

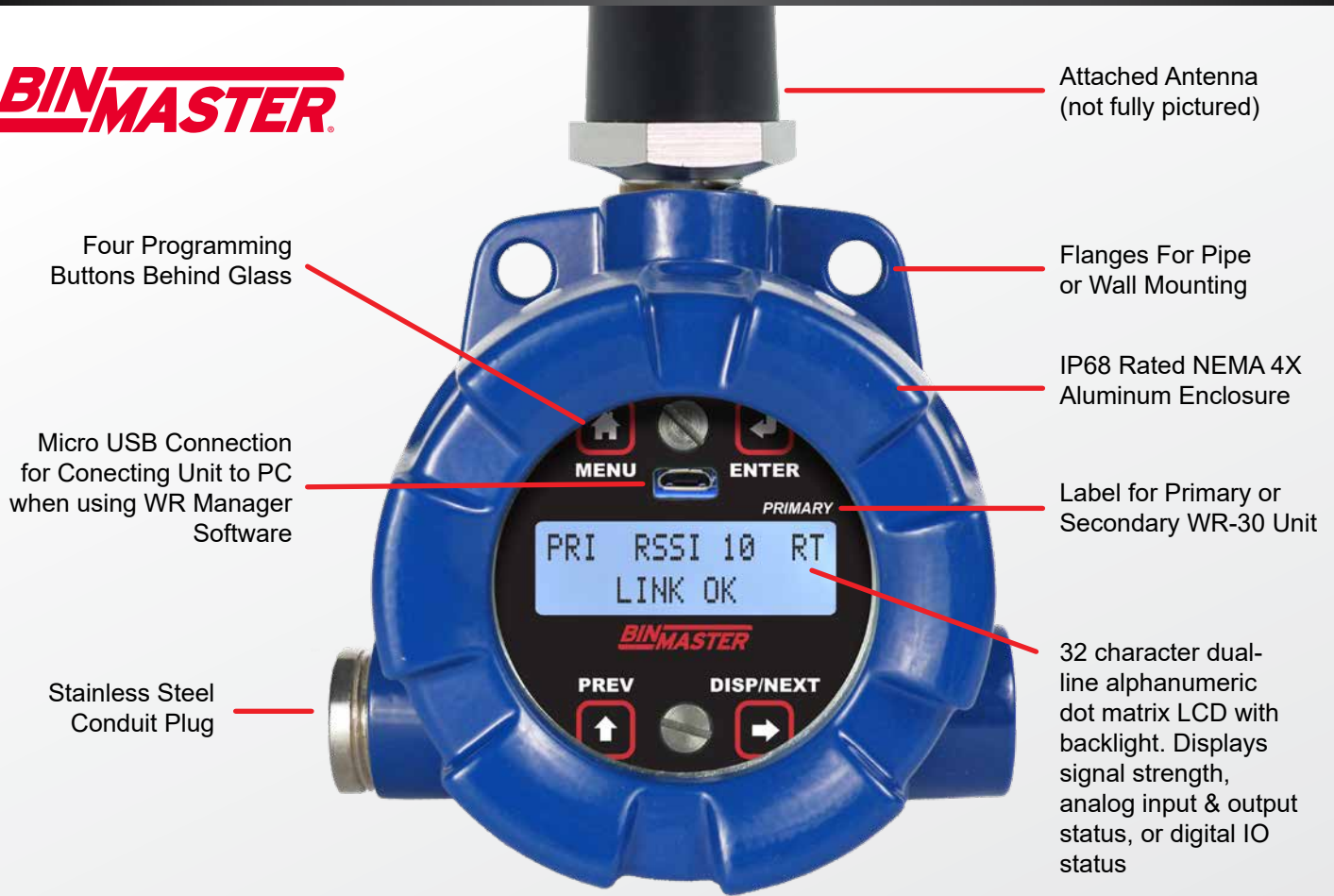
Point-To-Point Wireless Bridge



FEATURES

- Signal Wire Replacement in a Rugged, Industrial Housing
- Inputs and Outputs on Both Field Units
- Simple to Order, Configure, & Install
- 1 Mile Line-of-Sight Outdoor, 500 Feet Indoor Range
- Inputs: Analog (4-20 mA, 0-10 V, 0-5 V, 1-5 V), Digital, and RS-485 Modbus® Communications
- Outputs: Analog (4-20 mA), Digital, and RS-485 Modbus® Communications
- Remote or Attached Antenna
- Repeaters and Directional Antennas Available
- Flanges for Wall or Pipe Mounting
- Software Available for Even Easier Setup
- NEMA 4X, IP68 Enclosure

BINMASTER



INTRODUCTION

The BinMaster WR-30 gives you a simple, straightforward way to get an analog, discrete, or Modbus® signal from where you have it to where you need it. It's a point-to-point wireless bridge packaged in a rugged, weather tight housing designed to meet the demands of industrial installations.

