PDW30 & PDW90 Repeater Field Unit
Instruction Manual

PRECISION DIGITAL +
WIRELESS

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- Wireless Repeater Unit in a Rugged, Industrial Housing
- Simple to Order, Configure, & Install
- Increase Range an Additional 1 Mile Line-of-Sight, 500 Ft Indoor
- Remote or Attached Antenna
- Flanges for Wall or Pipe Mounting
- Software Available for Even Easier Setup
- Rugged, IP68, NEMA 4X Enclosure
- 3-Year Warranty

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Disclaimer

The information contained in this document is subject to change without notice. Precision Digital Corporation makes no representations or warranties with respect to the contents hereof; and specifically disclaims any implied warranties of merchantability or fitness for a particular purpose.

⚠ CAUTION

- Read complete instructions prior to installation and operation of the device.

⚠ WARNINGS

- Risk of electric shock or personal injury.
- This product is not recommended for life support applications or applications where malfunctioning could result in personal injury or property loss. Anyone using this product for such applications does so at their own risk. Precision Digital Corporation shall not be held liable for damages resulting from such improper use.
- Failure to follow installation guidelines could result in death or serious injury. Make sure only qualified personnel perform the installation.

⚠ **WARNING**

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

Limited Warranty

Precision Digital Corporation warrants this product against defects in material or workmanship for the specified period under "Specifications" from the date of shipment from the factory. Precision Digital's liability under this limited warranty shall not exceed the purchase value, repair, or replacement of the defective unit. See Warranty Information and Terms & Conditions on www.predig.com for complete details.

Registered Trademarks

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Introduction

Precision Digital PDW30-RNA wireless signal repeaters are used to retransmit wireless signals when connectivity between PDW30 or PDW90 wireless units is an issue. They are incredibly simple to install as they only require power and a network ID. Any units in range of the repeater with the same network ID will retransmit through it, thus increasing signal strength. Use repeaters to broadcast over very long distances or around permanent obstacles.

Ordering Information

Model	Description
PDW30-RNA	PDW30 & PDW90 Repeater Field Unit

Accessories

Model	Description
PDA10	PDW Wireless Signal Strength Survey Tool
PDA3120-S	RP-SMA M/F Antenna Cable 20ft
PDA3140-S	RP-SMA M/F Antenna Cable 40ft
PDA3120-N	RP-SMA F to N Male Antenna Cable 20ft
PDA3140-N	RP-SMA F to N Male Antenna Cable 40ft
PDA3900-12-N	PDW 900 MHz Antenna, 1/2" NPT
PDA3900-6Y-N	Yagi Antenna 6dB
PDA3900-9Y-N	Yagi Antenna 9dB
PDA6963-SS	Stainless Steel PDW30 Mounting Kit

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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 PDW Manager software.
Password	A programmable password restricts modification of programmed 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. Two 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 *Mounting Dimensions* on page *6* for mounting space requirements.
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 year parts and labor. See Warranty Information and Terms & Conditions on www.predig.com for complete details.

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 PDW Manager software
Interference Reduction	Frequency Hopping Spread Spectrum (FHSS)
Power Output	24 dBm (250 mW)
Sensitivity	-101 dBm

PDW 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

Safety Information

⚠ **CAUTION**

- Read complete instructions prior to installation and operation of the device.

⚠ **WARNINGS**

- Read all product labels completely and follow all instructions and requirements listed on the labels for installation or service.
- Installation and service should be performed only by trained service personnel. Service requiring replacement of internal components must be performed at the factory.

Installation

All pushbuttons and wiring connectors are accessed by opening the enclosure. To access electrical connectors, remove the 2 captive screws and remove the display assembly. Pushbuttons may also be accessed using the magnet assembly if reed switches are installed.

Unpacking

Remove both units from box. Inspect the packaging and contents for damage. Report damages, if any, to the carrier. If any part is missing or the units malfunction, please contact your supplier or the factory for assistance.

