

# OneWireless Network Overview

## Product Information Note

**Honeywell's OneWireless Network seamlessly extends process control into the field. Innovative wireless applications and services help industrial facilities meet higher productivity goals and ever-stricter security and environmental regulations. As the only solution in the market which supports all major industrial wireless standards, this open technology provides maximum flexibility to not only deal with immediate requirements but also to respond to future initiatives.**

### A Multiprotocol Industrial Wireless Network

Honeywell's OneWireless™ Network brings immediate benefits to industrial sites:

- A multiprotocol site-wide wireless network eliminates the risk and need to specify a protocol standard. ISA100 Wireless\* (IEC 62734), WirelessHART\* (IEC 62759) and Wi-Fi devices are supported under a single infrastructure.
- Cost-effective, quick roll-out of battery-powered field instruments to improve process efficiency; increase asset availability; and meet health, safety and environmental (HSE) regulations at lower cost
- Flexibility to choose the field instrumentation from any vendor supplying ISA100 Wireless and/or WirelessHART compliant devices with the power of native integration to Honeywell Experion®.
- Empowering a mobile workforce with remote access to process data and other plant-related information
- Enhanced plant security with deployment of cost-effective wireless Closed Circuit Television (CCTV) cameras
- Improved personnel safety with portable wireless and fixed gas detectors
- Easier connection of remote controllers and legacy devices to the central control system

*From the field to the control room, Honeywell wireless technology allows seamless extension of the process control network into the field.*



*OneWireless Network is a multi-application, multi-standard and multi-protocol wireless network that can be tailored to offer the coverage needed, from adding a simple wireless field instrument to a completely integrated, plant-wide, multi-application wireless network.*

## OneWireless Network Pillars

OneWireless Network draws on a flexible portfolio of interconnected components:

### OneWireless Wireless Device Manager

Honeywell OneWireless Wireless Device Manager (WDM) manages all wireless field devices, including ISA100 Wireless and WirelessHART field instruments and network infrastructure devices, such as access points.

Assuming the roles of the wireless field-instrument network gateway, and system and security manager, the WDM provides initial wireless device configuration, and stores wireless network system data to configure wireless devices. It also manages security keys for all field devices; security keys are required to join the wireless network. Keys can be provisioned to a wireless field device via Infrared from various generic handheld devices or over-the-air, as defined by the ISA100 Wireless standard. For WirelessHART devices, keys can be provisioned through a HART modem connection or also over-the-air

In a redundant configuration, the WDM enables design and implementation of a wireless network with no single point of failure.

Serving as a gateway connecting the field to the control network, the WDM hosts multiple interfaces to support the data needs of the control application. The WDM features interfaces for Modbus (Serial and TCP/IP), OPC UA, OPC DA, HART (serial and IP), Gateway General Client Interface (GCI), Honeywell Enraf, and Experion® PKS CDA.

### OneWireless Field Device Access Point

The OneWireless Field Device Access Point (FDAP) is a rugged industrial access point for ISA100 Wireless and WirelessHART field instruments. Once deployed in the field, FDAPs self-discover and self-organize into a managed, secure and redundant wireless, field-instrument mesh network. FDAP can also be used as Field Expandable Wireless IO (FEWIO).

## Cisco Aironet 1552S Outdoor Access Point

For IEEE 802.11 a/b/g/n clients, ISA100 Wireless and WirelessHART-compatible field instruments, users can employ the Cisco\* Aironet\* 1552S Access Point. With Cisco's CleanAir\* technology, it intelligently optimizes the network around radio frequency interference sources to improve the air quality, significantly increasing network performance and the user experience.

### Cisco Wireless Controllers

Cisco Wireless Controllers reduce the operational costs of Cisco Aironet 1552S Access Point networks by extending the network policy and security from the wired network core to the wireless edge. Cisco Wireless Controllers bring a number of benefits:

- Flexibility to centrally configure wireless policy, management or security settings on remote 1552S access points through centralized provisioning and management
- Wireless intrusion prevention system (WIPS) capabilities
- Enforcement of centrally-defined policy across wired and wireless networks
- Support for advanced mobility services, including ClientLink, VideoStream and CleanAir technology

## OneWireless XYR 6000 Field Instruments

Honeywell OneWireless XYR™ 6000 field instruments let customers capture process data from locations where running wire is cost-prohibitive or measurement is in a hazardous location.