The WR-30 is simple to order, simple to configure, and easy to trust with your application. Guaranteed ranges assure it will work with your application, or you can send it back - no questions asked. A wireless survey tool is available for those who may require a site survey for longer distances, making it easy to verify the installation will work the first time.

The WR-30 starts with an analog, discrete, or Modbus® input and wirelessly broadcasts it to a second WR-30 unit. The second unit then recreates that signal at its location. Just put the units in the field anywhere you have 12-24 VDC power.

Fixed or remote antenna modules are available, as well as a wide range of accessories including mounting kits, antenna-related accessories, and repeaters. The antenna may be directly attached or remotely located. High gain directional antennas are also offered.

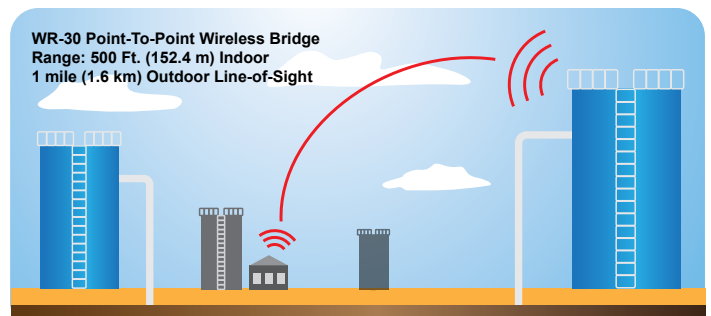
KEY FEATURES

Signal Wire Replacement In a Rugged Industrial Area

The WR-30 wireless system is housed in a rugged, IP68, NEMA 4X painted aluminum enclosure and is a smart, economical choice when you need two devices to communicate over long distances in a harsh industrial environment. It eliminates the need to spend time and money on hard wiring your instrumentation throughout your facility.

WR-30 Signal Range

The WR-30 has a range of 500 ft. indoors at industrial environments and an outside line-of-sight range of 1 mile. Any wireless network can be negatively affected by certain factors, such as physical obstacles and improper equipment placement. Check the installation guide and manual for tips on how to avoid common installation mistakes.

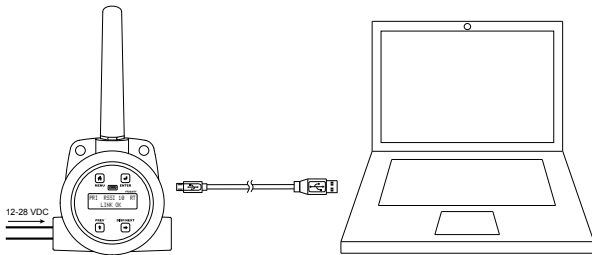


Inputs and Outputs

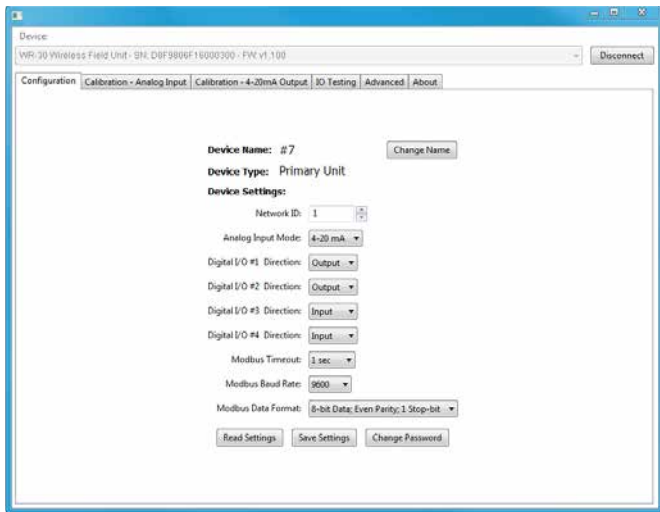
The WR-30 wireless bridge units accept an analog input (4-20 mA, 0-10 V, 0-5 V, or 1-5 V), up to four discrete digital inputs, and RS-485 Modbus Communications. They also come with analog (4-20 mA), digital, and RS-485 Modbus outputs.

