Aillio Technology Co., Ltd
www.aillio.com
support@aillio.com

Upgrading the Bullet R1 Power Electronics to V2

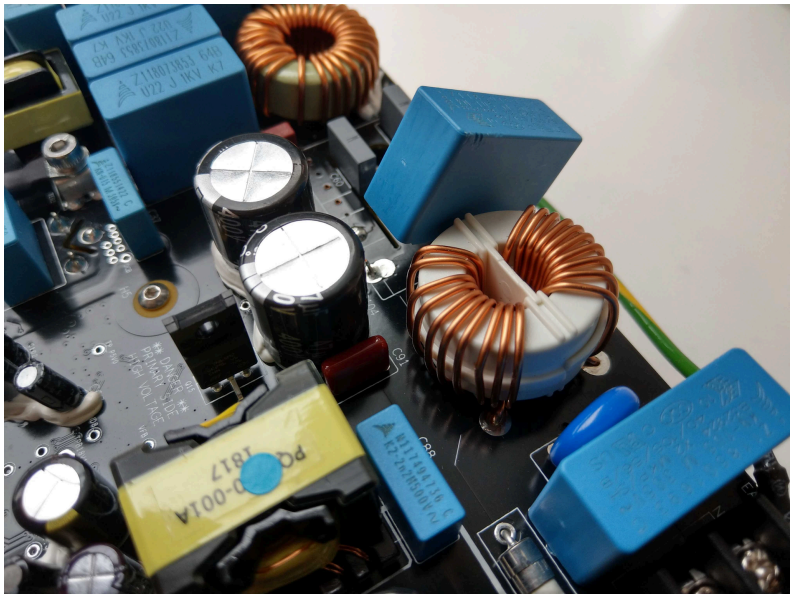
WARNING: THE BACK PCB MUST BE INSTALLED FIRST OR YOU WILL DAMAGE THE POWER ELECTRONICS MODULE

There are three PCBs on the Bullet R1 – The Back PCB (near the motor on the back of the Bullet), the Induction (or Power) PCB (under the Bullet), and the Control PCB (behind the control panel, with the buttons). Before upgrading to the V2 Induction PCB, please make sure you have the second version of the Back PCB installed (it should be black, not green).

We include the new Back PCB for customers with earlier serial numbers. The connectors are the same, so you only have to connect the wires as they were before. (See below).

WARNING: BE CAREFUL WHEN HANDLING THE INDUCTION BOARD; DO NOT PICK UP BOARD BY GRASPING COMPONENTS OR YOU MAY SNAP THEM OFF.

As you can see in the image below, the legs of the components are fragile. Please be careful when handling the board or you may damage it.

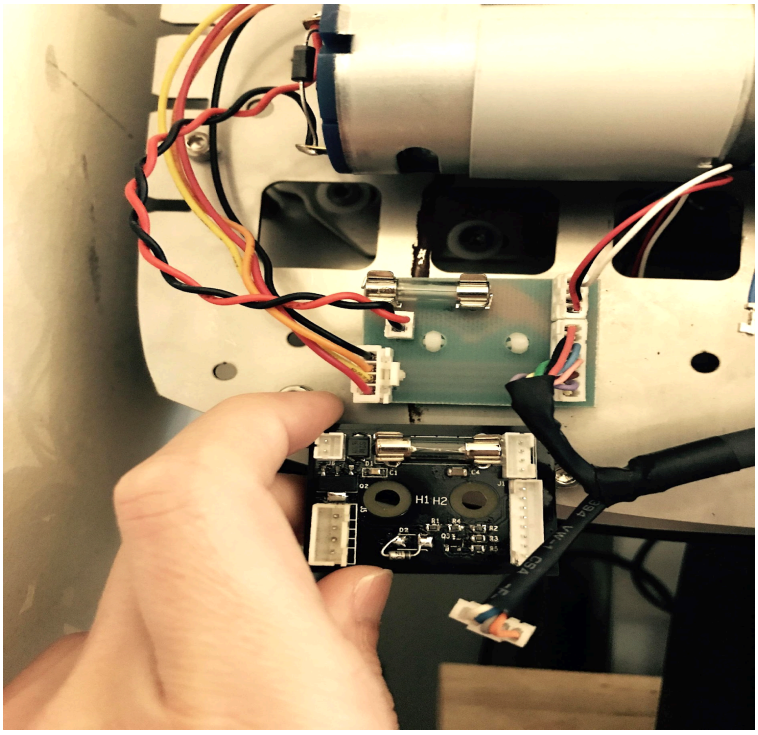


TOOLS NEEDED:

Small Utility Knife, Hex Driver 2mm, 2,5mm, 3mm, Philips Screw Driver, Scissor or cutter.

