SUSTECH
INTEGRATED TECHNOLOGIES

LoRa Alliance®
Member

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Smarter Operations in Oil & Gas

End-To-End LoRaWAN Solution

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SUSTECH is a LoRa Alliance Member

LoRa Alliance®

Official Certification of Membership
Sustech Integrated Technologies

The LoRa Alliance Inc. hereby certifies Sustech Integrated Technologies is in good standing of Adopter membership for the May 2023 to May 2024 term.

D McGinnis

Debbie McGinnis
Account Director
LoRa Alliance, Inc.

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Why do you have to Get started with LoRaWAN. . .

Low Cost

In LoRaWAN, the devices that are usually in greater quantity are the gateways and terminals. Since the gateway only serves as a data forwarder, its price is relatively cost-effective.

No need for a frequency license

LoRaWAN operates on a free public spectrum, available for anyone to use, LoRaWAN networks are deployed on free ISM bands (EU868) in UAE & GCC Countries allowing any service provider or enterprise to deploy and operate LoRaWAN networks without a frequency license.

Low Power Consumption and Long Life

Compared to 4G , LoRaWAN boasts ultra-low power consumption, whereas 4G lacks low power features. In outdoor settings such as agriculture and forestry, 4G cannot be battery-powered like LoRaWAN.

Wide Coverage Range

Using CSS and ADR, LoRaWAN can communicate with a gateway up to 15 km away in unobstructed open areas or up to 5 km away in urban areas. This means that a single gateway can cover all devices in an area of approximately 700 square kilometers.

Strong Penetration Capability

LoRa wireless modulation technology can penetrate indoor depths, with the ability to reach underground water and gas meter sensors.

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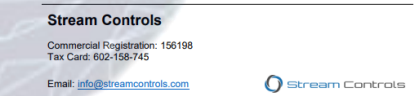
VAR Certificates



Why Solution Provider ?

SUSTECH
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A Solution Provider
Sensing + Technical Experience = Solution

We Sell the Solution
Not the Product

We Sell a Solution
Meet Clients
Satisfaction

FIT FOR PURPOSE

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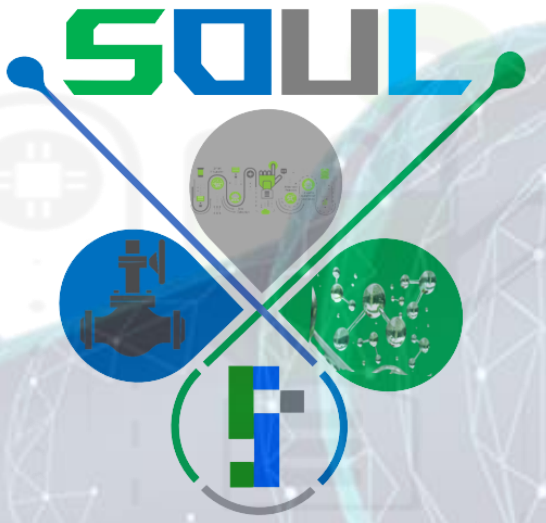
...has...



SMARTER OPERATIONS UTILIZING LORAWAN

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Smart data collection via Modbus / HART

Smarter Metering Solution

Smarter Wellhead Monitoring

Smarter Asset Monitoring

Smarter Non-Critical Control & Alarm

Smarter System Architecture

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DID YOU KNOW

.....that you can send Modbus & HART data via LoRaWAN?

Modbus

HART®
COMMUNICATION PROTOCOL

LoRaWAN®

Modbus-to-LoRaWAN

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Partial Stroke Test (PST) is a functional test that is performed on a valve to check its operability without affecting the process controlling.

Being PST is a critical element of the Safety Instrumented Systems (SIS).The PST ensures that the valve is working correctly, thus reducing the risk of equipment failures or accidents when is needed.

This where Modbus LoRa converter interfaced PST via RS485 Modbus connection systems can provide significant advantages by allowing for real-time monitoring and control the PST by reducing the human interface.

Sustech can interface and collect the data from the remote area via Modbus to LoRaWAN

Partial Stroke Test (PST)

Modbus-to-LoRaWAN

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LoRaWAN is designed to provide long-range communication with low power consumption, which makes it ideal for applications where data is transmitted infrequently and over long distances such as in MOV

MOV and valve diagnostic with Modbus interface to exiting systems have deferent data control/ collection can send by Modbus all data for predictive.

Sustech can interface and collect the data from the remote area via Modbus to LoRaWAN

Motor Operated Valve Diagnostics

HART-to-LoRaWAN

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The controller maintains a precise chemical injection rate under changing process conditions and reports injection data to a central location.

The HART device variables are made available for remote operation and monitoring.

Sustech solution uses a Certified HART to LoRaWAN Class 1 Div 2 hazardous converter: so you can take the signal measurements of equipment in the sensitive zone and transform them into a LoRaWAN® wireless signal