WR Manager Software for Even Easier Setup

The WR-30 is designed to be easy to setup, with just a few button pushes. However, the WR Manager allows you to program the WR-30 wireless units from a PC with a USB connection. Units connect to a PC via the micro USB connection on their face, underneath the enclosure cover. Use of WR Manager is required for programming advanced settings such as wireless encryption and analog signal calibration. WR Manager can be found on the included CD. Once the software is running, power the unit using a 12-28 VDC power supply and connect the device to the PC using the provided USB cable.



▲ Units connect to a PC via the micro USB connection



▲ Configuration Window of the WR Manager Software

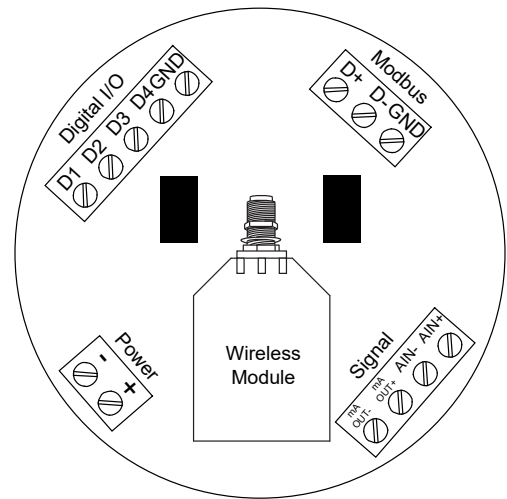
Wall or Pipe Mounting

The WR-30 has flanges with two mounting holes that may be used for a 1.5" pipe mounting or wall mounting. Alternatively, the unit may be supported by the conduit using the conduit holes provided. It can also be mounted by using a mounting bracket in orient the device antenna away from the pipe. For best signal strength, do not mount the module on metal pipe with the antenna parallel to the pipe.

NEMA 4X, IP68 Enclosure

The WR-30 units not only look great with their modern, smooth die cast aluminum enclosures, but they can be installed virtually anywhere. The NEMA 4X / IP68 rugged enclosure provides serious protection from the elements and harsh industrial environments.

CONNECTIONS

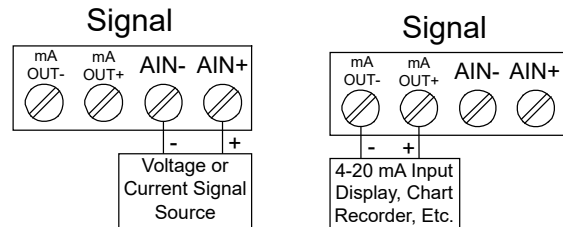


Input Signal Connector

The analog input may be either 4-20 mA, 0-10 V, 0-5 V, or 1-5 V. The appropriate input type must be programmed for each unit.

4-20 mA Output Connector

The 4-20 mA output corresponds with the analog input signal on the paired wireless device. The analog output signal is always 4-20 mA, regardless of the analog input type on the other wireless module.

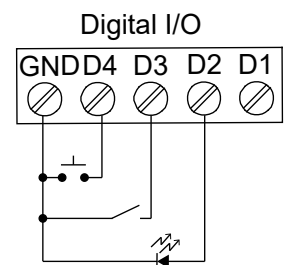


▲ Signal Connector

▲ 4-20 mA Output Connector

Digital I/O Connector

All digital connections are referenced to ground. The primary unit digital I/O settings determine the settings of the secondary unit. (e.g. if DI of the primary is an input, DI of the secondary is an output)

