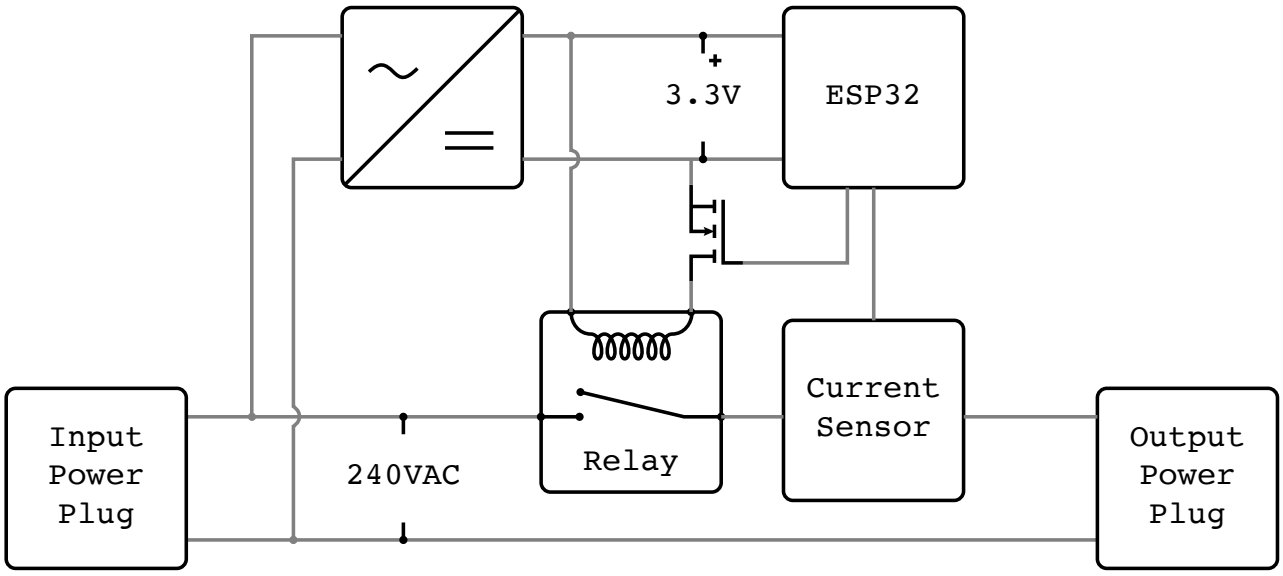
Power Outlet Control and Monitor

This device measures the current drawn from a power outlet and can switch the power outlet on or off. An ESP32 will be used to facilitate data acquisition and control. The ESP32 will connect to wifi where it can broadcast data to an online server and allow for remote control.



Schematic Diagram of POCM

BOM Specifications

AC-DC converter (Used to power ESP32 and hold relay on)

V_{in} : 240 VAC
V_o : 3.3 V ($\Delta V_o < 0.2$ V)
I_o : $1 + \frac{3.3}{R_c}$

NPN MOSFET (Used to switch relay on/off using ESP32)

V_{GS} : 3.3 V

Latching Relay (Used to switch power on/off)

Coil Voltage: 3.3 V
Contact rating: 240 VAC at 10 A
Coil Resistance: R_c
Note: A latching relay should be used in order to reduce the power consumption.

ESP32 (Used to record and control power usage. Updates data with online database)

Current Sensor (Used to measure current being drawn from outlet)

Rated for 240 VAC at 10 A
Compatible with $3.3V$ logic level