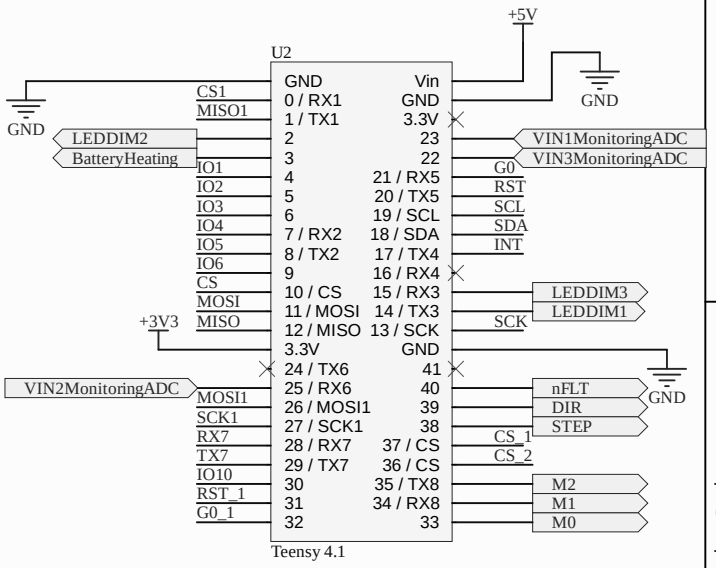
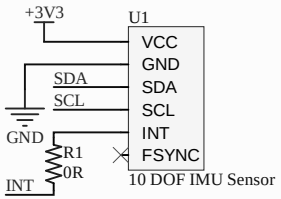
# MCU, Radios, and Sensors

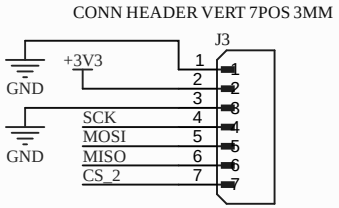
## Microcontroller



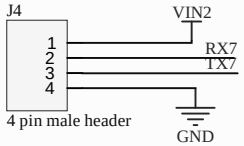

## IMU




## Altimeter

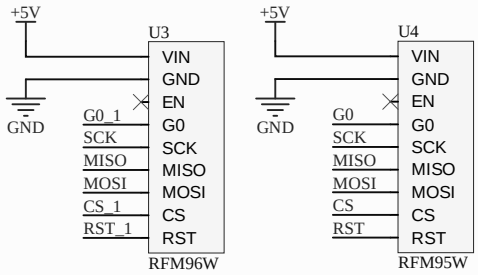


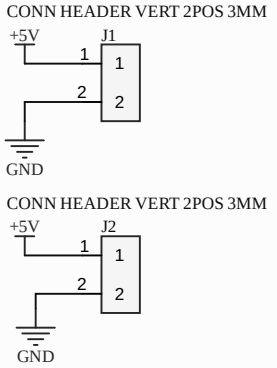

## Transponder Control



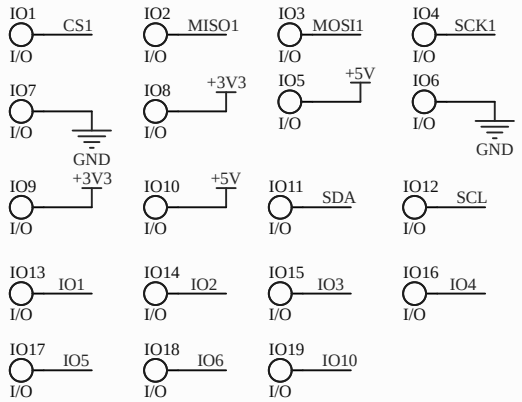

## Radios

For more efficient data transmission and reception between the ground station and the payload, two different radios will be used. These two radios work at different frequencies therefore, they won't be able to interfere with each other.

