

Industrial Wireless Whitepaper Review

Go Wireless

The Easiest Way To Get a Process Signal From Point A to Point B



SAVE ON TIME
SAVE ON MAINTENANCE
SAVE ON COST

A major problem that often comes up in industrial automation, particularly when trying to upgrade existing systems, is simply finding a way to get a process signal from point A to point B in the most economical and efficient manner.

Running physical wires between devices can be costly and time-consuming, especially when there is a need to run them through conduit or dig trenches over long distances. Facilities that have been in operation for a long time may have gone through many iterations of

process control equipment, leaving behind a rat's nest of old wires which makes running of new wires sometimes difficult. Often, it is simply less expensive and less time consuming to transmit the signal wirelessly.

Go Wireless

PRECISION DIGITAL WIRELESS

Real Life Applications

Many times a plant manager just wants to add a few measurements in the field and bring them back to the control room at the lowest cost, and the simplest way is to do it wirelessly. The following examples show how PDW wireless products were used for transmitting process information to where the operator wants it.

Municipal Wastewater Plant Uses PDW90 Wireless System to Transmit Process Signals to SCADA System

The Problem:

The operator of this municipal wastewater plant needed to monitor the process information from around the facility on a SCADA system located in the control room of the central building.

The process information comes from (2) 4-20mA transmitters and (6) digital status signals scattered around the plant that are a good distance away from the central building (B) including a chlorine storage

tank (A), open channel flow (C), aeration building blower status (D), pump station pump status (E), and compost blower status (F, G, H).

Hard wiring all these transmitters would mean running hundreds of feet of physical wires throughout the plant which would be too costly for the budget and take too much time, something the plant manager did not want to do.



PDW90 Field Unit Installation at Storage Building



PDW90 Field Unit Installation at Open Channel Flow



PDW90 Field Unit Installation at Aeration Basin Blowers

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Go Wireless

PRECISION DIGITAL WIRELESS

The Solution:

With future expansion in mind, the solution was to install a PDW90 point-to-multi-point wireless system consisting of one PDW90 base station and eight PDW90 field units. The field units were easy to install right out of the box, and with the 24 V power available around the plant, made it even more convenient to get the units up and running in no time.

To make sure there was a good connection between the base station and the field units a PDA10 wireless survey tool kit was used, which allowed the installer to test the signal before installing the units.

The rugged field units were mounted directly at the transmitter sites, each being independently ranged to the base station.

The range of the PDW90 units are 1 mile line-of-sight outdoors and 500 feet indoors. Although, many of the field units had obstructions to the base station, the internal antennas were mounted up high to avoid most obstacles and all signals between the units and base station were successful. No additional antennas were needed for this application.



PDW90 Base Station with Attached Antenna Inside Building



4-20 mA and Digital I/O go to the SCADA system

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Actual Application Stories Discussed

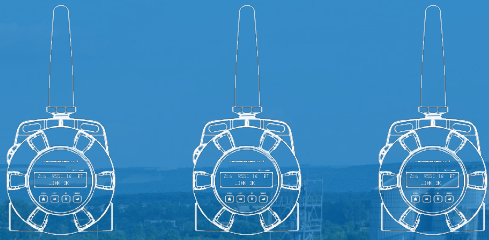


Joe Ryan

VP of Sales & Marketing

Joe brings almost 20 years of process industry experience in the design, support, manufacturing, marketing, and sales of process measurement and control devices. Joe has extensive field and support experience with process displays and controls, and a strong technical background including a bachelor's degree in Electromechanical Engineering and a master's degree in Computer & Electrical Engineering.

Agenda and Takeaways



Review the contents in the newly released *Go Wireless* whitepaper



Discuss the problems and solutions for upgrading existing systems and getting process signals from where you have them to where you want them



See real life applications examples using Precision Digital PDW wireless systems



See application examples of tank monitoring using point-to-point and point to multi-point wireless systems



