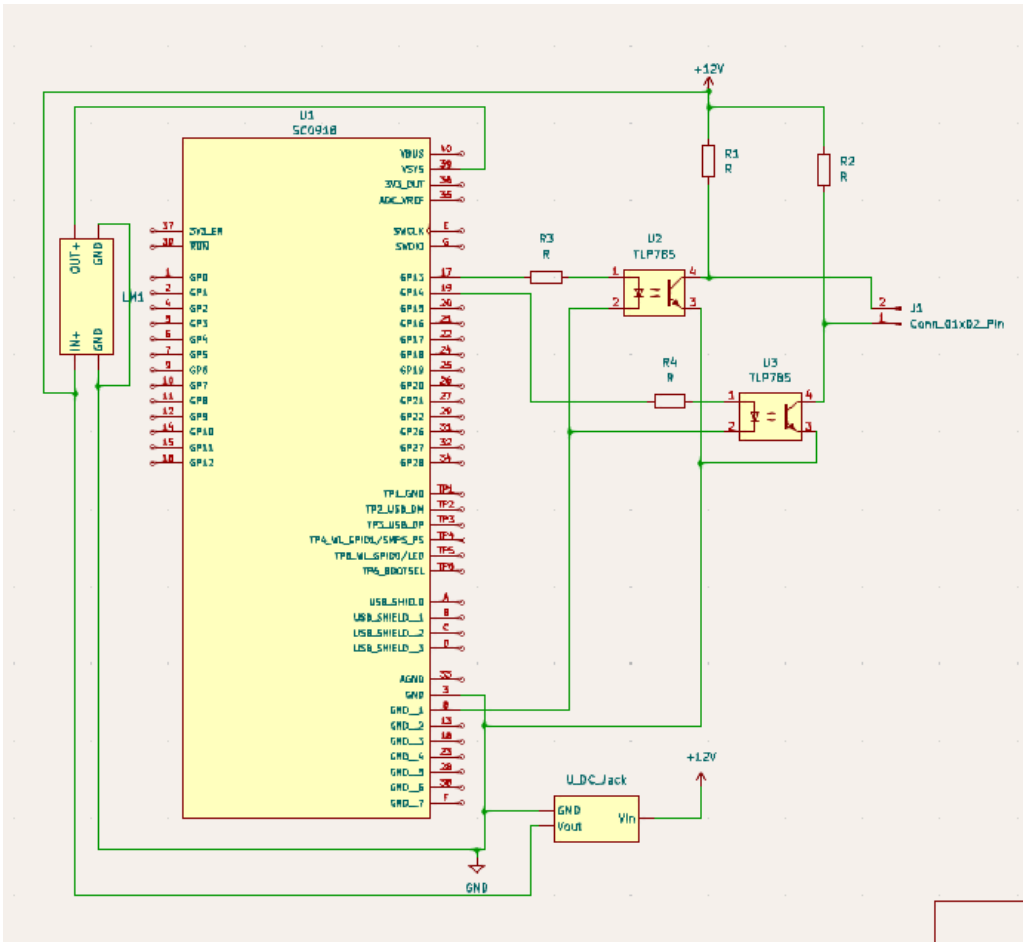
