

# VIVAVIS

DECODING THE FUTURE



## LoRa® and intelligent energy systems

On the energy sector, LoRa comes more and more into focus due to the following reasons. First, the 868MHz band has been allocated for licence-free operation in Europe and SRD sensors are quite cheap. Second, transmission quality is remarkably better compared to common radio technology. You can use LoRa technology even in places where common radio technology fails. VIVAVIS provides solutions and products suitable for this kind of data transmission.

### What is LoRa?

LoRa (Long Range) is a proprietary low-power wide-area network modulation technique. Based on the modulation technique CSS (chirp spread spectrum), LoRa guarantees high reception sensitivity thereby providing strong noise immunity. LoRa uses the 863 to 870MHz band. The band has been allocated for licence-free operation, but usage is restricted to 36 or 3.6 seconds per hour depending on the application type. Transmission power is also limited to maximum 25mW.

This is why using LoRa is optimal for locations with little data volume, for example, within supply networks (electricity, gas, water, district heating), districts/properties or industry and commerce. You can use the LoRa network to transmit any kind of payload. Information security is also guaranteed as messages are authenticated and encrypted.

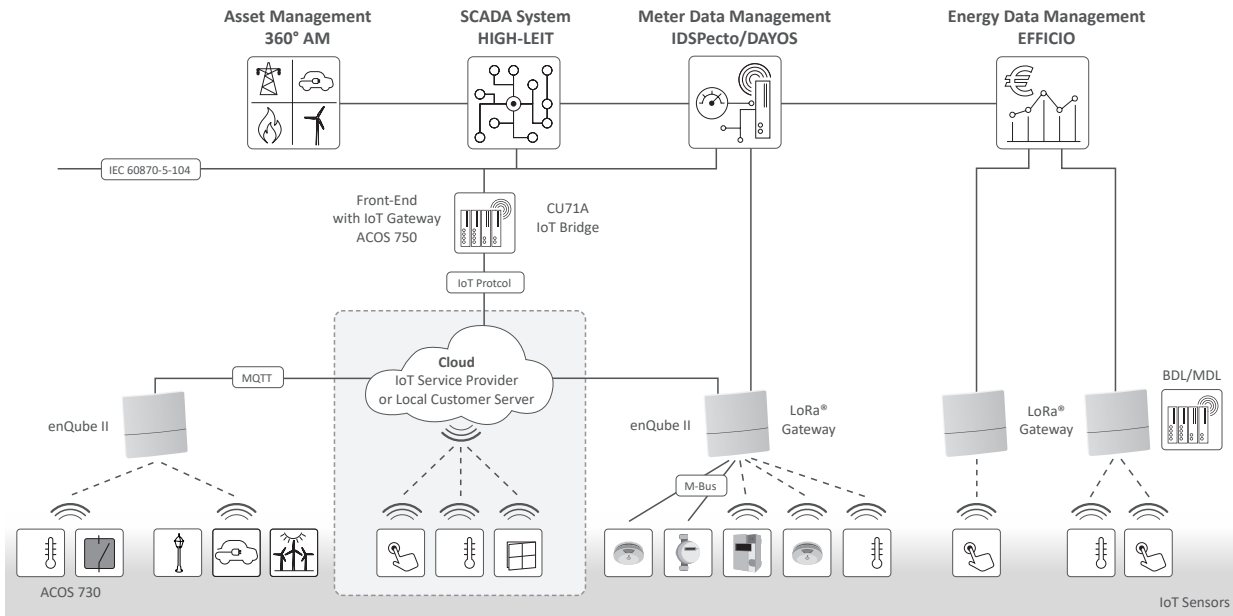
LoRa basically uses three operating modes: class A, B and C. Class A devices only send data via uplink at specific times. Data can only be sent to the devices via downlink immediately after the uplink. With regard to uplinks, class B devices behave the same way as class A devices, but class B devices offer additional downlinks at defined times. Class C devices send and receive at any time.

Components of a LoRa network:

- LoRa sensor
- LoRa modem
- LoRa gateway
- LoRa network server



Any common IoT sensor (eg for temperature, humidity, pressures, etc) can be used as LoRa sensor. Usually, such sensors are class A devices. VIVAVIS provides many sensors compatible with gateways and VIVAVIS devices such as, for example, **ACOS 730** or **enQube II** can be equipped with LoRa modems and thus become capable of LoRa communication. Such LoRa extensions reduce current communication costs.



The VIVAVIS LoRa concept focuses on the LoRa gateway. You configure the LoRa network by means of the integrated network server. The server communicates with sensors, decrypts sensor data and forwards it to the likewise integrated application server (Cloud or local server). The application server converts the sensor-specific format into the MQTT format. Via the CU71A (IoT bridge), this MQTT data can be securely integrated into IEC 60870-compliant messages and measured values via network isolation (IEC 60870-5-104/-101).

#### VIVAVIS use cases with LoRa®

In principle, you can use LoRa components in all applications aiming at digitizing energy systems. Independent of the use case, you can make savings on costs for installation, engineering, commissioning and communication.

#### Capacity optimization

In order to realize optimum operation of grids, data available on low and medium voltage level must be acquired in an economical way. Combined with common technologies, IoT sensors play a crucial role when evaluating the current actual state of grids and included flexibilities. This added value is not only generated for electricity distribution systems but also for distribution systems for gas, water and district heating.



#### Solution for districts

Districts and properties offer manifold application options for LoRa components with regard to efficient management. Typical use cases are submetering, charging infrastructure, car park management, health care (eg emergency call), environment (temperature, air quality, etc), smoke alarms or disposal (eg refuse collection).

#### Asset management

Asset management above all is dependent on quality and topicality of available asset data. By means of LoRa IoT sensors, assets can be managed and administered at low costs – be it initial commissioning, replacement procedures, maintenance periods, life cycle evaluations or investment planning.

#### Energy data management

In order to enable evaluation of energy efficiency of production processes in industry and commerce, you require numerous metering and acquisition points some of them even only temporarily installed. Wireless sensors offer significant advantages over permanently installed sensors especially with regard to temporary or mobile applications.

*The LoRa® Mark is a trademark of Semtech Corporation or its subsidiaries.*