

# Digitization of Existing Facilities

## Wireless Gauge Reader Applications

10/31/2022



# Problem: Most Plant Data is NOT Digitized



# Difficulty of Digitizing Existing Plants

## Just to read a simple pressure process value:

- Run wires (power and/or signal)
- I/O panels, termination
- Break seals, leak checks, material compatibility, safety checks
- Engineering assessment, documentation
- Process downtime
- Cybersecurity concerns



There are thousands of these devices with critical process data, but it costs over \$20,000 to instrument each one using conventional technology, plus cost of process downtime.

Typical traditional solution:  
INVASIVE AND COSTLY



# Need for Non-Invasive Digitization Technology

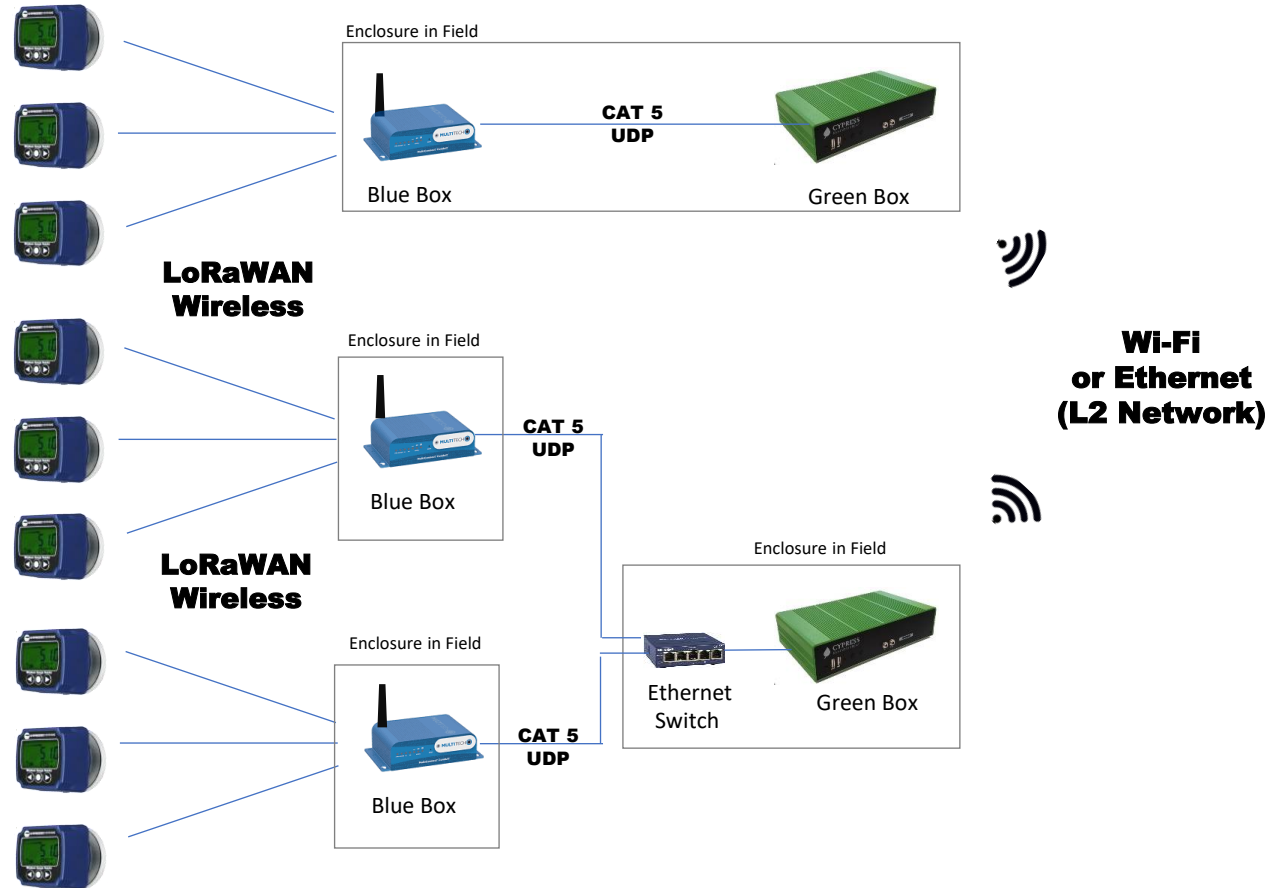
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## **Non-Invasive Sensors:**

