
4. Check all connection points to ensure there are no loose connections.
5. Check all on/off switches to ensure they are on, and all DC breakers are reset.
6. Check all inline fuses to ensure they haven't blown. You have the following fuses in this kit, with a spare included for each:
  - Inverter 300Amp Class T Fuse
  - Victron BMS 15A fuse
  - Temperature Sensor Fuse
7. Power cycling the entire system by turning the master electrical on/off switch to off, give it 5 seconds, and then back on.

If you are still having issues with your system, call AM Solar at 541-726-1091 to be put into our troubleshooting queue. Give us a shout **before** you get a headache and we'll help you through things! Please have a volt meter handy and performed the applicable tests above before contacting us. We'll be glad to help get you back up and running as quickly as possible!