X10 in Depth

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Overview

- X10 Pros and Cons
- Other Home Automation Products on the Market
- The Real Basics: Turn on a Light with a Keychain
- House Codes and Unit Codes
- Plugin/Lamp Modules
- Controller Modules
- Troubleshooting Accessories
- Advanced Modules
- Designing an X10 System
- Summary

X10 Pros and Cons

- **What is X10?**
    - Protocol?
    - Product Line?
    - Company?

- **… Yes! X10 is all of the above.**
- **But for our purposes, let's consider the X10 product line.**

X10 Pros and Cons

Pros

- Cheap
- Easy to understand
- Extensible/usable for hobbyists
- Low barriers to entry
- Readily available and widely tested

Cons

- One way communication only (no polling)
- Prone to interference
- Conceptually limited in scale
- Some signal delay

Other Home Automation Products on the Market

- **Insteon:**
    - Made by SmartLabs, Inc
    - Dual band communication
    - Mesh network
    - Supports polling
    - Somewhat expensive
    - Integrates well with X10

Other Home Automation Products on the Market

- **Z-Wave:**
  - Made by Sigma Designs
  - Wireless communication
  - Mesh network
  - Low power consumption
  - Supports polling
  - Somewhat expensive
  - More limited X10 integration
  - Proprietary protocol

Other Home Automation Products on the Market

- **Zigbee:**
  - IEEE Standard
  - Wireless communication
  - Mesh network
  - Low power consumption
  - Supports polling
  - Large number of nodes
  - Somewhat expensive
  - More limited X10 integration

The Real Basics: Turn on a Light with a Keychain

- Plug a lamp into transceiver
- Sync the house/unit codes
- Control the light remotely

The Real Basics: Turn on a Light with a Keychain

- **X10 Wireless KR19A Keychain Remote Starter Kit ($45)**

- **X10 KR32A SMART Wireless Keychain Remote ($20)**

House Codes and Unit Codes

- **House + Unit = X10 Address**
- **Commands sent to:**
  - House + Unit
  - Entire House Code
- **For example:**
  - "A 1 ON"
  - "A ALL ON"

Plugin/Lamp Modules

- **Appliance Module X10 AM486 ($10-$20)**
    - Receives all house/unit codes
    - Responds to ON and OFF
    - Dimming not supported
    - 2 Pin, non-grounded
    - Used for
        - Appliances
        - Fluorescent lamps
        - High intensity discharge lamps

- **Appliance Module X10 AM466 ($10-$20)**
    - Same device, but with grounded receptacle

Plugin/Lamp Modules

- **Appliance Module X10 LM465 ($10-$20)**
  - Receives all house/unit codes
  - Responds to ON and OFF
  - Responds to Dim/Brighten
  - 2 Pin, non-grounded
  - Used for Incandescent Lamps Only

Plugin/Lamp Modules

- **Screw-In Lamp Module X10 LM15A ($15-$25)**
  - Receives all house/unit codes
  - Responds to ON and OFF
  - Dimming not supported
  - Used for Incandescent Lamps Only
  - Affectionately called "Socket Rocket"

Switch Modules

- **Wall Switch Module X10 WS467 ($12 - $20)**
    - Receives all house/unit codes
    - Responds to ON and OFF
    - Responds to Dim/Brighten
    - Incandescent lights only
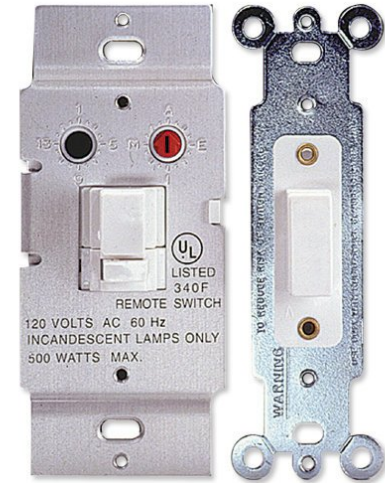   - 2 wire connection
    - In white or ivory

