

# USB Hub Replacement

Version 1.0 - IN PROGRESS

# Overview

These instructions outline a safe removal of the USB Hub and replacement with a new USB Hub.

**Issue:** Need to replace USB hub

**PPE:** eye protection, non-conductive gloves

**Tools:** Electrical Tape, Scissors

# Power Down LCR

- Using the instructions in slides 1 through 10 of TB 7 DM-HighCurrentPowerCycle.pptx, safely shut down the LCR

**WARNING: AT ALL TIMES DURING THIS SWAP YOU MUST ENSURE NO METAL FROM ANY CABLE TOUCHES THE METAL TRAY OR ANY PART OF ANY CONDUCTIVE COMPONENT ON THE TRAY. DOING SO WILL DAMAGE ESSENTIAL, SENSITIVE COMPONENTS**

- To mitigate this, only open the tray as much as you need to. You can pull the tray cover off, and then replace it at an angle to make an access zone to only what you need. Use a neoprene pad, or thick gaming mat to lay an insulated zone anywhere you need to set down still-wired components.

# Remove OLD USB Hub

1. Unplug 12V DC barrel connector from old USB hub and cover with tape to insulate it while you work.
2. Unplug usb cable from back of old USB hub and cover with tape to insulate it while you work.
3. Lift old USB Hub up carefully to dislodge velcro connection
4. Cut supplied velcro into 2x 2" strips, leave the backing on the adhesive, and stick the corresponding new pieces to the old strips on the tray. (Example: If the tray has the rough hook side stuck to it, place the opposite, the soft loop side on to it for adherence to the new USB hub).

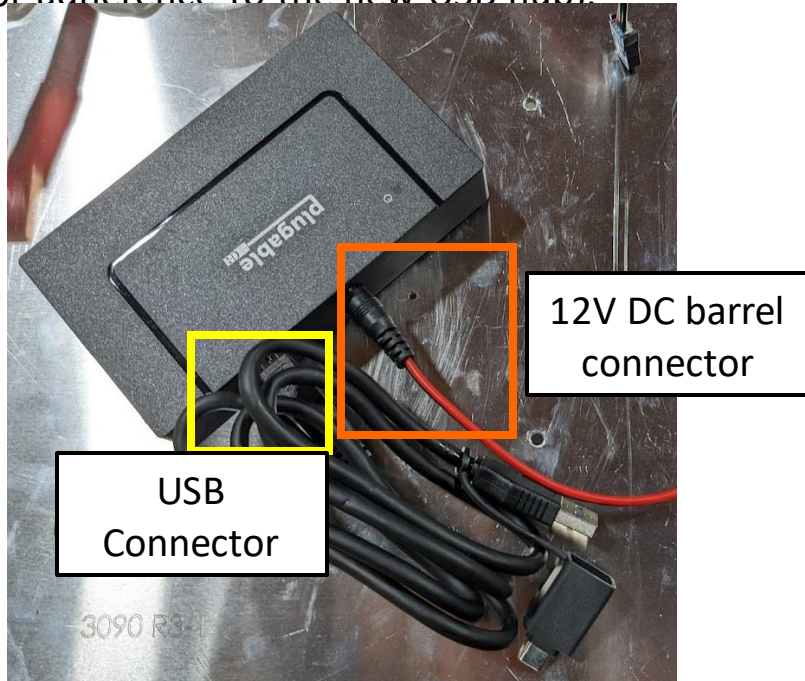
## Tools:

Electrical Tape

Scissors

## Parts:

003475 | 4x | 1/2" Wide Adhesive Velcro, 1" L



# Install New USB Hub

**WARNING: AT ALL TIMES DURING THIS SWAP YOU MUST ENSURE NO METAL FROM ANY CABLE TOUCHES THE METAL TRAY OR ANY PART OF ANY CONDUCTIVE COMPONENT ON THE TRAY. DOING SO WILL DAMAGE ESSENTIAL, SENSITIVE COMPONENTS**