UPDATE YOUR FIRMWARE

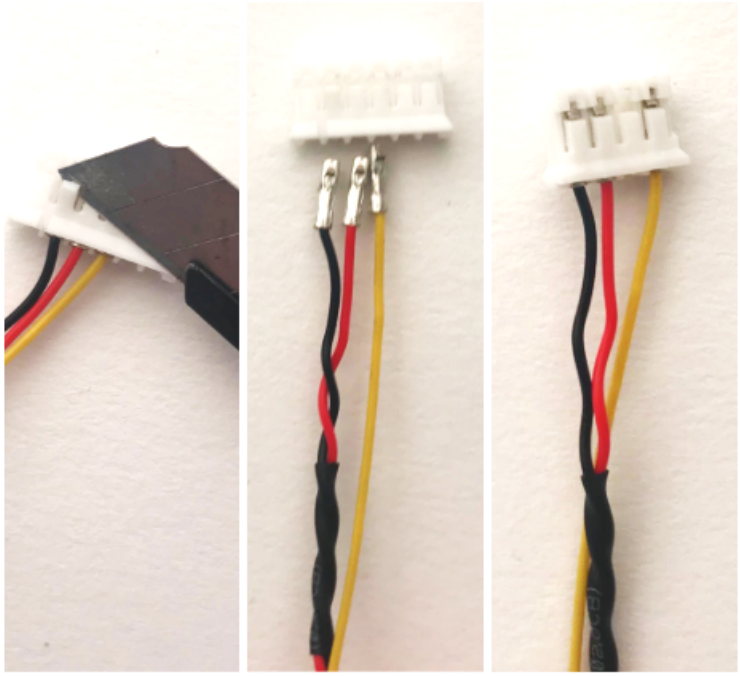
From Roastime, please update your firmware to the latest version, which is compatible with all versions 1, 1.5, and the next-gen V2. It will auto-detect the induction module at startup.



Upgrading to the V2 Induction PCB is pretty simple as long as you know how to remove the wires from the connector, and put them back together. If you have done IBTS upgrade, you know how to do it. If not, here's an example from the IBTS Guide:

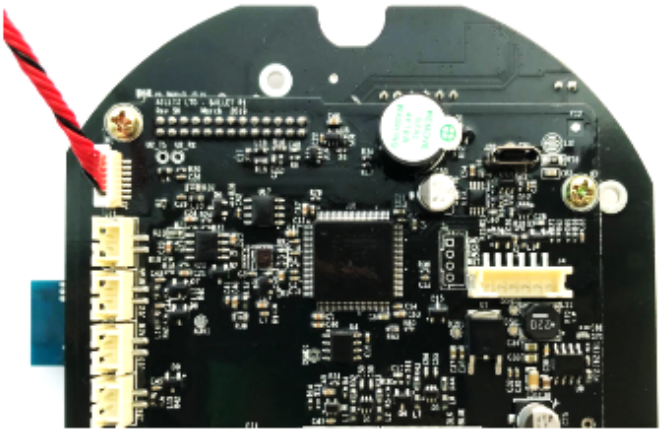
Take out the wires by flipping up the 'hook' with a tiny screwdriver, or similar flat tool.

Put the wires into the new connector. They should snap-in.



The other skill you will need is to cut the slots on the white plastic connector, turning the 8-pin connector into a 6-pin one. Here's how to do so. For V2 Control PCB and V2 Power PCB, you will need two 6-pin connectors for both ends. More details are in the following.

Note: It will be easier if you install the IBTS first. Please use the V2 IBTS wire for the V2 Control PCB.