Quick overview of PDW wireless products and where to get them



Problems with Getting a Process Signal From Point A to Point B



**Digging Trenches
Requires Many Hours
of Manpower**

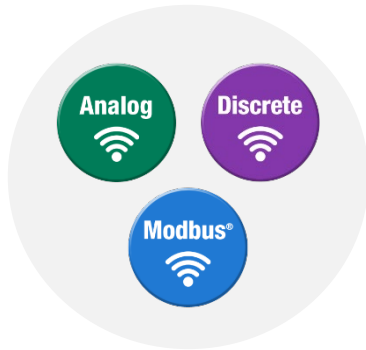


**Running Hundreds
of Feet of Wires
Is Not Economical**

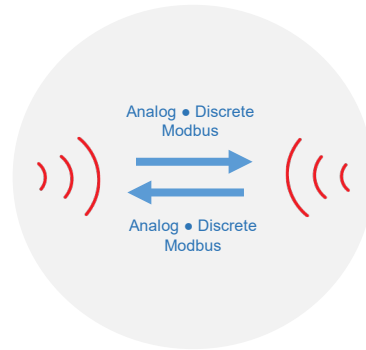


**Updating Existing
Systems Can Be
Complicated with a
Rat's Nest of Wires**

Benefits of Going with a PDW Wireless System



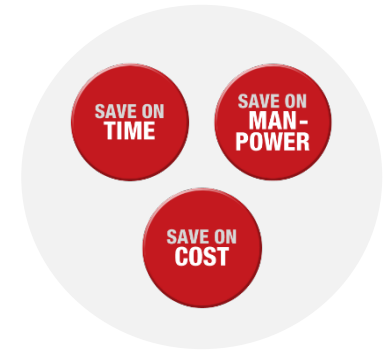
Transmit Analog,
Discrete, & Modbus
Signals Wirelessly



Can Transmit the
Process Signals in
Two Directions



Range of 1 Mile
Line-of-Sight Outdoors,
500 Feet Indoors



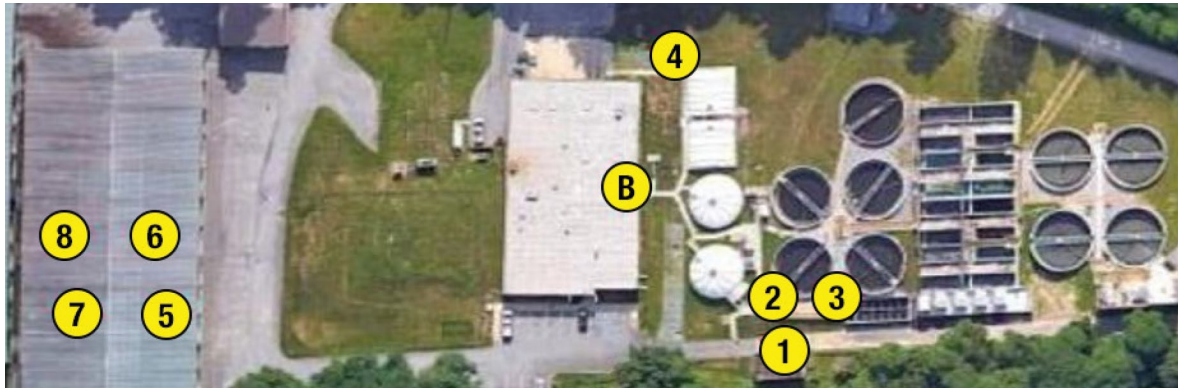
Save on Time,
Manpower,
and Cost



Real Life Applications

Real Life Application 1: Transmit Process Signals to a SCADA System

Wastewater Plant Uses PDW90 Wireless System to Transmit Process Signals to SCADA System



- B** Central Building
- 1** Chlorine Storage Tank
- 2** Open Channel Flow
- 3** Aeration Building Blower Status
- 4** Pump Station Pump Status
- 5** **6** | Compost Blower Status
- 7** **8** |

Operator needs to monitor process information on a SCADA system from in the control room.

Process info comes from (2) 4-20 mA transmitters and (6) digital status signals scattered around the plant.

The locations of the signals needed are a good distance away from the central building where the SCADA system is located.

Real Life Application 1: Transmit Process Signals to a SCADA System



**PDW90 Field Unit Installation
at Storage Building**



**PDW90 Field Unit Installation
at Open Channel Flow**

A PDW90 point to multi-point wireless system was installed.

Rugged field units mount directly at the transmitter sites, each independently ranged to the base station.

Internal antennas mounted high, with Loss of Signal (LoS) to the base station antenna. No additional antennas were needed for this application.

