WattStopper®

ESS ELECTRICAL SYSTEMS SOLUTIONS

Controls Overview

Agenda

- WattStopper line overview
- Bulit Outdoor Wireless Controls
- High Bay Sensors
- Fixture-Mount sensors
- Indoor update
- Questions

WattStopper Product Line Offering

- Occupancy Sensors
- Wall Switch Timers
- Plug Load Controls
- Day Lighting Controls – Dim, On/Off, Single Zone, Multi-Zone
- Lighting Control Panels
- Outdoor Wireless Controls
- Digital Control Systems
- Digital Networked Systems

WattStopper® Wireless Exterior Lighting Controls: Introduction

- A launch of an <u>established</u> technology (AIC Wireless acquired in 11/13).

- An <u>open platform</u> for controlling exterior lighting with an option to connect to wired lighting controls (DLM) and Building Management Systems (BACnet).

- <u>IP</u> (6LoWPAN) based to support IoT and M2M applications.

- <u>Family</u> of controls that integrate sensors and switches to the wireless network.

- Distributed control, scalable architecture

- <u>Web</u> platform with mobile access

- Potential to double the <u>savings</u> of LED retrofits

- **Mass Save $75 per fixture incentive**

WattStopper® Wireless Exterior Controls

▶ **Products**

1. WattStopper® BULIT® Wireless Control Node (on/off, dimming, twist-lock)

2. WattStopper® Wireless Input/Output Control Nodes

3. WattStopper® Wireless Network Manager

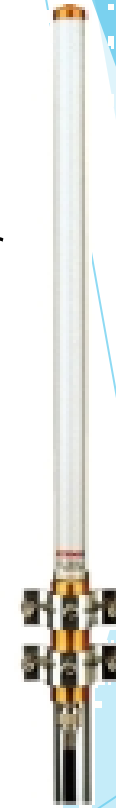4. WattStopper® Wireless Network Supervisor Software

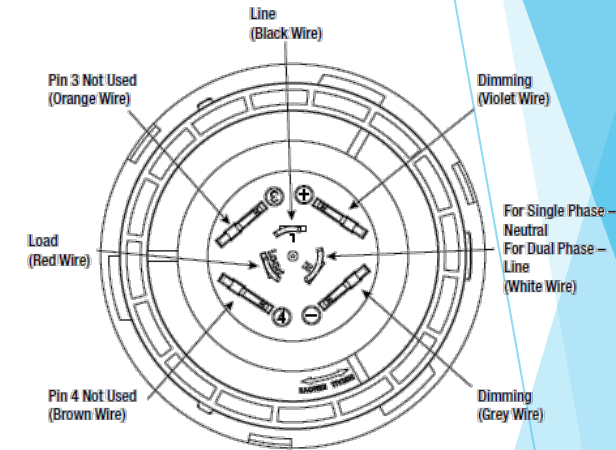**Accessories**

▶ Antennas

▶ Cables

▶ Surge Suppressor

Factory Services

▶ Surveys

▶ Drawings

▶ Programming

▶ Commissioning

OD09-24
Omni Directional Antenna

WattStopper® BULIT® Wireless Control Node:
NWTL-111 – NEMA C.136.41C; twist-lock control

WattStopper® BULIT® Wireless Control Node

- Replaces standard photocell Modules
- Astronomic Clock; Optional external photocell with IO Nodes
- Distributed intelligence
- Uses ANSI C136.41 receptacle
- ON/OFF and 0-10 volt dimming
- Power monitoring (Volts, amps)
- Recommended Points for Trending (CAPS)
    1. Override Input (Auto/ON/OFF)
    2. Dimming Input (Set light level)
    3. Voltage RMS
    4. Load Status
    5. Active Power (Wattage)

- Two Models:
    - NWTL-111-1P   120/277/347 volts
    - NWTL-111-2P   208/240/480 volts

Bottom View of NWTL-111

Line (Black Wire)
Pin 3 Not Used (Orange Wire)
Dimming (Violet Wire)
Load (Red Wire)
For Single Phase — Neutral
For Dual Phase — Line (White Wire)
Pin 4 Not Used (Brown Wire)
Dimming (Grey Wire)

# WattStopper® Wireless Input/Output Control Nodes

- Compatible with existing WattStopper power-packs, motion sensors, photocells and switches.
- Reduces field wiring for remote sensors or control.
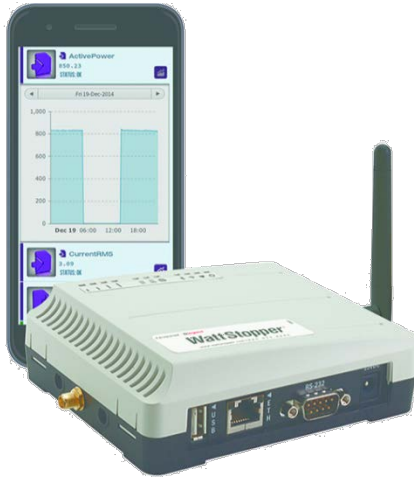- Managed by Wireless Network Managers.

