

## Technical Information

### OneWireless Field Device Access Point Specification Release 230 OW03-650-230, October 2014



#### OneWireless Network Overview

Honeywell OneWireless™ Network is an industrial wireless mesh network capable of simultaneously supporting ISA100 Wireless\* (IEC 62734) 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), Honeywell OneWireless Field Device Access Point (FDAP), Cisco\* Aironet\* 1552S Access Point, and Cisco Wireless Controller. The WDM manages the ISA100 Wireless field instrument network, including ISA100 Wireless field instruments, FDAPs, Cisco Aironet 1552S Access Points with embedded ISA100 Wireless radio, and HART\* devices connected wirelessly through the Honeywell OneWireless Adapter.

The FDAP is an industrial meshing access point providing secure and reliable wireless coverage for ISA100 Wireless field instruments only. It 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 FDAP self-discovers and forms an ISA100 Wireless-based wireless mesh network that routes data to and from wireless field instruments and process control applications.

The Cisco Aironet 1552S is an industrial meshing access point that provides secure and reliable wireless coverage for IEEE 802.11b/g/n wireless devices and ISA100 Wireless field instruments. Cisco access points 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 Controller provides real-time communications between the 1552S access points in order to simplify the deployment and operation of wireless networks. The controller delivers centralized security policies, Wireless Intrusion



Honeywell's Field Device Access Point (FDAP)

Prevention System (WIPS) capabilities, award-winning RF management, and Quality of Service (QoS) for process data, voice and video.

#### Product Overview

The FDAP is an industrial meshing access point for ISA100 Wireless field instruments. Once implemented in a plant, it self-discovers other neighboring ISA100 Wireless devices (e.g., Cisco access points, other FDAPs, and ISA100 Wireless field Instruments) to form a reliable and secure ISA100 Wireless-based wireless mesh network. The device can support all ISA100 Wireless field instruments including wired HART instruments connected to the OneWireless Adapter.

The FDAP 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 field instruments by a factor of 1.5 compared to ISA100 Wireless routing devices without diversity.

## Key Benefits

- Provides superior performance in multi-path and non-line-of-sight environments
- Enables use of wireless field instruments for applications requiring fast reporting rates (less than 10 seconds) and short latency (less than 250 mS)
- Optimizes the battery life of a wireless field instrument
- Enables wireless field devices in areas where Wi-Fi radios are not allowed
- Reduces the number of ISA100 Wireless routing devices needed for optimal wireless coverage of ISA100 Wireless field instruments
- Helps reduce operating costs (fewer line-powered routing devices and optimized batteries for wireless field instruments)

## Hardware

The FDAP is a 24 VDC- or 120/230 VAC-powered field device featuring an ISA100 Wireless radio with spatial diversity and one Ethernet input for optional connection to a wired network or a wireless access point. Users terminate the power cable and Ethernet cable inside the unit, eliminating the need for a separate enclosure or junction box for termination in hazardous environments.

The FDAP comes in two models: one model certified for Div 2/Zone 2 areas and a second certified for Div 1/Zone 0 areas.

### Access Point and Field Router

The FDAP can be used as both an access point and a field router. When connected to a wired backbone such as a Local Area Network (LAN) via an Ethernet port, the FDAP acts as an access point and will route ISA100 Wireless traffic via the Ethernet connection to the WDM. When installed as a router in the field but not connected to a wired backbone, the FDAP acts as a repeater and will route ISA100 Wireless traffic to another routing field device.

### Self-Configuring and Self-Healing Mesh

As previously stated, the FDAP self-discovers other neighboring ISA100 Wireless devices to form a reliable and secure ISA100 Wireless-based wireless mesh network. Honeywell's intelligent wireless routing algorithm enables the FDAP to identify the best route to send data to and from wireless field instruments. This algorithm optimizes the field instrument mesh network when FDAPs are added to, or removed from the network.

The FDAP radio operates in the license-free 2.4 GHz ISM band using the ISA100 Wireless radio, which is a standard-based IEEE 802.15.4 radio.

## Robust Embedded Security for ISA100 Communications

Security is a primary concern for the process automation community. To mitigate security threats, ISA100 Wireless 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 standard requires 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 infrared. The infrared 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 FDAP supports both authentication key distribution methods.

