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OneWireless Multinode Agency Compliance Professional Installation Guide

Honeywell Industrial Automation and Control
Ft. Washington, Pennsylvania

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1 DESIGNATION, SCOPE AND PREFACE

1.1 Designation

HONEYWELL ONEWIRELESS MULTINODE DEVICE.

1.1.1 Model Numbers and Revisions :

This document is valid for the following Multinode assembly number :

Number	Revision	Description
51153884-100	B	Honeywell OneWireless Multinode Device - Top Level Assembly Drawing

Table 1 – Assembly Number and Revision

1.2 Scope

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

1.3 Preface

This manual covers professional installation of the optional external antennas for use with the Honeywell OneWireless Multinode device. Since this device requires manual power limit settings for use with the higher gain antennas, it is classified by the FCC as a professional install device. To be in compliance with FCC requirements, the radio must be installed with one of several approved antennas listed in this document. The Honeywell OneWireless Multinode device works in conjunction with Honeywell XYR5000 and XYR6000 wireless transmitters and Wi-Fi access point devices. See the Getting Started with Honeywell OneWireless, Honeywell OneWireless Planning Guide and Honeywell OneWireless Multinode User's Guide, for general information on overall system implementation, configuration, and management of the multimode.

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2 FEDERAL COMMUNICATION COMMISSION (FCC)

2.1 FCC Compliance Statement

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.

2.2 IMPORTANT FCC NOTE

Intentional or unintentional changes or modifications must not be made to the Multinode 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.

2.2.1 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 20cm and a separation distance of at least 20cm from all persons.**
- **Remote Fixed Point-to-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 20cm and a separation distance of at least 100cm from all persons.**
- **Furthermore, when using integral antenna(s) the Multinode unit must not be co-located with any other antenna or transmitter device and have a separation distance of at least 20cm from all persons.**

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2.3 FCC and Industry Canada (IC) Identification Numbers:

- Honeywell Multinode FHSS Radio Limited Modular Approval
 - Federal Communication Commission Identification: **S57 – WNMNFHSS**

- Honeywell Multinode 802.11a/b/g Radio Limited Modular Approval
 - Federal Communication Commission Identification: **S57 – WNMNCM9**

- Honeywell Multinode FHSS Radio Limited Modular Approval
 - Industry Canada Identification: **573I – WNMNFHSS**

- Honeywell Multinode 802.11a/b/g Radio Limited Modular Approval
 - Industry Canada Identification: **573I – WNMNCM9**

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3 Abbreviations & Definitions

The term Honeywell Multinode Device (or simply Multinode) will be used to describe the composite unit which includes the Honeywell FHSS Radio Board, 3eTI Mesh Board, Power Supply board, and all subassemblies housed inside the Multinode enclosure.

ACMA	Australian Communications and Media Authority
ATEX	Potentially Explosive Atmospheres Directive
AWG	American Wire Gauge
Co-located	Two or more radios transmitting simultaneously and with less than 20cm of separation distance.
COTS	Commercial Off-The-Shelf
CSA	Canadian Standards Association
EMC	Electromagnetic Compatibility
ETSI	European Telecommunications Standards Institute
EU	European Union
FCC	Federal Communications Committee
FHSS	Frequency-Hopping Spread Spectrum
FM	Factory Mutual
IC	Industry Canada
IEEE	Institute of Electrical and Electronics Engineers
IR	Infrared
IrDA	Infrared Data Association
LED	Light Emitting Diode
MPE	Maximum Permissible Exposure
MTBF	Mean Time Between Failures
NEMA	National Electrical Manufacturers Association
PCB	Printed Circuit Board
PCI	Peripheral Components Interconnect
RAM	Random Access Memory
RJ-45	Registered Jack-45
RPN	Reverse Polarity N-type
SQA	Supplier Quality Assurance
Wi-Fi	Wireless Local Area Network based on IEEE 802.11 Specifications
WNSIA	Wireless Network for Secure Industrial Application

Table 2 –Table of Abbreviations and Definitions

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4 MULTINODE GENERAL DESCRIPTION

4.1 Intended Use

The Multinode unit is a key component of the Honeywell *Wireless Network for Secure Industrial Application* (WNSIA). It provides wireless mesh connectivity for wireless sensor networks and wireless worker appliances. The Multinode uses powerful radios to communicate with gateway devices connected to a wired DCS network, and a low-powered radio to communicate with wireless sensors. The Multinode unit consists of two types of radios: a sensor radio for communication with XYR 6000 transmitters and IEEE 802.11a/b/g radios for mesh (bridge) network and communication with mobile access point (client) devices.

