

OneWireless Adapter Professional Installation Guide

Document ID: XXXXXXXXX

Document File: OneWireless Adapter Pro-Install Guide Rev A2 (Preliminary).docx

Last Revision Date: 2 November 2010

Version: Rev A2

PRELIMINARY

Date	Revision	Reason
24 September 2010	A1	Initial Draft
2 November 2010	A2	Updated Safety Approval Information

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1 DESIGNATION, SCOPE AND PREFACE

1.1 Designation

This document is valid for the OneWireless Adapter (OWA). The OWA is intended to be directly connected to a HART device or network and provide a wireless interface between the wired HART network and the wireless ISA100 network.

1.2 Scope

This document outlines professional installation requirements for the Honeywell OWA. Professional installation is required to comply with certification agency and legal requirements. This document must be adhered to for all installations of the Honeywell OWA.

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1.3 Preface

This manual covers professional installation of the Honeywell OWA. See the Getting Started with Honeywell OneWireless, Honeywell OneWireless Planning Guide and Honeywell OWA User’s Guides for general information on overall system implementation, configuration, and management of these devices.

The OWA is classified by the FCC as a device that must be professionally installed.

1.4 Site Survey

It is assumed for the purposes of this document that a site survey has been performed and that the OWA is installed in a location consistent with the Model Selection Guide selection. Any changes to the location as a result of the actual installation of the OWAs into the site may require that the TX power setting of the radio board needs to be adjusted from the factory setting in order to maintain agency approvals. See Sections 11 and 12 for more information.

1.5 Abbreviations & Definitions

The term **Honeywell OWA** will be used to describe the composite unit which includes the Honeywell ISA100 RF Module and all subassemblies housed within the OWA enclosure.

Table 1 –Table of Abbreviations and Definitions

ACMA	Australian Communications and Media Authority
AD	Authentication Device
ATEX	Potentially Explosive Atmospheres Directive
AWG	American Wire Gauge
Co-located	Two or more radios transmitting simultaneously and with less than 20 cm of separation distance.
CSA	Canadian Standards Association
DCS	Distributed Control System
DSSS	Direct Sequence Spread Spectrum
EMC	Electromagnetic Compatibility
ETSI	European Telecommunications Standards Institute
EU	European Union
FCC	Federal Communications Committee
FHSS	Frequency-Hopping Spread Spectrum
FM	Factory Mutual
FSK	Frequency Shift Keying
GFSK	Gaussian Frequency Shift Keying
GTS	Honeywell Global Technical Services
IC	Industry Canada
IEEE	Institute of Electrical and Electronics Engineers
IR	Infrared
IrDA	Infrared Data Association
ISA100	International Society of Automation open-standard wireless networking technology
HART	Highway Addressable Remote Transducer Communications Protocol
MIC	Japan Ministry of Internal Affairs and Communications
MPE	Maximum Permissible Exposure
MSG	Honeywell Model Selection Guide
NA	North America – United States of America and Canada
NEMA	National Electrical Manufacturers Association
OQPSK	Offset Quadrature Phase-Shift Keying
OWA	OneWireless Adapter

TELEC	Japan Telecom Engineering Center
TIIS	Japan Technology Institution of Industrial Safety
TX	Transmit
Wi-Fi	Wireless Local Area Network based on IEEE 802.11 Specifications
WNSIA	Wireless Network for Secure Industrial Application

2 FEDERAL COMMUNICATION COMMISSION (FCC)

2.1 FCC Compliance Statements

- This device complies with Part 15 of FCC Rules and Regulations. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.
- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radiofrequency energy and, if not installed and used in accordance with these instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- Intentional or unintentional changes or modifications must not be made to the OWA unless under the express consent of the party responsible for compliance. Any such modifications could void the user's authority to operate the equipment and will void the manufacturer's warranty.