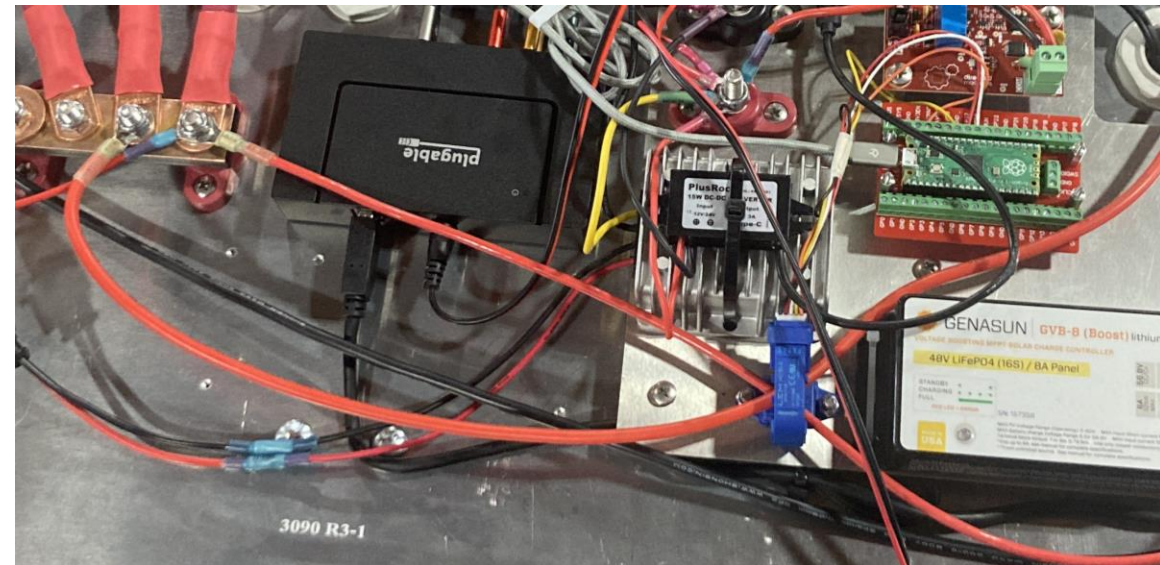
1. Remove NEW USB hub from packaging.
2. Untape and connect the 12V DC barrel connector from the SCC/SCC Alternative
3. Port by port, swap the usb cables from the old hub to the new hub. Carefully ensure you do not mix up any ports and the layout remains the same as before.

## Tools:

Scissors

## Parts:

004130 | 1x | Plugable 7-Port USB 3.0 Hub with 60W Power Adapter





# Install GPS in Tray

## Tools:

Scissors

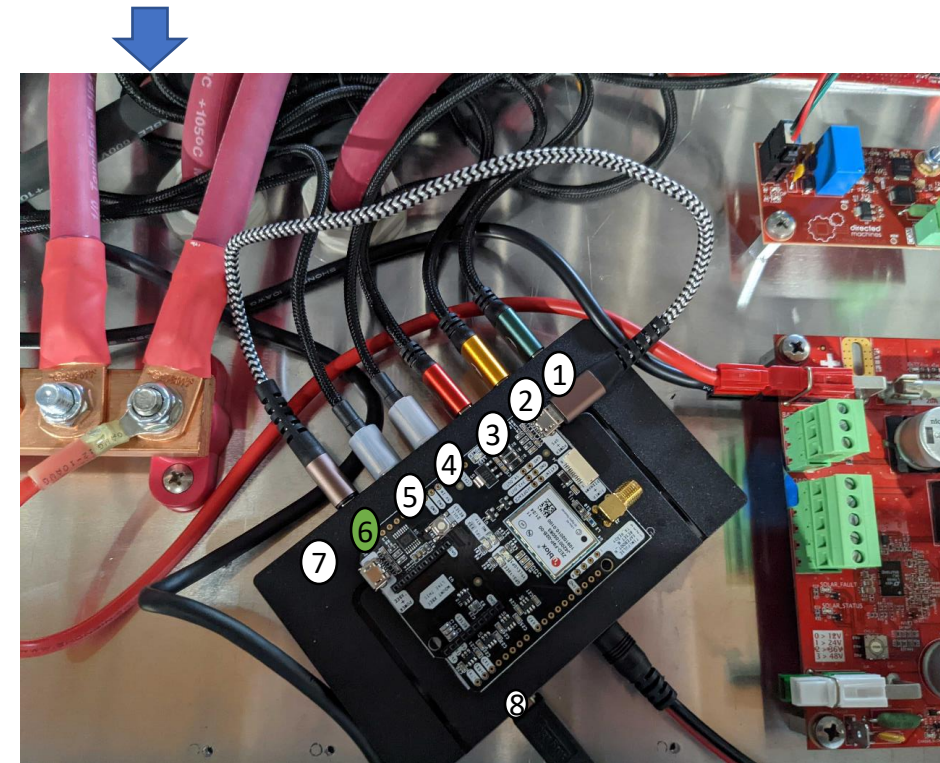
## Parts:

004156 | 1x | Sensor, GPS, L1+L2

003475 | 4x | 1/2" Velcro, 1" L

004280 | 1x | Cable, USB Micro to USB A

- a) Using the method on page 5, use the included velcro to cut 2x 2" strips to attach the GPS board to the top of the NEW usb hub, in the same position as on the old usb hub.
- b) Confirm port on board labeled "power + gps" is wired to port 6 of the USB hub using USB A to Micro USB cable ●



# Install New USB Hub

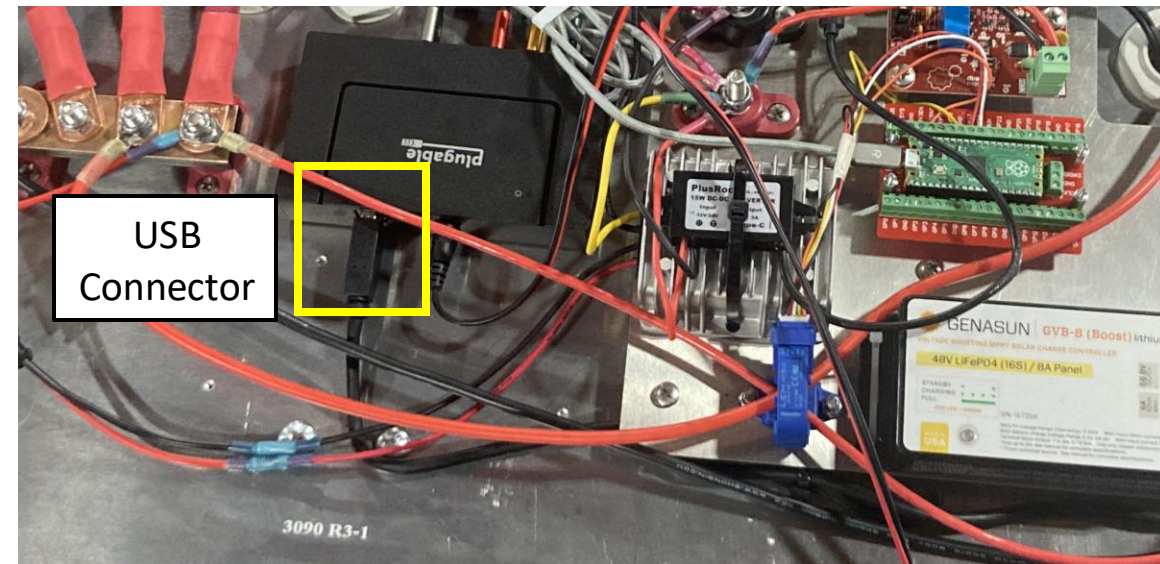
## Tools:

None

## Parts:

None

1. Remove plastic on new velcro on tray to expose sticky backing and press NEW USB hub into place on tray
2. Untape and connect USB connector that was unplugged from old USB port
3. **Use next 4 slides to verify wiring is in correct configuration**
4. If replacement cables sent with USB hub, use next 4 slides to determine placement of new cables. Carefully swap by entirely removing old cable without contacting tray, and then installing new cable without contacting tray.