4.2 Multinode Device Diagrams

Figure 1 shows the unit-level drawing of the Multinode Device. All cables exit the unit via a 3/4" conduit hub. The conduit hub allows end user to land conduit on the Multinode Device. **Figure 1** shows the Multinode and all of external interfaces.

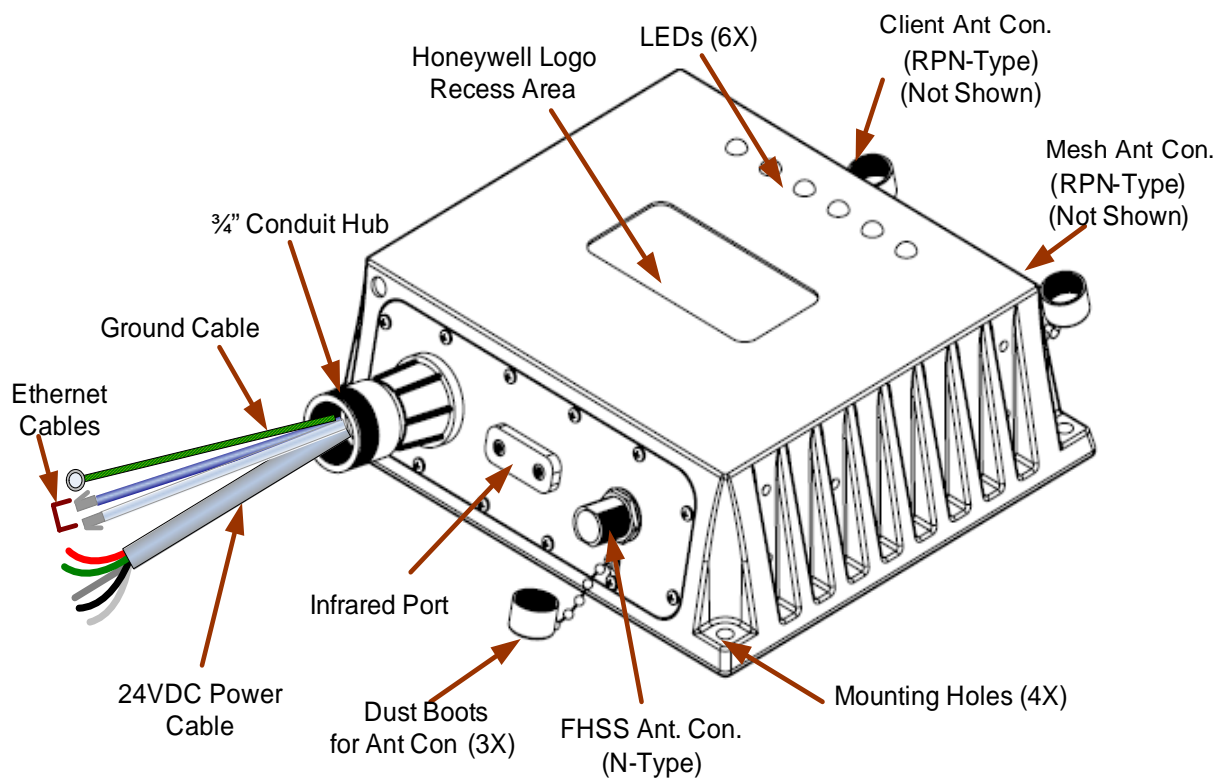


Figure 1 –Diagram of Multinode Unit showing various external attributes

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5 PRODUCT SPECIFICATIONS

5.1 Frequency Hopping Spread Spectrum (FHSS) Radio, 2.4GHz

Warning! The Multinode unit must be Professionally Installed in accordance with the requirements specified in this document. See Section 10, for professional installation maximum power setting requirements. Only the specified power settings, antenna types and gains and cable lengths (attenuation) as outlined in this document are valid for Multinode installations.

Item	Specification
Wireless Standard	Frequency Hopping Spread Spectrum (FHSS), 2.4GHz
Data Rates and Modulation	Data Rate: 250kbps Modulation: Gaussian Frequency Shift Keying (GFSK)
Frequency Band	2,402 – 2,482MHz
Transmit Power	Maximum: 19dBm (Maximum transmit power will vary by channel and individual country regulations.)
Receive Sensitivity (typical)	-98dBm

Table 3 – Specifications of FHSS Radio in Multinode Device.

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5.2 IEEE 802.11a/b/G (Wi-Fi) Radios

The Multinode has two IEEE 802.11 radios for implementing client (access point) and mesh (bridge) networks.

Warning! The Multinode unit must be Professionally Installed in accordance with the requirements specified in this document. See Section 11, for professional installation maximum power setting requirements. Only the specified power settings, antenna types and gains and cable lengths (attenuation) as outlined in this document are valid for Multinode installations.