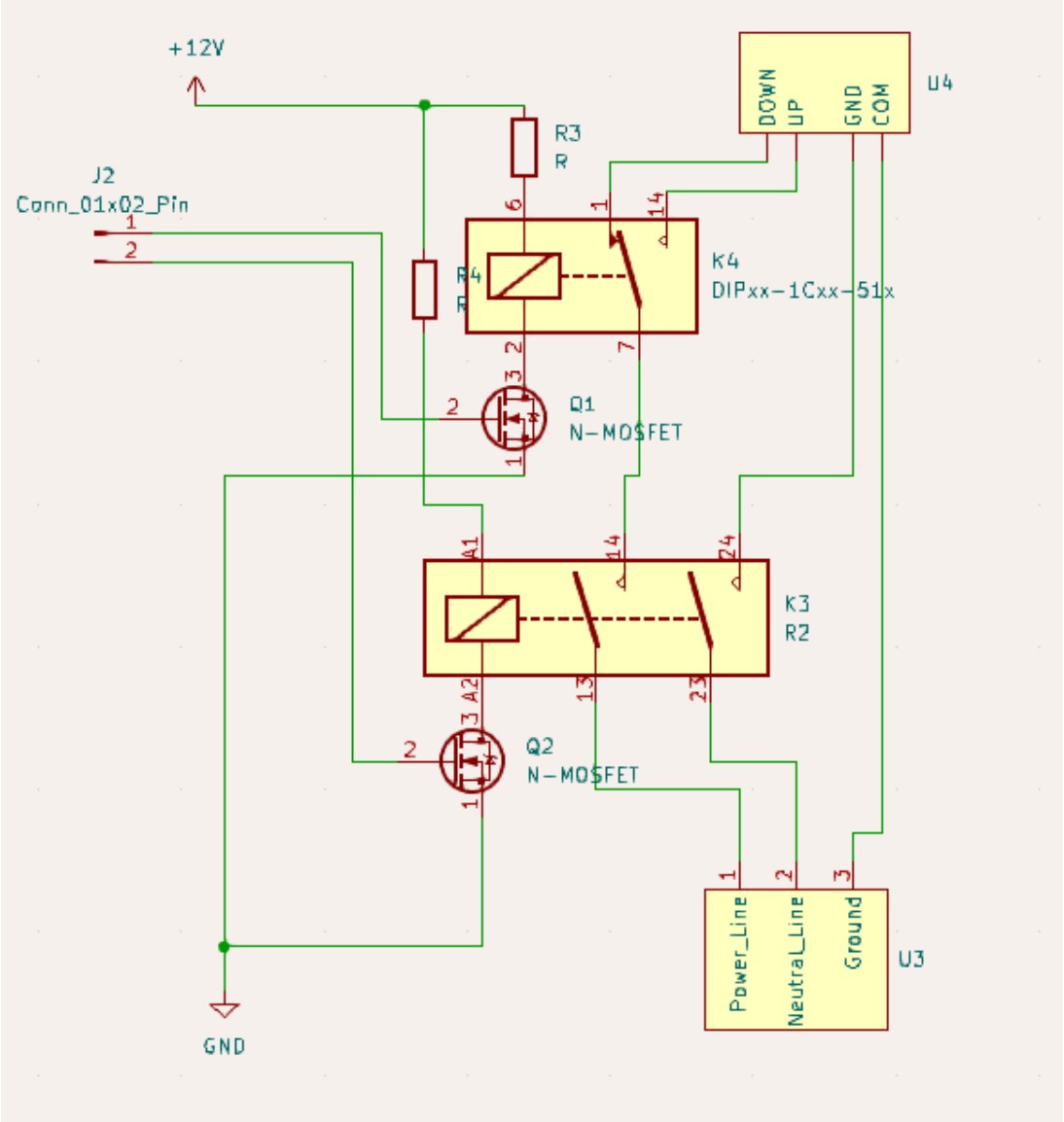
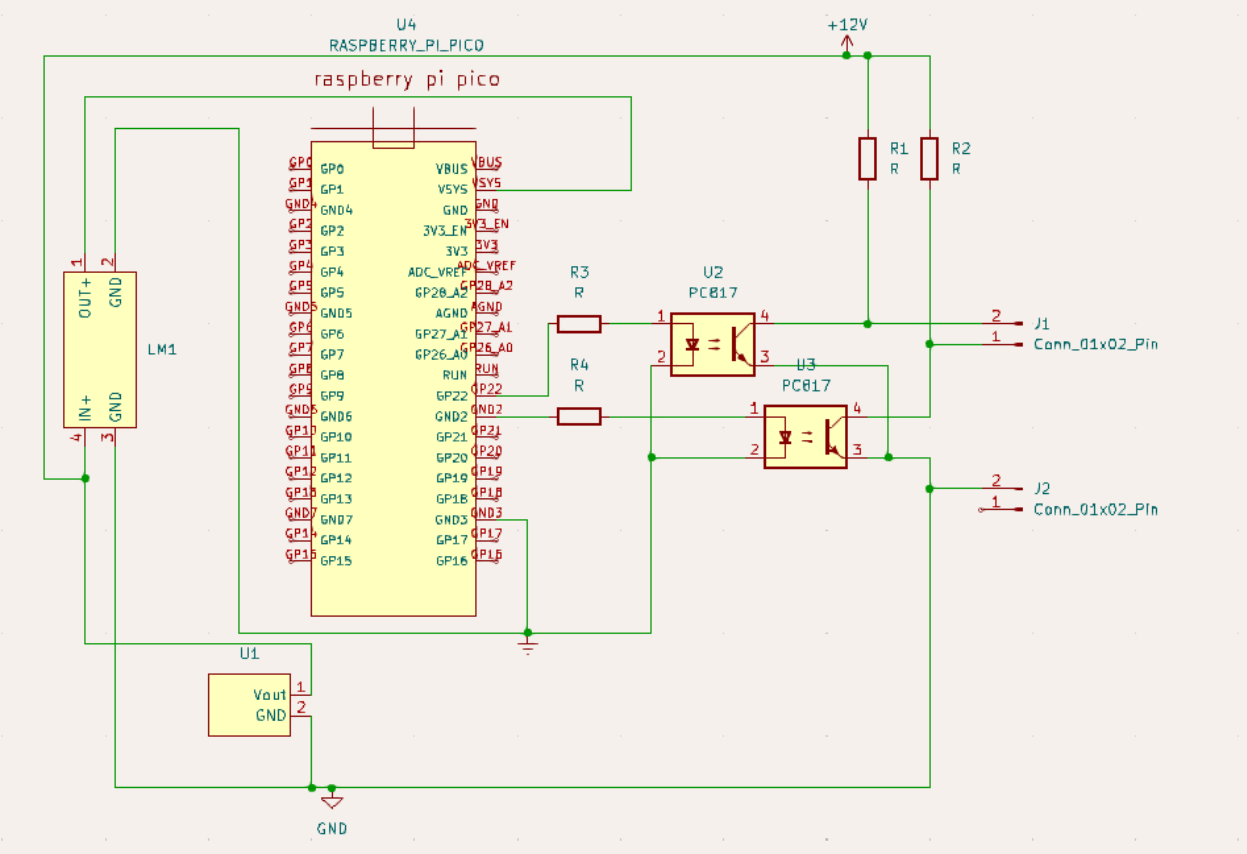
