

Honeywell OneWireless™ Process Control Access Point Specification Guide OW03-750-322, July 2022

Technical Specification

OneWireless Network Overview

Honeywell OneWireless™ Network is an industrial grade wireless mesh network capable of simultaneously supporting ISA100 Wireless* (IEC 62734), WirelessHART (IEC 62591) field instruments (transmitters, actuators, etc.), Wi-Fi devices and Ethernet/IP-based devices. The network is comprised of the following interconnected elements: Honeywell OneWireless Wireless Device Manager (WDM), that acts as the gateway and security manager of the wireless Field Instrumentation network, the OneWireless Field Device Access Point (FDAP1, FDAP2, and FDAP Gen3 Series), the Process Control Access Point (PCAP) and the Cisco Wireless LAN Controller (WLC) that manages the communications and network security between PCAPs.

The PCAP provides secure and reliable wireless coverage for both ISA100 Wireless and/or WirelessHART field instruments simultaneously. The PCAP uses advanced spatial diversity techniques to mitigate multi-path-induced communication problems found in typical industrial environments, and thereby improve communication reliability and increase effective range.

The PCAP self-discovers and forms an IEEE 802.15.4 -based wireless mesh network that routes data to and from ISA100 Wireless and/or WirelessHART field instruments and process control applications.

The Process Control Access Point also provides secure and reliable wireless coverage for IEEE 802.11b/g/n/ac Wave2 wireless devices. PCAPs self-discover and form a high-speed IEEE 802.11-based wireless mesh network that routes data to and from wireless clients (e.g., Wi-Fi clients, wired Ethernet devices and wireless field instruments) and process control applications. The Cisco Wireless LAN Controller (WLC) provides real-time communications between the PCAPs in order to simplify the deployment and operation of wireless networks,



OneWireless Process Controller Access Point (PCAP)

Product Overview

The OneWireless Process Control Access Point (PCAP) is a Honeywell offering and cannot be ordered through Cisco resellers. The PCAP simultaneously supports ISA100 Wireless, WirelessHART, Wi-Fi and Ethernet devices on a single industrial wireless network.

The built-in IEEE 802.15.4 radio has been designated specifically for mission-critical wireless connectivity to industrial sensor equipment communicating using the ISA100 Wireless and/or WirelessHART standard. The PCAP addresses the growing need for wireless mobility while also providing mission-critical connectivity for industrial sensors and equipment monitoring, such as:

- Monitoring the plant process while providing onsite security via wireless video surveillance
- Monitor for hazardous gasses in the field while a field operator downloads schematic, blueprints on a Wi-Fi client (tablet or PC)
- Provide real-time information to engineering regarding process changes and equipment to better track abnormalities immediately
- Control process loops while enabling AI and Mobile Operator functionality

The PCAP uses an advanced spatial diversity scheme combined with Honeywell's intelligent wireless algorithm to significantly improve communication reliability in extreme multi-path environments and extend the wireless coverage for ISA100 Wireless/WirelessHART field instruments by a factor of 1.5 compared to other wireless routing devices without diversity.

The OneWireless Process Control Access Point is Class 1, Div 2/Zone 2 hazardous location certified. This means it is designed specifically for hazardous environments like oil and gas, refineries, chemical plants, mining pits, and manufacturing.

The PCAP also provides customers with a single point of contact for technical support needs 24x7 via Honeywell's Global Technical Assistance Center.

Key Benefits

- Provides superior performance in multi-path and non-line-of-sight environments
- Single infrastructure offers up to 50% cost savings compared to a multi-network solution
- Optimizes the battery life of a wireless field instrument
- Enables wireless field devices in areas where wired transmitters would not be cost effective
- Helps reduce operating costs (fewer line-powered routing devices and optimized batteries for wireless field instruments)
- Honeywell is the single point of contact for all technical support needs
- Backward compatible with 1552S Aironet AP

Hardware

The Process Control Access Point contains a dual-radio system that are compliant with an IEEE 802.15.4-based wireless radio for ISA100 Wireless and WirelessHART connectivity with spatial diversity and an 802.11b/g/n/ac Wave2 Wi-Fi radio that also provides the IEEE backhaul. It offers one additional ethernet input for optional connection to a wired network or a wireless access point, and one extra Power-over-Ethernet (PoE) for additional functionality. Users terminate the power cable and ethernet cable inside the unit, eliminating the need for a separate enclosure or junction box for terminating in hazardous environments.

The PCAP is offered in both AC and DC power options and are Class 1, Div2/Zone2 certified.