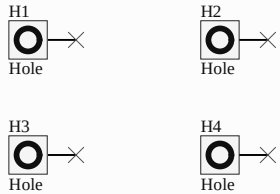



## Extra MCU Pins and Power Pins




## Holes

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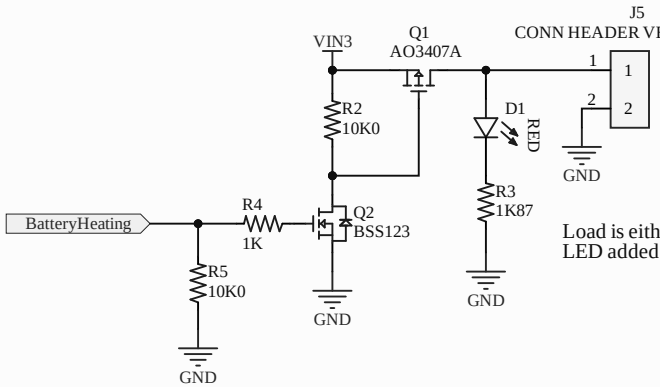
# Battery heating system

## Control Logic




Wires will be crimped on one side to fit in Molex connector and the other side will be soldered to the load (either power resistor or Peltier element).

Load is either a Peltier element or a 10 ohm power resistor rated at 2W.
LED added to know when load is expected to start drawing current

When temperature inside the box nears 0 degrees Celsius, send HIGH to BatteryHeating pin.
When doing layout remember that MOSFETs have a switching frequency that can cause noise.

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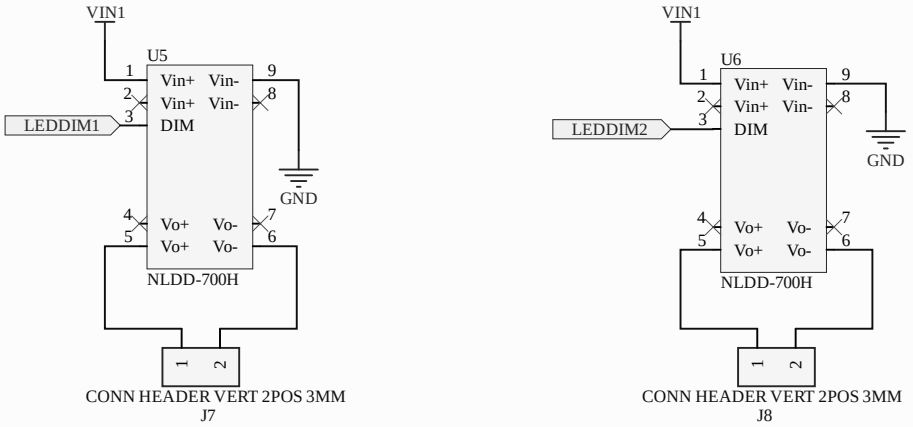
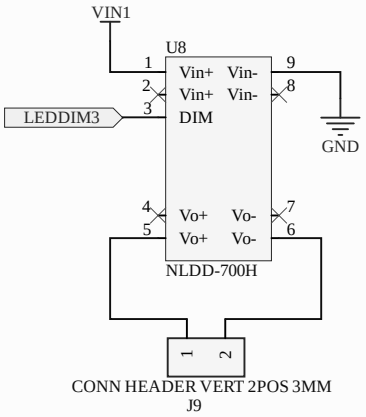
# LEDs, and Motors

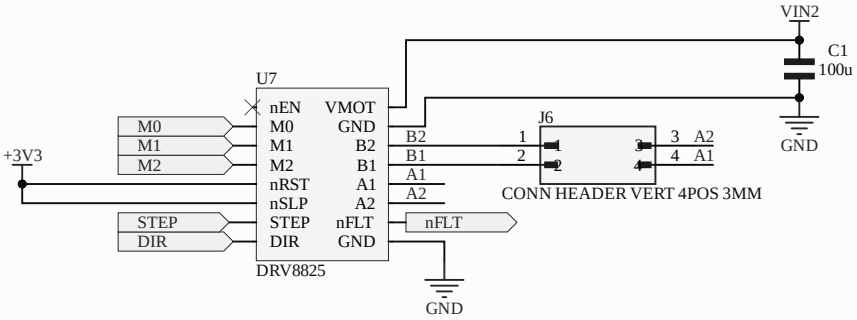
## LED System




The high-powered LEDs will be connected to the LED drivers thru the slip ring.
The slip ring is necessary for having a system that includes a stationary and a rotating part.

