

No Wires. No Limits.

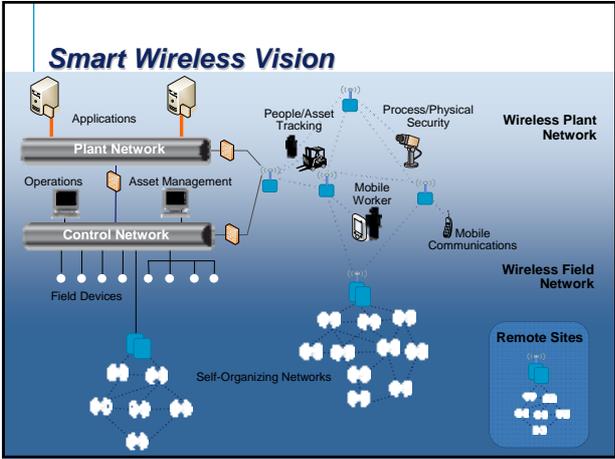
Smart Wireless Solutions

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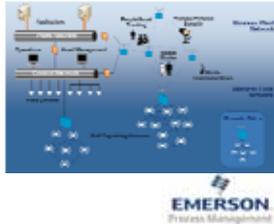

Agenda

- Emerson's Smart Wireless Vision
- Real Opportunities, Real Solutions
- Wireless Field Networks
- Wireless Plant Networks
- Secure, Reliable, Easy
- Summary



Smart Wireless Vision

- Seamlessly integrate both wired and wireless plant and field networks to address process industry needs
- Based on Open Standards
 - 802.11
 - 802.15.4
 - WirelessHART
- Network characteristics
 - Scalable
 - Secure
 - Reliable
 - Easy



Smart Wireless is the Enabler for New Plant Solutions

- Plant and process information
 - ✓ Extended plant and asset information, stranded diagnostics, and extending the 'walls' of the plant
- Workforce productivity
 - ✓ Remote and mobile operations and maintenance, automated work flow management, and mobile worker communications
- Business and plant management
 - ✓ Security, video surveillance, and people/ asset tracking



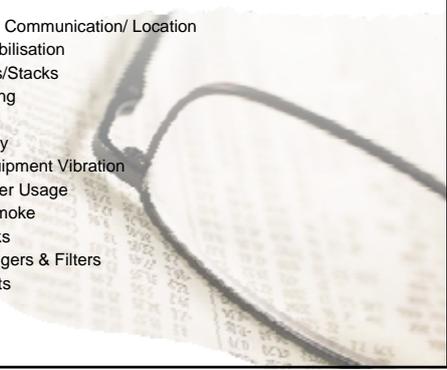
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**You Can See More...
The Opportunities Are Real**

- Utility Usage
- Field Worker Communication/ Location
- Operator Mobilisation
- Relief Valves/Stacks
- Asset Tracking
- Corrosion
- Plant Security
- Rotating Equipment Vibration
- Safety Shower Usage
- Fire, Gas, Smoke
- Spills & Leaks
- Heat Exchangers & Filters
- Ground Faults
- ...



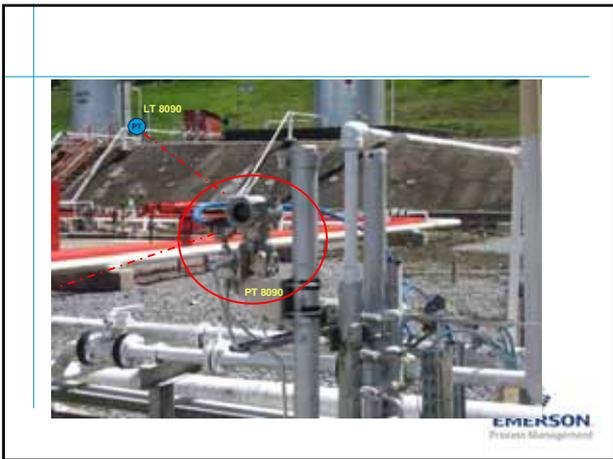
Customers Are Solving Real Plant Problems

Heat Trace Monitoring – Profile

- **Wireless devices change economics**
 - Improves CapX costs (less scaffolding)
 - Improves OpX – less downtime!
- provide temperature profile.
- Results
 - Reduced downtime due to clogged pipes
 - Wireless provided significant cost savings
 - Seamless integration into legacy host