3 INDUSTRY CANADA (IC)

3.1 IC Compliance Statements

- To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropic radiated power (EIRP) is not more than that permitted for successful communication.
- Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
- This Class A digital apparatus complies with Canadian ICES-003.
- French: Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

4 RF Safety Statement

To comply with FCC's and Industry Canada's RF exposure requirements, the following antenna installation and device operating configurations must be satisfied.

- Remote **Point-to-Multi-Point** antenna(s) for this unit must be fixed and mounted on outdoor permanent structures with a separation distance between the antenna(s) of greater than 20 cm and a separation distance of at least **20 cm** from all persons.
- Furthermore, the OWA unit must not be co-located with any other antenna or transmitter device and have a separation distance of at least 20 cm from all persons.

5 FCC and Industry Canada (IC) Identification Numbers

This information is shown on the label attached to each RF Module.

- Honeywell OWA Radio Module Identification
 - Honeywell Identification for Intrinsically Safe RF Modules: **50025034-002**

- Honeywell OWA Radio Limited Modular Approval
 - Federal Communication Commission Identification for Intrinsically Safe RF Modules: **S5750025034**
 - Industry Canada Identification for Intrinsically Safe RF Modules: **573I-50025034**

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6 INTENDED COUNTRY USAGE

6.1 NORTH AMERICA

Country	ISO 3166 2 letter code
Canada	CA
United States	US

6.2 EUROPEAN UNION

Country	ISO 3166 2 letter code	Country	ISO 3166 2 letter code
Austria	AT	Latvia	LV
Belgium	BE	Liechtenstein	LI
Bulgaria	BG	Lithuania	LT
Cyprus	CY	Malta	MT
Czech Republic	CZ	Netherlands	NL
Denmark	DK	Norway	NO
Estonia	EE	Poland	PL
Finland	FI	Portugal	PT
France	FR	Romania	RO
Germany	DE	Slovakia	SK
Greece	GR	Slovenia	SI
Hungary	HU	Spain	ES
Iceland	IS	Sweden	SE
Ireland	IE	Switzerland	CH
Italy	IT	United Kingdom	BG

7 OWA GENERAL DESCRIPTION

7.1 Intended Use

The OWA is a key component of the Honeywell *Wireless Network for Secure Industrial Application* (WNSIA). These transmitters are available for various sensor types including Digital Inputs, Temperature, High Level Analog Inputs, Pressure and Corrosion. The OWA uses a low-powered ISA100 2.4 GHz radio to communicate with Radio Infrastructure and Gateway devices that are connected to a wired DCS network.

7.2 OWA Diagrams

Figure 1 shows unit-level drawings of the OWA.

8 PRODUCT SPECIFICATIONS

8.1 ISA100 Radio, 2.4 GHz

Warning! The OWA must be Professionally Installed in accordance with the requirements specified in this document. See Section 10, for professional installation maximum TX power setting requirements. Only the specified TX power settings and antenna as outlined in this document are valid for OWA installations.

Table 2 – Specifications of ISA100 Radio Module in OWA

Item	Specification
Wireless Standard	FCC 15.247 / IEEE 802.15.4 Direct Sequence Spread Spectrum (DSSS), 2.4 GHz
Data Rates and Modulation	Data Rate: 250 kbps Modulation: Offset Quadrature Phase-Shift Keying (OQPSK – DSSS)
Frequency Band	2,405 – 2,475 MHz
Module Transmit Power	Maximum: 20 dBm (Maximum transmit power will vary by channel)
Receive Sensitivity (typical)	-100 dBm

8.2 OWA User Environment

Table 3 – User Environment Specifications for OWA

Item	Specification
Operating Temperature:	-40°C to +85°C (-40°F to +185°F)
Storage Temperature:	-40°C to +85°C (-40°F to +185°F)
Operating Humidity:	0 to 100% RH

Other Environmental specifications and information may be found in the appropriate Instrument Specification available on the Honeywell website.

