

# OneWireless Unlocks Multiple Value Applications

Honeywell



- Video Monitoring 
- Collaborative Operations 
- Vibration Monitoring 
- Corrosion Monitoring 
- Gauge Reading 
- Mobile Operations & Inspections 
- Emission Monitoring 
- Gas and Leak Detection 
- Tank Monitoring & Overfill Protection 
- Offsites Contamination Avoidance 

Extensive portfolio of **wireless applications and devices**  **OneWireless**

# XYR 6000 Transmitter Family

Honeywell

- 4 dBi antenna option for 2X distance
- 24 VDC instrument power option
- Stainless steel enclosure
- IECEx Certified

Temperature, Pressure, HLAI, DI, Options:



Differential Pressure



Temperature



High Level Analog Input.



Temp DI



Discrete Inputs



Gauge Pressure

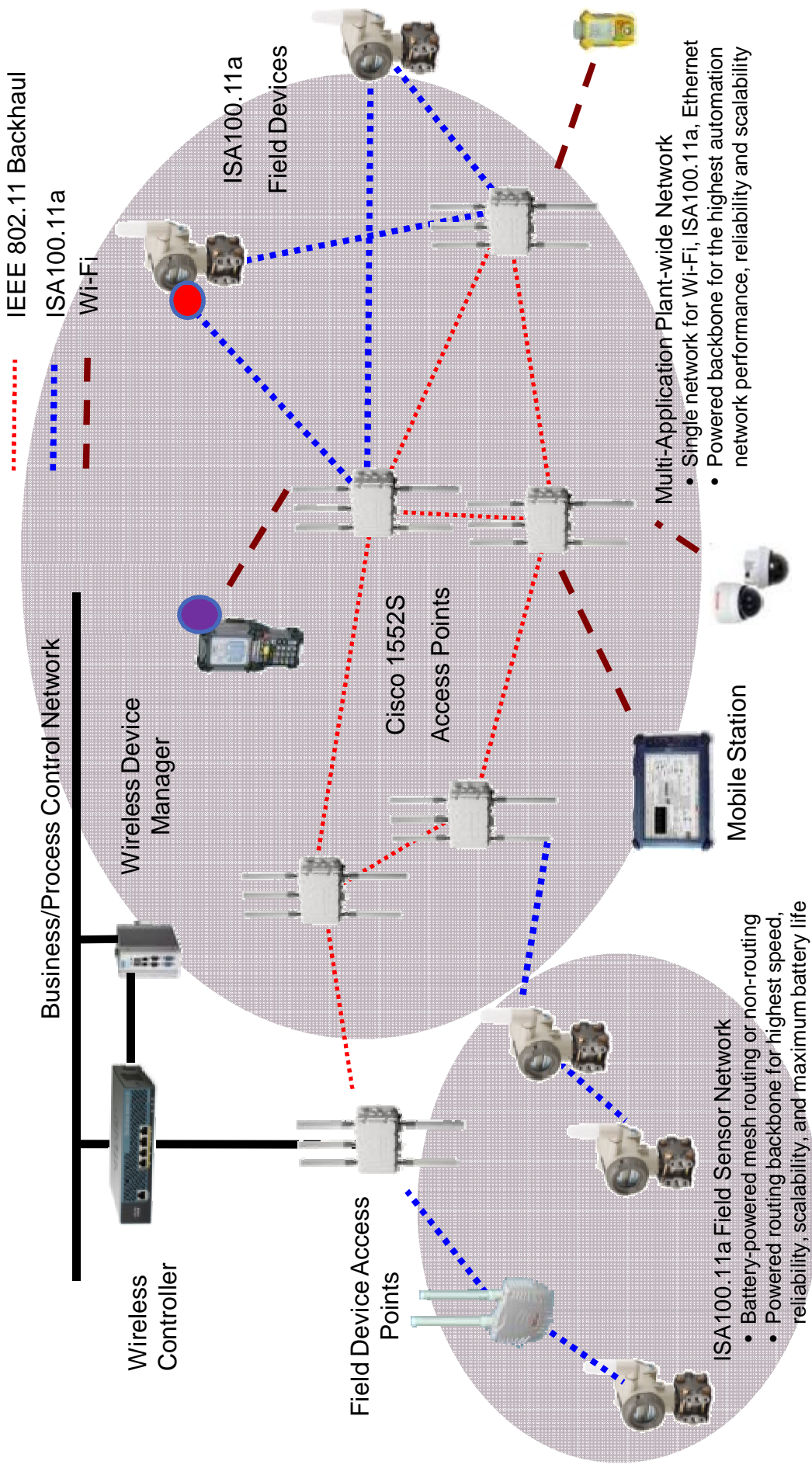


Valve Position

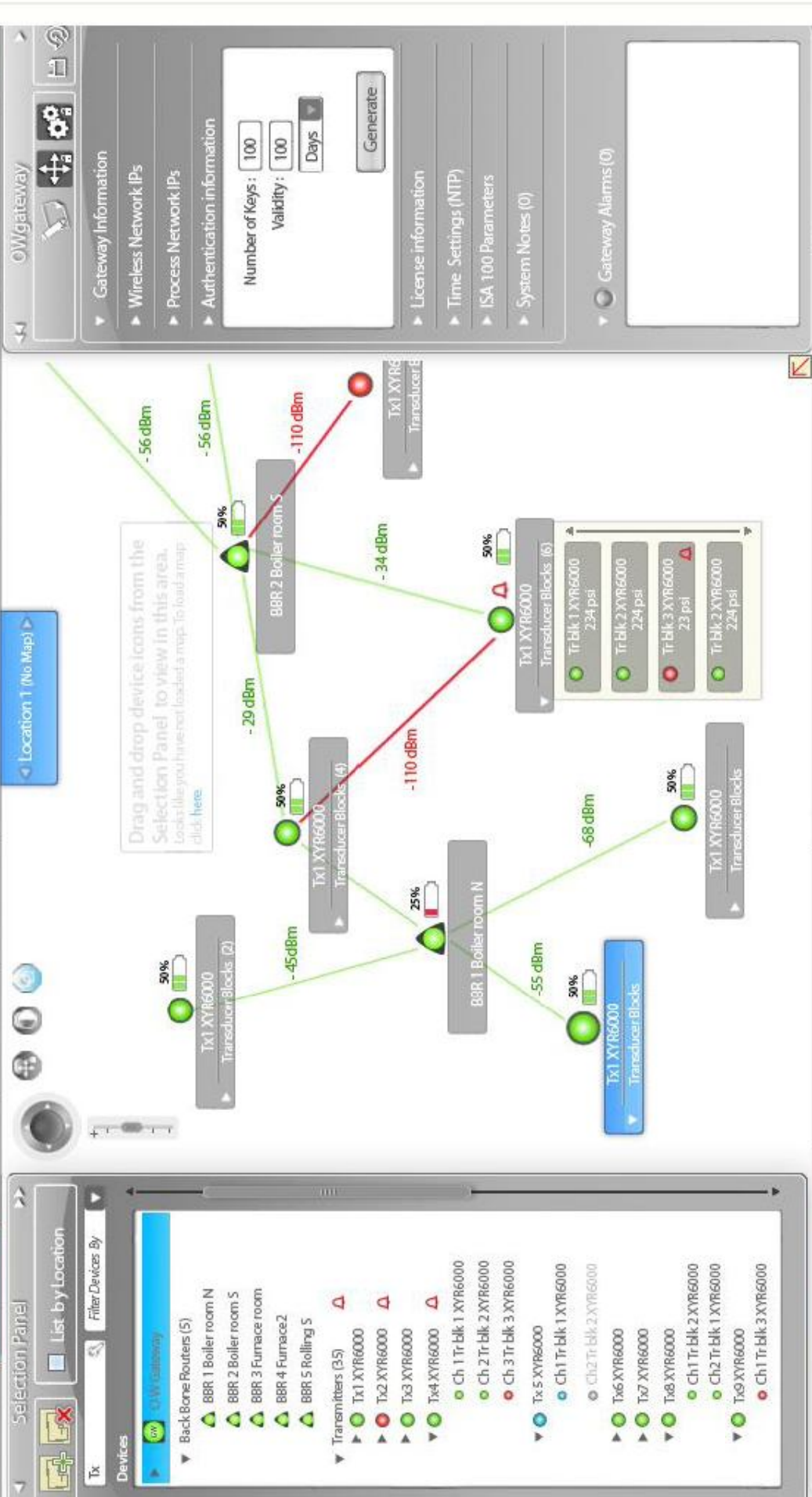


Universal I/O  
T/C,HLAI,DI/DO

# OneWireless Network with Cisco 1552S



One infrastructure for all applications



- Selection Panel**
- Filter Devices By
- Back Bone Routers (5)
  - BBR 1 Boiler room N
  - BBR 2 Boiler room S
  - BBR 3 Furnace room
  - BBR 4 Furnace 2
  - BBR 5 Rolling S
  - Transmitters (35)
    - TX1 XYR6000
    - TX2 XYR6000
    - TX3 XYR6000
    - TX4 XYR6000
    - Ch 1 Tr blk 1 XYR6000
    - Ch 2 Tr blk 2 XYR6000
    - Ch 3 Tr blk 3 XYR6000
    - TX 5 XYR6000
    - Ch1 Tr blk 1 XYR6000
    - Ch2 Tr blk 2 XYR6000
    - TX6 XYR6000
    - TX7 XYR6000
    - TX8 XYR6000
    - Ch1 Tr blk 2 XYR6000
    - Ch2 Tr blk 1 XYR6000
    - TX9 XYR6000
    - Ch1 Tr blk 3 XYR6000

# Cisco Aironet 1552S Access Point

Honeywell

- Higher throughput capability thanks to 802.11n and radio diversity (4 times more than 802.11 a/g throughput)
- Better ISA100.11a coverage thanks to the ISA100.11a radio diversity (30% improved range and reliability)
- Easier network management thanks to WLC and WCS (easier to update and monitor the network)
- In house termination, i.e. no need for additional junction box for Ethernet and power termination (simplifies engineering and installation)
- Multiple uplink options (Gigabit Ethernet - 10/100/1000 Base T, Fiber Optic option) which are useful for Greenfield projects



# OneWireless Field Device Access Point

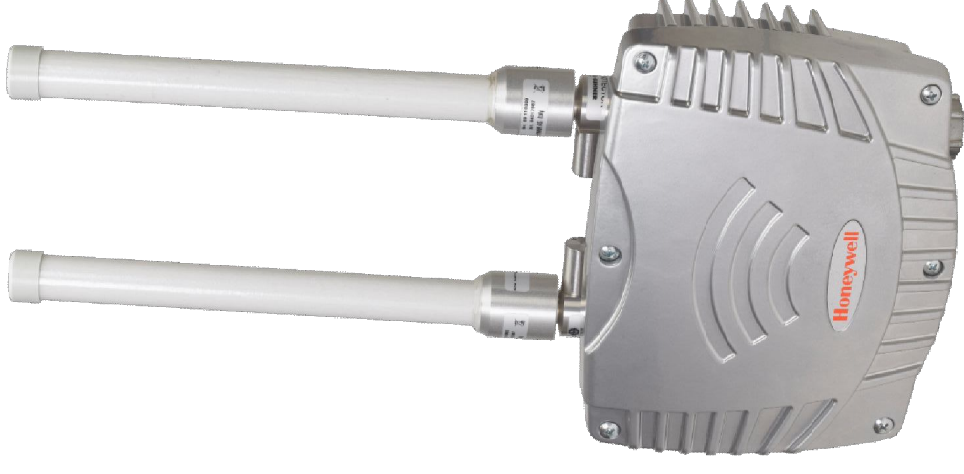
Honeywell

## Roles & Benefits:

- Access point for field instruments only
- Forms a self-forming, self-healing ISA100.11a mesh network and connects network to the wired or wireless network.
- Enables 10 years transmitter battery life
- Reduces wireless FI cost

## Features:

- Dual antennas for diversity to improve read rate success in multi-path environment and range
- 450 meters connection with wireless FI with standard integral antennas
- 24V DC and 110/230V AC powered