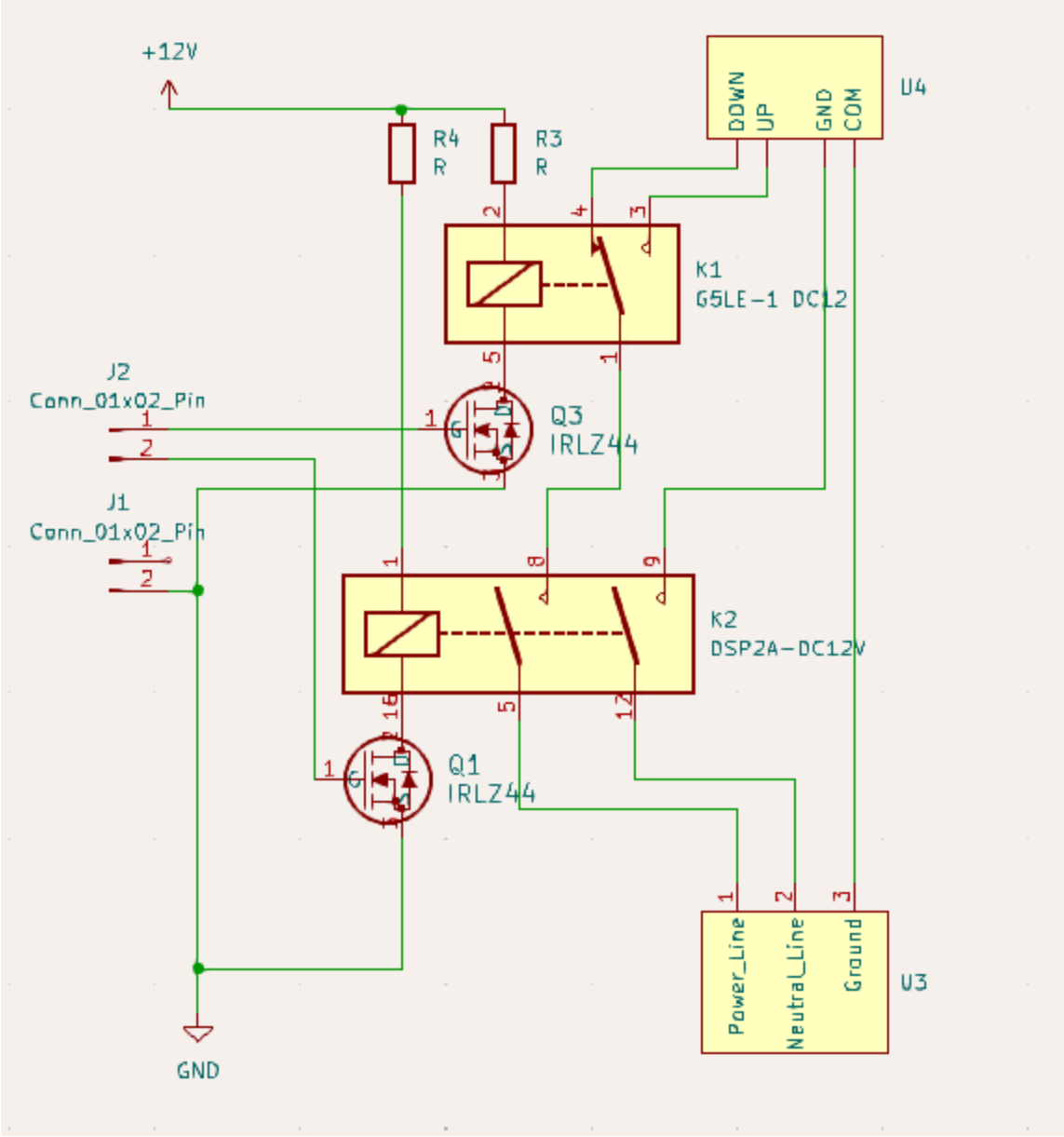

