

Technical Information

OneWireless Wireless Device Manager Specification

OW03-640-230, 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 composed 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 device network and ISA100 Wireless field devices such as Honeywell's OneWireless XYR™ 6000 field instruments, FDAPs, Cisco 1552S Access Points, HART* devices connected wirelessly through the OneWireless Adapter, and ISA100 Wireless field devices from other vendors.

The FDAP is an industrial meshing access point providing secure and reliable wireless coverage for ISA100 Wireless field devices. It uses advanced spatial diversity techniques to mitigate multipath induced communication problems found in typical industrial environments and thereby improve communication reliability and increase effective range. The FDAP device self-discovers and forms an ISA100 Wireless mesh network that routes data between ISA100 Wireless field devices and process control applications. For more information consult the FDAP Specification document.

The Cisco 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 1552S Access Points self-discover and form a high-speed IEEE 802.11-based wireless mesh network that routes data between wireless clients (e.g., Wi-Fi clients, wired Ethernet devices, and ISA100 Wireless field devices) and process control applications. For more information consult the Cisco Aironet 1552S Access Point Specification document.



Honeywell OneWireless Wireless Device Manager

The Cisco Wireless Controller provides real-time communication between Cisco 1552S Access Points to simplify the deployment and operation of wireless networks. The controller delivers centralized security policies, wireless intrusion prevention system (wIPS) capabilities, award-winning RF management, and quality of service (QoS) for process data, voice and video.

Wireless Device Manager Overview

The WDM allows users to design, commission, configure, and monitor the wireless field network and devices connected to it from a centralized location. A centralized management approach significantly simplifies day-to-day operations — resulting in a low cost-of-ownership.

The device assumes the roles of wireless field instrument network gateway, system manager, and security manager:

- As a gateway, WDM handles communication between ISA100 Wireless field instruments and information systems. It acts as a protocol translator between the application layer of the ISA100 Wireless standard and other application layers, such as Modbus (both RTU/Serial and TCP), HART, OPC-UA, OPC-DA, and CDA (Honeywell Experion® PKS communication protocol). Leveraging the ISA100 Wireless standard's tunneling feature, Honeywell's WDM offers a Generic Client Interface that enables wireless field devices to communicate with process applications using other types of field protocols, including proprietary protocols, over the ISA100 Wireless network.
- As a system manager, WDM governs the network, devices, and communications. When two devices need to communicate, they do so using a contract which is created, managed, modified, and terminated by the WDM. It also performs policy-based control of the network runtime configuration; monitors and reports on communication configuration, performance, and operational status; and, finally, provides time-related services.
- As a security manager, WDM issues security keys to wireless devices so they can join the wireless field instrument network. The device authenticates connectivity between nodes on the wireless field instrument network, manages session keys, and enables secure encrypted communication in the field instrument network.

Key Features

Great user experience	WDM offers a modern, beautiful, and feature rich user interface making it easy for users to commission ISA100 Wireless field devices and monitor the entire wireless system. With no software to install and an intuitive user interface, the time needed to commission ISA100 Wireless field instruments is reduced to only a few minutes.
Integration with Experion	The native communication between WDM and other Experion nodes significantly reduces the time spent incorporating wireless field instruments into a control strategy.
Integration with TPS and other DCS/PLC systems	A rich portfolio of integrated field protocol interfaces (i.e., Modbus, HART, OPC-UA, OPC-DA, GCI, Honeywell Enraf, and CDA) allows users to easily send data from ISA100 Wireless field devices to TDC3000 system, Honeywell Enraf Entis Pro, Field Device Manager and other host applications.
Robust security system	WDM offers end-to-end 128-bit encryption, application proxy agent and secured HTTPS (certificates)-based user interface, which protects users from cyber security threats.
Pre-configured reports with key performance indicators (KPIs)	WDM's built-in reports reduce by half the time spent monitoring and optimizing the wireless field instrument network.
Redundancy	WDM's redundancy improves significantly the reliability of the OneWireless network by ensuring no loss of process data.