Wellhead chemical injection skid diagnostics via Modbus or Hart to LoRa

Modbus-to-LoRaWAN

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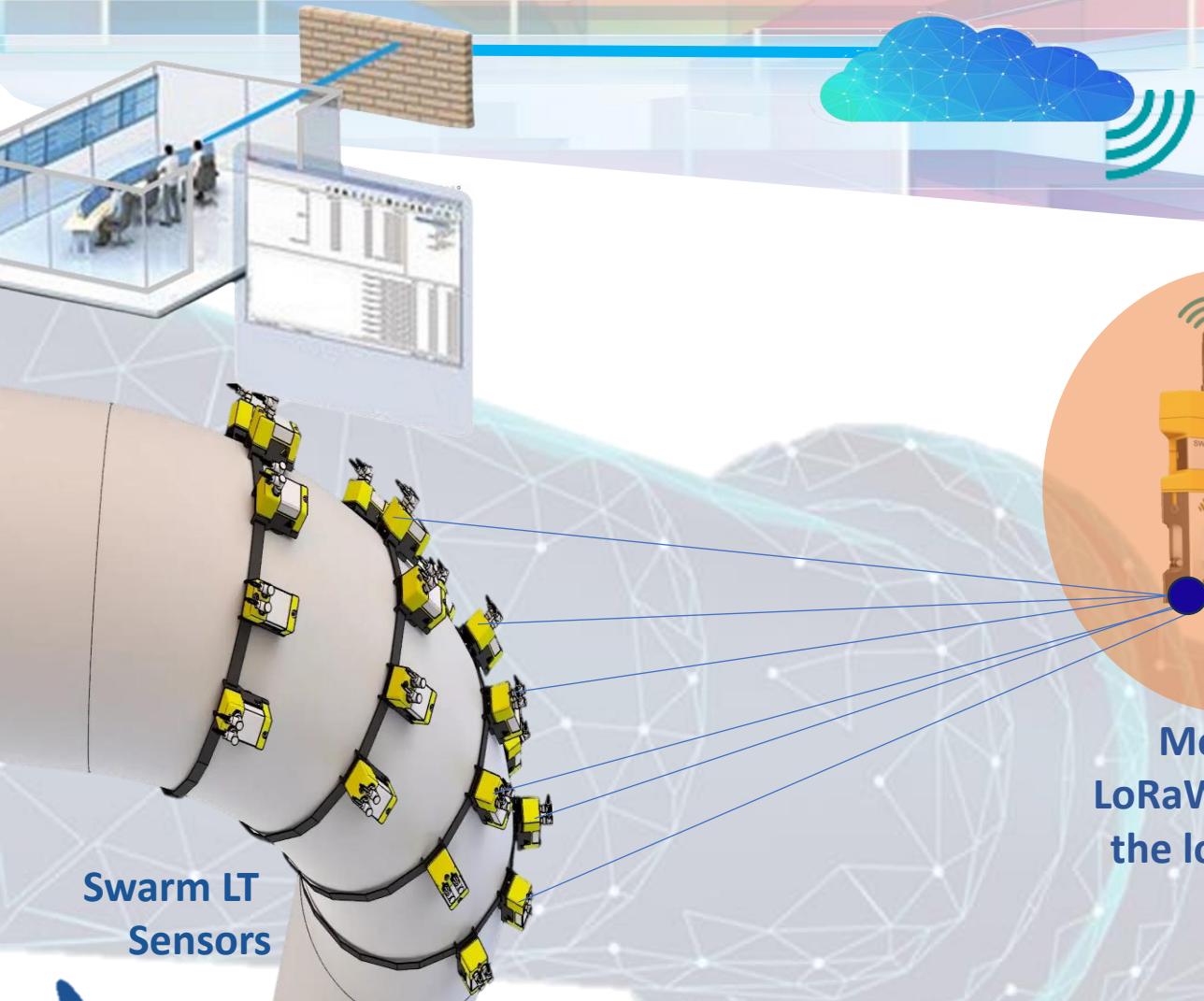
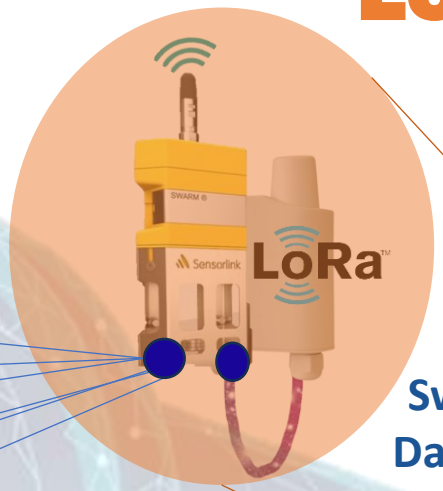
Corrosion Monitoring
LoRaWAN made it easy



Swarm LT
Sensors



Modbus to
LoRaWAN to send
the logging data

Swarm S2
Data Logger

Sensorlink

SUSTECH Associate Partner in related LoRaWAN

Gas, Electricity, Water, and Cooling Meter Remote Reading
&
Plant accounting and settlement systems
(PASS)

SUSTECH ...have the... SOUL

LoRaWAN®

Gas Metering

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Smart Gas Reeding & Billing System.

ACCOUNTING AND SETTLEMENT SYSTEMS FOR IPP AND IWP

MBS

Plant accounting and settlement systems (PASS)

- Integrated smart metering solution for independent power/water producers
- Settlement systems for power purchase agreements (PPA) and water purchase agreements (WPA)
- Automated billing and invoice verification
- Consulting, support & maintenance

MBS

Plant Accounting Settlement System (PASS)

LoRaWAN®

LoRa™

LoRa™

HAUK & SASKO INGENIEURGESELLSCHAFT MBH

SUSTECH Associate Partner in related PASS

SUSTECH ...have the... SOUL

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Smart Metering & Settlement System

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Solutions for Gas plants with Sulfur Recovery

MBS **Bulk solid and bulk liquid**

Faster and easier for reliable and correct accounting

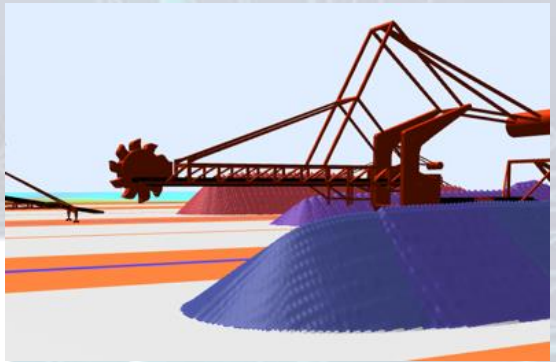
- **Digital twins** for bulk stockyards and material handling for liquids and solids
- Material balances through **IoT sensor integration**
- **Automation solutions** for stackers/reclaimers, train loaders, and ship loaders
- **Reduces costs and optimizes operation stackers and easier**

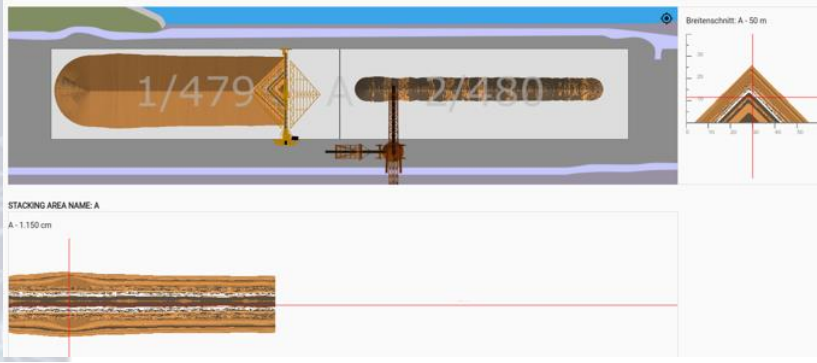
MBS

Plant Accounting Settlement System (PASS)

HAUK & SASKO INGENIEURGESELLSCHAFT MBH

SUSTECH Associate Partner in related PASS





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Smart Metering & Settlement System

