

Installation and Technical Manual for the Limitless™ Series WDRR Receiver

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WARNING **PERSONAL INJURY**

- DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

WARNING

Honeywell does not recommend using devices for critical control applications where there is, or may be, a single point of failure or where single points of failure may result in an unsafe condition. It is up to the end-user to weigh the risks and benefits to determine if the products are appropriate for the application based on security, safety and performance. Additionally, it is up to the end-user to ensure that the control strategy results in a safe operating condition if any crucial segment of the control solution fails.

Honeywell customers assume full responsibility for learning and meeting the required Declaration of Conformity, Regulations, Guidelines, etc. for each country in their distribution market.

Failure to comply with these instructions could result in death or serious injury.

WARNING **RF EXPOSURE**

- To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna used for this transmission must not be co-located in conjunction with any other antenna or transmitter.

Failure to comply with these instructions could result in death or serious injury.

WARNING

- The WDRR must be installed in accordance with the requirements specified in this document in order to comply with the specific Country Communication Agency requirements. (i.e. FCC, IC, ETSI, ACMA, etc.) See Section 3 as it requires choosing the correct Country Use Code and thus allowable antenna and/or cable usage.

WARNING

- Pay attention to ESD discharge at dc-in port.

WARNING

- Korean Communication Commission does not allow this equipment to be used for rescue service.

WARNING

- Anatel states that this device works as a secondary function model. It may not be used as a protection device against harmful interference. It cannot cause interference with systems that are running as primary function.

CAUTION

- * Power to the WDRR should not be applied during installation of antenna as damage could occur to the WDRR electronics.

CAUTION

- * The WDRR receiver offers optimal performance when paired with Limitless™ inputs that have a firmware version of 7170 or a greater number (i.e., FW7170 will be printed on the Limitless™ input label). If the Limitless™ input is paired with older firmware (FW7170 or a lesser number), the WDRR may exhibit delayed responses under simultaneous operation.

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1.

1 DESCRIPTION

1.1 General

The Limitless™ Series uses the latest commercial off-the-shelf wireless technology that can be used in a wide variety of applications. This is especially beneficial for remote monitoring applications where previous wiring installation or wire maintenance was not physically possible or economically feasible. This document will provide installation instructions to properly install a Limitless™ Wireless DIN Rail Receiver (WDRR), as well as a detailed understanding of its functions.

1.2 Principle of Operation

A Limitless™ input sends an RF signal to the WDRR when the Limitless™ digital input changes state. There may be up to 14 Limitless™ digital inputs that communicate and indicate their state to a single WDRR. A change of state of a Limitless™ input will cause the WDRR tri-color output LED paired to that particular input to turn red or green depending on configuration. This will also cause the associated WDRR NPN or PNP output to change state. The WDRR indicates low battery conditions, lost RF links, as well as other diagnostic and functional operations described in further detail throughout this manual.

1.3 Model Reference

WDRR	1	A	00	A	0	A
Switch type	GEN code	RF Code	Antenna type code	Country use code	Output code	Channel code
WDRR Series Din-Rail Receiver	1 Version 1	A 2.4 GHz; IEEE 802.15.4	00 No antenna; RP-SMA connector jack	A US, Canada Mexico	0 NPN/PNP selectable	A 14 channels
			01 2.2 dBi omni w/integral mount; straight design	B All other approved countries ^{1,2,3}		
			02 2.2 dBi omni w/integral mount; tilt/swivel	¹ Use with antenna type codes 00 - 03, 05, 10, 11 only; usage allowed in Country Use Code A.		
			03 3.0 dBi omni w/remote adhesive mount 9.8 ft cable	² Some countries require specific communication certifications. Contact Honeywell for existing certification information.		
			04 5.5 dBi omni w/remote mag. mount, tilt/swivel 5 ft cable	³ If Limitless™ devices are used on machinery that may be shipped globally, use country code "B".		
			05 5.5 dBi omni w/remote mag. mount, tilt/swivel 10 ft cable			
			06 9.0 dBi omni w/remote mag. mount, tilt/swivel 5 ft cable			
			07 9.0 dBi omni w/remote mag. mount, tilt/swivel 10 ft cable			
			08 8.0 dBi omni w/remote bkt. mount, str. design 3 ft cable			
			09 8.0 dBi omni w/remote bkt. mount, str. design 11 ft cable			
			10 2.2 dBi omni w/remote mag. mount, tilt/swivel 10 ft cable			
			11 0 dBi omni w/ integral mount; straight design			

Abbreviations and Definitions













Table 1 –Table of Abbreviations and Definitions

ACMA	Australian Communications and Media Authority
dB	Decibel
dBi	Decibel Isotropic
dBm	Decibel above or below 1 milliwatt
DSSS	Direct Sequence Spread Spectrum
EIRP	Equivalent isotropic radiated power
EMC	Electromagnetic Compatibility
ETSI	European Telecommunications Standards Institute
EU	European Union
FCC	Federal Communications Committee
ft-lbs	Foot-pounds
GHz	GigaHertz
IC	Industry Canada
ICES	Industry Canada Electrical Specification
IEEE	Institute of Electrical and Electronics Engineers
kbps	KiloBits Per Second
LED	Light Emitting Diode
MHz	MegaHertz
MPE	Maximum Permissible Exposure
NA	North America – United States of America and Canada
NEMA	National Electrical Manufacturers Association
ODVA	Open DeviceNet Vendors Association
R&TTE	Radio and Telecommunications Terminal Equipment
RP-SMA	Reverse Polarity SMA connector
RF	Radio Frequency
TX	Transmit
WGLA	Wireless Global Limit Switch Series
WDRR	Wireless DIN Rail Receiver

1.4 Symbol Definitions

The following table lists those symbols used in this document to denote certain conditions.

Table 2 –Table Symbol Definitions

Symbol	Definition
	ATTENTION: Identifies information that requires special consideration.
	TIP: Identifies advice or hints for the user, often in terms of performing a task.
CAUTION	Indicates a situation which, if not avoided, may result in equipment or work (data) on the system being damaged or lost, or may result in the inability to properly operate the process.
	CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. CAUTION symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	WARNING: Indicates a potentially hazardous situation, which, if not avoided, could result in serious injury or death. WARNING symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	WARNING, Risk of electrical shock: Potential shock hazard where HAZARDOUS LIVE voltages greater than 30 Vrms, 42.4 Vpeak, or 60 Vdc may be accessible.
	ESD HAZARD: Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices.
	Protective Earth (PE) terminal: Provided for connection of the protective earth (green or green/yellow) supply system conductor.
	Functional earth terminal: Used for non-safety purposes such as noise immunity improvement. NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national local electrical code requirements.
	Earth Ground: Functional earth connection. NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.
	Chassis Ground: Identifies a connection to the chassis or frame of the equipment shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.
	C-Tick Mark. The C-Tick Mark is a certification trade mark registered to ACMA (Australian Communications and Media Authority) in Australia under the Trade Marks Act 1995 and to RSM in New Zealand under section 47 of the NZ Trade Marks Act. The mark is only to be used in accordance with conditions laid down by ACMA and RSM. This mark is equal to the CE Mark used in the European Union.
	Notified Body. For radio equipment used in the European Union in accordance with the R&TTE Directive, the CE Mark and the notified body (NB) identification number is used when the NB is involved in the conformity assessment procedure. The alert sign must be used when a restriction on use (output power limit by a country at certain frequencies) applies to the equipment and must follow the CE marking.

2 SPECIFICATIONS

2.1 Intended Country Usage

Table 3 – North America; Country Use Code “A”

Country	ISO 3166 2 letter code
UNITED STATES	US
CANADA	CA
MEXICO	MX

Table 4 – Asia Pacific; Country Use Code “B”

Country	ISO 3166 2 letter code
AUSTRALIA	AU
INDIA	IN
KOREA	KR
BRAZIL	BR

Table 5 – European Union; Country Use Code “B”

Country	ISO 3166 2 letter code	Country	ISO 3166 2 letter code
Austria	AT	Latvia	LV
Belgium	BE	Lithuania	LT
Bulgaria	BG	Luxembourg	LU
Cyprus	CY	Malta	MT
Czech Republic	CZ	Netherlands	NL
Denmark	DK	Poland	PL
Estonia	EE	Portugal	PT
Finland	FI	Romania	RO
France	FR	Slovak Republic	SK
Germany	DE	Slovenia	SI
Greece	GR	Spain	ES
Hungary	HU	Sweden	SE
Ireland	IE	United Kingdom	GB
Italy	IT		

Table 6 – Other European Countries; Country Use Code “B”

Country	ISO 3166 2 letter code	Country	ISO 3166 2 letter code
Bosnia and Herzegovina	BA	Norway	NO
Croatia	HR	Russian Federation	RU
Iceland	IS	Serbia	RS
Liechtenstein	LI	Switzerland	CH
Macedonia	MK	Turkey	TR



ATTENTION

Contact Honeywell before use of the WDRR in countries not listed in Tables 3 thru 6.

2.2 Certification and Approvals

See the product label for applicable approvals and ratings.

Table 7 – Approvals and Ratings

Approval/Item	Rating or Country use
Enclosure type	IP20
Federal Communications Commission (FCC)	FCC Part 15.247
Industry Canada (IC)	Canadian ICES-003
European Telecommunications Standards Institute (ETSI)	CE mark
Australian Communications and Media Authority (ACMA)	C-Tick mark
Comision Federal de Telecomunicaciones (COFETEL)	Mexico RCPDIXBIO-1147
Wireless Planning & Coordination (WPC)	India 1001/2011/WLRO-006
Korean Communications Commission	Korea
State Radio Regulation Committee Certification Center (SRRC)	China
Agencia Nacional de Telecomunicaoas (ANATEL)	Brazil 7898911288043

WARNING

- The WDRR must be installed in accordance with the requirements specified in this document in order to comply with the specific Country Communication Agency requirements. (i.e. FCC, IC, ETSI, ACMA, etc.) See Section 3 as it requires choosing the correct Country Use Code and thus allowable antenna and/or cable usage.

2.3 Radio Module Specifications

Table 8 – Radio Module Specifications

Item	Specification
Radio module	Digi International XBee –PRO®
Wireless standard	WPAN IEEE 802.15.4 Direct Sequence Spread Spectrum (DSSS), 2.4 GHz
Data rate	250 kbps
Operating frequency	ISM 2.4 GHz
Module transmit power (max.)	Country code “A”: 22 dBm; Country code “B”: 8 dBm
Receive sensitivity (typ.)	-100 dBm
# of pairing (max.)	Up to 14 Limitless™ inputs can be paired to a single WDRR

2.4 Electrical Specifications

Table 9 – Electrical Specifications

Item	Specification
Supply voltage	10 Vdc to 28 Vdc
Supply current	500 mA max.
Output type	NPN current sinking, open collector or NPN “totem pole”;
Output voltage	Supply voltage minus 1.4 Vdc
Load current	10 mA max.
Leakage current	100 uA max.
Voltage drop	2.0 Vdc max. @ max. load @ 25 °C [77 °F]
Termination	Cage-clamp screw terminal blocks

WARNING

- Pay attention to ESD discharge at dc-in port.
- The cable length of the customer-supplied dc power source to the WDRR supply terminals cannot exceed 3 meters.