Pre-Installed Conduit Plug

The PDW30-RNA is supplied with one pre-installed optional conduit plug for installations that do not require the use of both conduit entries. The conduit plug includes an internal hexagonal socket recess for removal.

Mounting Instructions

The PDW30-RNA has 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. The antenna is threaded into one of the three conduit holes and may be moved as appropriate for the installation.

It can also be mounted by using the PDA6963 mounting bracket in order to orient the device antenna away from the pipe. Refer to *Mounting Dimensions* on page *6* for details on wall or panel space requirements.

Cover Jam Screw

The cover jam screw should be properly installed once the wireless units have been wired and tested in a safe environment. The cover jam screw is intended to prevent the removal of the units' cover while in operation without the use of tools. Using a M2 hex wrench, turn the screw clockwise until the screw contacts the unit. Turn the screw an additional 1/4 to 1/2 turn to secure the cover.

⚠ **CAUTION**

- Excess torque may damage the threads and/or wrench.

FCC Notice

Contains FCC ID: MCQ-XB900HP

The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i.) this device may not cause harmful interference and (ii.) this device must accept any interference received, including interference that may cause undesired operation.

⚠ **IMPORTANT**

- The RF module has been certified for remote and base radio applications. If the module will be used for portable applications, the device must undergo SAR testing. 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 the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

- If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Re-orient or relocate the receiving antenna, Increase the separation between the equipment and receiver. Connect equipment and receiver to outlets on different circuits or consult the dealer or an experienced radio/TV technician for help.

Canada (IC) Notice

Contains Model: XB900HP, IC: 1846A-XB900HP

Integrator is responsible for its product to comply with IC ICES-003 & FCC Part 15, Sub. B - Unintentional Radiators. ICES-003 is the same as FCC Part 15 Sub. B and Industry Canada accepts FCC test report or CISPR 22 test report for compliance with ICES-003.
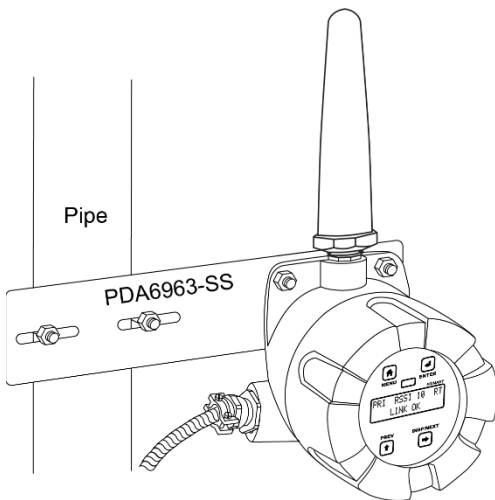
PDA6963-SS Stainless Steel Pipe Mounting Kit

Figure 1. PDA6963-SS Stainless Steel Pipe Mounting Kit
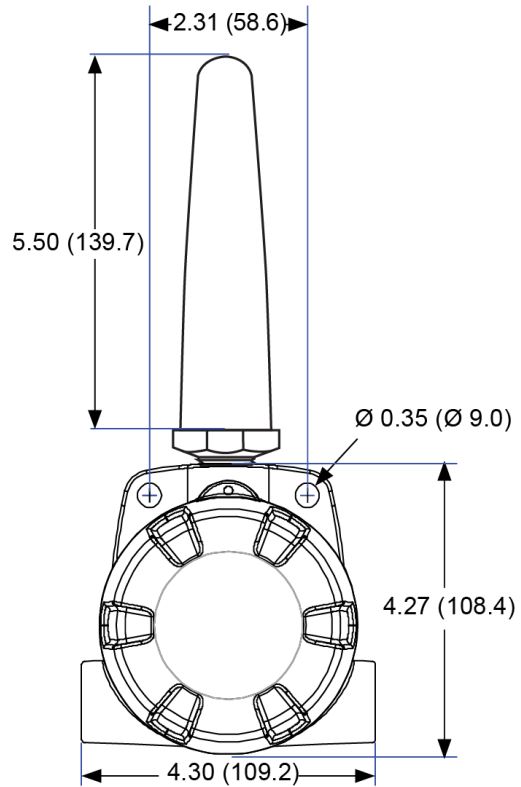
Mounting Dimensions