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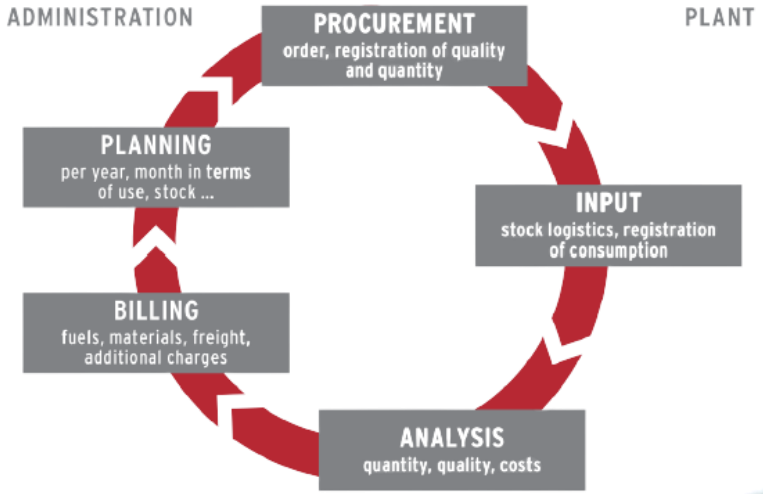
Electricity, Gas, Oil, hydrogen, Heat, Water & Process steam

Plant Accounting Settlement System (PASS)



MBS

Plant Accounting Settlement System (PASS)

HAUK & SASKO INGENIEURGESELLSCHAFT MBH

SUSTECH Associate Partner in related PASS

MBS Benefits and Value-Added

- Management system for the most important process in commercial plant operation: invoicing and settlement
- Integrated database solution for plant and back-office teams
- Strong reporting capability, high transparency delivered
- Acquisition of production and consumption meter data from digital control systems (DCS)
- Database for plant availability and capacity, load scheduling, and outage events
- Automatic calculation of invoices for electricity and water as per the contract clauses of PPA and WPA
- Generation of invoices and notices
- Comprehensive reporting
- Optional -Invoice verification for inputs: natural gas, fuel oil, coal, additives
- Optional -Fuel efficiency calculations / Fuel Demand Model

SUSTECH ...have the... SOUL

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Smart Metering & Settlement System

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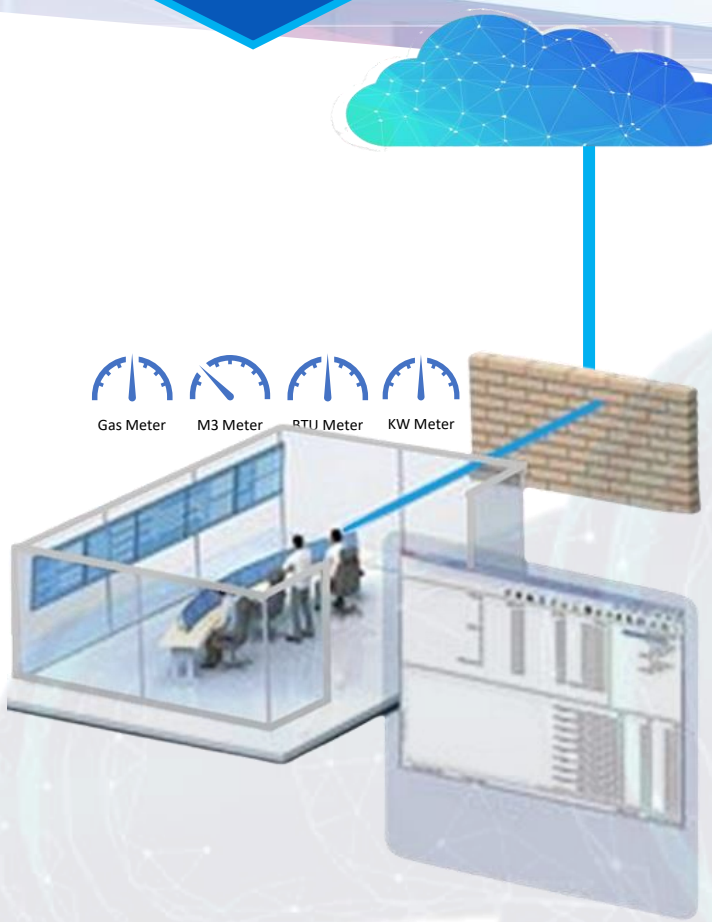
MBS **Smart Metering for Electricity, Gas, Cooling & Water**



LoRaWAN®

LoRa™

LoRa™

Gas

Water

Electricity

Cooling

MBS

Plant Accounting Settlement System (PASS)

HAUK & SASKO INGENIEURGESELLSCHAFT MBH

SUSTECH Associate Partner in related PASS

Smarter Wellhead Monitoring

CONVENTIONAL WELLHEAD

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Wellhead and Christmas tree products are used to monitor well pressure, adjust oil/gas well flow and have been in use for many years and proven to be effective for drilling and production operations.

However, they typically require a significant amount of manual labor and maintenance.

IIOT-ENABLED WELLHEAD

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Smart Wellheads consist of sensors, control systems, and communication networks, to enable real-time monitoring and control of the wellhead operations. Smart wellheads provide operators with better visibility into wellhead performance, enabling them to optimize production, reduce downtime, and enhance safety.

Predictive Maintenance: Sensors that collect data on the operating conditions of the wellhead. This data is analyzed using machine learning algorithms to predict when maintenance is required. Predictive maintenance can prevent equipment failures, reduce downtime, and extend the life of the wellhead.

Enhanced Safety: IIoT-enabled wellheads have improved safety features, such as ESD and automatic monitoring of pressure, temperature, and other critical parameters. It also enable operators to detect potential safety hazards before they occur, preventing accidents and minimizing risks.

Remote Monitoring: IIoT-enabled wellheads can be remotely monitored from a centralized control room, allowing operators to monitor multiple wellheads simultaneously. Remote monitoring improves operational efficiency and reduces the need for on-site personnel, which enhances safety.