Self-Configuring and Self-Healing Mesh

The Honeywell Process Control Access Point, PCAP, is an industrial meshing access point that provides secure and reliable wireless coverage for Wi-Fi 802.11a/g/n/ac, Wave 2 wireless devices and ISA100 Wireless and WirelessHART field instruments. The PCAP self-discovers and forms a high-speed IEEE 802.11-based wireless mesh network that routes data to and from wireless clients and process control applications.

Honeywell's intelligent wireless routing algorithm enables the PCAP to identify the best route to send data to and from wireless field instruments. This algorithm optimizes the field instrument mesh network when PCAPs are added to or removed from the network.

The PCAP offers high-performance mobility across large oil and gas facilities, chemical plants, manufacturing yards, and mining pits. The PCAP provides high-performance device access through improved

radio sensitivity and range with IEEE 802.11a/b/g/n/ac Wave2 with multiple-input multiple-output (MIMO) technology including two spatial streams. A Power-over-Ethernet (PoE) interface makes it easy to connect IP devices, such as IP video cameras.

ISA100 Wireless Compliant IEEE Backhaul

The OneWireless Process Control Access Point delivers an ISA100 Wireless--compliant backbone router that provides backhaul transport of the wireless sensor network traffic. The dual-radio is based on the IEEE 802.15.4 standard and communicates to all ISA100 Wireless compliant wireless field sensor devices.

Robust Embedded Security for ISA100 and WirelessHART Communications

Security is a primary concern for the process automation community. To mitigate security threats, ISA100 Wireless and WirelessHART requires all process data to be AES 128-bit encrypted. The data is encrypted and decrypted at the field I/O device and WDM level to provide end-to-end security for the process data.

In addition to data encryption, the ISA100 Wireless and WirelessHART standards require each wireless field device to be authenticated before joining the network. The ISA100 Wireless standard supports two types of authentication key distribution: over-the-air and Bluetooth Low-Energy (BLE). The BLE authentication key distribution method adds another layer of security as it requires users to be physically next to the wireless field instrument to add it to the network. The PCAP supports both authentication key distribution methods.

Third-Party Library Support

The authentication keys are managed by the WDM. An Android and Windows device app is used when opting for the BLE / HART modem authentication key distribution. The mobile app uploads the authentication keys from the WDM and downloads keys to field devices using short-range BLE communication for ISA100 Wireless or using a HART modem connection for WirelessHART devices. The PCAP features a conveniently located BLE sensor for use in device commissioning. Once a key is deployed to any wireless field device, including the PCAP, it is validated by the WDM before the wireless field device can join the OneWireless Network. Key deployment is a one-time activity, which means that devices can re-join the network after power-down or other service interruptions without re-keying the device.

Remote and Local Configuration

The PCAP is the definition of simplicity – this Honeywell exclusive, single-unit offering enable more efficient commission and future administration. PCAPs require minimal configuration with all configuration parameters easily accessible from the WDM, which centralizes all key functions required to

manage the field instrument network and wireless field devices.

The PCAP works in conjunction with a Wireless LAN Controller to configure and manage the wireless network. Central management and troubleshooting of the PCAP prevents costly maintenance service calls to remote outdoor locations This enables Network Administrators single solution for RF prediction, policy provisioning, network optimization, troubleshooting, security monitoring, and wireless LAN systems management.

Hardware Specifications

Lightning Surge Arrestors and Antenna Selection

The Process Control Access Point uses a total of four antennas – two at the top of the unit for IEEE802.11ac-wave2-based Wi-Fi connectivity and IEEE backhaul and two additional at the bottom enabling ISA100 Wireless and WirelessHART sensor connectivity.

The antenna selection includes integrated omni-directional antennas and remote-mounted, high-gain, and omni-directional antennas. The PCAP supports a variety of high and low-gain omni-directional antennas to provide flexibility in installation and maximum performance of the wireless system.