8.3 OWA Power Specifications

The OWA operates from one (a) D-size 3.6V Lithium Thionyl Chloride (Li/SOCl₂) battery and from power scavenging from the 4-20mA loop to which it is attached.

8.4 Weight

The weight of the complete OWA unit is 1 lb. (0.45 kg).

8.5 Dimensions

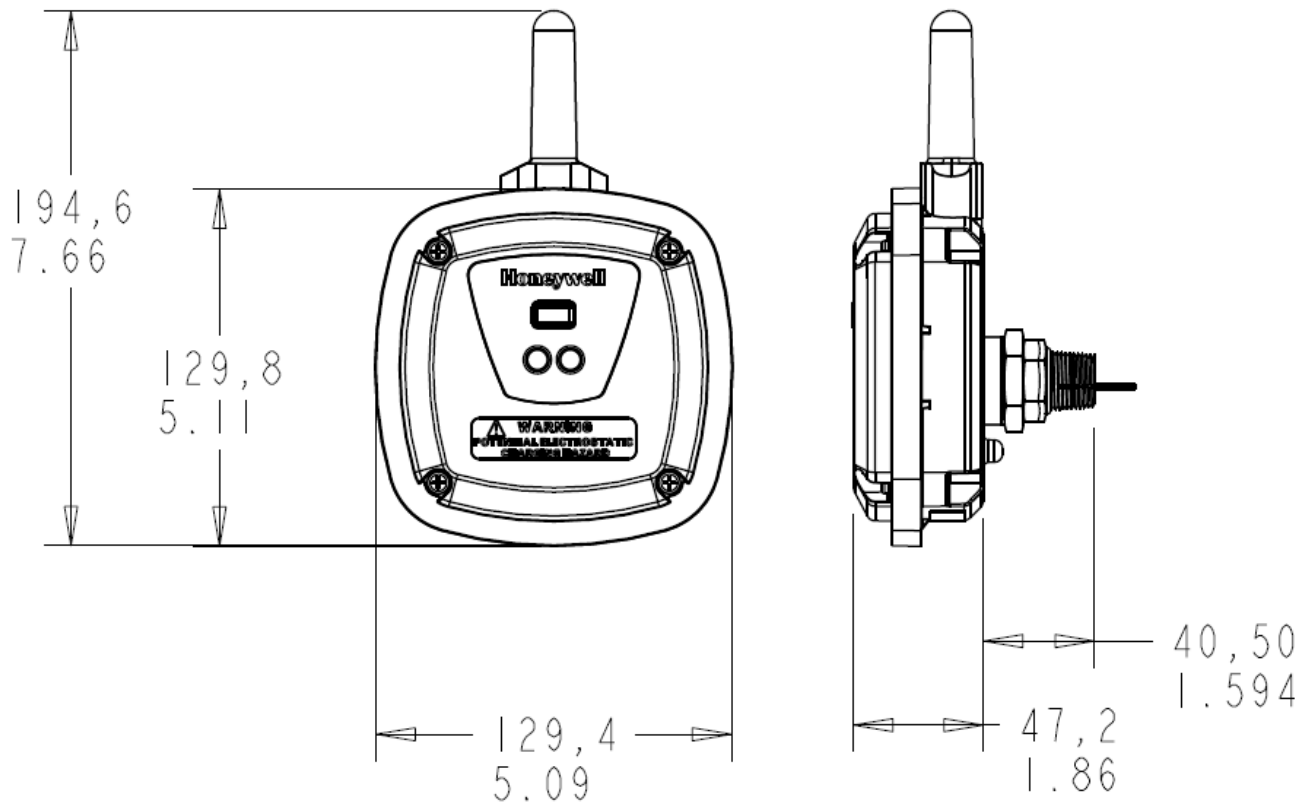


Figure 1 – OWA Dimensions

9 Approved Antenna Types/Gains

Table 4 – Approved Antenna Types/Gains

Antenna Type	Antenna Application	Manufacturer	Manufacturer Part Number	Honeywell Part Number	Beam Width	Peak Gain (dBi)	Freq. (GHz)	Agency Compliance
Omni (integral)	Point to Multi-Point	CENTURION	WCP2400-MMCX4	50053590-001	Omni	2.5	2.4	FCC, IC, ETSI

The antenna impedance is 50 ohms.