Transmitters In The Well Head Area

- 10 transmitters
- 2 initially connected up to gateway as host. 3 after self tuning of network .
- Latency of 2-3 sec in the system
- Update time 30 sec set on transmitters
- No line of sight between transmitters and Gate way.
- Daily radio communication in area
- Antennas for Online camera transmission in area



Customers Are Solving Real Plant Problems: NA Pulp Mill

- Application: Rotating Lime Kiln mid-zone temperature monitoring
- Solution to this challenging temperature application needed to solve throughput problem
 - Wired technology could not handle rotating equipment
- Wireless temperature transmitters placed 180° apart at mid-zone of kiln gave insight needed to solve mill bottleneck



Rotating Lime Kiln

"Four days after the order was placed we could see minute-by-minute mid-zone temperatures trending on the control system ... Since the wireless system has been installed, we can tell if there's build-up of lime in the mid-zone area. Overall, we have improved operation of the lime kiln, and increased throughput by 5%."

—Pulp Mill Leader

pH Control in Raw Water Treatment

Objective:

- Control of pH in raw water
- Ensure optimal pH value for flocculation and coagulation

Present Approach/Challenge:

- Lime is generally dosed at an excess
- Large fluctuations in pH due to changes in raw water quality

Wireless solution:

- Wireless transmitters for pH in flocculation tank

Benefits:

- Allows for accurate pH control in the flocculation tank
- pH value can be incorporated in feed-forward control to reduce lime usage.



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Monitoring of Auxiliary Power Transformers

Objective:

- Remote real time monitoring of auxiliary transformers

Present Approach/Challenge:

- Insufficient measurements on transformer oil and winding temperatures
- No measurement on oil tank level and transformer pressure
- Wired solutions near transformers have very high electro-magnetic interference

Wireless solution:

- Wireless transmitter to monitor transformer oil/winding temperature, tank level and gas pressure

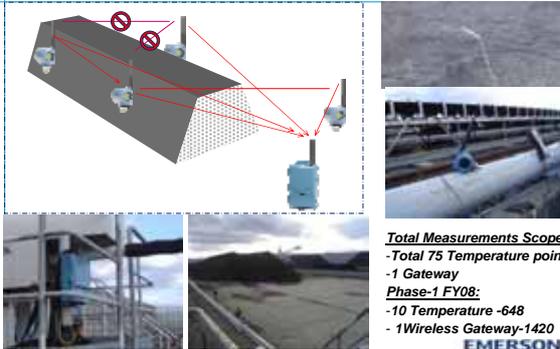
Benefits:

- Increased plant availability due to reduced transformer failures
- Reduced manual inspection routines



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**Success Story-4
- Coal Stackpile Temperature Measurement**



Total Measurements Scope:
 - Total 75 Temperature points
 - 1 Gateway
Phase-1 FY08:
 - 10 Temperature -648
 - 1 Wireless Gateway-1420

Customer is Soma Kyoda IPP Japan

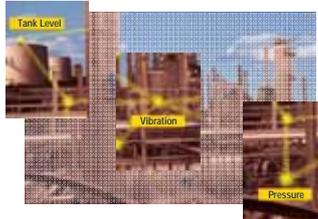


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The Smart Wireless Plant
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**Wireless "Field" Networks
Have Specific Requirements**

- Process Applications:
 - Sensing, condition monitoring, control and diagnostics
- Bandwidth:
 - Short, high priority communications
- Security/Reliability: We cannot 'drop a call'
 - Must coexist and perform in dynamic, harsh plant environment
- Power: LOW, lots of devices, widely distributed in harsh environments, batteries must last 5-10 years
- Standards (802.15.4)
 - WirelessHART (Driven by Process community)

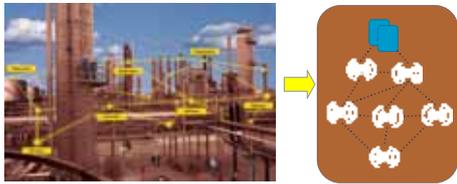


Smart Wireless Field Networks Meet Process Industry Needs



Smart Wireless Self-organising Field Network

- Self-organising Networks have demonstrated high reliability in the field
 - Use IEEE 802.15.4 with added channel hopping and Time Synchronised Mesh Protocol (TSMP)
 - Robust/tolerant to almost all interference and coexists with other wireless networks
 - Demonstrated > 99% field reliability
- Robust security is designed in - and easy