- ATEX Zone1 & 2 / Class 1 Div 1 & Div 2 Hazardous rating (IECEx Pending)
- 10/100 Mbps Ethernet



# OneWireless HART Adapter

Honeywell

## Benefits:

- Cost effective way to monitor the health of HART devices connected to non HART enabled I/Os
- Convert a HART device into a wireless device

## Key Features:

- ISA100.11a Compliant w/IR security provisioning
- Transmit diagnostics and process variable data
- **1,000 ft. LOS range**
- Powered from 4-20mA loop and D-cell battery
- Diagnostics indicated by LEDs
- FM Class 1, Div 1, ATEX Class 1, Zone 1



# OneWireless Gauge reader

Honeywell

- Save time by automating the reading of gauges
- Reduce safety risks by keeping employees from gauges in risky environments
- Improve efficiency and energy consumption by monitoring gauged applications
- Reduce troubleshooting time by quickly acquiring additional data





# OneWireless Mobile station

Honeywell

- Real-time access to:
  - Process data via Mobile Access Suite
  - Maintenance data via Asset Manager PKS, FDM or other third party applications
  - Work orders from third party applications
  - Drawings
  - Operational procedures
  - Locate assets using Honeywell's Instant Location web interface
  - And many more...
- Remote users to see the impact of their activities on the plant's operation in real-time



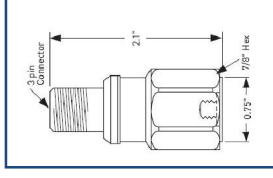
# OneWireless EHM R110 Solution

Honeywell

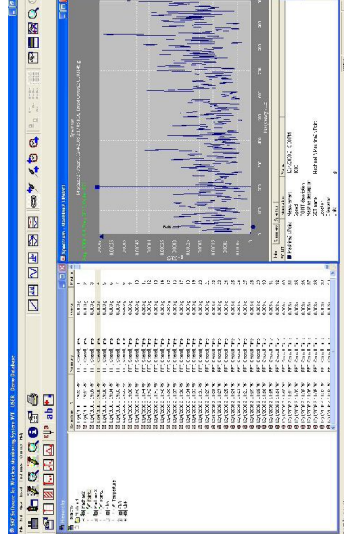
- Solution
  - Monitoring rotating equipment such as turbines, compressors, pumps, fans, blowers, motors etc
  - Data acquisition, Wireless infrastructure, and analysis software
  - Improve their plants safety and asset uptime and reduce maintenance costs
  - The only solution that provides “wired performance in the wireless world”



OneWireless EHM Wireless Interface Module



Accelerometer



EHM Analysis Software

# XYR6000 – Flexline Radar Gauge

Honeywell

- Input
  - Radar Gauge with measuring range upto 75 m and 0.4 mm accuracy
- Area Ratings
  - IP66 / IP67 according to EN 60529 (NEMA 4X)
  - ATEX, FM, CSA, IEC Ex Explosion-proof (Ex) and intrinsically-safe
  - Class 1 Div Group C and D
- Environment Ratings
  - 40°C to +65°C operating temperature
- Antenna Options
  - Integral (Ex) antenna
  - External high-gain antenna
- Range from Multinode
  - Up to 610 meters (2000 foot) range



# OneWireless Digital Video Monitoring

Honeywell

- Before Wireless
  - Some areas not monitored with video
  - Manual inspections (rounds), or
  - Not monitored at all
- After
  - Inexpensive remote monitoring
  - Increased security in real-time
  - Manual rounds eliminated
  - Cameras can be installed and moved easily
  - Video stream can be recorded and played back for the control system for reference, training, etc.



