IOT – INTERNET OF THINGS

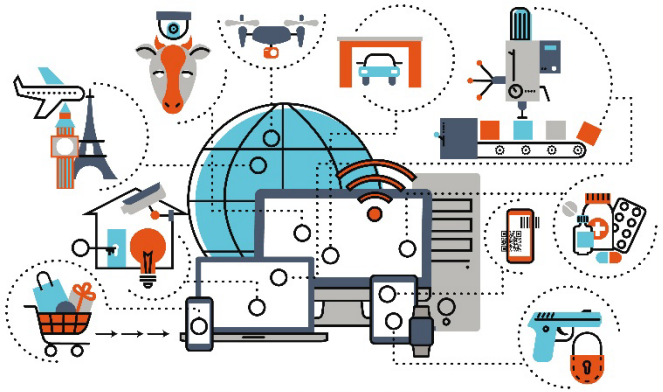
WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

IOT – INTERNET OF THINGS

General

By now, you have probably heard of Internet of Things. IoT is the name given to smart devices that are able to transmit anonymous data over a wireless network using antennas. Wireless devices are a normal part of our day, and even mundane products can have a huge impact. Items such as wireless ear buds, smart watches, and even sensors used to monitor crops and weather conditions for agriculture are part of IoT.

The increase in wireless IoT applications has forced many component manufacturers to retool some commonly used parts, including antennas, to transmit signals and data. Some devices are able to use currently available antennas, but miniaturization of devices has decreased available PCB space. This change has led to innovation in antenna technology and support services.



INTERNET OF THINGS

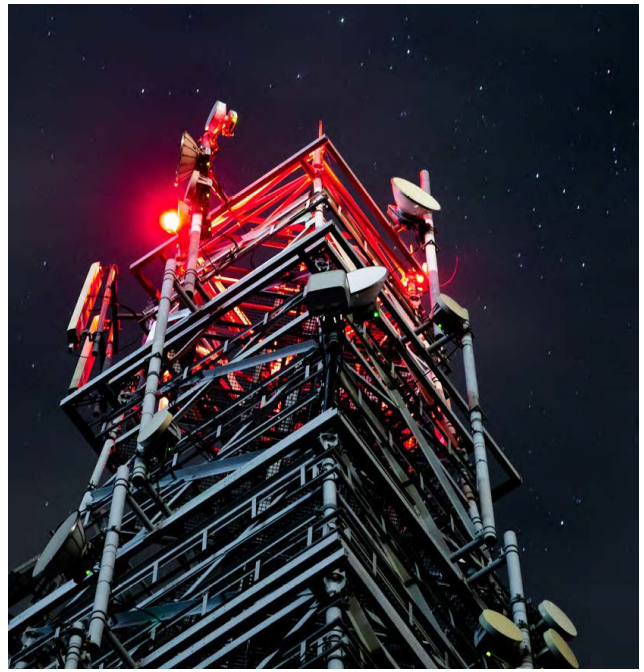
IOT – INTERNET OF THINGS

Main Purpose

The main purpose of any IoT solution is to get data from the field to the cloud where analysis of the same generates the desired value proposition for the application. With a wide range of IoT connectivity options available, the connectivity decision is increasingly based on the cost, security, coverage, power usage and the potential throughput of the connectivity. Multiple IoT connectivity options are available and at the broader level these solutions can be categorized into two types:

a) Short Range wireless connectivity solutions and
b) Long Range wireless connectivity solutions

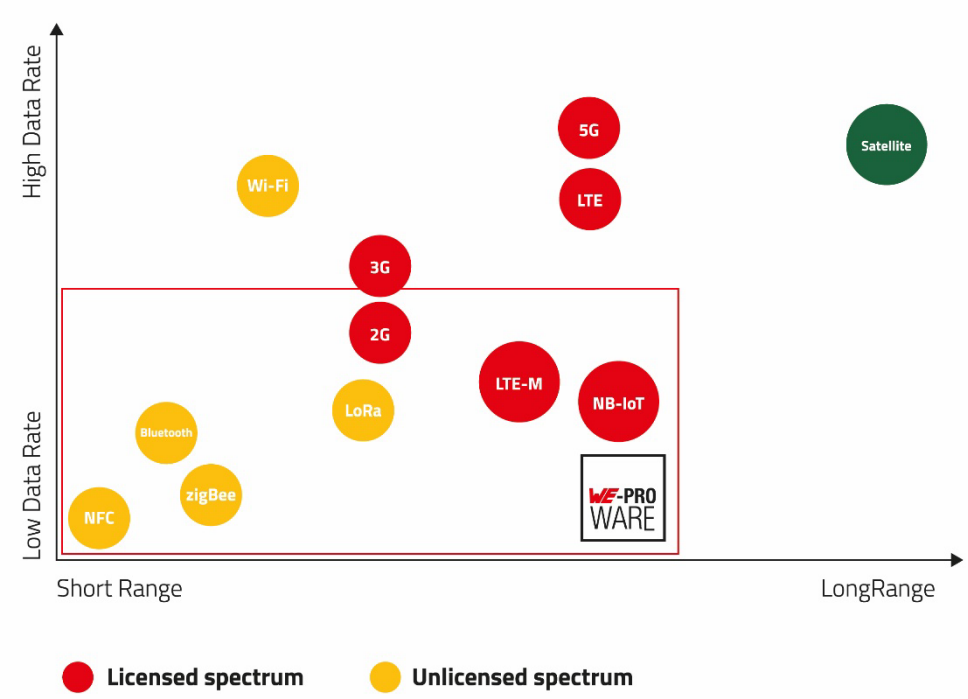
For few applications both short range and long range solutions can fit but application's ´requirements and environments determines which connectivity solution shall be used.



