

10/4/23

- What type of voltage are we measuring?
 - AC
- What type of current sensor do we want and why?
 - Hall Based, Shunt, or Transformer
- How are we distributing work?
Om and Guneet doing Circuit Design and firmware
Ravi doing app development and circuit validation
- Final decisions on parts by 10/5 and update parts list on design doc
- Get schematic and PCB design by Friday 10/6

Current Sensor Types- Considerations:

Hall Based

- Advantages:
 - Electrical Isolation: Hall-based sensors provide electrical isolation between the current-carrying conductor and the measurement circuit, enhancing safety and reducing interference.
 - Low Insertion Loss: They typically have low insertion loss, which minimizes the impact on the appliance's operation.
 - Wide Frequency Range: They can measure both AC and DC currents, suitable for a variety of appliances.
- Disadvantages:
 - Cost: Hall-based sensors can be relatively more expensive than shunt resistors, which could impact the project's budget.
 - Temperature Sensitivity: Their output can be affected by temperature variations, requiring compensation.
 - Limited Accuracy at Very Low Currents: Some Hall sensors may have limited accuracy at very low current levels.

Shunt

- Advantages:
 - Current Range: Shunt current sensors are well-suited for measuring currents in the range of a few milliamps up to hundreds of amps. In your case, with a maximum current of 20 A, a shunt resistor can handle this range without any issues.
 - Voltage Handling: Shunt resistors can handle voltages up to several hundred volts, making them suitable for your 250 V requirement.
 - Accuracy: Shunt resistors can provide high accuracy in current measurement, which is important for energy metering applications.
 - Cost: Shunt resistors are generally more cost-effective than high-precision Hall-based current sensors, which can be beneficial for cost-conscious projects.
- Disadvantages:

- Voltage Drop: Shunt resistors introduce a voltage drop in the circuit, which can affect the performance of the connected appliances.
- Heat Dissipation: At high currents, shunt resistors can generate heat that needs to be managed properly.
- Lack of Electrical Isolation: Shunt resistors do not provide electrical isolation, which might be a concern for safety and noise interference.

Voltage Sensor Guide:

<https://www.electroschematics.com/voltage-sensor/>