SEMTECH

SMART INDUSTRIAL CONTROL

Liquid Presence Detection

LoRa® APPLICATION BRIEF

DESCRIPTION

Leaks in pipelines and other systems that involve water, gas or chemicals present a serious issue with the potential for significant economic losses or substantial environmental pollution. Liquid presence detection systems are commonly used to monitor leaks, but in many cases, they are placed at long intervals along a pipeline due to the high cost of deployment. Internet of things (IoT) sensors and networks promise to cost-effectively add more sensors to these systems to detect leaks faster and minimize damage and losses.

By implementing a liquid presence detection systems comprised of sensors and gateways embedded with LoRa Technology, and an intelligent low power wide area network based on the LoRaWAN™ protocol, pipeline operators and industrial facility managers get the long-range wireless network coverage they need combined with the long battery life required for remote sensors.

HOW A LoRaWAN-BASED LIQUID PRESENCE DETECTION SYSTEM WORKS

Semtech LoRa Technology enables connectivity, real-time analytics, reporting, and additional functions such as geolocation.

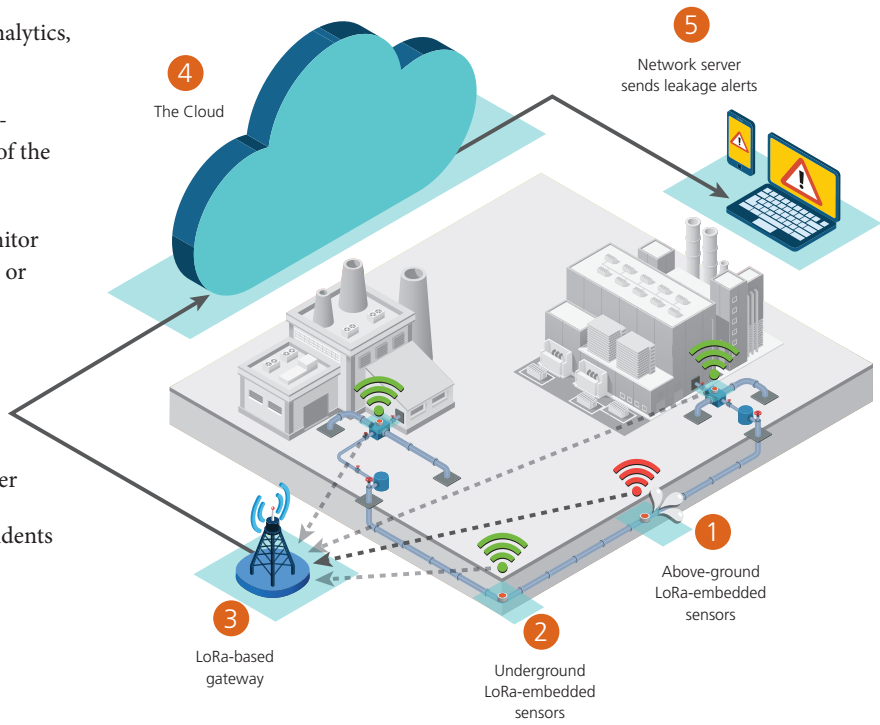
1. Internally-based and externally-based sensors on above-ground systems monitor the presence of liquid outside of the system to pinpoint leakage
2. For pipelines that are buried, underground sensors monitor soil around pipeline and use above ground RF antennas or underground radio systems to relay information
3. Sensors use LoRaWAN to communicate and send data to LoRa-based gateway
4. Gateway sends information to the Cloud-based server where the data is analyzed by an application server
5. Application server sends alerts on potential leakage incidents to system operators via mobile device

BENEFITS

- Increases frequency of leak detection sensors along a pipeline or in industrial plant cost effectively
- Detects leaks rapidly to minimize cost and environmental damage
- Works with internally-deployed and externally-deployed liquid presence detection systems
- Low power operation ensures sensor batteries can last up to 20 years.
- Long radio signal range of LoRa Technology provides maximum coverage with minimum infrastructure

APPLICATIONS

LoRa-based liquid presence systems help organizations to ensure the integrity of liquid transport and processing systems minimizing damage and losses from leakage.



Semtech products used in this application:

Sensors
- *SX1272/3*
- *SX1276/7/8/9*

Gateway
- *SX1301*

All application elements (sensing modules, gateways, servers, software) are available through LoRa Alliance™ partners.

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FIND YOUR IoT SOLUTION FROM SEMTECH'S LoRa ECOSYSTEM

MODULES & MODEMS | SENSORS | BASE STATIONS | NETWORK SERVERS | SYSTEM INTEGRATORS

For a full list of LoRa Ecosystem partners and services, visit our LoRa Community www.semtech.com/LoRaCommunity

KEY FEATURES OF SEMTECH'S LoRa WIRELESS RF TECHNOLOGY

LONG RANGE	Penetrates in dense urban and deep indoor environments, connecting to sensors 15-30 miles away in rural areas
LOW POWER	Enables multi-year battery lifetime of up to 20 years or more
HIGH CAPACITY	Supports millions of messages per base station
GEOLOCATION	Enables tracking applications without GPS or additional power consumption
STANDARDIZED	LoRaWAN specification ensures interoperability among applications, IoT solution providers and telecom operators
SECURE	Embedded end-to-end AES-128 encryption of data ensuring optimal privacy and protection
LOW COST	Reduces upfront infrastructure investments, as well as operating and end-node costs

JUMP-START YOUR IoT DEVELOPMENT TODAY

Semtech offers several training options to help you get started:

- Learn about Semtech's LoRa Technology platform: visit www.semtech.com/IoT
- Join the LoRa Community: www.semtech.com/LoRaCommunity
- Become a member of the LoRa Alliance™: visit www.lora-alliance.org
- Attend a LoRa Boot Camp for a full-day of training featuring LoRa Technology and real world applications: www.semtech.com/IoT
- Follow Semtech on LinkedIn and our LoRa Showcase page
- To contact one of our global offices in North America, Europe and Asia, visit www.semtech.com/contact

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200 Flynn Road, Camarillo, California 93012 • phone: (805) 498-2111 • fax: (805) 498-3804 • www.semtech.com