Item	Specification
Wireless Standards	IEEE 802.11a/b/g
Data Rates and Modulation	<ul style="list-style-type: none"> • 802.11a: 54, 48, 36, 24, 18, 12, 9, 6 Mbps, Orthogonal Frequency Division Multiplexing (OFDM) • 802.11b: 11, 5.5, 2, 1 Mbps, Direct Sequence Spread Spectrum (DSSS) • 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps, OFDM
Frequency Bands and Operating Channels	<p>United States and Canada (FCC and IC):</p> <ul style="list-style-type: none"> • 802.11b/g: 2,412 – 2,462MHz, Channels 1 – 11 • 802.11a: 5,745 – 5,825, Channels 149,153,157,161,165 <p>Europe (ETSI):</p> <ul style="list-style-type: none"> • 802.11b/g: 2,412 – 2,472MHz, Channels 1 – 13 • 802.11a: 5,500 – 5,700, Channels 100,104,108,112,116,120,124,128,132,136,140 <p>Australia (ACMA):</p> <ul style="list-style-type: none"> • 802.11b/g: 2,412 – 2,472MHz, Channels 1 – 13 • 802.11a: 5,745 – 5,825, Channels 149,153,157,161,165
Transmit power (Maximum transmit power will vary by channel, data rate, and individual country regulations.	<p>Maximum:</p> <ul style="list-style-type: none"> • 802.11a: 23 dBm • 802.11b: 16 dBm • 802.11g: 16 dBm
Receive sensitivity (typical)	<p>802.11a: -88dB@6Mbps, -87dB@9Mbps, -85@12Mbps, -83dB@18Mbps, -80dB@24Mbps, -75dB@36Mbps, -73dB@48Mbps, -71dB@54Mbps</p> <p>802.11b: -95dB@1Mbps, -94dB@2Mbps, -92dB@5.5Mbps, -90dB@11Mbps</p> <p>802.11g: -90dB@6Mbps, -89dB@9Mbps, -87@12Mbps, -85dB@18Mbps, -82dB@24Mbps, -79dB@36Mbps, -76dB@48Mbps, -74dB@54Mbps</p>

Table 4 – IEEE 802.11a/b/g Wi-Fi Radio Specifications.

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5.3 Multinode User Environment

Item	Specification
Operating Temperature:	-20 °C to +60 °C
Storage Temperature:	-20 °C to +60 °C
Operating Humidity:	0 to 100% RH

Table 5 – Specifications User Environment Multinode Device.

5.4 Multinode Power Specifications

Item	Specification
Operating Voltage:	20.4Vdc to 26.4Vdc
Power Consumption (typical):	25W

Table 6 – Power Specifications Multinode Device.

5.5 Weight

The weight of the complete Multinode units shall be 7.0 lb. (3.2 kg) maximum. This weight does not include the integral antennas.