All units: inches [mm]

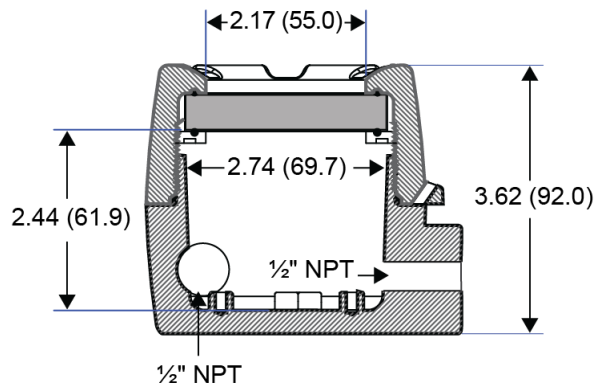
Figure 2. Enclosure Dimensions – Front View

Figure 3. Enclosure Dimensions – Side Cross Section View

Note: The supplied conduit plug may extend up to 0.6 in [15 mm] from the conduit opening when installed.

Connections

To access the power connector, remove the enclosure cover and unscrew the two captive stainless steel screws. Remove the electronics assembly from the enclosure. The power connection is made to a two terminal removable connector on the back of the assembly. Grounding connections are made to the two ground screws provided on the base – one internal and one external.

⚠ **WARNINGS**

- Static electricity can damage sensitive components.
- Observe safe handling precautions for static-sensitive components.
- Use proper grounding procedures/codes.
- Observe all safety regulations. Electrical wiring should be performed in accordance with all agency requirements and applicable national, state, and local codes to prevent damage to the device and ensure personnel safety.

Figure 4 below shows the locations of screw terminal blocks on the rear of the wireless unit assembly.

Note: *Digital I/O, Modbus, and Signal connections are not used with the repeater unit.*
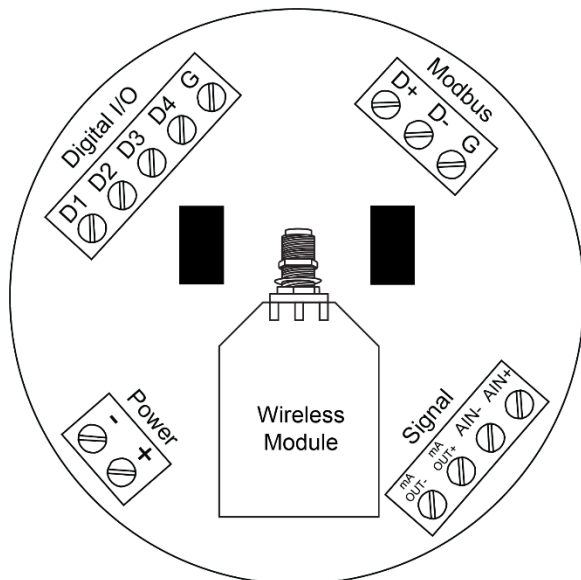
Figure 4. PDW30-RNA Device Assembly, Rear View

Wiring Diagram

Power Connector

Power connections are made to a two-terminal connector labeled POWER in *Figure 4*. The PDW30-RNA is reverse polarity protected; it will not be damaged if wired backward.

Make sure that the power supply can provide between 12 and 28 VDC to the wireless device.
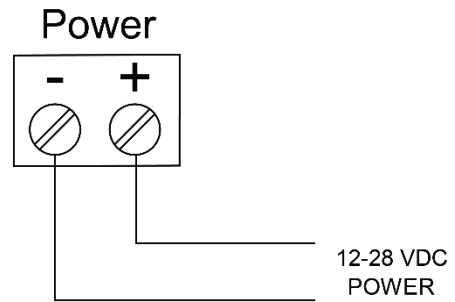

Figure 5. Power Connections

Setup and Programming

Overview

There are no jumpers to set for wireless device input selection.

