Sun Fun Kits V1 & V2 Assembly Manual

www.sunfunkits.com

Revision 1.01

Before you Begin:

Thank you for purchasing your Sun Fun Kits DIY battery kit, the diy battery kits makes assembling your battery quick and easy and only requires basic tools and hardware. We recommend having a basic understanding of DC wiring in order to assemble your battery pack. You will also need the following tools:

- Hex driver set: 3mm, 4mm, 5mm, and 8mm
- Insulated drives for securing bolts
- Thread locking compound (such as blue Loctite)
- Kapton tape 1” to 2” in width
- Double Sided Sticky tape
- Velcro style loop
- DC Voltmeter
- DC Power Supply that is able to charge up battery cells (3.65 volts, 20 Amps)

Optional:

- Silicone sealer (for those looking to make a water resistant battery)
- Hot glue gun (if you wish to secure wires using this method)

Preparing your battery cells:

Sun Fun Kits DIY battery kits support various prismatic cells, in this manual we will be using the EVE 280N type, however the process is the same for other manufacturers such as CATL, RCPT, and more, be sure to select the correct cell type when purchasing your kit.

Before you can begin organizing your battery pack, you will need to perform a TOP BALANCE of your battery cells. This process requires you to charge your cells in parallel, meaning you will join the positive terminal of all your cells into a single circuit and your negative terminals into a single circuit.

This process is explained in this tutorial video:
https://www.youtube.com/watch?v=JGbZozzCYvM

Assembling your battery cells:

After you have completed top balancing, it is now time to begin battery assembly. Begin by placing your cells in a series configuration with the left side of the battery having the **positive terminal on the lower left and the negative terminal on the lower right**.

Note: you may find some resistance installing your cells, this is because the EPO foam exerts pressure on the cells to keep them in place. We recommend adding the left most and right most cells first and then adding the remaining 2 inner cells in the end.

PLEASE MAKE SURE TO PLACE CELLS CORRECTLY IN THE ORDER ABOVE.

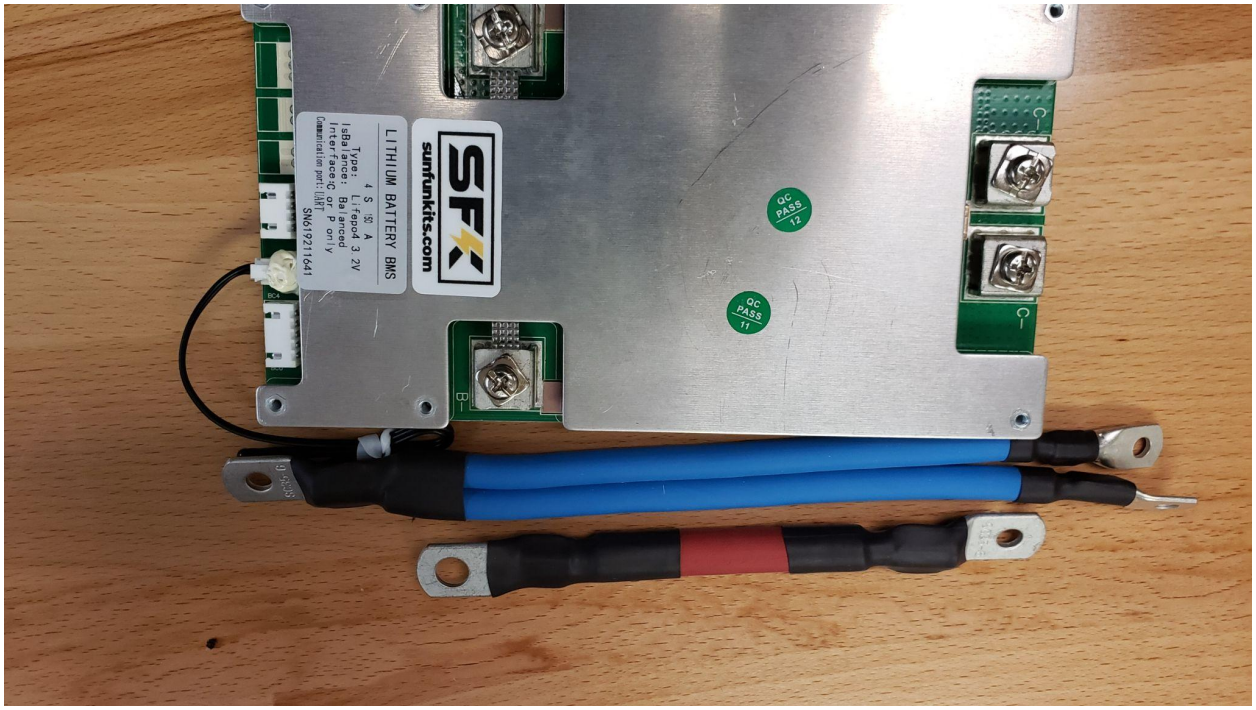
Once your cells in the correct position, it is now time to install your bottom bracket, this will vary depending on the option you select when purchasing your kit, generally the v1 kit have the bracket that is optimized for the EVE 280N with drilled holes, while the V2 kit is designed for various cells and can also support the EVE 280N with drilled or welded studs.

