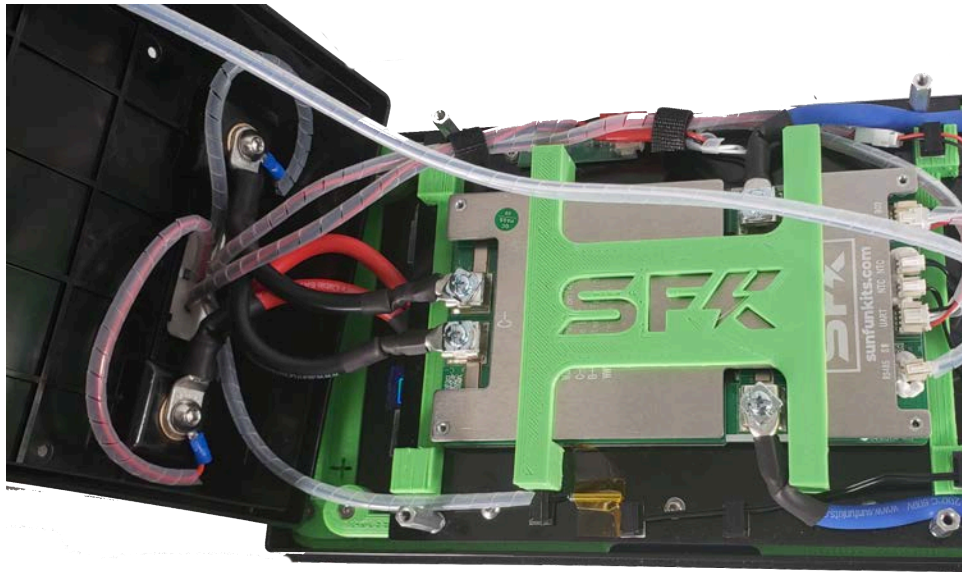


Sun Fun Kits V5 Standard Manual

Revision 1.0



V5 STANDARD



Before you Begin:

Thank you for purchasing the Sun Fun Kits V5 standard edition battery kit, diy battery kits make assembling your battery quick and easy and only require basic tools and hardware to assemble. We recommend having a basic understanding of DC wiring in order to assemble your battery pack and you will also need the following tools:

- Hex driver set: 3mm, 4mm, 5mm, and 8mm
- Insulated drives for securing bolts
- Kapton or PET tape 1" to 2" in width
- Velcro style loop
- DC Voltmeter
- Standard scissors
- 90% isopropyl alcohol.
- Adjustable DC Power Supply that is able to charge up battery cells (3.65 volts, 20 Amps) if manually balancing or standard 13.6v to charge the battery.
- 300-400 grit sandpaper

Optional:

- Electrical Safe Silicone sealant (for those looking to make a water resistant battery)
- Hot glue gun (if you wish to secure wires using this method)
- Spiral wrap in 6mm and 8mm O.D.



Preparing your battery cells:

Sun Fun Kits DIY battery kits support various prismatic cells, in this manual we will be using the EVE 280K V3 cells, however the process is the same for other manufacturers such as CATL, REPT, Ganfeng and more, the V5 Kit includes spacers and other items to ensure maximum compatibility for cells in this class (270-320 AH)



Certified Automotive/ESS Grade Cells generally do not require balancing; however, you may choose to balance your cells, we have a video explaining this process.

This process is explained in this tutorial video:

<https://www.youtube.com/watch?v=JGbZozzCYvM>

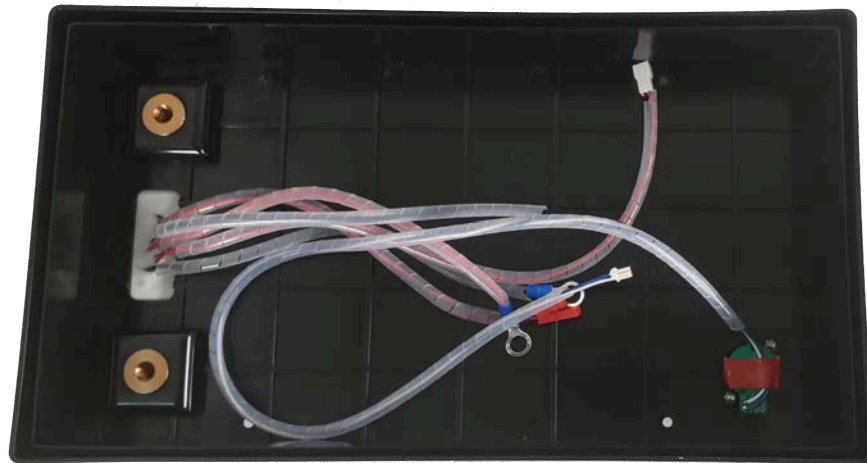
NOTE: With the 5 standard kit, simply assemble your pack, charge the battery at 5-20 amps and within a few hours your cells should be evenly balanced. Again, certified cells that are available with the v5 standard kit will balance very quickly with the active balancer.



The kit will come partially assembled, begin by unscrewing the 4 countersunk m4 screws at the top and remove the lid.



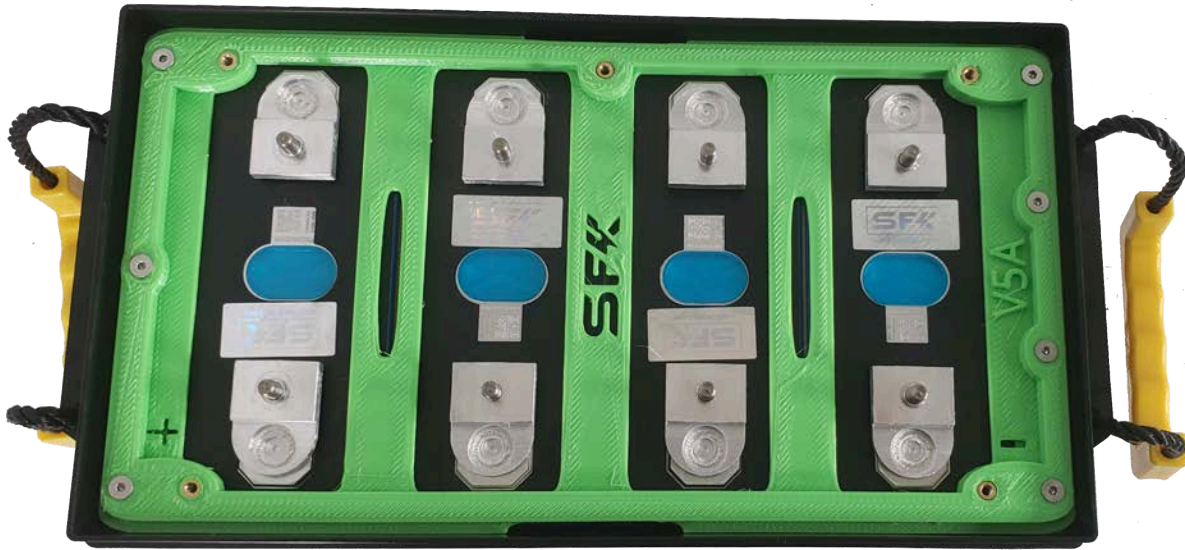
Remove the lid and set it aside, we recommend adding spiral to the wires, note the 2 red JST are wrapped into the same wire as these are used to supply power to the bluetooth module.



Once the lid is removed you will see the internal structure of the V5 standard kit, here you will then remove the top plate and the active balancer riser plate beneath:



After removing the bms and active balancer riser plate you will see the main plate and the cells:



PLEASE MAKE SURE CELLS CORRECTLY IN THE ORIENTATION ABOVE. If the are not, contact Sun Fun Kits Support

The V5 standard edition includes cells pre-installed with fiberglass separator sheets (1.5mm in thickness) This provides excellent cell security and also provides a thermal barrier between each cell.

