



Honeywell Wireless

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Honeywell

Agenda

- OneWireless Network R200
 - ISA100.11A
 - Benefits
- OneWireless Network Components
 - R200 topologies
 - Wireless Device Manager
 - Field Device Access Point
 - Field Instruments
- Competitive Comparison
- Message



What is the ISA100.11a Standard ?

The **ISA100.11a** standard was created to provide reliable and secure **wireless** operation for non-critical monitoring, alerting, and control applications.

The standard defines the specifications of:

- protocol suite
- system management
- gateway
- security

It is intended for low-data-rate wireless connectivity with fixed, portable, and moving devices supporting very limited power consumption requirements.

The standard addresses performance needs of applications such as

monitoring and process control

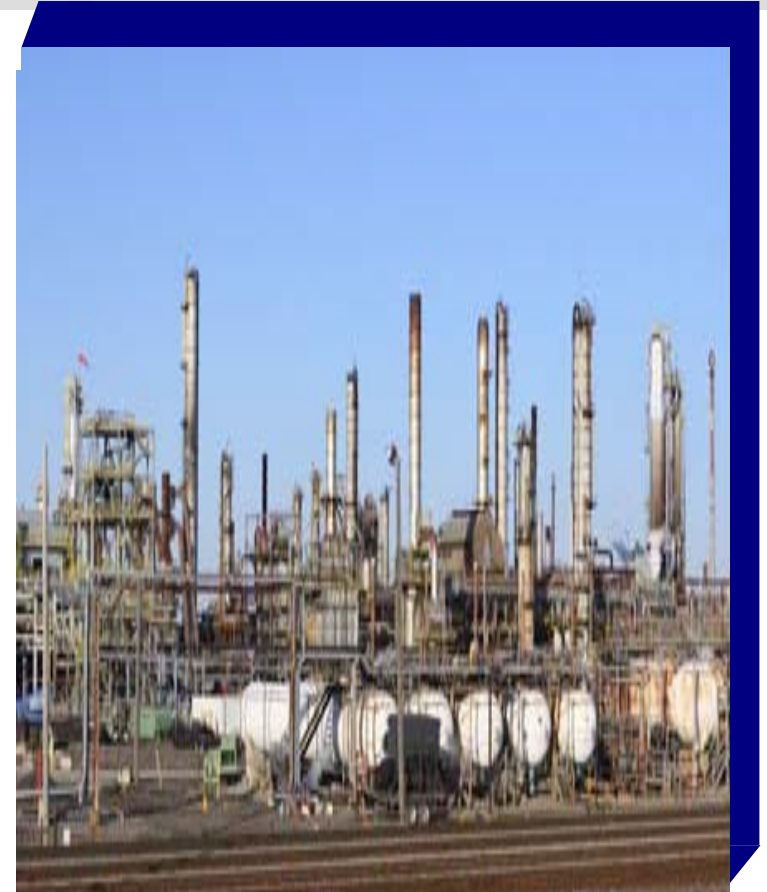
where latencies on the order of 100ms can be tolerated.

Fundamentals of the ISA100.11a Standard

- ISA100.11a wireless standard is an open communications protocol
- The Standard is flexible, supporting a wide range of protocols.
- The Standard uses the OSI seven layer model for design basis, leveraging existing best practice networking standards.
- Physical and data link layers use the IEEE 802.15.4 radio standard referencing the 2.4 GHz frequency band for global deployment
- Allows flexibility by using an algorithm to determine the best link formation
- Over the air firmware, configuration and provisioning

Benefits of Implementing with ISA100.11a

- Predictable and interoperable performance
- Flexible and deterministic operation
- Ensures reliable and secure data transmission
- Supports routing and non-routing devices
- Time and cost savings for installation, and validation
- Scalable to support thousands of devices



Cost, risk and time reduction in the selection and deployment of wireless products and systems.

