



Your webinar time:

8am Houston, Chicago, Mexico City
9am New York, Santiago
10am Rio de Janeiro, Buenos Aires
2pm London, Dublin, Edinburgh, Lisbon
3pm Paris, Amsterdam, Berlin, Rome, Stockholm, Vienna
4pm Athens, Bucharest
5pm Abu Dhabi, Muscat

ISA100 WCI Webinar

Webinar date & time:

Wednesday 15 April 2020 at 3pm (UTC+2) - Paris, Amsterdam, Berlin

ISA100 Wireless™ Scalability 3000 Wireless IO In One Network Enabling Process Control

Presenter: Honeywell

Diederik Mols

Diederik.mols@Honeywell.com

Audio for the Webinar:

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About the speaker



“Today Industrial Wireless is increasingly deployed as an integral part of the Integrated Control and Safety Systems (ICSS)”

Diederik Mols

Chairman of the Board
ISA100 Wireless
Compliance Institute



Business Manager
Industrial Wireless
Honeywell Process Solutions

Honeywell

Diederik Mols is Chairman of the Governance Board at the ISA100 Wireless Compliance Institute since October 2017. Prior to that he served two years as Vice-Chairman. Diederik also is an active team member of the WCI EMEA Marketing Team. Diederik got involved with Industrial Wireless back in 2009 in a business development role for the EMEA region. Currently Diederik is leading the Industrial Wireless business development efforts at Honeywell Process Solutions in a Global capacity. Diederik started his career as an officer in the Royal Dutch Navy and over the years he gained solid business skills with a number of multi-national organizations in various roles across Engineering, Sales, Marketing and General Management. Diederik holds Degrees from the Royal Dutch Naval Academy and the Delft University of Technology, the Netherlands.

Agenda

1. Typical Project Challenges
2. Introduction Industrial Wireless
3. ISA100 Wireless™ Industry Standard
4. ISA100 Wireless™ Scalability up to 3000 IO
5. ISA100 Wireless™ Process Control
6. Use Cases
7. Summary
8. Q&A



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Typical Project Challenges

- HSE Compliancy
- Improve
 - workforce efficiency
 - productivity
 - asset availability
- Reliable, cyber secure infrastructure
- Fast and cost-effective commissioning
- Tight budgets to execute projects



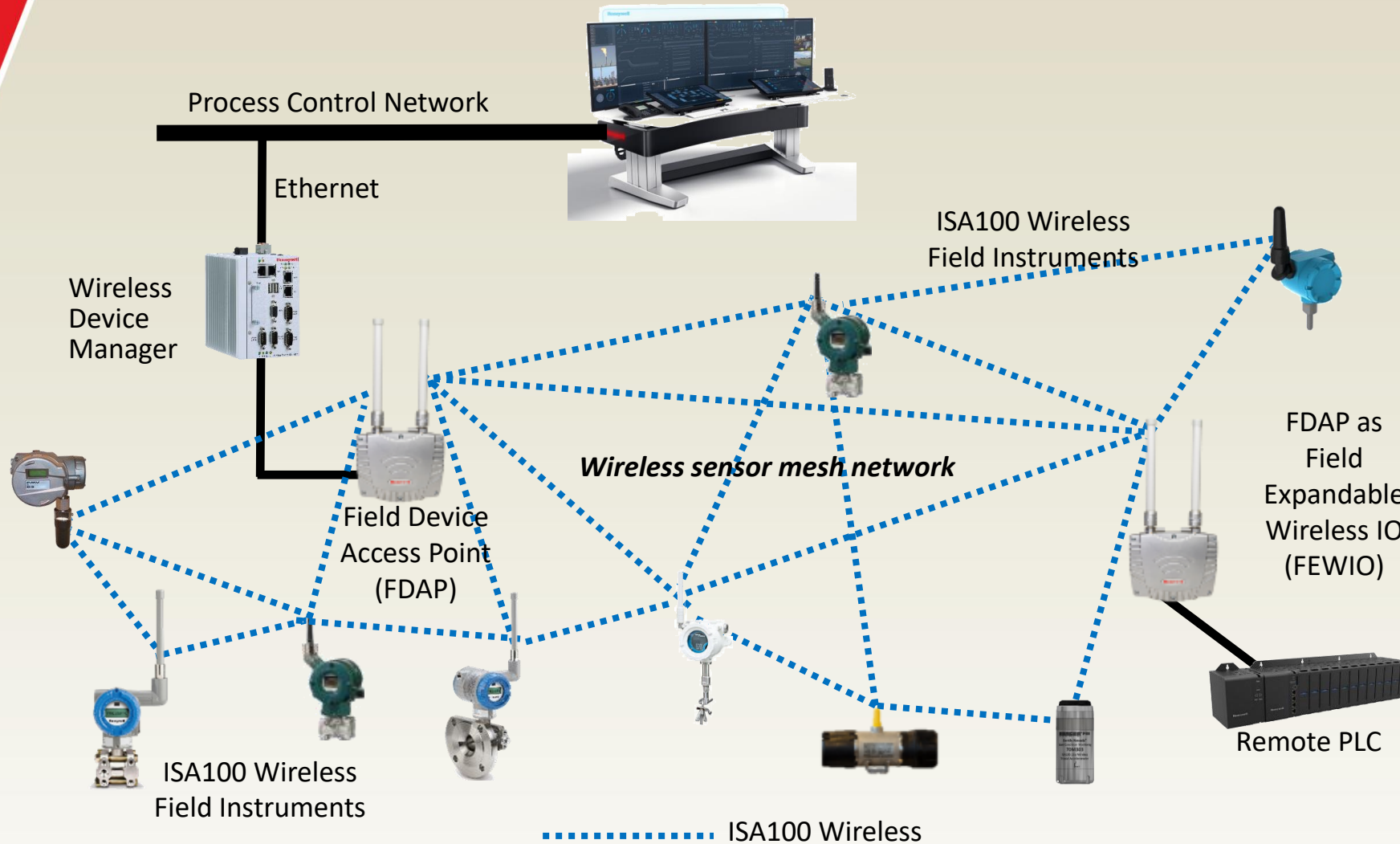
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Introduction to industrial Wireless

