• Data is paramount for control and management
  – Multiple protocols
  – Multiple industries
  – Multiple systems
  – Building, Safety, Factory
MULTIPLE SYSTEMS

- Modbus – 7 Million Nodes
  - Modbus RTU
  - Modbus TCP/IP
  - Modbus Plus
- BACnet – 3 Million Nodes
  - BACnet PTP
  - BACnet ARCnet
  - BACnet Ethernet
  - BACnet MS/TP
  - BACnet/IP

- Plus
  - Fire Alarm Control Panels
  - Industrial controls
  - Safety systems
  - Energy management systems
  - Environmental controls
  - Validation systems
  - A/V controls
UNIVERSITY OF ARIZONA

• 240 buildings
• Started 1885
• Multiple BAS/HVAC/Controls Vendors
  – Schneider Electric
  – Trane
  – Johnson Controls
  – Caterpillar
  – SimplexGrinnell
  – Siemens
  – GE
  – ABB
  – ......
**EnergyWise – Cisco**

- FieldServer gateway links BAS systems and devices to EnergyWise
- EnergyWise is an open control plane that extends to any energy consuming device
- Network as platform for energy and environmental command and control
FIRE ALARM CONTROL PANELS

- EST (Edwards UTC)
- Fike
- Hochiki Americas
- Honeywell Life Safety
- Gamewell-FCI
- Notifier
- Silent Knight
- Mircom
- SimplexGrinnell
- Siemens Fire Safety

FieldServer interfaces EST3 FACP to LonWorks in Echelon HQ
• Integration of industrial controls and building automation
  • Maximize control, minimize control systems
  • Necessary for validation control
  • Occupant comfort and safety
  • Maximize efficiency
  • Optimize energy consumption
  • Modbus, EtherNet/IP, OPC, DNP3, Profibus, ControlNet, ControlLogix
FieldServer integrates AV and conference room controls into BAS

- AMX
- Crestron
- Lutron
- Hunter-Douglas
FieldServer partners with Point Six wireless to link multiple wireless sensors to BAS networks

Applications in data centers, hospitals, food service and sub-metering

Also sold under Schneider Electric, Honeywell, JCI and more.
• Facilities Management LonWorks Gateway for Corp of Engineers
• Fire Suppression System aboard advanced-tech U.S. Navy Destroyers
FieldServer Technologies – 100+ protocols, 1000+ devices, 50,000+ instances.
Questions?
DEALING WITH REALITY: LIFE IN A MULTI-PROTOCOL WORLD

Presented By

Patrick Winkelman
V. P. Business Development
Distech Controls, Inc.
MULTI-PROTOCOL IS EVERYWHERE AND IS HERE TO STAY

- In our everyday personal and professional life
- Some integrate better than others
- Some sometimes
- Some not at all
In our Building Systems
Some integrate better than others
Some not at all
We have standards .... But
Not all are implemented equally
• Common Protocol Integration
  • LonTalk to LonTalk or BACnet to BACnet
    • Easy? Yes sometimes
    • Not all are implement to standards or certified
  • Common and Seamless Graphics, Alarms, Trends and Schedules

• Mixed Protocol Integration
  • LonTalk to BACnet or LonTalk to Modbus
    • Easy? Requires knowledge and experience
    • Not all are implement to standards or certified
    • Need a Gateway/Driver
  • Common and Seamless Graphics, Alarms, Trends and Schedules

• Can anyone do this?

• NOT NECESSARILY
Multi-Protocol integration is an expectation of the owner/engineer

- Standard Protocol integration is practical with training, product and support
  - LonTalk, BACnet, Modbus
  - Everyday reality of the market requirements
    - Existing system integration
    - Limitation of the OEM protocol selection

- Proprietary Protocols require specialized knowledge and hardware/drivers
  - Need software tools and knowledge of existing system
  - You “own” the system after integration – be prepared to support it
  - Make sure it is cost effective

- Requires the right Hardware/Software platform with support
  - Expect support to be somewhat limited

- Programming tools
  - Software tools for controllers are proprietary
Select the right integration platform
  - LonTalk, BACnet and Modbus should be standard optional features

Choose a knowledgeable Supplier for support
  - Need to have a backup when issues occur

Test in your lab
  - This is where you learn on your terms

Train or hire the skilled engineers
  - These resources are critical and will set you apart in the industry
THE MASTER SYSTEM INTEGRATOR - SPECIALIZED MULTI-PROTOCOL SKILLS