xWP Enclosure

WIO-xx

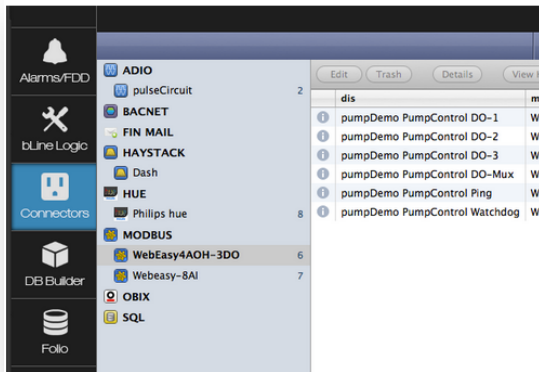| Controller	Digital Out	Analog Out	Digital In	Universal In
WIO-24	6	6	4	8
WIO-12	4	2	2	4
WIO-4	1	1	1	1
WIO-4DI	0	0	4	0
WIO-4DO	4	0	0	0
WIO-4UI	0	0	0	4
WIO-4WP	2	0	0	2
WIO-6WP	2	2	0	2

# Sensor Wiring
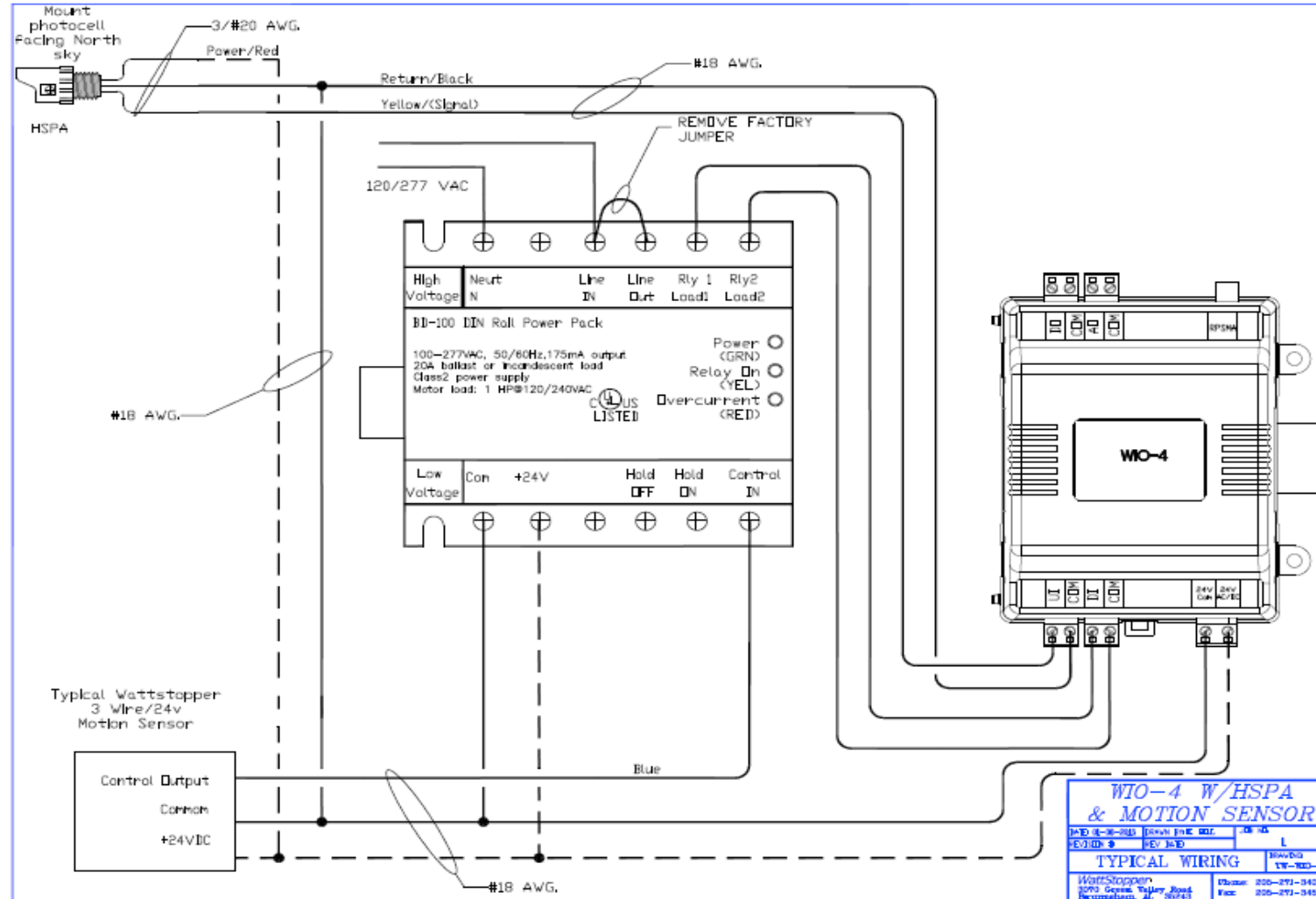
WattStopper® Wireless Network Manager

www.intellastar.com

▶ Web Server

- Manages 1 – 200 wireless Nodes
- Unlimited number of Managers per site.
- Built on Open Standards
  - ▶ Wireless IP protocol to Nodes.
  - ▶ Ethernet, WiFi and Cellular to connections to networks.
  - ▶ BACnet for integration to Building Management.