ISA100.11a Characteristics

Data Reliability Mechanisms

- frequency hopping, time diversity and determinism
- collision avoidance (*clear channel assessment*)
- antenna diversity

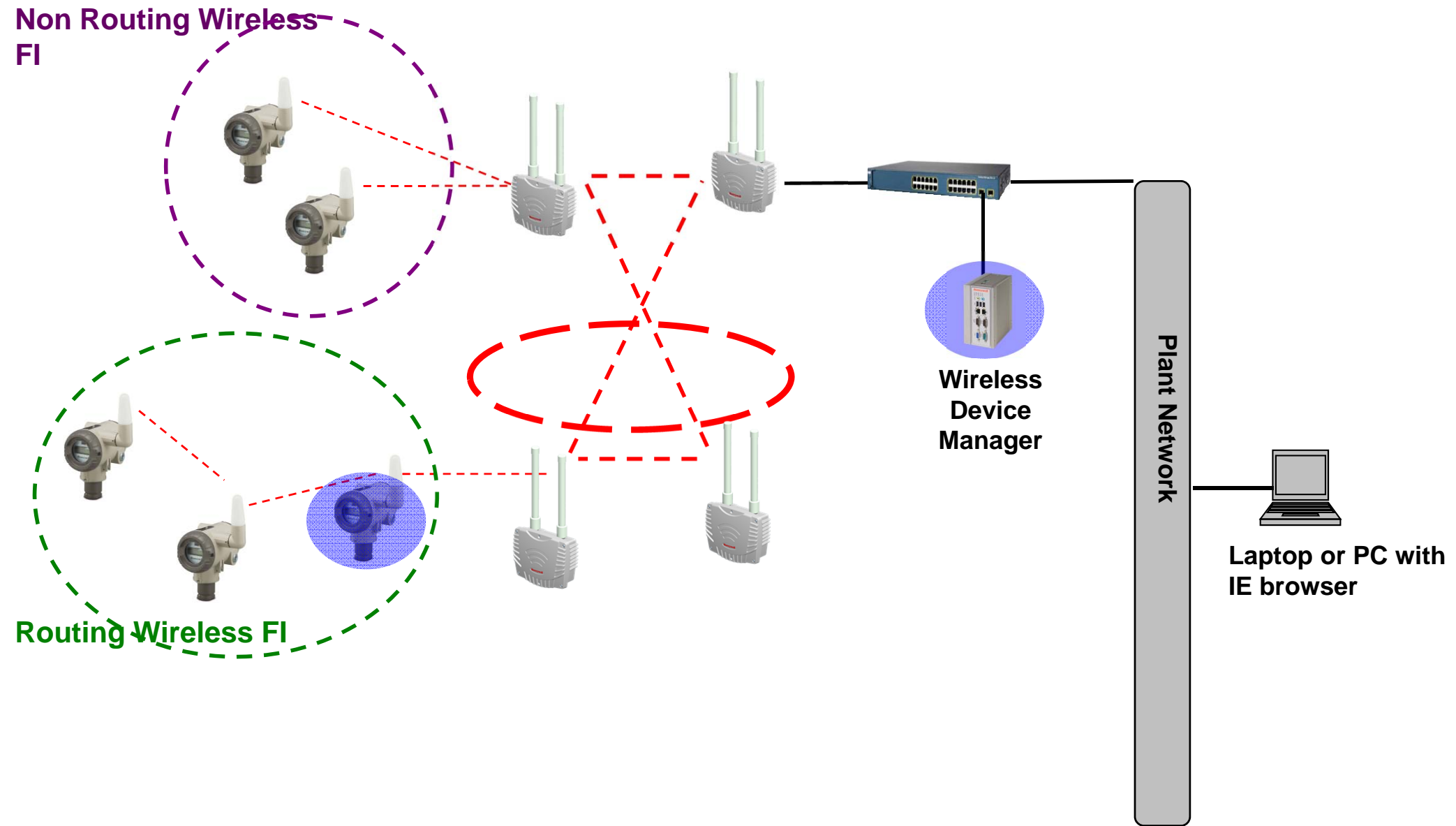
Data Security Mechanisms

- data encryption (*AES-128 block cyphers*)
- message authenticity
- flexible security key distribution methods