Install the bottom bracket with the M5 bolts and washers, you can use power tools to assist in this step.

After the bottom bracket is installed, you will now need to add thread locker to your terminals (if using drilled terminals)

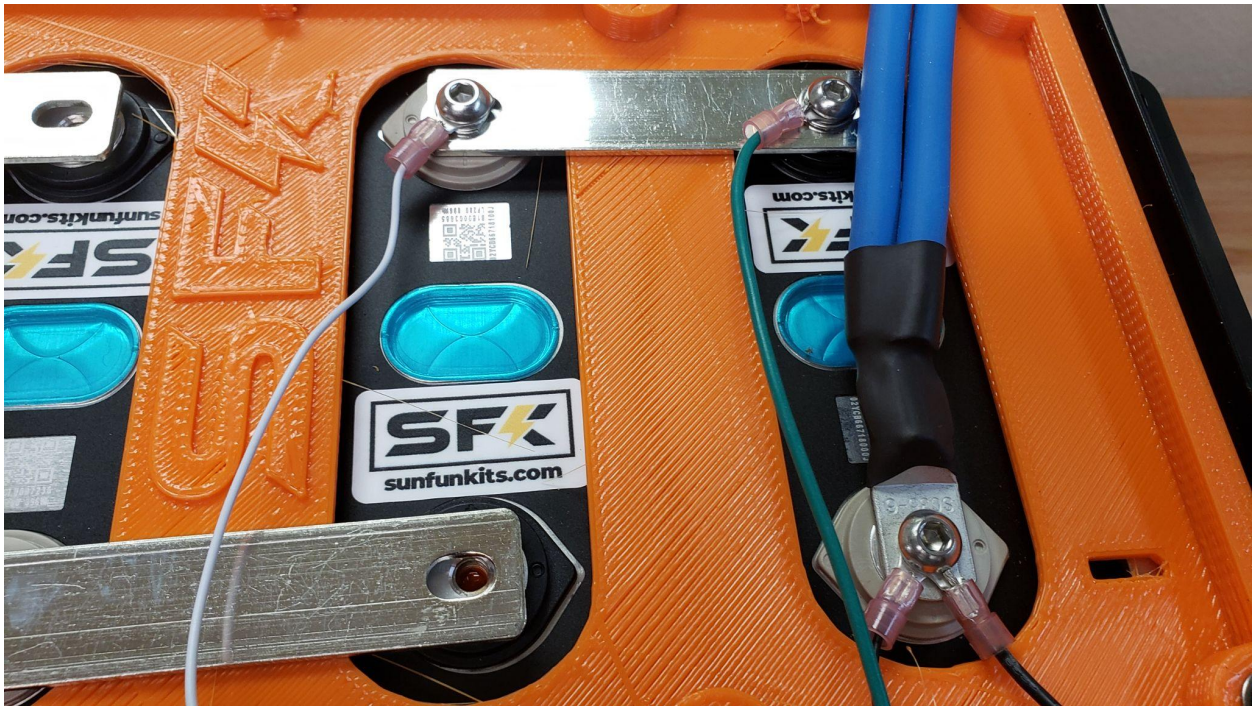
Setting Up Electronics & Cell wiring:

This step involves wiring up your cells, you will need a BMS system and optionally a supplementary balancing device to complete this step. You will also need to have the appropriate wiring done to complete the electrical setup. If you are using our SFK-150 4s Bms, all wiring and prep has been done for you and simply requires you to screw in your components.