Model Numbers	PCAP3A (Class 1 Div 2 / Zone 2) PCAP3D (Class 1 Div 2 / Zone 2)
Multiple Standards / Field Protocols	ISA100 Wireless (IEC 62734) WirelessHART (IEC 62591) Wi-Fi 802.11b/g/n/ac Wave2
Weight	PCAP3A 8.02 kg (17.7 lbs) PCAP3D 7.76 kg (17.1 lbs)
Dimensions	PCAP3A 290 x 281 x 173 mm (11.4 x 11.1 x 6.8 in) PCAP3D 290 x 281 x 173 mm (11.4 x 11.1 x 6.8 in)
Power	PCAP3A: 100-240 VAC, 50/60 Hz, 1.3A PCAP3D: 10.8-36 VDC, 5.9A
External Ports and Connections	4 X External antenna ports for 2.4 GHz / 5 GHz 802.11n-based Wi-Fi ² 2 X External antenna ports for 2.4 GHz ISA100 Wireless and WirelessHART field instruments
Internal Connections	1 X 10/100/1000 BASE-T autosensing PoE+ In 2 X 10/100/1000 BASE-T autosensing PoE Out 1 X Management console port (RJ-45) 1 X Shielded power cable 2 X Grounding cables
Environmental Ratings	IP66/IP67, G3 corrosion resistance per ANSI/ISA-S71.04-1985
Operating Temperature	-40 to +70° C (IECEX, ATEX, CSA)
Operating Humidity	0~95% non-condensing
Transportation and Storage Humidity	0~95% non-condensing
Mechanical Shock	4G – 5G Operation, 15G Non-Operational
Data Rates and Modulations	Radio (ISA100): 250 Kbps, DSSS/O-QPSK Radio (BLE): 1Mbps, FHSS/FSK Wired: 10 / 100 Mbps Fast Ethernet
Frequency Band and Operating Channels	Unlicensed ISM Band (2.4 – 2.483 GHz) ISA100: 13 DSSS channels for ISA100 Wireless and/or WirelessHART BLE: 40 FHSS channels

Compliance	<p>Radio Approvals (ISA100) FCC Part 15.247 Subparts B and C Canada – Industry Canada RSS247, Issue 2 RSS-Gen, Issue 5 ICES-003, Issue 6</p> <p>European Union – ETSI EN 300 328 V2.2.2(2019-07) EN 301 489-17 V3.2.2 EN 301 489-1 V2.2.3 IEC61326-1, 2013</p> <p>Radio Approvals (Bluetooth (NINA-B1 module)) FCC/CFR 47 part 15 unlicensed modular transmitter approval Canada - IC RSS European Union – ETSI RED</p> <p>CE Mark RED Directive 2014/53/EU EMC Directive 2004 / 108 / EC</p> <p>Hazardous Environment Ratings CSA: Class I, Division 2, Group A,B,C,D; T4 Nonincendive field wiring (NIFW) connection to external antenna</p>
Security	128-bit AES encryption
Quality of Service	Supported
Transmit Power (Maximum)	18 dBm
Receive Sensitivity (Typical)	-100 dBm @ 250 kbps
Network Interface	10/100 BASE-T autosensing

<p>Number of Supported ISA100 Wireless and WirelessHART Field Instruments</p>	<p>10 ISA100 Wireless or 8 WirelessHART Field Instruments at 0.5 second reporting rate OR 5 ISA100 Wireless and 4 WirelessHART Field Instruments at 0.5 second reporting rate 25 ISA100 Wireless or 25 WirelessHART Field Instruments at 1 second reporting rate OR 12 ISA100 Wireless and 12 WirelessHART Field Instruments at 1 second reporting rate 50 ISA100 Wireless or 50 WirelessHART Field Instruments at 2 seconds reporting rate OR 25 ISA100 Wireless and 25 WirelessHART Field Instruments at 2 seconds reporting rate 80 ISA100 Wireless Field Instruments at 5 seconds or 80 WirelessHART Field Instruments at 4 seconds reporting rate OR 40 ISA100 Wireless and 40 WirelessHART Field Instruments at 5 seconds and 4 seconds reporting rate respectively 100 ISA100 Wireless Field Instruments at 10 seconds or slower or 100 WirelessHART Field Instruments at 8 seconds or slower reporting rate OR 50 ISA100 Wireless and 50 WirelessHART Field Instruments at 10 seconds and 8 seconds or slower reporting rate respectively</p>
<p>Number of Supported Enraf FlexLine Radar Gauges / Wireless Field Interface (WFI)</p>	<p><i>PCAP as an access point (connected to a high-speed backbone³):</i> 13 Enraf FlexLine Radar Gauges / WFI</p>
<p>Field Expandable Wireless IO (FEWIO)</p>	<p>50 FEWIOs per WDM 3 Modbus slaves per FEWIO Maximum 100 Modbus registers per FEWIO at 30 seconds or slower update rate Maximum 16 Modbus registers per FEWIO at 1 second update rate Maximum 999 Modbus registers per WDM</p>
<p>Maximum Number of Wireless Network Hops Between an Access Point and a Field Device</p>	<p>4 Hops</p>
<p>Warranty</p>	<p>1 Year</p>
<p>ECCN</p>	<p>5A002 ENC</p>