- Controls engine to configure Inputs, Outputs, Groups, Schedules and Events.
- High end vector based graphics
- Histories
- 128K Bit Advanced Encryption Standard (AES)
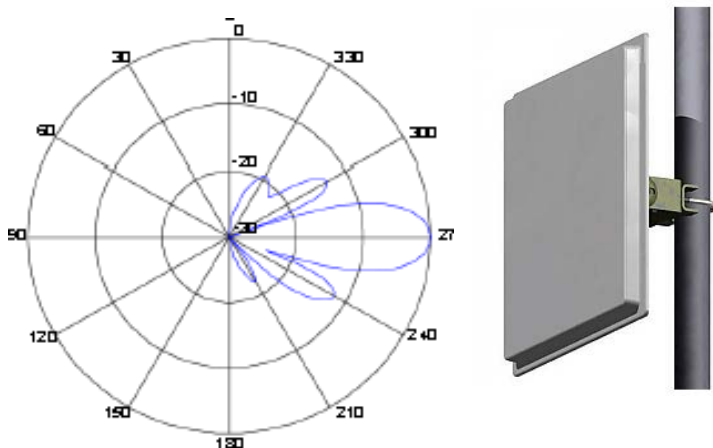- Mobile Integration (HTML5 and APP)

WattStopper® Wireless Network Manager Wiring

- Locate 2.4 GHz antenna on exterior of building.

- Locate cell antenna near window if possible.

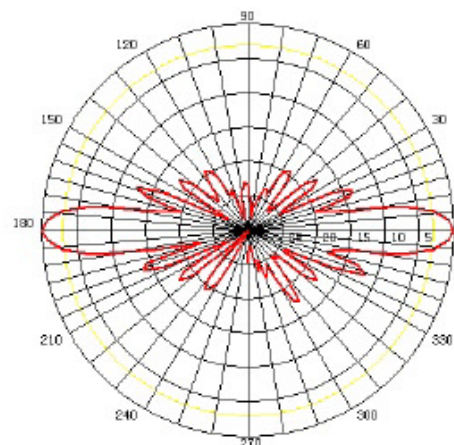- Allow for bending radius with LMR-600 antenna cable.

- Include inline surge protect
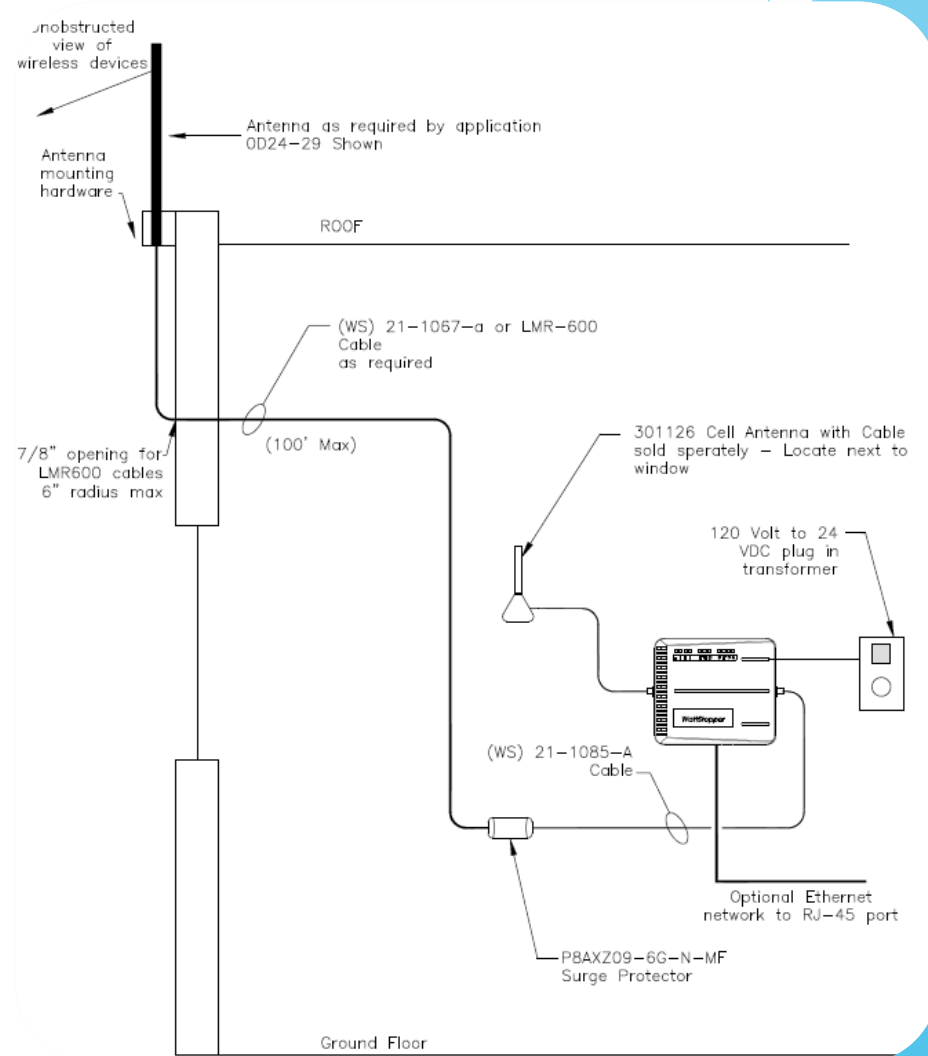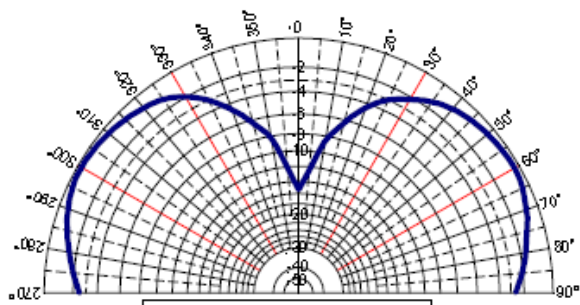
Antennas and Accessories

