Honeywell OneWireless™

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 and digitization goals and stricter security and environmental regulations. As the only solution in the market which supports major industrial wireless standards, this open technology provides the 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), *Wireless*HART* (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 *Wireless*HART compliant devices and the power of native integration to Honeywell Experion® PKS.
- Empowering a mobile workforce with remote access to process data and other plant-related information.
- Enhanced plant security with deployment of cost-effective wired and wireless Closed-Circuit Television (CCTV) cameras.
- Improved personnel safety with wireless portable and fixed gas detectors.
- Cost effective connection of remote controllers and legacy devices to the central control system.
- ISASecure Level 1 Certified – Truly cyber secure network with end-to-end data encryption, VLANs, security and session key rotation.

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 cyber secure, multi-application, multi-standard and multi-protocol wireless network that can be tailored to offer the coverage and performance needed, from adding a single wireless field instrument to a completely integrated, plant-wide, multi-application wireless control enabled 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 *Wireless*HART field instruments and network infrastructure devices, such as access points and routers.

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 *Wireless*HART devices, keys can be provisioned through a HART communicator connection or over-the-air.

In a redundant configuration, the WDM enables design and implementation of a wireless network without a single point of failure.

Serving as a gateway connecting wireless field instruments 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 *Wireless*HART 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) to enable wireless connectivity on legacy Modbus devices, like PLC's.

OneWireless Process Control Access Point

For IEEE 802.11b/g/n/ac Wave2 clients, ISA100 Wireless and *Wireless*HART compatible field instruments, users can deploy the OneWireless Project Control Access Point (PCAP). With 802.11ac Wave 2 connectivity, dual Power over Ethernet Plus (PoE+) out for IoT sensors or peripherals, multiple power-in sources, and a variety of uplink options, the PCAP is a flexible wireless solution. 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 Process Control Access Point networks by extending the network policy and security from the wired network core to the wireless edge. Cisco Wireless Controllers bring several benefits:

- Flexibility to centrally configure wireless policy, management or security settings on remote PCAPs 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.

Honeywell SmartLine Wireless Field Instruments

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

Compliant with the ISA100 Wireless standard, SmartLine Wireless field instruments can also be configured as routing devices allowing them to send not only their own data but also data received from neighboring field instruments. Transmitter maintenance is greatly reduced from hours to minutes with over-the-air firmware update capability. SmartLine Wireless field instruments can also be configured to non-routing. 70% longer range results in less hardware infrastructure than other wireless technologies.

Third Party ISA100 Wireless and *Wireless*HART 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 *Wireless*HART standards. For *Wireless*HART 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 provides users the capability to design a network that perfectly fits their business and digitization goals.

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 route data received from neighboring field instruments, with data able to traverse 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 neighbor FDAPs or PCAPs.

Mesh network for field instruments only: Adding FDAPs or PCAPs for wireless field instruments enables users to build a plant-wide wireless mesh network capable of supporting up to 3000 of field instruments in one network and sending data at update rates as fast as one second. This network is typically implemented by users who require reliable," wired-like" performance from battery-operated field instruments for time critical applications and process control, while maximizing battery life.

Mesh network for field instruments and Wi-Fi devices: Access points capable of communicating with ISA100 Wireless and *Wireless*HART field instruments, and IEEE 802.11 devices enable users to design a plant-wide multi-application network. With IEEE 802.11b/g/n/ac Wave2 support, users can deploy Wi-Fi devices such as handheld computers for the mobile workforce, personal gas detectors for personnel safety, and plant security systems, including Ethernet devices such as digital security cameras. At the same time, the network can support thousands of field instruments for monitoring and control. The network combines Wi-Fi coverage with the added benefit of meshing field instruments and mesh networks for field instruments.

Universal Network

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

Multi-standard network: OneWireless Network supports the ISA100 Wireless and *Wireless*HART 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 many unique interfaces, including GCI for ISA100 Wireless devices tunneling proprietary protocols for transmission through the network, an Enraf interface for Honeywell FlexLine radar level gauges and the Wireless Field Interface (WFI) to connect servo level gauges, 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 *Wireless*HART field instruments, once powered on and authenticated, are automatically recognized by Experion and ready to be used without any data mapping. In Experion PKS, process data (including configuration parameters) from these wireless field devices appears the same as data from wired field devices.