IIOT- ENABLED WELLHEAD

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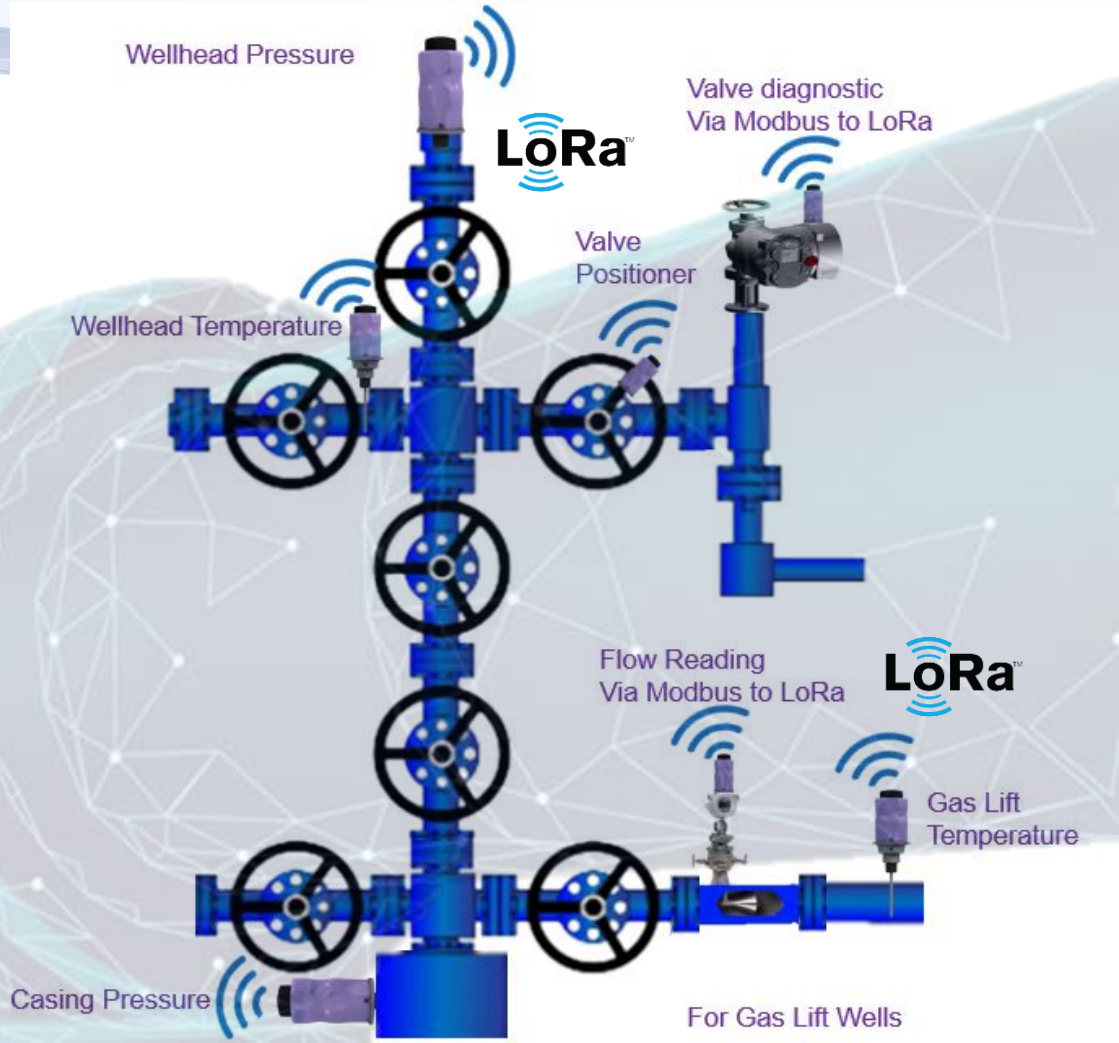
With the advent of newer technologies, such as ,

IIOT-enabled wellheads, for real-time data or monitoring capabilities, are being developed to improve efficiency, safety and productivity in the oil & gas industry.



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IIOT- ENABLED WELLHEAD

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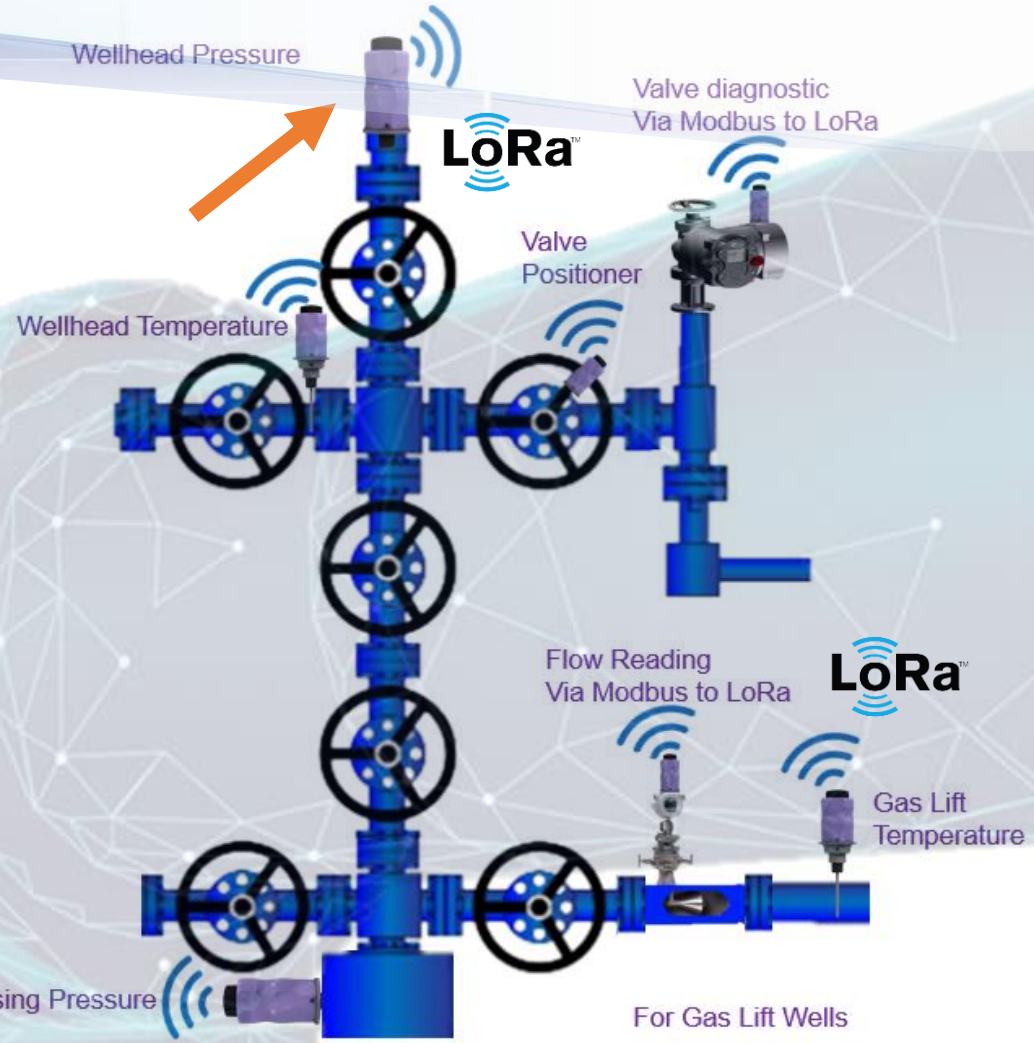
Implementing IIoT in wellheads requires the use of various field instruments to collect, transmit, and analyze data, e.g.,

Pressure Sensors: to measure the pressure of fluids in the wellbore and at the surface. They provide critical data for well monitoring, control, and optimization.



