



## ISA100 WCI Webinar

Webinar date: TBD

The presentation will begin at: TBD

# ISA100 Wireless™ - Vibration Condition Monitoring

Presenters:



**Chris McMillen**

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**Diederik Mols**

[Diederik.mols@Honeywell.com](mailto:Diederik.mols@Honeywell.com)

# Agenda

1. About the speakers
2. Introduction Industrial Wireless
3. ISA100 Wireless Industry Standard
4. Condition Monitoring and Wireless
5. Bently Nevada's Ranger Pro
6. Summary
7. Q&A



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# About the speaker



## Chris McMillen

Senior Product Manager - Sensors

Bently Nevada

Baker Hughes, a GE company



### Wire “less” or wire “free”

Defined as Wireless (wahyuh r-lis)

1. Having no wire
2. Device operation or actuation by electromagnetic waves

Chris McMillen is responsible for the overall lifecycle management of the Bently Nevada sensor portfolio spanning both wired and wireless solutions. His 22 years with the business have included roles within engineering, leadership, and business developments. Chris is a graduate of Washington State University in Pullman, WA with a bachelor’s degree in Mechanical Engineering

# 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



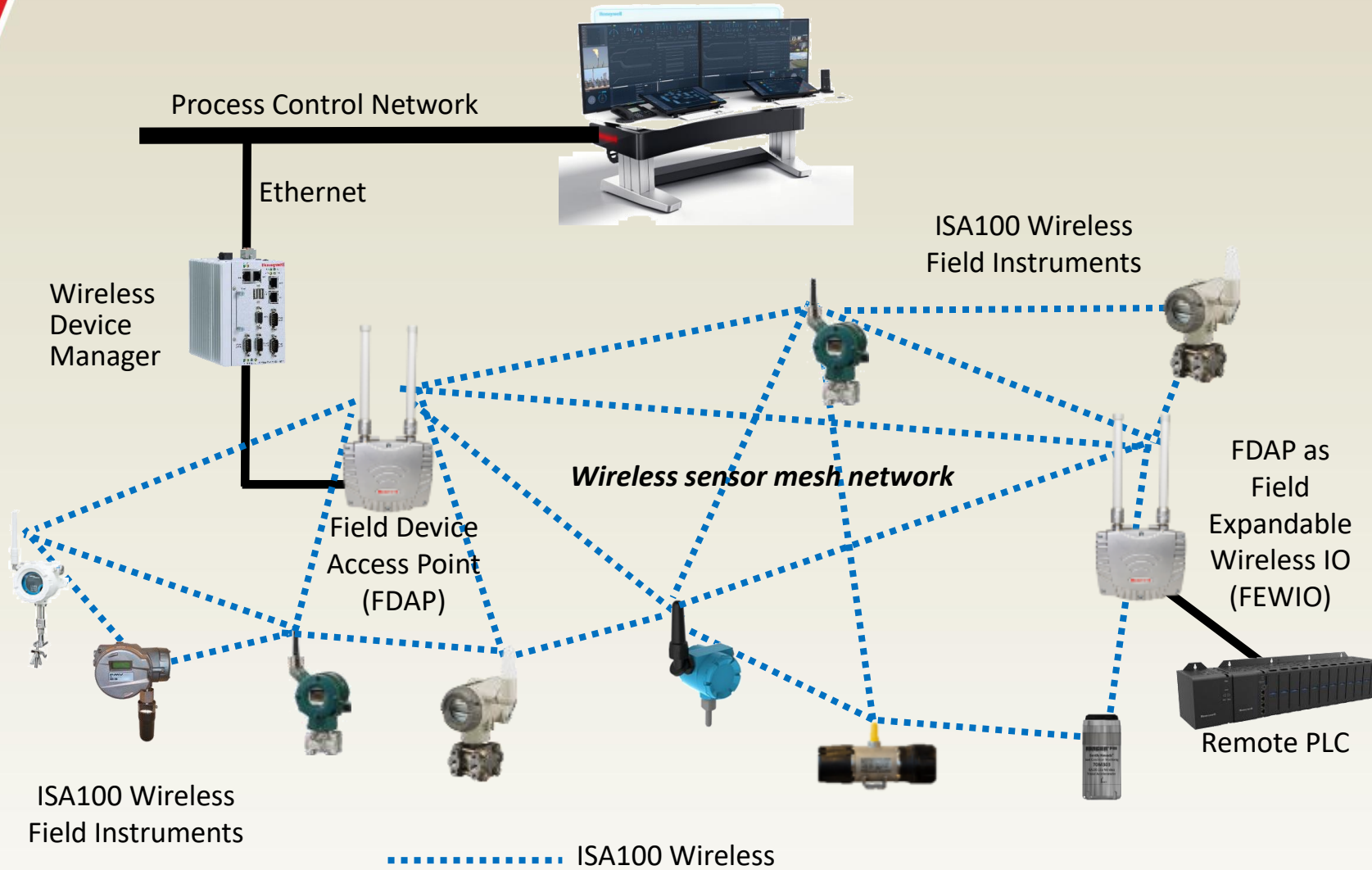
Diederik Mols is Chairman of the Governance Board at the ISA100 Wireless Compliance Institute since October 2017. Prior to that he served two years as Vice-Chairman. Diederik also is an active team member of the WCI EMEA Marketing Team. Diederik got involved with Industrial Wireless back in 2009 in a 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 Mols also is Chairman of the Governance Board at the ISA100 Wireless Compliance Institute. Since January 2015 he is an active team member of the WCI EMEA Marketing Team. Diederik started his career as an officer in the 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.