Setup and programming is done through the programming buttons located underneath the enclosure cover or using the PDW Manager software. After power and input signal connections have been completed and verified, apply power to the device.
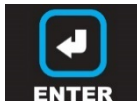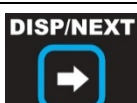
Buttons & Display
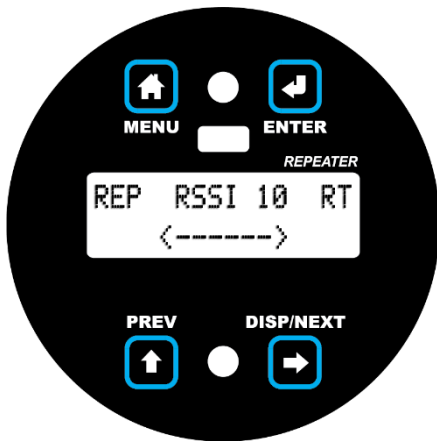
Display for PDW30-RNA Repeater Unit

Programming Buttons

The units can be programmed using the buttons located behind the enclosure cover. Use the Menu button to enter or exit *programming mode*, the Next button to cycle forward through menu options, the Previous button to cycle backward through menu options, and the Enter button to select the menu item or option you want.

During number entry, use the Next button to select a digit and the Previous button to increment the selected digit.

Button/Symbol	Description
MENU	**Menu** Enter or exit the device menu
ENTER	**Enter** Select a menu item of option
PREV	**Previous** Cycle backward through menus or increment digit
DISP/NEXT	**Next** Cycle forward through menus or select next digit

| Display	Status
RSSI	**Received Signal Strength Indicator** Indicates the wireless signal strength between wireless devices on a scale of 1 to 10. If the repeater is used in a PDW90 installation, this value represents the signal strength between the base station and the repeater. If the repeater is used in a PDW30 installation, this value represents the signal strength between the primary unit and the repeater.
RT	**Receiving/Transmitting** Flashes while the devices are sending and/or receiving data
REP	**Repeater** Indicates that the device is a repeater unit. This distinction is fixed and cannot be changed.

PDW Manager Software

The units can also be programmed using the PC based *PDW Manager*. Units connect to a PC via the micro USB connection on their face, underneath the enclosure cover.

Use of PDW Manager is required for programming advanced settings, such as wireless encryption.

***Note:*** *Units must be powered externally prior to programming via USB.*
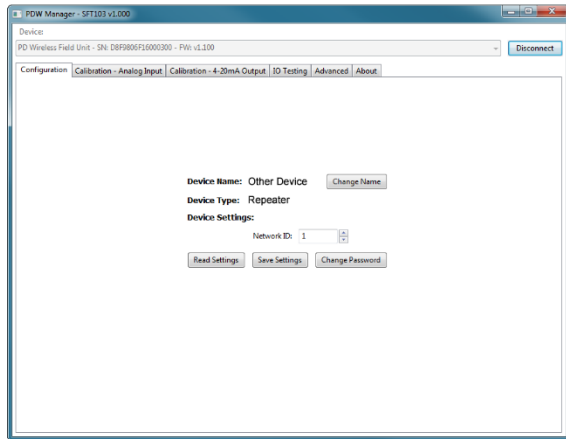
PDW Manager is available on the included CD or online at www.predig.com/pdwmanager.

Instructions on the use of PDW Manager to program the PDW30-RNA wireless units can be found under *Programming with PDW Manager* on page *11*.

