What We’ll Cover

• Wireless Use Cases
  1. Single Point Sensing (Temp Sensing)
  2. Component-To-Component (Mesh Network)
  3. Cellular Connectivity

• Economics Of Wireless
  ▶ Wired Vs Wireless
  ▶ Scenarios Where Wireless Is The Best Option
Why Consider Wireless For Retail Facilities?

• Reduces Cost
  ▶ 70% Of FMS Wiring Is For Networking/Sensors
  ▶ Eliminates Wires And Associated Cost/Time

• Improved Convenience And Flexibility
  ▶ Wireless Easily Accommodates Changes

• Open Stores Faster
  ▶ Shorten Time To Revenue
Why Consider Wireless For Retail Facilities?

• Operational Economics Drives Additional Connectivity
  ▶ More Devices “Connected”

• Enhanced Reliability
  ▶ Offer “Self Organizing” And “Self Healing” Capabilities
  ▶ Solar Powered

• Addresses IT Security Concerns

• IoT (Internet Of Things) Trend Has Expanded Options And Technology

Balancing Costs With Capabilities Is Key
Use Case 1
Single Point Sensing (Temp Sensing)
Use Case 2
Component-To-Component Network (Mesh)
Use Case 3
Cellular Connectivity
## Sensing Applications

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## Considerations

- Battery Life (Solar Has Changed The Game)
- Cost Of Pulling Wires Vs Cost Of Electronics
- Broadcast Rate Requirements (Affects Battery Life)
- Penetration Though Walls, Signage, And Other Obstacles
- Connectivity To Controller/Wireless Ecosystem
- Reliability Of Connection
Best Applications For Wireless

**Connectivity Value**
- Food Quality
- Energy Management
- Inventory Risk
- Control
- Likelihood Of Layout Changes

**Connectivity Difficulty**
- Long Wire Runs
- Roof Penetrations
- Concrete Cutting
- Ceiling Conduit

Wireless Connectivity Is Most Compelling When Value Is Greatest And Connectivity Is Most Difficult
Component-To-Component Wireless Networks

- Mesh Nodes Capable Of Re-Transmitting Messages To/From Adjacent Nodes
- As The Network Organizes, Most Efficient Path Is Learned And Used
  - Based On Signal Strength, Latency, Etc.
- Disruptions In Path (i.e. Loss Of Node) Force Nodes To Reconfigure Path Automatically
- Remodel Additions Seamlessly Join Existing Network
Component-To-Component Wireless Networks

- Works Well When Case Control Is Applied
  - Mesh Network Defined By Cases
- Self-Contained Case Control
  - Cases Can Easily Be Moved Anywhere In The Store
  - Connectivity Is Automatic
- Applying Wireless When Retrofitting A Store May Make Sense As Well
Economics Study – Wireless Applied To Case Temp Sensors

Scenario 1
- Electronics (15%)
- Commissioning (23%)
- Wiring (62%)
2 Sensors Per Case
Homeruns Each Sensor

Scenario 2
- Electronics (44%)
- Commissioning (13%)
- Wiring (43%)
2 Sensors Per Case
Electronics In Case
Comm. Wiring To Case

Scenario 3
- Commissioning (8%)
- Electronics (92%)
2 Sensors Per Case
Electronics In Case
Wireless

Base
10% Savings
20+% Savings

Cost Shift From Wiring & Commissioning To Electronics With 20+% Savings Possible
Cellular Wireless Access Provides IT Enhanced Security

Current – Using Customer’s Network & The Internet

- Inbound Firewall Port – Security
- Network To Network Connectivity
- Assumes Robust Network
- Intense IT Engagement
- High Touch IT Support

Future – Cellular Connectivity

- Highly Secure, Private Cell Network Direct To The Cloud
- Data + Alarms Over Network
- Store Management System NOT Connected To Customers Network
- Completely Independent From Customers IT Infrastructure
Cellular Connectivity

• In The Past Monitoring Stores Through The Internet Was OK. No More!

• Ever Since The High Profile Hacks Into Retail Chains, IT Security Has Been Heightened.

• The Internet Used To Be The Only Way To Connect. Now Cellular Is An Option.

• Internet Of Things Has Really Spawned A Whole New Industry Around The Connectivity Of Devices, Providing New Options And Driving Down Costs.
Key Points to Take Away

• There Are Some Situations Where Wireless Solutions Are Very Compelling
• Wireless Is Not The Answer For All Situations
• Understand The Underlying Economics Of Running Wires, Moving Cases, Etc.
• The Technology Associated With Cellular Connectivity Has Really Advanced Lately
• Cellular Connectivity Is Becoming More Preferable As The Options Increase And IT Security Is Heightened
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