2.5 Operational Characteristics

Item	Specification ³ (see example below)
Output response time (typ.) ¹	One (1) or more Limitless™ inputs: 25 mS (non-simultaneous operation; see NOTICE) Each additional Limitless™ input: Add 20 mS (simultaneous operation)
Limitless™ input actuation rate (max.) ²	20 cycles/min

¹ Time between Limitless™ input change of state (actuation or de-actuation) and the associated WDRR output change.

² One cycle is an actuation and de-actuation or two change of states of a Limitless™ input (50% duty cycle)

³ Specifications based on lab environment testing and simultaneous change of state (actuation or de-actuation) of up to 14 Limitless™ inputs. Actuation rate and/or response time may be affected by RF activity in the chosen application (see Section 8.4.3 for more information)

Example:

Simultaneous Operation= Typical Output Response time for four (4) Limitless inputs being actuated simultaneously:
25 mS + 20 mS + 20 mS +20 mS = 85 mS

Non-Simultaneous Operation= Typical Output Response time for four (4) Limitless inputs not being actuated simultaneously: 25 mS

NOTICE

- Improvement in the response time and /or increased actuation rate may be obtained by avoiding simultaneous change of state of the Limitless™ inputs. i.e. a 50 mS to 100 mS time span difference from one Limitless™ input change of state to any other Limitless™ input change of state.

CAUTION

- The WDRR receiver offers optimal performance when paired with Limitless™ inputs that have a firmware version of 7170 or a greater number (i.e., FW7170 will be printed on the Limitless™ input label). If the Limitless™ input is paired with older firmware (FW7170 or a lesser number), the WDRR may exhibit delayed responses under simultaneous operation.

2.6 EMC Specifications

The latest applicable EMC Standards are as follows:

- EN 300 328, V1.7.1
- EN 61326-1 (2006)
- EN 301 489-1, V1.8.1
- EN 301 489-17, V2.1.1

2.7 Environmental Specifications

Table 10 – Environmental Specifications

Item	Specification
Operating temperature	-20 °C to 70 °C [-4 °F to 158 °F]
Storage temperature	-20 °C to 70 °C [-4 °F to 158 °F]
Operating humidity	0 %RH to 100 %RH
Shock	IEC 60068-2-27; half sine, 10 g, 6 ms, 3 axis
Vibration	IEC 60068-2-6; 10-500 Hz w/ 0.35 mm – peak-to-peak, 58-500 Hz – 5 g

2.8 Agency Compliance Information

2.8.1 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 B 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 radio frequency 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/her own expense.
- Intentional or unintentional changes or modifications must not be made to the WDRR 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.

2.8.2 IC Compliance Statements

- To reduce potential radio interference to other users, the antenna type and its gain should be chosen so 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 B digital apparatus has been tested and found to comply with Canadian ICES-003.
- French: Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

2.8.3 Radio Frequency (RF) Safety Statement (FCC & IC)

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

- Remote antenna for this unit must be fixed and mounted on outdoor permanent structures with a separation distance between any other antenna(s) of greater than 20 cm and a separation distance of at least 20 cm [7.87 in] from all persons.
- Furthermore, when using an integral antenna with the WDRR, it must not be co-located with any other antenna or transmitter device and have a separation distance of at least 20 cm [7.87 in] from all persons.

2.8.4 European Restrictions

- Information regarding national restrictions can be found in document: ERC/REC 70-03 (Relating to the use of short-range devices including appendixes and annexes). Documentation may be found in the document database in the European Communication's office.
 - <http://www.erodocdb.dk/doks/dochistory.aspx?docintid=1622>

2.8.5 KCC Statements

- Pay attention to ESD discharge at dc-in port
- Korean Communication Commission does not allow this equipment to be used for rescue service
- The cable length of the customer-supplied dc power source to the WDRR supply terminals cannot exceed three meters

2.8.6 ANATEL Statements

- This device works as a secondary function model. It may not be used as a protection device against harmful interference with systems that are running in a primary function
- ANATEL requires the use of a Honeywell p/n: WDRRPWRASM

2.9 European (CE) Declaration of Conformity (DoC)

2.9.1 European Declaration of Conformity Statements

This section contains the European Declaration of Conformity (DoC) statement for the radio used in the Limitless™ WDRR receiver.

Figure 1. European Declaration of Conformity (DoC)



Honeywell Control Systems Ltd.,
Newhouse Industrial Estate,
Motherwell, Lanarkshire, ML1 5SB,
Scotland, United Kingdom.

Tel.: +44 (0)1698 481000
Fax: +44 (0)1698 481011

A subsidiary of Honeywell Control Systems Ltd.,

Registered Office: Honeywell House,
Arlington Business Park,
Bracknell, Berkshire,
R12 1EB.

Registered No 217808 (England)

EC Declaration of Conformity

Honeywell Control Systems Ltd. hereby declare that the products identified below conform to the essential requirements of the EC Directive(s) listed below and that the products supplied are in conformity with the type described in any EC Type Examination Certificate (EC TEC) identified below.

Manufacturer: Honeywell International, MICRO SWITCH Division,
Chicago & Spring Streets, Freeport, Illinois,
IL 61032-4353, USA

Product: Limit Switch
WDRR Wireless DIN Rail Receiver Series

Directive (Amendments)

2006/95/EEC

Conformity Details

Standards applied: EN 61010-1: 2001 + A2:2005

1999/5/EC and 2004/108/EC

Standards applied: BS EN 61326-1 2006
ETSI EN 300 328 V1.7.1
ETSI EN 301 489-1 V1.8.1 and -17 V2.1.1

Signed on behalf of Honeywell Control Systems Ltd. :

Frank Turnbull, S&C Chief Engineer

DoC No: A445

DoC Issue: 1

DoC Date: 22/03/2011

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2.9.2 For more information about the R&TTE Directive

The following website contains additional information about the Radio and Telecommunications Terminal Equipment (R&TTE) directive:

<http://ec.europa.eu/enterprise/sectors/rtte/faq/>

3 ANTENNA OPTIONS ALLOWED PER COUNTRY USE CODE

This section defines the antenna options that can be used in a particular country of interest; reference Section 2.1 for a list of Countries per Country Use Code. It is important to determine the country the WDRR will be used in. Thereby, noting the correct Country Use Code in the WDRR nomenclature will help ensure proper selection of antenna and/or cable options. The integral antenna mounts directly to the WDRR RP-SMA jack while the remote antenna mounts to the WDRR RP-SMA jack via a cable assembly (see Section 8.3.3.1). Further technical information on the WAN Series antennas, WAMM Series magnetic mounts and WCA Series cable assemblies can be found in Sections 8.13.

WARNING

- The WDRR must be installed in accordance with the requirements specified in this document in order to comply with the specific Country Communication Agency requirements. (i.e. FCC, IC, ETSI, ACMA, etc.) See Section 3 as it requires choosing the correct Country Use Code and thus allowable antenna and/or cable usage.

3.1 COUNTRY USE CODE “A” ANTENNA OPTIONS

Table 11 – Country Use Code A Antenna Options

COUNTRY CODE A					
Antenna Type Code (allowed for use)	Integral Mount Antennas (allowed for use)	Remote Mount Antennas (allowed for use)	Magnetic Remote Mount Assemblies/ Antennas WAMM100RSP-005 WAMM100RSP-010 (allowed for use)	Extension Cable Assemblies/Antennas for Remote Mount WCA200RSJRSP-002 WCA200RSJRSP-005 WCA200RSJRSP-010 WCA200RSJRSP-015 WCA200RSJRSP-020 (allowed for use)	Extension Cable Assemblies/Antennas for Remote Mount WCA200RNPRSP-002 WCA200RNPRSP-010 (allowed for use)
00	WAN01RSP	WAN03RSP	WAN01RSP	WAN01RSP	WAN06RNJ
01	WAN02RSP	WAN06RNJ	WAN02RSP	WAN02RSP	
02	WAN04RSP	WAN09RSP	WAN04RSP	WAN03RSP	
03	WAN05RSP	WAN10RSP	WAN05RSP	WAN04RSP	
04	WAN07RSP	WAN11RSP	WAN07RSP	WAN05RSP	
05	WAN08RSP		WAN08RSP	WAN07RSP	
06				WAN08RSP	
07				WAN09RSP	
08				WAN10RSP	
09				WAN11RSP	
10					
11					

Integral mount: Antennas have an RP-SMA plug that connects directly to the WDRR RP-SMA jack

Remote mount: Remote mount antenna uses a cable with a RP-SMA plug that connects directly to the WDRR RP-SMA jack

3.2 COUNTRY USE CODE “B” ANTENNA OPTIONS

Table 12 – Country Use Code B Antenna Options

COUNTRY CODE B					
Antenna Type Code (allowed for use)	Integral Mount Antennas (allowed for use)	Remote Mount Antennas (allowed for use)	Magnetic Remote Mount Assemblies/ Antenna WAMM100RSP-005 (allowed for use)	Magnetic Remote Mount Assemblies/ Antenna WAMM100RSP-010 (allowed for use)	Extension Cable Assemblies/Antennas for Remote Mount WCA200RSJRSP-005 WCA200RSJRSP-010 WCA200RSJRSP-015 WCA200RSJRSP-020 (allowed for use)
00	WAN01RSP	WAN03RSP	WAN01RSP	WAN01RSP	WAN01RSP
01	WAN02RSP	WAN09RSP	WAN02RSP	WAN02RSP	WAN02RSP
02	WAN07RSP	WAN10RSP	WAN07RSP	WAN04RSP	WAN03RSP
03	WAN08RSP		WAN08RSP	WAN07RSP	WAN07RSP
05				WAN08RSP	WAN08RSP
10					WAN09RSP
11					WAN10RSP
					WAN11RSP

Integral mount: Antennas have an RP-SMA plug that connects directly to the WDRR RP-SMA jack

Remote mount: Remote mount antenna uses a cable with a RP-SMA plug that connects directly to the WDRR RP-SMA jack



