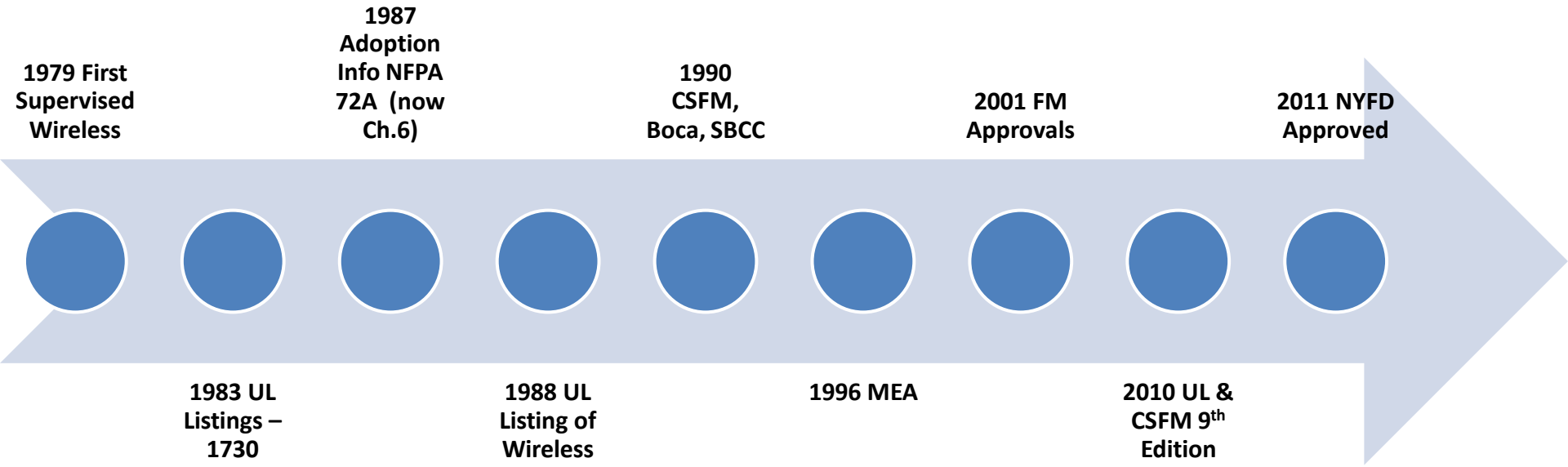
The Evolution of Commercial Wireless Fire Alarm Systems

Illinois Fire Inspectors Association Fall Trade Show

Presented By:
Larry Coveny
CMFP

Commercial Wireless Technology Timeline

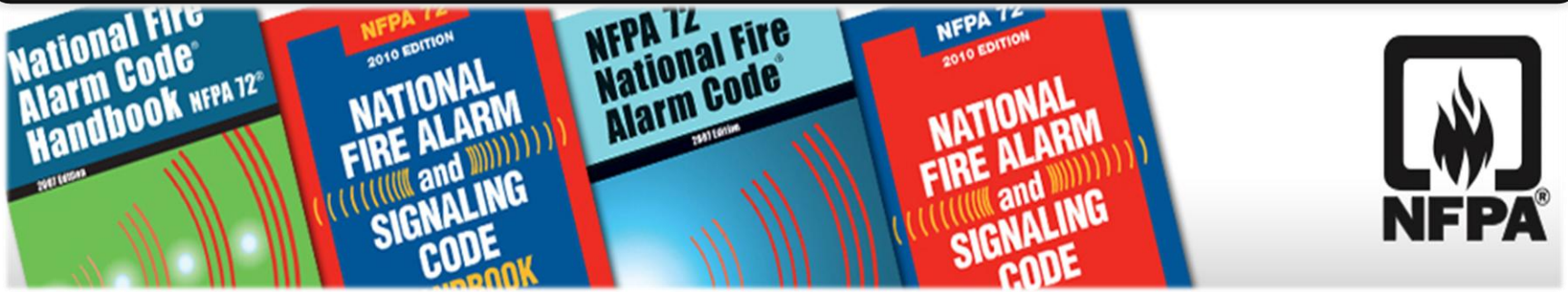


UL Listings & FM Approvals

- **Local**
- **Remote Station**
- **Central Station**
- **Auxiliary Service**
- **Automatic**
- **Smoke Detector Monitor**
- **Manual**
- **Waterflow**
- **Sprinkler Supervisory**