Setting Up Electronics & Cell wiring:

This step involves preparing wires, setting up the bus bars, and connecting the cells to the V5 standard edition SFK 150A bms. With the v5 standard edition all wires have been pre-crimped and cut for you, these are included in your wiring accessories bag. You will see 3 main wire harnesses with crimped lugs as well as a combination harness that includes the wires to the active balancer as well as the main bms. If you selected the option with the data port and the SFK data cable, this would be included as well.



Next let's review the combination active balancer and bms balancing wire harness



Here is how the lugs should be mounted:

Final Positive = **Red Lug**

White wire closes to Final Positive = **Blue Lug**

Center white wire = **Yellow Lug**

White wire closest to Final Negative = **Green Lug**

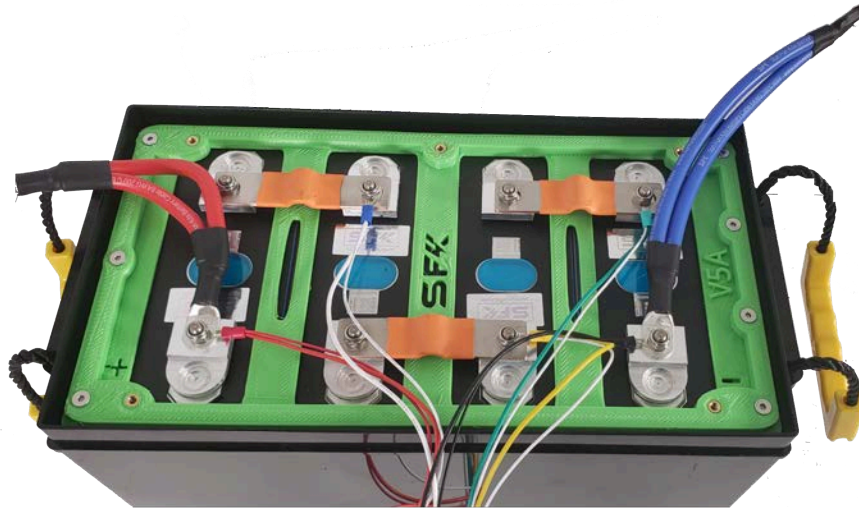
Final Negative = **Black Lug**

The combination harness uses a single set of lugs for both wires and makes the install cleaner and easier.

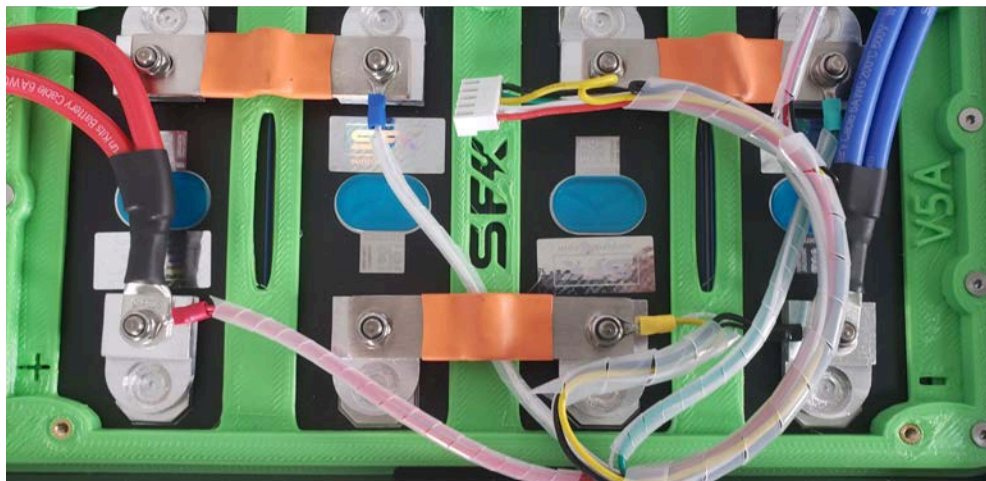
Note: Before beginning this step it is EXTREMELY IMPORTANT that you clean and wipe down all of your bus bars, washers, terminals and battery post with 90% isopropyl alcohol. Dirty terminals and connections will result in improper readings and poor results.