The PD6000 digital panel meter mounted in the box outside the storage building provides local display of the Sodium Hypochlorite tank level in gallons.

Real Life Application 1: Transmit Process Signals to a SCADA System



**PDW90 Field Unit Installation
at Aeration Basin Blowers**



**PDW90 Base Station with Attached
Antenna Inside Building**

The PDW90 field units have a range of 1 mile line-of-sight outdoors, 500 feet indoors.

The PDW90 base station was installed indoors in the central building.

The attached antenna on the base station had a good enough signal strength from inside the building, therefore, no need to mount it externally outside of the building.

Real Life Application 1: Transmit Process Signals to a SCADA System



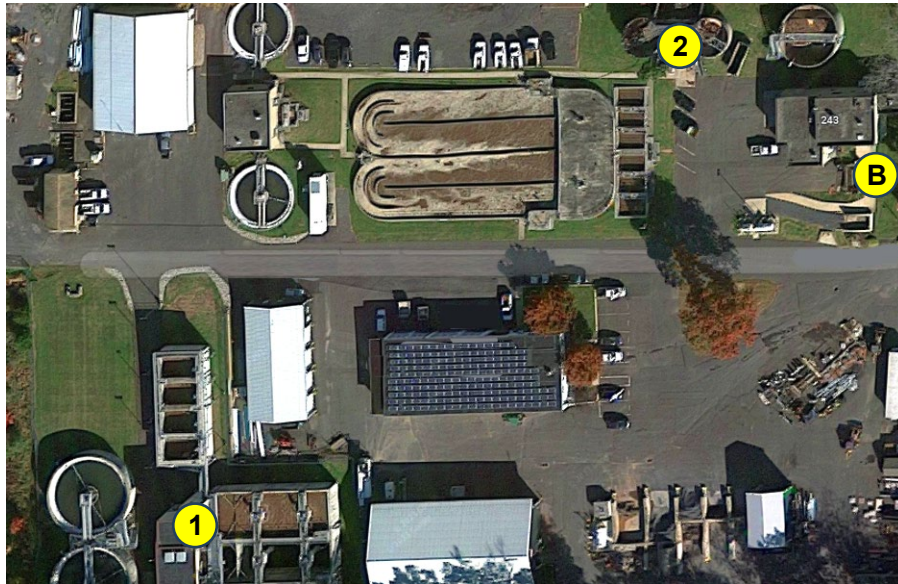
4-20 mA and Digital I/O go to the SCADA system

The installer connected the (2) 4-20 mA and (6) digital outputs from the PDW90 into the SCADA system.

The SCADA system conveniently displays all the information.

Real Life Application 2 : Primary Flow Calculation & Auto Sampling

Wastewater Treatment Facility Uses PDW90 Wireless System to Transmit Process Signals for Primary Flow Calculation on the ConSoliDator+ and Auto Sampling



- B** Primary Flow Calculation
- 1** Secondary Inflow
- 2** Final Effluent

System Overview

Process signals from the Secondary Inflow and Final Effluent are sent to the base station where Primary Inflow is calculated on the ConSoliDator+ and sent to the Auto-Sampler.

Real Life Application 2 : Primary Flow Calculation & Auto Sampling



**PDW90-FN Connected to 4-20 mA Sensor
Inside the Building**



**PDA3900 Yagi Antenna Mounted
Outside the Building**

Location 1: Secondary Inflow

An existing 4-20 mA sensor from the Secondary Influent is wired to a PDW90-FN field unit inside the building.

Coax cable is run through the wall to a Yagi antenna mounted outside. The signal path is 500' and goes through the trees.

Real Life Application 2 : Primary Flow Calculation & Auto Sampling



PDW90-FN Connected to 4-20 mA Sensor Inside the Building



PDA3900 Yagi Antenna Mounted Outside the Building

Location 2: Final Effluent

The 4-20 mA sensor from the Final Effluent is connected to a PDW90-FN field unit inside the building.

Coax cable is run through the wall to the antenna mounted on the roof. The signal path is 150' and goes through another building.