Industry Standards & Compliance

National Fire Alarm & Signaling Code



- **1987 – 72A**
- **2002 – Chapter 6**
  - **Section 6.16 – Special Requirements for Low Power Radio (Wireless Systems)**
- **2007 – Chapter 6**
  - **Section 6.17 – Special Requirements for Low Power Radio (Wireless Systems)**
- **2010 – Chapter 23**
  - **Section 23.18 - Special Requirements for Low Power Radio (Wireless Systems)**

Codes and Standards

NFPA 2007 Chapter 6

See Full PDF here
http://cwsifire.com/codes.php

6.17* Special Requirements for Low-Power Radio (Wireless) Systems.

6.17.1* Listing Requirements. Compliance with Section 6.17 shall require the use of low-power radio equipment specifically listed for the purpose.

6.17.2 Power Supplies. A primary battery (dry cell) shall be permitted to be used as the sole power source of a low- power radio transmitter where all of the following conditions are met:

(1) Each transmitter shall serve only one device and shall be individually identified at the receiver/fire alarm control unit.
(2) The battery shall be capable of operating the low-power radio transmitter for not less than 1 year before the battery depletion threshold is reached.
(3) A battery depletion signal shall be transmitted before the battery has been depleted to a level below that required to support alarm transmission after 7 additional days of non-alarm operation. This signal shall be distinctive from alarm, supervisory, tamper and trouble signals; shall visibly identify the affected low-power radio transmitter; and, when silenced, shall automatically re-sound at least once every 4 hours.
(4) Catastrophic (open or short) battery failure shall cause a trouble signal identifying the affected low-power radio transmitter at its receiver /fire alarm control unit. When silenced, the trouble signal shall automatically re-sound at least once every 4 hours.
(5) Any mode of failure of a primary battery in a low-power radio transmitter shall not affect any other low-power radio transmitter.

Performance & Supervision of Systems

NFPA & UL Requirements…

- Individual Identification
- Standalone Technology
- 10 Second Rule
- 60 Second Re-transmission Intervals
- Device Removal
- EOL
- Battery as Primary Power Supply
- AC Power Loss
- Supervisory Polling 200 Seconds 6-13
- Unwanted Transmission
- Hardware Fault *
- Smoke Detector Dirty Chamber *

**Not a requirement of Chapter 6 or 23.*

Supervisory Polling Requirements

See Full PDF here
http://cwsifire.com/codes.php

NFPA 2007 Chapter 6

6.17* Special Requirements for Low-Power Radio (Wireless) Systems.

6.17.1* Listing Requirements. Compliance with Section 6.17 shall require the use of low-power radio equipment specifically listed for the purpose.

6.17.4.2 The occurrence of any single fault that disables transmission between any low-power radio transmitter and the receiver/fire alarm control unit shall cause a latching trouble signal within 200 seconds.

Exception: When Federal Communications Commission (FCC) regulations prevent meeting the 200-second requirement, the time period for a low-power radio transmitter with only a single, connected alarm-initiating device shall be permitted to be increased to four times the minimum time interval permitted for a 1-second transmission up to the following:

- **Four hours maximum for a transmitter serving a single initiating device**
- **Four hours maximum for a retransmission device (repeater) where disabling of the repeater or its transmission does not prevent the receipt of signals at the receiver/fire alarm control unit from any initiating device transmitter**