# Field Advisor

Extends operator excellence to the field

- Personal Safety and Health
  - Safety routes
  - Safety equipment checks
  - Environmental checks







- Process Safety and Compliance
  - Process safety checks
  - Historical database

- Process Optimization
  - Start-up instructions
  - Flushing and cleaning
  - Product sampling

- Reliability improvement
  - Equipment checks
  - Reconditioning tasks
  - Historical database

*Designed to support operational and reliability work processes*

# Wireless Gas System

Impact Xtreme™	ConneX1™	Location Manager™	Wireless Options
 <ul style="list-style-type: none"> <li>• Multi Gas platform up to 6 combustible and/or toxic gas sensors with %RH &amp; Temp</li> <li>• WiFi &amp; GPS mode of location calculation &amp; data transfer onboard</li> <li>• Pump option for remote sampling</li> <li>• Panic Button if operator in distress</li> <li>• 2 way text (library &amp; free form capability)</li> <li>• Manual bump/calibration station Enforcer</li> <li>• Docking compatible</li> <li>• ISA 100 standard compatible</li> <li>• 3 Wireless mode application options</li> </ul>	 <ul style="list-style-type: none"> <li>• Single Gas Wireless for Toxic gases only</li> <li>• WiFi mode of location calculation &amp; data transfer</li> <li>• Man Down inertial sensor to alert for prone operator</li> <li>• Panic Button if operator in distress</li> <li>• 2 way text (preset message library within unit)</li> <li>• Small, lightweight for lapel or other on body attachment point</li> <li>• Docking compatible</li> <li>• ISA 100 standard compatible</li> <li>• WiFi infrastructure mode only</li> </ul>	 <ul style="list-style-type: none"> <li>• Windows based Location visualization engine that displays and archives actual readings and location per operator</li> <li>• Interactive capability to communicate with the operators based on their status and proximity to a hazardous event</li> <li>• OPC interface option to connect with additional value add software integration solutions</li> <li>• Reports &amp; alerts custom driven to suit application</li> </ul>	 <ul style="list-style-type: none"> <li>• Docking Fleet Manager for high volume user populations to automate the daily maintenance requirements</li> <li>• Safe T Cube option for wireless area monitoring applications</li> <li>• Location Anchor beacon to provide additional level of accuracy in WiFi based applications as appropriate to the use case</li> </ul>

# ISA100 solutions offered by First Tier Vendors **Honeywell**

Key aspects:

- Uninterrupted
- Interoperability
- Low maintenance
- Scalability
- Fast response time
- Coexistence



February 8, 2010

TO: Customers, Suppliers, Media and Process Industry Organizations

RE: The Growing Momentum for ISA100 Family of Standards

As major process automation product vendors, we are enthusiastically committed to the ISA100.11a industrial wireless standard. We are making significant investments to develop ISA100.11a-based products that will be available in 2010. We are excited about implementing the ISA100.11a standard as a technology that works as designed, creating the foundation for an extensible, scalable and flexible industrial communication platform for the future.



YOKOGAWA

**Honeywell**



GE

**azbil**

Yamatake Corporation

**FE Fuji Electric**



Apprion



NIVIS

Major process automation products are being developed, making significant investments in **Honeywell**

# ISA100 in the News - multi vendor installation

Honeywell

Multi-vendor ISA100.11a Installation at Arkema

Just days after the ISA100.11a standard was approved, a multi-vendor network was installed at Arkema in Crosby, Texas.

The screenshot shows the website for 'The Industrial Ethernet Book'. The main navigation bar includes: HOME | PRODUCTS | NEWS & EVENTS | ETHERNET | WIRELESS | ARTICLES | TECH FORUM | SUBSCRIBE | BLOG | MEDIA INF. The article title is 'ISA100 MULTIVENDOR USER TEST INSTALLATION AT CHEMICAL PLANT'. A red circle highlights the word 'WIRELESS' in the navigation bar. A red arrow points from the article title to the word 'WIRELESS'. Below the title, the text reads: 'The ISA100 Wireless Compliance Institute has installed a multi-vendor User Test of the technology at an Arkema plant in Crosby, Texas, demonstrating interoperability among devices from multiple vendors. Arkema is a €5.6B diversified global chemicals manufacturer with 80 industrial sites in more than 40 countries and six research and developer centers. Arkema's site in Crosby produces liquid organic peroxides that are used primarily to produce plastic resins, polystyrene, polyethylene, polypropylene, PVC and polyester reinforced fiberglass, and acrylic resins.'



Honeywell wireless temperature sensor



Yokogawa wireless pressure sensor

Suppliers participating in the Arkema site installation include **Gastronics, Honeywell, Nivis, Wilson Mohr, Wireless Access Solutions and Yokogawa.**



Honeywell wireless access point

The screenshot shows a webpage for 'The Industrial Ethernet Book'. It features a 'FREE INDUSTRIAL ETHERNET PRODUCT GUIDE' download button. The page includes text about the book's content, which covers various industrial Ethernet standards and products. There are also images of industrial equipment and a sidebar with a 'Product Guide' link.



# Companies Supporting ISA100

**Honeywell**

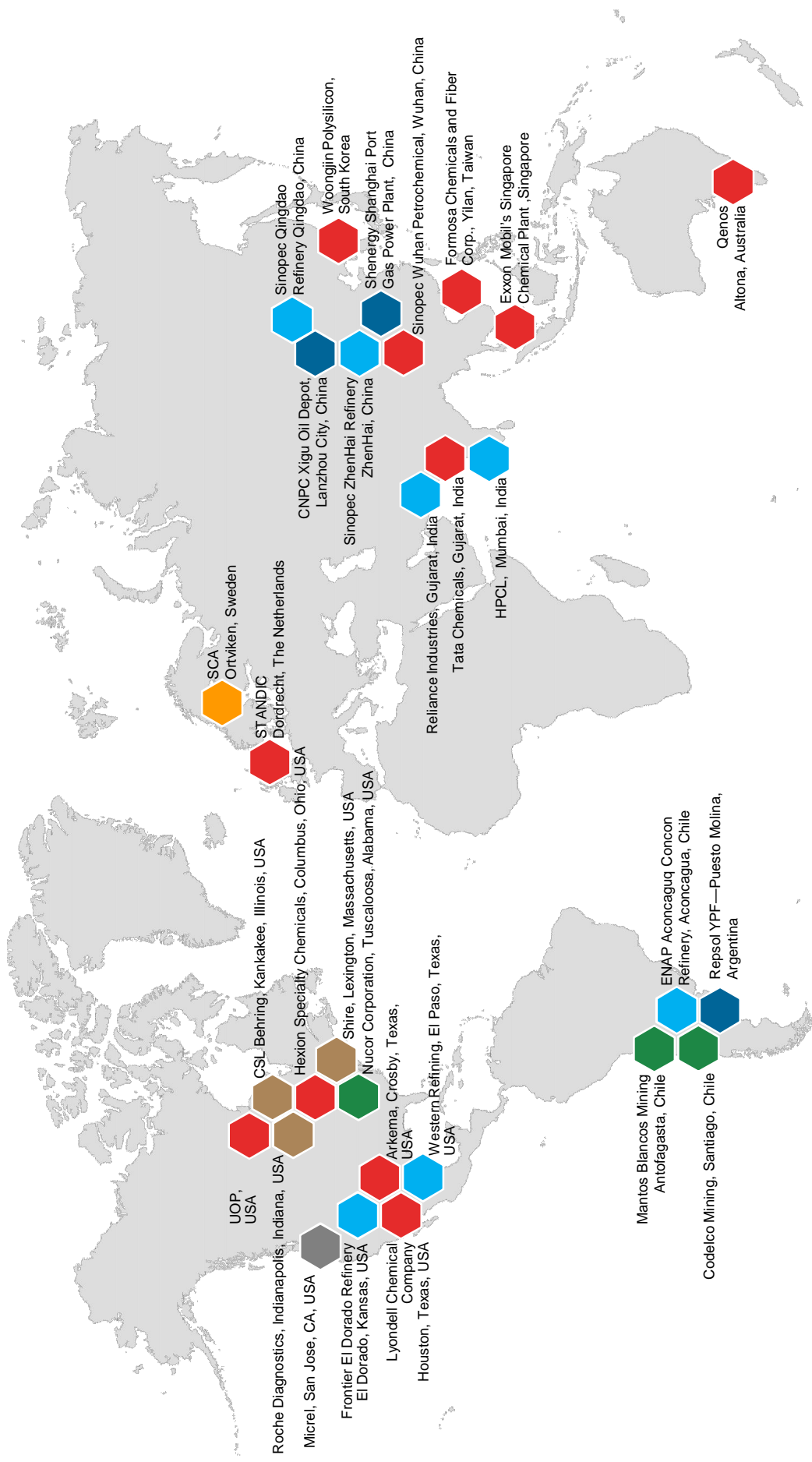
*End Users, Wireless Suppliers, DCS Suppliers, Instrument Suppliers, PLC Suppliers, Wireless Suppliers, DCS Suppliers, Instrument Suppliers, PLC Suppliers, Suppliers, Technology Suppliers, Research Firms, Consultants, Government Agencies, and Consortia*