- **Wall Switch Module X10 WA12A ($14 - $18)**
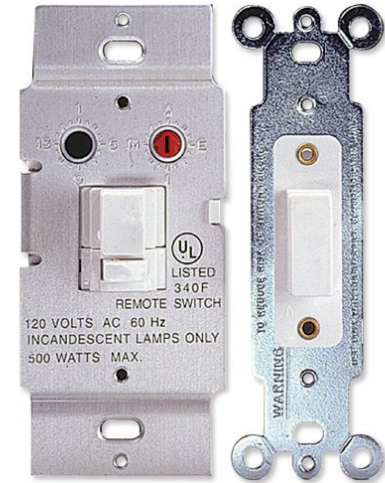   - Like WS467, but rocker switch style

Switch Modules

- **Wall Switch Module X10 WS477 ($15 - $20)**
  - Receives all house/unit codes
  - Responds to ON and OFF
  - Responds to Dim/Brighten
  - Incandescent lights only
  - More involved wiring
  - In white or ivory

- **Wall Switch Module X10 WA14A ($14 - $18)**
  - Like WS477 companion, but rocker switch style

Switch Modules

- **Wall Switch Module X10 WS13A ($20 - $25)**
  - Receives all house/unit codes
  - Responds to ON and OFF
  - Does not support dim and bright
  - Can control fluorescent lights
  - 2 wire connection
  - In white or ivory

Controller Modules

- **Controller Module X10 MC10A ($20 - $23)**
  - Simple Controller
  - Supports only 8 unit codes
  - 4 ON/OFF Buttons
  - Control up to 8 lamps/switches/appliances
  - All ON/OFF
  - Dim and bright for all
  - Remote control for the house
  - Also comes in black

Controller Modules

- **Controller Module X10 MC460 (Used/Cheap)**
  - Older generation of MC10A
  - Very similar specs
  - Discontinued manufacture, but…
  - Still available via resale

Controller Modules

- **Controller Module X10 CM11A ($15 - $30)**
  - Controller Interface
  - Connects to PC via 9-pin serial
  - Open source driver available at:
  - http://www.heyu.org/
  - Discontinued, but…
  - Easy to find for resale on ebay
- **Controller Module X10 CM17A ($15 - $30)**
  - "Firecracker"
  - Still made
  - Must be used with a transceiver
  - No direct plugin

Troubleshooting Accessories

- **XPPF Plug-In Noise Filter ($17 - $20)**
  - Plug X10 noise culprits into this
    - Laptops
    - Desktops
    - Television/Media equipment
    - Some surge protectors
    - Other household electronics
  - Dramatically reduces signal noise

Troubleshooting Accessories

- **Boosterlinc Plug-In PLC Signal Booster ($90)**
    - Smart Home (Insteon) Product
    - Dead-simple install (plug it in)
    - Substantially increases signal strength
    - Multiple can be installed
    - Good for apartments/condos

Troubleshooting Accessories

- **SignalLinc Phase Coupler ($25)**
    - Attaches to home breaker box
    - Helps with weak signals
    - Strengthens signal across "phases"
    - Probably not DIY

- **SignalLinc Plug-In Phase Coupler (?)**
    - Discontinued
    - Plugs into 240V Outlet (Dryer)
    - Same function, but without difficult install

Advanced Modules

- **Remote Chime X10 SC546A ($12 - $18)**
    - Listens on house/unit code for ON
    - "Sings" in response
    - Use as a doorbell extender
    - Use as a paging system
    - Combine with motion sensing

Advanced Modules

- **Motion Sensor X10 MS16A ($15 - $20)**
  - Battery operated
  - Senses motion or "dusk" and "dawn"
  - Transmits to X10 systems over RF
  - Sends ON when motion detected
  - Fully programmable with house/unit

Advanced Modules

- **Powerflash Interface X10 PSC01 ($35)**
  - Terminal input for contact made/broken
  - Configurable house/unit codes
  - Transmits wired signal
  - Three operational modes:
    - Sends ON when engaged
    - "Flashes" when engaged
    - Sends ON when engaged, OFF when disengaged

Designing an X10 System

- **Start simple.**
- **Build iteratively, as in Agile.**
- **Understand your home's electrical.**
- **Find X10 discussion communities:**
    - http://forums.x10.com/
    - http://www.opensourceautomation.com/phpBB3/
    - http://www.smarthome.com/FORUM/
- **Be safe.**
- **Think of user stories or use cases.**
- **Be creative!**

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