ATTENTION

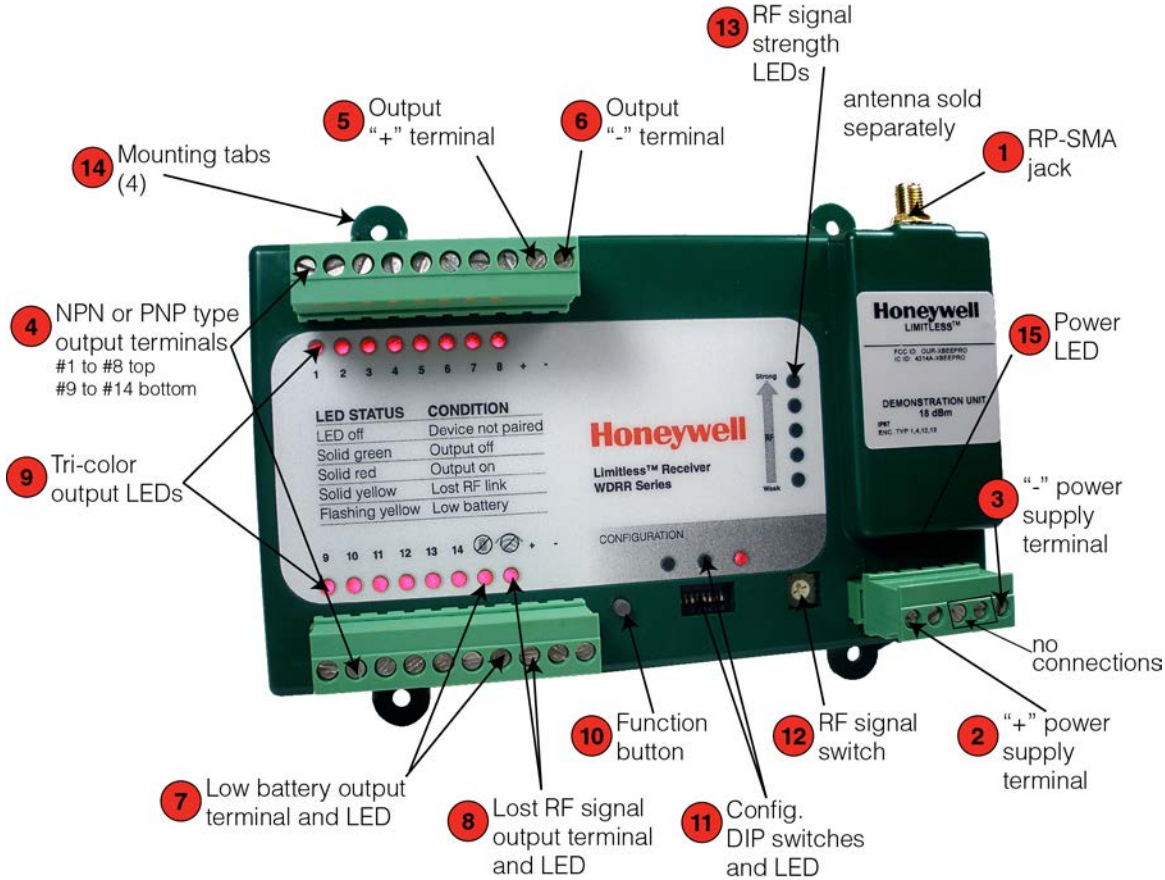
If using the WDRR in a portable application (for example, the WDRR is used in a handheld device and the antenna is less than 20 cm from the human body when the device is in operation): The integrator is responsible for passing additional SAR (Specific Absorption Rate) testing based on FCC rules 2.1091 and FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, OET Bulletin and Supplement C. The testing results will be submitted to the FCC for approval prior to selling the integrated unit. The required SAR testing measures emissions from the module and how they affect the person.

Notes for Section 3.1& 3.2 Tables 11 and 12:

1. Antennas listed in this chart are approved for use with the Digi International XBee –PRO® RF Module which the WDRR utilizes.
2. Industry Canada Compliance Statement: This device has been designed to operate with the antenna types listed in this document, and having a maximum gain of 9 dBi. Antenna types not included in this list or having a gain greater than 9 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 Ohm.

4 WDRR FEATURE OVERVIEW

Figure 2. Limitless™ WDRR DIN Rail Receiver with location call-out



5 FUNCTIONAL INDICATORS

The Limitless™ WDRR Series has several LEDs to indicate various states, functions, actions, etc. The LEDs functions are described in this section. Their indication depends on the position of the RF Link switch ⑫.

5.1 Power LED ⑮

Refer to Figure 2. One green LED turns on to indicate power is applied to the WDRR. This occurs when electrical power is supplied to the "+" ② and "-" ③ power supply terminals.

Notice: if product is being used in Brazil, a Honeywell part number: WDRRPWRASM will need to be used and electrical connections made as shown in Figure 3.



NOTICE

ANATEL requires the use of Honeywell part number, WDRRPWRASM.

Figure 3. Limitless™ WDRR DIN Rail Receiver with WDRRPWRASM connected

Brown wire connects to positive power supply terminal. Blue wire connects to negative power supply terminal.



5.2 Tri-color Output LEDs ⑨

Refer to Figure 2. Each tri-color output LED indicates when its respective Limitless™ input is paired to the WDRR and when it changes state. Each tri-color output LED also indicates a lost RF link between the respective Limitless™ input and WDRR or if the battery voltage level is low or dead. See tables below.

RF Link switch position “0” ⑫

Output LED status ⑨	Condition
LED off	No device paired to output
Solid green	Output off (set-up mode allows indication to be reversed)
Solid red	Output on (set-up mode allows indication to be reversed)
Solid yellow	Lost RF link
Flashing yellow	Low battery

RF Link switch position 1-9, A-E ⑫

Output LED status ⑨	Condition (RF Signal switch position 1-9, A-E)
LED off	No device paired to output
Flashing green	Output off & RF signal strength LEDs □○ indicated for chosen output
Flashing red	Output on & RF signal strength LEDs □○ indicated for chosen output
Solid yellow	Lost RF link
Flashing yellow	Low battery

RF Link switch position F ⑫

Sequence each LED color	LED test mode

5.3 Low Battery Output LED ⑦

Refer to Figure 2. The low battery output LED indicates when any one or more of the Limitless™ inputs has a low or dead battery. The LED will change state as shown below.

RF Link switch position 0-9, A-E ⑫

Low battery LED status ⑦	Condition
Solid green	Acceptable voltage(s)
Solid red	Low voltage(s)

RF Link switch position F ⑫

Sequence each LED color	LED test mode
-------------------------	---------------

5.4 Lost RF Link output LED ⑧

Refer to Figure 2. The lost RF link output LED indicates when any one or more of the Limitless™ inputs has lost the RF link or communication with the WDRR. The LED will change state as shown below.

RF Link switch position 0-9, A-E ⑫

Lost RF Signal LED status ⑧	Condition
Solid green	Acceptable RF link(s)
Solid red	Lost RF link(s)

RF Link switch position F ⑫

Sequence each LED color	LED test mode
-------------------------	---------------

5.5 RF Link Strength LEDs ⑬

Refer to Figure 2. The five (5) blue LEDs indicate the RF link strength of the Limitless™ input when communicating (i.e. Limitless™ input change of state/actuation) with the WDRR receiver. One (1) blue LED illuminated indicates a weak RF link. And increasing number of blue LEDs illuminated indicates a stronger RF link.

5.6 Configuration LEDs ⑪

Refer to Figure 2. The Function button ⑩ allows the Limitless™ WDRR Receiver to enter many different configuration modes such as set-up, pairing, purge, etc. The configuration LEDs ⑪ indicate both different modes as well as different states. See Section 6 for more detail.

6 ELECTRICAL CONFIGURATIONS/CONNECTIONS

⚠ WARNING
RISK OF ELECTRICAL SHOCK
 • Potential shock hazard where HAZARDOUS LIVE voltages greater than 30 Vrms, 42.4 Vpeak, or 60 Vdc may be accessible.
Failure to comply with these instructions could result in death or serious injury.

⚠ WARNING
 • Pay attention to ESD discharge at dc-in port.

i ATTENTION
 Do not run the electrical wires in parallel and close proximity to the antenna or antenna cable.

6.1 Configuration DIP Switches ⑪

Refer to Figure 2. The NPN/PNP-type outputs ④, NPN/PNP-type “low battery” output ⑦, and NPN/PNP-type “Lost RF Link” output ⑧ may be connected for use as: NPN-type current sinking or totem pole; PNP-type current sourcing or totem pole. The configuration DIP switches ⑪ identified as “1” and “2” on the DIP switch housing can be set to interface with a PLC as follows:

OUTPUT TYPE	DIP SW 1 LOGIC	DIP SW 2 LOGIC
NPN-type: Current sinking open collector	OFF	OFF
PNP-type: Current sourcing open collector	ON	OFF
NPN-type: Totem pole (current sinking) Modbus/TCP output*	OFF	ON
PNP-type: Totem pole (current sourcing) Modbus/TCP output*	ON	ON

Note: DIP switches 3 thru 8 are not used; factory default for both DIP switches is OFF.

**Honeywell has tested three different Modbus™ couplers offered by WAGO, Beckhoff Automation & Automation Direct that will convert the NPN/PNP output to a Modbus/TCP output. A test summary and detailed layout can be viewed at honeywell.com/sensing, keywords WDRR Modbus/TCP.*

6.2 RF Link Switch ⑫

Refer to Figure 2. The RF Link switch allows selection among the 14 different Limitless™ outputs to view the RF link strength of a specific Limitless™ input. The five (5) blue LEDs will then indicate the RF link strength of the Limitless™ input and corresponding chosen output (reference section 5.5). The following chart identifies switch position related to each Limitless™ input/output.

Switch position	NPN/PNP Input/Output # - RF Link strength displayed
0	None-Normal operation
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	None-LED test mode

Note: Factory default switch position is zero.

6.3 Power Supply connections ②③



WARNING

- The cable length of the customer-supplied dc power source to the WDRR supply terminals cannot exceed 3 meters.

Refer to Figure 2. The Limitless™ WDRR Series has two (2) cage clamp screw terminals on the housing's bottom right. A regulated voltage supply of 10 Vdc to 28 Vdc needs to be connected to the power supply terminals identified as "+" ② and "-" ③.



NOTICE

The measured voltage across the output "-" terminal ⑤ and the output "+" terminal ⑥ is nominally 1.5 Vdc less than the voltage supplied.