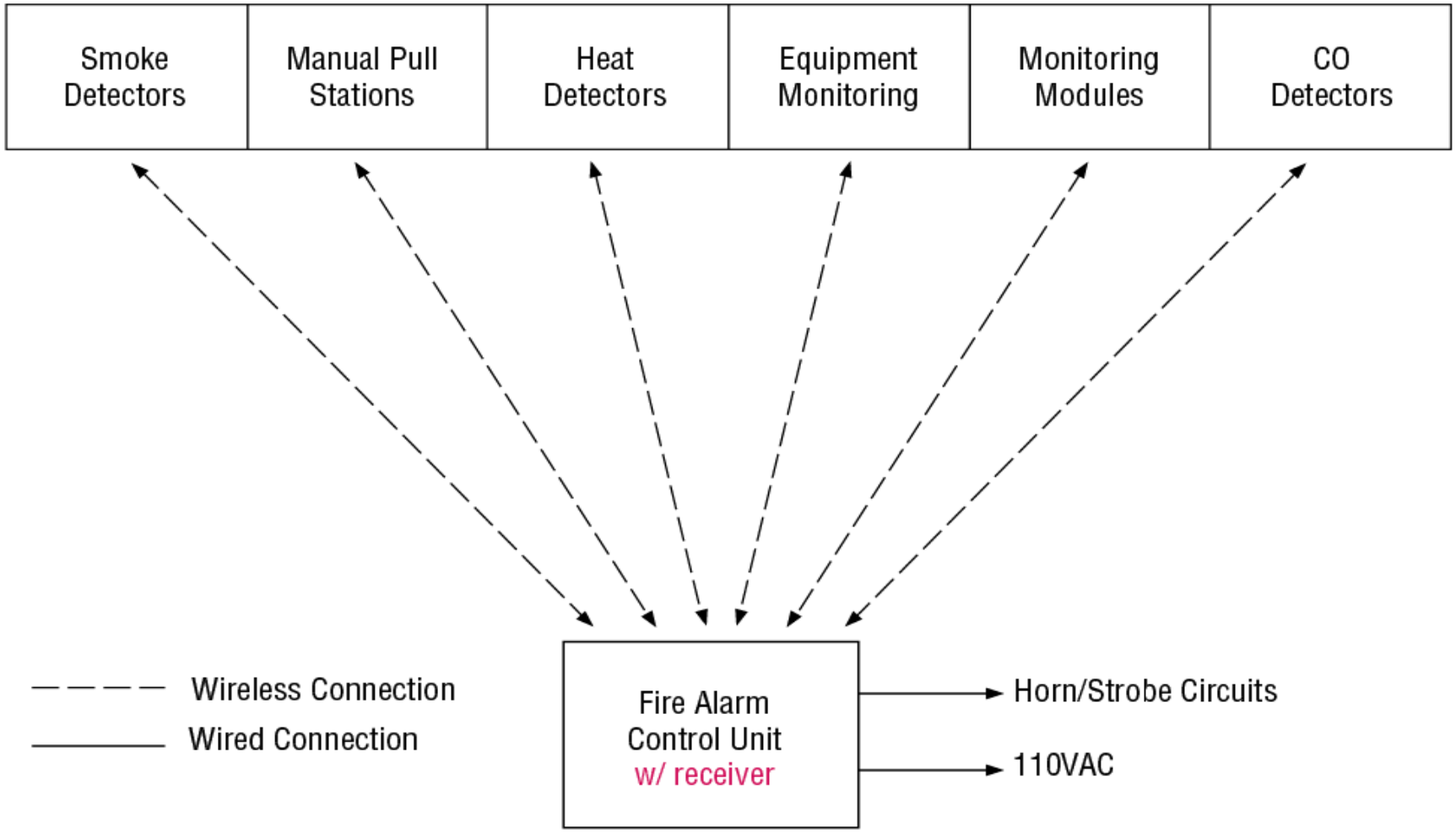
System Components & Design

- System Components:
  - Control Panels
  - Initialing Devices
  - Receivers
  - Repeaters
  - Relay Interfaces