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5.6 Dimensions

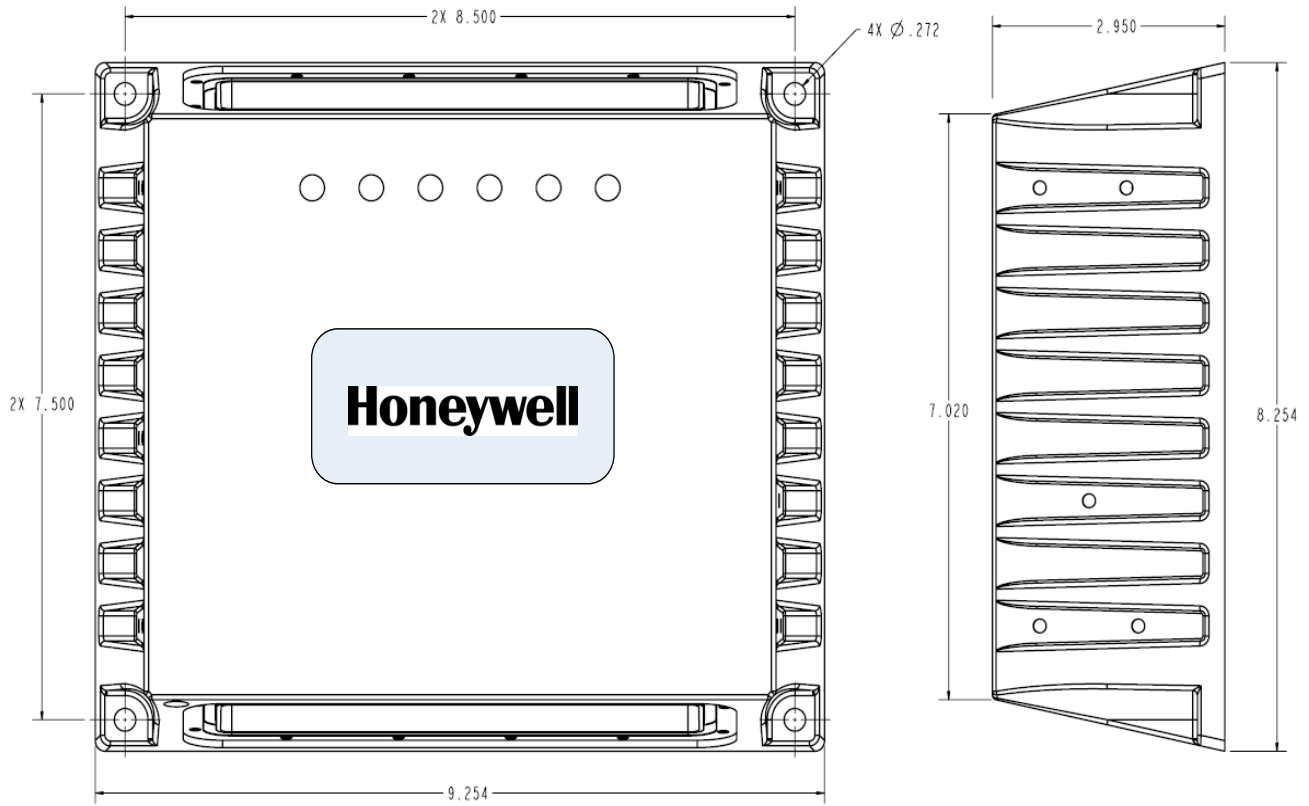


Figure 2 – Dimension of the Multinode Device

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6 Cables

6.1 External Interface Cables

Cable Type	Specification	Qty	Comments/Specification
External Ethernet	CAT5E Stranded Core	2	Routed through conduit hub. Termination = RJ-45 Modular Plug Finished Length = 24 inches
24VDC Power	Multi-conductor, AWG	1	Finished Length = 24 inches Routed through conduit hub Conductor Color: Red & Black = 24VDC White & Green = Common Drain wire = Chassis potential
Ground Conductor	AWG10	1	Routed through conduit hub Color = Green or Green with yellow stripes. Finished length = 24 inches

Note:

- Finished length is measured from conduit hub to outside tip of cable.
- Ground conductor must be attached to product safety protective earth and building steel ground.
- All external wiring must be routed through metal conduit.

Table 7 – External Cable Specification for Multinode Device.

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6.2 Antenna Cables

Cable Application	Honeywell Part #	Cable Type	Connector Type	Frequency (GHz)	Length (m)	Loss (dB)
FHSS	50018278-001	400 Series	N male to N male	2.4	1	0.9
FHSS	50018278-003	400 Series	N male to N male	2.4	3	1.1
FHSS	50018278-010	400 Series	N male to N male	2.4	10	2.4
802.11a/b/g	51202358-001	400 Series	RPN plug to N male	2.4/5.8	1	0.9 / 1.8
802.11a/b/g	51202358-003	400 Series	RPN plug to N male	2.4/5.8	3	1.1 / 2.3
802.11a/b/g	51202358-010	400 Series	RPN plug to N male	2.4/5.8	10	2.4 / 3.8

Table 8 - Antenna Cable Specifications for Multinode Device.

7 Antenna Lightning Arrestors

7.1 For use with Integral Antenna(s)

Application	Honeywell Part Number	Specification	Connector Type	Frequency (GHz)	Attenuation (dB)
FHSS	51202359-200	50 ohm	NM - NF	0 - 6	0.4 (max)
802.11 a/b/g	51202359-300	50 ohm	RPN Plug - NF	0 - 6	0.5 (max)

Table 9 – Lightning Arrestor Specifications for Integral Antenna(s)

7.2 For use with Remote Antenna(s)

Application	Honeywell Part Number	Specification	Connector Type	Frequency (GHz)	Attenuation (dB)
FHSS	50018279-090	50 ohm	NF to NF	0 - 3	0.4 (max)
802.11 a/b/g	51202359-100	50 ohm	NF toNF	0 - 6	0.5 (max)

NOTE: Depending on application needs, the “integral” arrestors may be used for remote antennas.

