Introduction
Door displays are used in most businesses and schools to identify room numbers, but are difficult to change and offer little information. What if they could be updated automatically, and be powered completely with indoor solar energy? Such a device would need to consume as little energy as possible, store collected energy for display updates, and know when an update is available.

Energy Harvester
- Collect and store energy from solar panel
- Shut off device if too little energy available
- Maximize energy harvesting rate

Gecko Micro-controller
- Request display updates from host
- Automatically wake itself, radio, and display
- Wake up periodically to check for updates
- Write updates to display via SPI interface
- Button to immediately check for updates
- Perform error checking on received packets

USB Dongle
- Connects to user's computer
- Receives update request wireless
- Sends request on to host computer via USB
- Teensy 2.0 attached to Xbee Radio

Results
- Unit stores ~40 Joules of energy
- Charges at the rate of ~1V/hour in Sr. lab lighting conditions (2mA input from solar panel) with no load
- Charges at half that rate with gecko micro-controller in sleep mode 1 (about 1mA current consumption)
- An update cycle drops the capacitor level by about .5 volts

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