

Home Automation Overview

George Gober

Assistive
Technology
Associate



[Objectives]

- Define Home Automation (HA) terms
- Introduce the spheres of control
- Identify and explain technologies used by HA (Infrared, Bluetooth, Internet)
- Introduce the variety of devices that may be controlled
- Provide a vision of the future

[What is Home Automation?]

In its simplest form Home Automation makes tasks in the home more easily performed.

More importantly, it usually involves remote control access of these tasks.

Smart Home technology is universally designed for everyone. AT will assist the user to access the universal system.

[3 Spheres of Control]



The Immediate



The Interface



The External

[The Immediate Sphere]



Direct Access

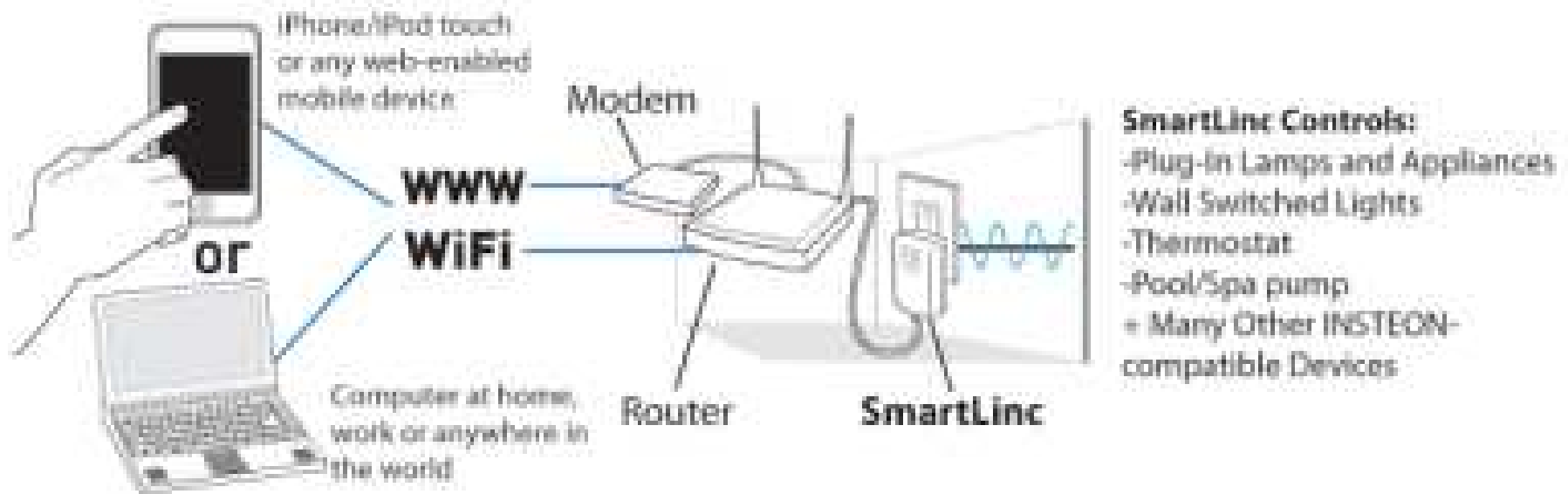
- Hand, Finger
- Orthotic Aid
 - Mouth stick
 - Hand stick, stylus

Scanning Access

- Switch
- Scanning menus
 - Visual
 - Audio

Hybrid: Voice recognition

How Home Automation Sees the Immediate Sphere



[The Interface Sphere]

Device Types



- Remote controls
- ECU, EADL
- Smart device
- Phones, tablets
- Computer

[The Interface Sphere]

Transmission Types



- InfraRed
- Bluetooth (Wireless)
- RFI (Radio Frequency ID)
- Internet Browser
- Hard wired

[Technology: Infrared]

- Infrared is light frequency wavelength
- Used for wireless communication
- Common in consumer electronics
- Line of sight, directional
- Infrared codes may be learned by most integrated control systems
- IrDA (Infrared Data Association) requires a minimum of one meter of transmission but many consumer devices will transmit up to 3m+

[Important Infrared Consideration]

How are the IR codes accessed?

Is there a pre-set list of IR codes? This is typical of most inexpensive “universal” remotes.

Is the device capable of “learning” IR codes? This is true of more expensive devices. It is important that the transmission device have this capability.