Begin by placing your bus bars in the orientation shown below and then, you will have the terminal lugs placed directly on top of the bus bar for the best cell voltage readings. Also take note of how the bus bars are placed on the cells.



Now you will add your series terminals and BMS balancing/monitoring wires as well as the active balancer wires. For version 5 we are now including M8 nylon lock nuts as they provide excellent anti-vibration capabilities without needing thread locking compound.



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 4-6 NM. **WARNING!** Loose terminals will cause the cells & batteries to fail.

USE EXTREME CAUTION! THE BLUE WIRE SHOULD NOT TOUCH THE POSITIVE TERMINAL OF THE FIRST CELL OR IT WILL ARC AND DESTROY THE CELL. You should consider covering this terminal with kapton tape or other insulating material to ensure that it can not short circuit the first cell.

We recommend using spiral wrap to safeguard balancer wires as these will prevent chafing. After you have setup your bus bars and wires you must now verify cell voltages, using a voltmeter ensure they read as follows:

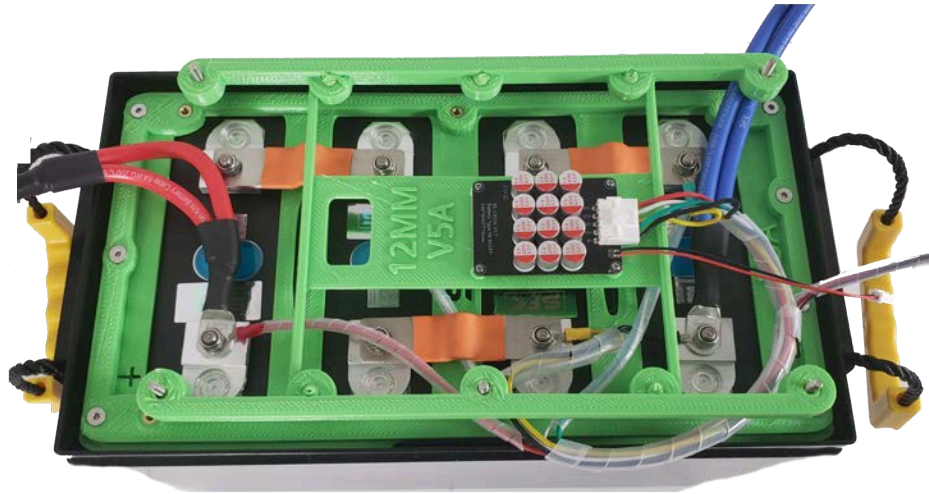
black wire = cell 1 (black lug) negative (0.00 Volts)
1st white wire (green lug) = cell 1 positive / (3.3 Volts)
2nd white wire (yellow lug) = cell 2 positive / (6.6 Volts)
3rd white wire (blue lug) = cell 3 positive / (9.9 Volts)
red wire = cell 4 (red lug) positive (13.2 Volts)



*Image show is form the v4 standard edition but the process is the same for the v5 standard