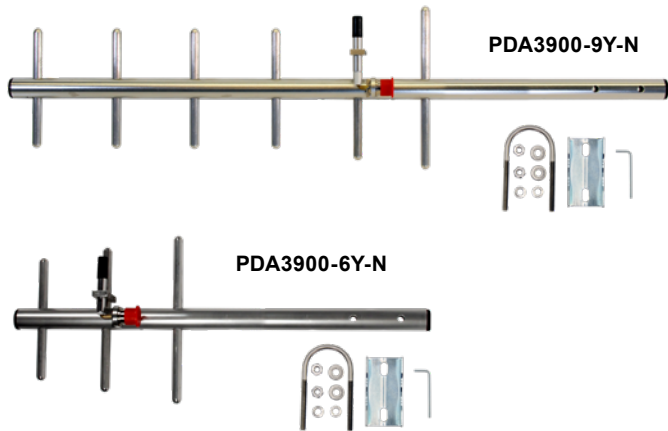


Note: Each connection may be set independently in the device settings as either an input or an output. In the diagram to the right, D4 & D3 are digital inputs and D2 is a digital output.

Modbus RTU Serial Communications

The WR-30 acts as a simple pass-through for Modbus communications. As such, multiple Modbus enabled devices may be transmitted wirelessly using the WR-30 Wireless Bridge.

YAGI HIGH GAIN ANTENNA ACCESSORY



The yagi antennas are made to work with point-to-point applications. These high gain antennas are ideal to use with BinMaster's WR wireless series because they give you the flexibility of installing the antenna exactly where you need to bridge your point-to-point wireless process signals while keeping the WR-30 unit in a convenient location for monitoring. Each Yagi is factory tuned on a network analyzer for best power match and lowest VSWR, offering the best possible performance. The yagi antennas also come complete with a mounting kit with stainless steel hardware.

Specifications

- Frequency:** 900 MHz
- Gain:** 6 or 9 dBd (based on model)
- Termination:** N-Female connector
- Mounting Kit:** Included for 1 1/4" pipe
- Dimensions:** PDA3900-6Y-N-BM: 17.125" (435 mm) x 6.875" (175 mm), PDA3900-9Y-N-BM: 28" (711 mm) x 6.875" (175 mm)
- Weight:** PDA3900-6Y-N-BM: 11.2 oz (318 g), PDA3900-9Y-N-BM: 16.8 oz (476 g)

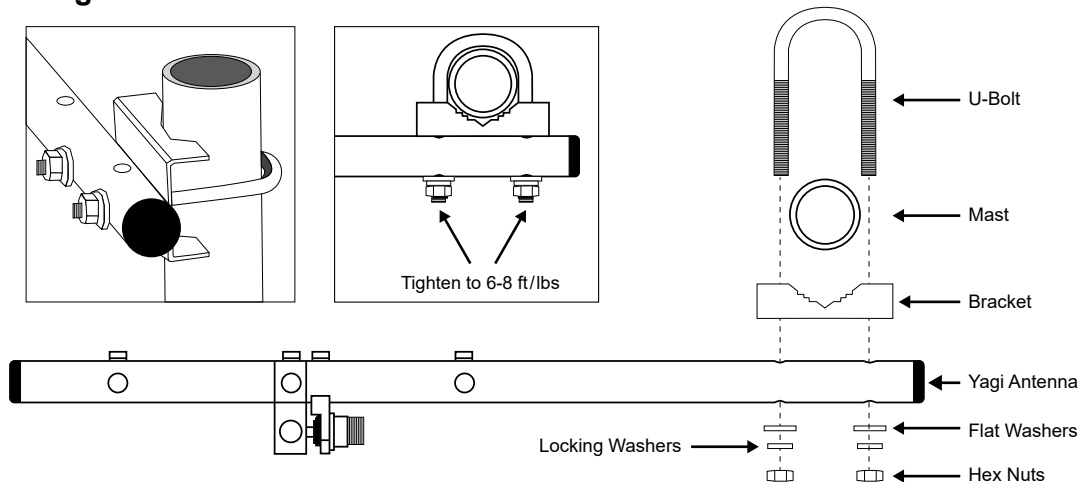
Connecting the Yagi Antenna to the WR-30 Unit



*Included with the PDA3120-N-BM or PDA3140-N-BM Extension Cable

Caution: Do not use excessive force when attaching coupler to WR-30 wireless module.

Mounting the Yagi Antenna



SPECIFICATIONS

Except where noted all specifications apply to operation at +25°C.

General

Display: 32-character dual-line alphanumeric dot matrix LCD display with backlight (4.68mm x 2.21mm characters)

Display Orientation: Display may be mounted at 180° from default orientation.