IIOT- ENABLED WELLHEAD

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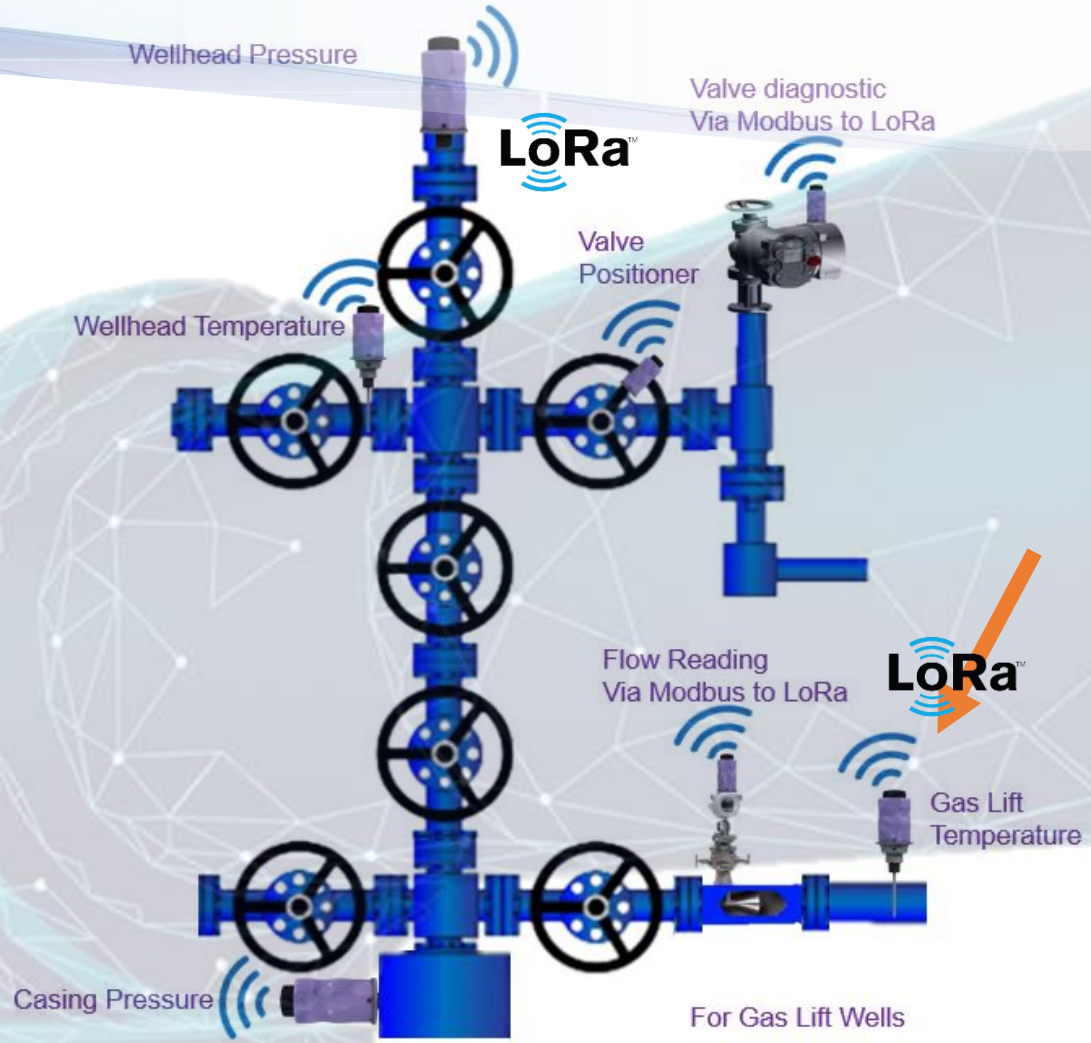
Temperature Sensors: to measure the temperature of fluids in the wellbore and at the surface. They provide critical data for well monitoring, control, and optimization..