System Management Features

The WDM is the ISA100 Wireless network system manager. Using WDM's intuitive web interface, users can easily design, commission, configure, and manage the ISA100 Wireless network, the ISA100 Wireless network devices (FDAP and Cisco 1552S Access Points) and all ISA100 Wireless field instruments associated with the network.

The device's web-based user interface has been designed to minimize the effort required to manage the ISA100 Wireless network and the hundreds of wireless field devices associated with the network. To simplify the browsing of hundreds of data points provided by the system, the user interface has been carefully divided into multiple tabs:

- The **Monitoring** tab allows users to add, configure, commission, and monitor wireless field devices (e.g., wireless field instruments and network nodes). This view offers an abundance of data in a clear and intuitive manner, thanks to smart buttons that hide/unhide information (signal strength, process value, battery life, etc.) depending on the user's needs. Users can drag and drop field devices on imported maps, allowing them to be aware of the geo-location of each device. The zoom in/out feature is very useful when monitoring a large system.
- The **Alarms/Events** tab displays the alarms and system events generated by the wireless field devices in a tabular format. Users can easily view active alarms as well as alarms and events that occurred in the past.

- The **Reports** tab offers several pre-defined reports that are used to maintain and optimize the network and field devices. These reports include battery life report, device health overview, connectivity report, and device summary. The reports can be easily exported for offline reviewing and analysis.

Security Manager Features

The WDM is the ISA100 Wireless network's security manager. It generates unique join keys required to authenticate and join the ISA100 Wireless network. It also generates unique session keys for each device needed to establish secure, encrypted connections over the ISA100 Wireless network. The process of downloading the ISA100 Wireless network security keys from the WDM to the ISA100 Wireless field device is called provisioning. Honeywell's WDM supports the two provisioning methods defined by the ISA100 Wireless standard: infrared provisioning and over-the-air provisioning.

Provisioning Application for Handheld Devices

Infrared provisioning consists of transmitting security keys to ISA100 Wireless field devices via the infrared port of a handheld device hosting Honeywell's OneWireless provisioning application. The infrared provisioning adds another element to the system's security: physical security. For a device to be issued a key, the technician must be close to the wireless field instrument.

The provisioning device application runs on any mobile platform with an IR port and Microsoft Windows* Mobile 5.0 or higher operating system.

Honeywell has tested the provisioning device software application on the HP iPAQ PDA, Honeywell 99Ex PDA and Ecom Instruments i.roc PDA.

The provisioning device application also allows users to view the configured settings of ISA100 Wireless field devices and enables them to transmit calibration commands to and from the transmitters.

Over-the-air Provisioning

Over-the-air provisioning allows a user to accept or reject an un-provisioned ISA100 Wireless field device via WDM's user interface. With this method, an external provisioning device (PDA) is no longer necessary.

Application Proxy Agent and Firewalls

WDM includes an application proxy agent that acts as an intermediary between the wireless network and the plant network. There is basically an air-gap between the two networks (i.e., there is no packet forwarding between the two networks). All traffic coming in from the wireless network terminates on the WDM. Wireless data is collected by the WDM using the wireless network port and is stored in its cache. Plant applications access data from WDM using one of the standard industrial protocols such as Modbus, OPC-UA, OPC-DA or CDA via the plant network port. Because external hosts only communicate with the proxy agent, internal IP addresses are not made known to the outside world. This approach is much more secure than any firewall, including application aware firewalls.

The Application Proxy Agent is supplemented by two firewalls implemented inside the WDM. These firewalls allow only a small number of ports to enter the WDM from the wireless network. WDM also firewalls the plant network to allow only a limited number of protocols to enter WDM from the plant network side.

End-to-end 128-bit Encryption

The WDM takes advantage of the ISA100 Wireless standard to ensure the integrity of the message. As such, process data is AES-128 bit encrypted at the source and decrypted at the destination (i.e., the WDM). This provides end-to-end security for the process data.