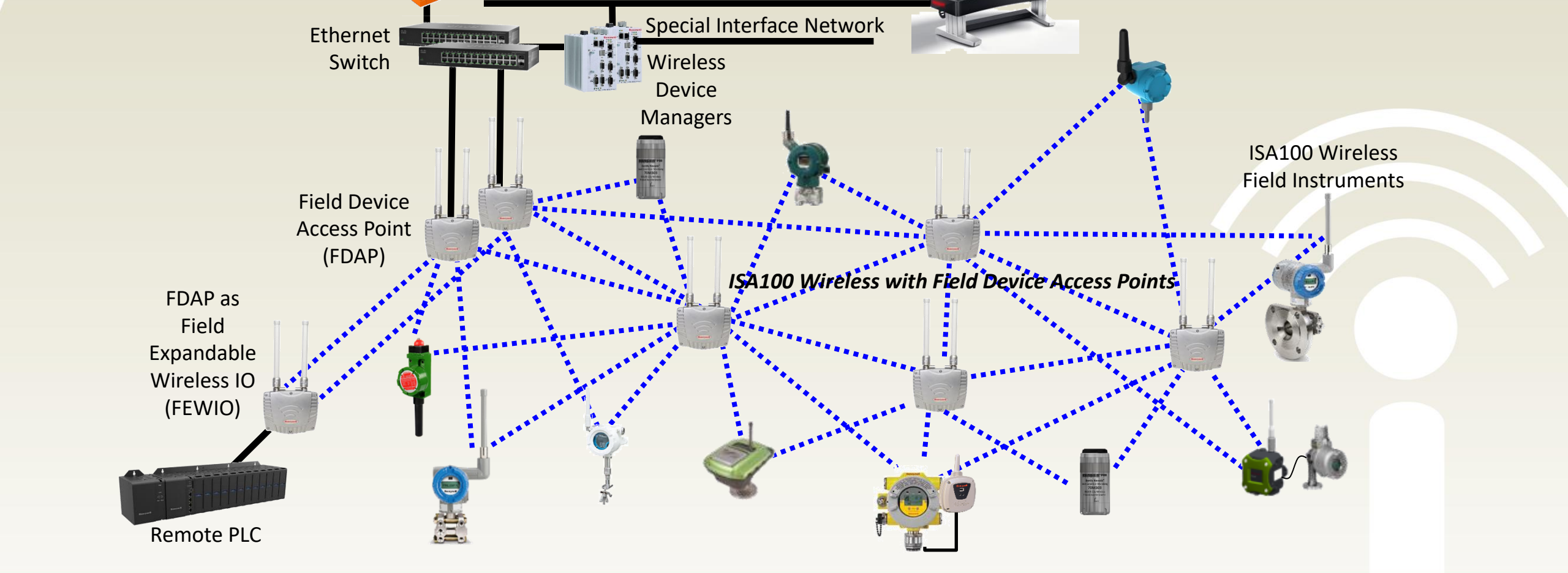


Applications examples

- Machine health monitoring
- Basic process control
- Monitoring of well heads
- Remote process monitoring
- Leak detection monitoring
- Diagnosis of field devices
- Condition monitoring of equipment
- Environmental monitoring
- Tank level monitoring
- Gas detection
- Fuel tank gauging
- Steam trap monitoring
- Open loop control
- Stranded data capture
- And more

ISA100 Wireless with Field Routers

The diagram illustrates a network architecture. At the top, a horizontal line represents the 'Business Network'. Below this line, a vertical line connects to a small orange box with flames, representing a field router. This router is connected to another horizontal line labeled 'Process Control Network'. To the right of the diagram is an image of a control room with multiple computer monitors displaying data.