+12V
U1
SC0918
R1
R
R2
R
R3
R
U2
TLP785
R4
R
U3
TLP785
J1
Conn_01x02_Pin
LM1
OUT+
GND
IN+
GND
U_DC_Jack
GND
Vout
Vin
+12V
GND

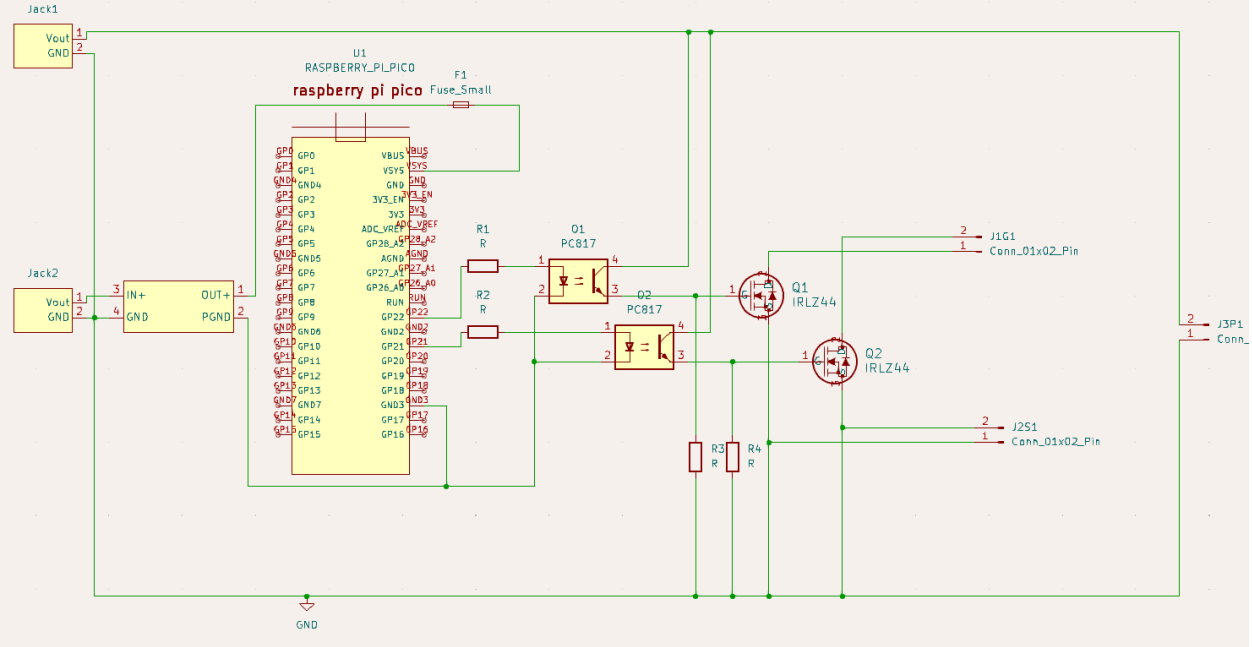