- Master System Integrator
  - Manages the network side of the Building Management System
    - Building Master Controller
    - Graphics
    - Integration
  - Typically does not get involved in building level controls
    - Manages the System Integrator relationship for the Owner or GC
  - Practical for Campus and multi-site facilities
• Yes it is a requirement of the industry
  • Prepare your business for these skills
• Standard protocols are practical to integrate
• Proprietary protocols are higher risk but some can be integrated
  • Do it for the right reasons
• You always need the right skills and product partner for success
The Use of EnOcean Technology in a Multi-Protocol World

May 11, 2011
Status Update on Progress & Activities

• Proven in over 100,000 building projects
• Over 700 interoperable products supported/provided by 180 companies
• Development of a Life Cycle Cost Analysis whitepaper on energy harvesting, wireless devices
• Establishing recognition within government space
  • Congressional briefing
• Continuing work with respect to building energy legislation and incentives
• EnOcean over IP
• System integrator training and certification
Why EnOcean Technology?

- Simplicity of EnOcean system to understand, to install and to use
  - Working to make processes even simpler with remote management of devices
    - DimOnOff: EnOcean bidirectional interface simplifies pairing of devices
    - Showcasing this at Alliance booth at LightFair
- No battery maintenance and no cable installation
  - Gutting buildings can be disruptive, expensive or even impossible
- Connectivity to LonWorks in proven case studies
  - Also connectivity to TCP/IP and other protocols
When does wireless make sense?

• Building Automation System planned (energy saving, central control, energy-use, monitoring)
• Flexible placement on glass, furniture, partition walls is desired
• Multi-functional buildings / Open floor plan for offices
• During renovation when new cables and wall opening would be difficult because of costs, time and disruption
• Time critical projects—“15 Days Project”
• Certified Green / Sustainable building requirement
  • LEED & Energy Star
Sensors & Switches are powered by tiny changes in the environment:

- **Mechanical**: pressing a light switch or turning a window handle
- **Solar**: in-room or sunlight – stores energy for multiple days & nights
- **Thermo**: temperature differences of >4 deg C
Wireless Transmission in Buildings: Considerations

- **Frequency**
  - use license free-band.

- **Range**
  - lower frequency, longer range
  - ensure receiver within safe range
  - take attenuators/angles into account

- **Attenuators**
  - metal & concrete block most signals
  - other materials reduce signal range

- **Interference**
  - avoid 2.4GHz inside buildings
    - WLAN, Bluetooth, Microwave Ovens,…

- **Health**
  - use low power, low duty-cycle wireless
  - short signals, low amount of data

- **Power Requirements**
  - cables, batteries, energy harvesting?
Wireless Transmission Scenarios
Case Studies: EnOcean and Distech Controls

The Need: Barclays Bank installed the technology at 500 sites across the UK, ranging from flagship sites to retrofitting old bank buildings and upgrading systems.

The Solution: Client wanted flexibility of install and future proofing of technology as well as web browsing capability and industry standard open protocols. EnOcean wireless technology was combined with Distech’s open protocol I/O controllers.

Environmental Monitoring & HVAC Control
Fire Alarm & Security
Utility Metering
Real Watch
Lift Monitoring
External Wireless Sensor
Environmental Monitoring & HVAC Control
Wireless Sensor
Wireless Sensor
Utility Metering
Real Watch
LONCOM
AMERICAS-2011
EnOcean Alliance and LonMark

- LON is the leading wired technology for intelligent buildings, with around 100 million devices using the technology.
- Perfect combination: flexibility of a wireless system combined with large bandwidth and range of a wired backbone.
- US Army has standardized on LON for BAS.
- DoD and NASA have agreed on Guide Specs and Design Guidance for LON systems.
- Re-dedicate ourselves to working with LonMark to develop solution oriented focus.
• Corporate HQ for Thermokon
• Utilized four EasySens/LON gateways installed in corridors of company building
• Each communicates with many offices, all featuring room temperature sensors, switches to control lighting and blinds, window contacts plus multi-sensors to detect motion and brightness
• Wireless components installed in reception, kitchen, conference and common room, in technical sectors and six offices
EnOcean over IP

• Controlling and monitoring building automation controls over IP networks

• This trend is key given that only 5 percent of small and medium sized buildings (100,000 square feet or less) are equipped with a building management system

• Small and medium sized buildings account for 98 percent of all buildings

• Solutions that combine IP based building management systems with wireless, end devices, are present an opportunity to attack both the fixed and variable costs of building automation systems

• BSC, SCL Elements (Can2Go), DimOnOff
Questions?

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