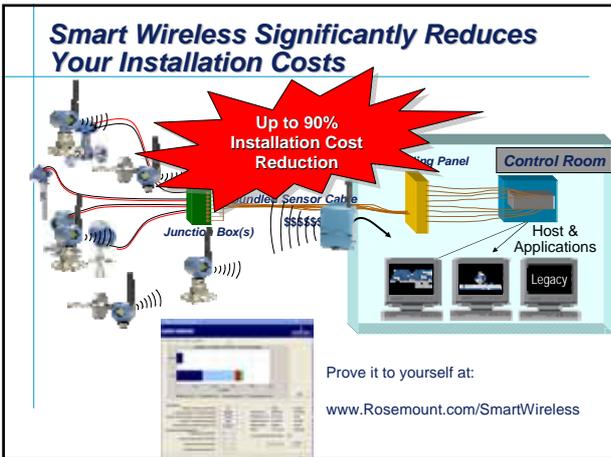
Smart Wireless Field Networks are Easy to Install, Use and Are Reliable!



Wireless Field Networks Reduce Installation Costs



Smart Wireless Significantly Reduces Your Installation Costs



International Standards Are In Place For Wireless Devices

- WirelessHART is the **ONLY** approved wireless standard for the process control industries
 - WirelessHART has focused on interoperable wireless **devices**
 - Leading suppliers have just released products for sale...available today
 - HART Communication Foundation
 - An international foundation
 - Contributing member to IEC
 - Over 210 members (Emerson, ABB, Siemens, Yokogawa, E&H, Honeywell, etc)
 - 24 million installed devices
 - Formed to develop and manage protocol standards & specifications



Wireless Field Networks – Benefits

- Save up to 90% on planned projects or devices
 - Wires, labor, conduit, junction boxes, drawings
- Enable projects / devices you always wanted to do, but couldn't justify
 - Less cost changes the economics
 - Many process, safety and environmental projects can now clear the financial hurdles (e.g. monitoring safety showers)
- Do projects that are difficult or impossible with wires
 - Rotating equipment (furnaces, kilns, drums)
 - Tough installation conditions for wires (hot, corrosive atmosphere, wet)
 - Movement (rail cars, skids, flexible manufacturing)

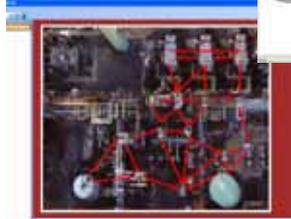


Easily Design and Manage Wireless Field Networks with AMS Wireless SNAP-ON

- Plan, optimize and diagnose WirelessHART field networks



- Drag & drop devices and gateway on a plot plan or picture of the plant



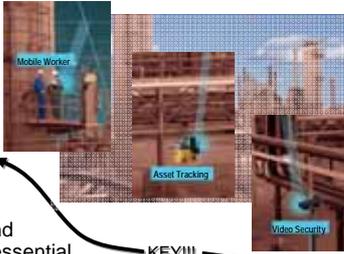
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Wireless "Plant" Networks Have Specific Requirements

- Plant/Business Applications:
 - Video, voice, mobile tools, tracking
- Bandwidth: High; multiple applications must share the service**
- Security/Reliability: Industrial security and robust coexistence essential
 - Must pass IT muster
- Power: Devices can be line powered or recharged daily
- Standards - Driven by IT community (802.11)**



KEY!!!

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Emerson and Cisco offer Open-Standard Wireless Solutions



Emerson is the global leader in process automation

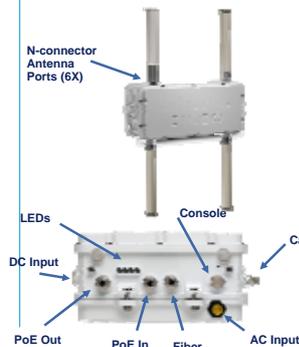


Cisco is the global leader in industrial networking

- Emerson Wireless Field Networks, plus...
- Cisco Unified Architecture for Wireless Plant Networks
 - Industrial-class Mesh IEEE 802.11 Access Points
 - Wireless Control System for centralized network and security management
 - Plant applications include video, voice, mobility, tracking
 - Leverage Cisco's extensive partner network

