

# POW-R

Power Outlet Wireless Reporter

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# Why XBee Radios?



- Small form factor (just larger than U.S. quarter)
- Low power consumption ( $\sim 0.1$  W)
- Talk over ZigBee 802.15.4 standard

# ZigBee Specification

- High level communications protocol
- Designed for low power digital radios
- Mesh network topology
- Network can expand on the fly
- 2.4GHz operating spectrum

# ZigBee Mesh and POW-R

- One Coordinator per mesh
  - Maintains mesh
  - Receives transmissions from all router XBees
  - Attached to POW-R server via Arduino
- All Satellites have router XBees
- Router XBees "bounce" transmissions to Coordinator

# Coordinator Arduino

- Hosts Coordinator XBee
- Powers LCD to display IP address of Server
- Sends Server data readings over serial

# Server

- Raspberry Pi
- Small form factor ( $\sim 8.5 \times 5.6$  cm)
- Low power consumption ( $\sim 3.5$  W)
- Acts as data center and web server for Display

# Lessons Learned

- Order parts ASAP
- Understanding new material
- Team dynamics
- Time management

# How would we do it all over again?

- Start development sooner
- Stick to schedule



# Future plans, potential improvements

- Satellite functionality
- Home Automation Framework

# Demonstration time!

Check it out!

# Questions and Closing

## Questions?

Presentation made using  $\text{\LaTeX}$

Our website: <http://powr.logrit.com/>