Gateway Features

The WDM manages the communication between wireless field instruments (transmitters or actuators) and process control applications. The device can be connected to the wired process control network at the Level 2 or Wireless DMZ (refer to the OneWireless Network Overview document).

Redundancy

WDM's redundancy improves significantly the reliability of the OneWireless network by ensuring no loss of process data. Two Wireless Device Managers can be configured as a redundant pair, consisting of a primary and secondary WDM. The primary WDM will constantly synchronize configuration and process data to the secondary Wireless Device in real-time. The secondary WDM will switch to the primary role if a software or hardware failure occurs on the primary WDM.

Interfaces

Modbus

WDM supports the Modbus protocol so that any standard measurement, status, or other parameter can be read by any Modbus application. Users can configure register number assignments based on their needs. The device supports Modbus RTU (RS-232 and RS-485) and Modbus TCP/IP interfaces.

OPC

The WDM hosts an OPC Unified Architecture (UA) server, which provides open system communication to ISA100 Wireless data. OPC UA provides a service-oriented architecture (SOA) for industrial applications. This platform-independent OPC server integrates the different flavors of the former OPC specifications (OPC DA, OPC HA and OPC AE) into a unified address space accessible with a single set of services. WDM exposes process data only over the OPC UA interface. The historical data or alarm/events are not currently supported. For OPC-based applications that only support DCOM/COM-based OPC, WDM offers an OPCUA Proxy that, when installed on the client machine, enables communication between a DCOM/COM-based OPC client and the WDM OPC UA server.

HART

Like other intelligent digital field instruments, ISA100 Wireless field instruments offer important diagnostic data. The WDM's HART interface allows users to access the diagnostics information from their favorite field instrument management system without native support for ISA100 Wireless, such as Honeywell's Field Device Manager R430 and earlier. This enables ISA100 Wireless field instruments to be monitored like any other HART field instrument.

The HART interface (HART IP) is also used to access diagnostics from HART devices connected to OneWireless Adapter.

Experion PKS CDA

WDM supports the Experion PKS CDA communication protocol, allowing Experion PKS 410 nodes and later such as C series controllers and ACE nodes to communicate directly with the WDM and ISA100 Wireless field devices.

