VIRtual eTracker

North Allegheny Senior High School

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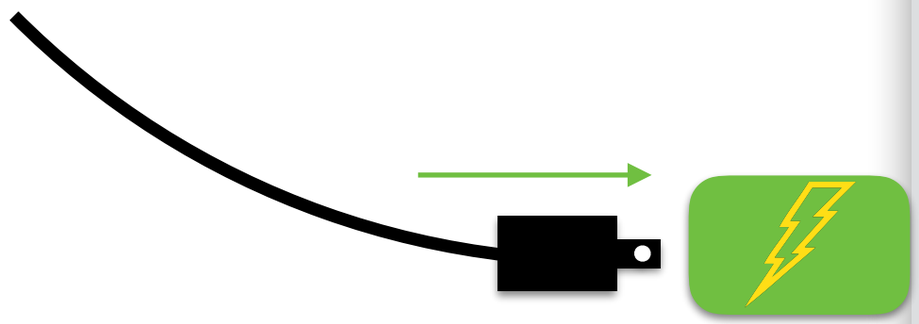
Track energy consumption in real time

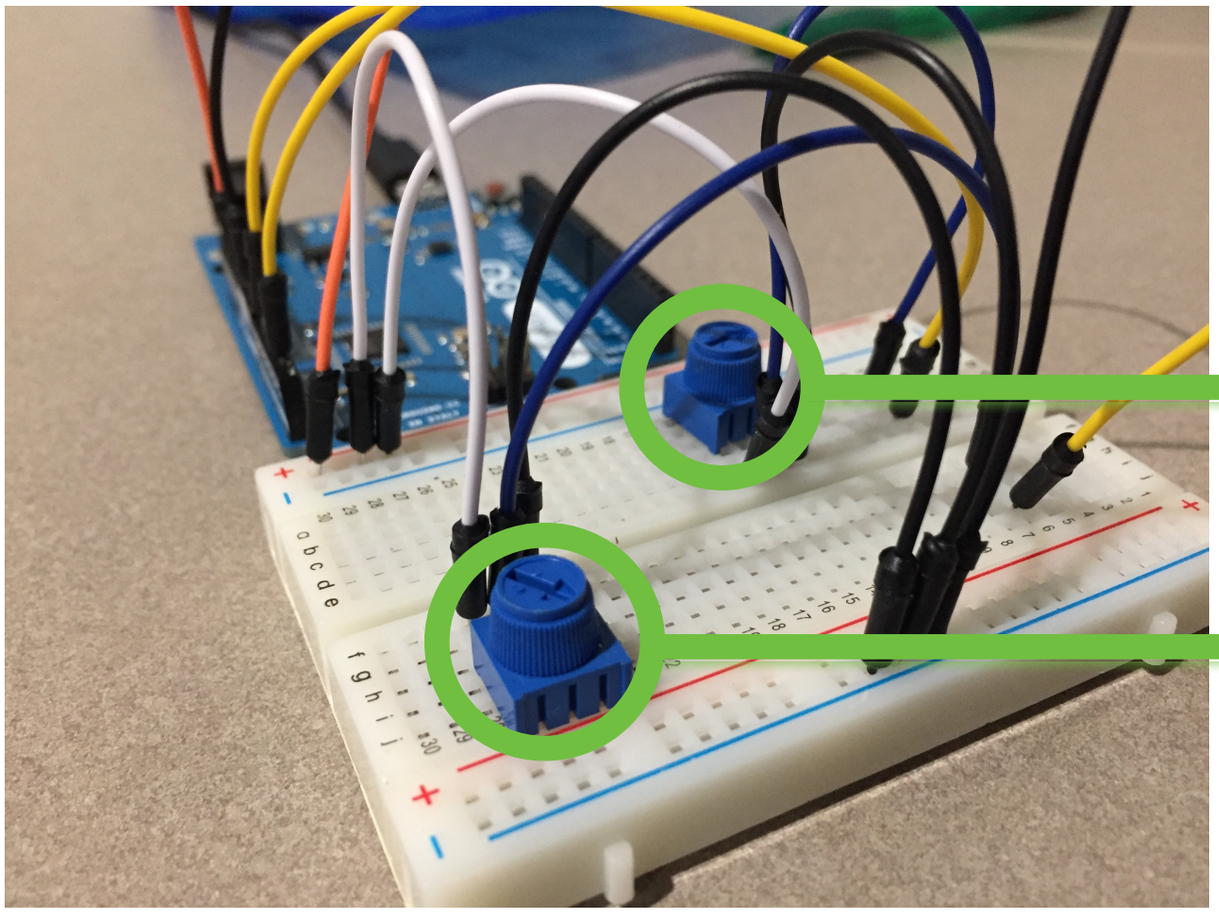
- Plug into wall outlet between socket and device
- Turn on bluetooth on your mobile device
- Get real time power consumption!