6.4 NPN or PNP output connections ④ ⑤ ⑥

Refer to Figure 2. The WDRR Series Receiver is supplied with fourteen (14) configurable NPN/PNP type outputs intended to be used with a customer provided PLC. A specific output will change when one or more of the Limitless™ input(s) changes. The customer has the option of connecting the outputs for use as: NPN- type current sinking or totem pole (current sinking); PNP-type current sourcing or totem pole (current sourcing). See Section 1.3 for proper settings of the DIP switches. The connections to the customer's PLC would be as follows for each:

NPN-type: Current Sinking or Totem Pole (current sinking) output connecting to a PLC sourcing input

- Connect NPN-type terminal ④ to PLC sourcing input
- Connect Output "+" terminal ⑤ to PLC common
- No connection to Output "-" terminal ⑥

PNP-type: Current Sourcing or Totem Pole (current sourcing) output connecting to a PLC sinking input

- Connect PNP-type terminal ④ to PLC sinking input
- Connect Output "-" terminal ⑥ to PLC common
- No connection to Output "+" terminal ⑤

CAUTION

Do not apply direct power (supply voltage "+" or "-") to the "-" terminal ⑤ or "+" terminal ⑥ or any of the NPN/PNP type output terminals④ as damage could occur to the WDRR electronics.

6.5 Low battery output connections ⑤ ⑥ ⑦

Refer to Figure 2. The Limitless™ WDRR Series is supplied with one configurable NPN/PNP type “low battery” output intended to be used with a customer provided PLC. The output changes state when one or more of the Limitless™ inputs has a low battery. The customer has the option of connecting the outputs for use as: NPN type-current sinking or totem pole (current sinking); PNP type-current sourcing or totem pole (current sourcing). See Section 1.3 for proper settings of the DIP switches. The connections to the customer’s PLC would be as follows for each:

NPN type-Current Sinking or Totem Pole (current sinking) output connecting to a PLC sourcing input:

- Low battery output terminal ⑦ to PLC sourcing input
- Connect Output “+” terminal ⑤ to PLC common
- No connection to Output “-” terminal ⑥

PNP type-Current Sourcing or Totem Pole (current sourcing) output connecting to a PLC sinking input:

- Low battery output terminal ⑦ to PLC sinking input
- Connect Output “-” terminal ⑥ to PLC common
- No connection to Output “+” terminal ⑤

CAUTION

Do not apply direct power (supply voltage “+” or “-”) to the “-” terminal ⑤ or “+” terminal ⑥ or any of the NPN/PNP type output terminals④ as damage could occur to the WDRR electronics.

6.6 Lost RF Link output connections ⑤ ⑥ ⑧

Refer to Figure 2. The Limitless™ WDRR Series is supplied with one configurable NPN/PNP type “Lost RF Link” output intended to be used with a customer provided PLC. The output changes state when one or more of the Limitless™ inputs has lost RF Link with the WDRR. The customer has the option of connecting the outputs for use as: NPN type-current sinking or totem pole (current sinking); PNP type-current sourcing or totem pole (current sourcing). See Section 1.3 for proper settings of the DIP switches. The connections to the customer’s PLC would be as follows for each:

NPN type-Current Sinking or Totem Pole (current sinking) output connecting to a PLC sourcing input:

- Lost RF link output terminal ⑧ to PLC sourcing input
- Connect Output “+” terminal ⑤ to PLC common
- No connection to Output “-” terminal ⑥

PNP type-Current Sourcing or Totem Pole (current sourcing) output connecting to a PLC sinking input:

- Low battery output terminal ⑧ to PLC sinking input
- Connect Output “-” terminal ⑥ to PLC common
- No connection to Output “+” terminal ⑤

CAUTION

Do not apply direct power (supply voltage “+” or “-”) to the “-” terminal ⑤ or “+” terminal ⑥ or any of the NPN/PNP type output terminals④ as damage could occur to the WDRR electronics.

7 CONFIGURATION MODES AND OPERATIONS

The configuration LEDs ⑩ will display different modes of operation and actions when used in conjunction with the function button ⑩.

7.1 Start-up or Re-start Sequence Mode

Zero switches paired to the WDRR: The configuration LEDs ⑩ will turn on for a few seconds while the WDRR performs a channel scan. Afterwards, all configuration LEDs ⑩ will turn off and only the green power LED ⑤ will be illuminated. This indicates power is supplied to the Limitless™ WDRR, and the unit is ready to use.

One or more switches paired (per Section 7.3) to the WDRR: The configuration LEDs ⑩ will turn on for a few seconds while the WDRR performs a channel scan. The WDRR receiver will enter system check mode for up to two minutes. The red, yellow, and green configuration LEDs ⑩ will illuminate sequentially until the system check is successfully completed. Afterwards, all configuration LEDs ⑩ will turn off, and the green power LED ⑤ will be lit indicating power is supplied to the WDRR. The Limitless™ WDRR is ready to use, and will also display the status of tri-color output LEDs ⑨, low battery output LED ⑦, and lost RF signal output LED ⑧ assuming the RF Link switch ⑥ is in position “0”.



ATTENTION

If there are multiple WDRRs being used in the application, apply power to previously paired WDRRs first (if any) and then to one WDRR at a time. **Allow time for each WDRR to complete its start-up sequence before applying power to the next WDRR. There is a maximum of five WDRRs that can be used in the same localized area. Contact Honeywell Application Engineering at 800-537-6945 if more than five WDRRs are desired to be used in the same localized area.**

7.2 Set-up Mode

The Set-up Mode allows the “normal” output indication and NPN/PNP electrical output to be reversed for all of the Limitless™ inputs. This set-up mode can only be utilized before any Limitless™ input is paired (see Section 7.3) to the WDRR. Once a Limitless™ input has been paired, you will no longer be able to access the Set-up Mode and a Factory Reset will need to be conducted to again allow access to the Set-up mode (see Section 7.5).

Example: The Limitless™ input is a WGLA Series switch with a pin plunger actuator. **Normal** operation has the pin plunger actuator not depressed, the tri-color output LED is green; then, once actuated the LED turns red, and the NPN/PNP electrical output will change state. The set-up mode allows this indication to be **reversed** by having the red tri-color output LED on when the plunger actuator is not being depressed. The NPN/PNP electrical output will also be reversed.

Step	Action
1	Completely read this procedure before starting to understand the timing of events needed to be performed.
2	Press the Function button ⑩ on WDRR for >1 to <4 seconds at which time the green configuration LED ⑩ will flash. Immediately release the function button. The red LED will illuminate with a short flash off every second.
3	To reverse the output indication and associated electrical state: Actuate the function button ⑩ once and release. The red LED will be off with a short flash on every second. In the next five seconds, actuate and release the function button ⑩ again (within 5 second intervals). This will cause the toggling between the Limitless™ output being “normal” or “reversed”. Once the desired output indication and state has been chosen, wait approximately 5 seconds for all configuration LEDs to turn off before proceeding with other configuration modes.

7.3 Pairing Mode

Pairing is required to initiate and establish an RF communication link between each WDRR and a Limitless™ input. **The Limitless™ input used in this Pairing Mode procedure example will be the Limitless™ WGLA switch.**

As there are up to 14 Limitless™ inputs that can be paired to a single WDRR, it is suggested to identify the Limitless™ input in the sequence of #1 to #14 (see Figure 7). The initial Limitless™ input paired to the WDRR will be Sequence #1 (corresponding to output #1), the second Limitless™ input paired will be Sequence #2 (corresponding to output #2) and so on. If replacing a Limitless™ input that has been purged (see section 7.4), identify the correct replacement Sequence # on the replacement switch.

Pairing a Limitless™ input to a purged sequence/output #: Follow the Pairing Mode operations below with the understanding that the lowest sequence/output # on the WDRR will be the first to re-pair and then the second lowest sequence/output # and so on (i.e., if the user has ten Limitless™ inputs and has purged sequence/output #3 and #5, the first Limitless™ input to be re-paired will be sequence/output #3. Performing the Pairing Mode operation on another Limitless™ input will then re-paired to sequence/output #5.).



ATTENTION

The WDRR receiver offers optimal performance when paired with Limitless™ inputs that have a firmware version of 7170 or a greater number (i.e., FW7170 will be printed on the Limitless™ input label). If the Limitless™ input is paired with older firmware (FW7170 or a lesser number), the WDRR may exhibit delayed responses under simultaneous operation.



ATTENTION

The purging of a Limitless™ input is required when a previously paired Limitless™ input is to be paired again. Refer to the Limitless™ switch installation and technical manual for purge mode information for the particular model of Limitless™ input.

The battery needs to be activated in the Limitless™ WGLA switch and proper power applied to the WDRR before proceeding with this pairing procedure. Once the pairing is completed, the Limitless™ WGLA switch selected will only communicate with the WDRR it was paired to and no other device.

Step	Action
1	Completely read this procedure before starting in order to understand the timing of events that need to be performed.
2	Limitless™ switch: Remove (if required) the two screws ⑦ on the housing cover and cover of the Limitless™ switch (see Figure 4) and locate the function button ⑧ (see Figure 6) to be used in Step 4.
3	WDRR: Press the Function button ⑧ on WDRR (see Figure 5) for more than four seconds but less than eight seconds at which time the green and yellow ⑩ LEDs (see Figure 5) will flash indicating to release the function button immediately as it has entered the pairing mode.
4	Limitless™ switch: Within a 30 second interval of Step 3, depress the function button ⑧ and hold depressed for more than five seconds but less than 12 seconds at which time the orange ⑨ LED turns on (see Figure 6). While in pairing mode, the orange led will flash on for 100 ms every second. The orange ⑨ LED flashes three times 100 ms on, 100 ms off when pairing succeeds. If pairing does not succeed, the orange ⑨ LED will turn off and user will need to repeat steps starting with Step #3.
5	WDRR: Successful pairing will be indicated by the green and yellow ⑩ LEDs (see Figure 5) ceasing to flash and remaining on for a few seconds before turning off.
6	To confirm proper pairing between the Limitless™ switch and WDRR, actuate the Limitless™ switch, and the tri-color output LED ⑥ (see Figure 2) should turn on to indicate the proper output status.
7	Optional: Record the Limitless™ sequence # on identification labels ⑥ and apply to the Limitless™ housing in desired locations (See Figure 7).
8	Repeat Steps 2-7 to add additional Limitless™ switches. Up to 14 Limitless™ switches can be paired to a single WDRR.

Limitless™ WDRR Receiver

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Figure 4. Limitless™ Switch Housing



Figure 6. Limitless™ Switch with Function Button Depressed



Figure 5. Limitless™ WDRR Housing



NOTE: Use a blunt object, such as a paper clip or tooth pick to actuate the function switch 18.

Figure 7. Limitless™ Switch Label Placement



7.4 Purge Mode

Purge mode is used to remove a Limitless™ input(s) that have a lost RF link with the WDRR (see Section 8.3.1 for possible causes and Section 5.2 for determining which Limitless™ switch(s) have a lost RF link). All Limitless™ inputs with a lost RF link may be purged at the same time.