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Process Management

Cisco 1522 Series Access Point



- Power over Ethernet (PoE) to connect & power devices
- Power Input options
 - AC: 90 – 480 VAC
 - DC: 48 VDC PoE Power Injector
 - 12 VDC for powering from alternative sources
 - Cable Power (PoC)
- Ruggedized enclosure
 - 40 to +55 °C with Solar Loading
 - IP67, NEMA-4X
 - 265kph wind gusts, 160kph sustained winds
 - Hazardous Safe Class 1, Zone 2/Div 2
- Paintable chassis
- FIPS-140-2 certifiable

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Process Management

Together We Deliver Complete, Best-in-Class Wireless Solutions for the Process Industries



Together We Deliver Complete, Best-in-Class Wireless Solutions for the Process Industries

- Cisco Unified Wireless Architecture
 - Industrial-class Mesh IEEE 802.11 Access Points
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Plant Network Applications

Mobile Worker:

- How?
 - Application runs on server in wired network
 - Use WiFi infrastructure – users roam, but stay connected
- DeltaV Remote Client
 - Provides all of the capability of DeltaV via wireless
 - Get alarms, alerts and monitor process during rounds
- AMS Remote Client
 - Provides access to full functionality including configurations, predictive diagnostics, audit trail, alert monitor and SNAP-ON's
 - Access other AMS Suite applications along with work orders from a CMMS, documentation, plant drawings, etc.

Clients can come in many form factors → (including I.S. rated)



Plant Network Applications

Video / Voice:

- How?
 - Wide variety of video and voice devices
 - Utilizes standard WiFi network
 - VLAN and QoS prioritize bandwidth appropriately
- Benefits
 - More effective communications (group, location based)
 - Cost effective solutions for monitoring danger or harsh areas (improve safety by removing people)
 - Reinforce plant security
 - Improve environmental compliance



Video Security System

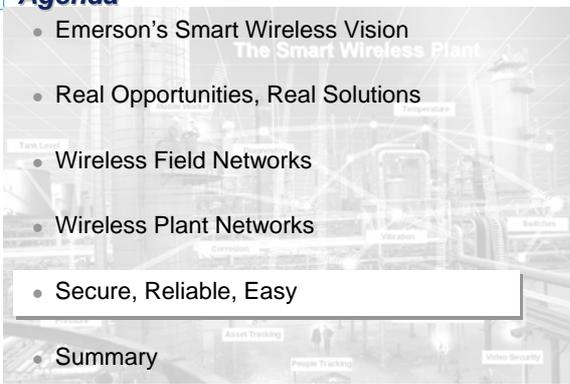


Voice & Handheld

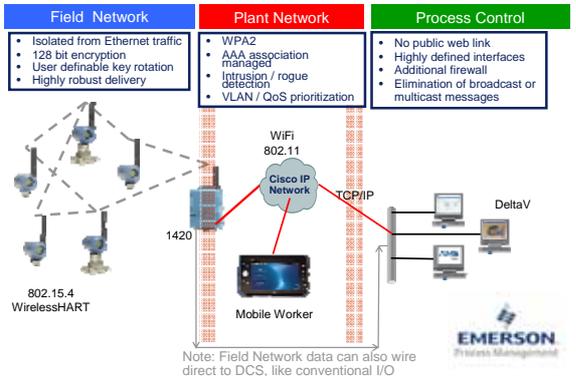


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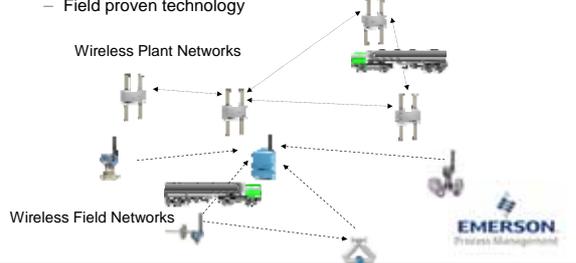


Secure – End to End



Reliable

- Field networks and Plant networks in Smart Wireless Solutions use self-organizing technology
 - Virtually unlimited paths for data to travel
 - Network continuously self-balances and optimizes
 - Field proven technology



Easy



- Easy to Install
 - Familiar instrument practices for field networks
 - Self-organizing networks minimize configuration
 - No site surveys for field networks
 - Seamless integration between wired & wireless
- Easy to maintain
 - Easily add field devices, gateways, access points
 - Asset and Network Management software:
 - Monitors health of devices
 - Monitors health of communications between devices
 - Quickly identifies faults

Your Smart Wireless Opportunities Are Without Limits...