Optimizes Device Power Usage

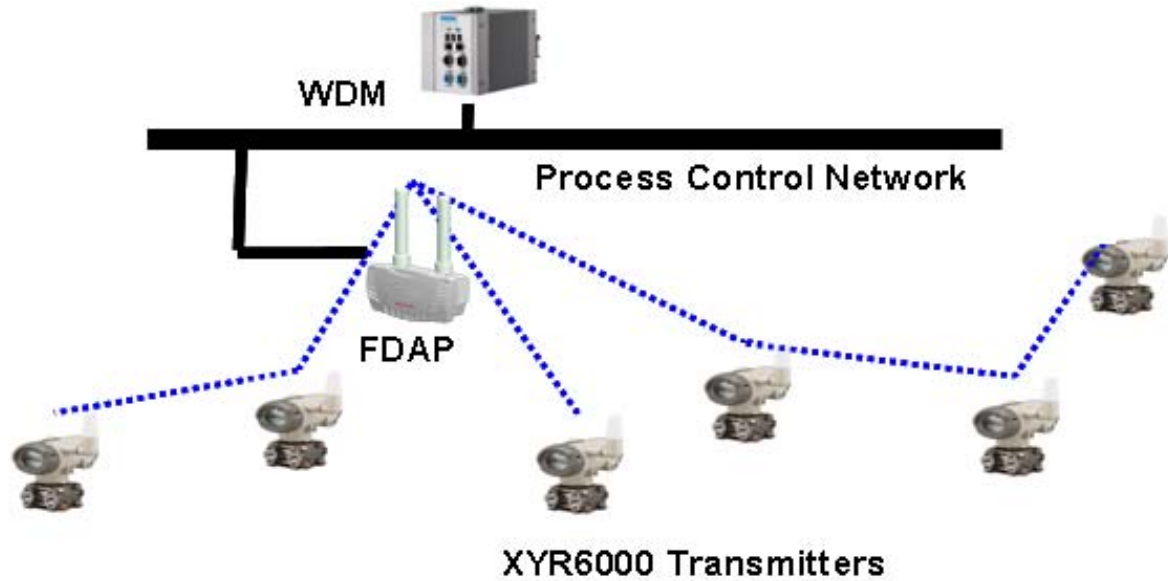
- field instruments allocated precise Tx/Rx timeslots
- non-routing nodes
- adjustable power levels for radio
- Standard off the shelf lithium batteries