▶ Sector and Directional

OMNI directional

ARC-PA2419B01 Flat Plate Sector 19 db
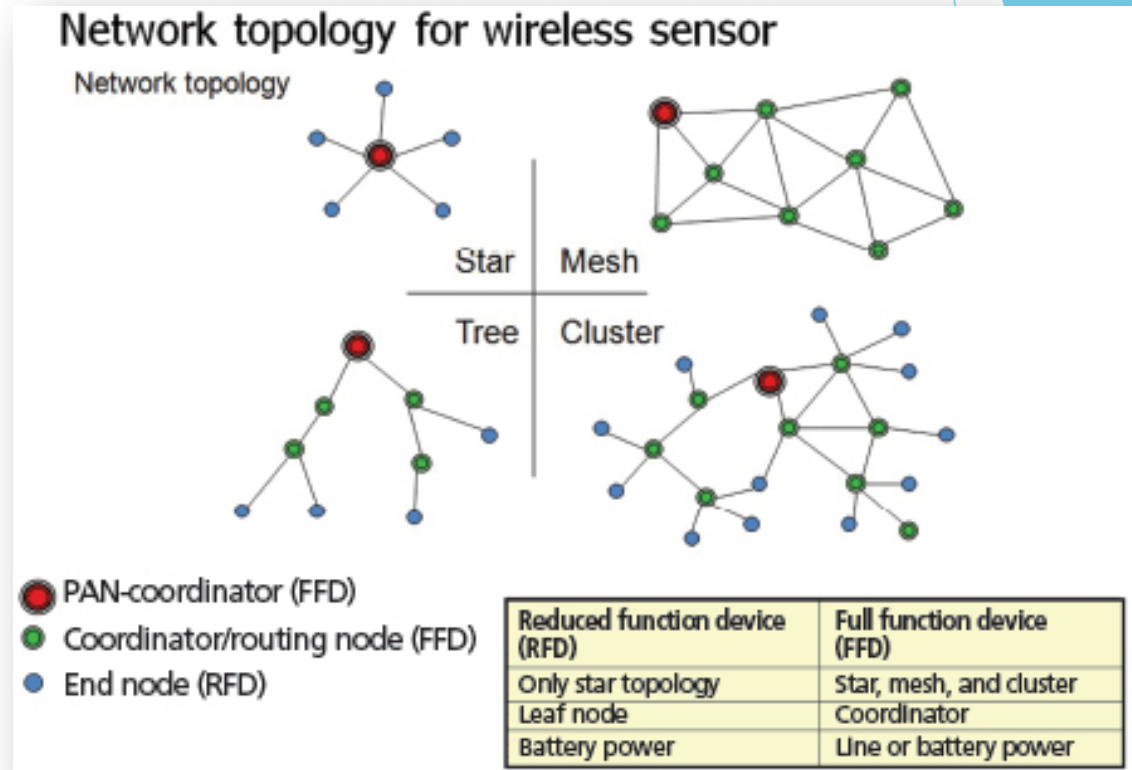
Exterior OD24-9