Real Life Application 2 : Primary Flow Calculation & Auto Sampling



Yagi Antenna connected to the PDW90 Base Station



PDW90 Base Station, ConsoliDator+ Controller, and Auto-Sampler



PD9000 ConsoliDator+ Multivariable Controller Display

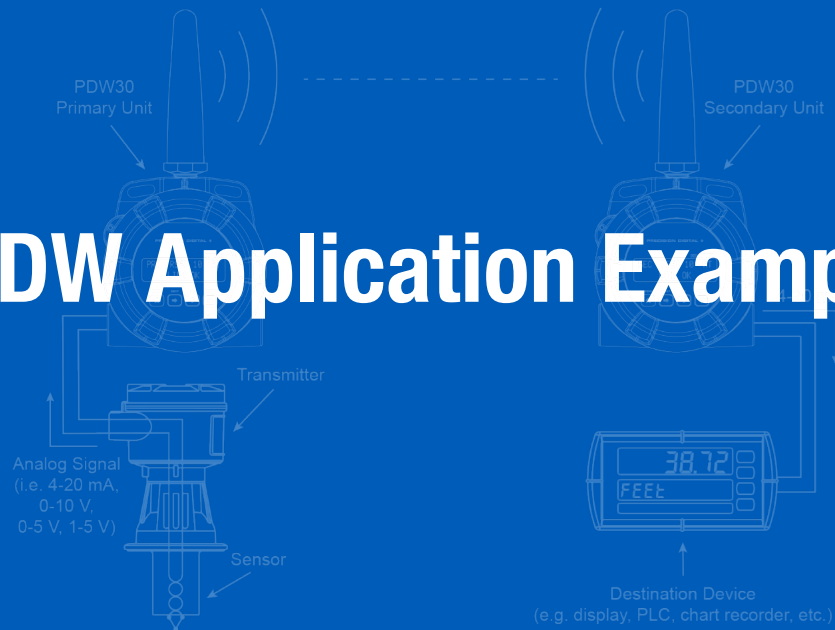
Location B: Primary Effluent

The base station antenna receives signals from locations 1 & 2, then sends 4-20 mA signals to the ConsoliDator+ multivariable controller which subtracts the Secondary Inflow from the Primary Effluent to calculate the Primary Inflow occurring at this spot.

The Calculated Primary Inflow value is then sent to the auto-sampler.

All the process values are logged to the included USB drive on the ConsoliDator+ Multivariable Controller.

PDW Application Examples



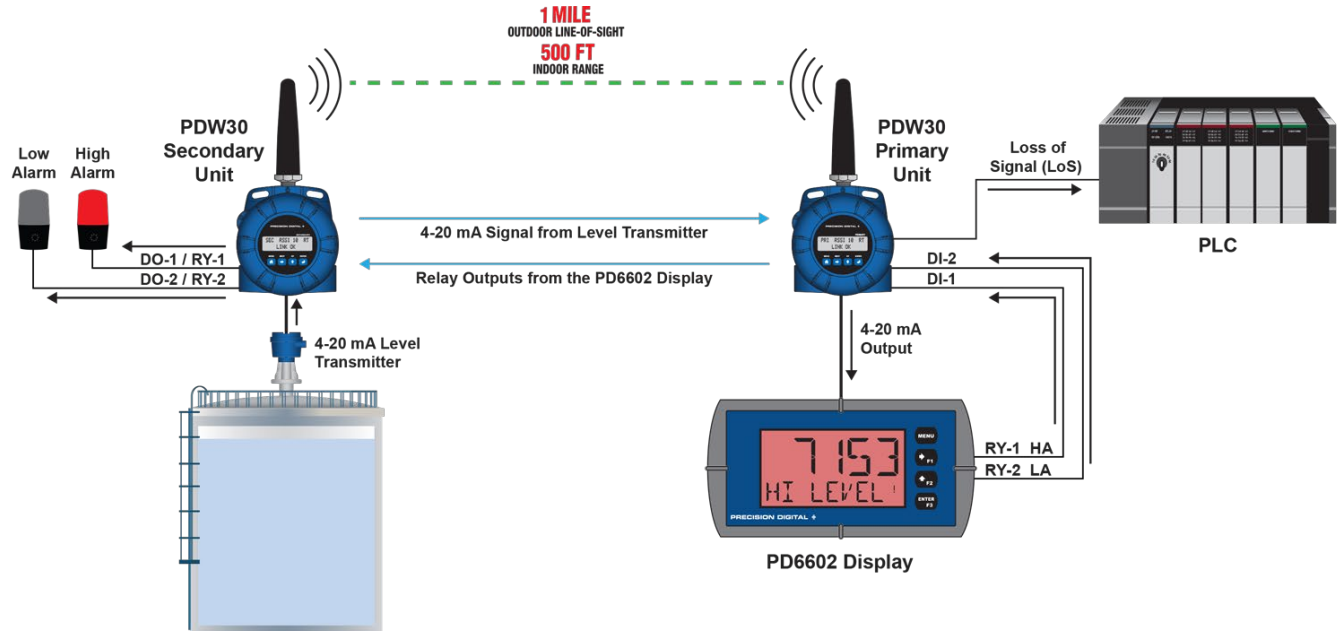
PDW Application Example 1: Level Monitoring of One Tank