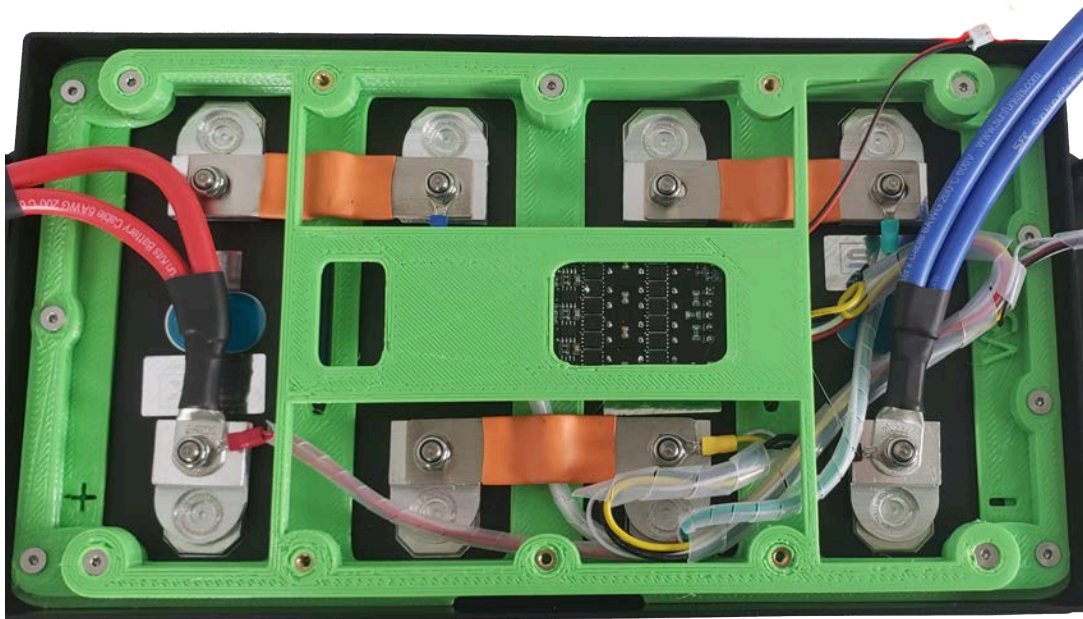
Installing riser and BMS mounting plates:

After you have verified that your cells are mounted correctly they have correct voltage readings, you can now begin mounting the BMS and other related electronics. Being by mounting the riser plate by first inserting the active balancer connector into the balancing unit and then rotate it so that it matches the mounting holes on the main kit plate:



Note: V5 standard kits include an activation lead that allows to set the active balancer behavior.

Secure the riser plate using the 5 countersunk M4 screws. We recommend only using hand tools for this process.



After this step we will install the main bms plate using 5x m5 button head screws. Take caution to make sure you do not pinch any wires between the plates.



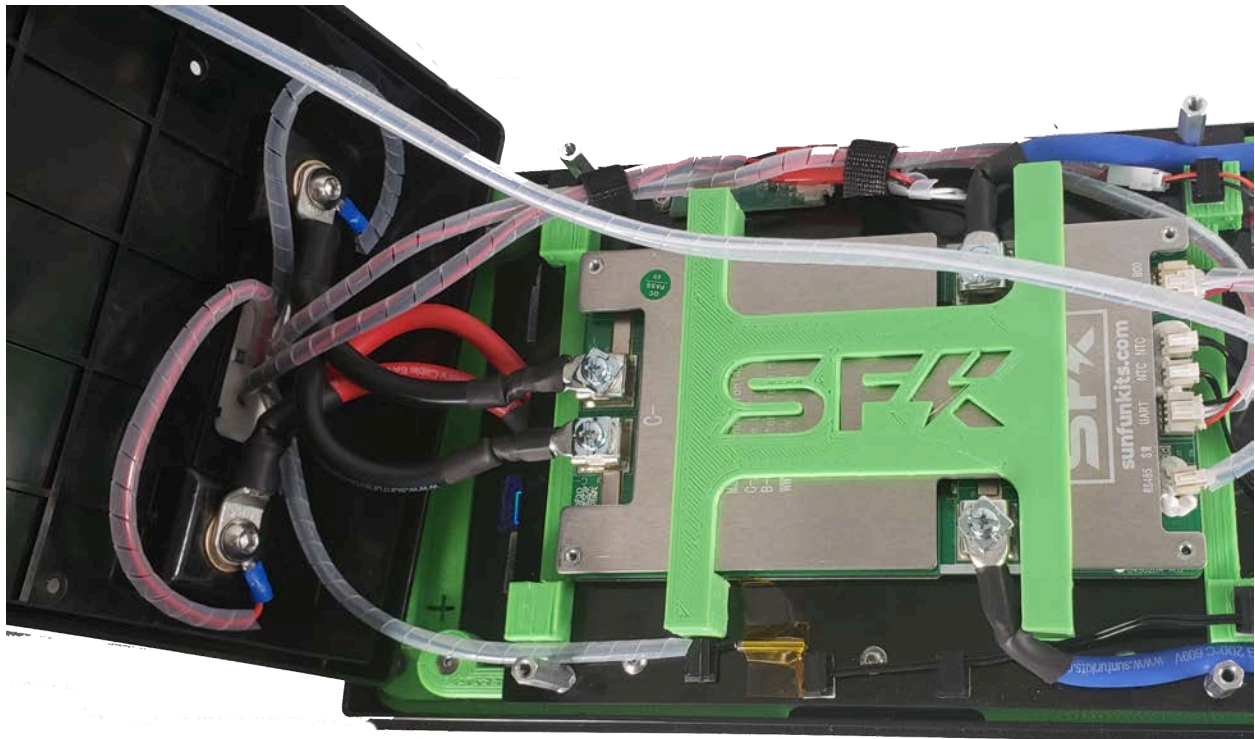
Begin installing the bms wires temp probes, use the image above as a reference. **NOTE: do not connect the BMS balancer wire until you have installed the lid & lugs.**