[Technology: Bluetooth]

- Wireless technology standard allowing electronic devices to communicate
- Wireless communication over short distances using radio transmission
- Becoming common in consumer electronics
- Omnidirectional
- Bluetooth specs call for a maximum connection distance of ten meters

[Technology: Wireless]

- There are other wireless technologies
- Omnidirectional
- RFI: Radio Frequency

The External Sphere

What can you really control?

- External dedicated Assistive Devices: ECUs, AAC devices
- External Environmental Controls: X10 or Insteon modules, power doors, telephones, home automation
- Computer: Assistive Programs
- External Entertainment Devices: TV, Cable, DVD, CD, iPod, etc.
- Any InfraRed remote controlled device

Technology: Systematic Automation Interface

- Control of lights and appliances
- Hospital bed features
- Control of HVAC and blinds
- Control of doors and elevators
- Control of TV, DVD, etc
- Control anything with an IR remote
- Activate Nurse call

Examples: EADL Devices

- Primo! ECU with Sero! IR phone
- VoiceMe voice recognition remote
- Big Button Remotes
- iPad Interface

Primo! ECU



- Direct access or switch/scan access
- Learning IR system
- Portable
- Battery
- Easy mounting options
- Works great with the Sero! phone



[VoiceMe]



- Voice activated remote control
- Takes time to program
- 80 commands
- Comparatively inexpensive
- Learns IR signals

[Big Button Remotes]



- Universal remote
- Learning IR system
- Portable
- Battery
- Direct access required

[iPad RI Infrared Interface]



- Direct access
- Pre-programmed
- Portable



Examples: Home Automation Systems

- Xfinity from Comcast
 - www.comcast.com
- Insteon products from SmartHome
 - www.smarthome.com
- The Nest
 - www.nest.com

Xfinity

Home Security and Automation System



Xfinity

Web Browser Interface



Xfinity

Mobile Interface



[SmartHome and Insteon]

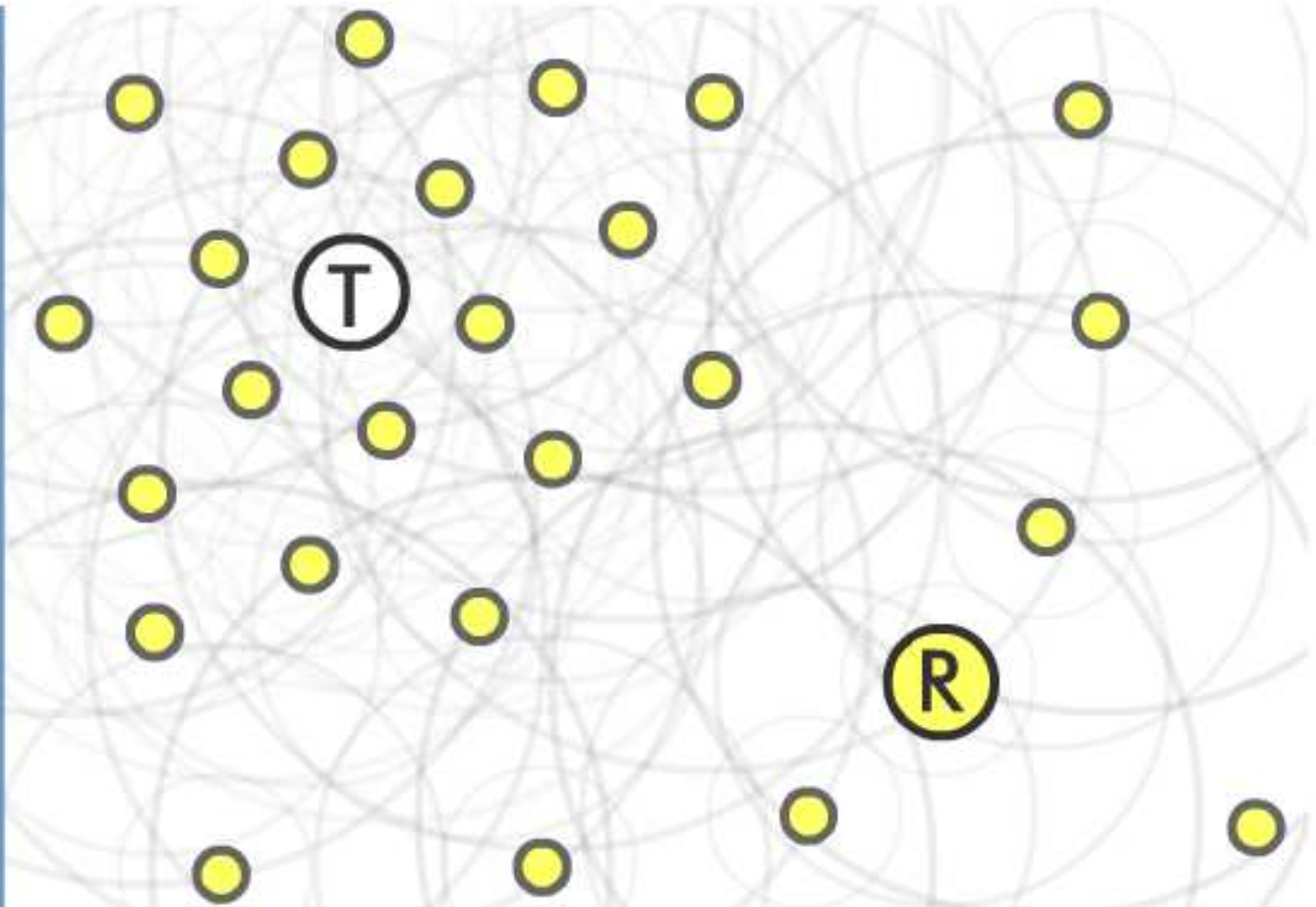
- Insteon modules are becoming the new standard
- Replacing the X10 modules
- More expensive but better designed
- Every Insteon module is a receiver and a transmitter