The 4-20 mA level transmitter is connected to the analog input of the secondary unit and then transmitted to the primary unit.

The primary unit is connected to the PD6602 display.

Relay 1 on the PD6602 connects to digital input 1 of the primary unit and transmits the signal to digital output 1 on the secondary unit which triggers the high alarm.

A Loss of Signal (LoS) digital output is connected to the PLC which sends an alert message if the wireless signal is lost.

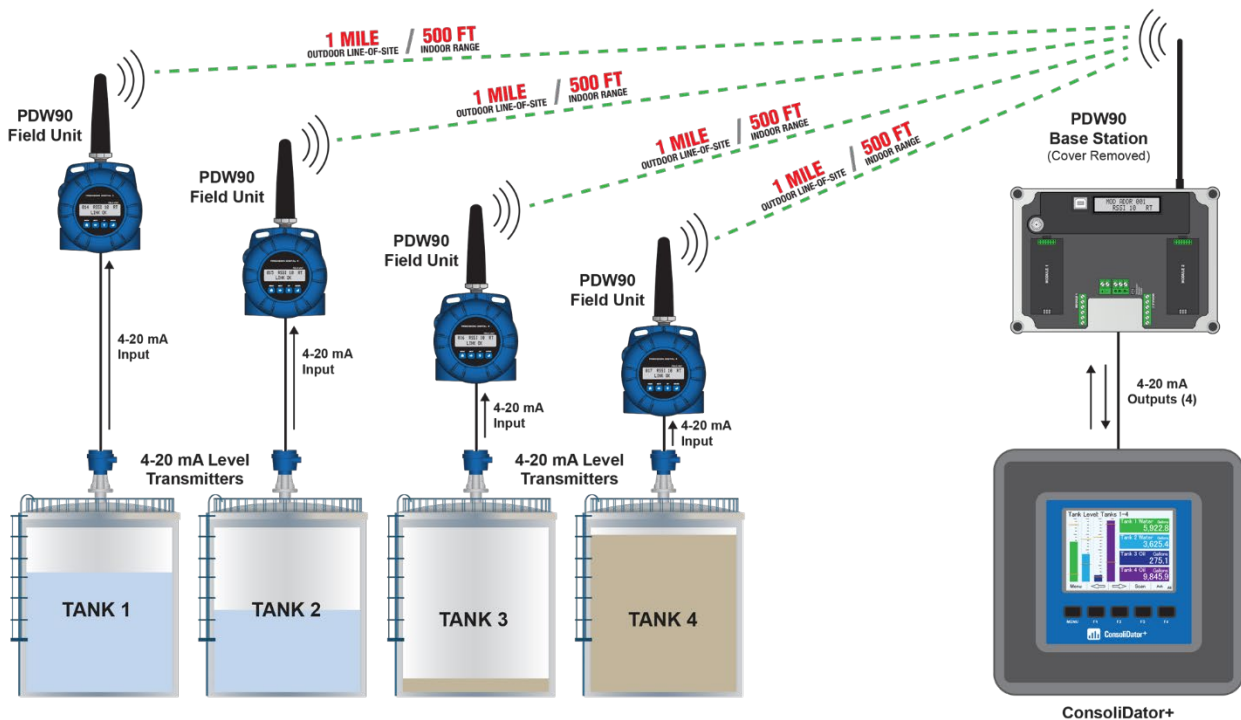


PDW Application Example 2: Level Monitoring of Four Tanks

The level in each tank is measured by a 4-20 mA level transmitter that is connected to a PDW90 field unit.

The four signals are then wirelessly transmitted to the PDW90 base station.