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 PCAP and FDAP deliver wired-like performance with wireless field instruments. Leveraging PCAPs, 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 obtain up to 10 years' battery life from their field instruments.

Self-contained and predictable power management: Without power efficiency, the benefits of wireless field instruments can be eroded by battery costs. SmartLine Wireless instruments offer a 10-year battery shelf life, low power consumption at fast update rates and use commercial, off-the-shelf batteries for lowest 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. Honeywell OneWireless network is ISASecure certified.

Over-the-air firmware upgrades and configuration: All ISA100 Wireless field instruments can be configured and upgraded over-the-air, saving up 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 or *Wireless*HART field device can auto-discover neighboring ISA100 Wireless */Wireless*HART devices and establish a communication path with them. Similarly, each PCAP / FDAP can auto-discover neighboring counterparts to establish communication paths allowing the formation of multiple paths between devices, 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, *Wireless*HART and IEEE 802.11b/g/n/ac Wave2: Standards ensure users' freedom of choice. Wi-Fi, ISA100 Wireless and FieldComm Group certification means users can be confident of complete interoperability for field devices, compliant with these leading industry standards, offered by any vendor of choice.

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 (e.g. 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 whereby a FDAP router can be configured as FEWIO, acting as Modbus slave thus enabling data transmission from Modbus devices back to the control room over ISA100 Wireless network provides significant cost savings. Both Modbus RTU and Modbus TCP are supported.

Experion PKS 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. This seamless integration is also extended to *Wireless*HART and wired HART devices on the OneWireless Network.

Professional installer support: The solution allows changing the wireless radio transmit power levels from the OneWireless user interface by 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 *Wireless*HART field devices offered by other vendors, thereby providing the flexibility of a truly open network.
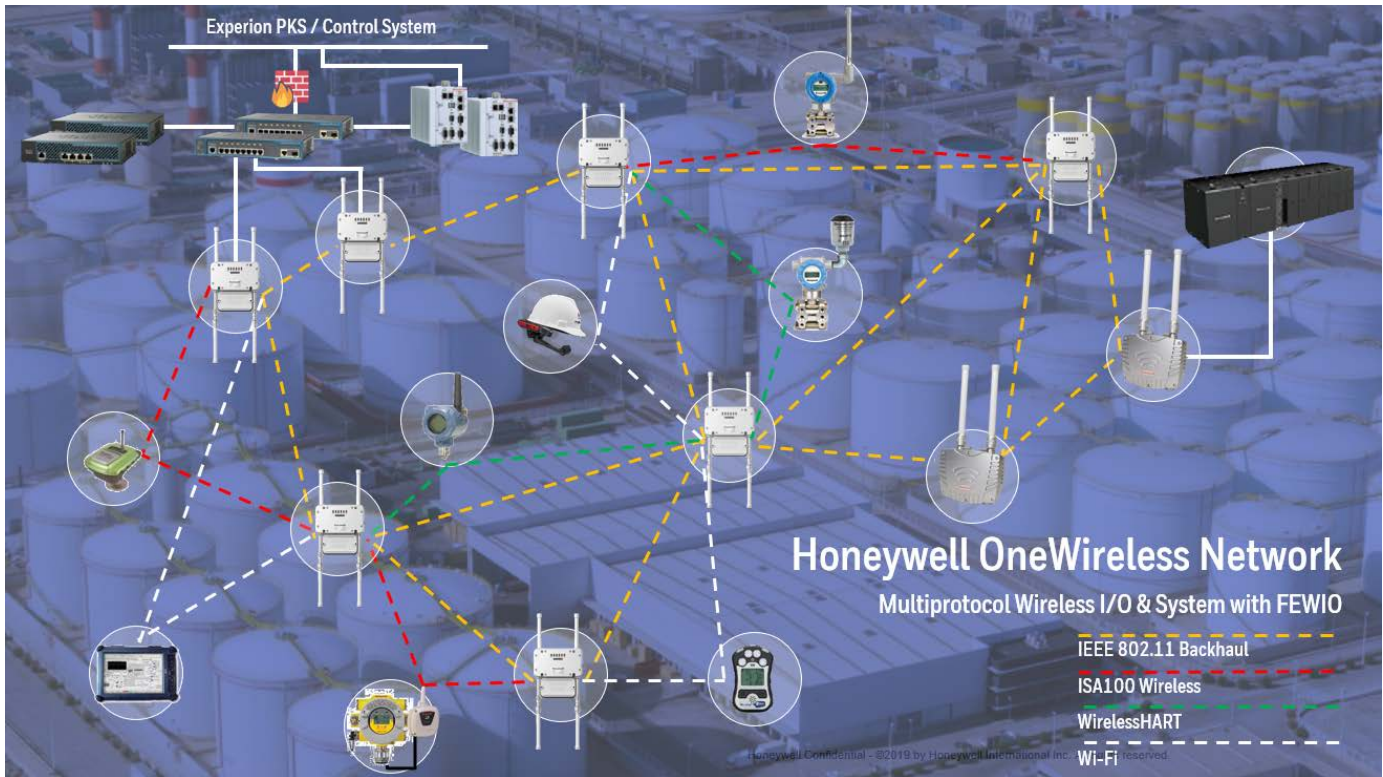
Using the Wi-Fi connectivity offered by the OneWireless Network, end users can access Experion data and displays through mobile devices, including tablets, handhelds and laptops, for greater responsiveness to operational changes.

