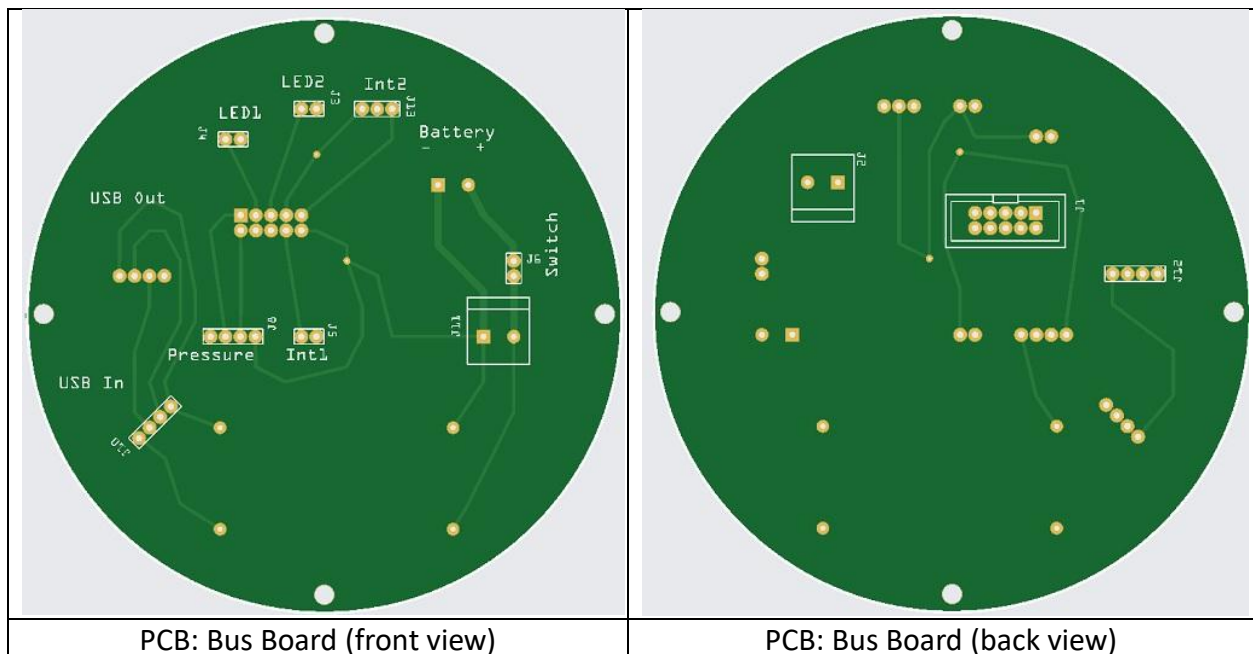


PCB: Bus Board

The Bus Board serves as a hub for signal and power distribution. The following external components are connected to the Bus Board: a) main power switch, b) timing switch, c) red LED, d) green LED, e) BAR30 pressure sensor, and f) the USB bulkhead connector. Signals for the LEDs (J3, J4), pressure sensor (J8), and timing switch (J5) are passed to/from the Main Board via a 10-wire ribbon cable (J1). An unused 3-pin JST-XH connector (J13), which was previously utilized as a flowmeter interrupt, connects to *Teensy* pin 40 (A16), 3.3V, and GND.

Power from the battery holder assembly is received through a screw terminal block (J2) on the back of the board. The motor ESC receives full battery power via a terminal block (J11) on the front of the board when the main power switch (J6) is closed. From that point, the battery power is also passed through a step-down voltage regulator to supply 5V DC to *Teensy* via a USB connector (J12). Thus, when the system is offline, only 5V power is supplied to *Teensy* through this USB link, whereas when the unit is online (i.e. connected to a PC via the bulkhead connector, J10), *Teensy* receives both power and data from the PC through the USB link.