Gateway General Client Interface

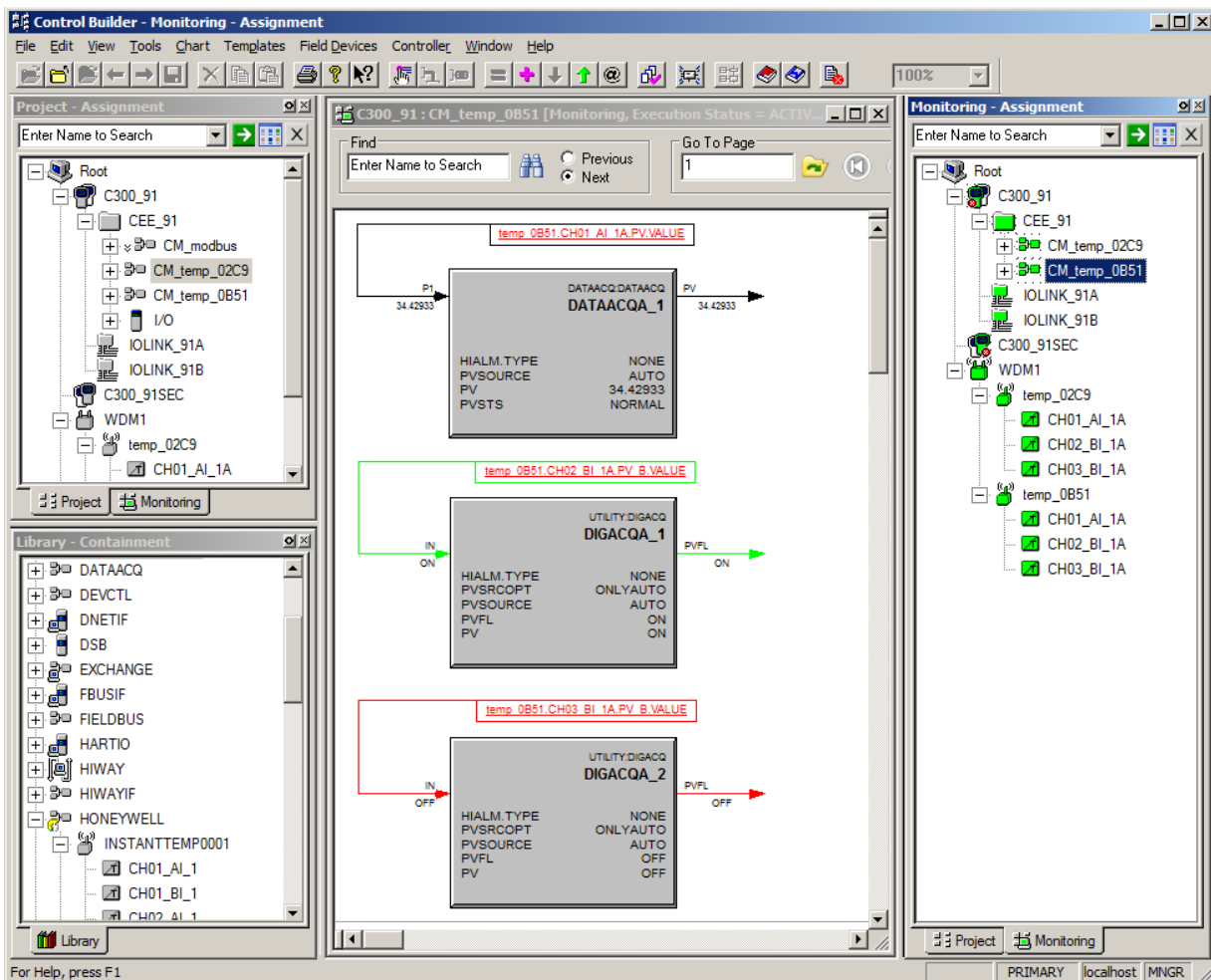
The Gateway General Client Interface (GCI) allows third-party client applications to communicate with ISA100 Wireless devices using the native ISA100 Wireless protocol. ISA100 Wireless can tunnel or encapsulate other protocols (e.g., proprietary, HART, FOUNDATION* fieldbus) and transport data between the host application and device. The GCI interface is currently used by Bently Nevada's System1 applications and SKF's @ptitude Analyst to communicate with their respective wireless vibration devices.

Honeywell's Field Device Manager also uses the GCI to manage the health of ISA100 Wireless field devices.

Experion Integration

Enraf Interface

The Enraf interface allows communication between the Honeywell Enraf Flexline Radar gauges, Enraf Wireless Field Interface (WFI) and Enraf Entis Pro software application. Leveraging ISA100 Wireless, tunneling capability, the Enraf's radar tank gauge, SmartRadar Flexline and Servo gauge equipped with WFI, can wirelessly send level and custody transfer information to Enraf's inventory management application, i.e. Entis Pro.