Qualified for Process Control: The OneWireless Network is qualified for process control by the Experion PKS C300 controller for control class 2, Closed Loop Supervisory Control (Set Point Change, Process Optimization) and class 3, Open Loop Control (Based on Requirement Operator In-Person).

The Only Network You Will Ever Need

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

- The highest performing, most reliable and cyber secure 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, *Wireless*HART and Wi-Fi in single infrastructure.

- The easiest system to commission and maintain.

Honeywell OneWireless Network
Multiprotocol Wireless I/O & System with FEWIO

IEEE 802.11 Backhaul
ISA100 Wireless
WirelessHART
Wi-Fi

Summary

OneWireless Network Architecture
OneWireless Network is composed of the WDM, FDAPs, PCAPs, Cisco Wireless WLAN Controller, SmartLine Wireless field instruments, and ISA100 Wireless and *Wireless*HART 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.

Highlighted Features

- Self-organizing, self-healing and high-speed IEEE 802.11b/g/n/ac Wave2-based wireless mesh network.

- Self-organizing, self-healing ISA100 Wireless and *Wireless*HART-based wireless mesh network.

- PCAP based on Heavy Duty Industrial Cisco Catalyst® IW6300 Wi-Fi Access Points providing secure and reliable wireless coverage for ISA100 Wireless, *Wireless*HART and IEEE 802.11 b/g/n/ac Wave2 wireless devices.

- Industrial meshing Field Device Access Points (FDAPs) providing secure and reliable wireless coverage for ISA100 Wireless and *Wireless*HART devices and FEWIO.

- A redundant capable gateway allowing design and implementation of a wireless network with no single point of failure.

- Self-contained and predictable power management designed for 10-year sensor battery life.

- System-wide multi-path capability with dual path connectivity at the wireless field device level, multi-path at the wireless network level (ISA100 Wireless, *Wireless*HART and IEEE 802.11 b/g/n/ac Wave2), and gateway redundancy.

- MIMO technology and antenna diversity used to improve Wi-Fi and wireless instruments coverage and reliability.

- ISA Secure Level 1 Certified.

- Routing and non-routing ISA100 Wireless and *Wireless*HART field instruments.

- Ability to configure ISA100 Wireless and *Wireless*HART field instruments with different update rates from 0.5 seconds up to 1 hour with latency control.

- End-to-end industrial security with industry standard 128-bit encryption with configurable options for session and network key rotation.

- Over-the-air firmware upgrades and configuration.

- Over-the-air provisioning for both ISA100 Wireless and *Wireless*HART devices.

- Support for all key legacy field interfaces (Modbus Serial/TCP, HART Serial/IP, OPC UA/DA).

- Peer-to-peer communication with Experion nodes using Experion's CDA communication protocol.

- Certified for use in hazardous environments.

- Dedicated Virtual LAN and Quality of Service for sensor traffic.

- Provision for professional installers to change the radio transmit power level from the OneWireless user interface.

Network Standards

- 2.4 GHz and 5 GHz IEEE 802.11b/g/n/ac Wave2 for use in facilities worldwide.

- 2.4 GHz ISA100 Wireless and *Wireless*HART for wireless field instruments.

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).

- ISA Secure Level 1 Certified.

- Configurable Network and Session Key Rotation options.

Supported Host Protocol Interfaces

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

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