## Motor System




Wires will be crimped on both sides. On one side the crimped wires will be connected to the 4 pin Molex connector. On the other, the crimped wire will be connected to the 4 pin female header connection from the NEMA-17 motor.

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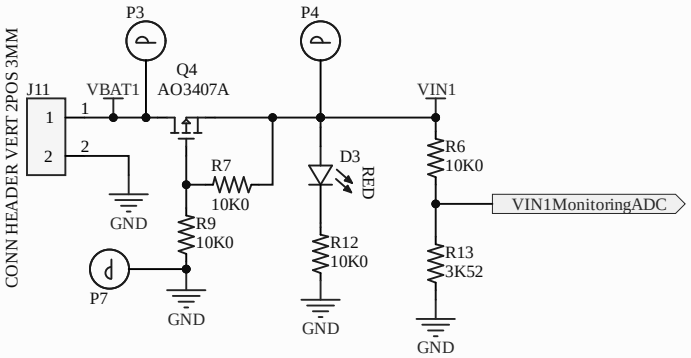
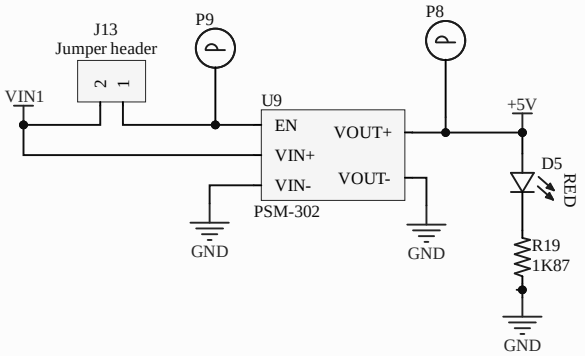
# Power Management

## Power (MCU, Radio, Sensors, and LEDs)

Expected: 3S Li-Po, max 12.6V, min 7.5V  Voltage divider: 12.6 * 3.52/13.52 ~ 3.28V



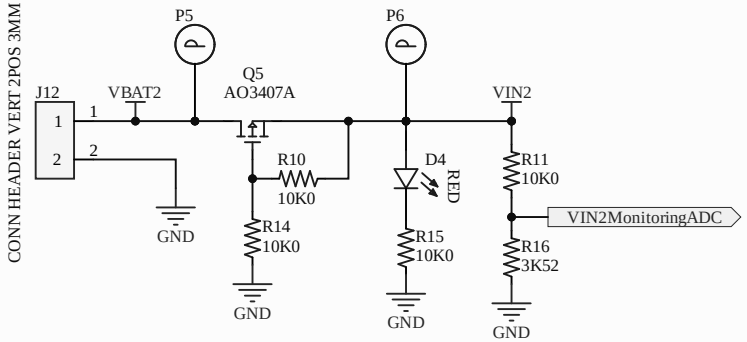

XT60 connector will be soldered onto crimped wires.




Jumper header used to control power to the MCU.
The pins of the jumper header will be shorted using a jumper cap.

## Power (Motor)

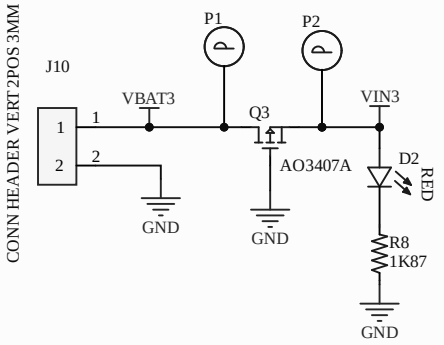
Expected: 3S Li-Po, max 12.6V, min 7.5V  Voltage divider: 12.6 * 3.52/13.52 ~ 3.28V



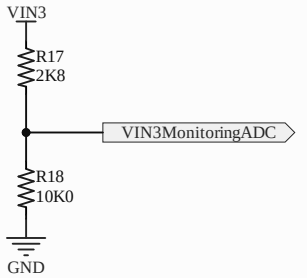

XT60 connector will be soldered onto crimped wires.

## Power (Heating)

Expected: 1S Li-ion, max 4.2V, min 3.0V




The 1S Li-ion powers the heating circuitry thru a battery holder.
Crimped wires will be soldered to the battery holder wires.




Voltage Divider: 4.2 V * 10/12.8 ~ 3.281 Vmax

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