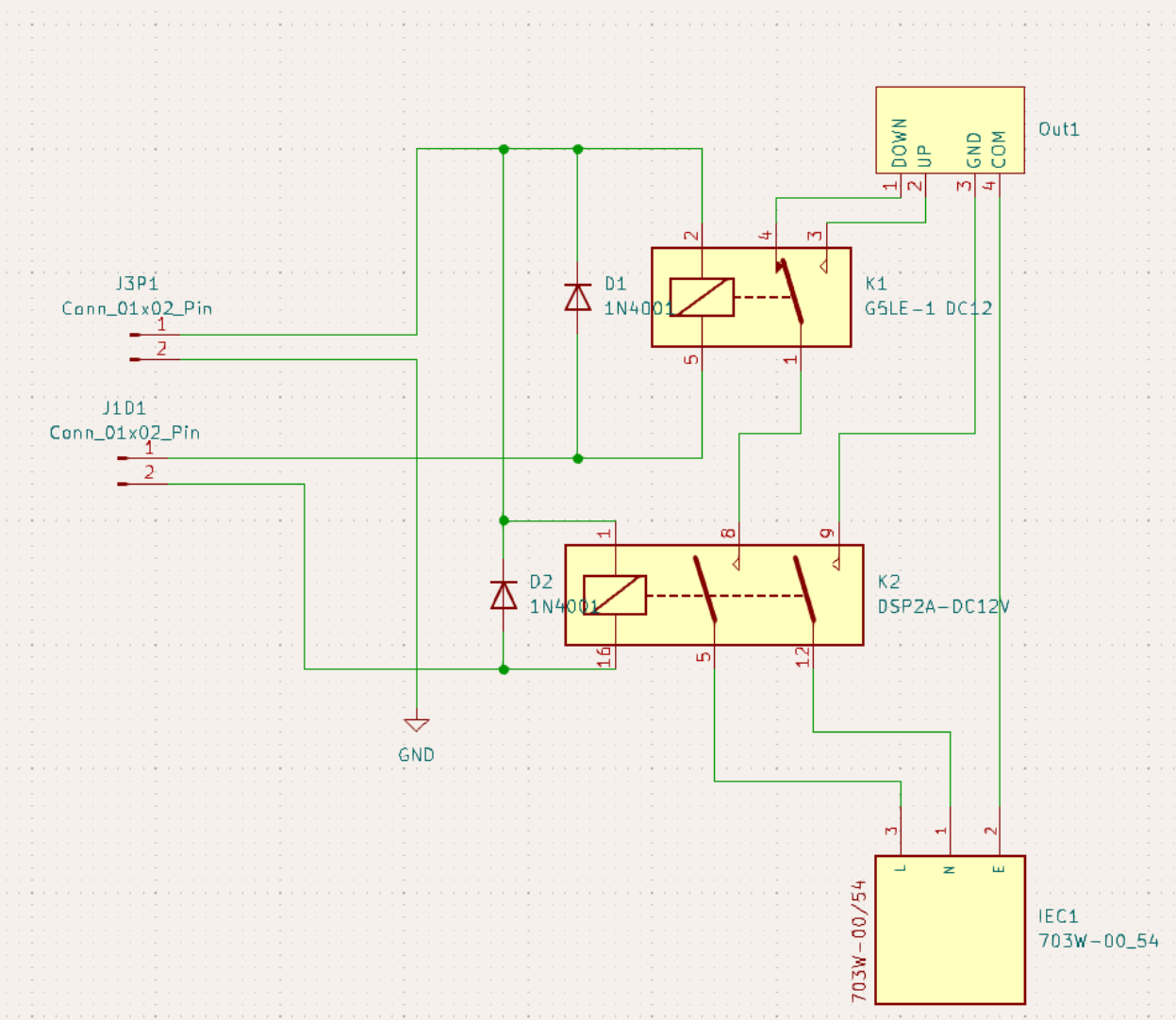
New Revisions made 02/09/2025: Changed layout of power distribution from the 12 to 5 volt converter.