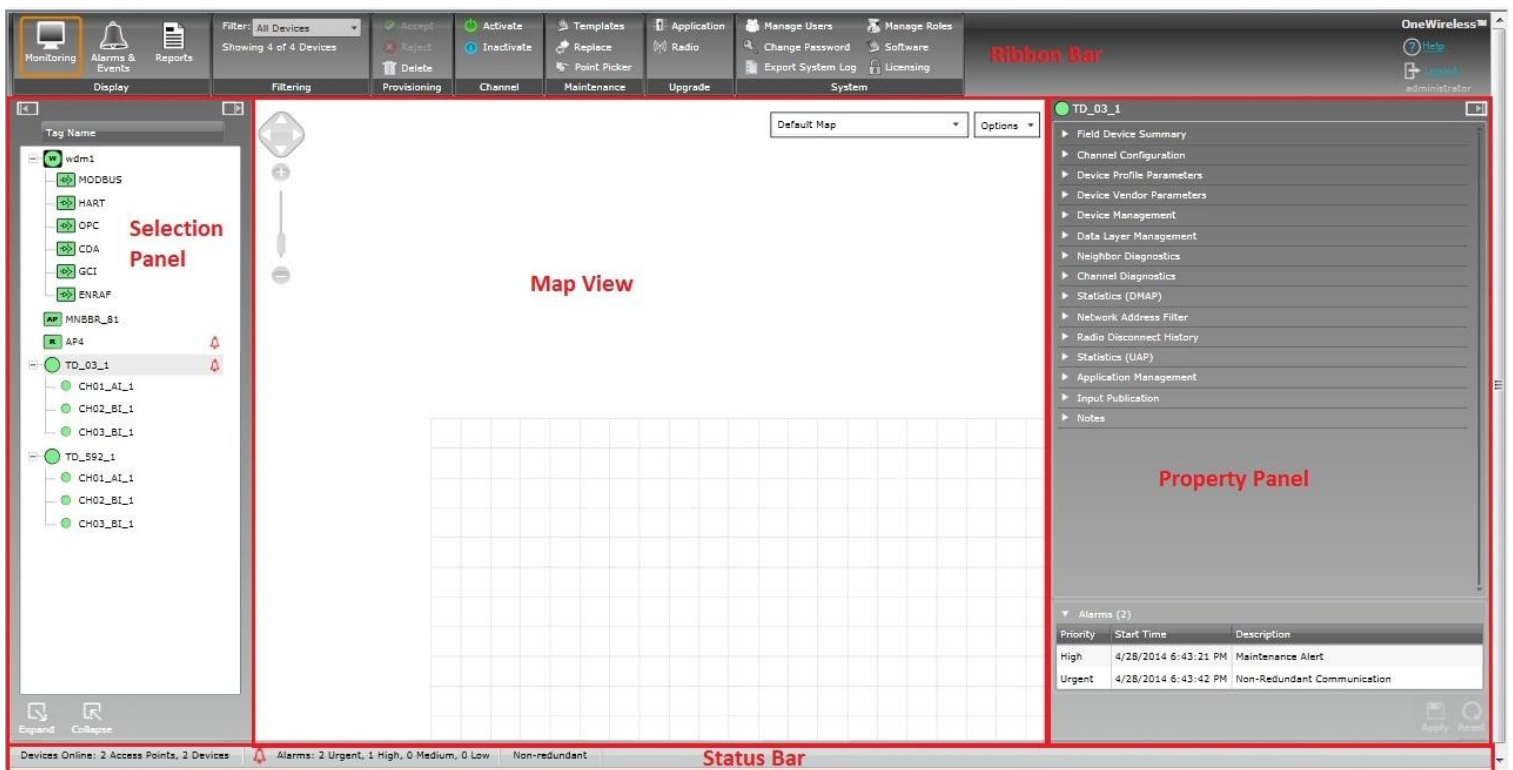
Users of Experion PKS R410 or higher can easily add and configure ISA100 field devices to their control system. Using Experion Control Builder, users add their Wireless Device Managers to their control system. All ISA100 field instruments associated to a Wireless Device Manager are automatically detected and displayed in Experion Control Builder. Users can then configure the field instruments and incorporate them in their control strategies.

Web-based User Interface

The WDM provides an unbelievable user experience with its optimized, web-based user interfaces and pre-built reports. The user interface is designed to simplify device configuration, security configuration, and monitoring of the ISA100 Wireless network. It comprises the following main elements:

The tight integration with Experion significantly simplifies the management and monitoring of the ISA100 network including associated system alarms.

With Experion's native support for ISA100 Wireless, users do not need to do any data mapping or non-value-added engineering such as custom faceplates and custom-detailed displays.