IIOT- ENABLED WELLHEAD

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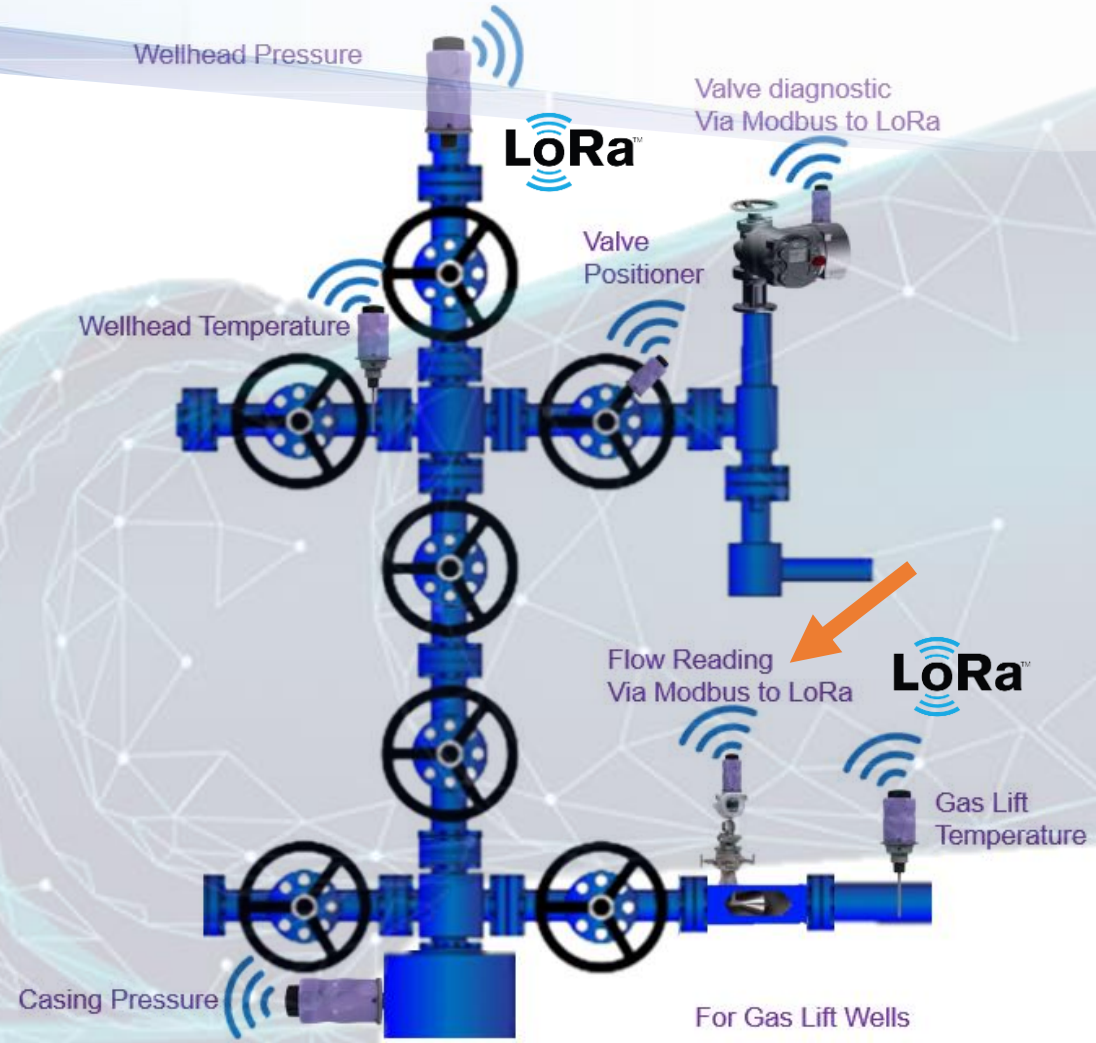
Flow Meters: to measure the flow rate of fluids in the wellbore and at the surface. They provide critical data for well monitoring, control, and optimization.



IIOT- ENABLED WELLHEAD

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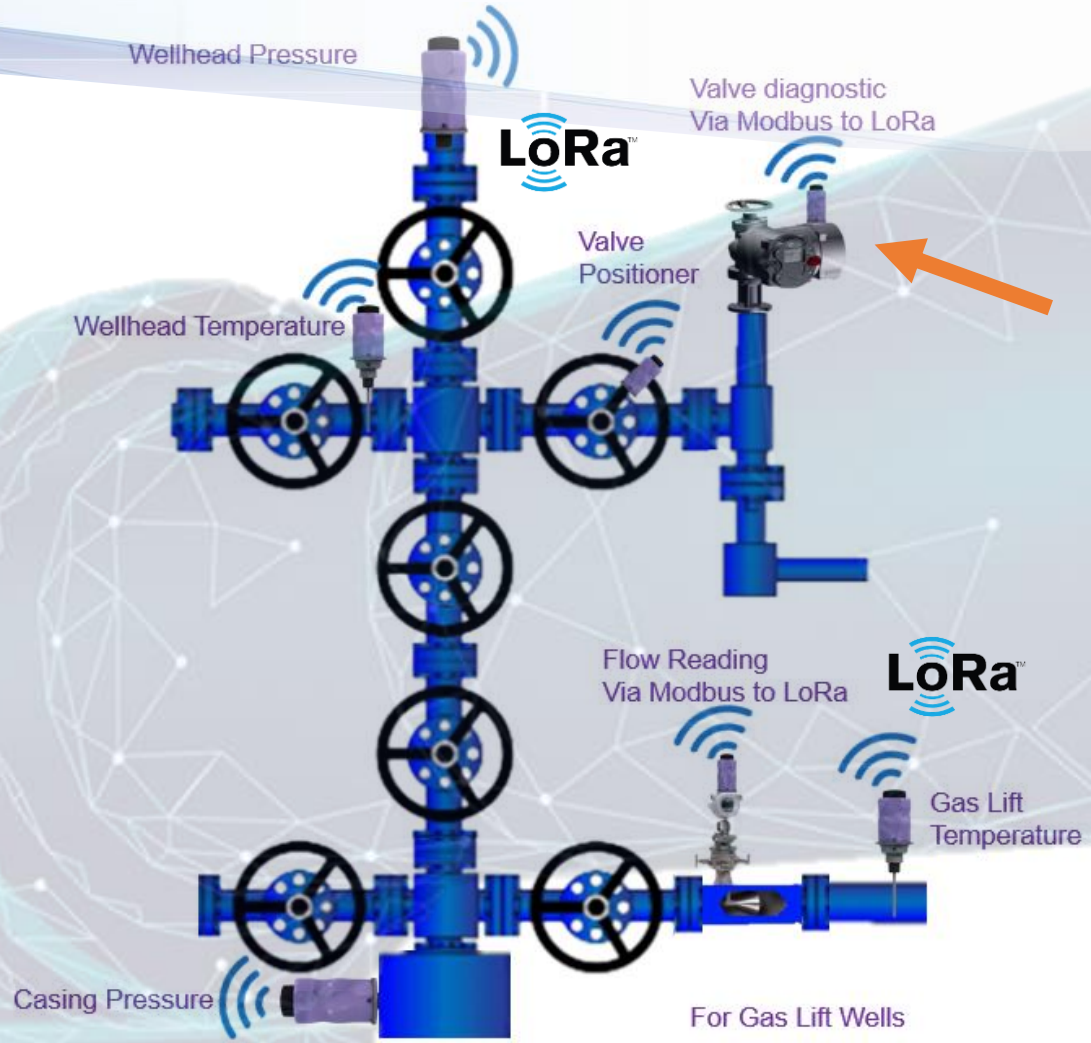
Valves & Actuators: Control valves (choke) are used to regulate the flow of fluids in the wellbore and at the surface. Actuators are used to move valves and chokes.

They are controlled by IIoT-enabled control systems to optimize well production and ensure safety.