Network ID: Field selectable: 0 - 99

Programming Methods: Four programming buttons (behind glass) or PC with WR Manager software.

Recalibration: All inputs and outputs are calibrated at the factory. Recalibration is recommended at least every 12 months.

Process/Digital I/O Display: Press the display button once to display the present analog input and output. Press the display button again to display digital I/O states.

Password: A programmable password restricts modification of program settings.

Power: 12-28 VDC, 5 W max

Non-Volatile Memory: All programmed settings are stored in non-volatile memory for a minimum of ten years if power is lost.

Isolation: 500 V

Environmental: *Operating temperature range:* -40 to 65°C (display inoperable < -20 °C); *Storage temperature range:* -40 to 85°C; *Relative humidity:* 0 to 90% non-condensing

Connections: Removable screw terminal blocks accept 16 to 30 AWG wire.

Enclosure: Cast aluminum with glass window, 0.30% max copper content, corrosion resistant powder coating, color: blue. NEMA 4X/IP68. Three ½" NPT threaded conduit openings. One ½" NPT stainless steel conduit plug with 10 mm hex key fitting installed.

Mounting: May be mounted directly to conduit. Two mounting holes for 1.5" pipe or wall mounting. See manual for mounting space requirements.

Signal Connector Tightening Torque: 2.5 lb-in (0.28 Nm)

Shipping Dimensions: 17" x 14" x 9" (43.2 cm x 35.6 cm x 22.9 cm) (L x W X H)

Shipping Weight: 5 lbs. (2.27 kg)

Warranty: 3 years parts & labor

Wireless Radio

Frequency: 900 MHz

Range: 500 ft (152.4 m) indoor, 1 mi (1.61 km) outdoor (line-of-sight)

Encryption: AES 128-bit encryption available using WR Manager software.

Interference Reduction: Frequency Hopping Spread Spectrum (FHSS)

Power Output: 24 dBm (250 mW)

Sensitivity: -101 dBm

Antenna Cable Connection: RP-SMA right angle male

Analog Input

Inputs: *Field selectable:* 4-20 mA, 0-10 V, 0-5 V, 1-5 V

Accuracy: ±0.03% of calibrated span ±1 count

Temperature Drift: 0.005% of calibrated span/°C max from 0 to 65°C ambient, 0.01% of calibrated span/°C max from -40 to 0°C ambient

Input Impedance: *Voltage ranges:* greater than 500 kΩ; *Current ranges:* 50 - 100 Ω (depending on resettable fuse impedance)

Signal Loss: Inputs will remain off (open circuit) until wireless units are reconnected.

HART Transparency: Analog input will not interfere with existing HART communications on the wired 4-20 mA signal

Isolated 4-20 mA Transmitter Output

Output Source: Analog input from connected wireless unit

Calibration: *Factory calibrated:* 4.000 to 20.000 = 4-20 mA output

Accuracy: ± 0.1% of span ± 0.004 mA

Temperature Drift: 0.4 μA/°C max from 0 to 65°C ambient, 0.8 μA/°C max from -40 to 0°C ambient

Note: Analog output drift is separate from input drift.

Signal Loss: mA output will become 3.2 mA after approx. 25 seconds.

Output Loop Resistance:

Power Supply	Minimum	Maximum
24 VDC	10 Ω	900 Ω

Digital Input / Output Terminal

Channels: Four (4) digital connections, independently field selectable as either inputs or outputs

DI Logic High: 3 to 5Vdc, TTL logic level

DI Logic Low: 0 to 1.1 VDC

DO Logic High: 3.1 to 3.3 VDC

DO Logic Low: 0 to 0.4 VDC

Source Current: 10 mA maximum output current

Sink Current: 1.5 mA minimum input current

Signal Loss: Digital output goes to logic high

Operation: A closed dry contact from a Digital input terminal to GND will result in a digital output low on the corresponding output pin.