Backbone Architecture



Honeywell OneWireless Implementation

Single Wired FDAP- No redundant path creation

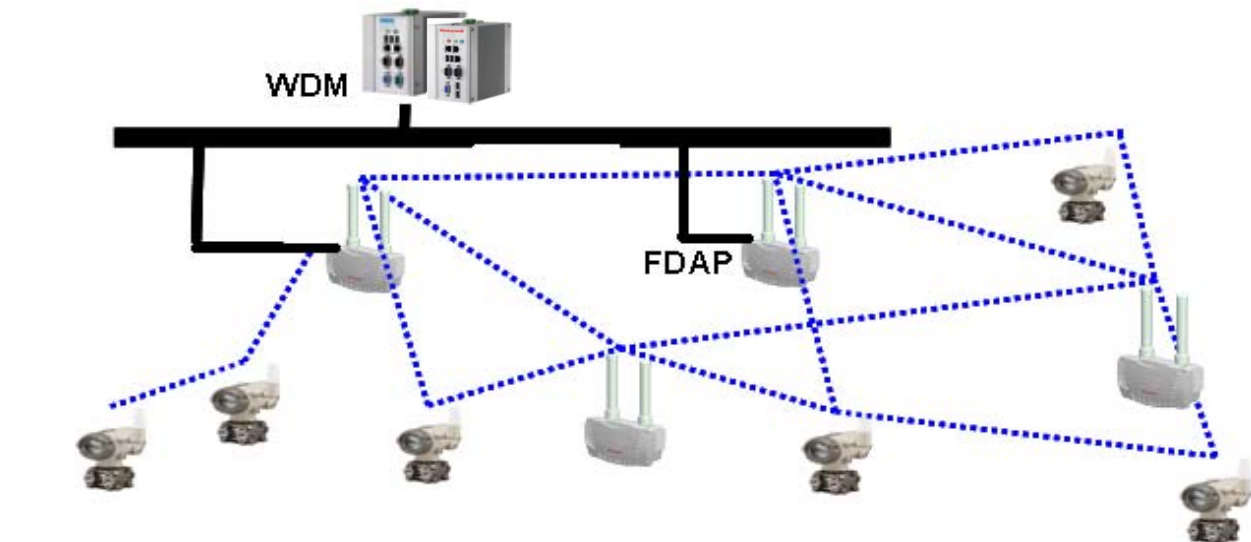


Field Instrument

Meshing

Variants

2 Wires FDAPs for redundant path creation



OneWireless Network Components – ISA100

Wireless Device Manager



Manages ISA100 field devices and network

Easy to use

Field Device Access point



Wireless Coverage for ISA1- field instruments

Fast and Reliable

XYR 6000 Field Instruments



Battery powered wireless field instruments

Multi-Year battery life with fast update rates

Field Device Manager and System Gateway

Wireless Device Manager

Role and Benefits

- Manages wireless ISA100 field instruments and network devices
- Gateway for field devices and host systems
- Acts as security manager controlling device and message key distribution
- Reduces engineering required to commission and maintain the wireless field instrument network

Features

- **Interfaces:** Modbus , HART, OPC UA/DA, CDA and GCI
- Web based interface **simplifies** network configuration and usability
- Integrated firewall
- Fully redundant capability



OneWireless – R220 Interface

The screenshot displays the OneWireless R220 interface, a network management tool. The browser address bar shows the URL 192.168.1.5. The interface includes a top navigation bar with tabs for Monitoring, Alarms & Events, and Reports. Below this is a main menu with various management options such as Filtering, Provisioning, Channel, Maintenance, Upgrade, Application, Manage Users, Change Password, Export System Log, and Manage Roles. The central area features a network topology map with nodes representing devices and their interconnections. A tooltip for the selected device provides the following details:

- Devices: fdap_0048, temp_030E
- Type: Primary Routing, Primary Time Sync
- RSQI: 253, RSSI: -56/-46dBm, TxFallRatio: 12%
- Overall Status: Good

The left sidebar lists the following devices:

- wdm230p5
- fdap_0048
- fdap_0045
- enraf_80FB
- aidido_14EA
- temp_02C3
- temp_030E
- temp_0551
- temp_0901
- temp_4000

The bottom status bar indicates: Devices Online: 2 Access Points, 7 Devices; Alarms: 1 Urgent, 2 High, 0 Medium, 0 Low; Primary: No partner.

Access Point for Field Devices

Field Device Access Point

Roles and Benefits

- Access point for field instruments only
- Forms a self-healing, self-meshing ISA100.11a network
- Superior Rx/Tx data integrity with dual antennas
- Reduces wireless field I/O cost

Features

- 450 meter data access of wireless field instruments with standard integral antennas
- Operating Temperature -40 to +75 °C
- 24V DC and 110/230V AC powered
- FM/CSA Class 1 Div 1(or DIV 2) and ATEX safety ratings
- Dual antennas for diversity (*improved read rate*)
- Supports up to 60 field devices (*@5 sec. reporting period*)



XYR6000 Wireless Transmitter

Wireless Field Instruments

Roles and Benefits

- Measures and wirelessly transmits data in industrial and hazardous area environments
- Configurable data routing
- Provides flexibility of field instrument I/O use

Features

- ISA100 compliant
- 450 meter range with standard integral antenna
- Wired-like performance over wireless with configurable 1, 5, 10, 30, 60 sec. update rates
- Innovative power management, and over-the-air firmware update and configuration change
- FM/CSA Class 1 Div 1 and ATEX, IEC Ex safety ratings



ISA100
Wireless
COMPLIANT

XYR 6000 – Pressure Measurements

Differential Pressure



- 0 to 400 in. H₂O
- 0 to 600 in. H₂O
- 0 to 100 psi
- 0 to 3,000 psi

Gauge and Absolute Pressure



- 0 to 500 psig
- 0 to 3,000 psig
- 0 to 6,000 psig
- 0 to 10,000 psig
- 0 to 500 psia