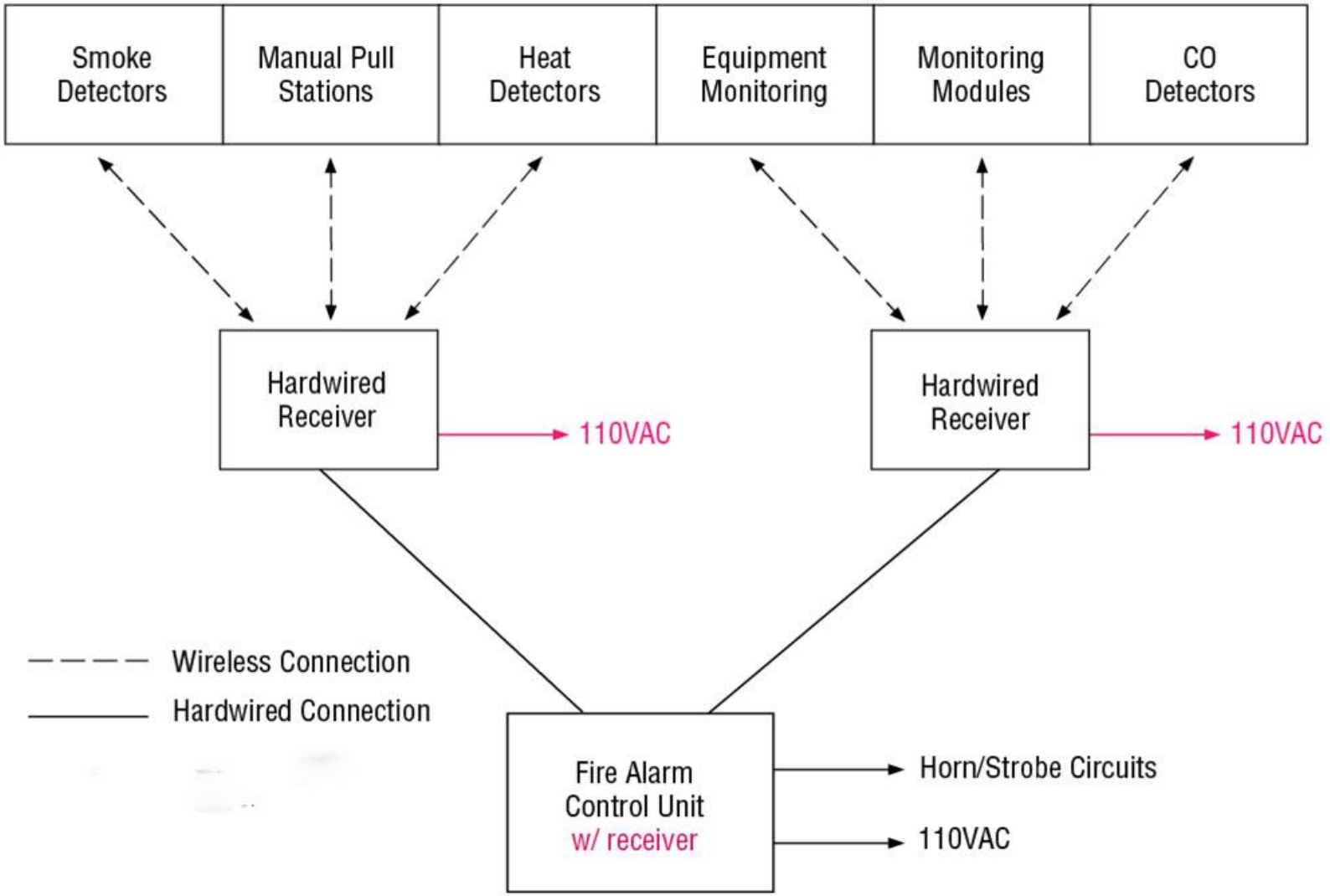
- Control Unit Capabilities
  - 32 Zone
  - 128 Zone
  - 256 Zone
  - 1028 Zone

- System Design Considerations
  - Comparison of True RF and Hybrid
  - Repeater Survey
  - UL Requirement – 3db loss in survey mode
  - Audio Visual Requirements
  - Ancillary Control Functions