Table 10 – Lightning Arrestor Specifications for Remote Antenna(s)

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8 Approved Antenna Types/Gains

8.1 FHSS Radio:

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	SMARTANT	HON04-052160	51506534-100	Omni	5	2.4	FCC, IC, ETSI, ACMA
Omni (remote)	Point to Multi-Point	HYPERLINK	HGV-2409U	50018414-001	Omni	8	2.4	FCC, IC, ETSI, ACMA
Sector (remote)	Point to Multi-Point	HYPERLINK	HG2414SP-120	NA	120°	14	2.4	FCC, IC, ETSI, ACMA

Table 11 – Approved Antenna Types/Gains, FHSS Radio

8.2 802.11a/b/g Access point and Bridge (Mesh) Radio

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	SMARTANT	SAA04-220080	51153883-305	Omni	4.5	2.4 802.11b/g	FCC, IC, ETSI, ACMA
						7	5.4 802.11a	ETSI
							5.8 802.11a	FCC, IC, ACMA
Omni (remote)	Point to Multi-Point	HYPERLINK	HGV-2409U	50018414-001	Omni	8	2.4 802.11b/g	FCC, IC, ETSI, ACMA
Omni (remote)	Point to Multi-Point	HYPERLINK	HG5412U	NA	Omni	12	5.4 802.11a	ETSI
Omni (remote)	Point to Multi-Point	HYPERLINK	HG5812U-PRO	NA	Omni	12	5.8 802.11a	FCC, IC, ACMA
Sector (remote)	Point to Multi-Point	HYPERLINK	HG2414SP-120	NA	120°	14	2.4 802.11b/g	FCC, IC, ETSI, ACMA
Sector (remote)	Point to Multi-Point	HYPERLINK	HG5417P-090	NA	90°	17	5.4 802.11a	ETSI
Sector (remote)	Point to Multi-Point	HYPERLINK	HG5817P-090	NA	90°	17	5.8 802.11a	FCC, IC, ACMA
YAGI (remote)	Point to Multi-Point	TELEX	5816AB	NA	19°	16.5	5.8 802.11a	FCC, IC, ACMA
DISH (remote)	Fixed Point to Point	HYPERLINK	HG5423D	NA	9°	23	5.4 802.11a	ETSI
DISH (remote)	Fixed Point to Point	HYPERLINK	HG5824D	NA	9°	24	5.8 802.11a	FCC, IC, ACMA

Table 12 – Approved Antenna Types/Gains, 802.11a/b/g Radios

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9 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.

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

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

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10 EIRP LIMITS, FHSS RADIO

Antenna Type	Radio Usage / Application		Freq. (GHz)	Max. Ant. Gain (dBi)	Min. Cable Length (m)	Min. Cable Loss (dB)	Max. Radio Output Power (dBm)	Max. EIRP (dBm)	Agency/Country
Omni	Point to Multi-Point	Integral	2.4	5	0	0	19	24	FCC, IC
							14	19	ETSI, ACMA
Omni	Point to Multi-Point	Remote	2.4	8	1	0.9	17	24	FCC, IC
							12	19	ETSI, ACMA
Sector	Point to Multi-Point	Remote	2.4	14	1	0.9	12	25	FCC, IC
							6	19	ETSI, ACMA

Notes:

- The values in the above table 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.
 - Cable length/loss below the minimum 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.

Table 13 – EIRP Limits, FHSS Radio

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11 EIRP LIMITS, 802.11a (5.8GHz) Access Point and Bridge Radio

Ant. Type	Radio Usage / Application		Freq. (GHz)	Max. Ant. Gain (dBi)	Min. Cable Length (m)	Min. Cable Loss (dB)	Max. Radio Output Power (dBm)	Max. EIRP (dBm)	Pro-Install Power Setting	Agency/Country
Omni	Point to Multi-Point	Integral	5.8 802.11a	7	0	0	23	30	25	FCC, IC
							23	30	25	ACMA
Omni	Point to Multi-Point	Remote	5.8 802.11a	12	1	1.8	23	33	25	FCC, IC
							20	30	2	ACMA
Sector	Point to Multi-Point	Remote	5.8 802.11a	17	1	1.8	17	32	-7	FCC, IC
							14	30	-12	ACMA
Yagi	Point to Multi-Point	Remote	5.8 802.11a	16.5	1	1.8	17	31	-7	FCC, IC
							15	30	-11	ACMA
Dish	Fixed Pt. to Pt.	Remote	5.8 802.11a	24	1	1.8	23	45	25	FCC, IC
							8	30	-24	ACMA

Notes:

- The values in the above table have been determined through agency certification testing.
- Maximum transmit power will vary by channel, data rate, and individual country regulations.
- 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.
 - Cable length/loss below the minimum 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.