As part of the ISA100 Wireless standard, XYR 6000 field instruments can be configured as routing devices allowing them to send not only their own data but also data received from neighboring field instruments. These devices can be upgraded to the latest versions with a simple over-the-air firmware update. XYR 6000 field instruments can also be configured to non-routing. The OneWireless Network allows a mixture of routing and non-routing sensors on the same network allowing users to design and deploy the wireless sensor network that suits the application's data needs.

## Third Party ISA100 Wireless and WirelessHART Field Instruments

Honeywell OneWireless Network is a truly open network which can support any field instrument from any supplier compliant to the ISA100 Wireless and WirelessHART standards. For WirelessHART the OneWireless solution supports both native wireless instruments and wireless adaptors which can transmit the data from wired HART devices over the wireless network.

## Advantages

### Flexibility and Scalability

The OneWireless Network gives users the options to design a network that perfectly fits their applications needs.

**Meshing and non-meshing field instruments:** Each wireless field instrument can communicate with two or more other field instruments to form a mesh network. Field instruments can send their own data and also route data received from neighboring field instruments, with data able to pass through multiple instruments before reaching the host gateway. Typically used to tactically implement a handful of battery-operated field instruments, this type of network is employed for non-critical monitoring purposes that do not require fast update rates.

Non-meshing (non-routing) instruments can also be deployed in the network along with meshing instruments. This flexibility allows critical process data to be transmitted through the network with the lowest latency possible. ISA100 Wireless' unique capability of duo-cast further optimizes the dual path connectivity and reliability where the field device transmits the same packet simultaneously to two neighbors.

**Mesh network for field instruments only:** Adding access points for wireless field instruments enables users to build a plant-wide wireless mesh network capable of supporting hundreds of field instruments sending data at update rates as fast as one second. This network is typically implemented by users who want reliable, "wired-like" performance for battery-operated field instruments used in critical monitoring and control while maximizing battery life.

**Mesh network for field instruments and Wi-Fi devices** Access points capable of communicating with ISA100 Wireless and WirelessHART field instruments, and IEEE 802.11 devices enable users to design a plant-wide multi-application network. With IEEE 802.11 support, users can deploy Wi-Fi devices like handhelds for the mobile workforce and personnel safety, and plant security systems, including Ethernet devices such as digital security cameras. At the same time, it can support hundreds of field instruments for monitoring and control. The network combines Wi-Fi coverage with the best features of meshing field instruments and mesh networks for field instruments only.

### Universal Network

The OneWireless Network supports all communication standards and field protocols required for industrial applications.

**Multi-standard network:** OneWireless Network supports the ISA100 Wireless and WirelessHART standards for wireless field instruments; IEEE 802.11 for Wi-Fi devices and IEEE 802.3 for Ethernet-based devices.

**Multi-interface network:** End-users can easily integrate wireless data with their existing applications that are using legacy field protocol interfaces, including Modbus (serial and TCP), HART (serial and IP), and OPC. The WDM also offers a number of unique interfaces, including GCI for ISA100 Wireless devices tunneling proprietary protocols for transmission through the network, an Enraf interface for Honeywell Enraf FlexLine radar gauges and the Wireless Field Interface (WFI), and an Experion® PKS CDA interface for peer-to-peer communication with Honeywell's Experion controllers and server.

With Experion PKS CDA, ISA100 Wireless and WirelessHART field instruments, once powered on and authenticated, are automatically recognized by Experion and ready to be used without any data mapping. Process data (including configuration parameters) from these wireless data sources appear to be exactly the same as data from wired data sources.

With these features and functions, a multi-standard, multi-interface network drastically reduces costs associated with wireless network deployment, maintenance and security management.

### High Performance Network

**Wired-like performance:** Wireless access points such as the Cisco Aironet 1552S Access Point and FDAP deliver wired-like performance with wireless field instruments. With these access points, users can configure their wireless field instruments as routing or non-routing field instruments. Non-routing field instruments consume less power, enabling OneWireless Network users to get more than three years' battery life from their field instruments while retaining one-second update rates.