ISA SP100 is a wireless-driven standard!

**Honeywell**

# Customer Reference List



# **Honeywell**

**Thank you!**

*Setting the Standard for Automation™*



**ISA DELHI SECTION**  
Asia Pacific District

# WirelessHART

**Unnikrishnan.R**  
Manager

Business Unit - Components & Technologies  
Process Automation Division

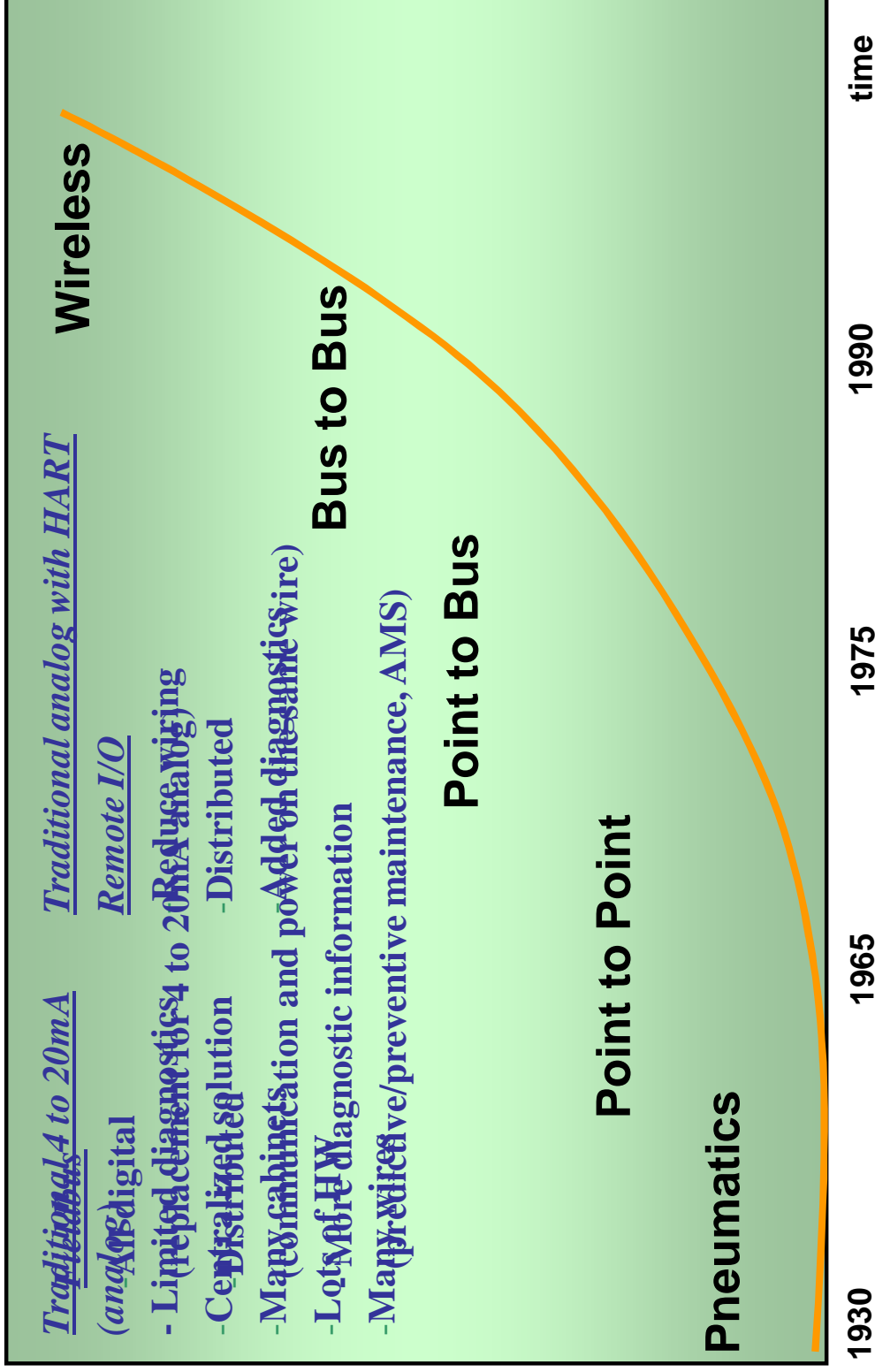
Standards  
Certification  
Education & Training  
Publishing  
Conferences & Exhibits