The authentication keys are managed by the WDM. A handheld device is used when opting for the infrared authentication key distribution. The handheld uploads the authentication keys from the WDM and downloads keys to field devices using short-range infrared communication. The FDAP features a conveniently located IR port for use in device commissioning. Once a key is deployed to an ISA100 Wireless field device, including the FDAP, it is validated by the WDM before the ISA100 Wireless field device can join the ISA100 Wireless 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

FDAPs require little configuration. All configuration parameters are easily accessible from the WDM, which centralizes all key functions required to manage the field instrument network and wireless field devices.

### Lightning Surge Arrestors and Antenna Selection

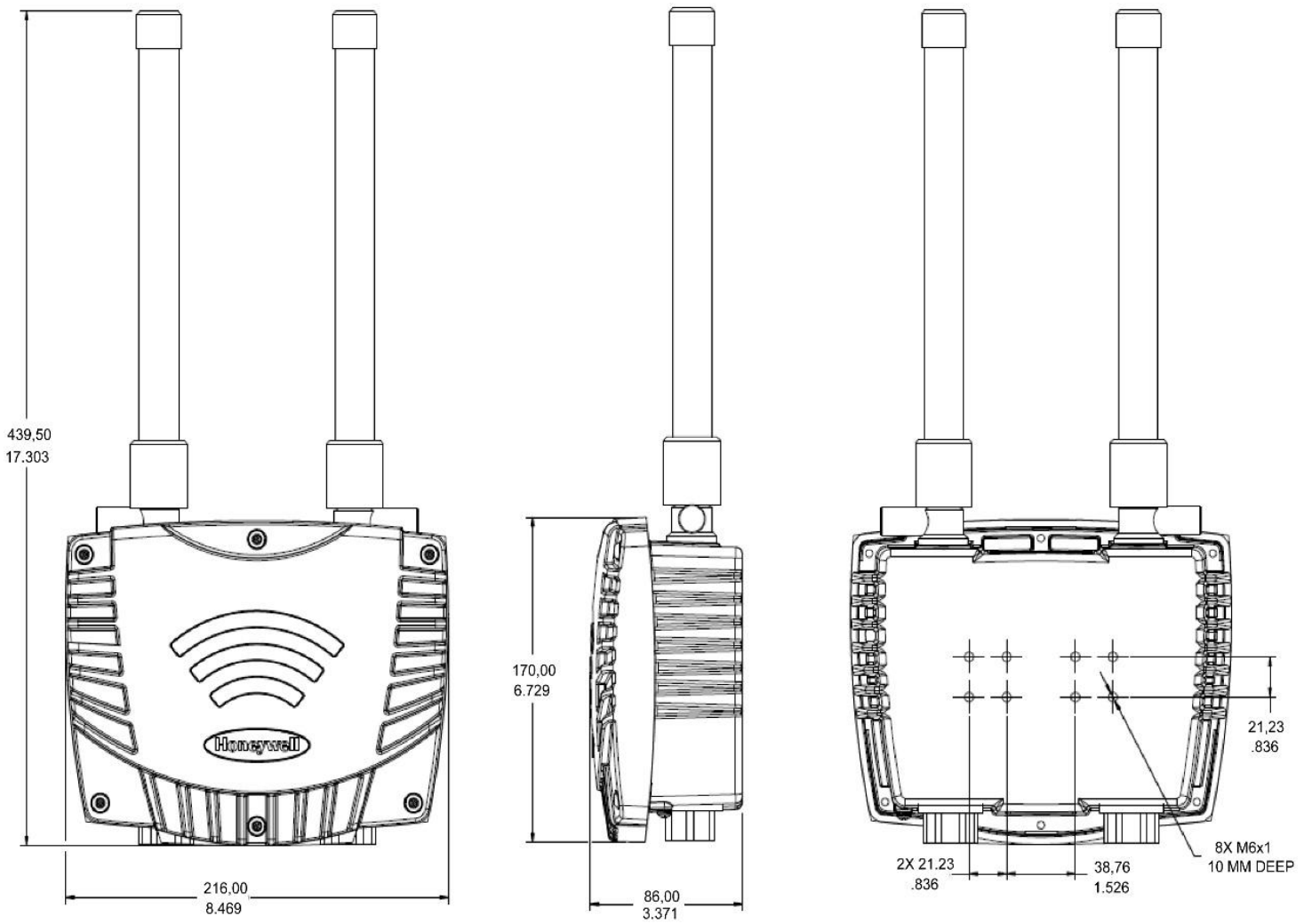
FDAPs come with the choice of integral and remote surge arrestors as well as integral and remote antennas. The antenna selection includes integrated omni-directional antennas and remote-mounted, high-gain, directional and omni-directional antennas. The FDAP supports a variety of high- and low-gain directional antennas to provide flexibility in installation and maximum performance of the wireless system.