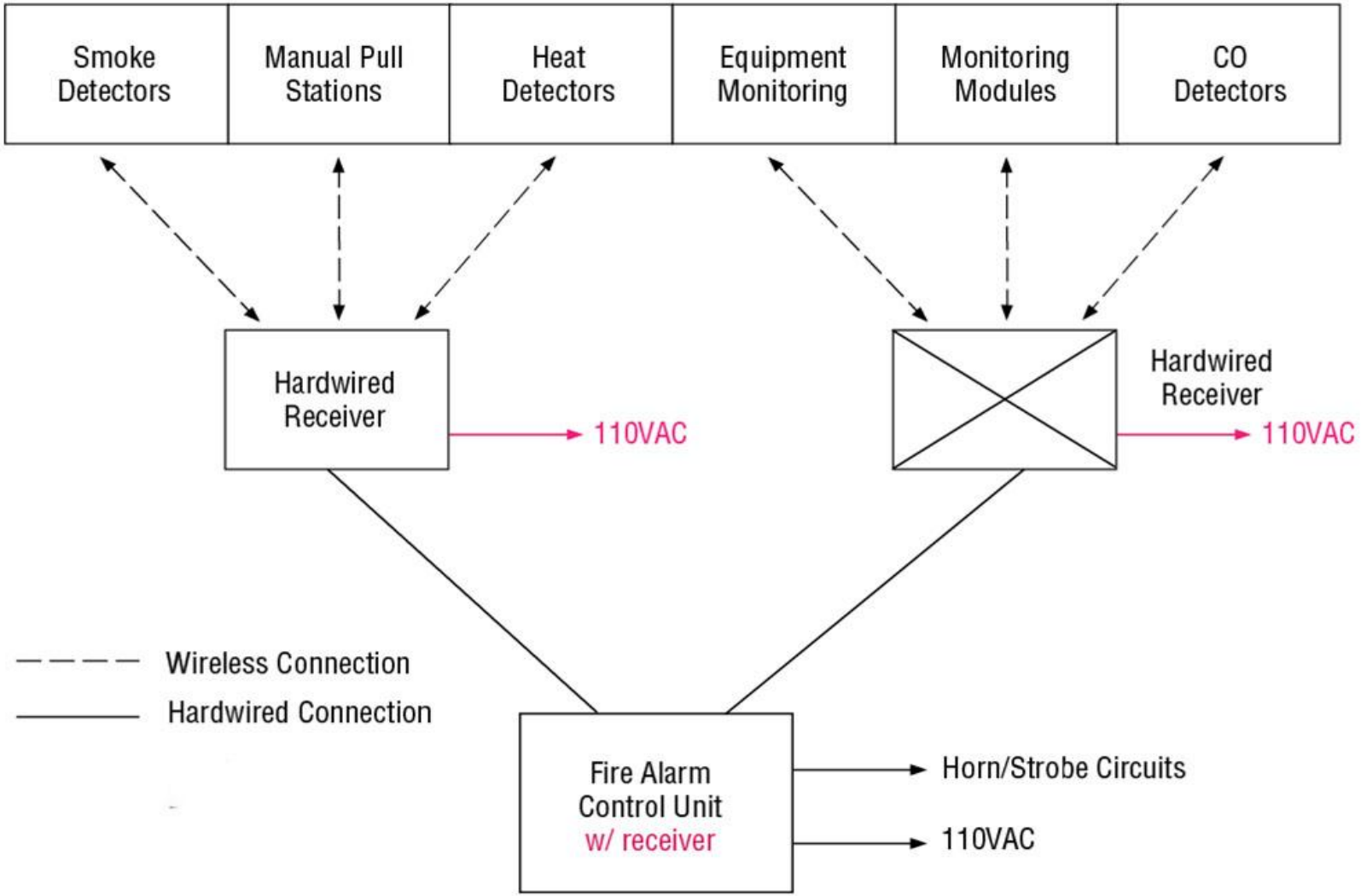
System Configuration – One Way RF



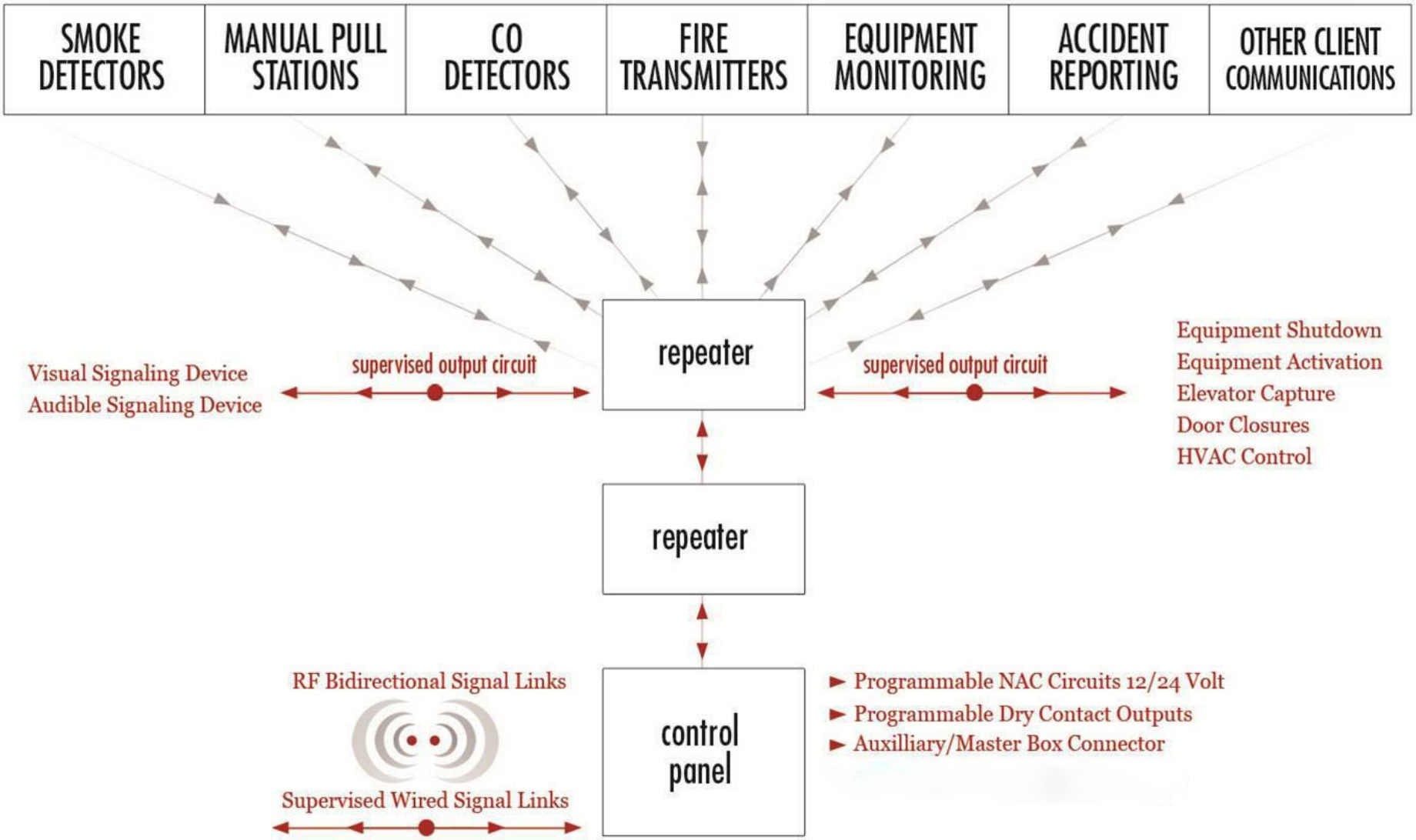
System Configuration – Hybrid



System Configuration – Class B



True Bi-Directional RF Point to Point System



Protection & Detection

Fully Supervised and Provides for…

- **Complete Automatic Fire Alarm**
- **Campus Systems – Stand Alone & Hybrid**
- **Flow, Tamper & PIV Monitoring**
- **Multiple System Integration**
- **Plant & Building Evacuation Systems**
- **Accident Reporting**
- **Monitoring of Existing Systems**
- **Environmental Monitoring & Control**

Garden Style Housing/Family Developments

Goodbye SLCs and Multiple Monitoring Accounts…

Installation and Recurring Constraints of Hardwired Systems

- Underground SLC Loops
- Disruption to Grounds and Utilities
- Individually Monitored Accounts by Building
- Problems Associated with Lightning

System Advantages

- Multiple Building Interconnection via Transmitter Interconnect
- Point ID Display
- Multiple Alarm and Supervisory Reporting
- Off Premise Reporting of Building and Alarm Type
- Reduction of Yearly Maintenance Expenditures
- Virtually Impervious to Lighting
- Installed in a Fraction of the Time
- Substantial Cost Savings