- No breaking seals, no leak checks, no wetted parts
- Lightweight, no structural impact
- No power wires, no signal wires
- Little/no engineering review/analysis
- Takes minutes to install, no plant downtime required
- No new software to install, works with existing plant infrastructure

# Cypress Family of Non-Invasive Digitization Solutions

# Typical Deployment Architecture



Connection via RESTful API, OPC UA, or OPC DA

OSI PI / R\*Time Historian 3<sup>rd</sup> Party App



Web Application Clients HTTPS using browser



Wireless Gauge Reader

# Cypress Solution: Wireless Gauge Reader



- “Electronic Eyeball” reads gauges and transmits readings wirelessly
- Non-invasive, clamp-on to existing gauges in minutes
- No downtime, no leak check, no wiring, no drawings
- Battery life of 3+ years at 15 minute sample rate
- IP56/NEMA 4 rated for outdoor use
- Various size and types of mounting adapters to fit most existing gauges
- Reads dial gauges, hour meters, LED/LCD displays

# Wireless Digit Reader



- Reads numeric indicators
- Exactly same form factor as Wireless Gauge Reader
- Should not require additional engineering review/approval
- Has different firmware than WGR
- Wireless transmission duty cycle is higher - battery life about 30% of WGR. Use slower sample rate to compensate



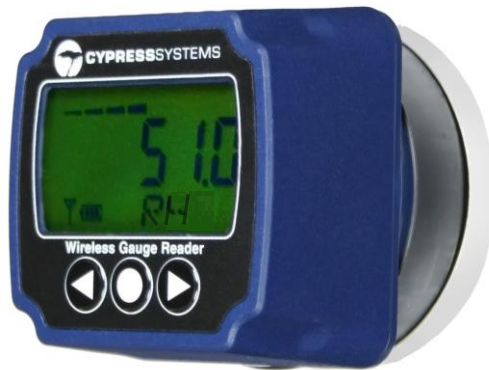


# Wireless Transducer Reader



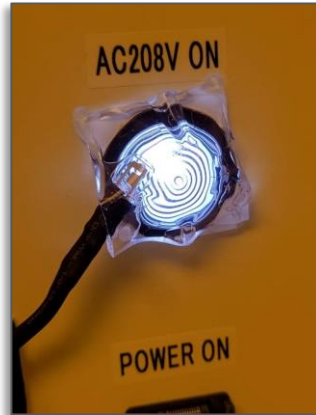
- Software configurable I/O and signal conditioning
- Enables wireless remote monitoring of virtually any analog transducer or instrument with the following outputs: 4-20mA, 0-5V, or 0-10V, RS-232, RS-485, thermocouple, thermistor
- 2 channels per device
- Compatible with most existing flow meters, current meters, particle counters, thermocouples, weigh scales, etc.
- Battery life of 3+ years at 15 minute sample rate
- Optional enclosures for NEMA 6, IP 67 protection
- Enables data logging to enable trend analysis, notification, or statistical process control

# Wireless Humidity and Temperature Monitor



- -20 °C to +70 °C (-4 °F to 158 °F) Temperature Range
- 0 – 100% Relative Humidity Range
- Displays Temperature, Relative Humidity, and Wet Bulb Temperature (optional)
- Used for worker heat stress management, materials life tracking etc.
- Magnetic Mounting for steel walls or columns
- Adhesive Mounting for other surfaces
- Battery life of 3+ years at 15 minute sample rate
- IP56/NEMA 4 rated for outdoor use

# Wireless Indicator Light Reader



- Non-invasive stick-on light sensor
- Small form factor, does not obscure operator view of indicator
- Light weight, optical detection only - minimal engineering review
- Optical detection is “air-gapped” – minimal cyber security review
- Will require EMI exclusion distance consideration depending on type of equipment

# Wireless Steam Trap/Pipe Wall Temp Monitor



Leaking Traps Waste Energy



Typical Steam Trap

- Traps are a necessary part of the steam distribution system, usually hundreds of units per site
- 15-20% average failure rate; leaks steam
- Failed traps lose \$5,000 per year (1/8" orifice)
- Manual inspection typically done annually – labor intensive, do not catch problems in timely manner
- Solution: Wireless steam trap monitor detects faults and alarms on error, avoiding expensive leak loss
- Non-invasive installation: no breaking seals, wireless, integrates with BMS
- Battery life of 3+ years at typical sample rates
- IP65/NEMA 4 rated for outdoor use
- One year payback on investment

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# Cypress network: Open System to Integrate with 3rd LoRaWAN sensors



# Integration of 3<sup>rd</sup> Party LoRaWAN devices



## MultiTech Reveal™ Wireless Proximity Sensors

MultiTech Reveal™ LoRaWAN Wireless Proximity Sensors detect contact between two wires, proximity detection with a magnet, range with an ultrasonic signal, while the Reveal UltraSonic Level Sensors provide high accuracy proximity detection and ranging in air.