**Self-contained and predictable power management:** Without power efficiency, the benefits of wireless field instruments can be eroded by battery costs. Honeywell offers efficient instruments with a 10-year battery shelf life at fast update rates. Honeywell's wireless field instruments use commercial, off-the-shelf batteries for low lifecycle costs.

**End-to-end industrial security:** Honeywell protects plant information and ensures safe operations with industry-standard 128-bit encryption at the mesh, Wi-Fi and wireless field instrument level.

**Over-the-air firmware upgrades and configuration:** All ISA100 Wireless field instruments can be configured and upgraded over-the-air, saving one to two hours of labor per update, for each field instrument.

### High Data Availability

Honeywell offers the best data availability for wireless field instruments with the following features:

**Redundant paths:** Each ISA100 Wireless / WirelessHART field device can auto-discover neighboring ISA100 Wireless /WirelessHART devices and establish a communication path with them. Similarly, each Cisco Aironet 1552S Access Point / FDAP can auto-discover neighboring counterparts to establish communication paths. This feature allows the formation of multiple paths between the client device and application, increasing data availability.

**Data segregation:** OneWireless Network uses virtual local area networks (VLANs) to segregate the data and QoS tagging to guarantee expected performance levels by prioritizing data transported across the VLANs.

WDM also allows users to segregate the acquired sensor data away from the process control network by utilizing the Special Interface Network (SIN).

**Channel blacklisting:** OneWireless Network users can determine and configure the channels available for communication in the network. This method can be used to improve network performance by preventing interference between devices.

**Antenna diversity:** Antenna diversity is used to enhance both Wi-Fi and field-instrument wireless coverage reliability in multi-path environments.

### Investment Protection

Honeywell's industrial wireless portfolio is future-proof thanks to adoption of communications standards.

**ISA100 Wireless, WirelessHART and IEEE 802.11 a/b/g/n:** Standards ensure users' freedom of choice. Wi-Fi, ISA100 Wireless and FieldComm Group certification means users can be confident of complete interoperability for compliant field devices from multiple vendors.

**Support for all key field interfaces:** Leveraging the network's multi-protocol capability, users can easily integrate wireless field instruments with their existing applications using Modbus, HART, OPC, GCI, Enraf, and Experion PKS CDA.

GCI allows third-party client applications to access their wireless field data from the WDM. These third-party applications also can leverage the ISA100 Wireless data tunneling feature to transmit their proprietary data format through the wireless network. Tunneling allows an ISA100 Wireless packet to transmit non-native ISA100 Wireless data (proprietary, HART® or FOUNDATION™ fieldbus) through the ISA100 Wireless network. No interpretation of the packet content is necessary. Several field device manufacturers already use this feature to transport proprietary protocols over the ISA100 Wireless network.

Honeywell Enraf's FlexLine Radar tank level gauge and Wireless Field Interface (WFI) natively communicate with the Honeywell Enraf Entis Pro application using the Enraf interface. These wireless Enraf products also leverage the tunneling feature to transmit their proprietary data, and thus users of these existing applications continue to operate the same regardless if the data source is wired or wireless.

**Field Expandable Wireless IO:** An innovative solution using which a FDAP router can be converted into a Modbus master thereby enabling data transmission from Modbus devices back into control room over ISA100 Wireless network in a cost effective manner. Both Modbus RTU and Modbus TCP are supported.

**Experion integration:** Experion users can take advantage of full OneWireless Network integration. Using the WDM's Experion PKS CDA interface, Experion PKS nodes such as C300 controllers and ACE nodes can communicate natively with wireless field devices. This tight integration significantly reduces time spent incorporating wireless field instruments' data into control strategies and displays. Furthermore, there is seamless integration of HART data from WirelessHART and wired HART devices.

**Professional installer support:** The solution allows changing the wireless radio transmit power levels from the OneWireless user interface for qualified professional installers. This saves several labor hours and field visits for the installation and troubleshooting of the field devices and access points.