Note, a Limitless™ input with a good RF link cannot be purged. If a Limitless™ input with a good RF link is intended to be purged, remove battery first as this will cause a 'lost RF' indication after a few minutes.

Ensure proper power is applied to the WDRR (green power LED illuminated) before proceeding with this procedure.

Step	Action
1	Press the Function button ⑩ on WDRR for approximately eight to 12 seconds at which time the green, yellow, red configuration LEDs ⑪ will be flashing. Refer to Figure 2.
2	Once the purge mode is completed, the lost RF indication (yellow LED on at output) on the Tri-color output LED(s) ⑫ will turn-off and the WDRR will return to normal operation.

7.5 Factory Reset Mode

Factory reset mode is used to remove/un-pair all Limitless™ inputs that were previously paired to the WDRR and thus it is being returned to the as-manufactured condition. Ensure proper power is applied to the WDRR (green power LEDs illuminated) before proceeding with this procedure.

Step	Action
1	Press the Function button ⑩ on WDRR until the green, yellow, red configuration LEDs ⑪ are flashing as well as the fourteen tri-color LEDs ⑫. Continue to hold the Function button on WDRR until the LEDs turn off. Immediately release the function button. The configuration LEDs ⑪ will turn on and then off indicating that the WDRR has been factory reset. Refer to Figure 2.
2	Verification of proper reset can be confirmed by operating each of the Limitless™ inputs originally paired to the reset WDRR. Repeat procedure if the Limitless™ inputs are still indicating an output on the WDRR.
3	Turn power off to WDRR.

7.6 Abort Mode

The Abort mode provides a last chance to cancel the operation before the WDRR goes into Factory Reset mode. If the operator holds the function button ⑩ for more than 12 seconds, but does not wish to put the WDRR into the Factory Reset mode, he/she can immediately release the function button ⑩ to put the WDRR into Abort mode. The WDRR immediately returns to normal operation.

The configuration LEDs ⑪ will display different modes of operation and actions when used in conjunction with the function button ⑩. The operation and LED functions are visually depicted and described below.

8 ANTENNA CONSIDERATIONS/OPTIONS

8.1 Overview of Antenna Options

The following chart lists the antenna options along with various characteristics referenced throughout. This section is intended to assist an end user in determining the antenna(s) worth investigating and subjecting to application requirements for proof of suitability.

Ant. type code*	Repl. ant.	Replacement antenna mount or cable	Ant. gain (max.)	Design/style	Mount	Cable length	Environment usage **	Antenna material	Cable material/type	Mount material
01	WAN01RSP	N/A	2.2 dBi	Omni/ Straight	Integral	N/A	Indoor or outdoor use	UV stable LG Key flex BT-1040D	N/A	N/A
02	WAN02RSP	N/A	2.2 dBi	Omni / Tilt- and- swivel	Integral	N/A	Indoor or outdoor use	UV stable LG Keyflex BT-1040D	N/A	N/A
03	WAN03RSP	N/A	3.0 dBi	Omni/ Flat	Remote with adhesive mount	2,99 m [9.8 ft]	Indoor or outdoor use	UV stable ABS	UV stable PVC/ RG-174 coax	N/A
04	WAN04RSP	WAMM100R SP-005	5.5 dBi	Omni/ Tilt- and- swivel	Remote with magnetic mount	1,52 m [5 ft]	Indoor or limited outdoor exposure. Protect against direct rain, salt, snow, ice, etc.	UV stable Molded Polyurethane	UV stable PVC/ RG-174 coax	UV stable black ABS
05	WAN04RSP	WAMM100R SP-010	5.5 dBi	Omni/ Tilt- and- swivel	Remote with magnetic mount	3,04 m [10 ft]	Indoor or limited outdoor exposure. Protect against direct rain, salt, snow, ice, etc.	UV stable Molded Polyurethane	UV stable PVC/ RG-174 coax	UV stable black ABS
06	WAN05RSP	WAMM100R SP-005	9.0 dBi	Omni/ Tilt- and- swivel	Remote with magnetic mount	1,52 m [5 ft]	Indoor or limited outdoor exposure. Protect against direct rain, salt, snow, ice, etc.	UV stable Molded Polyurethane	UV stable PVC/ RG-174 coax	UV stable black ABS
07	WAN05RSP	WAMM100R SP-010	9.0 dBi	Omni/ Tilt- and- swivel	Remote with magnetic mount	3,04 m [10 ft]	Indoor or limited outdoor exposure. Protect against direct rain, salt, snow, ice, etc.	UV stable Molded Polyurethane	UV stable PVC/ RG-174 coax	UV stable black ABS
08	WAN06RSP	WCA200RNP RSP-002	8.0 dBi	Omni/ Straight	Remote with mast mount	0,91 m [3 ft]	Indoor or outdoor use	UV stable fiberglass	UV stable PVC/RG-316 coax, UV stable Polyethylene/200 Series coax	300 series SST aluminum alloy
09	WAN06RSP	WCA200RNP RSP-010	8.0 dBi	Omni/ Straight	Remote with mast mount	3,35 m [11 ft]	Indoor or outdoor use	UV stable fiberglass	UV stable PVC/RG-316 coax, UV stable Polyethylene/200 Series coax	300 series SST aluminum alloy
10	WAN01RSP	WAMM100R SP-010	2.2 dBi	Omni/ Straight	Remote with magnetic mount	3,04 m [10 ft]	Indoor or limited outdoor exposure. Protect against direct rain, salt, snow, ice, etc.	UV stable LG Keyflex BT-1040D	UV stable PVC/ RG-174 coax	UV stable black ABS

Ant. type code*	Repl. ant.	Replacement antenna mount or cable	Ant. gain (max.)	Design/style	Mount	Cable length	Environment usage **	Antenna material	Cable material/type	Mount material
n/a	WAN07RSP	N/A	0 dBi	Omni/Straight	Integral	N/A	Indoor or outdoor use	UV stable	N/A	N/A
n/a	WAN08RSP	N/A	0 dBi	Omni/90degre	Integral	N/A	Indoor or outdoor use	UV stable	N/A	N/A
n/a	WAN09RSP	N/A	3.0 dBi	Omni/Low profile straight	Remote with magnetic mount	4,57 m [15 ft]	Indoor or outdoor use	UV stable ABS plastic	UV stable Black PVC	Nickel plated steel
n/a	WAN10RSP	N/A	5.0 dBi	Omni/Straight	Remote with magnetic mount	4,57 m [15 ft]	Indoor or outdoor use	Nickel Plated Steel	UV stable Black PVC	Nickel plated steel
n/a	WAN11RSP	N/A	4.0 dBi	Omni/Low profile dome	Remote with mobile thru-hole screw mount	4,57 m [15 ft]	Indoor or outdoor use	UV stable Black PVC	UV stable Black PVC	Nickel plated steel

*Reference Limitless™ nomenclature (i.e. WDRR Series, WGLA Series, etc.)

**Reference Limitless™ Environment Usage section 8.4 for further details



ATTENTION

The antenna cables should not be modified (i.e. cut short and/or re-terminated) as it may affect Communication Agency approval.

WARNING

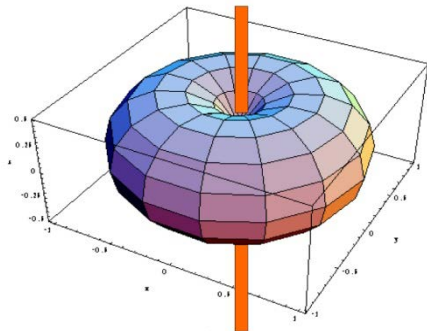
- The WDRR must be installed in accordance with the requirements specified in this document in order to comply with the specific Country Communication Agency requirements. (i.e. FCC, IC, ETSI, ACMA, etc.) See Section 3 as it requires choosing the correct Country Use Code and thus allowable antenna and/or cable usage.

8.2 Omni-directional Antenna Design

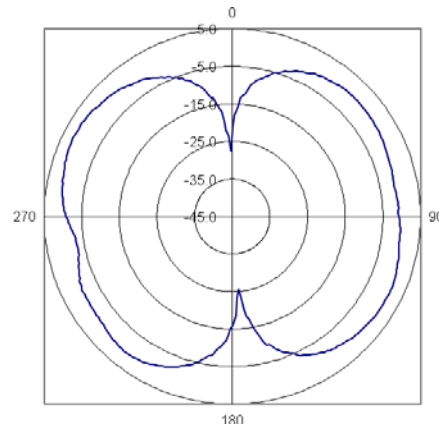
The Limitless™ Series omni-directional antennas were chosen for their ability to be used in applications where transmit-and-receiver antennas may be moving with respect to each other or could be stationary. These monopole and dipole antennas radiate power (power from the internal radio of the WDRR monitor) in a 360° outward pattern in a plane perpendicular to the length of the antenna element. The term “omni” may suggest that the antenna radiates power in all directions, but that is not the case. The actual antenna radiation pattern looks more like a toroid (doughnut-shape) as shown in Figure 9.

Figure 9. Radiation Pattern of an Omni-directional Antenna

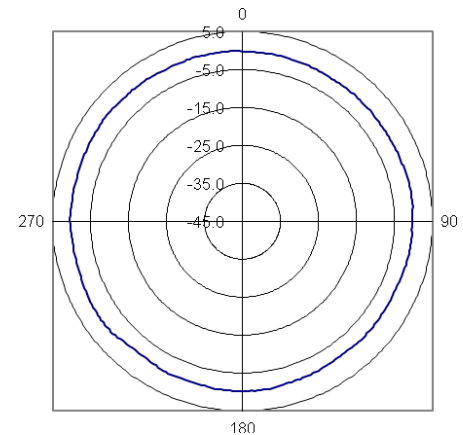
Toroid Radiation Pattern -
Pattern is 360 degrees in the vertical plane, but not the horizontal plane



2.2 dBi RF Antenna Pattern - Horizontal



2.2 dBi RF Antenna Pattern - Vertical



The antenna radiates virtually zero power in the Z axis and most of the power in the X and Y axis. Increasing the antenna’s gain will increase the power only in the X and Y axis. As a result, the radiation pattern becomes narrower. For instance, this is analogous to the reflector in an automobile’s headlight. The reflector does not add light or increase the luminous intensity of the light bulb, rather it simply directs all the light energy in the forward direction where the light is needed most.

8.3 Antenna Mounting and Considerations

8.3.1 Antenna Mounting Location with Respect to RF Signal

⚠ WARNING
RF EXPOSURE
To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm [7.87 in] or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna used for this transmission must not be co-located in conjunction with any other antenna or transmitter.
Failure to comply with these instructions could result in death or serious injury.