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



# 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**
  - Bently Nevada
- 
**Gas**
  - GasSecure, Scott Safety, New Cosmos, Riken Keiki
- 
**pH**
  - Honeywell, Yokogawa

# Online resources



[www.isa100wci.org](http://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
- 700+ members and growing; please join and invite your peers to join as well !
- Receiving over 5,000 web views per month



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# Condition Monitoring and Wireless

Wireless

- ✓ Simple to deploy
- ✓ Fast to expand
- ✓ Cost effective
- ✓ Periodic measurements

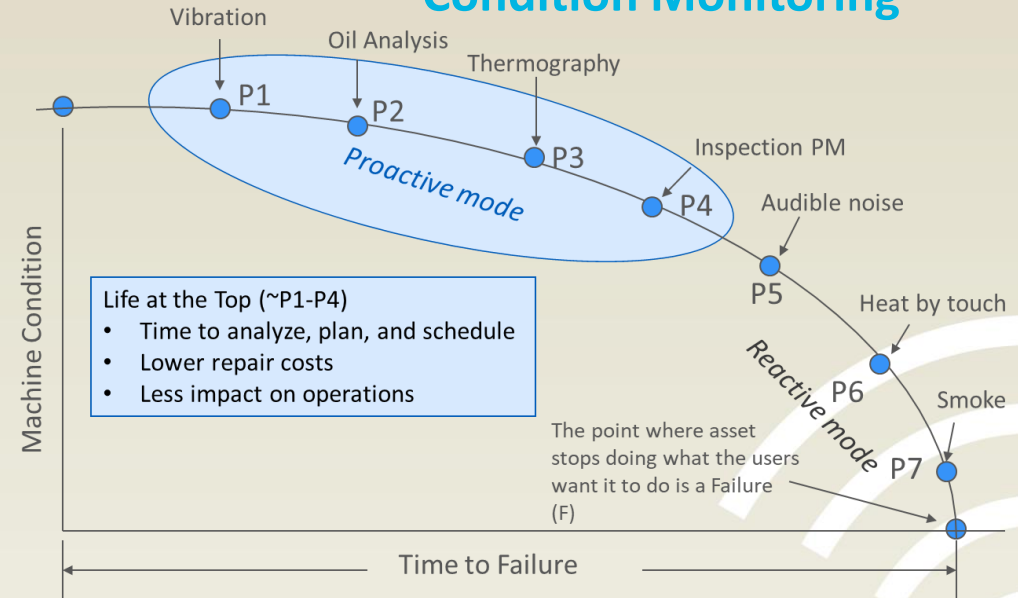
Portable

- ✓ See, hear, smell
- ✓ Periodic measurements
- ✓ Initial investment

Wired

- ✓ Higher point counts
- ✓ Fastest sampling rates
- ✓ Protection capable
- ✓ More sensor types