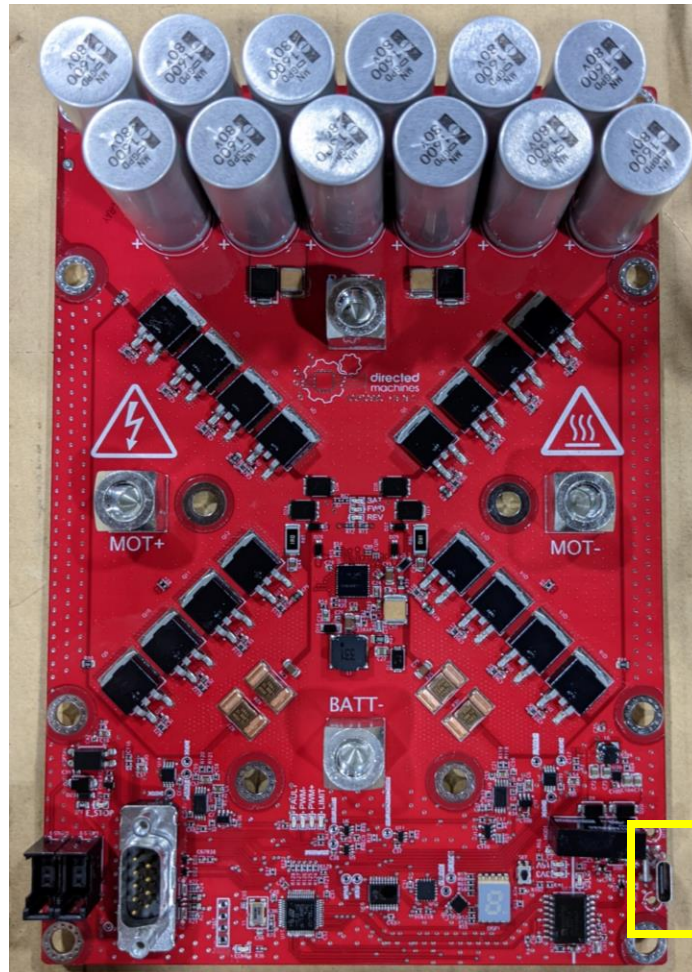




# USB Cable Warning

**WARNING: 300A MC USB-C INPUT CONNECTORS ARE FRAGILE DO NOT APPLY SIDEWAYS FORCE OR THEY WILL BREAK. SEE RIGHT PHOTO BELOW**

300 Amp Motor  
Controller (300A MC)



USB-C Input

# Wire USB Cables to Hub

**WARNING: 300A MC USB-C CONNECTORS ARE FRAGILE DO NOT APPLY SIDEWAYS FORCE OR THEY WILL BREAK**

Wire as neatly as possible and use cable ties to retain extra cable slack

1. Green or blue cable from hub port 1 to AUX1 MC
2. Gold cable from hub port 2 to LMC MC
3. Red cable from hub port 3 to RMC MC
4. Skip if SCC Alternative is used: USB A to c cable from hub port 4 to SCC
5. Skip if SCC is used: USB A to micro USB from hub port 5 to SCC Alternative