There are several environmental factors to consider when determining antenna location during installation. These factors can affect the radio frequency (RF) signal strength being both transmitted and received by the Limitless™ input and corresponding WDRR monitor. It is desirable for the antenna to be mounted in a place that will limit exposure of adjacent materials/objects between the Limitless™ switch and WDRR monitor, as they have an effect on RF signal strength. If the mounting location for an omni-directional antenna is on the side of a building or tower, the antenna pattern will be degraded on the building or tower side.

Obstacles that affect antenna patterns and RF signal strength:

- Indoor: Concrete, wood, drywall, metal walls, etc.
- Outdoor: Vehicles, buildings, trees, structures, topology, weather conditions, chain link fence, major power cables, etc.

The best performance is achieved when both the Limitless™ input and WDRR monitor antennas are mounted at the same height and in a direct line of sight (LOS) with no obstructions. Generally, the higher the antenna is above ground, the better it performs. Another concern is RF interference, discussed in Section 8.4.3.

Figure 10. Limitless™ switch to WDRR Antennas with RF Signal Line of Sight (LOS) Free From Obstacles

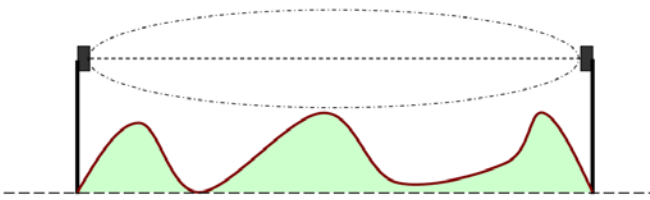
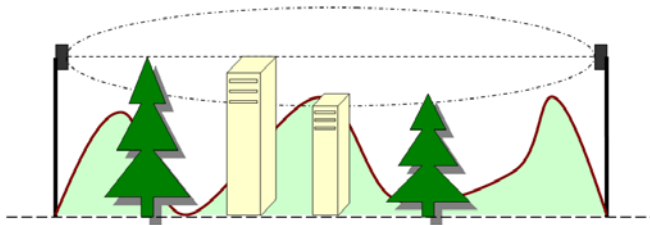


Figure 11. Limitless™ switch to WDRR Antennas with RF Signal Line of Sight (LOS) Affected by Obstacles



8.3.2 Outdoor Installation Warnings

⚠ WARNING
LIVES MAY BE AT RISK!
Carefully observe these instructions and any special instructions included with the equipment being installed.

⚠ WARNING
CONTACTING POWER LINES CAN BE LETHAL
Look over the site before beginning any installation and anticipate possible hazards, especially these:

- Make sure no power lines are near where possible contact can be made. Antennas, masts, towers, guy wires, or cables may lean or fall and contact these lines. People may be injured or killed if they are touching or holding any part of equipment when it contacts electric lines. Make sure there is NO possibility that equipment or personnel can come in contact directly or indirectly with power lines.
- Assume all overhead lines are power lines.
- The horizontal distance from a tower, mast, or antenna to the nearest power line should be at least twice the total length of the mast/antenna combination. This will ensure that the mast will not contact power if it falls during either installation or later.

⚠ WARNING
TO AVOID FALLING, USE SAFE PROCEDURES WHEN WORKING AT HEIGHTS ABOVE GROUND

- Select equipment locations that will allow safe, simple equipment installation
- Don't work alone. A friend or co-worker can save a life if an accident happens.
- Use approved, non-conducting ladders and other safety equipment. Make sure all equipment is in good repair.
- If a tower or mast begins falling, don't attempt to catch it. Stand back and let it fall.
- If anything such as a wire or mast does come in contact with a power line, DON'T TOUCH IT OR ATTEMPT TO MOVE IT. Instead, save a life by calling the power company.
- Don't attempt to erect antennas or towers on windy days.

WARNING

MAKE SURE ALL TOWERS AND MASTS ARE SECURELY GROUNDED, AND ELECTRICAL CABLES CONNECTED TO ANTENNAS HAVE LIGHTNING ARRESTORS.

This will help prevent fire damage or human injury in case of lightning, static build up, or short circuit within equipment connected to antenna.

- The base of the antenna mast or tower must be connected directly to the building protective ground or to one-or-more approved grounding rods, using 1 AWG ground wire and corrosion-resistant connectors.
- Refer to the National Electrical Code for grounding details.
- Lightning arrestors for antenna feed coaxial cables are available from HyperLink Technologies, Inc.

WARNING

If a person comes in contact with electrical power, and cannot move

DO NOT TOUCH THAT PERSON OR RISK ELECTROCUTION

- Use a non-conductive dry board, stick, or rope to push, pull, or drag them so they no longer are in contact with electrical power.
- Once they are no longer contacting electrical power, administer CPR if certified, and make sure emergency medical aid has been requested.

8.3.3 Antenna Connection, Styles, and Mounting Options

WARNING

RF EXPOSURE

To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm [7.87 in] or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna used for this transmission must not be co-located in conjunction with any other antenna or transmitter.

Failure to comply with these instructions could result in death or serious injury.

CAUTION

Power to the WDRR should not be applied during installation of an antenna as damage could occur to the WDRR electronics.

8.3.3.1 Antenna Connection

Physical connection of the antenna to the WDRR is accomplished by using mating RP-SMA connectors: plug and jack. Integral-mount antennas have an RP-SMA plug that connects directly to the WDRR RP-SMA jack. The remote mount antenna uses a cable with a RP-SMA plug that connects directly to the WDRR RP-SMA jack allowing the antenna to be remotely mounted away from the WDRR. Mounting options are based on user preference, communication agency approvals, WDRR mounting location, and obstacles as discussed in Section 8.3.1.

An **integral or remote mount antenna** can be easily mounted by threading the mating RP-SMA plug of the antenna to the WDRR's RP-SMA jack. Reference section 8.4.1 for further details on extra environmental protection of RP-SMA connections. Tighten the RP-SMA connection until finger tight. See Figures 12 and 13.

Figure 12. Limitless™ WDRR RP-SMA Connection, Integral



Figure 13. Limitless™ WDRR RP-SMA Connection, Remote



8.3.3.2 Antenna Styles and Mounting Options

Choosing an antenna mounting style depends on application conditions, antenna benefits and/or features, and user preference. The antenna's gain (discussed further in Section 8.5) to some extent determines physical size. Another consideration is the amount of room available in the application.

Straight or Tilt/Swivel: A benefit of the straight antenna is rigid design and resistance to being repositioned (shock, vibration, wind, etc.) when compared to a tilt-and-swivel design. It is more resistant to weather conditions as there's no swivel-joint connection for contaminants to enter. A benefit of the tilt & swivel design is that it allows easier positioning in relation to other antenna(s) to obtain a suitable RF signal.

Catalog listings: WAN01RSP, WAN02RSP, WAN07RSP, WAN08RSP

Figure 14. Straight, Right-Angle, and Tilt-and-Swivel antennas

WAN01RSP	WAN02RSP	WAN07RSP	WAN08RSP
Straight wireless antenna with 2.2 dBi gain, reverse polarity SMA plug, connector mount (RP-SMA)	Tilt/swivel wireless antenna with 2.2 dBi gain, reverse polarity SMA plug, connector mount (RP-SMA)	Straight wireless antenna with 0 dBi gain, reverse polarity SMA plug, connector mount 0 dBi straight w/RP-SMA plug	Right angle wireless antenna with 0 dBi gain, reverse polarity SMA plug, connector mount 0 dBi straight w/RP-SMA plug
			

Adhesive mount: The benefit of a remote adhesive mount antenna is mounting flexibility to a number of surfaces and in various orientations. Remember, the surface an antenna is being mounted to will affect the radiation pattern. Use masking tape to temporarily attach the antenna. Perform fade-margin testing, as described in Section 8.5 before permanently mounting.

Catalog listing: WAN03RSP

Permanent mounting: Pre-clean the antenna's mounting surface with an alcohol wipe. Peel paper protection from adhesive strip and mount to the cleaned surface.

Figure 15. Adhesive Mount Antenna – Step 1. Pre-clean the surface



Figure 16. Adhesive Mount Antenna – Step 2. Peel Protection from Adhesive Strip



Figure 17. Adhesive Mount Antenna – Step 3. Mount the Antenna



Mast mount: The benefit of the mast-mount antenna is its rigid design and resistance to displacement when subjected to shock, vibration, wind, etc. It can be easily mounted high above the ground to obtain greater RF signal performance and it withstands winds up to 100 mph.

Catalog listing: WAN06RNJ

- **Mast-mount bracket** (Included with the 8 dBi antenna): Attach antenna to its mounting bracket. Tighten nut. Assemble two U-clamps around mast and tighten nuts. Ensure provided lock washers are compressed to a flat condition.

Figure 18. Mast Mount Antenna – Tighten nut on mounting bracket



Figure 19. Mast Mount Antenna – Side View with Attachment to Pipe






Magnetic mount: The benefit of the magnetic-mount antenna is its ability to mount on any ferrous-metal surface and in various orientations. A smooth metal surface is preferred to allow the best attraction of the magnet to the surface. First, determine if the magnetic attraction is sufficient to hold the antenna in the desired position (i.e., shock, vibration, etc. in the application). Placing the antenna in a location where it cannot be inadvertently displaced may help.

Catalog listings: WAMM100RSP-005 & WAMM100RSP-010: These magnetic-mount bases are not designed for mobile applications.

Catalog listings: WAN09RSP & WAN10RSP: These magnetic-mount antennas are designed for mobile applications and can withstand winds at >150 mph.

Use Magnetic Mounts with the following antenna catalog listings: **WAN01RSP, WAN02RSP, WAN04RSP, WAN05RSP, WAN07RSP, WAN08RSP**

<p>Figure 20. Magnetic Mount Base with Antenna – Mounted on Steel Surface</p>	<p>Figure 21. WAN09RSP Magnetic Mount Antenna</p>	<p>Figure 22. WAN10RSP Magnetic Mount Antenna</p>
		

Thru-hole mount: The benefit of the thru-hole mount antenna is it allows the cable to run “thru” the mounting surface. There is also an adhesive material between the antenna housing and the mounting surface for seal protection. This is a very low profile, rugged design [approximately 30 mm (1.18 in) height] when mounted and can also can be used in mobile applications.

Catalog listing: WAN11RSP

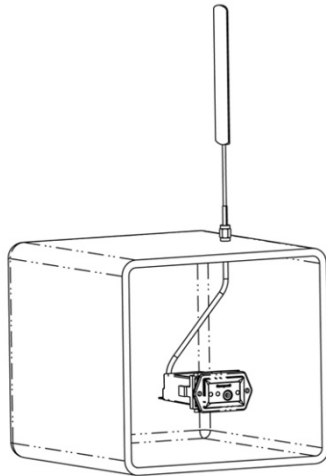
Figure 23. Through-hole mount antenna



8.3.3.3 Antenna Adjustment Considerations

The antennas of the Limitless™ input and WDRR monitor should be oriented in parallel as best as possible. This will, in most cases, allow the longest range and highest RF signal. The least RF signal is normally in-line with the top of the antenna, so avoid having the antennas pointed directly toward or directly away from each other.

