



Energy Group

# KWHR Meter Project

AUTOMATING THE SHARING OF  
LIMITED SOLAR POWER

Carl Satterberg

**Eleventh Annual**

**School of Science, Engineering, and Health Symposium**

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# The Need

**Objective** – Design and implement a reliable and manufacturable device to measure, display, and limit AC power usage by a home or another building.

- Energy sharing
- Energy awareness
- Energy conservation

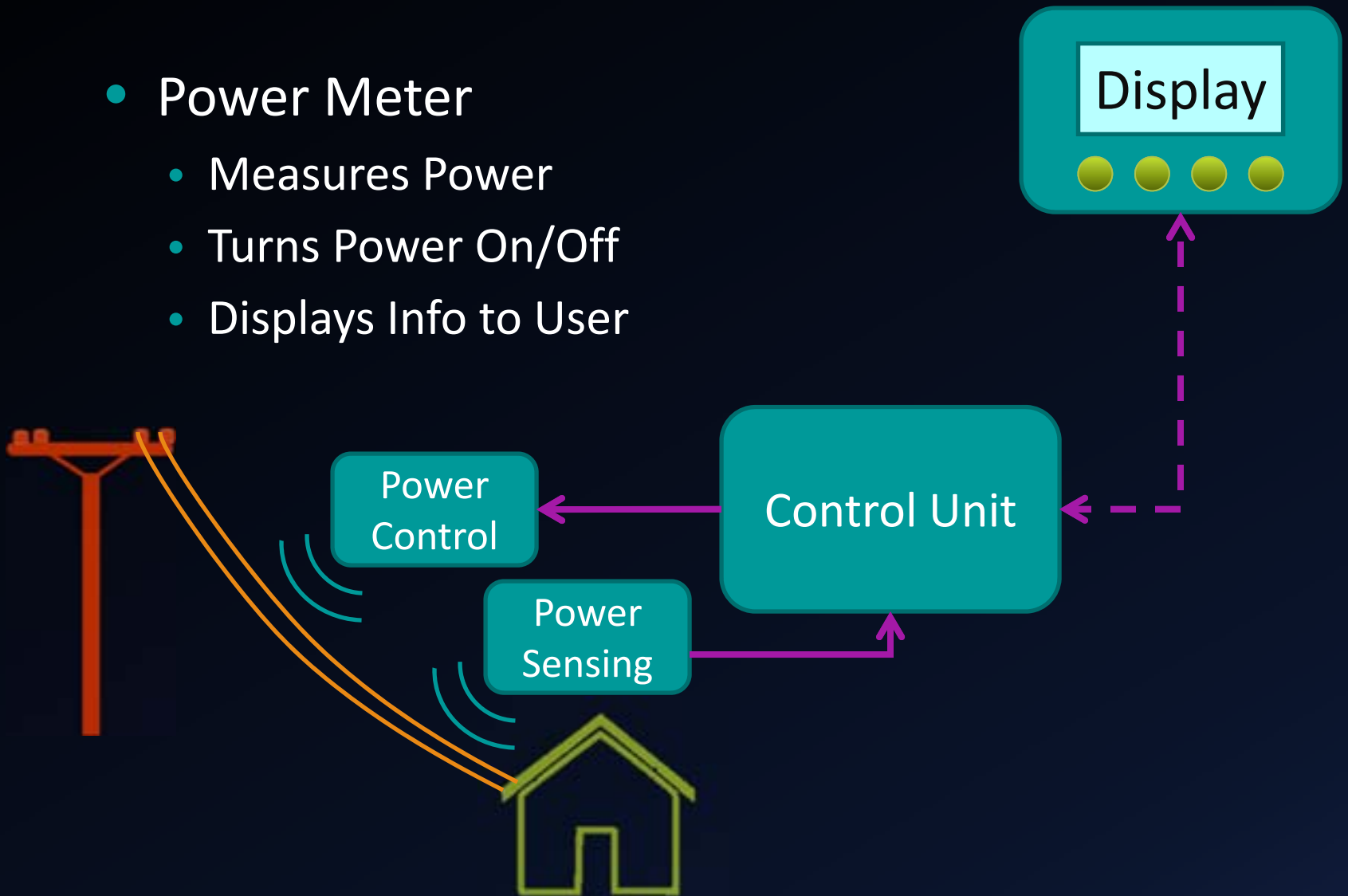
## Clients:

- SIM (Serving In Mission)
- Matt Walsh



# Goals

- Power Meter
  - Measures Power
  - Turns Power On/Off
  - Displays Info to User