TRA24003NP Cabinet Mount

Antenna Cables

Network Topologies
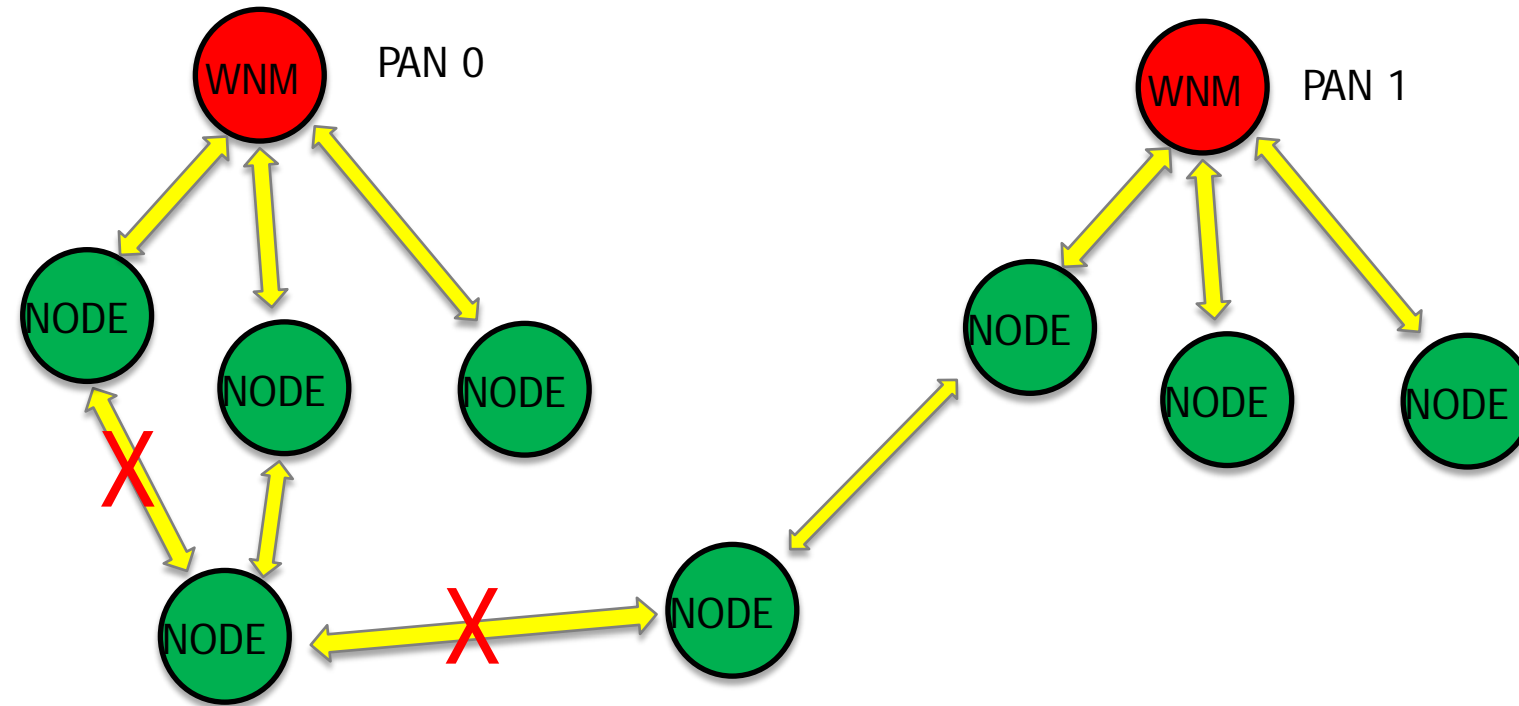## Wireless Exterior Control

▶ WattStopper = tree topology

1. Larger coverage area than star network.

2. Messages between nodes must get routed to first common ancestor

3. End devices can sleep

4. Moderate code and memory requirements

5. A self-healing tree can re-route automatically if link to parent is broken.

Network topology for wireless sensor

Network topology

Star | Mesh

Tree | Cluster

- PAN-coordinator (FFD)
- Coordinator/routing node (FFD)
- End node (RFD)

Reduced function device (RFD)	Full function device (FFD)
Only star topology	Star, mesh, and cluster
Leaf node	Coordinator
Battery power	Line or battery power

🔴 PAN Coordinator = WattStopper® Wireless Network Manager (WNM)
🟢 Coordinator / Routing Nodes = WattStopper® Wireless Network Nodes
⚫ End Node = None today

WattStopper - Self Healing Network

WattStopper® Wireless Network Manager (WNM)