Begin by aligning your buss bars as follows:

Now you will begin by adding your series terminals and BMS balancing/monitoring wires:



Sun Fun Kits include 6mm bolts that are 8mm in length; these will fit the drilled EVE 280N cells properly and will ensure a proper fit. Our BMS also includes correct sized terminals that fit 6mm threads/blots properly.

You will need to ensure a tight fit, take care not to strip your battery terminals, if you are using a torque wrench you will want to tighten down to 6-8 NM. **WARNING LOOSE terminals will cause the cells & batteries to fail.**

The writing schematic should be as follows:

black wire = cell 1 negative
1st white wire = cell 1 positive
2nd white wire = cell 2 positive
3rd white wire = cell 3 positive
red wire = cell 4 positive

Your voltages should read:

3.6, 7.2, 10.8,14.4 (if the battery cells were full during the install).

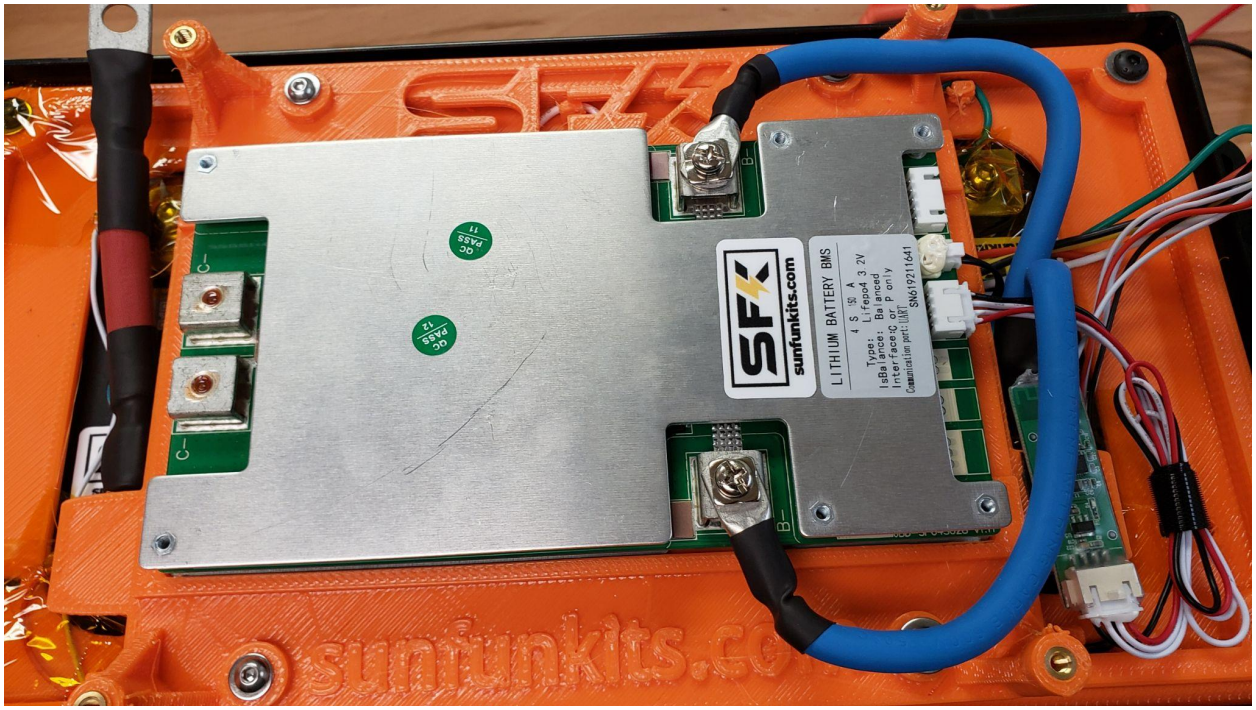
If you are using a supplementary balance, you should install this as well, you will need to share the final negative and positive terminals of the battery for multiple devices. **Make sure the wired main terminals are the ones that touch the cell terminal** and only stack the other rings on top.

Once you have verified the wiring has been installed correctly, you can now begin by attaching the top plate & your BMS.