10 Equivalent Isotropically Radiated Power (EIRP)

In radio communication systems, Equivalent Isotropically Radiated Power (EIRP) or, alternatively, Effective Isotropic Radiated Power, is the amount of power that would have to be emitted by an isotropic antenna (that evenly distributes power in all directions and is a theoretical construct) to produce the peak power density observed in the direction of maximum antenna gain. EIRP can take into account the losses in transmission line and connectors and includes the gain of the antenna. The EIRP is often stated in terms of decibels over a reference power level that would be the power emitted by an isotropic radiator with an equivalent signal strength. The EIRP allows making comparisons between different emitters regardless of type, size or form. From the EIRP, and with knowledge of a real antenna's gain, it is possible to calculate real power and field strength values.

$$\text{EIRP(dBm)} = \text{Radio TX Power (dBm)} - \text{Cable Loss (dB)} + \text{Antenna Gain(dBi)}$$

Antenna gain is expressed relative to a (theoretical) isotropic reference antenna (dBi).

11 EIRP LIMITS

Table 5 – Maximum EIRP Limits for ISA100 Radios

Antenna Type	Radio Usage / Application		Freq. (GHz)	Max. Ant. Gain (dBi)	Agency/Country	Max. TX Power Setting (dBm) ¹	Max. EIRP (dBm)
2.5 dBi Omni	Point to Multi-Point	Integral	2.4	2.5	FCC, IC	20	22
					ETSI	8	10

Notes for Table 5:

- The Maximum TX Power Setting values given in Table 5 represent the power produced by the Radio circuit within the RF Module. These Maximum TX Power Setting values do not include antenna gain nor do they include the losses caused by the enclosure, cables and connectors. When these external gains and losses are included, then using these Maximum TX Power Setting values ensures that the OWA EIRP will not exceed the maximum EIRP limits that are given in Table 5.
- The values in the above tables have been determined through agency certification testing.
- The following shall apply for antenna type, frequency range, application/usage and agency/country compliance:
 - Antenna gains above the maximum values shown shall not be used.
 - Maximum overall radio output power shown shall not be exceeded.
 - Maximum EIRP values shown above shall not be exceeded.
- Industry Canada Compliance Statement:** This device has been designed to operate with the antenna types listed in this document. Antenna types not included in this list are strictly prohibited for use with this device.

Table 6 – Factory Transmit Power Settings for FCC, IC and ETSI

Description	TX Power Setting for ETSI ³ (dBm)	TX Power Setting for FCC/IC ³ (dBm)
2.5 dBi Integral Antenna	8	14

Notes for Table 6:

- The Model Number of any instrument may be found on the identification name plate located on the outside of the OWA.
- TX Power is set by the Honeywell factory producing the OWA. The factory set value for TX power is determined by the customer's model number selections in the Model Selection Guide in Table II for Country Code and is consistent with the values shown in Table 6. If the Country location is changed in the field away from the Model Number listed on the instrument's nameplate, then the TX power setting should likewise be changed per the table above to match the new Country selection. See Section 12.
- The TX Power Setting values given in and Table 6 represent the power produced by the Radio circuit within the RF Module. These TX Power Setting values do not include antenna gain. When this external gain is included, then using the TX power values in Table 6 ensures that the OWA EIRP will not exceed the maximum EIRP limits that are given in Table 5.

12 Setting TX Power

Warning! The OWA must be Professionally Installed in accordance with the requirements specified in this document. Only the specified power settings, antenna type and gain as outlined in this document are valid for OWA installations.