## Hardware Specifications

<b>Model Numbers</b>	FDAP1 (Class 1 Div 1 / Zone 0) FDAP2 (Class 1 Div 2 / Zone 2)
<b>Multiple Standards / Field Protocols</b>	ISA100 Wireless
<b>Weight</b>	3.86 kg (5.5 lbs)
<b>Dimensions</b>	216 x 170 x 86 mm (8.47 x 6.73 x 3.37 in)
<b>Power</b>	FDAP1: 18-30 VDC at 2 Watts FDAP2 <sup>1</sup> : 18-30 VDC at 2 Watts / 90-264 VAC, 50/60 Hz
<b>External Ports and Connections</b>	2 X external antenna ports for 2.4 GHz ISA100 Wireless field instruments
<b>Internal Connections</b>	1 X 10/100 Mbps auto-negotiation Ethernet port 1 X shielded power cable 1 X grounding cable
<b>Environmental Ratings</b>	IP66, NEMA Type 4X, G3 corrosion resistance per ANSI/ISA-S71.04-1985
<b>Operating Temperature</b>	FDAP1: -40 to +75° C (FM) -40 to +70° C (IECEX) FDAP2: -40 to +70° C (FM)
<b>Transportation and Storage Temperature</b>	-40 to +85° C
<b>Operating Humidity</b>	0~100% non-condensing
<b>Transportation and Storage Humidity</b>	0~100% non-condensing
<b>Mechanical Shock</b>	4G
<b>Data Rates and Modulations</b>	Radio: 250 Kbps, DSSS/O-QPSK Wire: 10 / 100 Mbps Fast Ethernet
<b>Frequency Band and Operating Channels</b>	Unlicensed ISM Band (2.4 – 2.483 GHz) 13 DSSS channels for ISA100 Wireless
<b>Compliance</b>	<b>Radio Approvals</b> <b>FCC Part 15.247 Subparts B and C</b> <b>Canada – Industry Canada</b> Method RSS-210, Issue 7 RSS-Gen, Issue 2 ICES-003, Issue 4 <b>Australia and New Zealand – ACMA</b> AS NZS 4268-2008 <b>European Union – ETSI</b> EN 300 328 V1.8.1 EN 301 489-17 V2.2.1 EN 301 489-1 V1.9.2 IEC61326-1, 2006 <b>CE Mark</b>

	<p>R&amp;TTE Directive 1999 / 5 / EC  EMC Directive 2004 / 108 / EC  LVD Directive 73 / 23 / EEC  ATEX Directive 94 / 9 / EC</p> <p><b>Hazardous Environment Ratings</b>  <i>FDAP1 Model:</i>  FM: Class I, Division 1 Group C, D / Zone 0 Group IIB T4  IECEX CSA 14.0024X: Ex ia IIB Ga T4  <i>FDAP2 Model:</i>  FM: Class I, Division 2 Group A, B, C, D / Zone 2 Group IIC T4  ATEX: II 3G Ex nA [nL] IIC T4 (Pending)</p>
<b>Security</b>	128-bit AES encryption
<b>Quality of Service</b>	Supported
<b>Transmit Power (Maximum)</b>	18 dBm
<b>Receive Sensitivity (Typical)</b>	-95 dBm @ 250 kbps
<b>Network Interface</b>	10/100 Mbps Ethernet, auto-sensing
<b>Number of Supported Honeywell OneWireless XYR™ 6000 Field Instruments</b>	<p><i>FDAP as an access point (connected to a high-speed backbone<sup>1</sup>):</i>  18 ISA100 Wireless Field Instruments at 1 second reporting rate  60 ISA100 Wireless Field Instruments at 5 seconds or greater reporting rate</p> <p><i>FDAP as a router (routing data to another ISA100 device):</i>  10 ISA100 Wireless Field Instruments at 1 second reporting rate  20 ISA100 Wireless Field Instruments at 5 seconds or more reporting rate</p>
<b>Number of Supported Enraf FlexLine Radar Gauges</b>	<p><i>FDAP as an access point (connected to a high-speed backbone<sup>1</sup>):</i>  13 Enraf FlexLine Radar Gauges</p> <p><i>FDAP as a router (routing data to another ISA100 device):</i>  10 Honeywell Enraf FlexLine Radar Gauges with 1 second publication rate with input only channels  5 devices with 1 second publication rate with both input and output channels</p>
<b>Number of Supported SKF WVT Field Devices</b>	<p><i>FDAP as an access point (connected to a high-speed backbone<sup>1</sup>):</i>  15 Wireless Vibration Transmitter (WVT) Field Devices</p> <p><i>FDAP as a router (routing data to another ISA100 device):</i>  10 Wireless Vibration Transmitter (WVT) Field Devices</p>
<b>Maximum Number of Wireless Network Hops Between an Access Point and a Field Device</b>	4 Hops
<b>Warranty</b>	1 Year
<b>ECCN</b>	5A002 ENC