- Ribbon Bar** – The Ribbon Bar allows for immediate access to commonly-used functions, such as filtering or channel activate/inactivate. It consists of groupings of user interface controls for controlling display elements and accessing various functions for managing, monitoring and maintaining the OneWireless Network. These user interface controls are contextual and are enabled based on user role and devices/channels selected in the Selection Panel or the Map View.
- Map View** – The Map View provides a visual representation of the OneWireless Network and its wireless coverage.
- Selection Panel** – The Selection Panel displays a list of all the ISA100 Wireless devices that are configured in the OneWireless Network.
- Property Panel** – The Property Panel contains configuration properties of all the ISA100 Wireless devices configured in the OneWireless Network.
- Status Bar** – The Status Bar provides an overview of the network status by displaying the number of online devices, active alarms, and the progress of any maintenance operation.

Users can quickly assess the performance of their network and devices via pre-built reports:

- **Battery Life** – Lists all devices that require battery replacement and/or have battery level less than 50%.
- **Device Health Overview** – Lists all the devices with wireless network disconnection and alarms.
- **Connection Summary** – Lists all connections with a poor or unacceptable signal quality.
- **Device Summary** – Provides a summary of each device configured in the network. Using the filter option on the Ribbon Bar, users can remove devices from the report.
- **Connection History** – Lists all the history of connection changes.
- **Device History** – Lists all device status changes.

Technical Specifications

Model Number	WDMX
General	Certification: CE, FCC Class A, UL, CCC Dimensions: 110 x 155 x 140 mm (4.4" x 6.1" x 5.6") Weight: 2.0 kg Power Consumption: 24 W (Typical) Power Requirement: 9 (Min.) ~ 36 (Max.) V _{DC} (e.g +24 V @ 1.25 A) Mounting: DIN-rail, Wall
Hardware	Indicators: Power, IDE, LAN (Active, Status), Serial (Tx, Rx) Serial Ports: 1 x RS-232 and 1 X RS-485 with DB9 Connectors LAN: 3 x 10/100/1000 Base-T RJ-45 ports (PCN, FDN, and Redundant Private Path) USB: 4 x USB, EHCI, Rev 2.0 Compliant
Environment	Operation Temperature: -10 to +65 °C (14 to 149 °F) Storage Temperature: -20 to +80 °C (-4 to 176 °F) Operating Humidity: 20 to 95% (non-condensing) Storage Humidity: 0 to 95% (non-condensing) Shock Protection: IEC 68 2-27 Vibration Protection: IEC 68 2-64 (Random 1 Oct/min, 1 hr/axis)
Certification	CE, FCC Class A, UL, CCC
Languages	English
Field Network Capacity	40 access points (Cisco 1552S Access Points and/or FDAPs as access points) 40 Field Device Routers 100 ISA100 Wireless Field Instruments
Supported Field Device Update Rates	1, 5, 10, 30, or 60 seconds for published attributes

Hardware Design

The WDM is a rugged, compact, embedded device, with a small footprint which saves users real estate space. All ports are readily accessible from the front for easy connection of the wireless field network to another network. The WDM provides flexible mounting options – it comes with both a DIN-rail mounting kit and wall mounting kit, allowing users to easily mount the device in a field cabinet or on a wall.

The WDM hosts a sleek, modern user interface, which leverages the latest web technology. Users, with valid username and password, can manage the wireless field instrument network from any PC with a standard web browser via a secure HTTPS connection, eliminating the need for any software installation on a PC.