## Condition Monitoring



|                           | Portable | Wireless      | Wired |
|---------------------------|----------|---------------|-------|
| Data Frequency            | Good     | <b>Better</b> | Best  |
| Installation & Deployment | Better   | <b>Best</b>   | Good  |
| Sampling Rates            | Good     | <b>Better</b> | Best  |
| Protection                | n/a      | <b>n/a</b>    | Best  |
| Investment \$             |          |               |       |

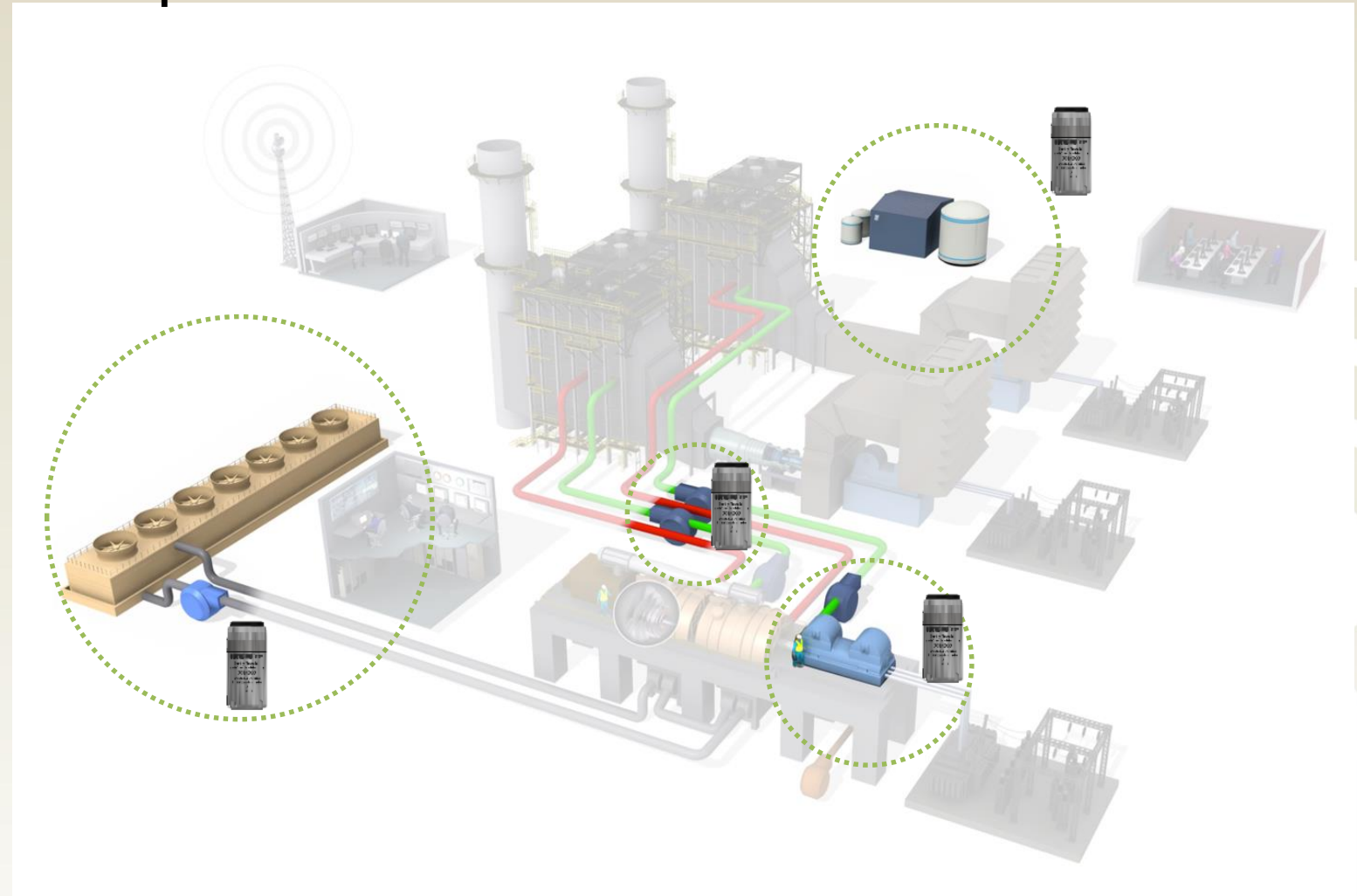
# Wireless areas to consider

- Range – distance between sensor & gateway
- Protocol – Proprietary or open
- Data Bandwidth & Frequency – Simple/rich data & how often
- Power Source – Battery life, availability, ease of maintenance
- Security – Encryption methodology