Figure 24. Highest RF signal when antennas are as parallel to each other as possible
(parallel arrangement shown with the Limitless™ WPMM monitor and WGLA switch)



8.4 Environmental Usage/Concerns

8.4.1 Choosing an Antenna/Cable to Meet Application Exposure Conditions

There is no antenna or cable design impervious to every environmental condition it could be exposed to. Review the application environment as follows:

Step 1	Determine where the antenna will be installed and the application conditions: indoor, outdoor, or limited outdoor exposure. Even if the antenna is going to be used indoors, an outdoor antenna may be more suitable (i.e., resistant to fluids, rigid construction, etc.)
Step 2	Determine what the antenna may be subjected to (i.e., fluids, chemicals, oils, wind, shock, vibration, etc.)
Step 3	<p>A. Review antenna and/or cable materials (listed in Section 8.1) with respect to resistance of chemicals and fluids in the application. If choosing an adhesive mount, adhesive resistance testing may be necessary.</p> <p>B. If shock, vibration, wind, rain, sleet/snow, etc. are in the application, choose an antenna rated for outdoors and has a rigid design as defined in Sections 8.1 and 8.3.3.2.</p>
Step 4	<p>This step may be required to provide an extra level of protection, especially if the application may be subjecting antennas and cables to liquids. The RP-SMA connections, tilt/swivel joints, and cable entrances are potential leak paths that could lead to corrosion. The following procedure is one way to provide extra protection to these connections and joints.</p> <p>Ensure the area applying tape to is clean from contaminants by first cleaning it with mild detergent/water and completely dry. Follow with an isopropyl alcohol wipe of the area.</p> <p>Layer 1: Wrap a layer of polyvinyl chloride insulating tape Layer 2: Wrap a layer of rubber splicing tape i.e. Scotch™ 23 Layer 3: Wrap a layer of UV stable polyvinyl chloride insulating tape Layer 1 allows the user to remove Layer 2 for connector inspection, antenna replacement, repositioning of the tilt/swivel antenna, etc.</p>

In the end, the antenna/cable choice may need to be tested in the actual application conditions to prove suitability.

8.4.2 Outdoor Antenna Installations - Lightning Concerns

Outdoor antenna installations can lead to the possible damage caused by nearby lightning strikes that induce charges or surges on the antenna and/or antenna extension cables.

A lightning arrestor such as the AL6-RSPRSJBW-9 from L-COM Global Connectivity can be reviewed against application requirements.



ATTENTION

National, local, and/or regulatory agencies may require the use of a lightning arrestor and possibly other requirements for an antenna system installation. It is recommended that the customer review and adhere to these requirements.

8.4.3 Lightning Arrestor

The lightning arrestor may be mounted directly on the sensor, or at the far end of the antenna cable, mounted to a sheet of metal in a through-hole. Generally, the choice should be made based on having the shortest, most direct path to a good, solid ground.

If the lightning arrestor is mounted directly on the sensor, use caution when attaching a grounding wire to the arrestor to avoid putting undue stress on the sensor's antenna connector.

If the coax cable is to enter a building, then the lightning arrestor should be mounted as close as possible to where the lead-in wire enters the building. The lightning arrestor recommended by Honeywell (AL6-RSPRSJBW-9 from L-COM Global Connectivity) features a bulkhead RP-SMA connector with a rubber "O"-ring seal which can be used for mounting through an enclosure wall. Both connector ports of the lightning arrestor provide equal protection no matter which way it is installed. Either port can face the antenna and either port can face the sensor.

8.4.4 RF Interference

The Limitless™ input and WDRR radio operate in the 2.4 GHz range. Upon initial power-up of the WDRR radio, it will automatically scan each of the 12 channels in the 2.4 GHz range and choose a channel with the least amount of usage energy. This provides a level of protection from RF interference as the chosen channel (where RF communication is low) will have a lower chance of signal collision.

However, if multiple RF sources exist in the chosen channel, the external source has extremely high power intensity, or it is in close proximity to the Limitless™ Series antenna, RF interference can cause an RF signal to not reach the Limitless™ input or WDRR. RF interference can be caused by many sources (i.e., other radios in the same operating range, high frequency digital products, conventional microwave ovens, etc.). If the Limitless™ Series is in an environment with a high usage of products in the 2.4 GHz range, or the RF environment is unknown, an on-site RF survey may prove to be valuable in identifying possible RF interference sources along with other existing wireless devices.

Once the RF sources are identified and located, it may allow the Limitless™ Series antennas to be moved away from the identified RF sources to achieve acceptable performance. The other option is removing the external source, if feasible.

8.5 Choosing an Antenna Gain (dBi) with Acceptable Fade-Margin

There are several different Limitless™ Series antenna gain options to choose from. This section helps determine the antenna version(s) that will provide suitable RF signal performance for specific applications.

The Limitless™ Series antenna's actual gain is measured by how much of the input power from the WDRR's internal radio is concentrated in a particular direction. The WDRR antenna transmits RF signals, and also receives RF signals from a Limitless™ input. In a particular application, transmit signal strength may be better than the receive signal strength or vice versa. The intent is to choose an antenna with the optimum gain relative to application conditions for both transmitting and receiving.

Fade-margin is the amount of excess power available above and beyond what is necessary to maintain a reliable RF signal between the transmitter and receiver. Normally, an acceptable threshold of excess power to ensure effective operation in a variety of environmental conditions is 10 dB. A simple way to determine if the signal strength is sufficient is to temporarily install a 10 dB attenuator* between the RP-SMA plug of the antenna or remote cable and WDRR's RP-SMA jack. This should be completed in an operating application environment with good nominal environmental conditions. Starting with the antenna chosen in Section 3 & 8.3, install the attenuator and operate the system until exposure of all normal application conditions is completed while monitoring the Lost RF LED and/or Lost RF Signal Output. If the fade-margin is unacceptable, the Lost RF LED illuminates solid (lost RF signal output changes state) indicating the antenna position on the Limitless™ switch and/or WDRR receiver will need to be changed and/or another antenna type should be chosen. The RF Signal LEDs are also useful in indicating the RF Link Strength; refer to Section 5.5 for more information.

Try several mounting locations and/or antennas along with retesting each with the attenuator to determine the optimal set-up that provides an acceptable fade-margin. Remove the attenuator after testing is completed.

*Suggested sources/part numbers

- 10 dB attenuator (i.e. Crystek – Part number: CATTEN-0100)
- RP-SMA female to SMA male connector adaptor (i.e. Connector City – Part number : ADP-SMAM-RPSF)
- RP-SMA male to SMA female connector adaptor (i.e. Connector City – Part number : ADP-RPSM-SMAF)

9 WDRR Mounting

The WDRR is intended to be mounted to a DIN Rail or mounted via the housing's four (4) mounting tabs.

9.1 DIN Rail mounting:

The WDRR receiver is supplied with two snap-in DIN Rail tabs that need to be inserted into the back of the WDRR housing as shown below.

Figure 25. Limitless™ WDRR Mounting Clips



9.2 Tab mounting:

The WDRR has four tabs intended to allow mounting with a #6 style screw. As there are many types of screw fasteners, care should be taken to not overtighten the fastener and cause the mounting tab/housing to crack or fracture. Also, ensure that the housing is being mounted on a flat surface.

Figure 26. Limitless™ WDRR Mounting Tabs



10 INSPECTION AND MAINTENANCE

10.1 WDRR Inspection and Replacement

Periodic inspection

- Check the WDRR housing for signs of damage. Replace if necessary
- Check the LEDs to determine if any are non-functioning (Refer to Section 6.2; Switch position “F”- LED test mode)

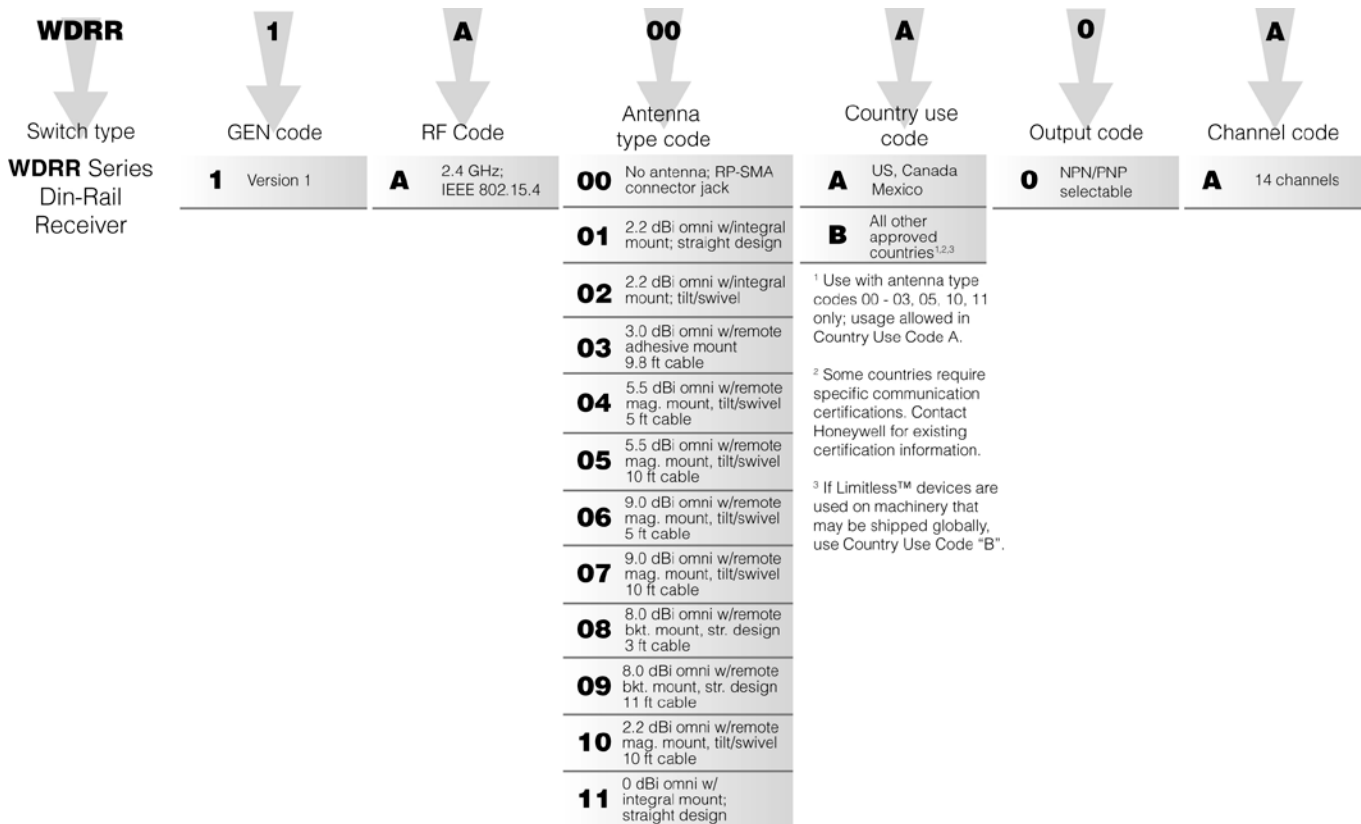
10.2 Antenna Inspection and Replacement

Periodic inspection

- Check antenna or cable connection to WDRR connector to ensure it is tight and bear no signs of damage or corrosion. Replace if necessary per Section 8.3.