Dual Head Gauge Pressure



- 0 to 500 psi
- 0 to 3,000 psi

XYR 6000 – Temperature Measurements

Temperature and Discrete Input



Model - STTW401

- 3 T/C Max

- 3 DI Max

- 2 RTD Max

User selection input types

Channel 1	Channel 2	Channel 3
DI	DI	DI
DI	T/C or mV	DI
DI	DI	T/C or mV
DI	T/C or mV	T/C or mV
DI	RTD or ohm	NA
T/C or mV	T/C or mV	T/C or mV
T/C or mV	T/C or mV	DI
T/C or mV	DI	T/C or mV
HLAI	DI	DI
RTD or ohm	RTD or ohm	NA
RTD or ohm	T/C or mV	NA
T/C or mV	RTD or ohm	NA
RTD or ohm	DI	NA

XYR 6000 – I/O Transmitters

High Level Analog Input



SYIW600
0/1 to 5 V
and
0/4 to 20 mA

Universal I/O TC, HLAI, DI/DO



STUW700
1-3 HLAI, 1-2 TC,
1-2 Discrete Inputs

STUW701
1-2 HLAI, 1-2 TC,
1-2 Discrete Inputs,
1 DO

User selection of input types – STUW700 / 701

Channel 1	Channel 2	Channel 3
DI	DI	HLAI / DO
DI	HLAI	HLAI / DO
DI	T/C or MV	HLAI / DO
HLAI	DI	HLAI / DO
HLAI	HLAI	HLAI / DO
HLAI	T/C or MV	HLAI / DO
T/C or MV	DI	HLAI / DO
T/C or MV	HLAI	HLAI / DO
T/C or MV	T/C or MV	HLAI / DO

OneWireless Adapter



Benefits:

- Cost effective way to monitor the health of HART devices connected to non HART enabled I/Os
- Convert a HART device into a wireless device

Key Features:

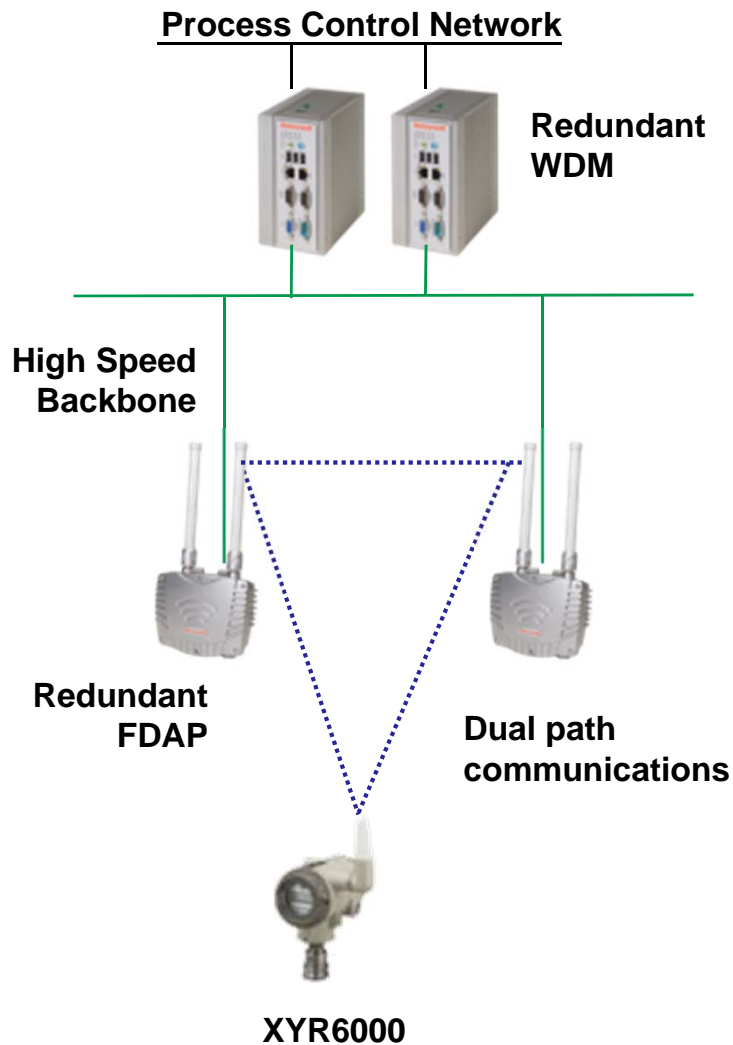
- ISA100.11a Compliant w/IR security provisioning
- Transmit diagnostics and process variable data
- 1,000 ft. LOS range
- Powered from 4-20mA loop and D-cell battery
- Diagnostics indicated by LEDs
- FM Class 1, Div 1, ATEX Class 1, Zone 1