Insteon Transmission

INSTEON
SIGNAL PROPAGATION

- T** Transmitter
- R** Receiver
- INSTEON-
Compatible
Device

Transmission Stages



SmartHome and Insteon

- Interface
- Module

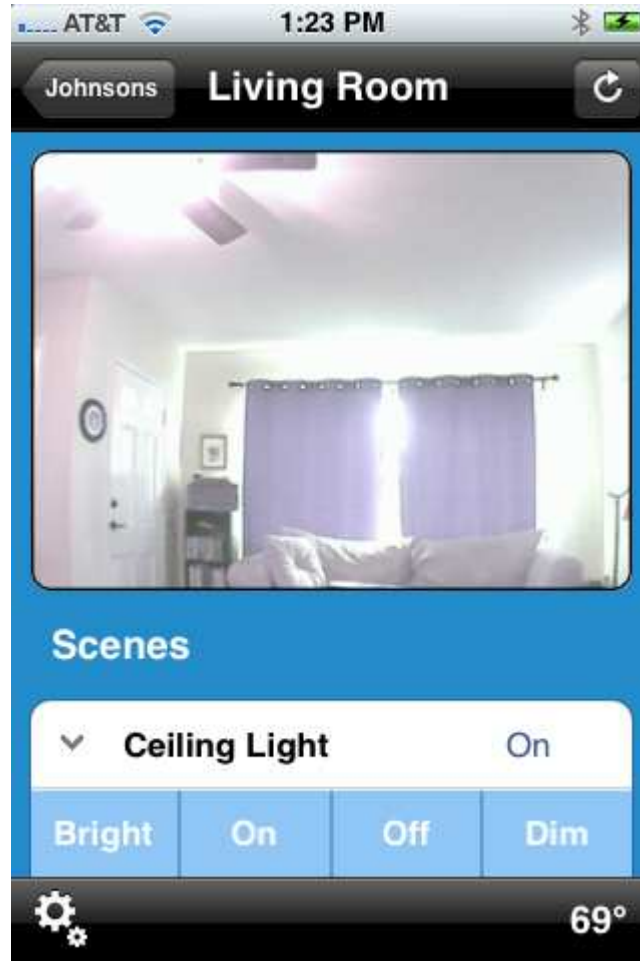


[Insteon Interface]

Mobile Apps

or

Browser Interface



[The Nest

The Device



[The Nest]

The Interface: Internet browser program



[The Future of Home Automation]

- More Smart Home technologies will be developed
- Voice Activation will improve
- Device communication protocols may become universal and specified
- Mainstream devices will become more and more controllable
- Smart devices (in items we consider “dumb” at this time) like clothing, food products, etc.
- Internet able devices will increase
- Neurologically controlled devices will appear