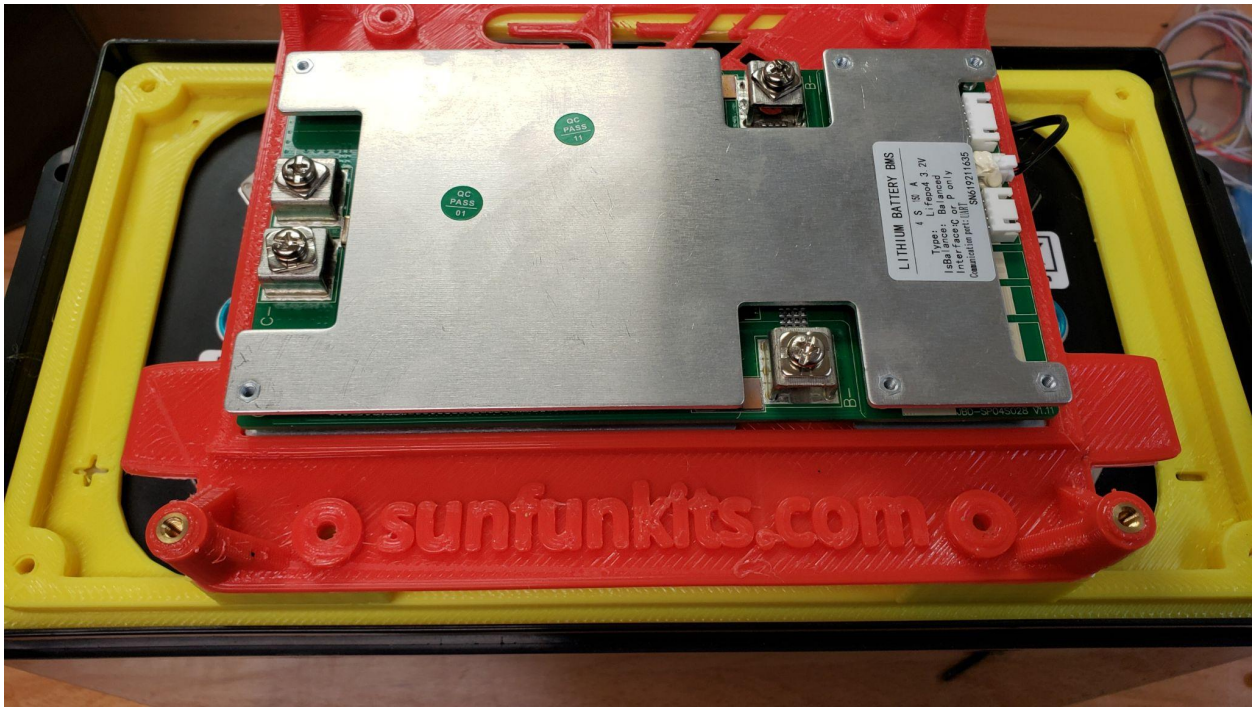
V1 & V2 difference:

Both the V1 and V2 kit are essentially the same with the major difference being that the v2 kit can accommodate taller cells and cells with welded studs by incorporating a spacer and internal riser design.

V1 kits will allow you to simply install your top plate directly on top of the bottom plate as shown:



The v2 kits allow for a spacer to be incorporated:

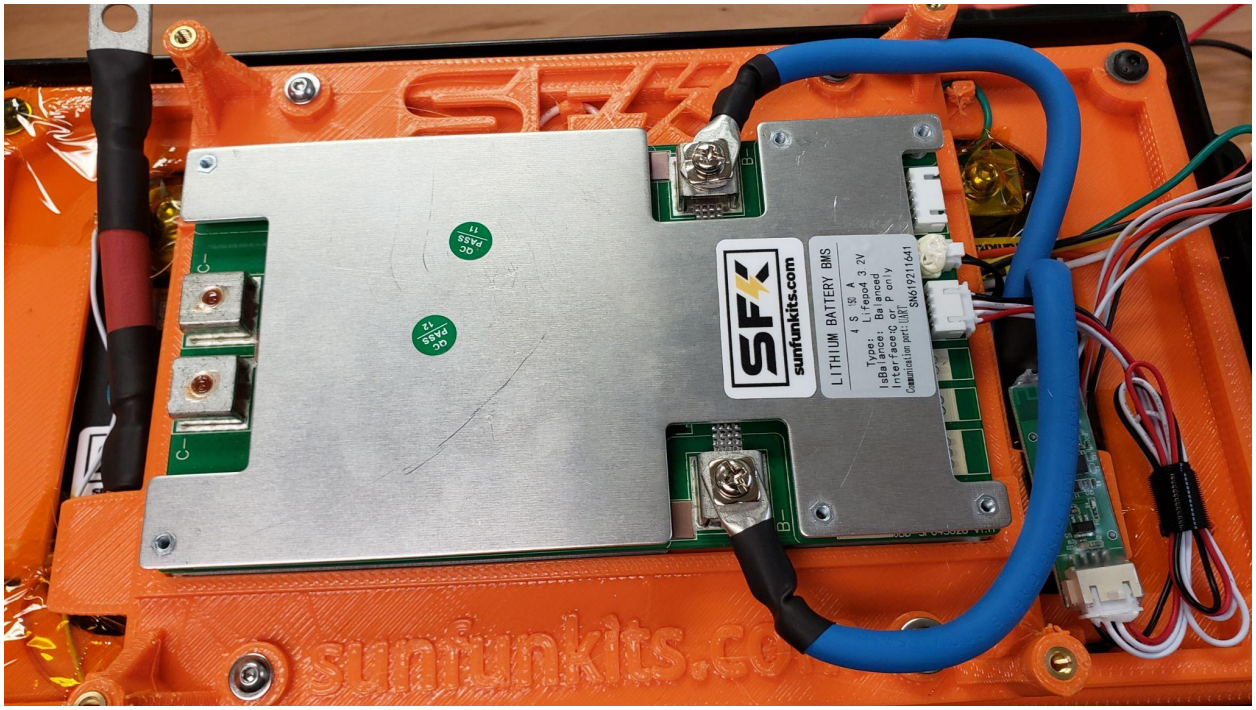


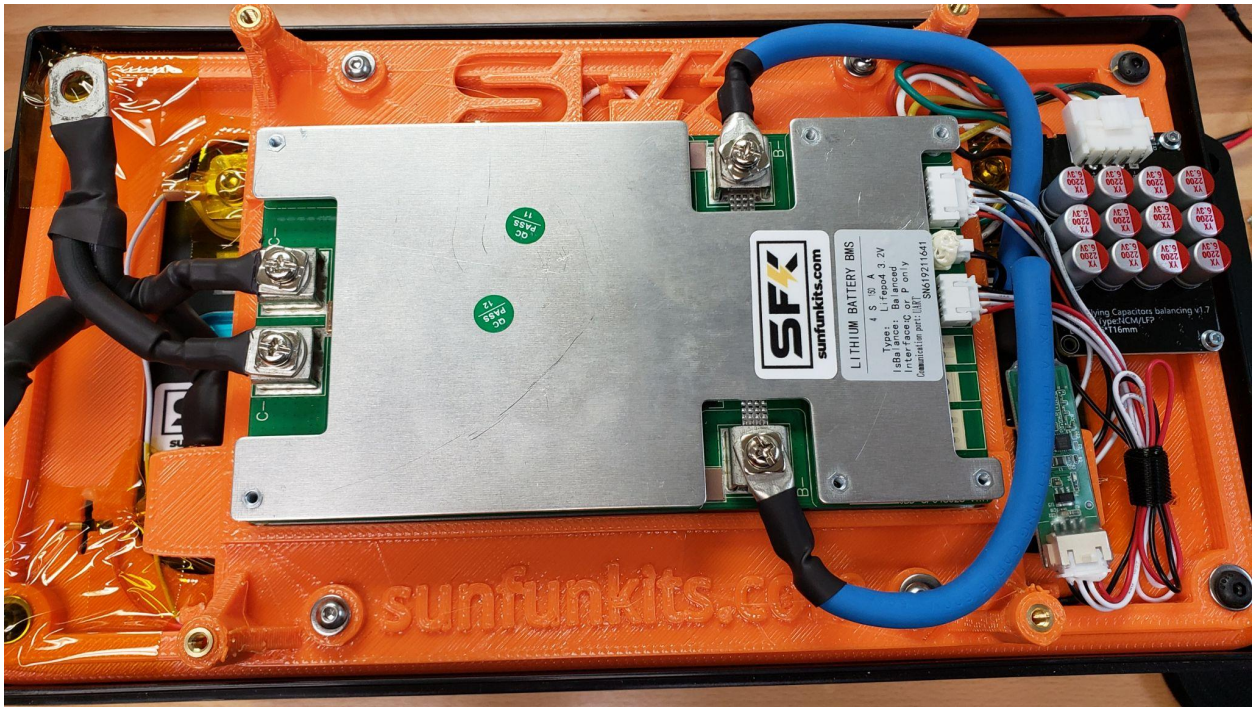
Your v2 kit will include taller mounting screws to attach the top plate to the bottom plate.