The OWA as shipped from the factory will have its TX Power value set according to its Model Number and this value is consistent with those values given in Table 6.

The TX Power setting may be changed via the Authentication Device when a special application (app) is installed. This app is considered to be Honeywell sensitive material and is made available only to the qualified Professional Installer. Due to radio approval body regulations, changing the TX Power setting is only available if the professional installer option has been explicitly enabled on your Authentication Device. If you do not have the professional installer option enabled and would like to do so, then please contact Honeywell Global Technical Services (GTS). A separate application, AuthDev Power Settings, is required to enable the "Write TX Power Level" option.

When this app is installed in the AD, the TX power setting, normally a read-only parameter, becomes a read/write parameter.

The TX Power adjustment feature is provided for Professional Installers to adjust the OWA TX power to match a change made at the installation site and still ensure that the EIRP does not exceed the regulatory limits.

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13 Agency Label Information

The following information shall be clearly and permanently labeled on the OWA unit:

13.1 External FCC/IC Labels

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION.
FCC ID: S5750025034 / IC: 573I-50025034



13.2 Internal FCC/IC Label

50021957-004

RF MOD 50025034-002
FCC ID: S5750025034
IC: 573I-50025034

14 RF Safety, Maximum Permissible Exposure (MPE) Statement

To comply with FCC's and Industry Canada's RF exposure requirements, the following antenna installation and device operating configurations must be satisfied:

The OWA unit must not be co-located with any other antenna or transmitter device and have a separation distance of at least 20 cm from all persons.

15 Agency Compliance

15.1 Radio and EMC Certifications

15.1.1 Federal Communication Commission (FCC)

- Specification: FCC Part 15.247 Subpart B for unintentional radiators
- Specification: FCC Part 15.247 Subpart C for intentional radiators

15.1.2 Industry Canada (IC)

- Method: RSS-210, Issue 7
- RSS-Gen, Issue 2
- ICES-003, Issue 4

15.1.3 European Telecommunications Standards Institute (ETSI)

- Emissions Specification and Method: EN 300 328 V1.7.1
- Emissions Spec and Method: EN 301 893 V1.3.1
- Immunity Specification: EN 301 489-17 V1.2.1
- Immunity Method: EN 301 489-1 V1.6.1
- Product Standard: IEC61326-1 (1st Edition, 2002-02, Industrial Locations)

15.2 Product Safety Agency Certifications

15.2.1 Canadian Standards Association (CSA)

- ANSI/ISA S82.02.01 (61010-1) CSA C22.2 No. 1010-1, ANSI/UL 61010-1, Safety Standard for Electrical Equipment for Measurement, Control and Laboratory Use – Part 1: General Requirements
- C22.2 No. 0, General Requirements - Canadian Electrical Code, Part II
- C22.2 No. 94, Special Purpose Enclosures, Industrial Products
- C22.2 No. 142, Industrial Control Equipment, Industrial Products
- C22.2 No. 157, Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations
- C22.2 No. 213, Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations
- E60079-0, Electrical Apparatus for Explosive Gas Atmospheres, Part 0: General Requirements
- E60079-15, Electrical Apparatus for Explosive Gas Atmospheres, Part 15: Electrical Apparatus With Type of Protection "n"
- CSA C22.2 No. 60529, Degrees of Protection Provided by Enclosures (IP Code)
- CSA E61241-1-1, Electrical Apparatus for Use in the Presence of Combustible Dust Temperature code: T4 (135°C) based on the maximum specified ambient of 85°C.