OneWireless versus sensor mesh network



Wireless sensor mesh network

- Signal latencies of up to a minute
- Battery costs up to 30 times more



Transmitter



Transmitter



Transmitter



Transmitter



Transmitter



Gateway

0.5 km



Transmitter



ISA100 Wireless with
Field Device Access Points (FDAPs)



Gateway

- Real time performance
- Maximum battery lifetime

Different solution Different performance

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ISA100 Wireless Fast Facts

- International standard IEC 62734 since 2014
- Complies with ETSI EN 300 320 v1.8.1 (LBT)
- End-User Driven Standard - meeting all current and future industrial needs
- Sensor routing or field routers for best performance – Freedom of choice
- Broad Multi-Vendor Portfolio of ISA100 Wireless Devices
- ISA100 Wireless enables SIL-2 Certification
- Ensured Interoperability - best-in-class solutions from best-in-class suppliers
- Readily available ISA100 Wireless Modules and Stacks
- Enable fast-track development and go to market

Benefits of ISA100 Wireless Instrumentation

Cost Savings	<ul style="list-style-type: none">• Up to 90% of installed cos of conventional measurement technology can be for cable conduit and related construction• Typically: 1/2 the costs, 1/5 of the time• New and scaled applications are now economically feasible
Improved Reliability	<ul style="list-style-type: none">• Wired sensors may be prone to failure in difficult environment• Wireless can add redundancy to a wired solution
Improved Visibility	<ul style="list-style-type: none">• Condition monitoring of secondary and remote equipment• Process monitoring, fast additional data for trouble shooting
Improved Control	<ul style="list-style-type: none">• Add wireless to existing processes for more optimal control
Improved Safety	<ul style="list-style-type: none">• Safety related alarms - end to end SIL2 certifiable

ISA100 Wireless Product Portfolio

Infrastructure



Independent Gateway

- Honeywell, Yokogawa



Access Point (AP)

- Honeywell, Yokogawa



Integrated Gateway/AP

- Honeywell, Yokogawa, CDS, Nexcom



GW/AP + Recorder

- Yokogawa



Adapter (HART, etc.)

- Honeywell, Yokogawa



Measurement & Control



Temperature

- Honeywell, Yokogawa



Pressure / Flow

- Honeywell, Yokogawa



Level

- Honeywell, Yokogawa



DI/DO, AI

- Honeywell, Yokogawa



Valve Position

- Eltav, Flowserve, Honeywell



HSE + Life cycle



Corrosion

- RCS , Honeywell



Steam Trap

- Spirax Sarco, TLV, Armstrong, Bitherm



Vibration

- GE's Bently Nevada, Divigraph



Gas

- GasSecure, Scott Safety, New Cosmos, Riken Keiki



pH

- Honeywell, Yokogawa

Online resources



www.isa100wci.org

- Learning Center with White Papers
- Articles, End-user stories, Forum
- Receiving over 20,000 web views per month
- Full list of certified/registered ISA100 Wireless devices
- And more useful content for you and your business

LinkedIn [ISA100 Wireless Interest Group](#)

- Latest news, end-user and expert discussions, insights
- 800 members and growing; please join and invite your peers to join as well !
- Receiving over 5,000 web views per month
- **Limited Time Offer: Join the group and you will be entered in a prize draw to win a new iPad**

ISA100 Wireless Interest group

Limited Time Promotion



Scan the QR code and join the ISA100 Wireless LinkedIn group. If you join during our limited time offer, you will be entered in a prize draw to win a new iPad!



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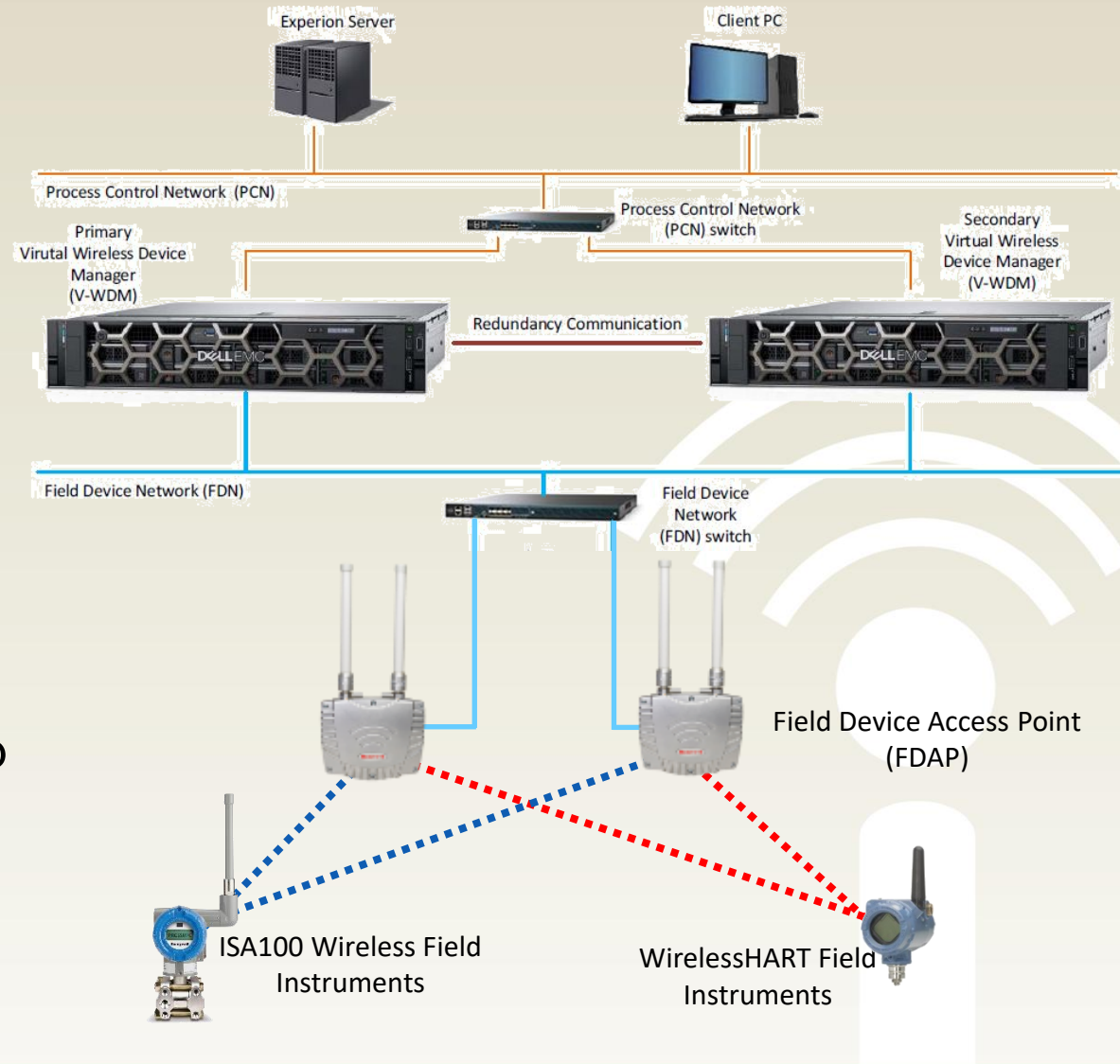