IIOT- ENABLED WELLHEAD

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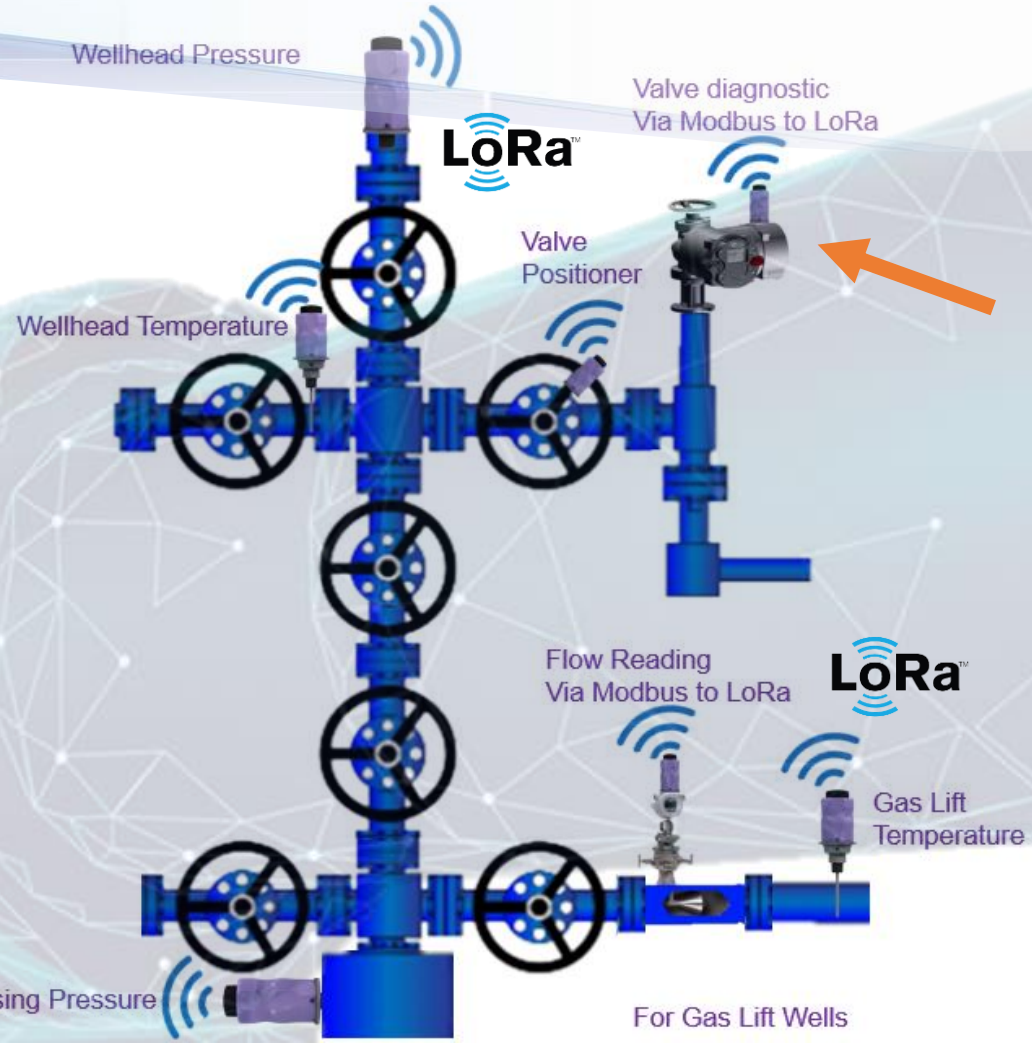
Communication Device & Data Loggers:

1. LoRa End Nodes: to transmit data from the field instruments to control system
2. Data Loggers: to record and store data from the field instruments for later analysis.

Our end-to-end solution is based on LoRaWAN technology as shown next.....



OUR SMART WELLHEAD

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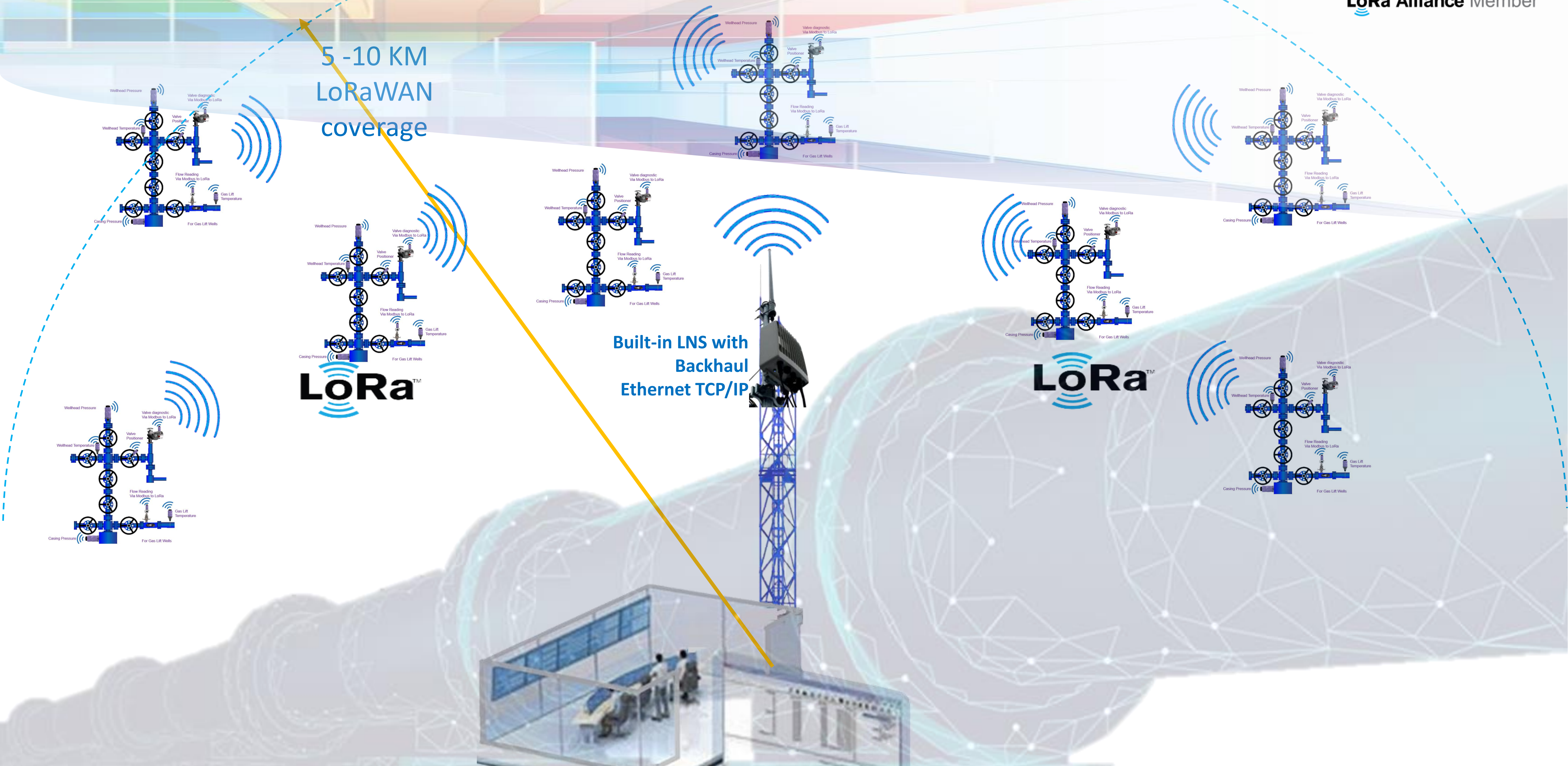