15.2.2 Factory Mutual (FM)

- ANSI/ISA S82.02.01 (61010-1) CSA C22.2 No. 1010-1, ANSI/UL 61010-1, Safety Standard for Electrical Equipment for Measurement, Control and Laboratory Use – Part 1: General Requirements
- Factory Mutual Approval Standard Class No. 3600, "Electrical Equipment for Use in Hazardous (Classified) Locations – General Requirements"

- Factory Mutual Approval Standard Class No. 3810, “Electrical and Electronic Test, Measuring, and Process Control Equipment
- Factory Mutual Approval Standard Class No. 3611, “Electrical Equipment for Use in Class I, Division 2, Class II, Division 2 and Class III, Division 1 and 2 Hazardous (Classified) Locations
- ANSI/NEMA 250, Enclosures for Electrical Equipment (1,000 Volts Maximum)
- ANSI/ISA -12.00.01-2002 (IEC 60079-0 Mod), Electrical Apparatus for Explosive Gas Atmospheres – General Requirements
- ANSI/ISA -12.02.01-2002 (IEC 60079-11 Mod), Electrical Apparatus for Explosive Gas Atmospheres – Intrinsic Safety
- ANSI/IEC 60529, Degrees of protection provided by enclosures (IP Code)
- ANSI/ISA 60079-31 (12.10.03), Explosive Atmospheres – Part 31: Equipment Dust Ignition Protection by Enclosure "t"
- ANSI/ISA -12.12.01-2003 (IEC 60079-15 Mod), Electrical Apparatus for Explosive atmospheres – Part 15: Equipment protection by type of protection "n"
- Temperature code: T4 (135°C) based on the maximum specified ambient of 85°C.

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15.2.3 European ATEX Certification (ATEX)

- EN 60079-0, Electrical Apparatus for Explosive Gas Atmospheres, Part 0: General Requirements
- EN 60079-11, Electrical Apparatus for Explosive Gas Atmospheres, Part 11: Intrinsic Safety "i"
- EN 60079-15, Electrical Apparatus for Explosive Gas Atmospheres, Part 15: Electrical Apparatus with Type of Protection "n"
- EN 60529, Degrees of protection provided by enclosures (IP Code)
- EN 60079-26, Explosive Atmospheres – Part 26: Equipment With Equipment Protection level (EPL) Ga
- EN 60079-31, Explosive Atmospheres – Part 31: Equipment Dust Ignition Protection by Enclosure "t"
- The temperature code for the OWA shall not exceed T4 (135°C) based on the maximum specified ambient of 85°C.

15.2.4 IECEx Certification

- IEC 60079-0, Electrical Apparatus for Explosive Gas Atmospheres, Part 0: General Requirements
- IEC 60079-11, Electrical Apparatus for Explosive Gas Atmospheres, Part 11: Intrinsic Safety "i"
- IEC 60079-15, Electrical Apparatus for Explosive Gas Atmospheres, Part 15: Electrical Apparatus with Type of Protection "n"
- IEC 60529, Degrees of protection provided by enclosures (IP Code)
- IEC 60079-26, Explosive Atmospheres – Part 26: Equipment With Equipment Protection level (EPL) Ga
- IEC 60079-31, Explosive Atmospheres – Part 31: Equipment Dust Ignition Protection by Enclosure "t"
- The temperature code for the OWA shall not exceed T4 (135°C) based on the maximum specified ambient of 85°C.

15.2.5 European Union Certification (CE-mark)

- Compliance with:
 - R&TTE Directive 1999/5/EC
 - EMC Directive 2004/108/EC
 - ATEX Directive 94/9/EC

16 Reference Documents

Table 7 – Reference documents

- 1 Getting Started with Honeywell OneWireless
- 2 Honeywell OneWireless Planning Guide
- 3 OneWireless OWA Model Selection Guides
- 4 Honeywell OWA User's Manuals
- 5 Honeywell OneWireless System Administration Guide
- 6 Honeywell OneWireless Field Network Dictionary
- 7 OneWireless Builder Parameter Reference
- 8 OneWireless Builder User's Guide

These reference documents may be found on the Honeywell HPS website for Wireless Instrumentation.

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