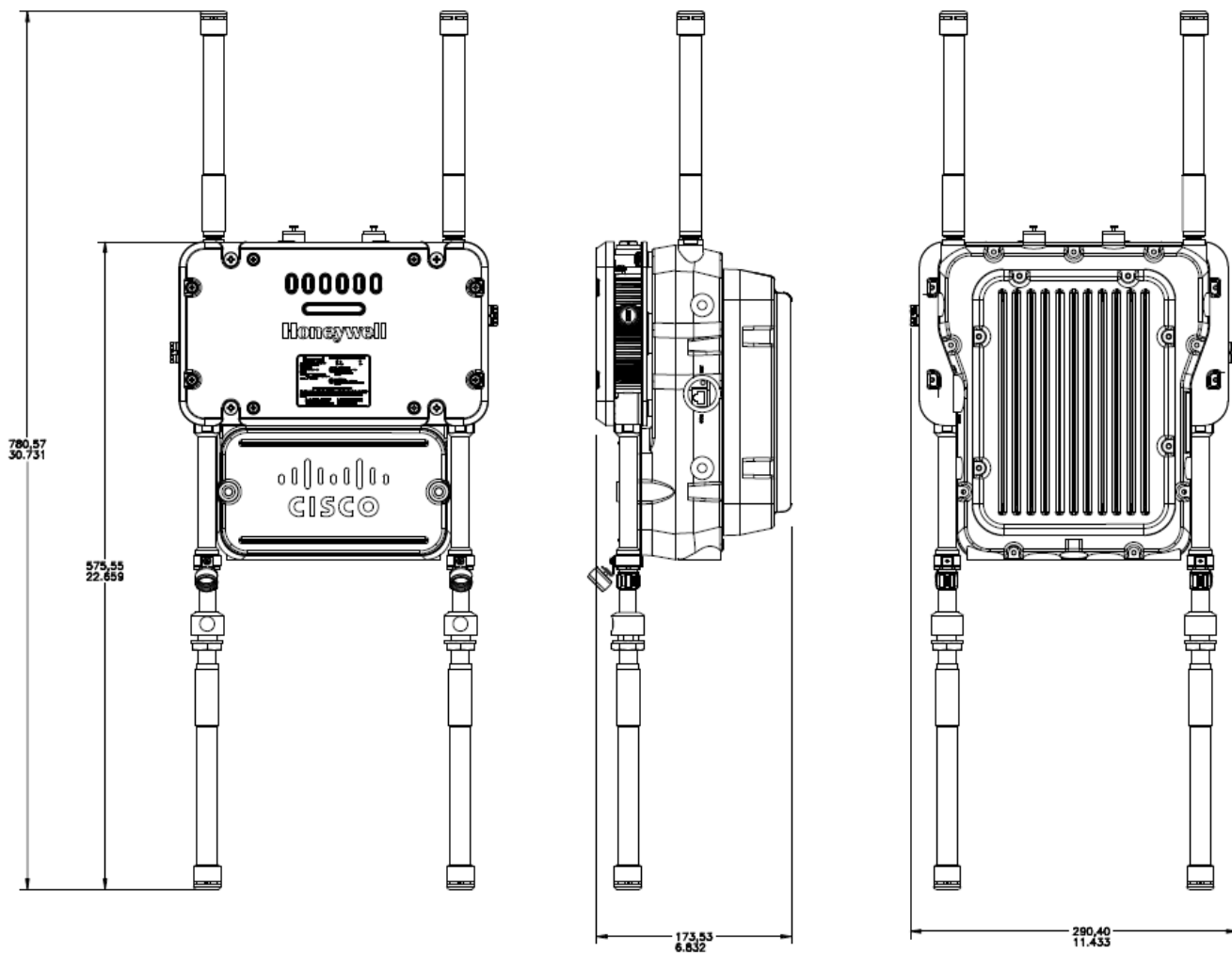
¹ No external power converter required when used with AC power input

² Uses two outer antenna connection ports for 802.11n-based Wi-Fi

³ These limits are for applications using Enraf Interface protocol tunnel. When Enraf Interface protocol tunnel is disabled, capacity limits as specified for ISA100 Wireless instruments apply

Technical Drawing

Units: mm [inches]