WattStopper® Wireless Network Node

WattStopper® Wireless Exterior Control Network
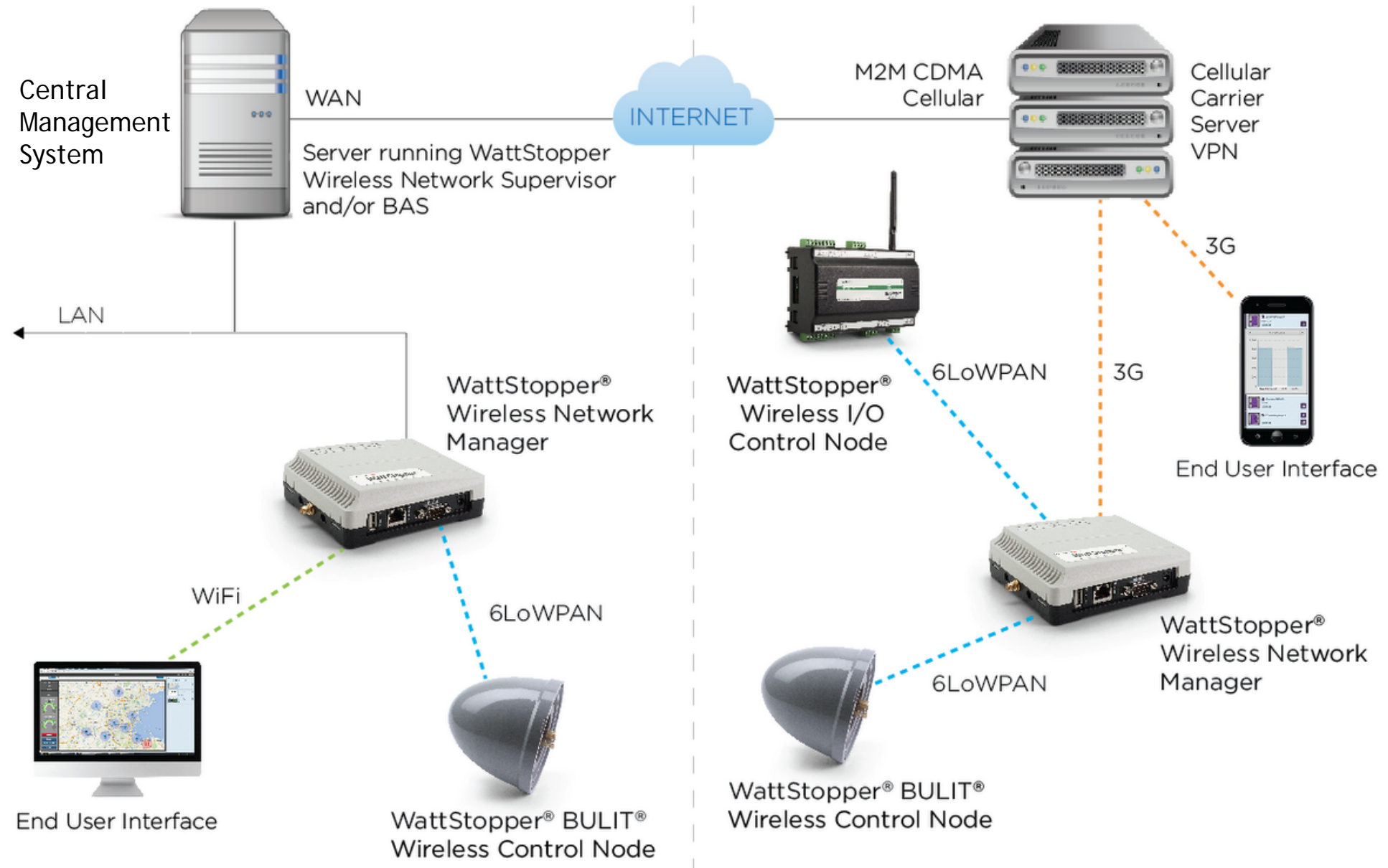
WattStopper® Wireless Network Supervisor

