Predictive Maintenance

LoRa® APPLICATION BRIEF

DESCRIPTION

Many facilities leverage preventative maintenance to ensure the proper functioning of equipment through routine inspections and by making assumptions about the status of the equipment based on the age of the equipment and how often it is used. However, preventative maintenance can lead to unnecessary repairs or missed status cues that can result in unnecessary expenses or delays in service.

By implementing a predictive maintenance solution comprised of sensors and gateways embedded with LoRa Technology and an intelligent low power wide area network based on the LoRaWAN™ protocol, information on equipment temperature, power, sound, and more can be gathered. An example of this is the monitoring of ventilation fan motors which are operating almost 24 hours a day. Different mechanical harmonics as they age are well identified, and by using a LoRa-based sensor and modem, the health of the motor and its life cycle position can be communicated to alert the need for replacement of the motor. This information can then be sent to facility managers who can determine when a problem appears to be developing and schedule maintenance at the most convenient time while saving significantly in maintenance costs.

HOW A LoRaWAN-BASED PREDICTIVE MAINTENANCE SYSTEM WORKS

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

1. Equipment status data collected by a sensor embedded with LoRa Technology

2. Data from sensor is periodically sent to a LoRa-based gateway

3. Gateway sends information to network server where the data is analyzed by an application server

4. Application server sends alerts to facility manager via mobile device or computer
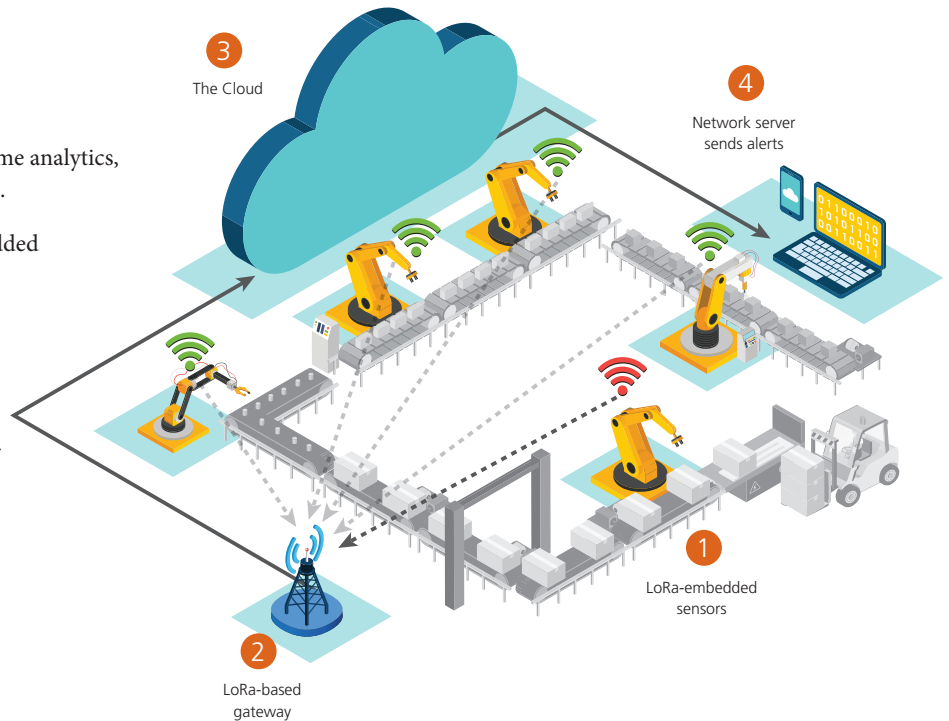
BENEFITS

- Identify potential equipment problems before they occur by monitoring temperature, power, sound, and other elements using sensors embedded with LoRa Technology

- Reduce downtime and maintenance costs

- Easy to set up and low power operation ensures sensor batteries can last up to 20 years

- Provides reliable RF communication link between sensing infrastructure and LoRaWAN-based network

APPLICATIONS

Sensors placed on equipment throughout a facility can monitor equipment function to alert facility managers of status so that they may identify problems before they occur and reduce downtime and maintenance costs.

3 The Cloud

4 Network server sends alerts

1 LoRa-embedded sensors

2 LoRa-based gateway

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.

LoRa® APPLICATION BRIEF

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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