# Typical applications

Move from reactive maintenance to predictive maintenance

| Machine Type                 |   |
|------------------------------|---|
| Agitators                    | ✓ |
| Air compressors              | ✓ |
| Ball mills                   | ✓ |
| Blowers                      | ✓ |
| Centrifuges                  | ✓ |
| Cooling tower fans and pumps | ✓ |
| ID, FD fans                  | ✓ |
| Pumps                        | ✓ |
| Mixers                       | ✓ |
| Motors                       | ✓ |
| Screw compressors            | ✓ |
| Small motors                 | ✓ |
| Small recip                  | ✓ |



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# Ranger Pro

- ✓ Productivity ... more assets under surveillance
- ✓ Reliability ... more frequent asset information
- ✓ Safety ... hazardous or difficult to access areas
- ✓ Security ... 128bit AES
- ✓ Cost ... low installation and deployment costs



ATEX Zone 0, CSA Cl1 Div1



ISA100 Protocol



User Friendly



More assets under measurement



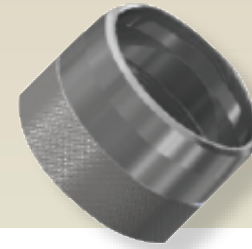
Triaxial vibration + temperature





# Ranger Pro Specifications

Radio E-module  
ISA100



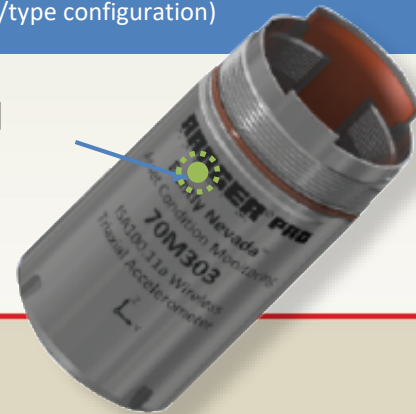
3.5" (89 mm)



1.6" (41 mm)