RS-485 Modbus® RTU Serial Communications

Compatibility: EIA-485

Connectors: Removable screw terminal connector

Max Distance: 3,937' (1,200 m) max

Baud Rate: 1200 – 57,600 bps

Data: 8 bit (1 start bit, 2 stop bits)

Parity: Even, Odd, or None with 2 stop bits

Modbus Timeout: 0.5, 1, 2, 3, 4, 5 seconds; user selectable

WR Manager Software

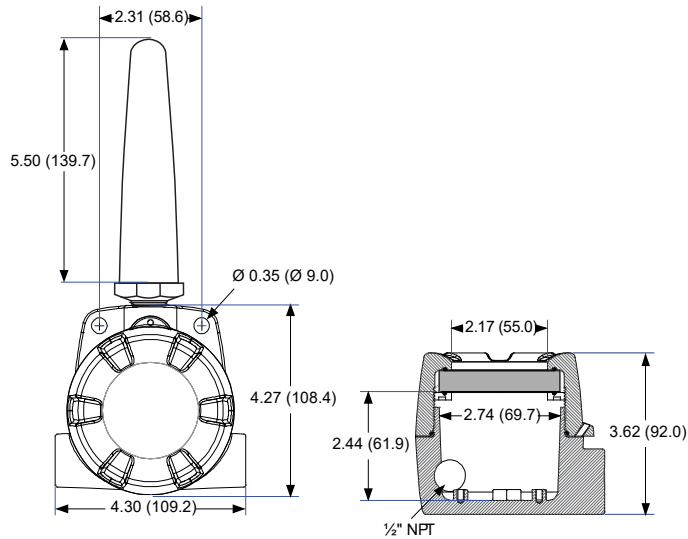
System Requirements: Microsoft® Windows® XP/Vista/7/8/10

Communications: USB 2.0 (Standard USB A to Micro USB B)

Configuration: Configure devices one at a time

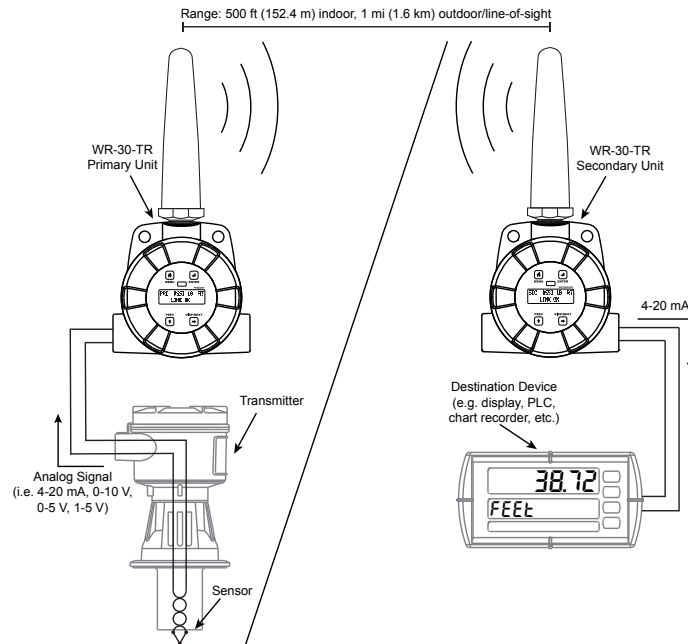
DIMENSIONS

Units: Inch (mm)



APPLICATION EXAMPLE

This simple example demonstrates how the WR-30 may be used to wirelessly bridge an analog signal. Because the WR-30 can input and output a 4-20 mA signal, it is ideal for integration into existing 4-20 mA systems.



⚠ WARNING

Cancer and Reproductive Harm - www.P65Warnings.ca.gov

ORDERING INFORMATION

WR-30 Point-to-Point Wireless System	
Model	Description
WR-30-TR	WR-30 Point-to-Point Wireless Bridge
Accessories	
Model	Description
WR-30-RP	Wireless Repeater Kit
PDA3120-N-BM	RP-SMA F to N Male Antenna Cable 20ft
PDA3140-N-BM	RP-SMA F to N Male Antenna Cable 40ft
PDA3120-S-BM	RP-SMA M/F Antenna Cable 20ft
PDA3140-S-BM	RP-SMA M/F Antenna Cable 40ft
PDA3900-12-N-BM	WR-90 MHz Antenna, 1/2" NPT
PDA3900-6Y-N-BM	Yagi Antenna 6dB
PDA3900-9Y-N-BM	Yagi Antenna 9dB
PDA6963-BM	Stainless Steel WR-30 Mounting Kit

Note: Extension cables include the following parts:

- (1) Antenna Coupler
- (1) Cable Gland
- (1) 8" Length of Coax Seal Tape
- (1) 1/2" NPT Cable Gland

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