

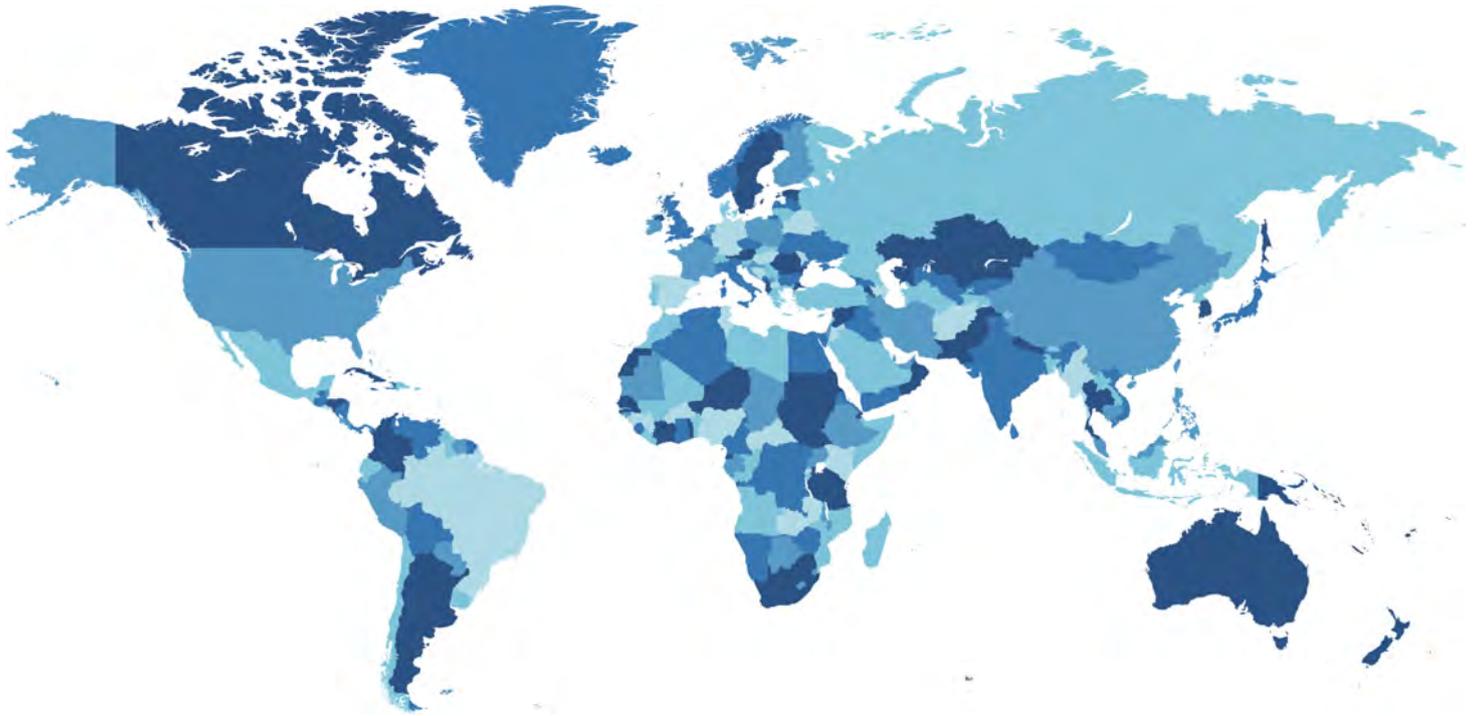


LoRa™

Connecting the Internet of Things

RF proximity

LoRa is the Trademark of LPWA Technologies with LoRaWAN being the Trademark of the LoRa Alliance.



Energy Efficient Data Connections

Everywhere we go we are surrounded by data networks that have been designed for use by mains-powered equipment or by mobile devices with relatively large batteries that need to be frequently charged. The 'Internet of Things' is rapidly gaining pace with more everyday items or 'things' needing a 24/7 cloud connection to send or receive data. Whilst existing mobile data networks like 4G or Wi-Fi can transfer data, high power requirements make these technologies unsuitable for use with small battery-powered devices or for connecting remote sensors with no backup power connections. To overcome these limitations a new energy-efficient wireless network called LoRa has been developed. Already deployed in several countries, LoRa is quickly becoming the leading enabler for the 'Internet of Things'.