Hotels & Motels

Occupancy, uninterrupted…

Life Safety/Retrofit Challenges

- Meeting Requirements of DB Level and Retrofit Applications
- Inconvenience for Guests & Staff
- Loss of Revenue Due to Down Occupancy
- Remodeling and Refurbishing Expenses
- Interconnection of Remote Buildings

System Advantages

- Meet Challenges with Alternate Design & Performance Criteria
- Total Fire Alarm System Upgrade with Minimum Disruption
- Takes Minutes to Install
- Rooms, Restaurants, Meeting Rooms, Health Clubs, etc.
- Reduces Loss of Revenue
- Reduces Downed Occupancy

Industrial

Eliminate Conduit, Wiring, Disruption to Operations…

System Advantages

- Flow/Tamper/PIV Monitoring
- Combination Systems
- Plant Evacuation/Multiple Emergency Types
- Equipment Control
- Emergency Reporting
- Process Control Monitoring
- Intrinsically Safe Application
- Lost Revenue from Down Operations
- Remote Building Reporting & Control
- No Underground Disruption
- Mandated Requirements
- Premium Reductions

Historic

Rapid Installation, Non-Invasive, Preserve Esthetics…

Substantially Reduce

- Wiring
- Wire mold
- Conduit
- Patching
- Refurbishing

Eliminate

- Asbestos Abatement

Applications

- State Capitol Buildings
- National Landmarks
- National Historic Register Buildings
- Courthouses
- Museums
- Bed and Breakfasts

Colleges & Universities

Life Safety Needs of Educational Facilities

- Similar Needs of Historic Structures
- Need to Monitor Existing Fire Alarm Panels
- New Construction & Building Expansions are Continuous
- Retrofitting
- Existing Buildings
- Dormitories
- Off Campus Housing
- Multiple Site Reporting

System Advantages

- Provides Point Addressable Detection & Annunciation of All Alarm & Supervisory Signals
- Eliminates Non-Detected Tamper and Vandalism
- Fire Detection, Notification & Communication System

High Rise Buildings

Residential & Commercial…

Challenges

- Required to Update Existing Fire Alarm Systems to Meet New Code Requirements
- Associations are Faced with Financial Burdens Associated with the Cost of System Upgrade and Refurbishing Expenses
- Unsightly Conduit and Wire Mold Compromise the Décor of the Property Both in Common Areas and Individual Units
- Tenant Build-Outs and Relocations
- 75 DB Requirement

System Advantages

- Unobtrusive Installation
- Point Annunciation & Early Warning Detection
- Control Units UL Listed 864 & 1730

Governmental

Military, Private Sector, Mass Notification…

Applications

- Military/Barracks
- Home Land Security
- Dry Docked Naval Vessels
- Aircraft Maintenance Hangers
- Embassies & Memorials
- Federal & State Court Houses
- State Capital Buildings

System Advantages

- Portability for the Relocation of Installed Equipment
- Provide Ancillary Reporting such as Duress Systems and Evacuation
- Local/Proprietary Wireless Reporting/Long Range Radio

Unique Applications

The flexibility of Wireless Brings New Opportunity…

- **Zoos**
- **Convention Centers**
- **Traveling Museum Exhibits**
- **Temporary Smoke Detection & Evacuation**