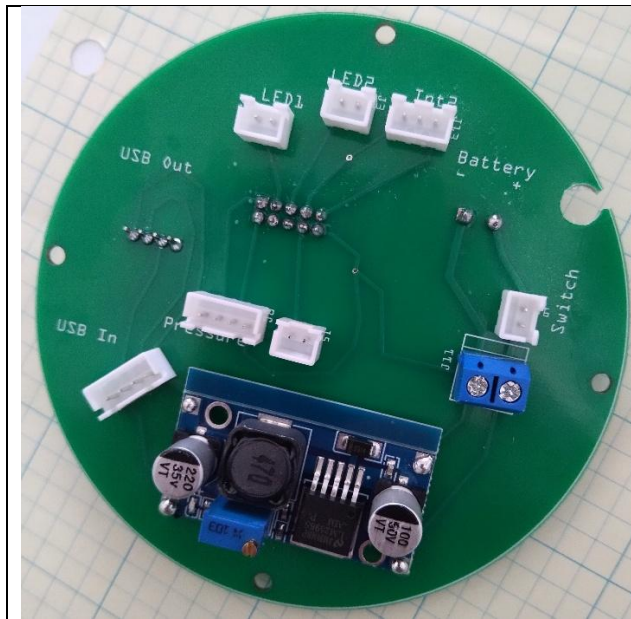
The Bus Board is mounted between the endcap and the Mainboard with brass spacers through the four mounting holes.



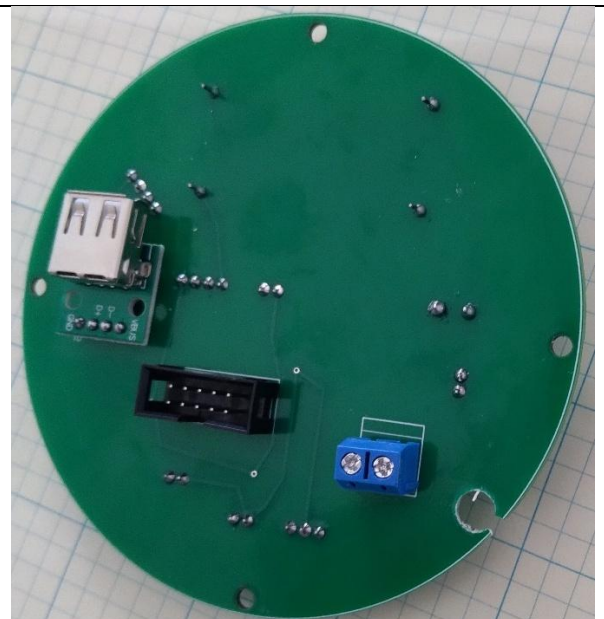
Bill of Materials (BOM)					
#	Description	Loc.	Cost	Qty	Supplier
1	IDC 10-Pin male header ribbon cable connector socket, 2.54 mm pitch	J1	\$0.15	1	Amazon.com
2	JST-XH 2-pin PCB mount connector, 2.54 mm pitch	J3, J4, J5, J6	\$0.03	4	Amazon.com
3	JST-XH 3-pin PCB mount connector, 2.54 mm pitch	J13	\$0.03	1	Amazon.com
4	JST-XH 4-pin PCB mount connector, 2.54 mm pitch	J8, J10	\$0.03	2	Amazon.com
5	Screw terminal block connector, 2-pin, THT, 5 mm pitch	J2, J11	\$0.15	2	Amazon.com
6	USB type A female breakout board, 2.54 mm pitch	J12	\$0.70	1	Amazon.com
7	LM2596 DC-DC adjustable Buck converter step-down voltage regulator module		\$1.25	1	Amazon.com

Assembly (approximate time: 30 minutes):

1. Solder all components into place as indicated in the photos.



Assembled PCB: Bus Board (front)



Assembled PCB: Bus Board (back)

Recommended mods:

When using a 4-inch pressure tube, the cables from the flow sensor and the ESC PWM signal wires will get squeezed as they pass by the Bus Board. The solution is to drill a quarter inch hole at the edge of the Bus Board to create a notch, and use it to pass the wires through to the Mainboard (see photo of assembled PCB above for notch placement).