LoRa by RF Proximity

Connecting the Internet of Things

What is LoRa?

LoRa is a new energy-efficient long-range wireless technology that has been developed to enable low data rate communications over long distances by sensors and other battery-powered devices. Using LoRa and the associated LoRaWAN network protocol it is possible to securely connect millions of devices to the Cloud in secure local, regional, national or worldwide networks. LoRa is quickly becoming the leading enabler of the Internet of Things.

Energy Efficient

Conventional wireless data communication technologies like Wi-Fi or 4G were developed for the high speed transfer of large amounts of data to and from the Internet. LoRa is different and has been designed to maximise energy efficiency in applications that only need to securely exchange small amounts of data with the Cloud. LoRa-enabled devices conserve energy by powering down between short data transmissions, which are sent and received at pre-set times, or in response to external events. This highly efficient method of operation enables a typical LoRa wireless module to transmit and receive data for 10 years using two penlight batteries.

Operating Range

The term LoRa stands for Long Range communication. Even with highly efficient ultra low power consumption a LoRa radio module can transmit data over 20km (line of sight) in a rural environment. In dense urban environments LoRa-enabled devices can send data over 3-5km, (depending on the antenna size and elevation). Unlike some other technologies LoRa radio signals can penetrate deep into buildings. These capabilities make LoRa the ideal technology to use with a wide range of applications - from rural livestock tracking to environmental monitoring or metering inside buildings.

Security

LoRa has been designed with data security in mind. The technology supports LoRaWAN™ - a Low Power Wide Area Network (LPWAN) specification designed for the 'Internet of Things' including applications involving critical infrastructure or confidential personal data. Security is provided through the use of spread spectrum technology supported by a unique Network key (EU164), a unique Application key (EU164) and a Device specific key (EU128). Further security is provided to prevent spoofing, flooding and man-in-the-middle network attacks.

Two-way Communications

LoRa facilitates two-way communication between a server and a connected device. For example, a LoRa-enabled door lock can automatically notify a server of any change in lock status or battery voltage but the same lock can also be remotely locked or unlocked over a LoRaWAN network.

Existing Technologies Vs LoRa: The Differences

	GSM	LoRa
Transmitter Price	> £15	< £15
Battery Life (AA)	< 1 Week	5 - 15 Years
Data Capacity	12 MB/Sec (4G+)	12 MB/Year
Range	5 - 8 km	3 - 15 km
Roaming	Worldwide	Available Mid 2016 LoRaWAN (1.1)
Localization in Network	No	Yes

LoRa Example 1: Automatic Meter Reading

Around the world utility companies are changing to remote metering as a cost-effective way to monitor network flows and individual usage. Unlike other solutions which require drive-by meter reading or specialist radio gateways our metering solution can use any LoRaWAN-compliant network to continuously monitor hundreds of thousands of LoRa-enabled meters.

This represents a significant commercial advantage over other metering technologies. RF Proximity can provide integrated end-to-end metering solutions for water, gas, electricity and heating oil.

LoRa Example 2: Environmental Monitoring

With a lengthy operational battery life and a long transmission range LoRa is the ideal technology for remote wireless sensing applications, including remote environmental monitoring. Typical applications include the remote temperature monitoring of goods in transit, monitoring the temperature of retail display units and monitoring the room temperatures of vulnerable persons in health and social care settings.

Other environmental factors including humidity, light intensity and noise levels can be monitored simultaneously, making LoRa ideal for automated Facilities Management solutions.



Water

Lighting

**Air
Pollution**

**Public
Event**

**Fire
Detector**

**Waste
Containers**

**Traffic
Control**

**Tracking
Device**

**Door
Lock**

Gas

Metering

Parking

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The benefits of LoRa solutions from RF Proximity:

Cost-effective Connectivity:

SIM-free wireless connections that cut costs and save energy.

Long-range, low-power solutions:

Over 20km range and 10 years battery life from penlight sized batteries.

High-security Cloud connections:

End-to-end network security for the Internet of Things.

Two-way Communications:

Securely send and receive data from tens of thousands of connected devices.

For more information or to arrange a demonstration please contact...

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