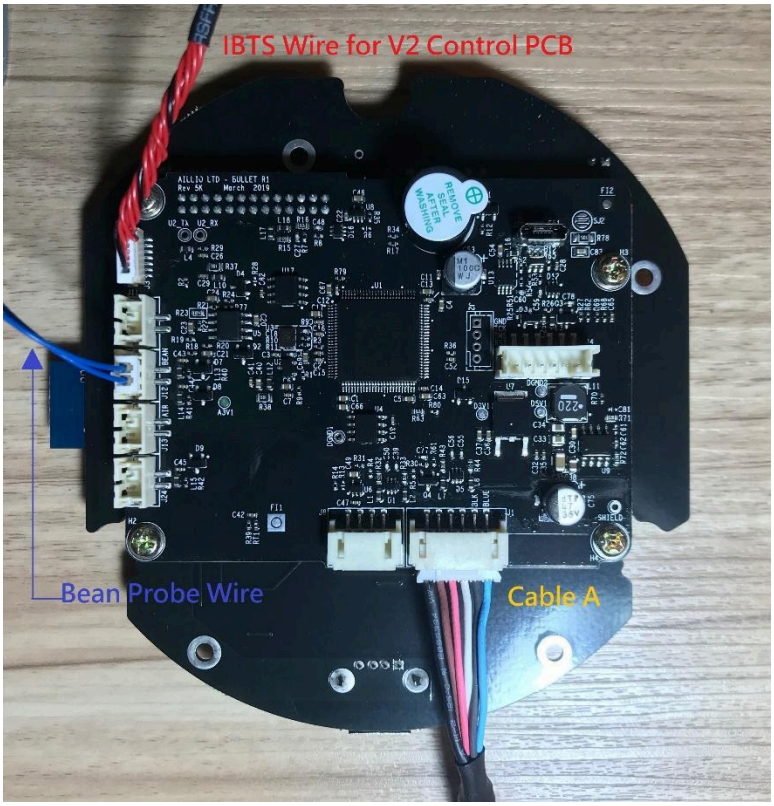


V2 Control PCB (2019)

V2 Control PCB

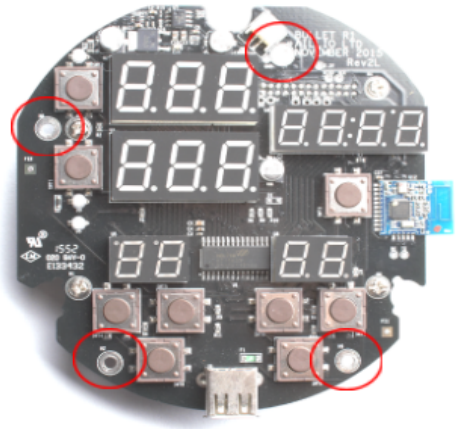
The V1 (and 1.5) Induction PCB used a 14 wire configuration to connect to the Control PCB. The V2 Induction PCB, however, only needs 6 wires to connect with the V2 Control PCB. We'll be making changes at both ends of the connection. Let's begin with the Control PCB side.

