WirelessHART

Product Launch Overview
Wireless technologies continue to evolve into our everyday lives, the inevitable and highly anticipated migration of wireless benefits has finally arrived to the process automation world. WirelessHART provides the first wireless standard developed strictly for industrial applications, bringing the numerous benefits and cost saving advantages of wireless technology directly to the process facility.

**WirelessHART: INTRODUCTION**

WirelessHART, as a result of the HART protocol, is an open and interoperable standard that carries the proven HART protocol further, enabling field devices to be configured, maintained, and diagnosed. This protocol cuts down on the need for minimal additional training, offers wireless access to the entire process facility, and can be used worldwide without licensing restrictions.

**From HART to WirelessHART**

Based on the proven HART protocol, WirelessHART is the first standard in the process automation industry that combines wireless technology with HART enabled field devices to increase reliability and range of communication. Unlike other wireless networks, WirelessHART is supported by multiple suppliers as a common, interoperable standard. Users have the freedom to select the best devices for their applications. WirelessHART products provide HOST integration in the same manner as wired HART, making it easy to set up, operate, and maintain. Given its strict set of standards, WirelessHART helps to redefine the definition of asset management, preventative maintenance, and plant monitoring through a truly wireless solution.

**WirelessHART Standards:**

- An open and interoperative standard
- Based upon the establish HART protocol
- Uses known tools and procedures for configuration, maintenance, and diagnosis
- Requires minimal additional training
- Allows wireless access to existing field devices
- Can be used worldwide without licensing

**WirelessHART Network Structure**

The essential functionality of the WirelessHART is its reliable mesh network, which allows each sensor to act as both a router and a repeater. The network is not dependent on one central gateway, allowing for easy setup of large distributed network structures. In the case of interrupted communications, the WirelessHART network automatically re-routes the signal in order to maintain uninterrupted communications. The WirelessHART flat mesh network allows the use of multiple communication paths simultaneously to enable a considerably higher data transfer rate. Combining all these functions together is what makes WirelessHART the ideal wireless solution tailored specifically for the unique requirements of the process automation industry.
WirelessHART: PRODUCT OVERVIEW

WirelessHART Gateway

As a core element of the mesh network, the Gateway is the main component for wireless integration. Packed inside a compact and rugged enclosure, the Gateway acts as the central point for providing seamless interfacing between the wireless network and the plant’s process control or asset management system. As the network manager, the Gateway automatically handles essential tasks such as self-determining the best possible paths of communication within the network, giving users a simple and effective solution to fast and cost effective data communication.

CUSTOMER BENEFITS

- Easy-to-understand network diagnostics greatly reduce maintenance cost and increase availability
- Simple commissioning allows savings on cost and time
- Network can be configured and engineered offline or through remote access
- Flexible integration, allowing customers to use their choice of control system manufacturer.

KEY FEATURES

- Supports up to 250 devices
- Web browser interface
- DDs, and DTMs available
- Ethernet I/P, Modbus, HART, AMS—integration options
- Network management with visual topography

Network Manager - Visual topography view
**WirelessHART Adapter**

The WirelessHART Adapter is the primary component for converting traditional wired 4..20mA devices into a completely wireless application. Both rugged and versatile, the rotatable adapter allows connection directly into the instrument housing cable gland for easy installation. As a truly wireless solution, the WirelessHART Adapter powers both itself and the field device through an intelligent power management system, powering field devices only during user-selected communication cycles, allowing for optimal user-configurability and battery lifespans up to several years.

---

**CUSTOMER BENEFITS**

- True wireless functionality and mesh network drastically cuts installation time and costs
- Highly secured 128 bit encryption
- Simple user configurability for fast maintenance and commissioning
- Battery life up to 5-10 years through intelligent power management

---

**KEY FEATURES**

- Ex gas and dust certification (cCSAUs/ATEX/IECEx) Zone 1/21, Div. 1
- Easily upgrades conventional field devices to WirelessHART
- Robust aluminum or general-purpose housing
- Measurement intervals between 1s and 24hrs
- Automatically acts a repeater for consistent network strength

---

**WirelessHART Temperature Converter**

The WirelessHART Temperature Converter is a standalone component designed specifically for wireless temperature monitoring. With all the same essential benefits of the WirelessHART Adapter, the Temperature Converter provides connectivity to thermocouple or RTD sensors for an easy solution to wireless temperature measurement.

---

**CUSTOMER BENEFITS**

- Local temperature measurements without the need of additional enclosure.
- Battery lifetime up to 10 years
- Two inputs for RTD and/or Thermocouple (internal CJC)
Wireless Network Simulation and Modeling

In addition to hardware, Pepperl+Fuchs also offers customers the only stand-alone 3D simulation software for WirelessHART network planning. It is based on mathematical algorithms for precise pre-installation planning. Allowing customers to test applications upfront before any devices are commissioned. The software modeling provides users the ability to achieve drastically reduced installation and planning costs.

**Simulate More, Test Less**

Modeling with WiNCMod

For simulation, it is generally required to model the environment and/or the plant. Using WiNCMod, the user can import his/her own plant from existing CAD data (2D or 3D). No CAD data? You can easily create the plant with WiNCMod by easily selecting preconfigured typical plant parts. After creating the 3D model, materials such as steel, concrete or stone can be assigned to the appropriate parts of the model. This assigning is necessary as different materials affect the range of the sensors.
Simulation with WiNCSim

For simulation, users can select specific P+F devices from a preset library. Device parameters are pre-set for realistic simulation based on experience and a ray tracing algorithm. During simulation, the radio signal reception strength of each sensor, at each point in the network surroundings, are calculated to determine the quality of the connection. Results are then displayed graphically, showing all possible communication paths, reception field strength of each device, and the total field strength of all devices in the network. This allows users to easily identify the ranges that each sensor should be positioned and pinpoints the ideal location for optimal signal quality throughout the network.

CUSTOMER BENEFITS

- Easy planning of networks by taking environmental factors into account without plant walkthrough
- Cost savings due to reduction of installation and commission time
- Increased process availability and cost savings through device layout optimization
Battery Life Calculator

The WirelessHART Adapter and Temperature Converter provide users a true wireless solution through battery powered operation. To complement this solution; Pepperl+Fuchs developed a convenient and free battery life calculator. The battery life calculator removes the uncertainty associated with battery life potential. Users can conveniently calculate battery life by configuring devices to real life standards with a long list of variables and settings to provide maintenance and operational cost analysis.

CUSTOMER BENEFITS

- Free and simple solution to handle battery life questions
- Highly configurable for each application including device properties and environmental conditions
- Printable reports for both mean and extreme temperature ranges
**WirelessHART Applications**

**Possible Target Applications**

- **In General:** Wireless communications used for monitoring devices that are not part of a control loop.
- **Asset Monitoring:** Apart from the field device itself, also other assets can be monitored:
  - Temperature monitoring of ball bearings, heat exchangers, motors, and pumps
  - Level monitoring of grease or coolants
  - Corrosion monitoring in pipes and pumps
  - Monitoring of static pressure (not intended to record dynamic pressure changes)
  - Monitoring on mobile equipment, pipes and drainage, and slow rotating equipment
  - Monitoring for clogged drainage