This shows how the v2 kits look from the outside, the lid and bottom are the same as the v1, but the spacer in the middle is unique to the v2 kit.

DO NOT USE POWER TOOLS TO ATTACH YOUR TOP PLATE, only use hand tools and tighten gently.

The SFK 150 4s BMS includes an NTP probe, this can be mounted on the underside of your top plate, or directly to any of the cells in the battery.





Secure components such as the Bluetooth dongle or supplementary balancer using double sided sticky tape. Also use Velcro strap to tidy up any loose wires. Use thread locker to secure the terminals to the BMS.

If using an active balancer, you may use small hobby screws to secure it to the outer rail of the bottom plate.

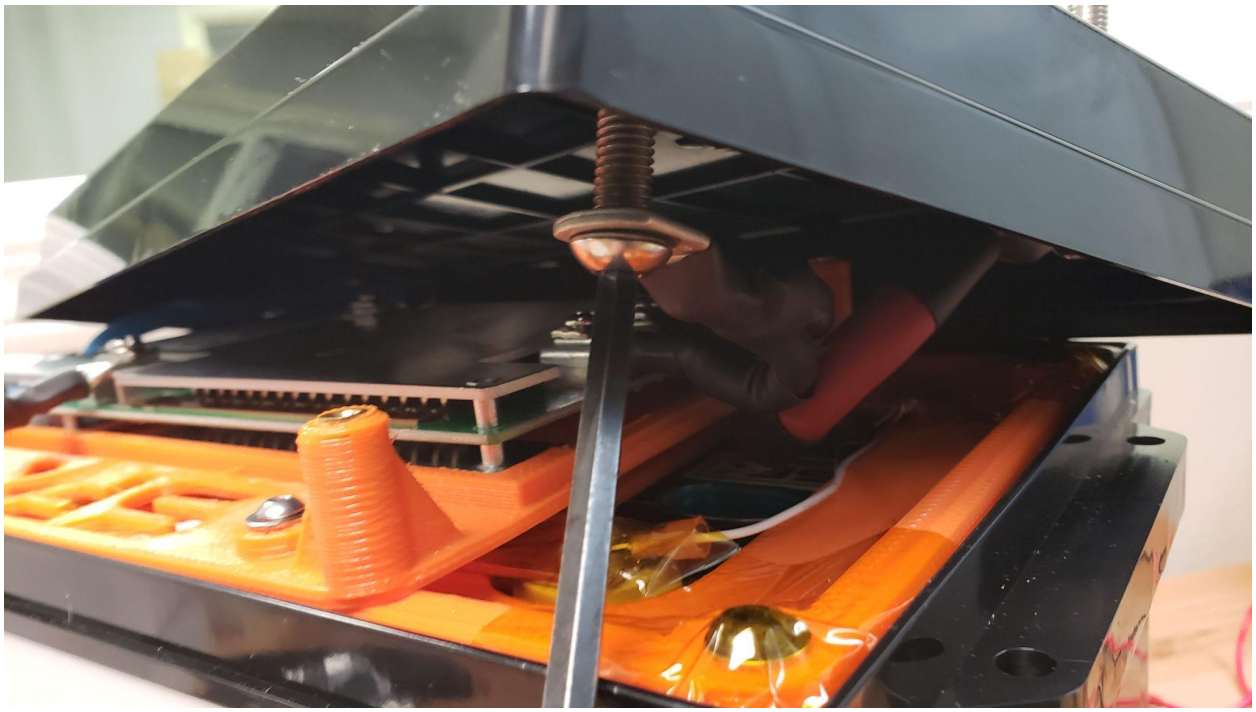
Finally, bend the negative & red terminals in place to prepare them for lid install. We recommend keeping your balance wires out of the BMS for the time being and only inserting them once the final bolts have been installed.

<u>Attaching terminal bolts & lid:</u>

The last step in completing your DIY battery is to attach the terminal bolts and lid. This process begins with inserting the m8 bolts from inside your battery through the brass inserts in the lid.