How V2 Control PCB Will Look Like When Everything is Done

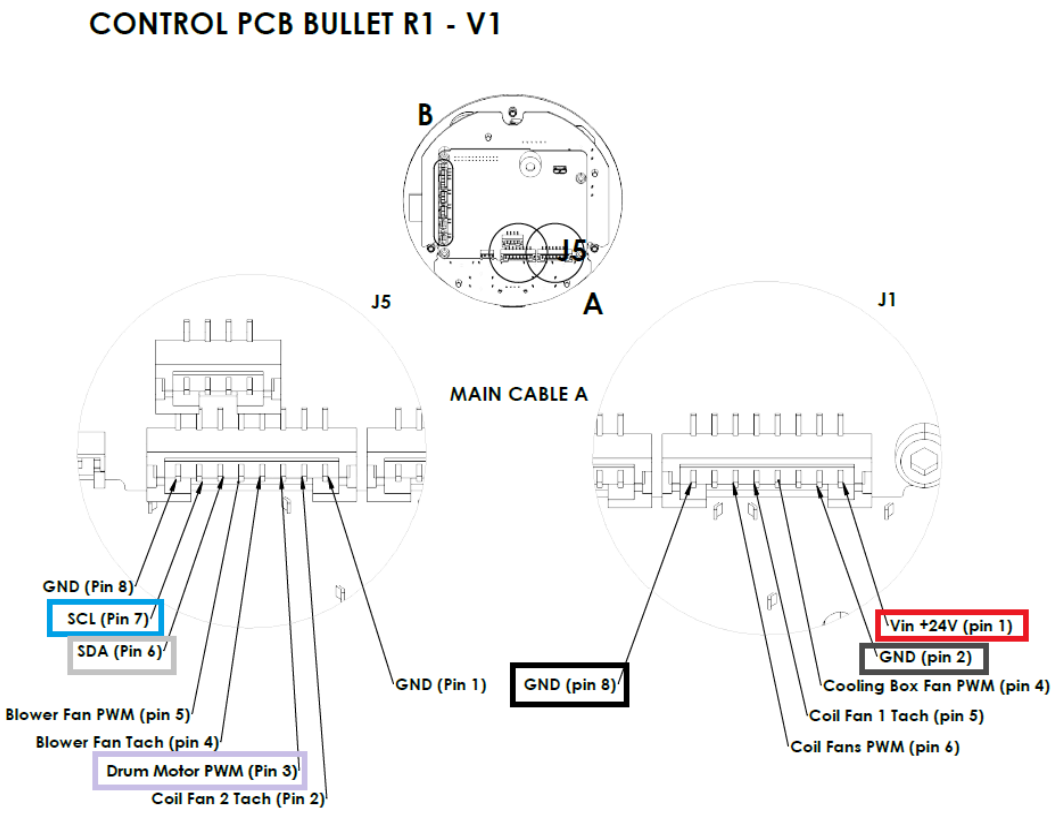


(The color codes of the wires on your Cable A if different. Please follow the guide below.)

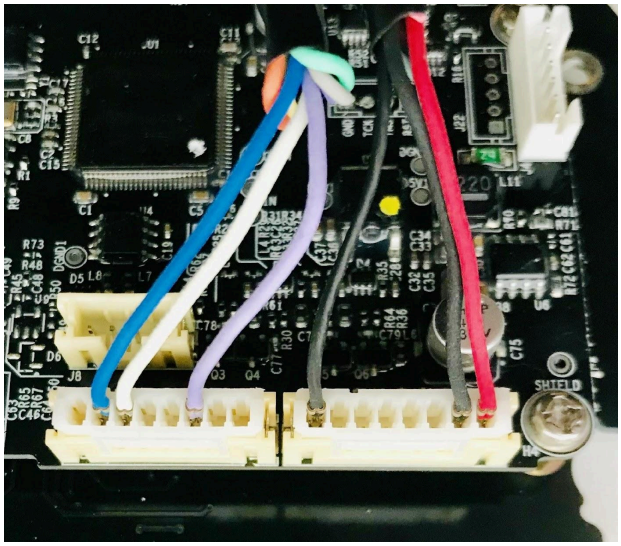
Start by removing the V1 Control PCB. You will need to unscrew the three screws on the Face plate (H2), then remove it together with the buttons. Unscrew the four highlighted black phillips screws. Carefully pull out the Control PCB Module and remove all the wires from the connectors.



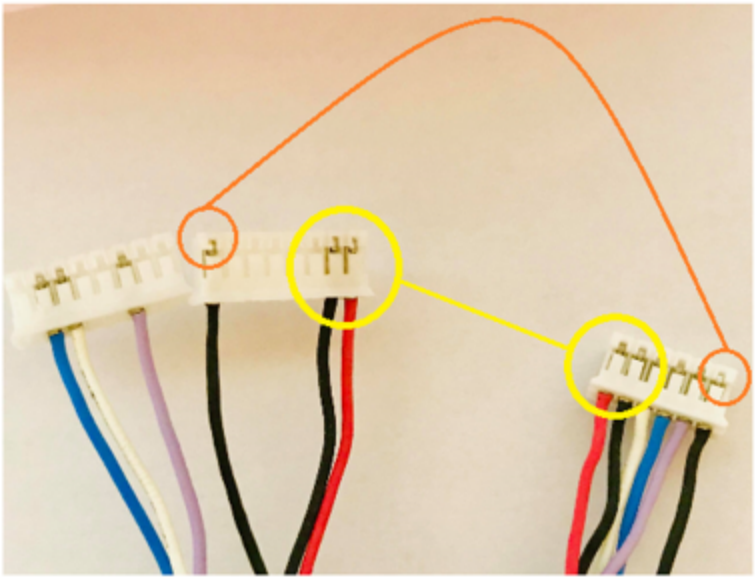
Now, look at the back of the Control PCB, down at the bottom you will see Cable A connected to two connectors. Please keep the highlighted wires (all six of them) intact and remove the rest.