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Honeywell OneWireless – Virtual WDM

Virtual Wireless Device Manager (vWDM)

- Provides highly scalable OneWireless solution
- vWDM can support up to **3000 devices**
 - Single vWDM = 6 WDM
- Capacity managed via 500-device bundles
- Increased WDM OPC performance
- Hardware options for vWDM
 - Purchase new virtual appliance hosts
 - Leverage existing virtual host capacity
- **Single Sign-On (SSO)** to manage network of up to 3000 wireless IO



Other UNIQUE FEATURES

Special Interface Network (SIN)

- Segregate Data From PCN Network – IIOT and Asset Management solutions
- External Interfaces allowed over SIN – Modbus, Enraf, OPC, GCI, HART



Field Expandable Wireless IO (FEWIO) - a new device type

- FDAP as router can be converted to a Field Expandable Wireless IO (FEWIO)
- Data collected over RS485 & transmitted to control room over wireless
- FEWIO Supports
 - Modbus RTU
 - RS-485 serial Interface used for connecting to serial interface devices
 - Modbus TCP



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Latest innovations of OneWireless R320

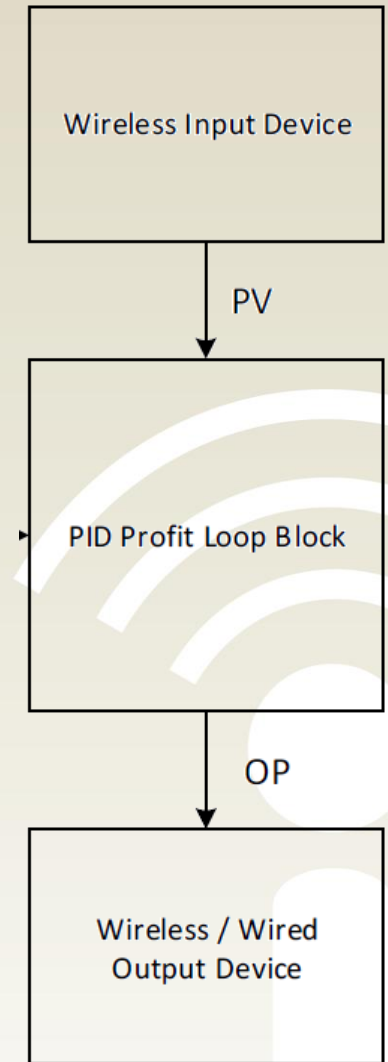
- Virtual WDM – 3000 Wireless IO
- Control over wireless
- ISASecure Certification
- Secure Communications - IPsec
- SIN Redundancy
- WDM Improvements



Control over Wireless

- OW systems can be used for control applications
- ISA100 Wireless AO devices supported
- For PID loops
- Input device can be wireless
- Output device can be wireless

Type	Class	Type Based on Industry	Recommendation
Control	1	Closed loop Regulatory Control (Critical control loops)	Not Recommended
	2	Closed Loop Supervisory Control (Set Point Change, Process Optimization)	Recommended
	3	Open Loop Control (Based on Requirement/ Operator In-Person)	Recommended
Monitoring	4	Event Action/ Sequence based (Based on Event /Small operation task)	Recommended
	5	Uploading/Downloading (Requirement based Task/ Action)	Recommended