U4
RASPBERRY_PI_PICO
raspberry pi pico
+12V
R1
R
R2
R
R3
R
R4
R
U2
PC817
U3
PC817
J1
Conn_01x02_Pin
J2
Conn_01x02_Pin
LM1
OUT+
GND
IN+
GND
U1
Vout
GND
GND

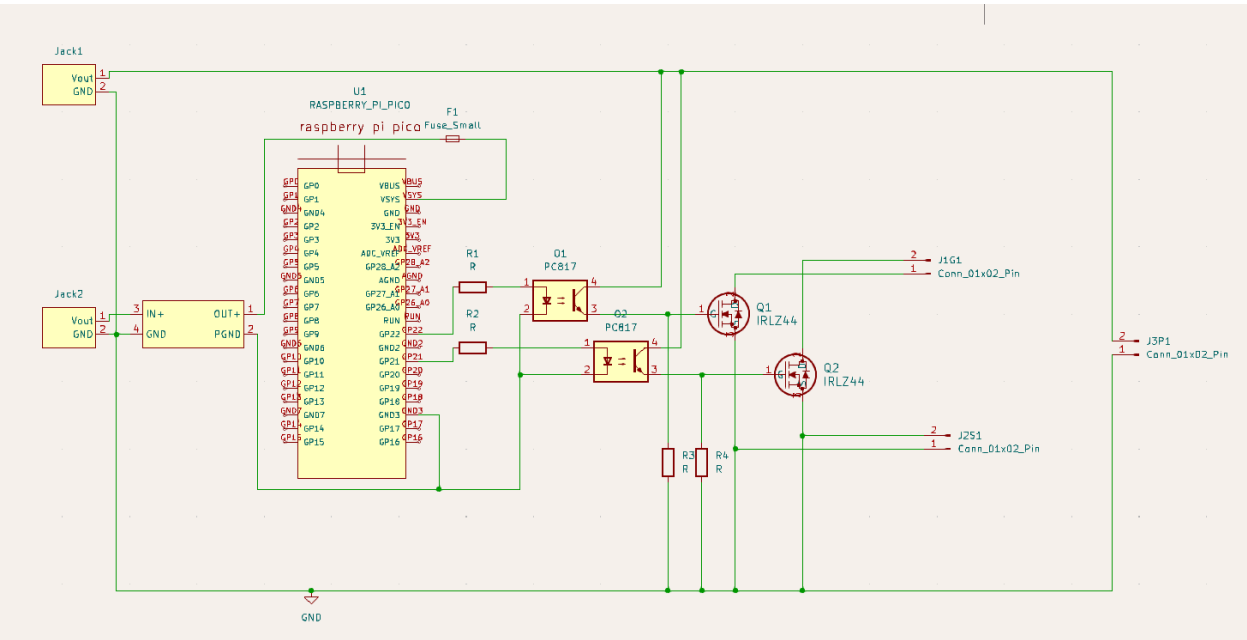


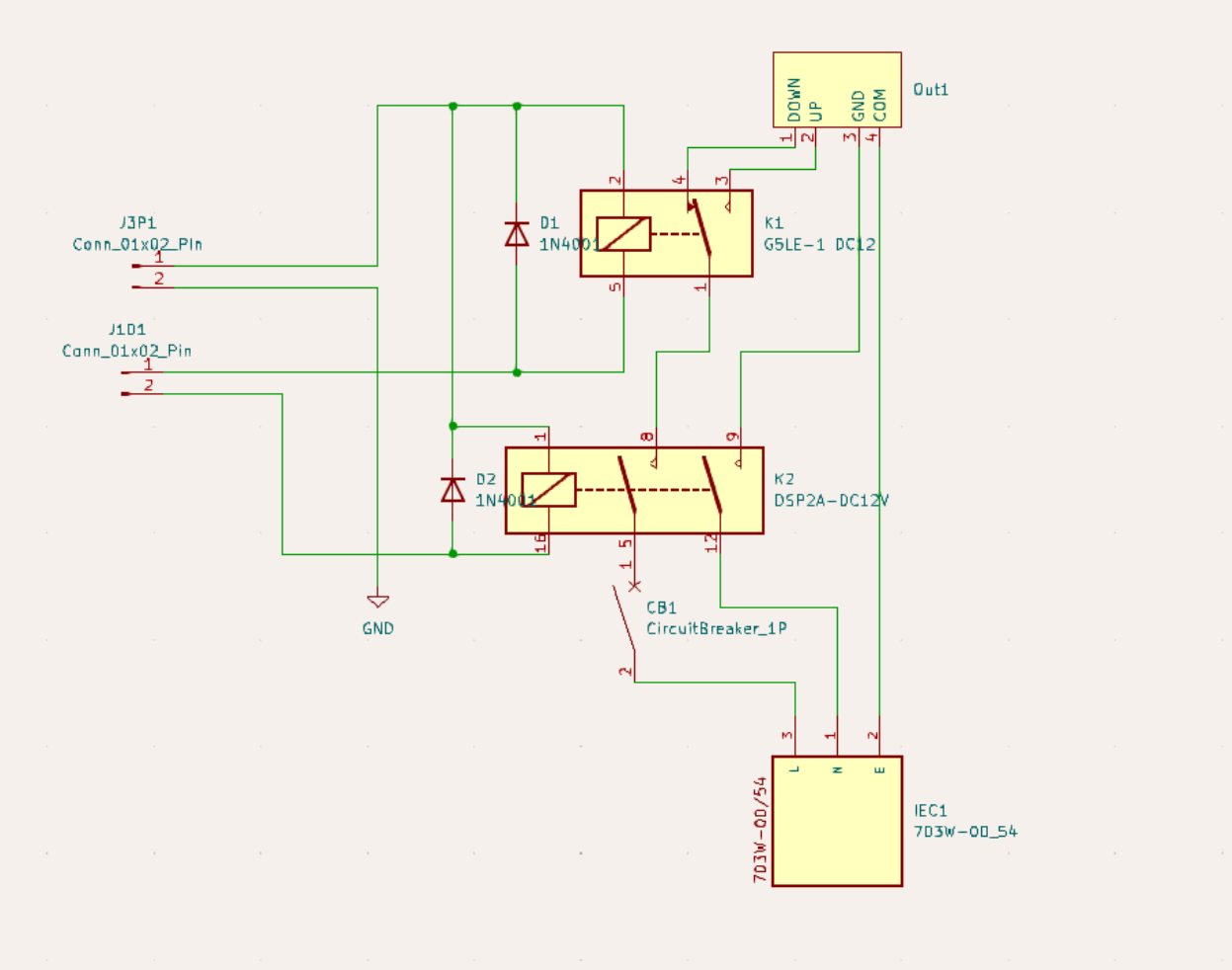
New revisions made 02/12/2025: Adjusted resistors to one schematic from the other, switched transistors, and fixed schematic layout. The resistors in this schematic are as follows: R1=180k, R2=200k, R3 & R4 = 10k.


Jack1
Vout
GND
Jack2
Vout
GND
IN+
GND
OUT+
PGND
U1
RASPBERRY_PI_PICO
raspberry pi pico
F1
Fuse_Small
R1
R
R2
R
Q1
PC817
Q2
PC817
Q1
IRLZ44
Q2
IRLZ44
R3
R
R4
R
J1G1
Conn_01x02_Pin
J2S1
Conn_01x02_Pin
J3P1
Conn_
GND



New revisions made 02/15/2025: Adjusted placement of resistors and their values as follows: R3=180k, R4=200k, R1 & R2 = 10k. Also, implemented fly back diodes to prevent unwanted voltage spikes.