Please cut off the wires that you removed and tape them together, avoiding possible short-circuit. It should look like this afterward:



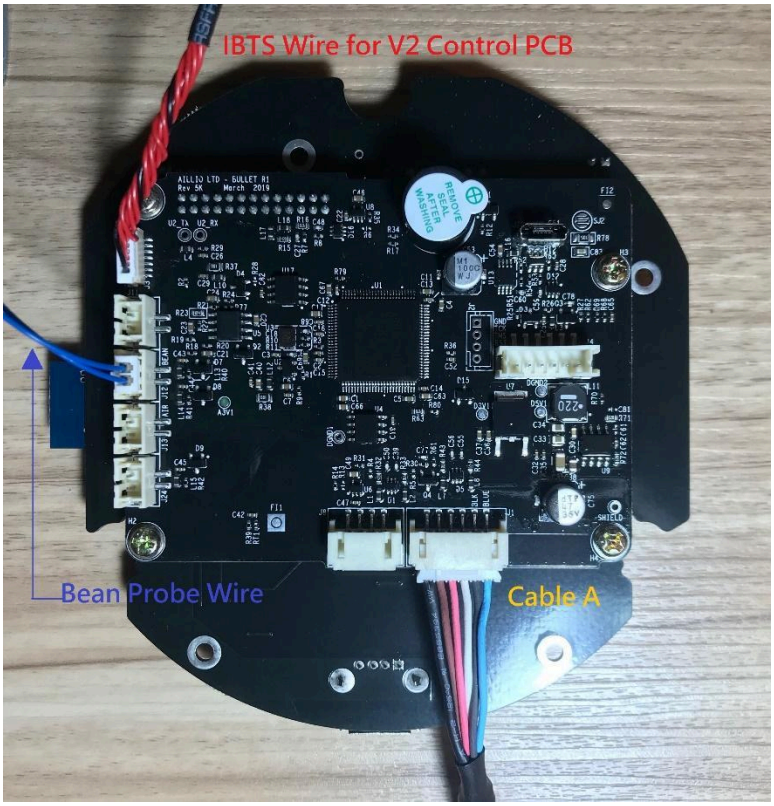
Now we need to make all the wires onto a 6-pin connector to go with the V2 Control PCB.



To make one of the 8-pin white plastic connectors into a 6-pin one, please remove all the wires first, then cut off two slots from one side of the connector together. If you cut one slot out from each side, it won't fit into the PCB's female connector.

IMPORTANT: Since there are two black wires, please make sure to carefully follow the diagram below. Please note the black wire next to the red wire in the old setup. You will also seat them next to each other in the new connector.