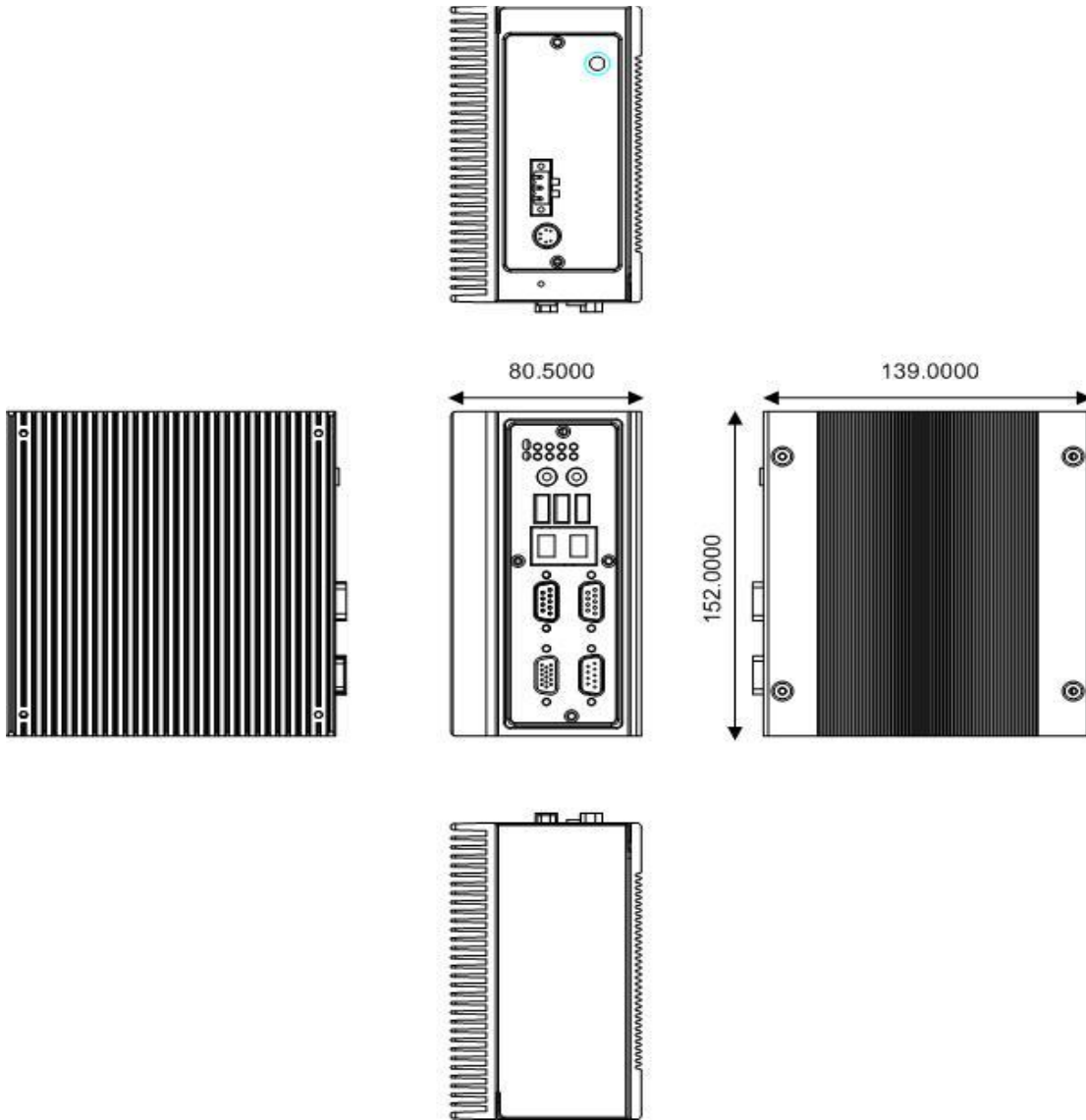
Model Number	WDMX
Field Communication	Modbus RTU (RS-232 and RS-485) and Modbus TCP/IP (up to 10 clients) HART RTU (RS-232 and RS-485) (1 client) HART IP (up to 5 clients) OPC UA (up to 5 clients) OPC DA using provided OPC-UA to OPC-DA proxy installed on client PC (up to 5 clients) Honeywell Experion PKS CDA communication protocol (up to 5 display clients and 5 peer clients) Gateway General Client Interface (up to 5 clients) Enraf Serial (1 client) Enraf UDP (up to 12 clients)
Supported Web Browsers¹	Microsoft Internet Explorer 7.0 or higher Firefox 3.6 or higher Google Chrome 12.0 or higher
Number of Supported Web Clients	2 clients
Web Client Refresh Rate	5 seconds
Maximum Number of Alarms and Events	1000 alarms 24576 events
Redundancy	Control processing switchover interruption time: 15 seconds Maximum initial synchronization time: 180 seconds
Supported Number of Parallel Firmware Upgrades for Field Devices	3 devices (recommended)
Supported Provisioning Handheld	All handheld platforms with a Windows Mobile 5.0 or higher operating system and an Infrared Red (IrDA) port

Important Note:

Honeywell uses Allen-Bradley's 1606-XLP30E power supply to power the Wireless Device Manager.