# Agenda

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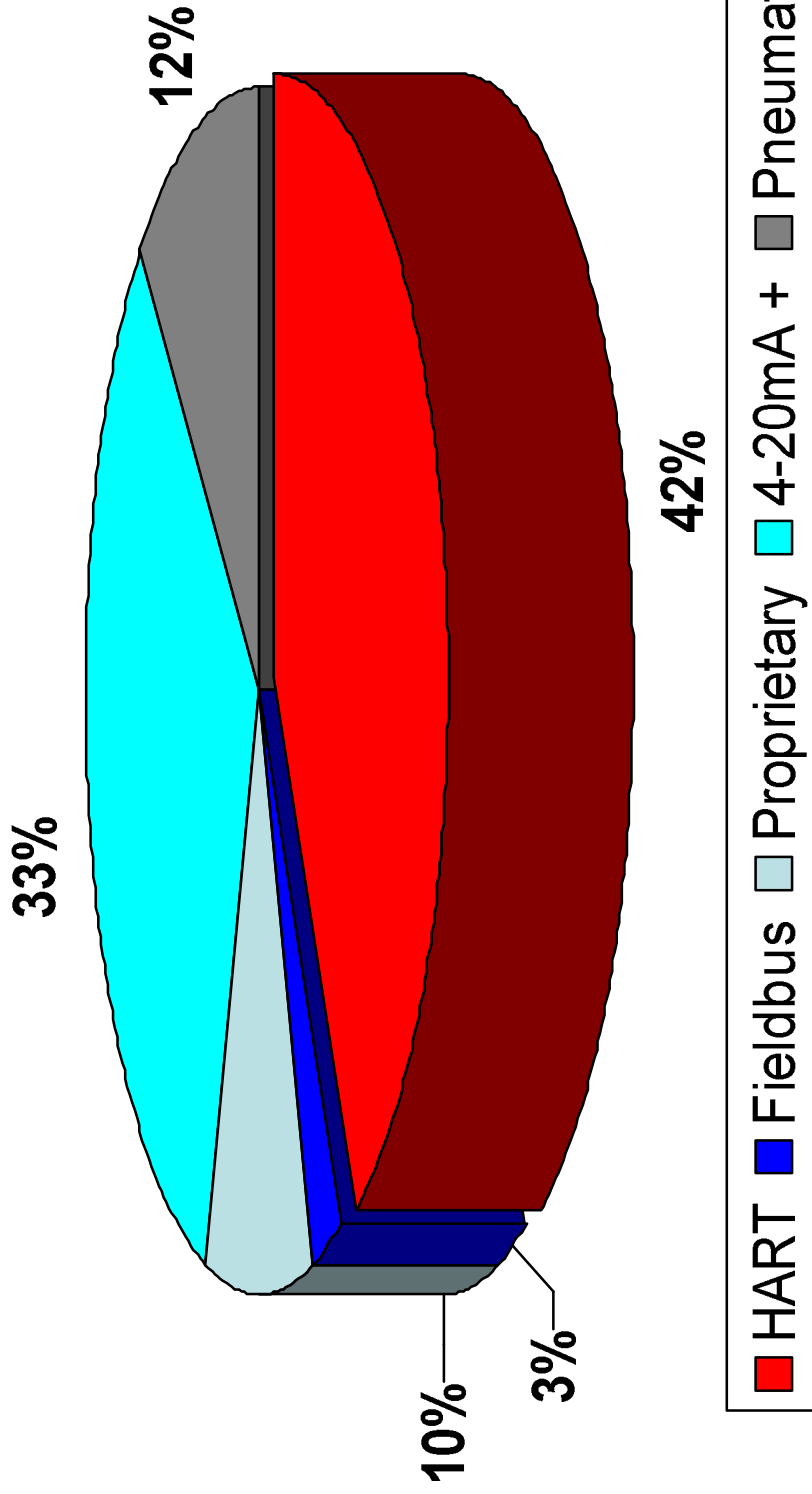
- **Introduction and application range**
- **How WirelessHART works**
- **Planning a WirelessHART network**
- **Device placement**
- **WirelessHART components Commissioning**
- **Wireless Network Simulation**
- **Integration into DCS and/or Asset Management System**

# Control System History

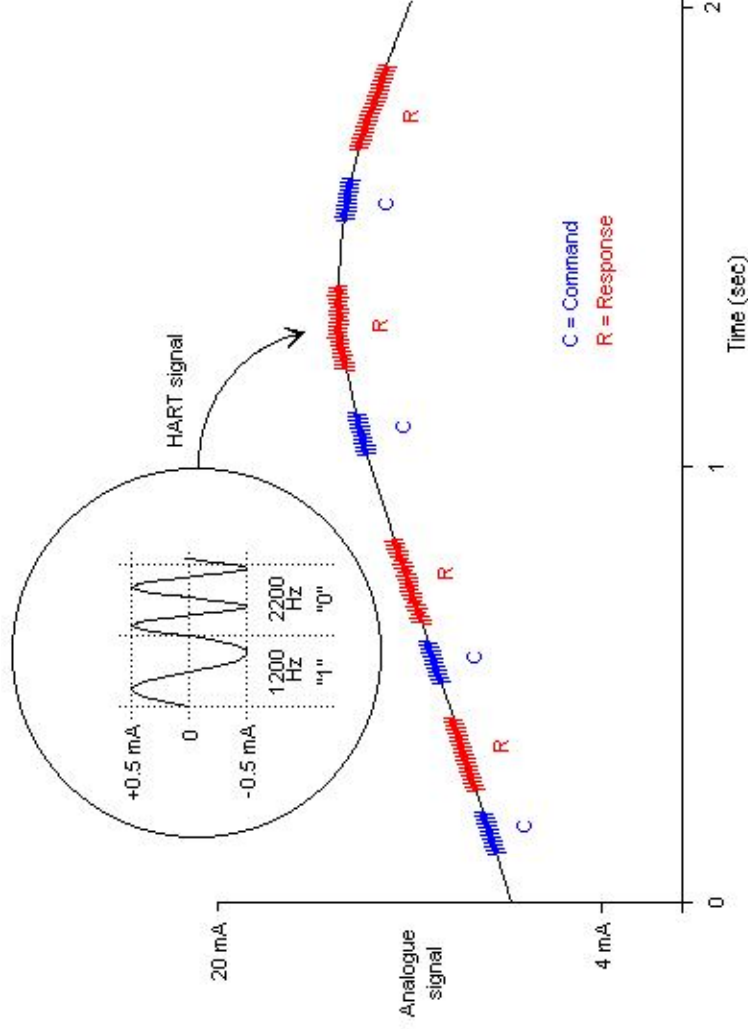


# Worldwide Installations

~ 56 Million Devices at Y.E. 2006



- HART means:  
“Highway Addressed Remote Transducer”





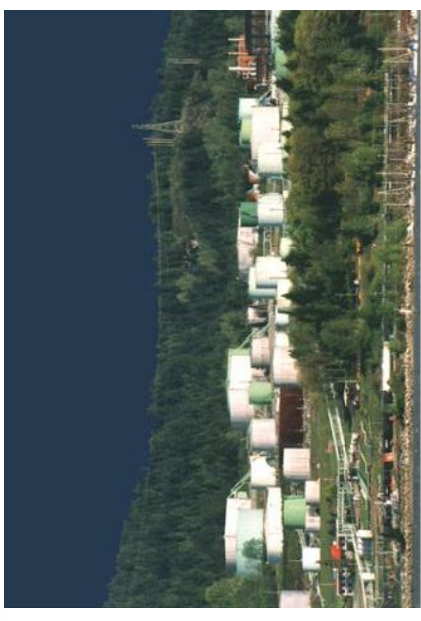
## Application range of HART

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- HART protocol mainly is used to
  - Configure
  - Parameterise
  - Maintain
  - Diagnose
- Field devices in process automation industry
- It is also used for monitoring purpose
- The same applies to WirelessHART
- With WirelessHART the application range can be extended to control (future extension!)
  - Open as well as closed loops
  - Update times (cycle time) of 1 s can be reached