### Technical Drawing



Model Selection Guide



Section 13  
Page: WNM-11  
Effective Date: January 1, 2014

OneWireless  
Field Device Access Point

Model Selection Guide  
with Price Data

Model Selection Guide  
34-XY-16-92 Issue 4

Honeywell Proprietary



Instructions

- 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.

Key Number      I      II      III      IV      V

[ ] - [ ] - [ ] - [ ] - [ ] - [ ]

List Price equals the sum of all prices for all selections made.

KEY NUMBER

Description	Part Number	Selection	Avail.
Field Device Access Point with Class 1 Div 2 certification (i.e. 24VDC and 120/230V AC power input)	51198665-200	FDAP2	•
Field Device Access Point with Class 1 Div 1 certification (24VDC power input)	51198665-100	FDAP1	•

TABLE I - DSSS Antenna 1 Options

None	N/A	F0 _ _ _ _	•
5 dBi Integral Omni	51506534-101	F1 _ _ _ _	•
6 dBi Integral Omni	51198667-100	F6 _ _ _ _	•
8 dBi Remote Omni	50018414-001	F8 _ _ _ _	•
with No Integral Lightning Surge Arrestor	N/A	_ _ 00 _ _	•
with Integral Lightning Surge Arrestor	51202383-200	_ _ SA _ _	•
with Remote Lightning Surge Arrestor	51202359-100	_ _ RS _ _	•
No Cable	N/A	_ _ _ _ 00	•
1 m (3.2 ft) Cable	50018278-001	_ _ _ _ 01	•
3 m (9.8 ft) Cable	50018278-003	_ _ _ _ 03	•
10 m (32 ft) Cable	50018278-010	_ _ _ _ 10	•

TABLE II - DSSS Antenna 2 Options

Description	Part Number	Selection	Avail.
None	N/A	F0 _ _ _ _	•
5 dBi Integral Omni	51506534-101	F1 _ _ _ _	•
6 dBi Integral Omni	51198667-100	F6 _ _ _ _	•
8 dBi Remote Omni	50018414-001	F8 _ _ _ _	•
with No Integral Lightning Surge Arrestor	N/A	_ _ 00 _ _	•
with Integral Lightning Surge Arrestor	51202383-200	_ _ SA _ _	•
with Remote Lightning Surge Arrestor	51202359-100	_ _ RS _ _	•
No Cable	N/A	_ _ _ _ 00	•
1 m (3.2 ft) Cable	50018278-001	_ _ _ _ 01	•
3 m (9.8 ft) Cable	50018278-003	_ _ _ _ 03	•
10 m (32 ft) Cable	50018278-010	_ _ _ _ 10	•

TABLE III - Options

None	N/A	00	•
Wall mount kit	51202381-501	WM	•
Pole mount kit for 6.35 cm (2 1/2") max diameter pole	51196557-502	PM	•

TABLE IV - Documentation

OneWireless Network R200 Electronic Documentation on a CD	51153920-001	DD	•
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TABLE V

Factory Use		0000	•
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NOTES:

- No power supply required
- Electronic Documentation is mandatory

<sup>1</sup> No external power converter required when used with AC power input

<sup>2</sup> Field Instruments with input channels only

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#### **For More Information**

To learn more about Honeywell's OneWireless solutions, visit our website

[www.honeywellprocess.com](http://www.honeywellprocess.com) or contact your Honeywell account manager.

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