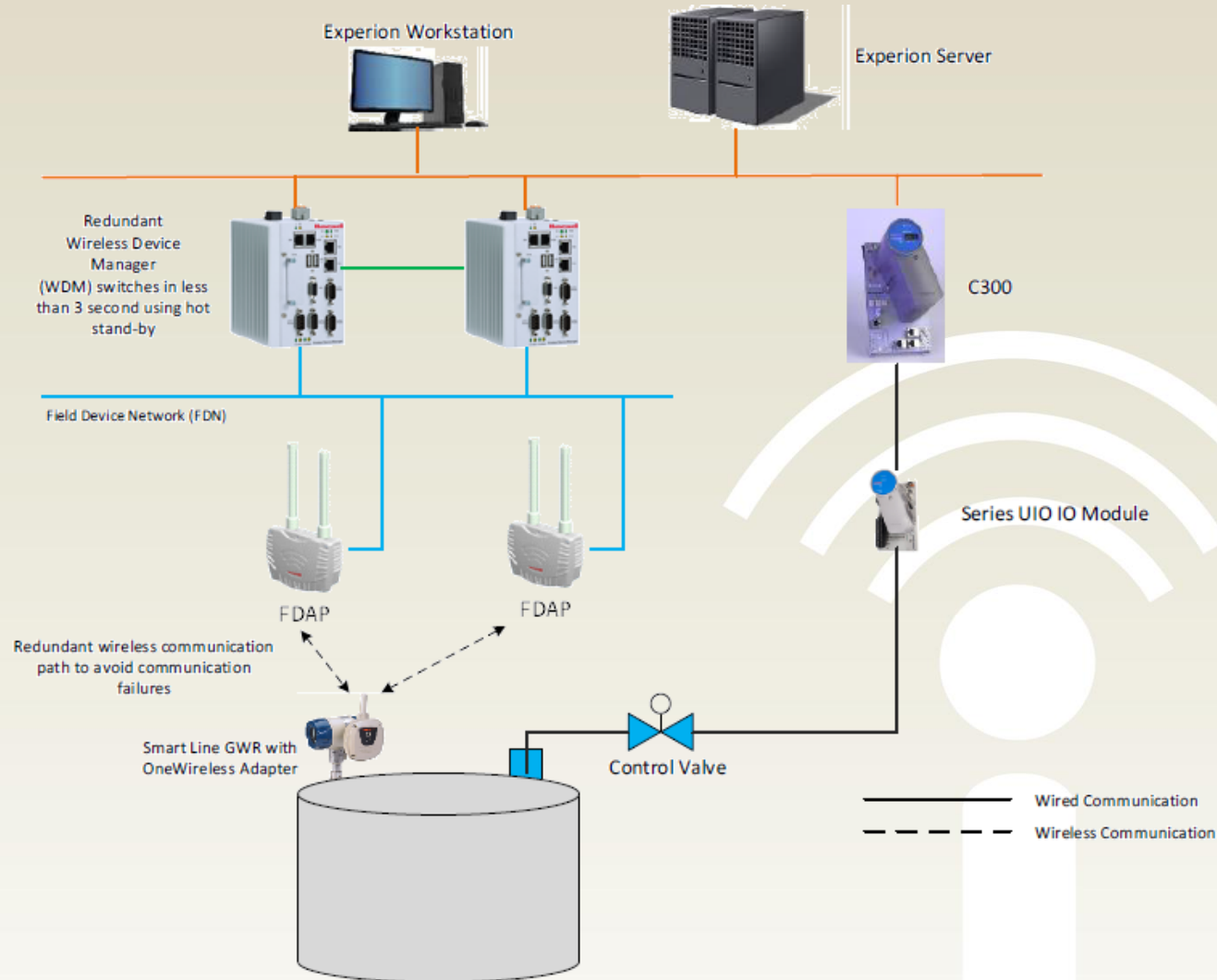


Control over Wireless

Topology Example I

4 Seconds or Faster Loops

- Multi HOP network
- Input is Wireless
- Output is Wired

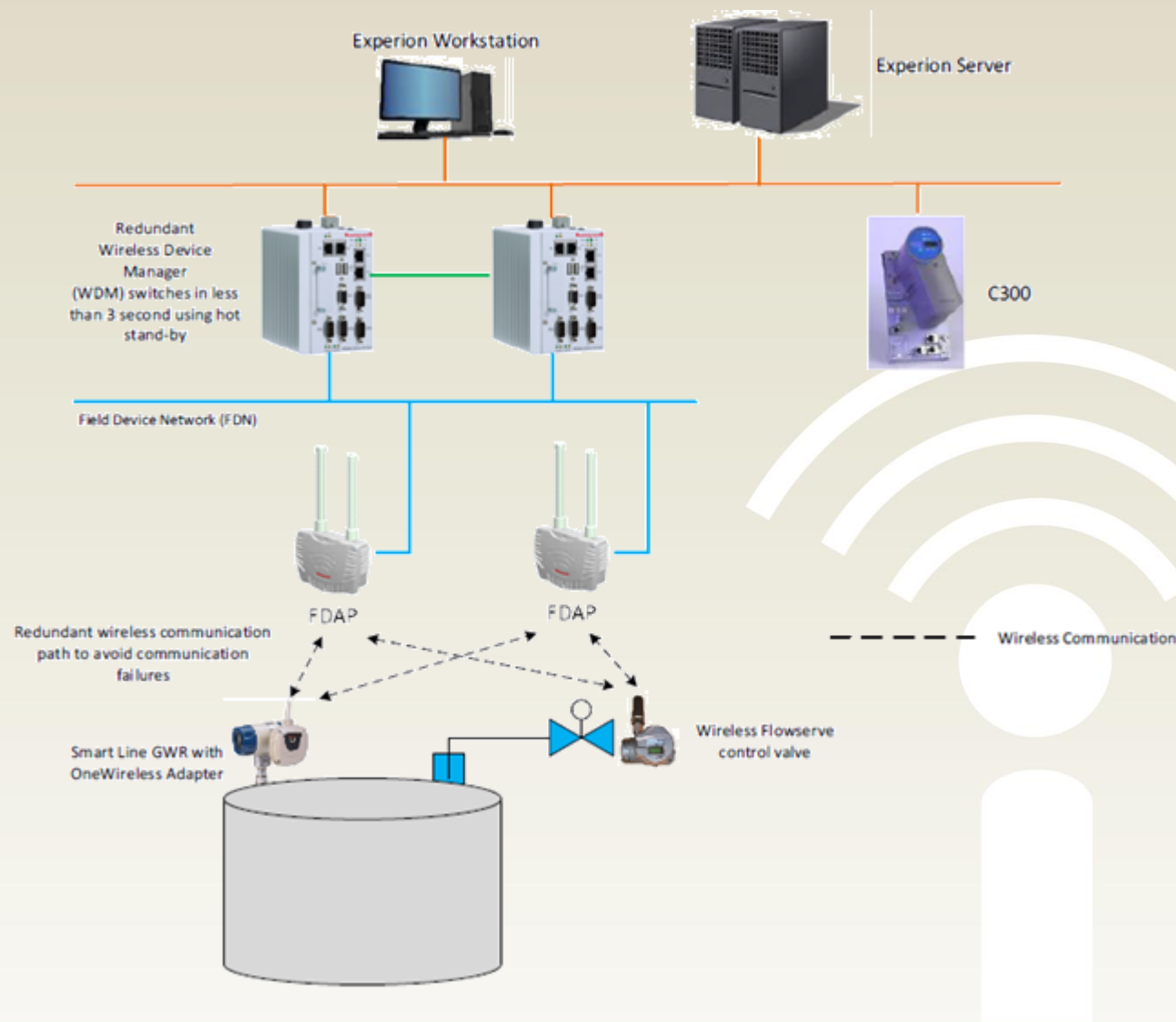