Additional Values

- Enables new measurement and control applications, and access to data in areas where wiring costs are prohibitive
- Flexibility for adding new I/O
- Easy to relocate transmitters if application changes
- Enhances safety by reducing the chance of human error
- Reduces overall installed costs and enables faster commissioning (~ 50% savings vs. wired option)
- Lower point cost and downtime reduction with flexible transmitter product functionality (i.e. more I/O per transmitter, digital output for alarming, block instantiation)
- Functional compliance to ISA100.11a standard provides predictable and interoperable performance together with cost, risk and time reduction in deployment

Cost, risk and time reduction in deployment

Today's Requirements for Wireless Implementations



➤ Redundancy

- Dual path communications from both the transmitters as well as the infrastructure
- Redundant system manager/gateways

➤ Expanded use of 1 second update rates

- With good battery life performance
- Achieved using the flexible network layout including adding field routers
- 1 second update rates system wide

➤ Control

- Requires ability to define latency (e.g. high speed backbone, non-mesh)

➤ New solutions that weren't practical or possible with wired

- Wireless vibration, safety shower monitoring, redundant level monitoring, etc..

Wireless Standards

ISA100.11a - part of ISA100 standards committee aiming at a single integrated series of open standards – designed by end users and suppliers.



WirelessHART - developed by the HART Communications Foundation based on legacy wired HART principles – primarily a vendor organization.

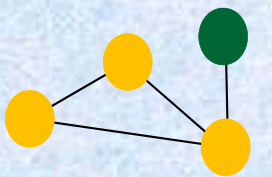
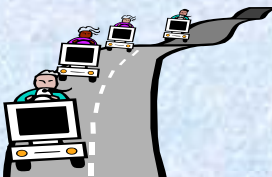


The **ISA100.11a** industrial wireless standard is designed from the ground up, with defined ISO stack, system management, gateway and security specifications for Process Automation secure and reliable operation.

Highlighting the Differences

ISA100.11a

WirelessHART



<p>Defined and specified backbone architecture - minimizes latency, provides added bandwidth and quality of service.</p>	<p>Gateway only, no defined backbone network or devices (<i>network access point defined - external connections not specified</i>).</p>
<p>Support for other communications protocols via tunneling - provides integration of legacy protocols and devices, protecting installed investment.</p>	<p>Supports only HART using the thumb device</p>
<p>Field instrument transmitters use standard off-the-shelf batteries - provides a lower cost of ownership.</p>	<p>Field instruments use custom proprietary battery packs that need to be purchased from the instrument supplier.</p>
<p>Device routing flexibility - provides device energy saving and improved network data throughput.</p>	<p>Device routing inherently fixed in all devices.</p>

Comparing Emerson

Honeywell OneWireless

Combines meshing, router radio diversity and redundancy features - ensures **data availability and reliability**.

Offers a more powerful, **longer range radio** (16 dBm) - saves cost due to fewer access point and/or routing devices.

Flexible device provisioning options

Control ready performance with 1 sec. device update rates system wide.

Emerson Wireless

Provides device meshing and limited redundancy support.

Radio power fixed at 10 dBm.

Field instruments can be secured and provisioned through the use of a handheld device.

Update rates limited to 4 sec if transmitter meshing is used

Why is our solution the best in the market?

• Flexible

- Why select a solution that can satisfy only one type of application?
- With Honeywell, users have choice. They can easily scale up from a handful of transmitters to 100s of transmitters while allowing for higher bandwidth protocols via tunneling

• Performance

- Wired like performance over wireless thanks to a real network infrastructure
- Honeywell instruments support one second update rate system wide
- Greatly superior battery life
- Longest transmission range thanks to radio diversity and higher radio power output
- Over the air firmware upgrade and configuration

Flexible, Performance, Easy to Use, Low Life Cycle Cost

The End

The Honeywell logo is centered on a light green rectangular background. The word "Honeywell" is written in a bold, red, sans-serif font. A small registered trademark symbol (®) is located at the top right of the word.