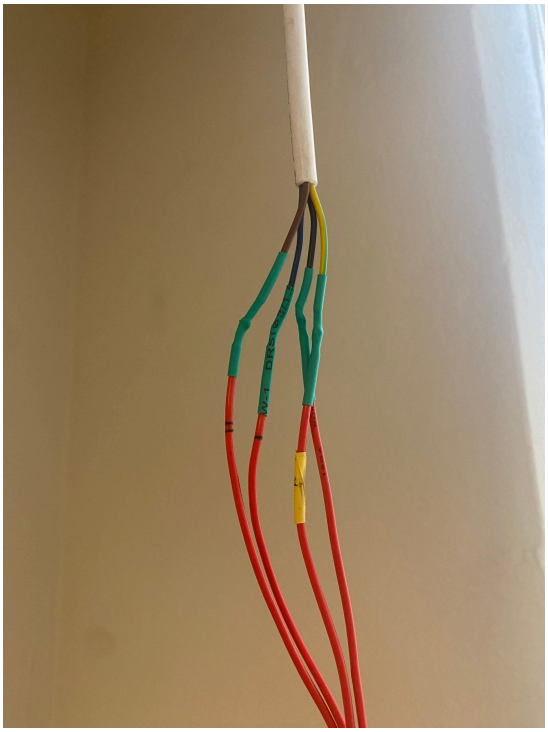


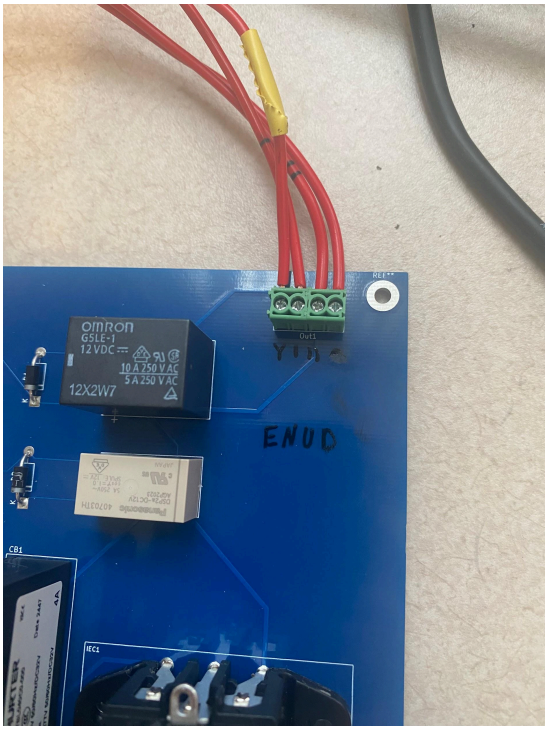


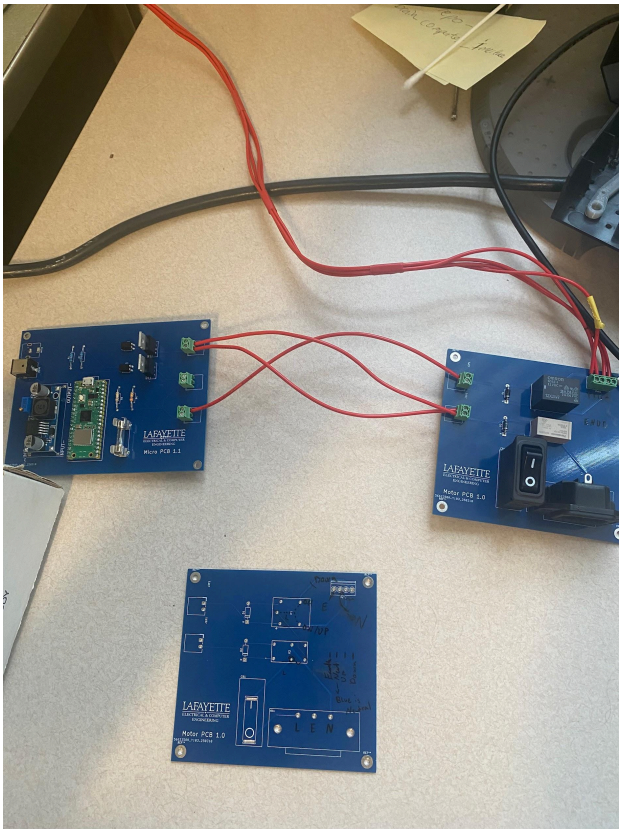
New revisions made 04/15/2025: Implemented fuse and circuit breaker to abide by safety regulations and concerns.

The system design is divided across two separate PCBs: one dedicated to power distribution and the other to the microcontroller. This separation provides electrical isolation between the DC power and AC power domains, enabling safe and effective motor control. The Raspberry Pi Pico W microcontroller communicates with the central hub using the MQTT protocol, facilitated by the ArduinoHA library. This allows the device to be controlled through the Home Assistant (HA) web interface.

Wiring:




OMRON
G5LE-1
12VDC
10A 250VAC
5A 250VAC
12X2W7
ENUD


LAFAYETTE
Micro PCB 1.1
LAFAYETTE
Motor PCB 1.0
LAFAYETTE
Motor PCB 1.0