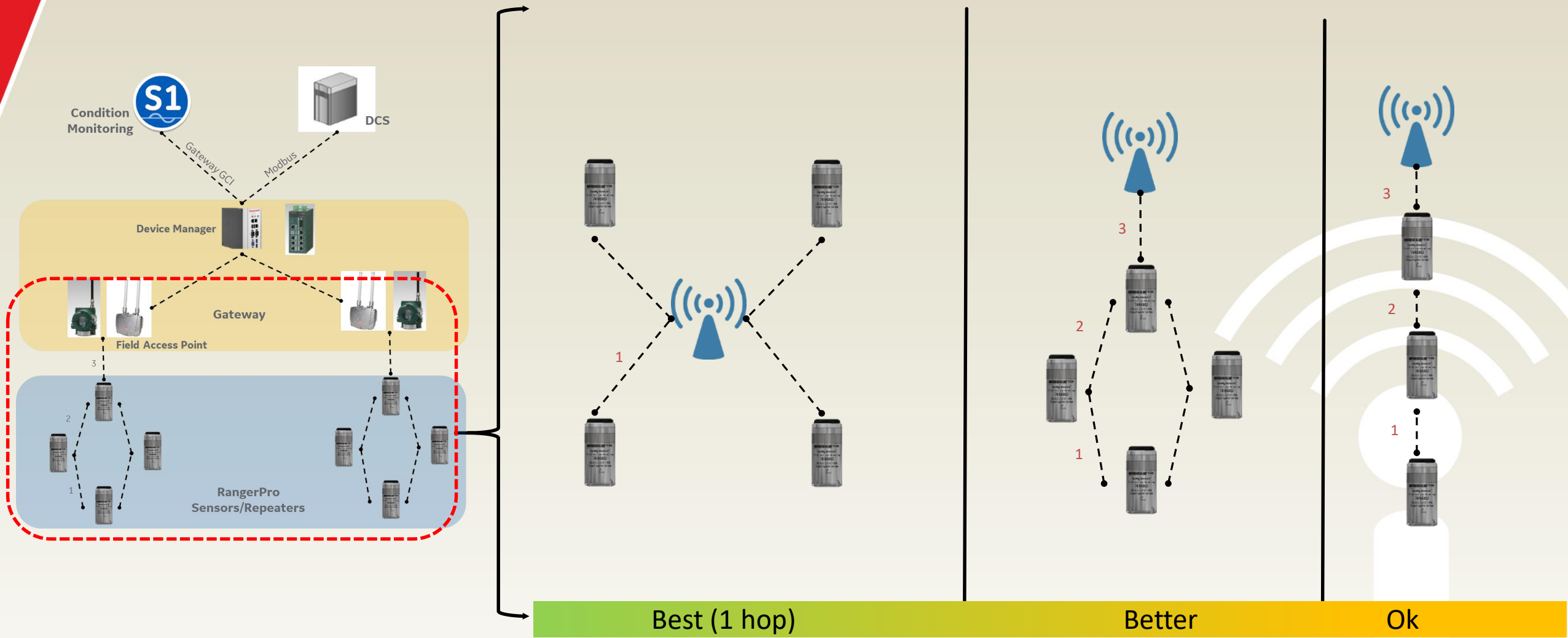
- ATEX/IECEX Zone 0 [ia I/IIC T4] Class 1 Div 1
- **Truly wireless:** sensors embedded in package
- **All in one** - Velocity (5-1kHz), Acceleration (5-10kHz) + Temperature
- **Trended values + waveforms/spectrums**
- Full System 1 connectivity
- Auto forming, self healing **ISA100** Wireless Network Protocol
- **Replaceable** lithium-thionyl chloride battery
- IP67 hermetically sealed electronics
- Temperature: -40C to + 85C
- Range: 150 meters (line of sight), 100 meters typical industrial environment
- Security: 128-bit AES encryption
- Modbus output to **DCS or Plant Historian** trended values
- GCI interface trended values & waveforms to **System 1**
- **Battery life:** up to 5 years (depending upon data frequency/type configuration)

**Triax or single embedded  
vibration sensors**

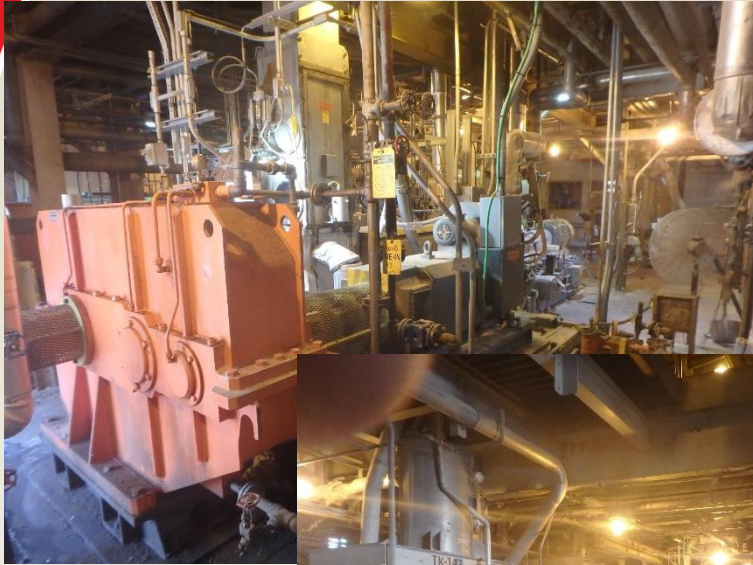


**Standard battery size ... Bently provided Or  
locally available for end user procurement**

# Ranger Pro Network Deployment Setups



# Typical Site



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# Summary

- **Investment:** Cost effective for more plant wide asset coverage vs traditional wired
- **Installation and Deployment:** Ease of deployment and/or expansion
- **Performance:** ISA100 Wireless enables data integrity and security
- **Choice:** Large portfolio of other ISA100 Wireless devices measurands
- **Innovation:** Field Expandable Wireless IO (FEWIO) is a new cost-effective method to connect remote PLCs to the DCS

**THANK  
YOU**

**For Your Attention!**



# Questions?



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[Ranger Pro](#)

[Bently Nevada](#)



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[ISA100 Wireless Interest Group](#) 

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