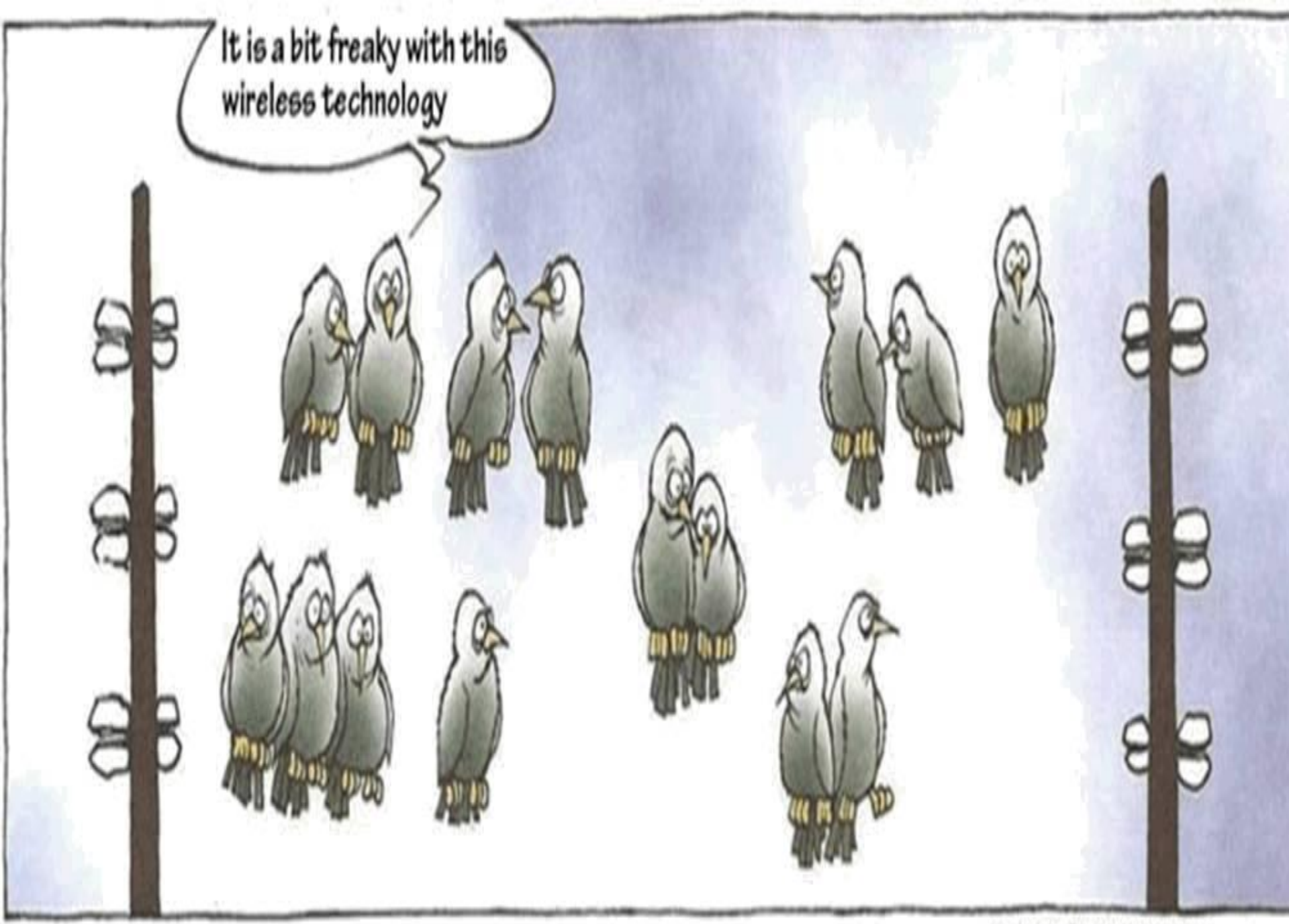
Technology Alternatives

Multi Chanel Frequency Hopping Format	Single Channel Transmission
200 Second Supervisory Reporting	1 HR check-in with 4 HR Report
Bi-Directional RF	1 Way RF
10 Second Rule for Notification Activation via RF	Wired to Panel
AVs and Control Functions wired to Repeaters	AVs and Control Functions wired to Control Panel
True RF Protocol	Hybrid
Technology Protocols May Vary	

Benefits

Wireless offers…

- Rapid and Efficient Installation
- Ease of Modification and Expansion
- Virtually Impervious to Lightning
- Eliminates Ground Faults
- Minimal Disruption to Operations
- Aesthetics Preserved
- Retaining System Operations during Crossovers
- Continued Operation in the Event of Prolonged Power Outage
- Stand Alone Technology


It is a bit freaky with this wireless technology
COPYRIGHT : MORTEN INGEMANN

Wireless

One Simple Decision.
Endless Solutions.
Thank You.

Chicago Metro Fire Prevention

10798 N.W. 53rd Street I Sunrise, FL 33351 T 954.318.6005 F 954.318.6004