¹The user interface is designed for and recommended to be run in the browser in full screen with a resolution of 1280 X 1024

Technical Drawing





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OneWireless Wireless Device Manager

Model Selection Guide

Instructions

<p>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> <p>Key Number I II III IV</p> <p>_____ - _____ - _____ - _____ - _____</p>	<p>List Price equals the sum of all prices for all selections made.</p>
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KEY NUMBER	243	Part Number	Selection	Avail.
Description				
Wireless Device Manager (Notes 1, 2, 3, 5, 6) includes: DIN Rail mounting hardware, power connector, OneWireless R230 License with 4 X ISA100 AP (FDAP as an AP or Cisco 1552S) WDM Modbus Interface Printed Software Release Note OneWireless Network R230 Electronic Documentation on a CD		51198663-200 OW-WDM230 51153920-001	WDMX	 •

TABLE I - Power Supply	Part Number	Selection	Avail.
No power supply	N/A	00	•
24VDC Power Supply	51198676-100	PS	•

TABLE II - Interface Options (Notes 6, 7)	Part Number	Selection	Avail.
WDM HART Interface	OW-WDMHRT	HI	•
No HART Interface		00	•
WDM OPC Interface	OW-WDMOPC	OI	•
No OPC Interface		00	•
WDM Enraf Interface	OW-WDMERF	EI	•
No Enraf Interface		00	•
WDM GCI Interface	OW-WDMGCI	GI	•
No GCI Interface		00	•
WDM CDA Interface	OW-WDMCDA	CI	•
No CDA Interface		00	•

TABLE III - ISA100 Wireless Access Point (FDAP/Cisco 1552S AP) CAL	Part Number	Selection	Avail.
Additional ISA100 Wireless Access Point Connection (FDAP as an AP or Cisco 1552S) (Notes 4, 6, 7)	OW-WDMBBR	XXX	•

TABLE IV	Part Number	Selection	Avail.
Factory Use	N/A	00	•

NOTES:

1. WDM requires 24VDC
2. A software license key is required to activate the OneWireless R230 software installed on WDM. Selection WDMX includes the base license as described and additional options can be ordered through respective tables.
3. Orders must be accompanied with the OneWireless Specifier.
The OneWireless Specifier is located on the same HFS Extranet site as this MSG. The specifier needs to include either SO# or PO#.
The completed OneWireless specifier should be sent to FPSoftwareLicense@honeywell.com
4. In Table III, user shall specify the number of ISA100 Access Points connections. Example, if the user needs to add an additional FDAP as an AP to the system, they will need to replace XXX by 001. Similarly, if the user needs to add 5 Cisco AP to the system, they will need to replace XXX by 005. The maximum number of APs allowed per WDM is 40 (040). But since the base license already contains 4 APs, the max value allowed for XXX is 036. Therefore valid range for XXX is 001 to 036
5. Only one WDM order shall be placed at a time per system per end user
6. For secondary WDM do not order any options from Table II and Table III
7. OneWireless R230 License can be expanded at a later point by individually ordering options in Table II and Table III
However please review the existing license before ordering further options, so that same option is not ordered again accidentally
8. For license expansions the user needs to provide the following information while placing the order:
MSID and System Number or copy of the current license
9. Existing users can request a free of cost upgrade to OneWireless R230 by ordering OW-UPG230
10. For upgrade orders using OW-UPG230, the user shall provide the MSID or copy of the current license, while placing the order

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For More Information

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