# Typical Applications

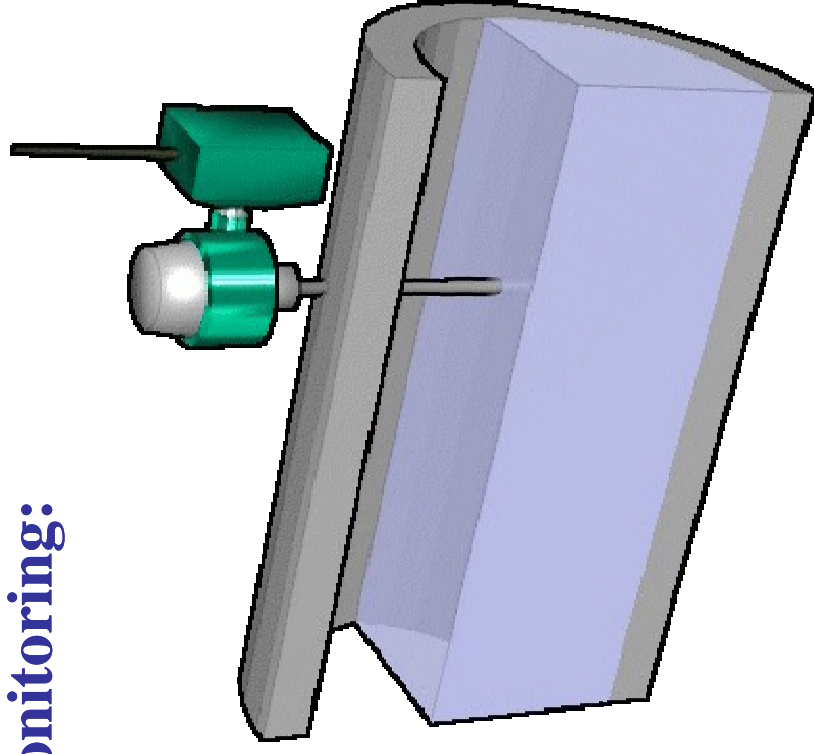
- Heavy Industry
- Extraction, Refining
- Conveying, Processing
- Manufacturing, Storage
- Water/Wastewater
- Municipal, Rural
- Environmental
- Pump Control
- Tank Levels
- Flow Measurement
- Preventative Maintenance



# Application Examples



## Environmental monitoring: Corrosion

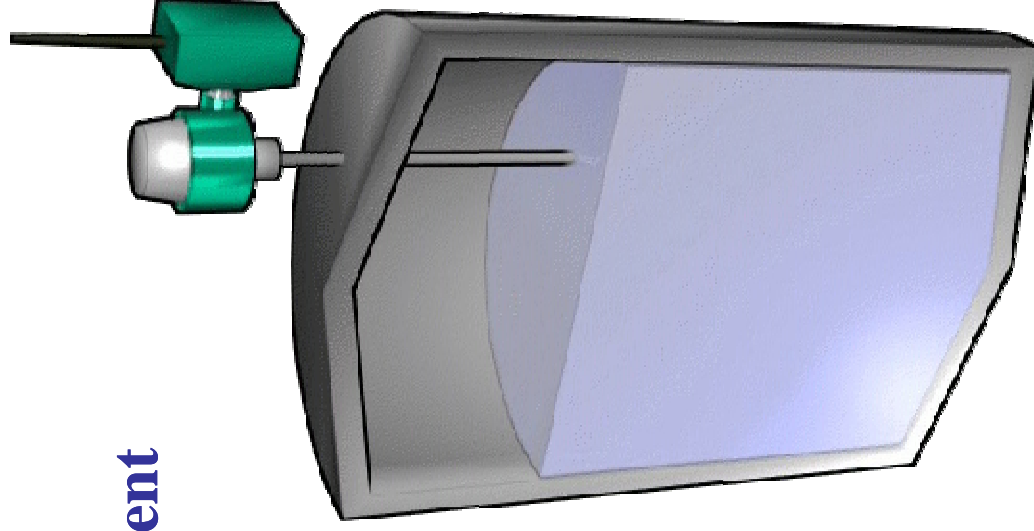


# Application Examples

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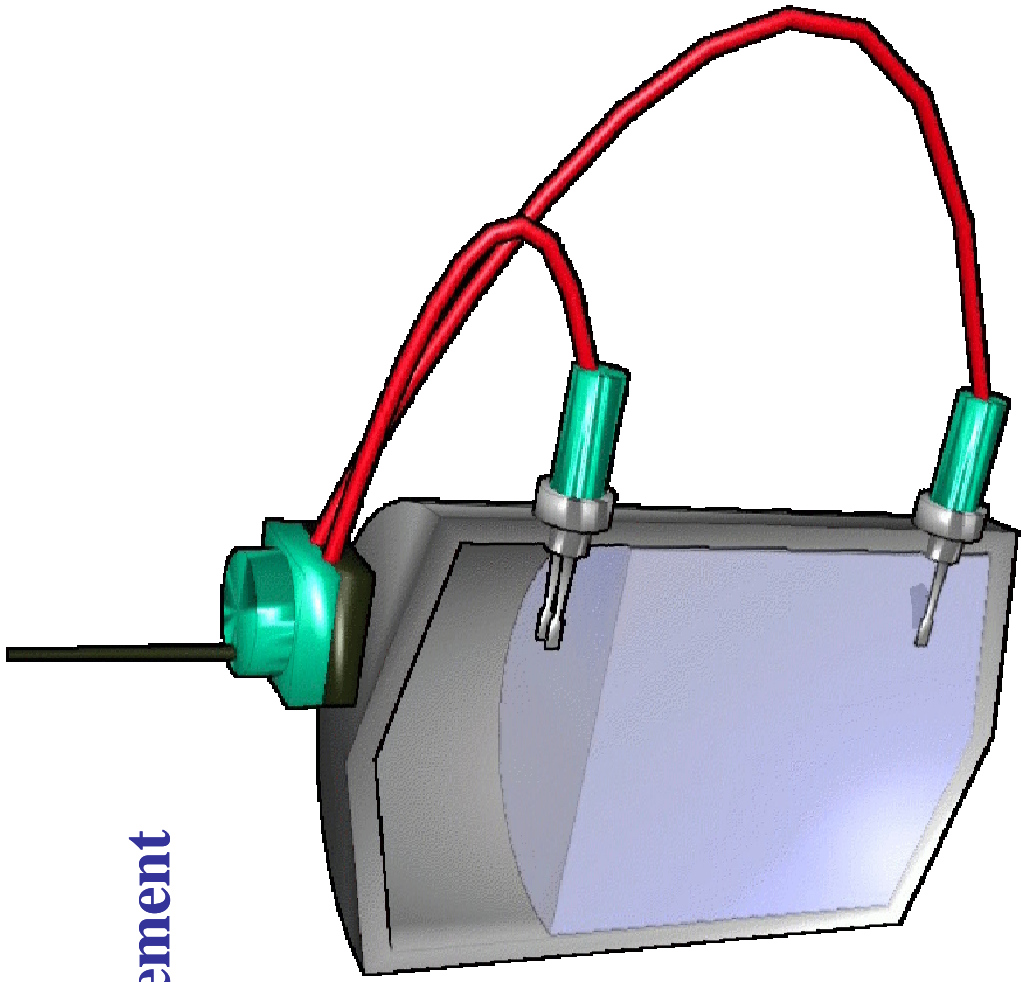