Table 14 – EIRP Limits, 802.11a (5.8GHz) Radios

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12 EIRP LIMITS, 802.11a (5.4GHz) Access Point and Bridge Radio

Ant. Type	Radio Usage / Application		Freq. (GHz)	Max. Ant. Gain (dBi)	Min. Cable Length (m)	Min. Cable Loss (dB)	Max. Radio Output Power (dBm)	Max. EIRP (dBm)	Pro-Install Power Setting	Agency/ Country
Omni	Point to Multi-Point	Integral	5.4 802.11a	7	0	0	23	30	2	ETSI
Omni	Point to Multi-Point	Remote	5.4 802.11a	12	1	1.8	19	30	-6	ETSI
Sector	Point to Multi-Point	Remote	5.4 802.11a	17	1	1.8	14	30	-17	ETSI
Dish	Fixed Pt. to Pt.	Remote	5.4 802.11a	23	1	1.8	8	30	-35	ETSI

Notes:

- The values in the above table have been determined through agency certification testing.
- Maximum transmit power will vary by channel, data rate, and individual country regulations.
- 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.
 - Cable length/loss below the minimum 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.

Table 15 – EIRP Limits, 802.11a (5.4GHz) Radios

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13 EIRP LIMITS, 802.11b/g (2.4GHz) Access Point and Bridge Radio

Ant. Type	Radio Usage / Application		Freq. (GHz)	Max. Ant. Gain (dBi)	Min. Cable Length (m)	Min. Cable Loss (dB)	Max. Radio Output Power (dBm)	Max. EIRP (dBm)	Pro-Install Power Setting	Agency/ Country
Omni	Point to Multi-Point	Integral	2.4 802.11b/g	4.5	0	0	16	21	40	FCC, IC
							15	19	2	ETSI, ACMA
Omni	Point to Multi-Point	Remote	2.4 802.11b/g	8	1	0.9	16	23	40	FCC, IC
							12	19	-4	ETSI, ACMA
Sector	Point to Multi-Point	Remote	2.4 802.11b/g	14	10	2.4	16	28	40	FCC, IC
							6	19	-23	ETSI, ACMA

Notes:

- The values in the above table have been determined through agency certification testing.
- Maximum transmit power will vary by channel, data rate, and individual country regulations.
- 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.
 - Cable length/loss below the minimum 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.

Table 16 – EIRP Limits, 802.11b/g (2.4GHz) Radios

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14 Setting Power and Country Code: FHSS Radio

Warning! The Multinode unit must be Professionally Installed in accordance with the requirements specified in this document. Only the specified power settings, antenna types and gains and cable lengths (attenuation) as outlined in this document are valid for Multinode installations.

Set the radio power level using the Authentication Device application. Due to regulations, this command is only available if professional installer options have explicitly been enabled on your PDA. If you have not enabled professional installer options and would like to do so, please contact Honeywell DE or TAC. A separate application, AuthDev Power Settings, is required to enable the "Write TX Power Level" option.

Perform the following procedure to read and change the radio power level on your multinode or wireless device:

- Open the Authentication Device application on your Windows Mobile PDA.
- From the main menu, choose the Advanced Options menu to open the Advanced Options form.
- From the Advanced Options form, choose "Read TX Power Level" from the command drop down box.
- Aim the Authentication Device at your node and press the Transmit Command button to read the data from the node. The TX Power reading will be presented on your screen.
- If you have enabled professional installer options within the Authentication Device, choose the "Write TX Power Level" from the command drop down box.
- Choose a new power level. Aim the Authentication Device at your node and press the Transmit Command button to write the data to the node.

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15 Setting Power & Country Code: 802.11 Access Point & Bridge Radio

Warning! The Multinode unit must be Professionally Installed in accordance with the requirements specified in this document. Only the specified power settings, antenna types and gains and cable lengths (attenuation) as outlined in this document are valid for Multinode installations.

Programming the Country Code

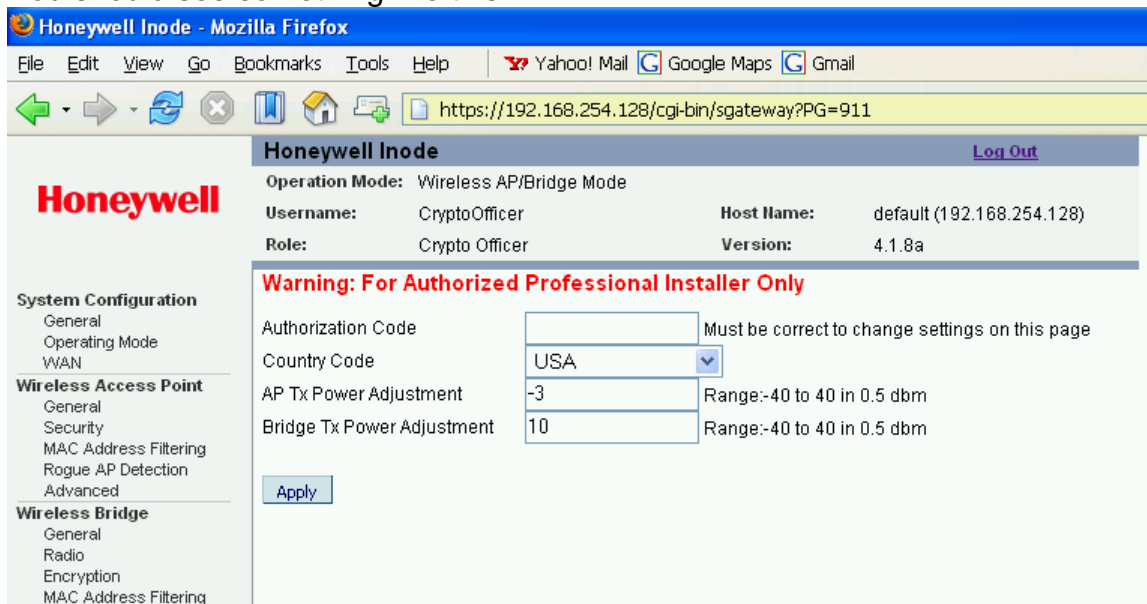
A hidden page on the Multinode Configuration Tool has been designed for professional installers to change country code and radio output power settings. A valid authorization code has to be entered for the any information to be modified. **This authorization code is hard-coded in the firmware and shall be kept as a SECRET at all times.**