## Version 1.0

- Expensive
- Unreliable
- Unsafe
- Obtrusive
- Imprecise

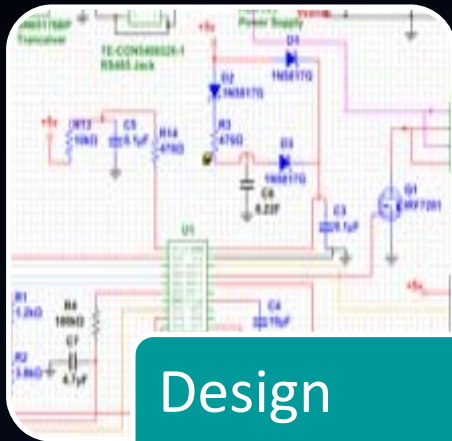


# Version 2.0 Features

- Two-Box design
- Cost effective microcontroller
- New power sensing circuitry
- Improved User Interface
- Safety

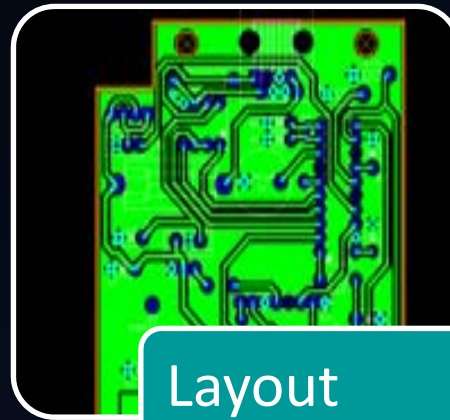


# Circuit Design



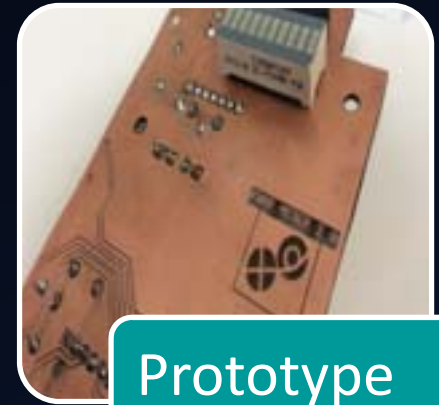
Design

- Multisim



Layout

- Ultiboard

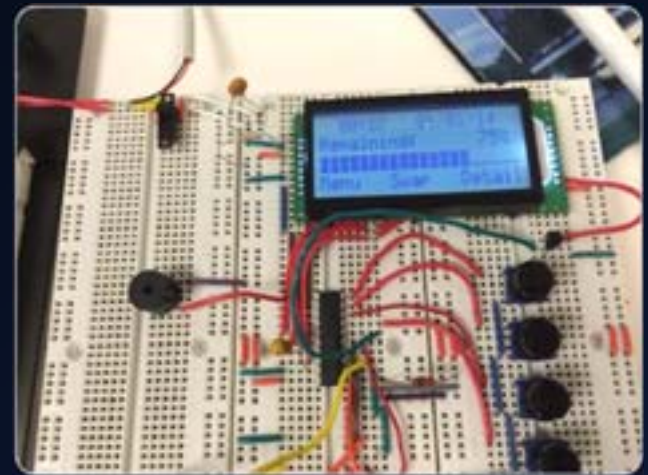


Prototype

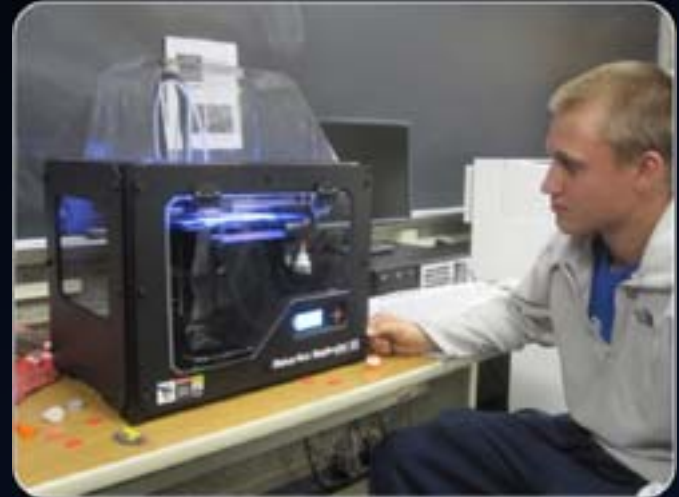
- PCB Milling



# Firmware



# Enclosure





# Site Team Trip to Burkina Faso

- Usage Testing
- Environmental Data
- New Clients



# Future Work

- Respond to Feedback
- Manufacturing Larger Quantities
- Adding Features
  - Data Logging/Reporting
  - “Smart” Power Control
- New Clients



# Acknowledgements

- The KWHR Meter Team:
  - Aaron Gettemy, Nathan Chaney, Ashley Evans, Dan Baker, Zach Sorrell, Matt Wilkinson, Wes Ashton, Karine Moussa, Nathan Millary, Russell Woleslagle
- Tom Austin
- Dale Johnson and Matt Walsh
- Tony Beers, Dr. Fish, Dr. Swartz





Questions?