**Storage:  
Continuous Level Measurement**



# Application Examples

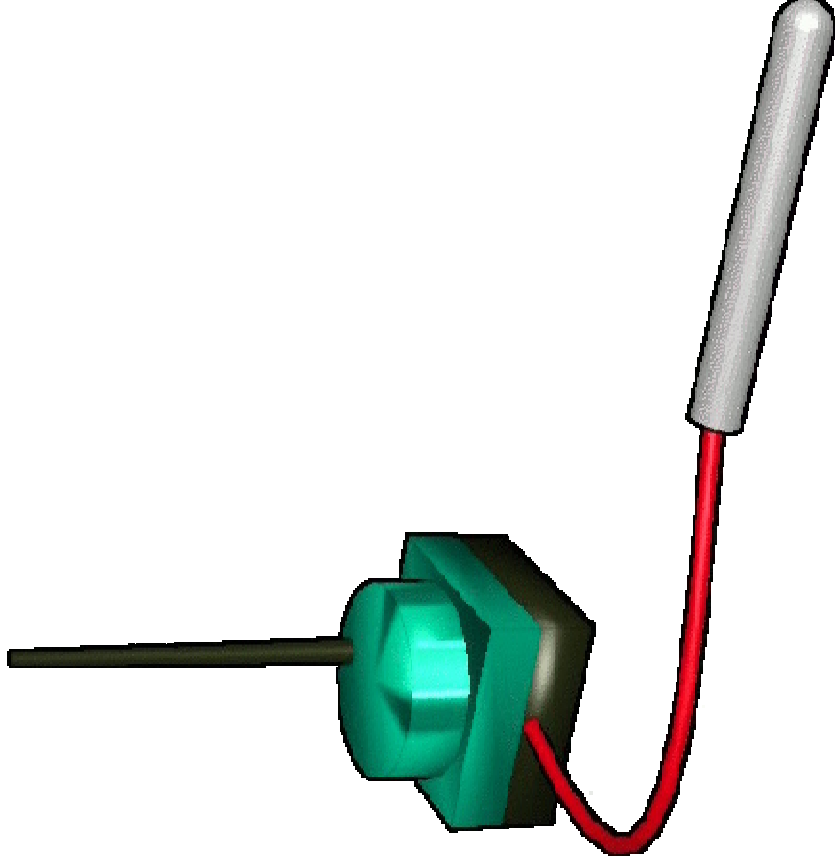
**Storage:  
Discrete Level Measurement**



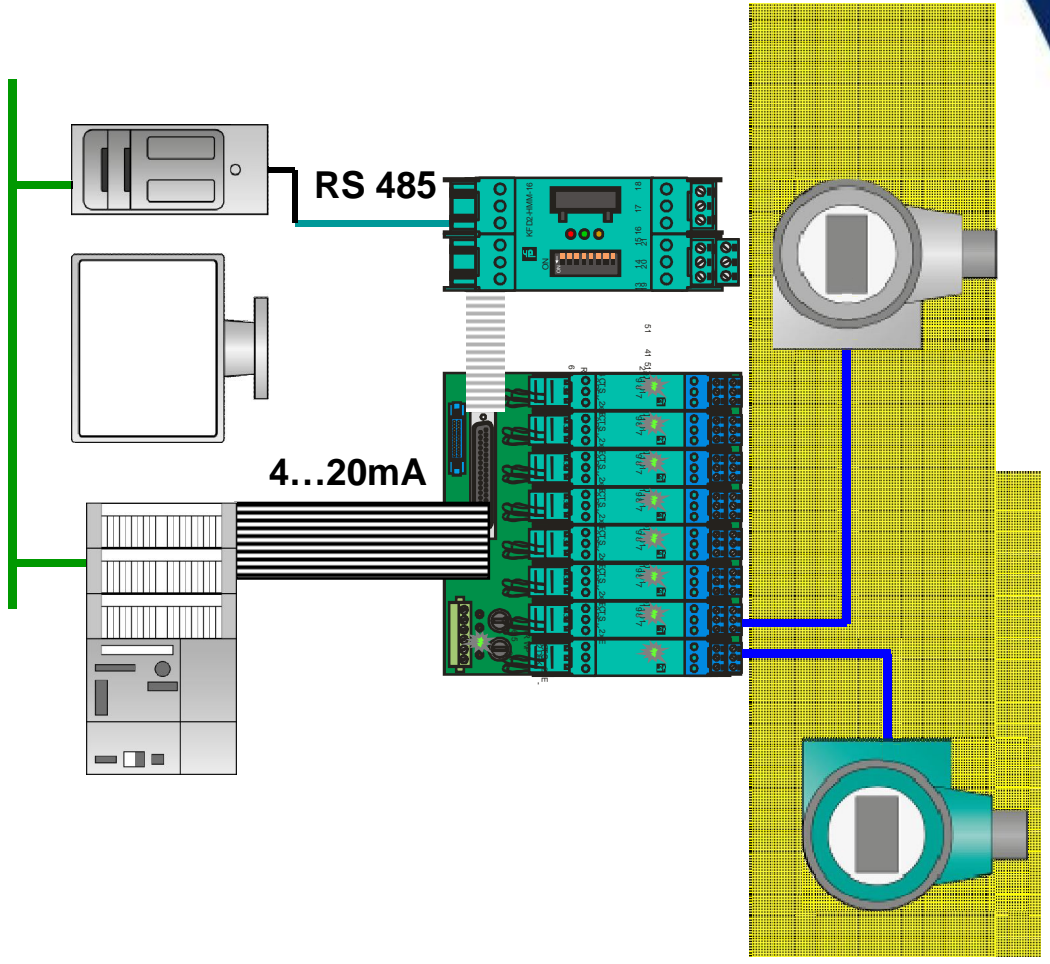
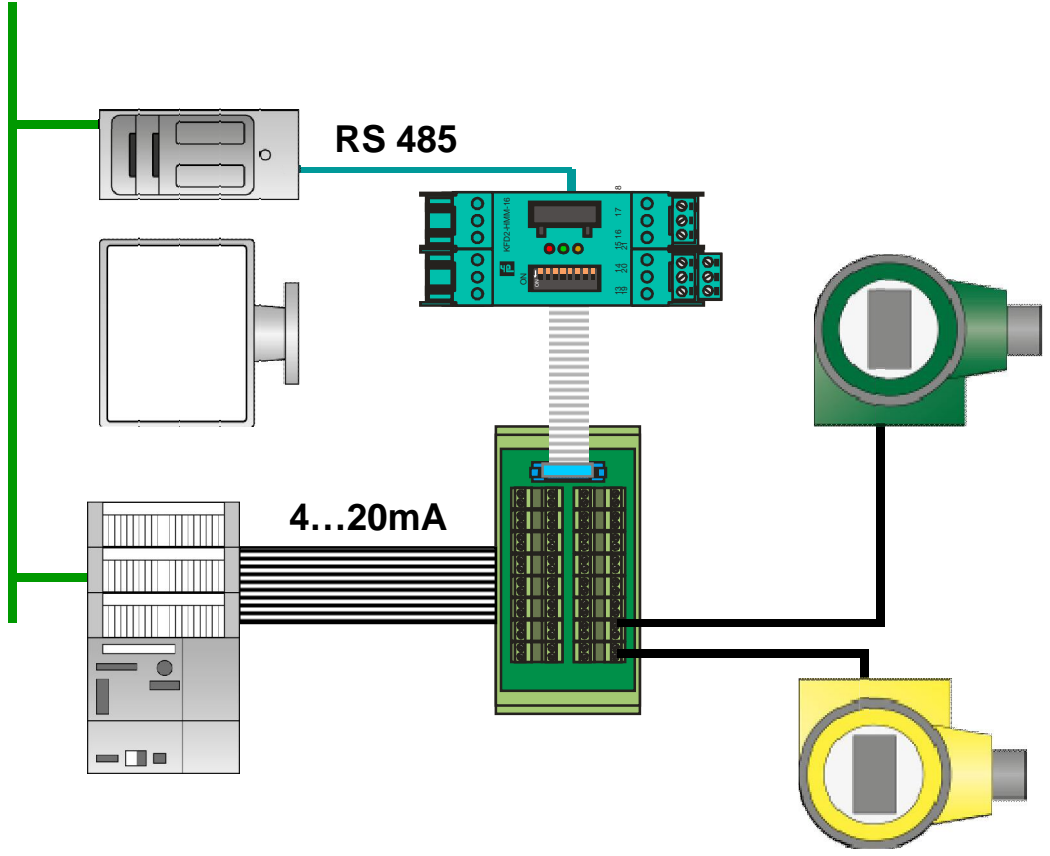
# Application Examples