Setup Menu

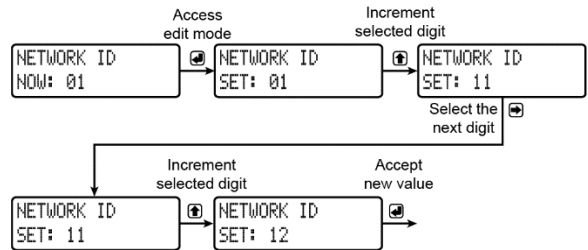The setup menu consists of network ID, password, and factory defaults restoration.
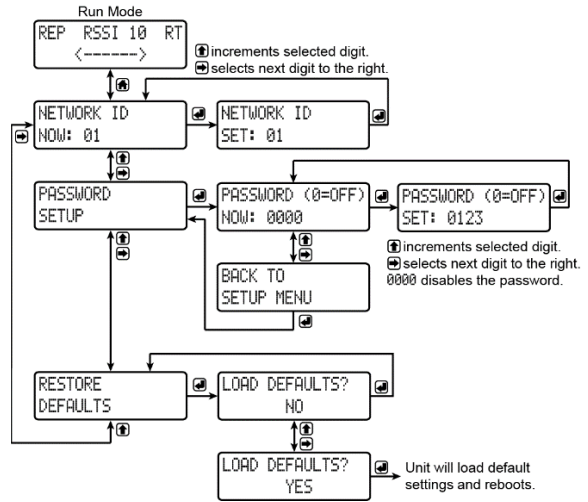
Entering Numeric Values

Numeric values are set using the Next and Previous buttons. Press Next to select next digit and Previous to increment digit value.
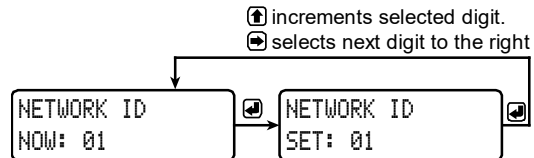
The selected digit will flash.

Press the Enter button, at any time, to accept the value or the Menu button to exit without saving.


Network ID

The network ID determines with which wireless devices the repeater will connect. The repeater unit must share the same network ID as the other wireless devices in order to communicate with them.

Password Setup

The wireless repeater may be protected with a four digit numeric password in order to prevent unauthorized tampering. When a password has been set, you will be prompted to enter that password in order to access the device menu.
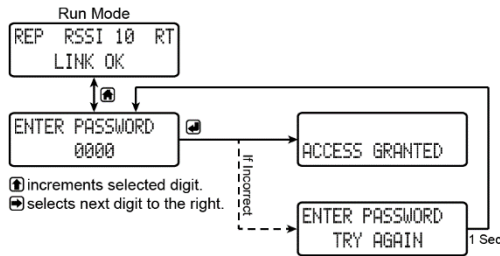
To disable password protection, simply enter 0000 as the password.
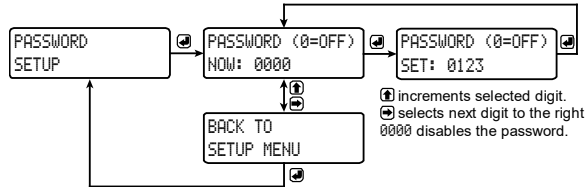
Note: See Entering Numeric Values on page 9 for instructions on how to enter numbers

Making Changes to a Password Protected Repeater

Once a password has been set on the device, you will be required to enter that password before being allowed to access the device menu.


Note: Setting a password will require you to enter the password to access the device settings via the PC software as well.

Did you forget the password?
The password may be disabled by entering a master password. If you are authorized to make changes, enter the master password 7300 to unlock the device.