## Tools:

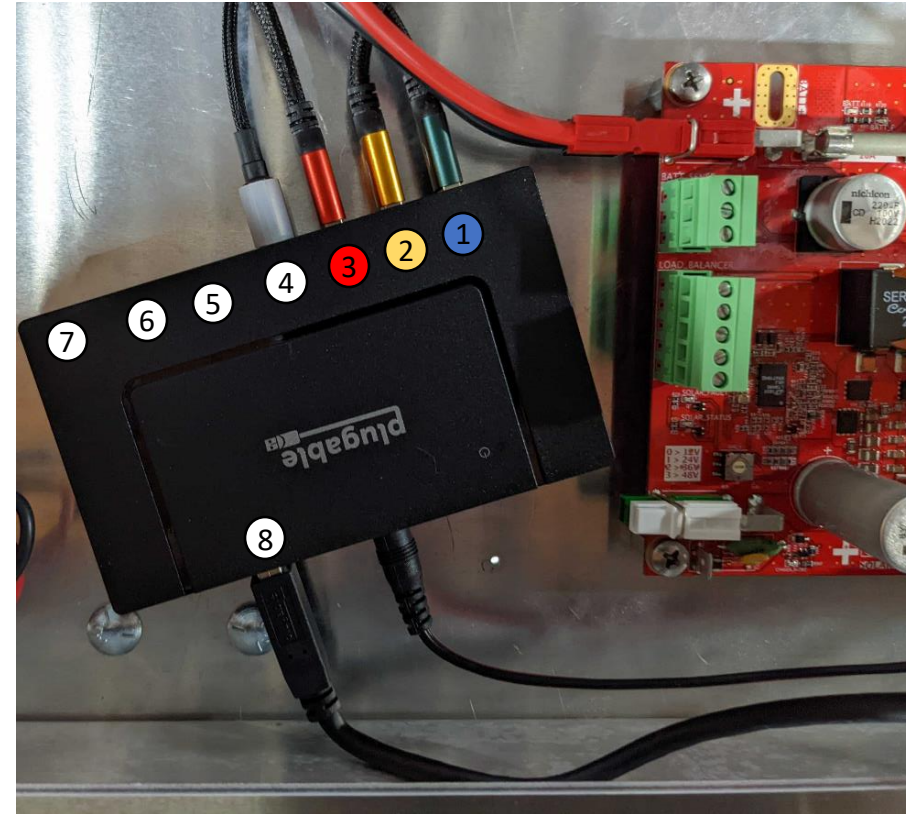
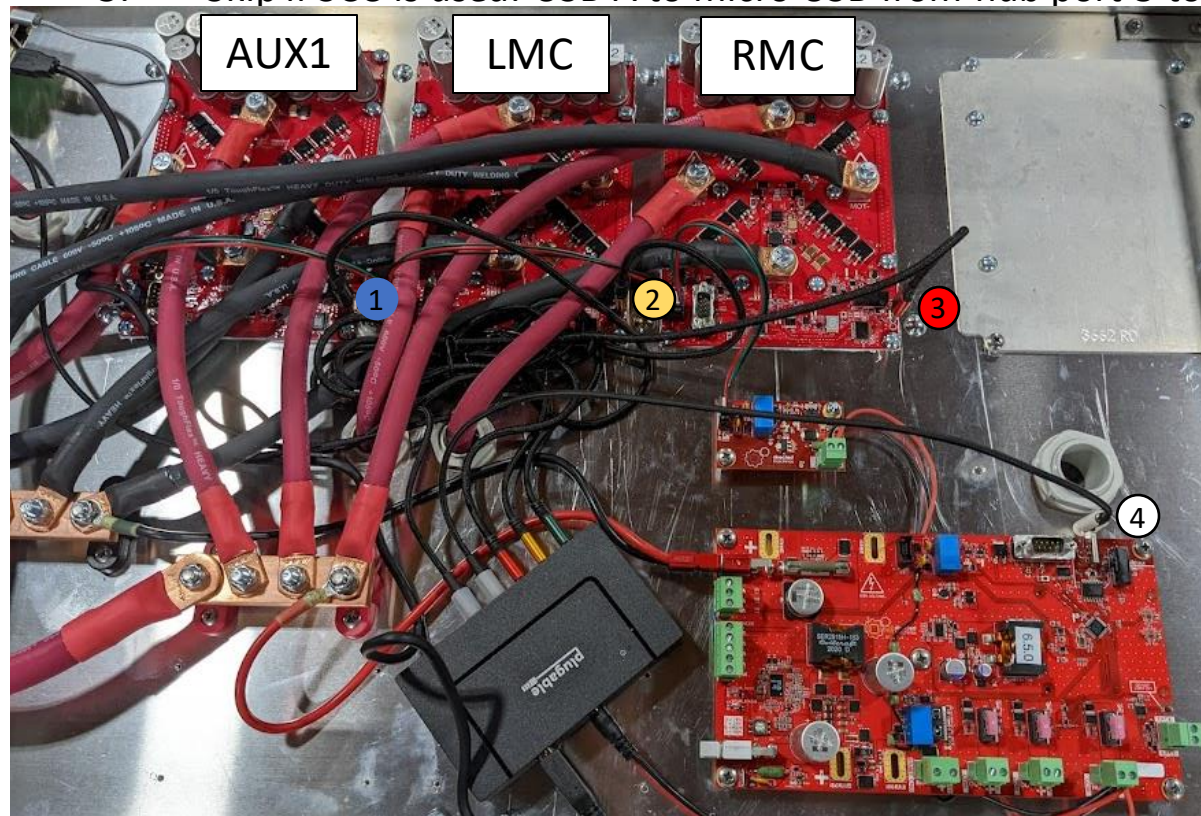
None

