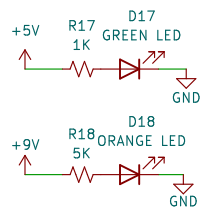
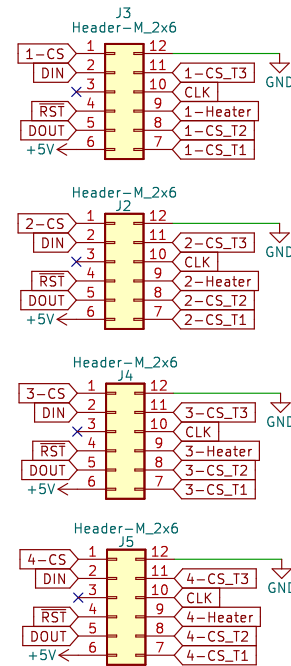


Power Indicators

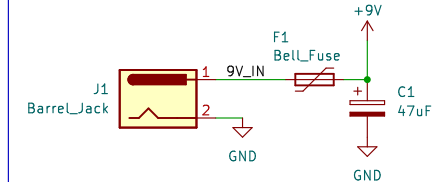


Thermal Mockup Connectors

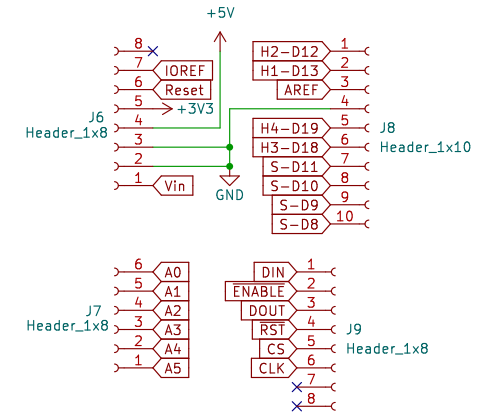


Connector: FCS-12-SG

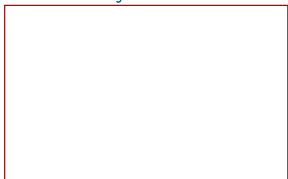
Power Input For Heaters



Arduino Uno Connectors

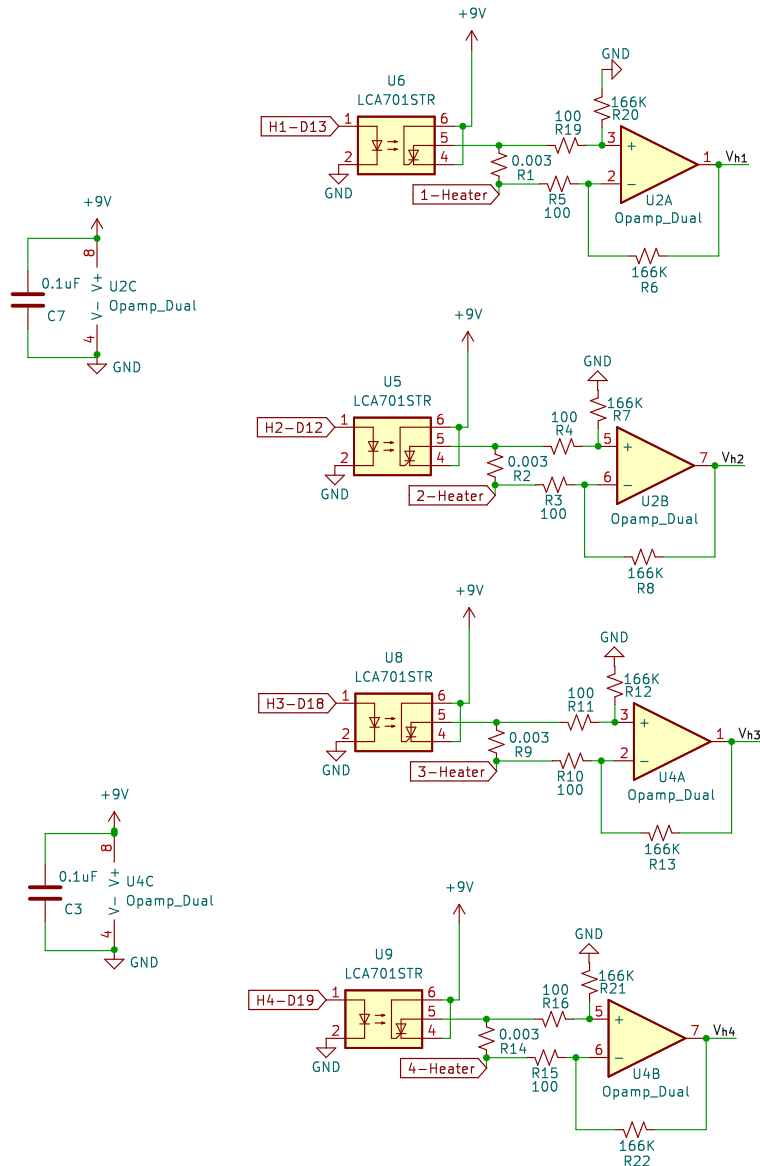


current-sensing



File: current-sensing-p2.kicad_sch

Heater Current Sensing



Gain:

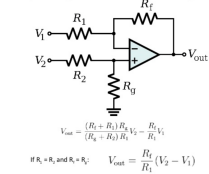
$$V_{sense} = I_{max} \times R_{sense}$$

$$3 \text{ mV} = 1 \text{ A} \times 0.003 \Omega$$

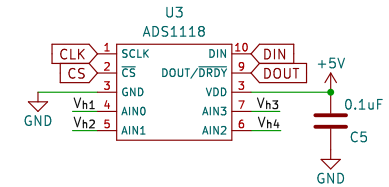
$$G_{needed} = V_{ACD_max} / V_{sense}$$

$$G_{needed} = 1666$$

Op-Amp Differential Amplifier



Current Read-out



ADS1118:

16-bit ADC (Max Input Singal 5v)
 $5 / (2^{16} - 1) = 7.6295 \times 10^{-5} \text{ V}_{smallest_step}$
 $V_{smallest_step} / G = 7.6295 \times 10^{-5} / 1661 = 4.59 \times 10^{-8} \text{ V}$
 $4.59 \times 10^{-8} = I_R \times 0.003$
 $I_R \approx 0.015 \text{ mA}$