Installing Lid:

After you have set the BMS and main wires, you will need to prepare the lid, for this you will need 400 grit sandpaper and will need to scuff the main brass rings to remove any of the residual abs sheen from the lid molding process. Once done, wipe and clean with 90% isopropyl alcohol.



We will now attach the remaining wires for the kit by attaching the GEN 2 B power to the main lugs as well as the power supply to the bluetooth module and the active balancer activation mode to our active balancer module:



It is extremely important that you mount the main lugs directly to the brass conductor rings, the switch rings will sit on TOP of the main wire rings.

ENSURE A TIGHT FIT! You must make sure the bolt is making proper and solid contact to the brass insert, a loose contact will generate heat and can lead to battery failure. Ensure at least 8-12 NM torque setting (appx 110 inch/lbs).

Install the wires as shown and route the wires to best suit your needs, you can use the included wire keeps to assist in cable management.

Starting in 2024, we are now including a rubber gasket/seal to enhance the moisture/temperature protection of the battery; this is provided as a self-adhesive strip that can be attached to the inner lip of the case. ENSURE YOU CLEAN the lip with 91% isopropyl alcohol and let dry before installing:



There should be sufficient length to cover the entire perimeter of the case, you do not need to stretch the rubber, but keep a firm grip to prevent slack while installing. Once done use a utility knife to remove any excess for a flush fit.

Once the lid wires are secured, you can now insert the balancing wires into your BMS.

Finish off by bolting down the top lid using the 4x16mm countersunk screws. **USE HAND TOOLS! No Impact Drivers for this step!**



Once done your kit is now complete and ready for testing. Verify your install works by turning on the bluetooth function, press the bluetooth icon and it will illuminate as **blue** indicating bluetooth is active. Press again to deactivate bluetooth functionality.

You can turn on the active balancer by pressing the active balancer icon; the **blue** light indicates the balancer is on and working in normal mode. If you prefer the active balancer only works when the battery is near high voltage (about 3.35v/cell or 13.4v or higher) then press the button again and you will see a **green** light, this is called Hi-Mode. To turn off the active balancer altogether, press again, the kit will now only use BMS passive balancing.

The 3rd button on the V5 standard edition is an external temperature sensor, by pressing it you can see the internal temperature of your battery, this will be indicated by the color of the LED and will range from Deep Blue (very cold), to Red (very hot). This button does not perform any function and is simply used as a way to quickly find which temperature range your battery is currently operating in.

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>

<https://apps.apple.com/tt/app/sun-fun-kits-bms/id1600445506>