Restore Defaults

If a mistake has been made while programming the wireless repeater device, and it is unclear where the error occurred, the best option may be to perform a factory reset of the device and begin again.
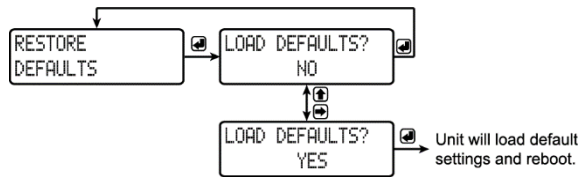
Programming with PDW Manager

PDW Manager allows you to program the PDW30-RNA wireless repeater unit from a PC with a USB connection. The unit connects to a PC via the micro USB connection on its face, underneath the enclosure cover. Use of PDW Manager is required for programming advanced settings such as wireless encryption.

PDW Manager can be found on the included CD or downloaded from www.predig.com/pdwmanager. 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.
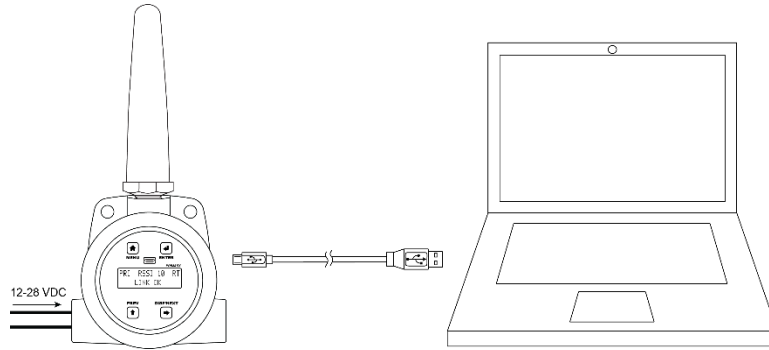
The PC will automatically install the appropriate device drivers. Once this has completed, the device will appear in the *Device* list at the top of the PDW Manager window. Click *Connect*.
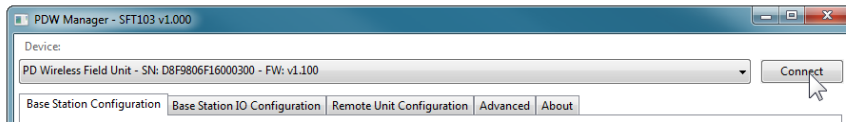
The image below shows the available options on the configuration tab while the *repeater* unit is connected.

Device Name
Click Change Name to enter a new reference name for the wireless device.

Network ID
Enter the same Network ID as the PDW30 or PDW90 system the repeater will operate with.

Read Settings
Click this button to load settings from the wireless hardware and display them here. This will overwrite any changes you have made in the software.

Save Settings
Click this button to write all of the changes you have made in the above fields to the wireless hardware.

Change Password
Click this button to change the password needed to change device settings. Enter 0000 to disable.

Disconnect
Click this button to disconnect from the repeater and prepare it to be unplugged from the computer.

Note: The two calibration tabs and the IO Testing tab are not applicable to the repeater unit.

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Device communication can be secured by enabling 128-bit AES encryption. A channel mask may also be set for interference immunity. The encryption key and channel mask may be entered on the *Advanced* tab.

Once you have entered the encryption information, click Save *Settings*. The wireless devices must share identical encryption keys in order to communicate, so be sure to enter the same information for the second unit.

Channel Mask
Set a channel mask for interference immunity.

AES Encryption
Devices can be programmed to communicate securely using 128-bit AES encryption. Enable encryption using the drop-down at the top and enter an encryption key. The two key fields must start with "0x" followed by 16 hexadecimal characters (for example: 0x46D34C5666542D06).

Read Settings
Click this button to load settings from the wireless unit hardware and display them here. This will overwrite any changes you have made in the software.

Reset to Factory Defaults
Click this button to permanently reset all setting on the device to their factory defaults. This will overwrite all changes you have made to the device.

Save Settings
Click this button to write all of the changes you have made in the above fields to the wireless unit hardware.

Contact Precision Digital

Technical Support

Call: (800) 610-5239 or (508) 655-7300

Fax: (508) 655-8990

Email: support@predig.com

Sales Support

Call: (800) 343-1001 or (508) 655-7300

Fax: (508) 655-8990

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