11 CHOOSING A WDRR SERIES CATALOG LISTING

This section is intended to be used for identifying a catalog listing from the WDRR nomenclature to determine suitability in a particular application.



The following procedure refers to appropriate sections in this manual to determine/build a WDRR listing.

Step 1) Determine the country the product will be used in. Review Section 2.1 (Intended Country Usage) to determine the Country Use Code (A or B) in relation to the country the WDRR will be used in.

Step 2) Determine the antennas and/or Antenna Type Codes allowable for use. Review Section 3 (ANTENNA OPTIONS ALLOWED PER COUNTRY USE CODE) to determine the antennas/cables allowed for use in a particular country (based on the Country Use Code determined in Step 1). Some antenna/cable options can be ordered with the WDRR and some are ordered separately. If an antenna is ordered separately, choose Antenna Type Code 00 (see product nomenclature).

Step 3) Review Section 8.1 (Overview of Antenna Options) against the antenna list identified in Step 2. Initially, narrow options by choosing a desired antenna that can be used indoor/outdoor or indoor/limited outdoor exposure.

Step 4) Review Sections 8.2 & 8.3 (Omni-directional Antenna Design & Antenna Mounting and Considerations) for a background of antenna design, considerations, warnings, etc. Choose a possible integral or remote-mount antenna.

Step 5) Sections 8.4 and 8.1 help to determine the antenna material most suitable for use based on the application environment. Also consider the effects of lightning or RF Interference (if applicable).

12 QUICK START UP & INSTALLATION

There are many sections in this manual that describe the consideration, concerns, specifications, etc. with respect to country of use, antenna choices, environmental effects, etc. The following sections are useful for initially “starting up” the WDRR and associated Limitless™ input.



ATTENTION

Ensure that the country the product is being used in appears in the chart along with the correct Country Use Code on the WDRR label. Review Section 1.3 and 2.1 in this manual. If required, contact Honeywell before use of the WDRR in Countries not listed in Table 3 thru 6 in Section 2.1.

Suggested Start-up Sections to Review	Section
Electrical Configurations/Connections	6
Start-up or Restart Sequence Mode	7.1
Set-up Mode	7.2
Pair Mode	7.3
Antenna Connection, Styles, and Mounting Options	8.3.3
Antenna Adjustment Considerations	8.3.4
Environmental Usage/Concerns	8.4
Choosing an Antenna Gain (dBi) with Acceptable Fade-Margin	8.5
WDRR mounting	9
Functional LED Indicators	5

13 ACCESSORIES

13.1 Antenna Options

Limitless™ Antennas

WAN01RSP	WAN02RSP	WAN03RSP	WAN04RSP	WAN07RSP
Straight wireless antenna with 2.2 dBi gain, reverse polarity SMA plug, connector mount (RP-SMA)	Tilt/swivel wireless antenna with 2.2 dBi gain, reverse polarity SMA plug, connector mount (RP-SMA)	flat wireless antenna with 3 dBi gain, reverse polarity SMA plug, adhesive mount with 3,05 m [10 ft] cable	tilt/swivel wireless antenna with 5.5 dBi gain, reverse polarity SMA plug, connector mount (RP-SMA)	Straight wireless antenna with 0 dBi gain, reverse polarity SMA plug, connector mount 0 dBi straight w/RP-SMA plug
				
WAN06RNJ	WAN05RSP	WAN08RSP	WAN10RSP	
Straight wireless antenna with 8 dBi gain, reverse polarity N jack, bracket mount with 0,31 m [1 ft] cable	Tilt/swivel wireless antenna with 9 dBi gain, reverse polarity SMA plug, connector mount (RP-SMA)	Right angle wireless antenna with 0 dBi gain, reverse polarity SMA plug, connector mount 0 dBi straight w/RP-SMA plug	Straight antenna with 5.0 dBi gain, reverse polarity SMA plug, mobile magnetic mount with 4,57 m [15 ft] cable	
				
WAN09RSP	WAN11RSP			
Low profile straight antenna with 3.0 dBi gain, reverse polarity SMA plug, mobile magnetic mount with 4,57 m [15 ft] cable	Low profile dome antenna with 4.0 dBi gain, reverse polarity SMA plug, mobile thru-hole screw mount with 3 m [9.8 ft] cable			
				

13.2 Antenna Cable and Mounting Options

Limitless™ Cable Accessories

WCA200RNPRSP-002/010 Cable Assembly



Limitless™ Panel Mount Accessories

WAMM100RSP-005/010 Magnetic Antenna Mount



STANDARD CABLE ACCESSORIES

Part Number	Description
WCA200RNPRSP-002	200 Series coax cable assembly, reverse polarity N plug, reverse polarity SMA plug, 2 ft of cable
WCA200RNPRSP-010	200 Series coax cable assembly, reverse polarity N plug, reverse polarity SMA plug, 10 ft of cable
WAMM100RSP-005	Magnetic antenna mounting, 100 Series coax cable, reverse polarity SMA plug with 5 ft of cable
WAMM100RSP-010	Magnetic antenna mounting, 100 Series coax cable, reverse polarity SMA plug with 10 ft of cable

14 INSTALLATION DRAWINGS

14.1 Drawing Availability

Complete installation drawings for each listing of the WDRR Series and Limitless™ accessories are available at sensing.honeywell.com

15 TROUBLESHOOTING GUIDES

The troubleshooting guide includes WDRR indications and symptoms as it is being used in conjunction with the Limitless™ input series. Refer to Section 4 for layout of LEDs, terminals, connections, etc.

SYMPTOM	CAUSE	RESOLUTION
Green power LED is not ON	10 Vdc to 28 Vdc is not applied to "+" & "-" terminals	Check for proper connection and 10 Vdc to 28 Vdc to "+" and "-" terminals per Section 6.3
	Power leads connected in reverse	Check for proper connection of power: "+" and "-" terminals per Section 6.3
Green, yellow and/or red configuration LEDs do not blink ON at start-up	WDRR internal electronics damaged	Replace WDRR
	LED(s) burnt out	Check LED operation per Section 6.2 and replace WDRR if necessary
Tri-color output LEDs are momentarily OFF then ON with possible NPN/PNP output change during normal operation. Resulting in only green Power LED on and possibly incorrect yellow and red LED indication/output for up to 30 seconds.	ESD/EMI exposure beyond published specifications or device performing self check	Determine source for ESD/EMI emissions in application and take action to remove
Yellow tri-color output LED is flashing	Low battery in Limitless™ input	<ul style="list-style-type: none"> • Determine which Limitless™ input has a low battery using the procedure in Section 6.5 • Replace Limitless™ switch battery per Limitless™ input Installation guide
	Incorrect battery installed in Limitless™ input	<ul style="list-style-type: none"> • Determine which Limitless™ input has a low battery using the procedure in Section 6.5 • Replace Limitless™ switch battery per Limitless™ input Installation guide
Yellow tri-color output LED is constantly ON	Dead or low battery in Limitless™ input	<ul style="list-style-type: none"> • Determine which Limitless™ input has a low battery using the procedure in Section 6.5 • Limitless™ input status will in this case be reported as lost RF • Replace Limitless™ input battery per Limitless™ input installation guide
	Incorrect battery installed in Limitless™ input	<ul style="list-style-type: none"> • Determine which Limitless™ input has a low battery using the procedure in Section 6.5 • Limitless™ input status will in this case be reported as lost RF • Replace Limitless™ input battery per Limitless™ input installation guide
	RF range/distance between WDRR and Limitless™ input is beyond capability	Reposition Limitless™ input closer to the WDRR until yellow LED is no longer ON
	Exposure to adjacent materials/objects and/or materials/objects	Reposition Limitless™ input away from objects until yellow LED is no longer ON
	Damage or missing antenna from WDRR and/or Limitless™ input	Replace antenna per Section 8.3
	Antenna alignment is not acceptable	Reposition antenna per Section 8.3
	Damage to antenna cable	Replace antenna cable per Section 8.3
	Loose antenna or cable connections	Check connections and tighten as necessary per Section 8.3

SYMPTOM	CAUSE	RESOLUTION
Red tri-color output LED is not ON when Limitless™ input changes state (i.e. switch actuated) (green power LED ON, yellow LED OFF)	Limitless™ input is not paired to WDRR	Pair Limitless™ input to WDRR per Section 7.3
	If applicable – external actuator of Limitless™ WDRR damaged	Replace Limitless™ actuator
	If applicable – actuating head of Limitless™ switch damaged	Replace Limitless™ actuating head
	Limitless™ input internal electronics damaged	Replace Limitless™ input
	Tri-color LED burnt out or damaged electronics of WDRR	Replace WDRR
	Tri-color red LED burnt out	Check LED operation per Section 6.2 and replace WDRR if necessary
NPN/PNP output(s) is not changing state when Limitless™ input(s) is actuated (green power LED ON, yellow LEDs OFF)	Limitless™ input(s) is not paired to WDRR	Pair Limitless™ input(s) to WDRR per Section 7.3
	Incorrect connections	Check for correct connections to output terminal(s) per Section 6.4
	If applicable – external actuator of Limitless™ switch damaged	Replace Limitless™ actuator
	If applicable – actuating head of Limitless™ switch damaged	Replace Limitless™ actuating head
	Limitless™ input(s) internal electronics damaged	Replace Limitless™ input(s)
	Damaged output(s)	Replace WDRR

Limitless™ WDRR Receiver

Issue 4 50063987

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

E-mail: info.sc@honeywell.com

Internet: www.honeywell.com/sensing

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	+44 (0) 1698 481676 Fax
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	+1-305-883-8257 Fax
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