Control over Wireless

Topology Example II

1 Second or Faster Loops

- Single HOP network
- Input is Wireless
- Output is Wireless



ISA Secure Level 1 Certified

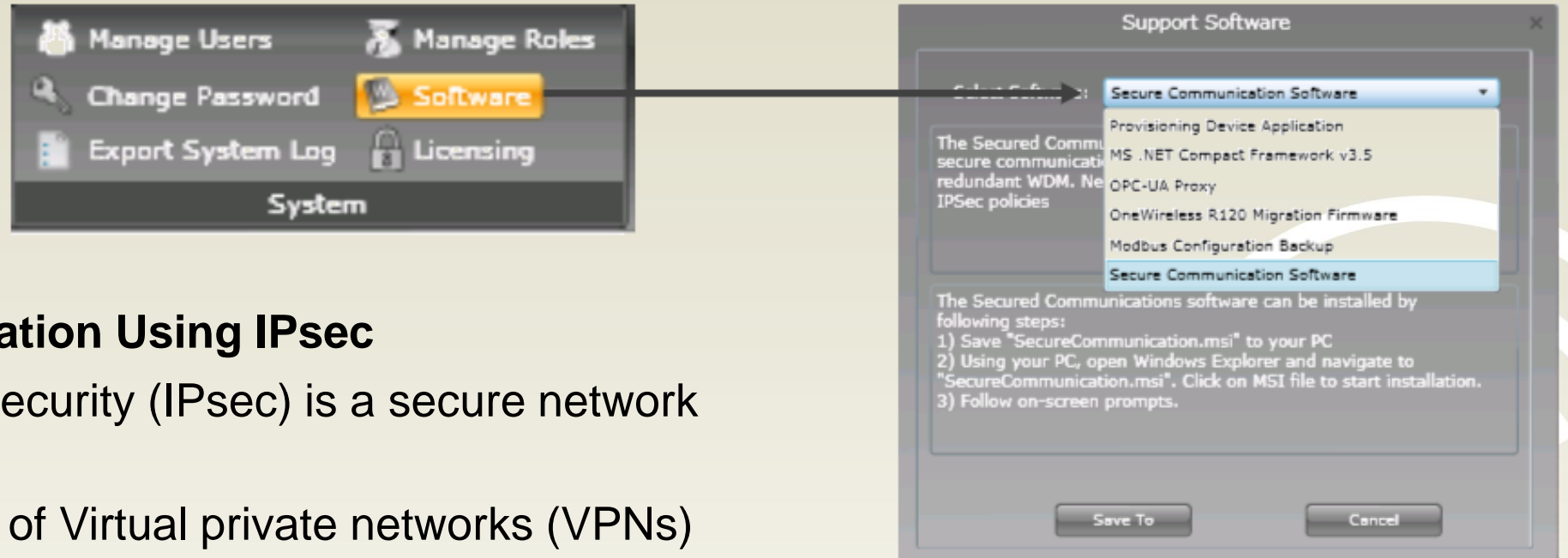
Industry First!