## Interoperability

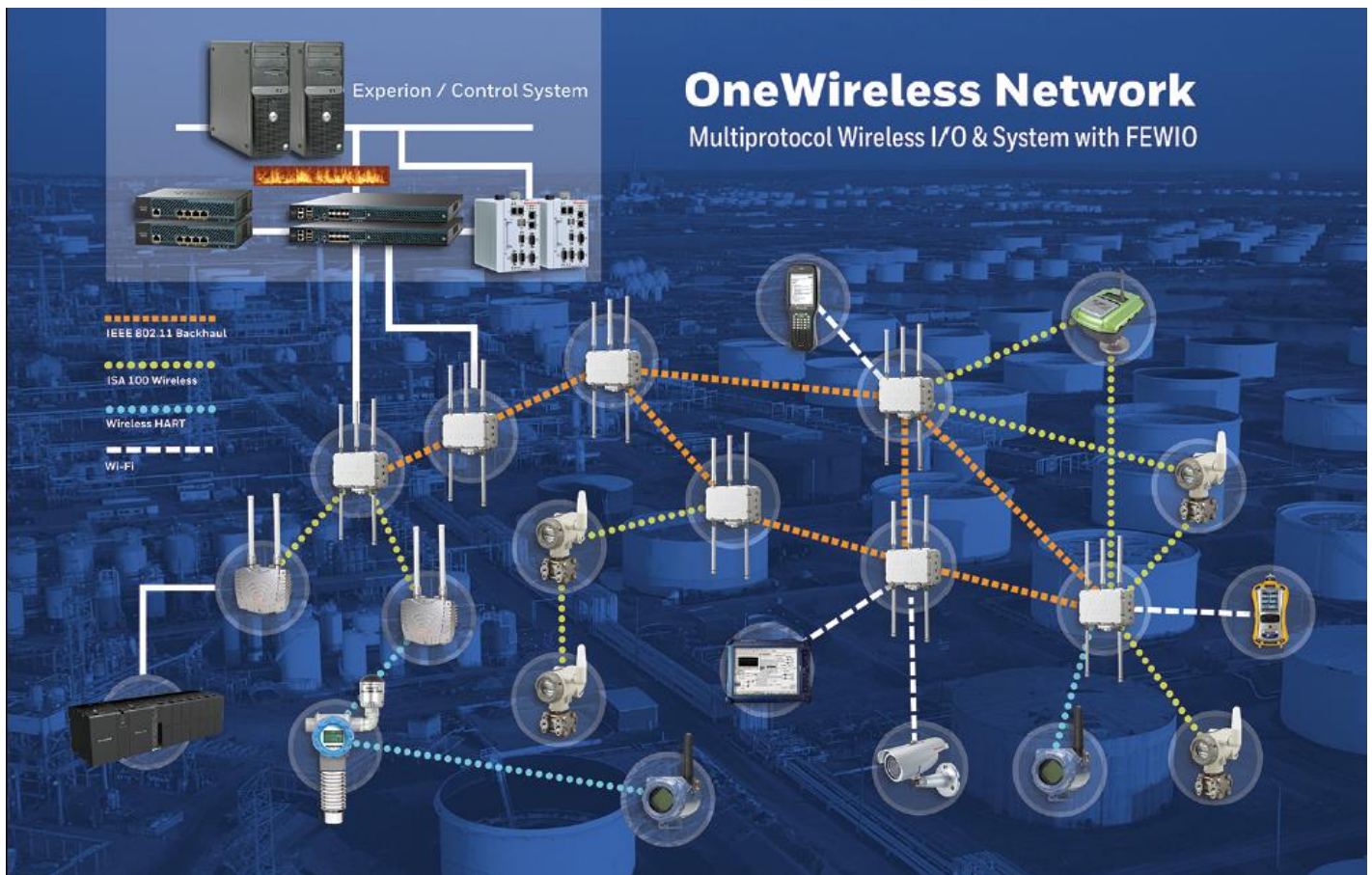
The OneWireless Network is fully interoperable with ISA100 Wireless and WirelessHART field devices offered by other vendors, thereby providing the flexibility of a truly open network.

Using the Wi-Fi connectivity offered by the OneWireless Network, end users can access Experion data and displays through mobile devices, including tablets, handhelds and laptops, for greater responsiveness to operational changes.