To access the hidden page, type the following URL in your browser:

https://192.168.254.128/cgi-bin/sgateway?PG=911

**Change 192.168.254.128 to the IP address of your unit, and make sure you login as:
Login: CryptoOfficer, Password: CryptoFIPS**

You should see something like this:



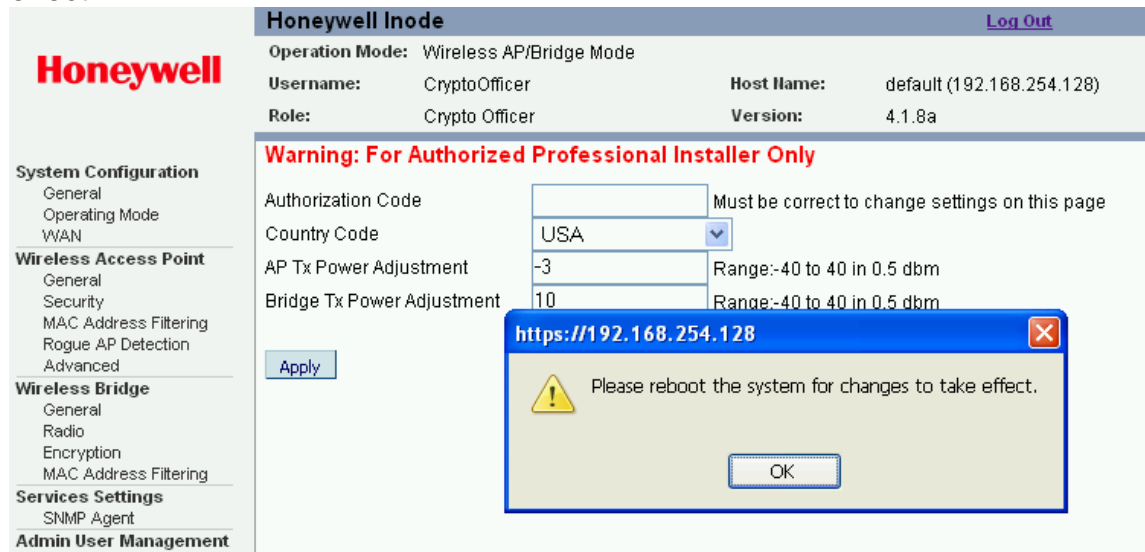
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The authorization code is: "Raptor2007!" without the quote **(YOU MUST KEEP THIS AS A SECRET)**

Change the following options based on values you determined in Section 11:

- Country Code
- Adjustment to Max TX power of Access Point Radio (increase or decrease)
- Adjustment to Max TX power of Bridge Radio (increase or decrease)

After applying the changes, you will be notified to reboot the unit for any changes to take effect.



Note that the adjustment of radio Max TX power has limits. It will level off on both the low end and high end. This feature is provided for professional installers to adjust the card output power to match the specific selection of antenna and keep the total output power under the regulatory threshold.

The setting here are saved in non-volatile memory inside the unit. Restoring the unit to factory default settings does not change these values.