Security Level 1

- Comprehensive, end-to-end integrated security system
 - Confidentiality
 - Data Integrity and Authenticity
 - Source Authentication
 - Protection to Reply Attacks
 - Advanced Key Management Service
 - Wi-Fi data goes to IT via Firewall
- Independently reconfirmed by a comprehensive hackathon
- WDM continuously and automatically logs all modifications, events, and changes
- Log file provides transparent network status end-to-end, offering additional protection and prevention of unwanted events



Secure Communications - IPsec

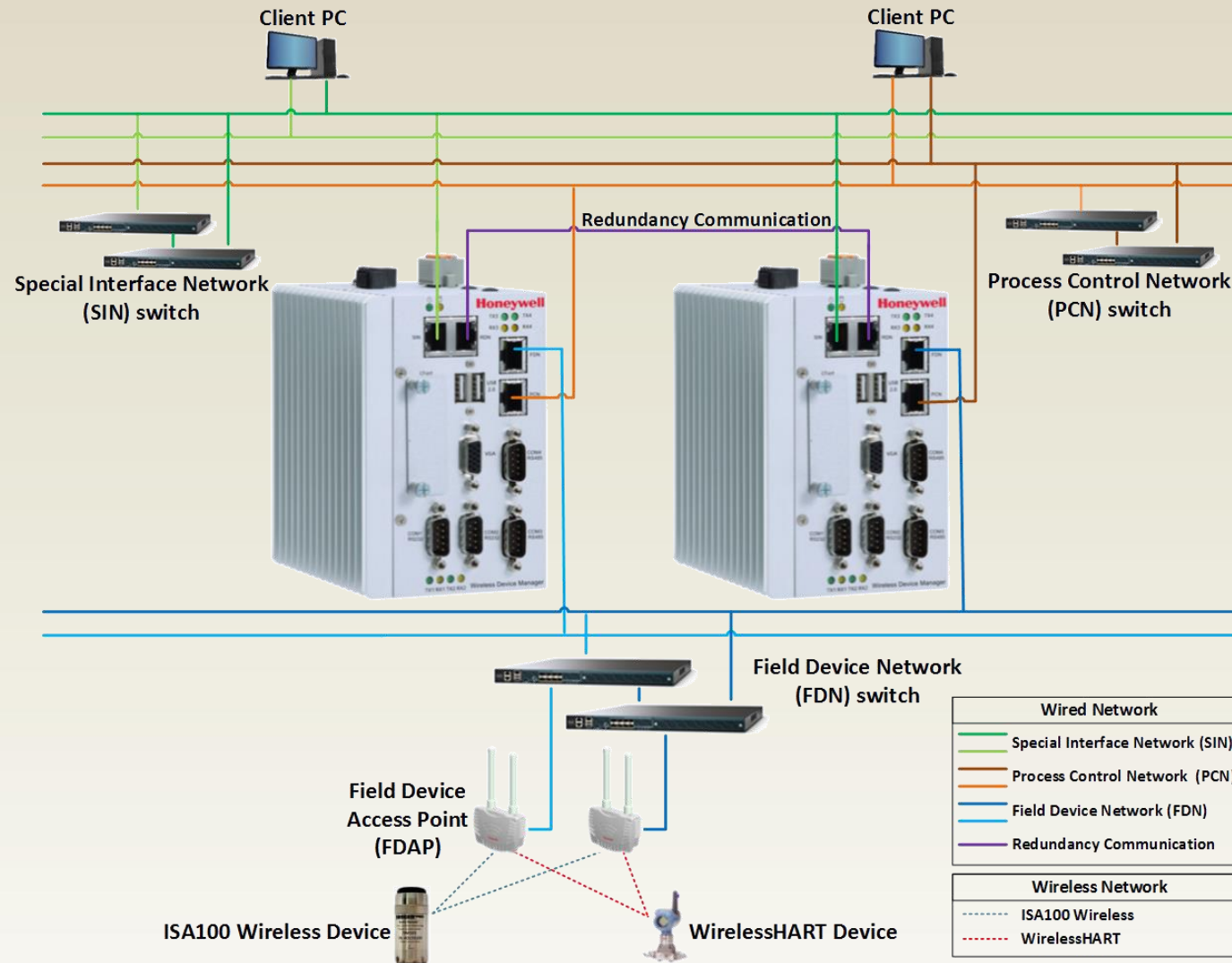


Secure Communication Using IPsec

- Internet Protocol Security (IPsec) is a secure network protocol
- Similar to principle of Virtual private networks (VPNs)
- Authenticates and encrypts packets of data
- IPsec enables secure communication between WDM and Windows node on Process Control Network (PCN) and Special Interface Network (SIN)