- ▶ Central Management System
- Software only – Can run on a local server, virtual machine on customer site, or hosted services.
- Same software on larger hardware platform.
- Shares site templates across Wireless Network Managers.
- Single IP address for customer sites, provides transparency from Wireless Network Managers
- Allows Node visualization comparison across networks.
- Long term storage of historical data
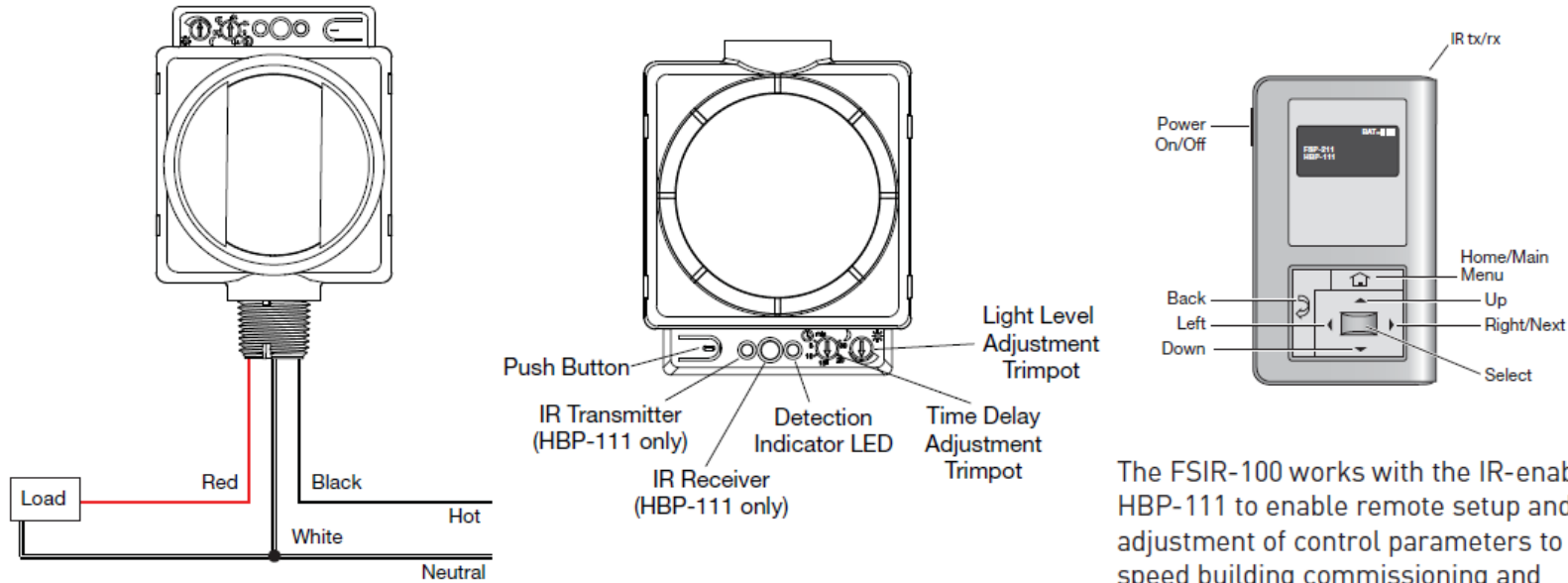
Graphics and Histories
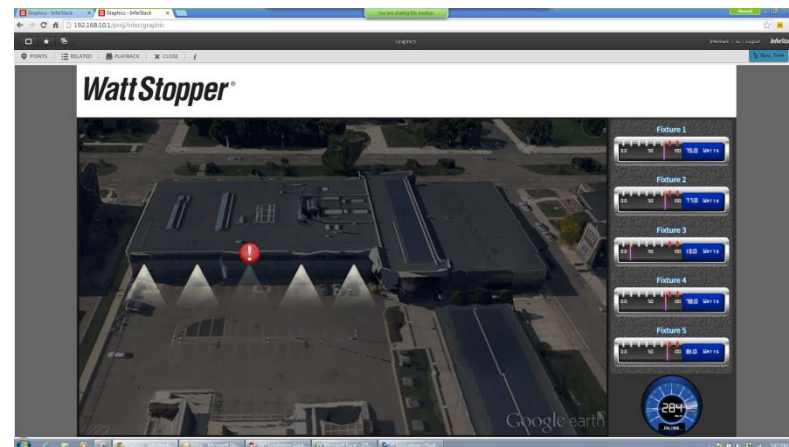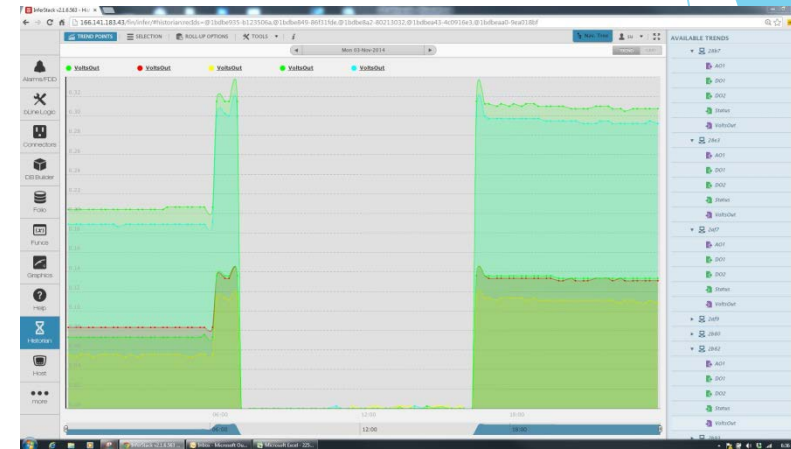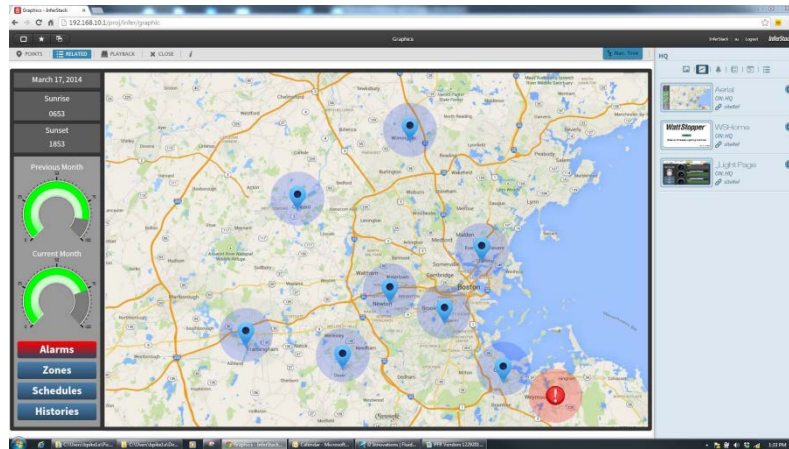
Fixture Mount Sensor- FSP 211

- Adjustable high/low trim levels
- Rated for extreme temperatures
- Hold-off functionality (daylight)
- Uses handheld tool for adjustments
- IP66 rating
- Heights 8'-40'
- 0-10v capable

New High Bay Sensors

HBP Wiring and Controls

The FSIR-100 works with the IR-enabled HBP-111 to enable remote setup and adjustment of control parameters to speed building commissioning and simplify maintenance.