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15.1 Power Setting Reference Table, 802.11 Access Point & Bridge Radio:






Multinode Bridge and Access Point Radio Ports				
WIRELESS MODE	802.11a	802.11a	802.11b/g mixed	802.11b/g mixed
CHANNEL	120 (5.6GHz)	157 (5.785GHz)	7 (2.442GHz)	6 (2.437GHz)
TX PWR MODE	FIXED, 8	FIXED, 8	FIXED, 8	FIXED, 8
Professional Installer TX Power Setting	MEASURED OUTPUT POWER (dBm)	MEASURED OUTPUT POWER (dBm)	MEASURED OUTPUT POWER (dBm)	MEASURED OUTPUT POWER (dBm)
40	24.0	23.0	17.2	16.2
35	24.0	23.0	17.2	16.2
30	24.0	23.0	17.2	16.2
25	24.0	23.0	17.2	16.2
20	24.0	23.0	17.2	16.2
15	24.0	23.0	17.2	16.2
10	23.9	20.7	17.2	16.2
5	23.7	20.1	15.7	16.2
0	21.8	19.6	13.8	16.1
-5	19.7	17.2	11.3	12.4
-10	17.0	15.7	9.0	10.7
-15	15.0	11.8	7.4	8.4
-20	12.5	8.9	6.7	6.4
-25	9.7	7.3	5.2	4.9
-30	8.5	5.2	2.4	2.8
-35	8.4	4.6	2.3	1.6
-40	8.4	4.6	2.3	1.4

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16 Agency Label Information

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

<p>Honeywell Phoenix, AZ, USA 85029 MADE IN USA</p>		<p>Multinode Wireless Device</p>	
<p>Model: WNMN Part No.: 51153884-100</p>			
<p>Input: 24VDC, +10%/-15%, 25W Amb. Temp.: -20°C to +60°C</p>			
 		 	
<p>Cl. I, Div. 2 Grp. ABCD; T4 Cl. I, Zone 2, AEx/Ex nC IIC T4 Type 4X</p>		<p>II 3G EEx nA IIC T4 FM07ATEXXXXXXX IP 66/67</p>	
<p>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 or interference and (2) this device must accept and interference received, including interference that may cause undesired operation.</p>			
<p>Contains: FCC ID: S57 – WNMNFHSS IC: 5731 – WNMNFHSS FCC ID: S57 – WNMNCM9 IC: 5731 – WNMNCM9</p>			
			

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17 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.

- *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 20cm and a separation distance of at least 20cm from all persons.*
- *Remote Fixed Point-to-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 20cm and a separation distance of at least 100cm from all persons.*
- *Furthermore, when using integral antenna(s) the Multinode unit must not be co-located with any other antenna or transmitter device and have a separation distance of at least 20cm from all persons.*

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18 AGENCY COMPLIANCE

18.1 Radio and EMC Certifications

18.1.1 Federal Communication Commission (FCC)

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

18.1.2 Industry Canada (IC)

- Specification: FCC Part 15.247 Subpart B for unintentional radiators
- Specification: FCC Part 15.247 Subpart C for intentional radiators
- Method: RSS-210, Issue 6 and RSS-Gen, Issue 1

18.1.3 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)

18.1.4 Australian communications and media authority (ACMA)

- Specification: AS NZS 4771-2000

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18.2 Product Safety Agency Certifications

18.2.1 Canadian Standards Association (CSA)

IEC61010-1 (2nd Edition, 2001-02), "Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use, part 1: General Requirements

CSA HAZ-LOC Standards?

- Temperature code: T4 (135°C) based on the maximum specified ambient of 60°C.

18.2.2 Factory Mutual (FM)

FM electrical equipment requirements for use within Class I, Division 2, Groups A, B, C and D/Zone 2, Group IIC Hazardous Locations.

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

- Temperature code: T4 (135°C) based on the maximum specified ambient of 60°C.

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18.2.3 European ATEX Certification (ATEX)

The completely assembled Multinode will conform to European electrical equipment requirements for use within Zone 2, Ex n IIC, Hazardous Locations.

European Norms Standard EN 50014:1992, "Electrical Apparatus for Potentially Explosive Atmospheres - General Requirements"

European Norms Standard EN 50021:1999, "Electrical Apparatus for Potentially Explosive Atmospheres - Type of Protection "n"

The temperature code for the Multinode shall not exceed T4 (135°C) based on the maximum specified ambient of 60°C.

18.3 European Union Certification (CE-mark)

- Compliance with:
 - R&TTE Directive 1999/5/EC
 - EMC Directive 2004/108/EC
 - LVD Directive 73/23/EEC
 - ATEX Directive 94/9/EC

19 Reference Documents

- 1 Getting Started with Honeywell OneWireless
- 2 Honeywell OneWireless Planning Guide
- 3 Honeywell OneWireless Multinode User's Guide
- 4 Radio Antenna: A Primer White Paper
- 5 Honeywell OneWireless System Administration Guide
- 6 Honeywell OneWireless Field Network Dictionary
- 7 OneWireless Builder Parameter Reference
- 8 OneWireless Builder User's Guide

Table 17 – Reference documents

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