## Parts:

003676/004283 | 1x | Cable, USB C to USB A, 3 ft. Green or Blue

003675/004284 | 1x | Cable, USB C to USB A, 3 ft. Gold

002492/004281 | 1x | Cable, USB C to USB A, 3 ft. Red



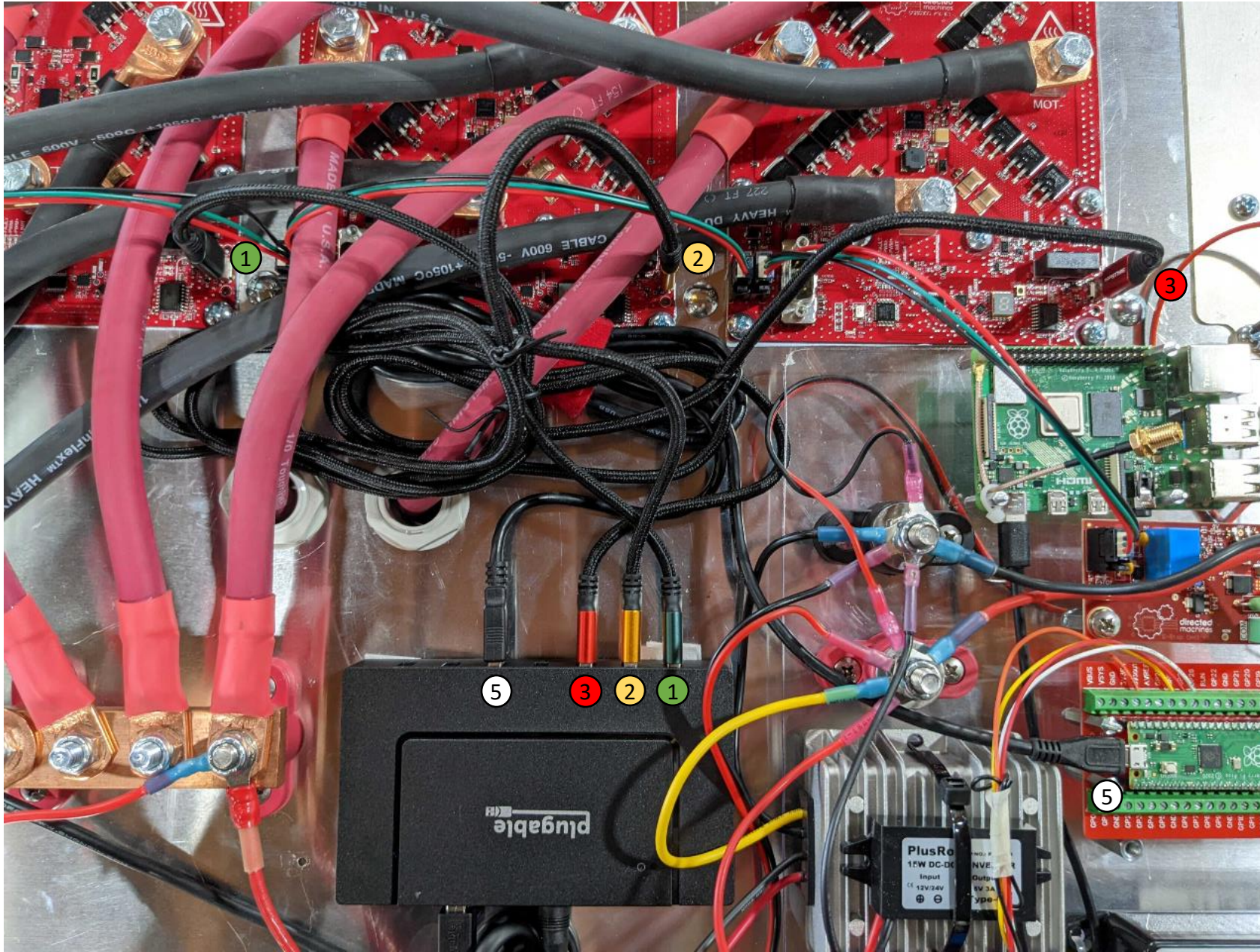


# Wire USB Cables to Hub

Verification image below from SCC Alternative Build

Tools:

Parts:



- Port 1: Green or blue cable, left AUXMC.
- Port 2: Gold cable, center LMC.
- Port 3: Red cable, right RMC.
- Port 5: Alt SCC (seen in bottom-right)