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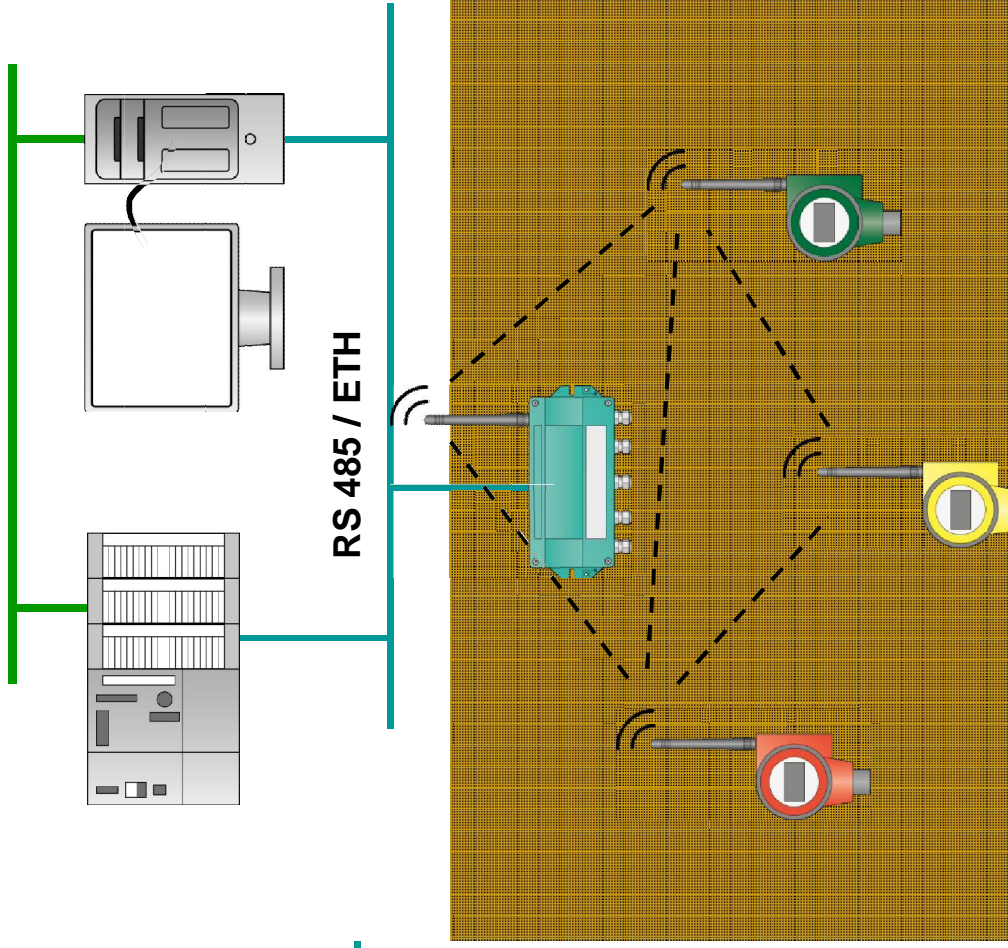
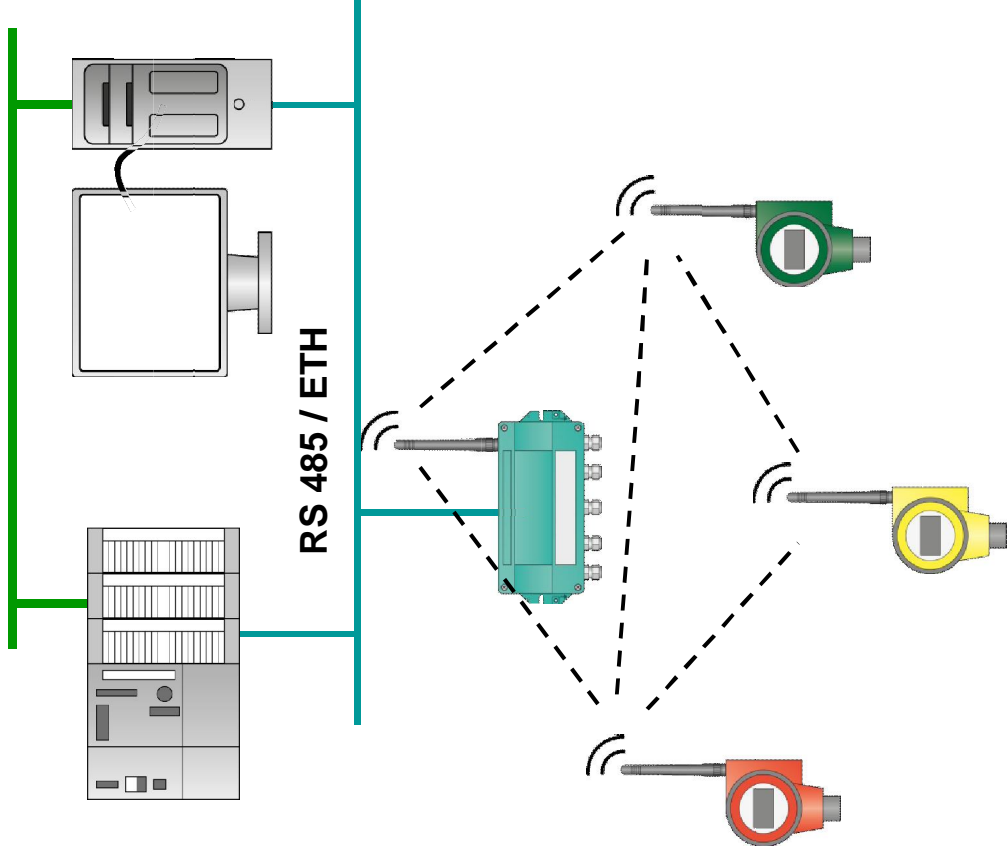
**Monitoring:  
Temperature**



# Layout Wired HART Structure



# WirelessHART Structure





## Elements of WirelessHART

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- License Free 2.4GHz ISM Band based on IEC802.15 has been chosen as the preferred radio frequency
- Advantages:
  - Worldwide usable without any permission for using this Bandwidth (rare restrictions apply)
  - Cheap and freely available Hardware due to WLAN standard IEC802.15.4
  - Designed for very low power consumption = battery powered devices
- Disadvantages:
  - Limited range due to limited output power <10 MB/s / 50m in industrial plants
  - Already used frequency band (WLAN, Bluetooth, ZigBee), therefore transmission reliability seems to be <100%

Solution is.....

Flat Mesh Network

Network Management

Frequency Hopping

Time Division Multiple Access (TDMA)

.....The Elements of WirelessHART

## **Elements of WirelessHART**

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- **Mesh Network**
  - Each participant is working as a “repeater”
  - Increased communication area
  - Max. distance between 2 participants 200 m (best case!)
  - Broken paths are detoured which increases transmission reliability
  - The network is a self healing network
  - New participants will be integrated automatically

## **Elements of WirelessHART**

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- **Network Management**
  - The Network is organized and controlled by a central component, the Network Manager
  - The Network Manager
    - forms the Network
    - determines the communication paths between all participants
    - as well as alternative paths and timings
  - Newly added participants are added to the network automatically

## Elements of WirelessHART

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- **Frequency Hopping**
  - IEEE 802.15.4 allows 16 Channels
  - Wireless HART switches through these 16 Channels
  - Already occupied channels (e.g. from a WLAN) are blacklisted and will be avoided

## Elements of WirelessHART

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- **Time Division Multiple Access (TDMA)**
  - All Wireless HART participants are highly accurate synchronized
  - They start to communicate within a 10ms time frame
  - Between the communications, the participants go into sleep mode to save Battery Power

# Mesh Network: How it Works