The hardware component connects wirelessly through Bluetooth low energy

10.1 μA at 120s interval

Our proof of concept simulates current usage from common appliances



Potentiometers vary the voltage input reading, which mimics the ampere usage of a household appliance

The following equations are used to simulate ampere usage:

Washing machine simulation

analogRead * 2 * (5 / 1023.0)

Washing machines draw 5-10 amps at 120 V

Television simulation

analogRead / 10 * (5 / 1023.0)

A 32” LED/LCD display will draw ~0.5 amps at 120 V

Voltage from Arduino ranges from 0 to 5, which is related to an appropriate ampere value

From simulated ampere values, wattage is calculated

Power = Current x Voltage

P = I x V

W = A x V

W = calculated * 120 V

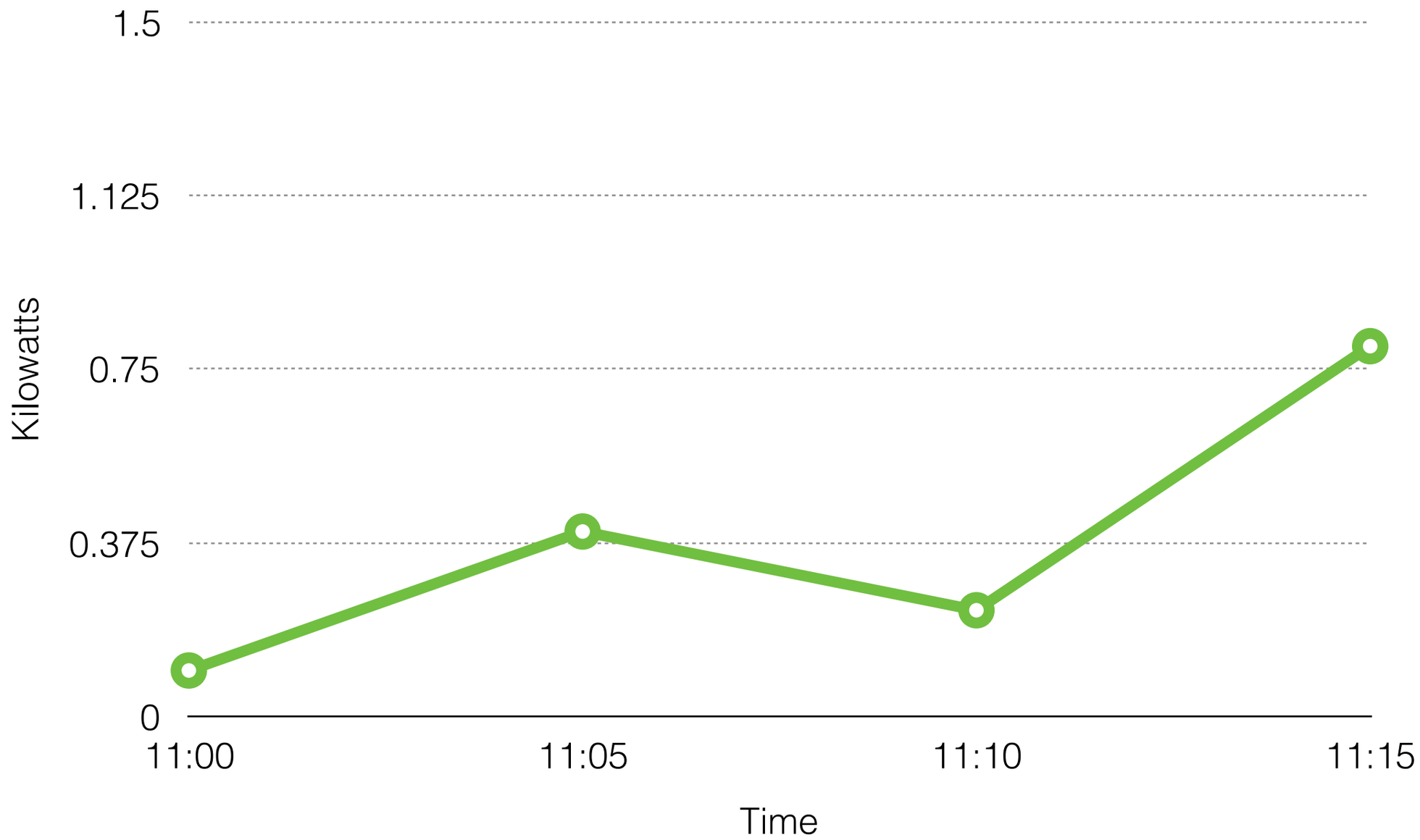
kWh and cost measurements are displayed in real time at 1 Hz

kWh = (W / 1000) * 1 hr

Cost = kWh * 13.2 cents/kWh

In PA, the average household payed ¢13.2

A real time graph is displayed containing wattage vs . time data



Individual modules may be selected as well, in addition total energy usage