Again, here's how V2 Control PCB looks like when everything is done



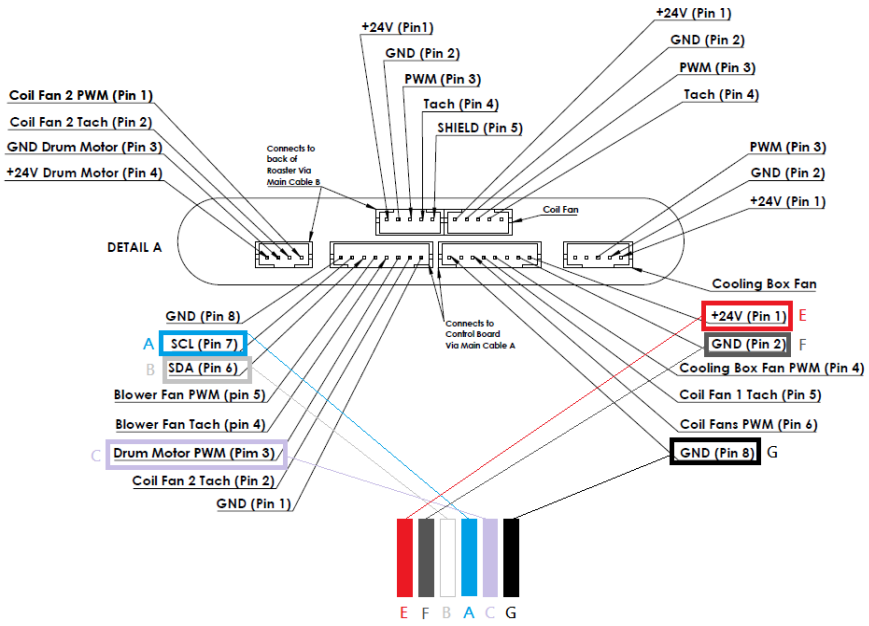
V2 Power PCB

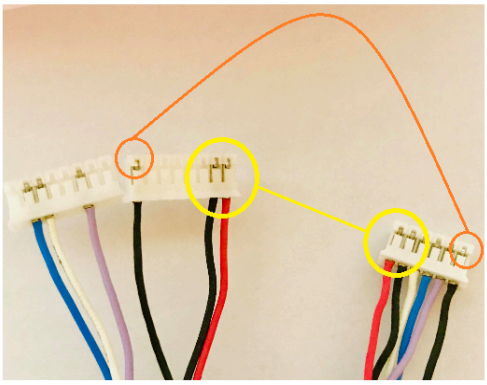
Now we can go on to install the V2 Induction PCB Module. The steps of removing and installing an Induction PCB Module can be found in this guide: https://drive.google.com/open?id=1LW9aTeaSAttMoVqp4aSPE3vuTLhkulve.

But of course, as we mentioned before, the wiring on the V2 board is a little bit different. View the diagram below to rewire the Cable A wires on the Induction PCB end. After folding or clipping away the unnecessary wires, we will need to put the six remaining wires into the 6-pin connector.

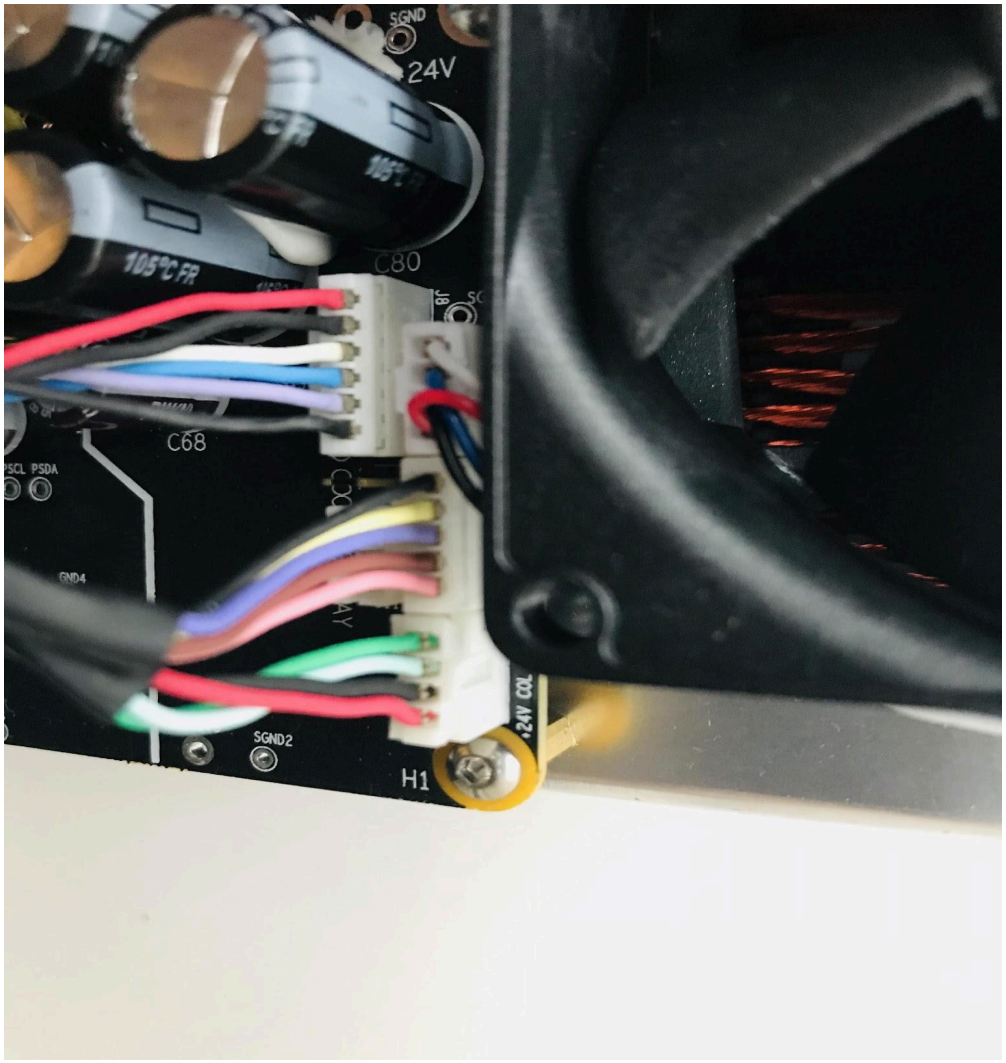
IMPORTANT: Since there are two black wires, please make sure to carefully follow the diagram below. Please note the black wire next to the red wire in the old setup. You will also seat them next to each other in the new connector.