Model # and Description

HBP-111-L7	High/low bay PIR sensor with IR remote capability
HBP-112-L7	High/low bay PIR sensor, no remote capability
HBP-EM1	High/low bay extender module
HBP-SM1	High/low bay surface mount module
HBP-L7	Spare L7 lens for HBP-111 or HBP-112
FSIR-100	Remote handheld configuration tool

Sensor Technologies

- PIR
- Ultrasonic
- Dual Technology

DT-305
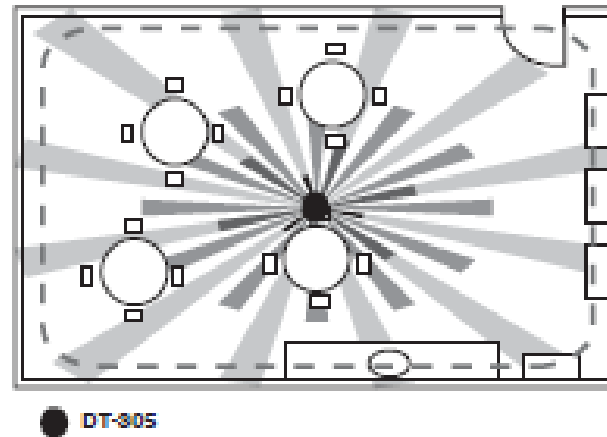
Passive Infrared

- Passive means that it emits almost no energy. You are the energy source
- "Looks" for the movement of heat against a cooler background
- Must have both heat as well as motion to trigger the lighting
- Works by "Line of Sight"
- Responds better to movement that is lateral rather that forward and back.
- Industry accepted technology
- WattStopper sensors have 2 levels of lenses, 52 layers (vs. 26 or less with competitors)

Ultrasonic

- Active Technology
- Projects a high frequency signal into the space and then measures the return time of that signal.
- Volumetric coverage pattern utilizing the Doppler effect
- Greater minor motion coverage
- Responds well to perpendicular motion

Dual technology

- WattStopper introduced the industry's 1st Dual Technology sensor in 1991 specifically to address HVAC concerns

- Incorporates both Ultrasonic and PIR technologies

- WattStopper Dual-Tech allows for either/or scenario to detect occupancy

- Eliminates false activations associated with certain applications

Line Voltage Sensors

- CI-355: 360 Infrared Ceiling Sensor

- DT-355: 360 Degree Dual Technology Ceiling Sensor

- Often used in retrofit applications but can be used in new construction

- Eliminates the need to install power packs

- Limited load capability – 7 amps versus 20 amps

Power Packs
BZ-50

- Power Pack generates 24Vdc to power sensors

- Utilizes Zero Crossing Technology – extends life of relays by switching at zero-crossing point of AC power curve and reduces pitting of the contacts
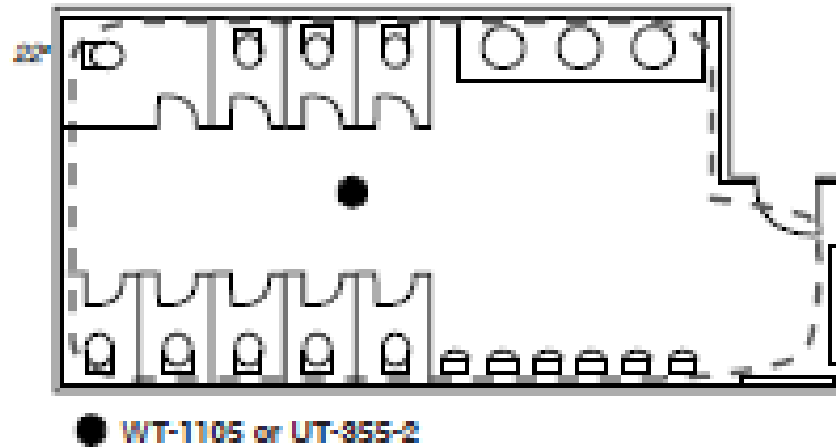
- Relay capacity: 20 Amps

- Plenum Rated

Power Packs
BZ-150

▶ Manual–on (vacancy) capability (versus Auto-on/occupancy only with BZ-50)

▶ Hold-On input

▶ Hold-Off input

▶ All other features similar to BZ-50

▶ Requires LV switch

Common Applications

- Conference Rooms
- Offices
- Warehouses
- Classrooms
- Restrooms

● WT-1105 or UT-355-2

Applications

- Small Conference Rooms - Wall switch sensors or WPIR
- Larger Conference Rooms – CX-105 or DT-205 or DT-305
- Small Office – same as small conference room
- Large Office (private) same as large conference room
- Open Office – DT-305, W-2000, WT-2205, CI-205/305
- Warehouse Aisle – HB series or CX-105 with -3 or -4 lens
- Warehouse open area – HB series or CI-205-1

Applications

- Classrooms – avoid wall switch sensors – vandalism - rooms up to 28′-30′ use 1 DT-205 or DT-305. Rooms beyond 30′, use 2 or more sensors

- Small Restrooms – one person – Ultrasonic wall switch sensor or Passive Infrared

- Large Restrooms – multi-stall – Ultrasonic ceiling sensors W, WT or UT series   NO Dual Technology here !

Optional-Neutral Sensors

- Decide whether or not neutral needed after purchase
  - No special configuration required (tab to expose terminals)
- Compliant with 2011 NEC requirements, or compatible with existing wiring
- 120/277 VAC and 347 VAC models available
- Choices of PIR or dual technology
- Single or dual relay sensors in 6 colors
- Fully featured to complement previously released WattStopper sensors
- Simplifies ordering

Questions