Smarter Assets Monitoring

Equipment Assets Monitoring

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Applications we can Provide:

- Heat exchanger
- Steam trap
- Pumps Vibration
- Manual Valve Positioner
- Pressure Release Valves
- Pipes corrosion monitoring
- Valves leak monitoring
- Heat exchanger Condition
- Cooling condition
- Motor-operated valves
- Emergency shutdown system
- Motor current reading
- Filters and strainers

Equipment Assets Monitoring

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SMARTER SOLUTIONS

FOR YOUR COMPLEX ASSET-INTEGRITY CHALLENGES

NEON Vibration Sensor

NEON Pressure Gauge

LoRa™

NEON Temperature Sensor

NEON Pressure Sensor

TW TG L

NEON Valve Postioner

NEON Temperature Transmitter

NEON Contact Sensor

LoRaWAN Architecture

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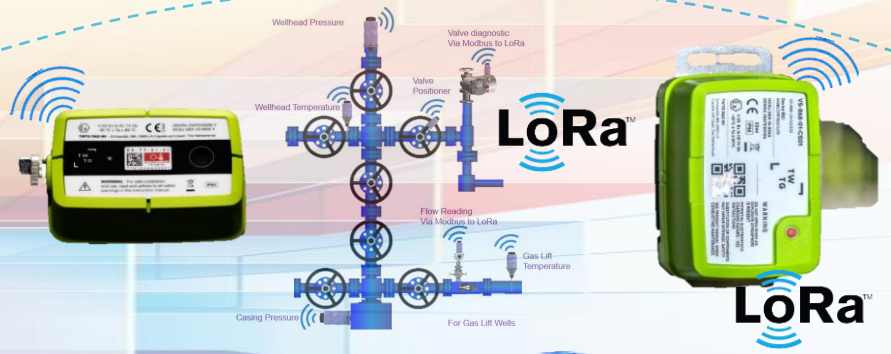


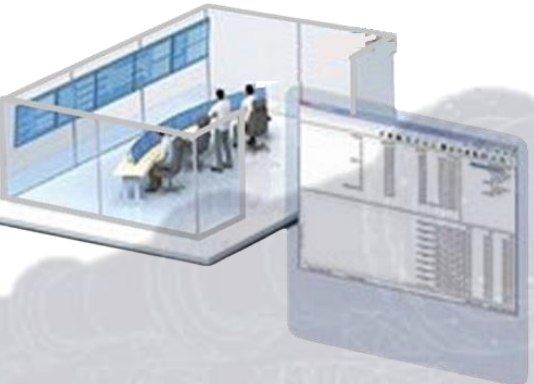
LoRa Antenna

Coaxial Cable
1.5 with IP67 rated with Lightning Arrestor

24 VDC for MultiTech gateway

LoRaWAN Gateway with Backhaul 4G/WI-FI, Satellite & Ethernet TCP/IP

Note: Ethernet TCP/IP when the mast same location of CR .



24 VDC Panel w/ 400 W power output

Battery Backup Panel with charger and Lora device for battery diagnostic and built in Cooling for internal panel temperature with heat insulation

- Panel will be fixed @ the mast at 1.5m Height
- The solar panel will be fixed on the mast @ 2 M Height
- The Gateway will be Fixed @ the Mast on 4.5 m Height
- The LoRa Antenna will be fixed @ the End of the Mast
- This Mast with antina when it is in remote area without power we consider batteries with thermal cooling and heat insulation

Smarter Non-Critical Control & Alarm

Non-Critical Control& Alarm

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LoRaWAN®

MQTT

Static IP address

Chemical Injection Skid HART to LoRaWAN

Corrosion datalogger Modbus to LoRaWAN

Motor Operated Valve Modbus to LoRaWAN

Input/output Lora

LoRa

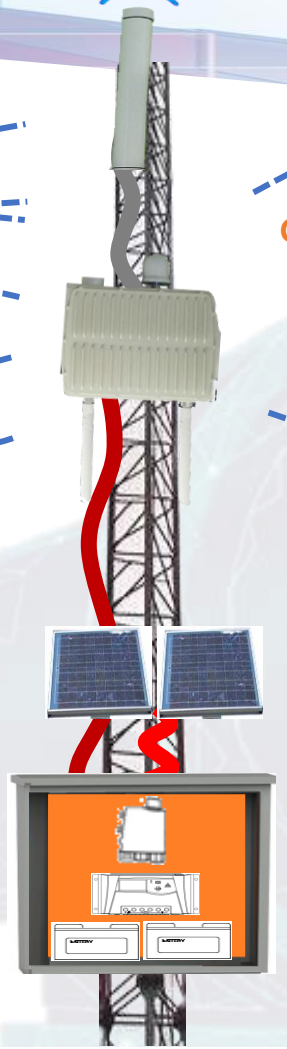
LoRa

LoRa

LoRa

LoRa

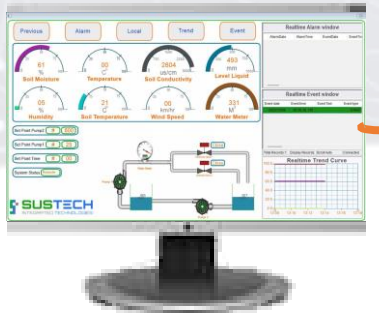
LoRa



Gateway with Built-in LNS with MQTT Client

PLC with MQTT Client

MQTT Broker Server



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- Main Office in Masdar – UAE
- Abu Dhabi Office - UAE
- Backoffice support – Manila
- Backoffice support – Jordan

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