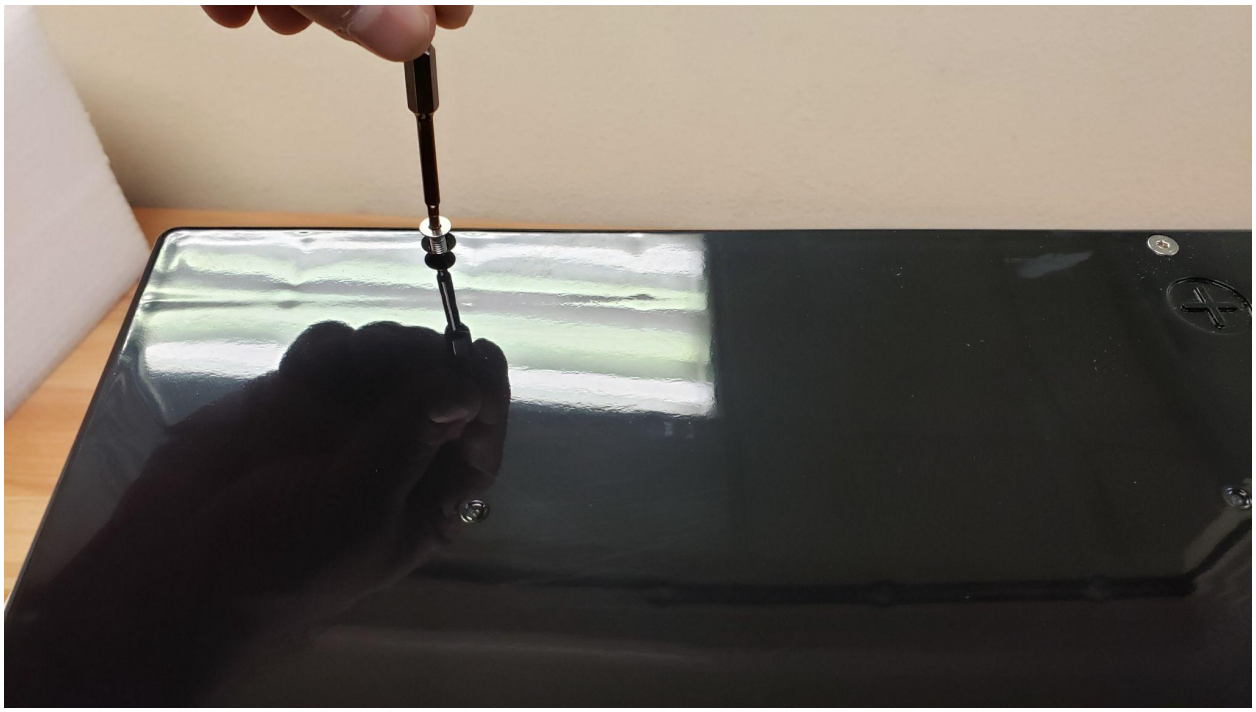
YOU MUST ENSURE A TIGHT FIT DURING THIS PROCESS, THREAD LOCKER AND A NUT DRIVER ARE REQUIRED TO MAKE SURE THE TERMINAL WIRES ARE NOT LOOSE. LOOSE TERMINALS WILL DESTROY YOUR BATTERY!

Prepare the m8 bolts with thread locker compound on the portion closest to the terminal head.



Using your hex driver, secure the bolt to the terminal, **make sure you have the wires correctly oriented and that they are inserted into the correct terminal (red wire to the positive terminal and black wire to the negative)**

Secure the top of the bolt using a lock washer and a m8 nut, make sure they are tight and not loose. Once both terminals have been secure you can now secure the lid using the 4x m4 countersunk screws; **HAND TIGHTEN ONLY!**



NOTE: If you prefer to increase water resistance you can add silicone sealant to the ridge of the lid before installing it, this will add a perimeter shield to assist in water/moisture intrusion while still keeping the lid removable. We do not recommend permanent glue or sealant in our kits.

Finish up your kit install by attaching the positive & negative stickers and the carry handles.

The handles buckle into the ridge of the case, use your hex driver to push them into position.

Monitoring Apps & Tests:

You can now connect to your battery and perform tests; visit Google Play Store or Apple IOS App store and search for: Sun Fun Kits BMS

https://play.google.com/store/apps/details?id=com.companyname.sfkble&hl=en&gl=US

The SFK BMS is also compatible with the XiaoXing BMS if you want to tweak additional parameters, this is available here:

https://apps.apple.com/us/app/xiaoxiang-bms/id1375405426

Assembly Videos:

To complement this manual, we also have a video guide you can view to assist in battery assembly:

https://www.youtube.com/watch?v=2yTd6jyj0tc&list=PLqaRtAJZ58SJ4BbStDgRCuV9OhJsUPmS_