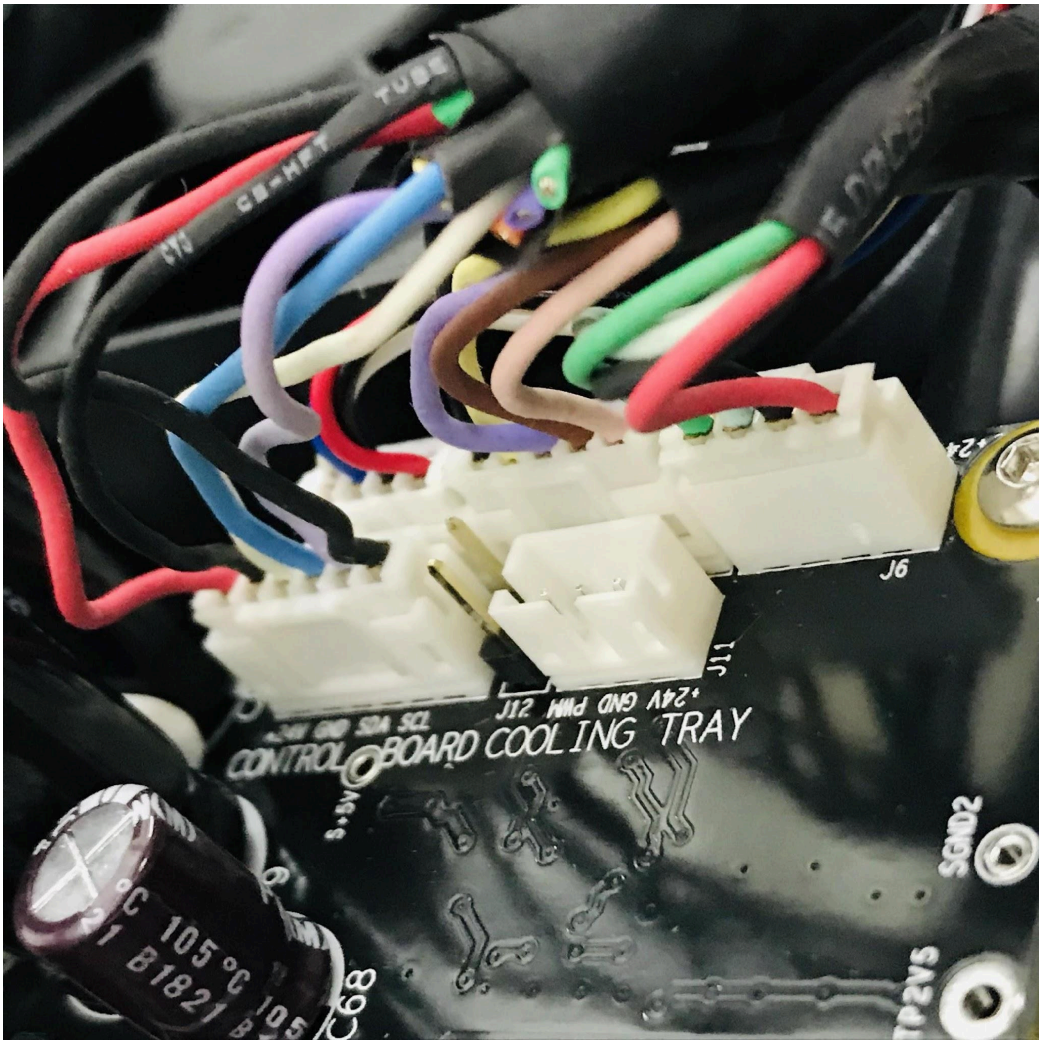
Power PCB Cable A - From v1.0 wiring to v2.0