## The Only Network You Will Ever Need

Honeywell's OneWireless Network extends the process control network into the field with the most effective solution and lowest total cost of ownership:

- The highest performing and most reliable network; field-proven for best uptime
- The most cost-efficient network available
- The most versatile, flexible and scalable network in the industrial market
- The only network to support ISA100 Wireless, WirelessHART and Wi-Fi in single infrastructure
- The easiest system to commission and maintain



## Summary

<b>OneWireless Network Architecture</b>	
<p>OneWireless Network is composed of the WDM, FDAPs, Cisco 1552S Access Points, Cisco Wireless WLAN Controller, XYR 6000 field instruments, and ISA100 Wireless and WirelessHART field instrumentation from other vendors. The network can be tailored to satisfy diverse application requirements, from a simple wireless sensor network to a multi-application, plant-wide wireless network.</p>	
<b>Highlighted Features</b>	
<ul style="list-style-type: none"><li>• Self-organizing, self-healing and high-speed IEEE 802.11 a/b/g/n-based wireless mesh network</li><li>• Self-organizing, self-healing ISA100 Wireless and WirelessHART-based wireless mesh network</li><li>• Industrial meshing access points (Cisco Aironet 1552S Access Points) providing secure and reliable wireless coverage for ISA100 Wireless, WirelessHART and IEEE 802.11 a/b/g/n wireless devices</li><li>• Industrial meshing access points (FDAPs) providing secure and reliable wireless coverage for ISA100 Wireless and WirelessHART devices and FEWIO</li><li>• A redundant gateway allowing design and implementation of a wireless network with no single point of failure</li><li>• Self-contained and predictable power management designed for 10-year sensor battery life</li><li>• System-wide multi-path capability with dual path connectivity at the wireless field device level, multi-path at the wireless network level (ISA100 Wireless, WirelessHART and IEEE 802.11 a/b/g/n), and gateway redundancy</li><li>• MIMO technology and antenna diversity used to improve Wi-Fi and wireless instruments coverage and reliability</li></ul>	<ul style="list-style-type: none"><li>• Routing and non-routing ISA100 Wireless and WirelessHART field instruments</li><li>• Ability to configure ISA100 Wireless and WirelessHART field instruments with different update rates from 0.5 seconds up to 1 hour with latency control</li><li>• End-to-end industrial security with industry standard 128-bit encryption with configurable options for session and network key rotation</li><li>• Over-the-air firmware upgrades and configuration</li><li>• Over-the-air provisioning for both ISA100 Wireless and WirelessHART devices</li><li>• Support for all key legacy field interfaces (Modbus Serial/TCP, HART Serial/IP, OPC UA/DA)</li><li>• Peer-to-peer communication with Experion nodes using Experion's CDA communication protocol</li><li>• Certified for use in hazardous environments</li><li>• Dedicated Virtual LAN and Quality of Service for sensor traffic</li><li>• Provision for professional installers to change the radio transmit power level from the OneWireless user interface</li></ul>
<b>Network Standards</b>	
<ul style="list-style-type: none"><li>• 2.4 GHz and 5.8 GHz IEEE 802.11 a/b/g/n for use in facilities worldwide</li><li>• 2.4 GHz ISA100 Wireless and WirelessHART for wireless field instruments</li></ul>	

## Network Security

### End-to-end security:

- AES 128-bit encryption for process data
- 802.11i, Wi-Fi protected access (WPA2), WPA
- 802.1X authentication, including extensible authentication protocol and protected EAP (EAP-PEAP), EAP transport layer security (EAP-TLS), EAP-tunneled TLS (EAP-TTLS), and Cisco LEAP
- Advanced encryption standards (AES), temporal key integrity protocol (TKIP)
- VPN pass through
- IP Security (IPsec), Layer 2 Tunneling Protocol (L2TP)
- Configurable Network and Session Key Rotation options

### Supported Field Protocol Interfaces

Modbus TCP/Serial, HART IP/Serial, OPC UA, OPC DA, CDA (Honeywell Experion PKS communication protocol), Gateway Client Interface (GCI), Enraf Interface

### For More Information

Learn more about how Honeywell's Wireless solutions, visit [honeywellprocess.com](http://honeywellprocess.com) or contact your Honeywell Account Manager, Distributor or System Integrator.

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