# Wire USB Hub to the Pi

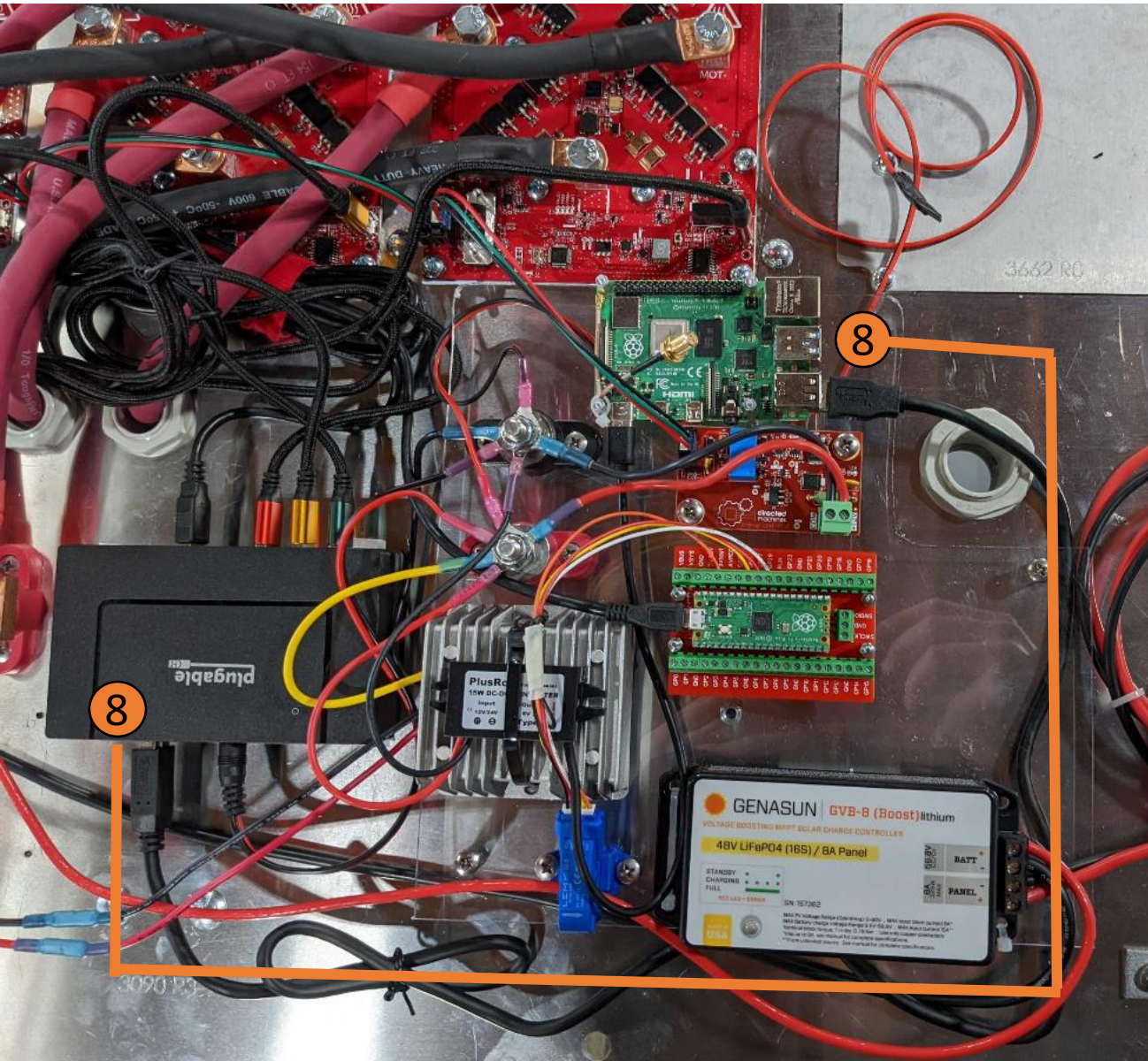
1. Plug the USB end of port 8 into the lower left USB port of the pi
2. Route along the path shown in orange and use twist tie to retain any extra cable

## Tools:

None

## Parts:

None



# Confirm Wiring with DM

- Take photos of all USB wiring to the hub (both ends of each cable) as well as a clear overall shot of the tray, and send to [support@directedmachines.com](mailto:support@directedmachines.com)
- The above photos must be confirmed by the support team (or over video call) BEFORE you power back up the LCR



# Power Up LCR

- Using the instructions in slides 11 through 12 of TB 7 [DM-HighCurrentPowerCycle.pptx](#), safely start up the LCR.
- Enable drive switch on side of lcr and make sure e-stops are not pressed
- From this point on, ensure you are at least 15 feet away from the LCR during this test.

# Safely Test LCR

- Ensure you are at least 15 feet away from the LCR at all times during this test.
- Using your connected phone, enable the drive option in the upper-left corner of Manual UI.
- Test driving the LCR forward and back, and then spinning in place. Make sure all directions respond as expected. If not, Motor Controller USB placement is in incorrect order. Refer to page 8.
- If all works well, open the settings and enable Axle Aux.
- Drive forwards and back to test that the mower enables with driving motion.
- If LCR does not respond as expected, the Motor Controller USB placement is in incorrect order. Refer to page 8.