Special Interface Network (SIN) Redundancy

25



- Instant Seamless Automatic Switchover

WDM Improvements

WDM Redundancy

- Improved redundancy switchover time to ≤ 4 sec between primary and secondary
- Meets control over wireless application needs

WDM Duplication or Recovery

- Easy process to generate bootable ISO file back-ups
- Enabling easy configuration duplication or recovery by USB back-up



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Reduce project costs, increase safety and efficiency



World's largest bauxite mining and a leading alumina producer



Challenges

- Provide an engineered, secured, managed & integrated wireless network into Alcoa Alumina refineries process areas.
- Supporting ISA100 Wireless instruments and sensors
- Supporting mobile operators using handheld devices
- Allow for wireless connectivity of mobile PCS/EHM equipment
- Enabling IIOT and IOT in the future

Solution

- Site wide OneWireless networks at 7 refineries around the globe
- Light weight wireless pressure transmitters
- Wireless safety shower panic buttons
- Wireless push button for operator rounds timestamping
- ISA100 wireless FEWIO to connect remote PLCs

Results

- Typical conservative cost saving of \$10k per wireless instrument over traditional hardwired installation
- Speed of deployment – process data in just one day.
- Mobility of sensors and instruments to be moved around to troubleshoot or perform trials as required
- Support mobile operators out in the refinery process areas
- Monitor moving equipment now possible with standard devices
- New opportunities waiting to be found

Perimeter Monitoring – Time Critical

LNG Facility in Middle East - Brownfield

29

Challenges

- Cost effective alarming system for detection of gas leaks
- Quickest deployment time
- Limited to no cabling
- Meet 3 seconds end to end alarm requirement.

Solution

- OneWireless network based on FDAPs
- Solar power panels
- XYR6000 Universal Transmitters
- Sounders, beacons

Results

- Improved site safety system on time and within budget.
- 3 seconds alarming requirement consistently met.
- Compliance to government regulations for HSE within given timeframe.



Personnel Safety - Reduce Response Time

Gas Field in Middle East - Greenfield

30

Challenges

- Safeguard personnel from sour gas leak.
- Identify the location of personnel in case of a gas leak event / man down situation.
- Preparedness of first time responders.

Solution

- Active Worker Personal Gas Safety
- Site wide OneWireless Network.

Results

- Risk level brought under acceptable limits.
- Better prepared emergency responders.
- Location identification and 2-way communications.



Cost-effective Modbus Data Acquisition

Challenges

- Transfer multiple parameters from remote Flow Meters to Experion DCS
- Meet tight project budget
- Execute project in days rather than weeks

Solution

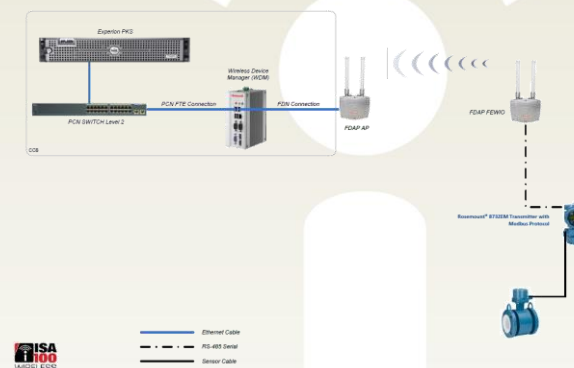
- OneWireless Network
- Field Expandable Wireless IO (FEWIO)
- Existing flow meter with Modbus transmitter connected to FDAP (FEWIO) via RS-485 Serial

Results

- 50% Project Cost Saving relative to traditional wiring
- Project execution completed in 1/5th of the time relative to a traditional wired project
- Increased Speed of Data to the operator – hours to milli-seconds.
- Increased situational awareness



Liquefied Natural Gas (LNG) plant in the Northern Territory of Australia



Reduce project costs, increase blending performance

Challenges

- Maintenance and obsolescence issues of
 - Tank gauging equipment and
 - Inventory management system
- Tank farm spread over large 7 square miles area
- Migrate to new system under 48 hour cutover

Solution

- OneWireless Network
- 147 Wireless FlexLine Radar & Servo Gauges
- 137 XYR 6000 Multi-channel transmitters
- 60 Floating roof Tuning Fork & Float Switches
- Mobile Station enabling operator mobility

Results

- 30% Project Cost Saving relative to traditional wiring
- Increased System Reliability
- Increased Speed of Data to the operator - minutes to seconds
- Blending Performance Increased 18% (# of Blends per week)



Borger- TX Refinery



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Summary

Costs

- Typical conservative cost saving of \$10k per wireless instrument

Speed

- Project execution in 1/5th of the time - data in just 1 day

Performance

- ISA100 Wireless enables near real time performance

Choice

- Large portfolio of ISA100 Wireless devices by multiple vendors

Innovation

- Up to 3000 IO
- Process Control Qualified
- Field Expandable Wireless IO (FEWIO)



**THANK
YOU**

For Your Attention!



Questions?



www.isa100wci.org



[ISA100 Wireless Interest Group](#) 

750+ members and growing; please join and invite your peers to join as well !

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