## MultiTech Reveal™ Wireless Push Button Sensors

The MultiTech Reveal™ LoRaWAN Wireless Push Button Sensor transmits on a button press event. They can be used as a panic button wearable device, personal emergency response system (PERS), remote control or other remote push button applications. When the button is pressed, an alert is sent to the wireless network.



## MultiTech Reveal™ Wireless Movement Sensors

MultiTech Reveal™ LoRaWAN Wireless Movement Sensors use an ultra sensitive internal accelerometer to detect movement of a critical asset. When movement is detected that exceeds a certain threshold, an alert is sent over the wireless network. Reveal Tilt Sensors detect transitions between horizontal and vertical orientation, as well as reporting the angle of the tilt.

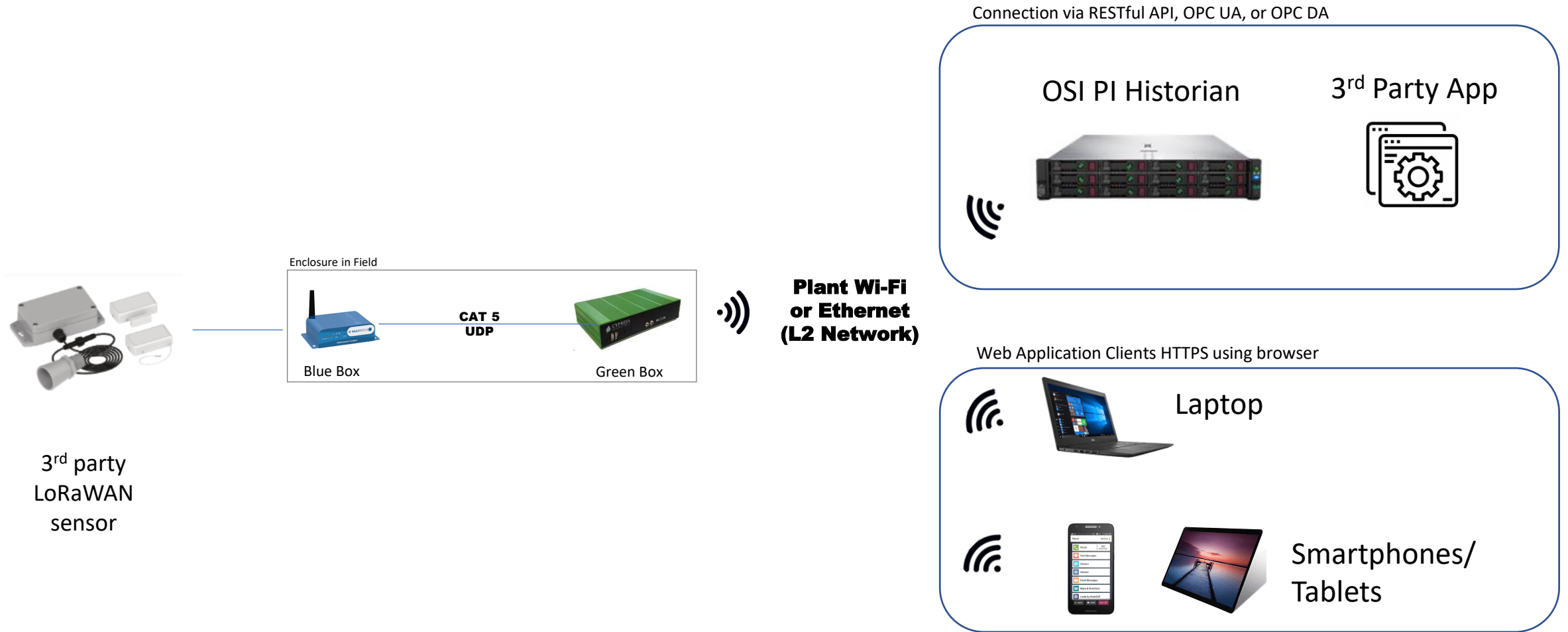


## MultiTech Reveal™ Wireless Leak Detection Sensors

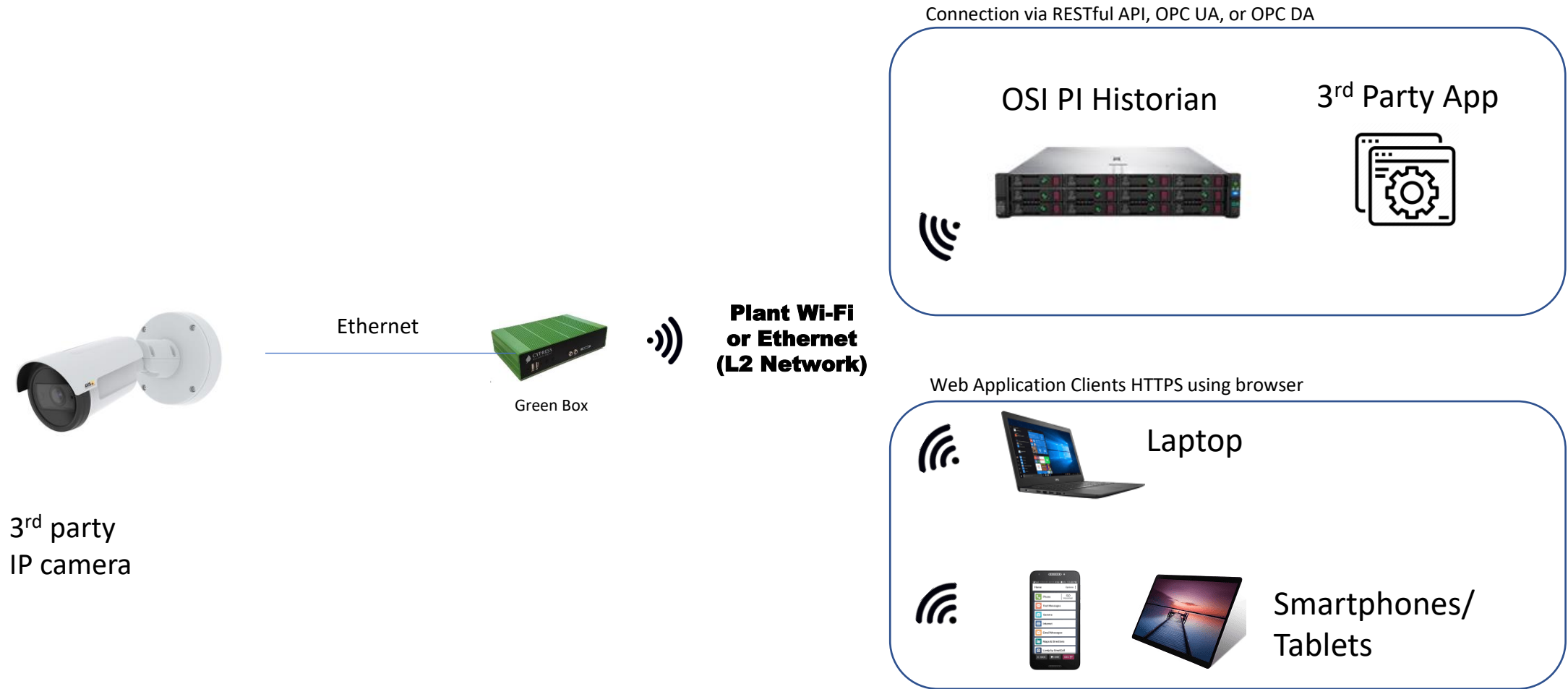
MultiTech Reveal™ LoRaWAN Wireless Leak Detection Sensors use a water probe to detect the presence of water or other liquids. When the presence of water or another liquid is detected, an alert is sent over the wireless network to prevent a potentially catastrophic event.

- Integrate devices with Cypress Gateway and GBC
- Same wireless network infrastructure
- Same cyber security approval
- Same OSI PI connectivity

# Integration of 3<sup>rd</sup> Party Sensors



# Integration of 3<sup>rd</sup> Party IP Cameras



# Reading Sight Glasses, Vertical Indicators (Q2 2023)



- Capture images from 3<sup>rd</sup> party IP Cameras
- Leverage GBC machine vision engine to automatically convert to digital value and store for history, trending, alarming
- No need for human operator to always check camera feed
- Same GBC infrastructure
- Same cyber security approval
- Same OSI PI connectivity