PCAP 3A/3D WITH LIGHTNING SURGE ARRESTOR

Model Selection Guide



Section 13
 Page: PCAP-1
 Effective Date: July 25, 2022

OneWireless Process Control Access Point

Model Selection Guide
 34-XY-16-101 Issue 7

Model Selection Guide with Price Data

Honeywell Proprietary



Instructions

<ul style="list-style-type: none"> • Select the desired key number. The arrow to the right marks the selection available. • Make one selection from Table I. Select Table II options as desired. <p style="margin-top: 10px;">Key Number I II III IV</p> <p style="margin-top: 5px;"> <input style="width: 50px; border: 1px solid black;" type="text"/> - <input style="width: 50px; border: 1px solid black;" type="text"/> - <input style="width: 50px; border: 1px solid black;" type="text"/> - <input style="width: 50px; border: 1px solid black;" type="text"/> - <input style="width: 50px; border: 1px solid black;" type="text"/> </p>	<p>List Price equals the sum of all prices for all selections made.</p>
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KEY NUMBER

Description	Selection	Avail.
Process Control Access Point; 100 - 240 VAC with Class 1 Div 2 certification includes wall/pipe mounting hardware, Dual band antennas (qty = 2) (Note 3, 5, 6, 7)	PCAP3A	•
Process Control Access Point; 10.8 - 36 VDC with Class 1 Div 2 certification includes: Wall/pipe mounting hardware, Dual band antennas (qty = 2) (Note 3, 5, 6, 7)	PCAP3D	•

TABLE I - DSSS Antenna Options (ISA100 Wireless+WirelessHART), supplied in pair

None	F0 _____	•
5 dBi Integral Omni (Qty = 2)	F5 _____	•
8 dBi Integral Omni (Qty = 2)	F8 _____	•
8 dBi Remote Omni (Qty = 2)	R8 _____	•
with No Lightning Surge Arrestor	__ 00 __	•
with Lightning Surger Arrestor (Qty = 2)	SA	•
No Cable	_____ 00	•
3 m (9.8 ft) Cable (Qty = 2)	_____ 03	a
10 m (32 ft) Cable (Qty = 2)	_____ 10	a

TABLE II - Firmware Version

OneWireless R3xx - Delivers latest R3xx radio firmware (Note 8)	A	•
RTLS R323 or above	B	a

TABLE III - Destination Country / Modem Country Certification

	Selection	Avail.
Canada	A_	•
United States	B_	•
India	D_	•
Europe	E_	•
Saudi Arabia, UAE	M_	•
Australia, New Zealand	Z_	•
China	H_	•
Canada	_A	c
United States	_B	d
India	_D	e
Europe	_E	f
Saudi Arabia, UAE	_M	g
Australia, New Zealand	_Z	h
China	_H	i

TABLE IV

Factory Use	0000	•
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Restrictions

Restriction Letter	Available Only With		Not Available With	
	Table	Selection	Table	Selection
a	1	R8_		
c	3	A_		
d	3	B_		
e	3	D_		
f	3	E_		
g	3	M_		
h	3	Z_		
i	3	H_		

NOTES:

1. No power supply required
2. Electronic Documentation is mandatory
3. If customer has pre-existing IW6300 unit and only needs Gen3 Plus to create field-upgraded PCAP, use OneWireless FDAP Gen3 Series MSG for ordering.
4. Supplied in pairs (qty = 2)
5. Unit is Class 1 / Div 2 Certified
6. Includes pair (qty =2) WiFi 4/7dBi omnidirectional, vertically polarized antennas for Hazardous Locations
7. Includes wall and pole mounting kit
8. Select correct software release from the drop-down menu in the OneWireless R3xx field.

Replacement Parts

Description	Kit Number
Lightning Surge Arrestor for integral/remote omni DSSS antenna (ISA100 Wireless+WirelessHART), Qty. 1	51121705-501
5 dBi Integral Omni DSSS Antenna (ISA100 Wireless+WirelessHART), Qty. 1	51121705-502
8 dBi Integral Omni DSSS Antenna (ISA100 Wireless+WirelessHART), Qty. 1	51121705-503
4dBi/7dBi Dual Band Omni Antenna (ISA100 Wireless+WirelessHART), Qty. 1	51121705-504
8 dBi Remote Omni DSSS Antenna (ISA100 Wireless+WirelessHART), Qty. 1	51121705-505
3 m (9.8 ft) Cable for remote omni DSSS antenna (ISA100 Wireless+WirelessHART), Qty. 1	51121705-506
10 m (32 ft) Cable for remote omni DSSS antenna (ISA100 Wireless+WirelessHART), Qty. 1	51121705-507

** Consult Honeywell Order Entry Systems for current parts pricing.

The minimum value of orders acceptable for Honeywell is USD 500. Handling fee is the amount of the difference between USD 500 and the actual purchase price.

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For More Information

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