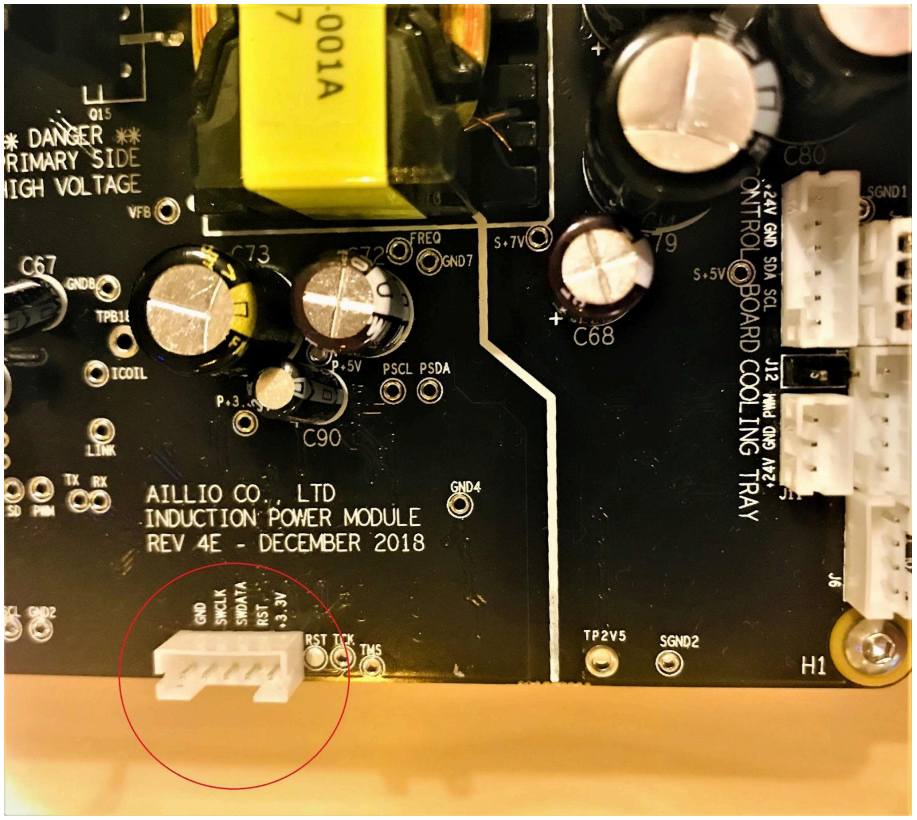


Please follow the picture below to insert all the connectors on to the V2 Induction PCB Module. Please make sure all the connectors are firmly pushed in.


SGND
24V
105°C FR
C80
C68
PSCL PSDA
GND4
SGND2
H1
+24V COL



Please note, the highlighted connector is for programming only and should never be connected to any wire/connector on the Bullet. Please don't connect the previous version of 5 pin Cooling Fan Cable to this connector.



DANGER
PRIMARY SIDE
HIGH VOLTAGE
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INDUCTION POWER MODULE
REV 4E - DECEMBER 2018
CONTROL BOARD COOLING TRAY
GND
SWCLK
SWDATA
RST
+3.3V
RST
TCK
TMS
TP2V5
SGND2
H1
C67
C73
C72
C68
C80
C90
FREQ
GND7
S+7V
S+5V
P+5V
PSCL
PSDA
GND4
VFB
ICOIL
LINK
TX
RX
SGND1