The base station then sends all four signals out as 4-20 mA signals to the ConsoliDator+ multivariable controller.



PDW Wireless Products



PDW30 Point-to-Point Wireless Bridge



Visit predig.com/PDW30 for Details

Features

- Virtually Plug and Play Right out of Box
- Range: 1 Mile Line-of-Sight Outdoors, 500 Feet Indoors
- Wireless Transmission Between Primary and Secondary Units of Analog, Discrete, Modbus Signals
- Inputs and Outputs: 4-20 mA or 0-10 V (1), Discrete/Digital (up to 4), Modbus
- Loss of Signal (LoS) Digital Output
- Field Installable Relay Module with Two Form A (SPST) 5A Relays (Available For Both Units)
- CapTouch Through-Glass Button Programming
- Larger IP68, NEMA 4X Aluminum & Stainless Steel Enclosures (Plenty of Room for Wiring)

PDW90 Point to Multi-Point Wireless System



Features

- System Consisting of Wireless Base Station & Field Units
- Range: 1 Mile Line-of-Sight Outdoors, 500 Feet Indoors
- Signal Wire Replacement for Up to 32 4-20 mA Signals
- Base Stations For 2, 6, or 16 Field Installable I/O Modules & Modbus
- Loss of Signal (LoS) Digital Output
- Field Units Available In NEMA 4X Aluminum & Stainless Steel
- Field Unit Operating Temperature Range: -55 To 75°C (-67 To 167°F)

Visit predig.com/PDW90 for Details

PDWR Wireless Repeater



Aluminum



Stainless Steel

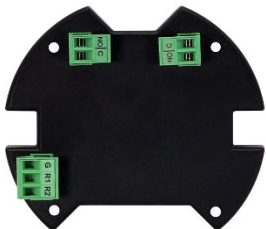
Visit predig.com/PDWR for Details

Features

- Improves Signal Strength and Range for PDW Wireless Systems
- Use in PDW30 Point-to-Point and PDW90 Point to Multi-Point Wireless Systems
- Increase Range an Additional 1 Mile Line-of-Sight Outdoors, 500 Feet Indoors
- Use CapTouch Through-Glass Buttons to Change Network ID
- IP68, NEMA 4X Aluminum & Stainless Steel Enclosures With Plenty of Room for Field Wiring
- Operating Temperature Range: -55 to 75°C (-67 to 167°F)

PDW Wireless Accessories

PDWM-2RY Relays Module



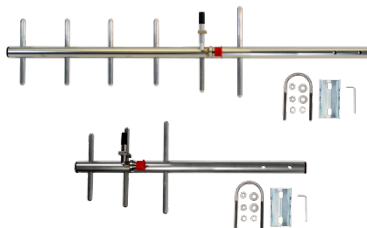
- Two Form A (SPST) Relays
- Use with PDW30, PDW90, and PDWR Field Units
- Easy to Install
- Removable Connector Plugs Make Wiring Easy

PDWM90 Base Station Modules



- Adds Functionality to the PDW90 System
- Completely Enclosed Plastic Housings for Added Protection
- Dual Analog Inputs
- Dual Analog Outputs
- Four Digital I/O
- Dual Relays

PDWA3900 Yagi Antennas



- Antennas are Fully Assembled
- Tuned on a network analyzer for best power match and lowest VSWR
- Antennas ship complete with a mounting kit that includes stainless steel hardware

PDWA6963-SS Pipe-Mount Kit



- Mounts PDW Wireless Field Units to 1.5" or 2" Pipes
- Suitable for Horizontal or Vertical Pipes (Two kits needed for horizontal mounting)
- All Necessary Hardware Provided
- 316 Stainless Steel

PDA10 Wireless Surveying Tool Kit



Visit predig.com/PDA10 for Details

Features

- Great for Testing Signal Strength at Desired Location Before Installing
- Range: 1 Mile Line-of-Sight Outdoors, 500 Feet Indoors
- Convenient, Portable Handheld Unit and Target Unit
- 32-Character Dual-Line Alphanumeric Dot Matrix LCD with Backlight
- Buttons for Cycling Through Network IDs, Repeaters, and Field Units

PDW Wireless Resources



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Questions?

If you have any questions, then reach out to us.



Joe Ryan
VP of Sales & Marketing

jryan@predig.com