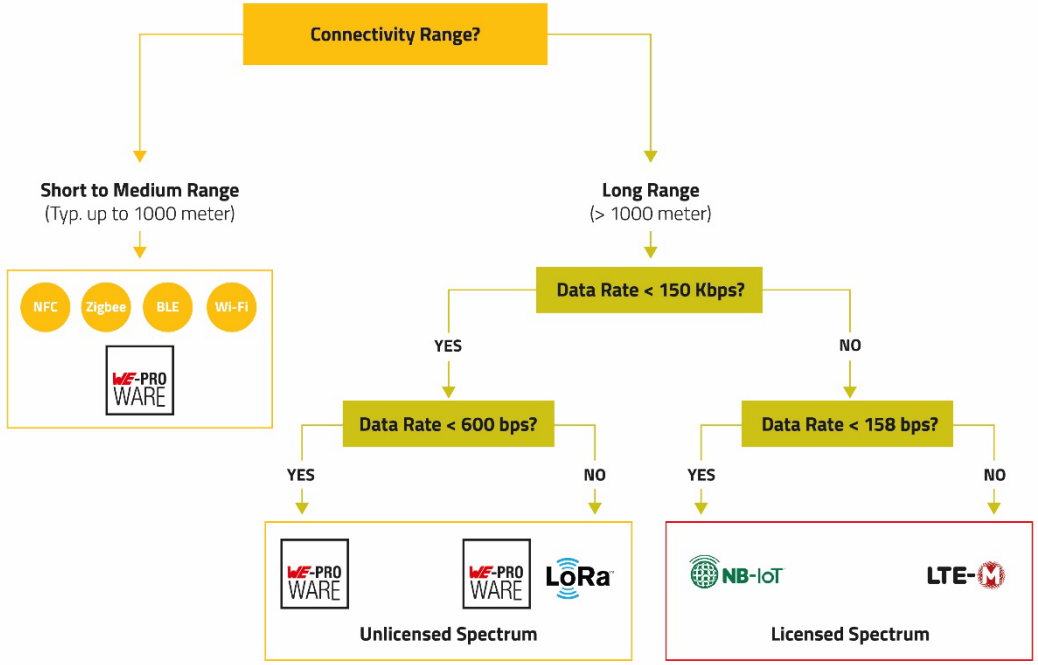
IOT – INTERNET OF THINGS

Protocols and Standards

Overview of different protocols and standards



Choice between different protocols and standards



IOT – INTERNET OF THINGS

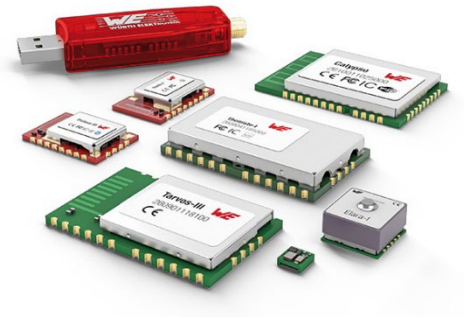
IoT and Würth Elektronik

The Internet of Things (IoT) is the ubiquitous network of physical objects/devices or "things" embedded with electronics and connectivity in order to achieve greater value and services by exchanging data with the respective manufacturers, operators or other connected devices. Various studies predict large growth rates for the Internet of Things in the coming years. Innovative wireless technologies, which are also energy-saving, make a significant contribution to this development.

Würth Elektronik eiSos provides device manufacturers with wireless technologies based on several RF standards and frequency bands, which are suitable for IoT networking. The application areas are versatile: Wearables, Connected Home, environmental monitoring, infrastructure management, manufacturing, Smart Metering, medical/healthcare systems, building automation, transportation and large scale deployments and many more.

WE Modules:

- WLAN Modules
- Bluetooth Modules
- LTE Module



ANTENNAS IN IOT

There are three general types of antennas used in IoT: wire antenna, PCB/trace antenna, and chip antenna. Each type has its pros and cons.

Common types of Antenna topologies in IoT:

Wire antenna
- Low cost
- Easy design
- Space constraints

PCB/trace antenna
- High performance
- Needs sometimes matching
- Needs RF expertise

Chip antenna
- Small size
- Easy to integrate
- Needs usually matching

Multilayer chip antennas, specifically, have been developed to address the decreased space on the PCB common in smaller IoT devices.

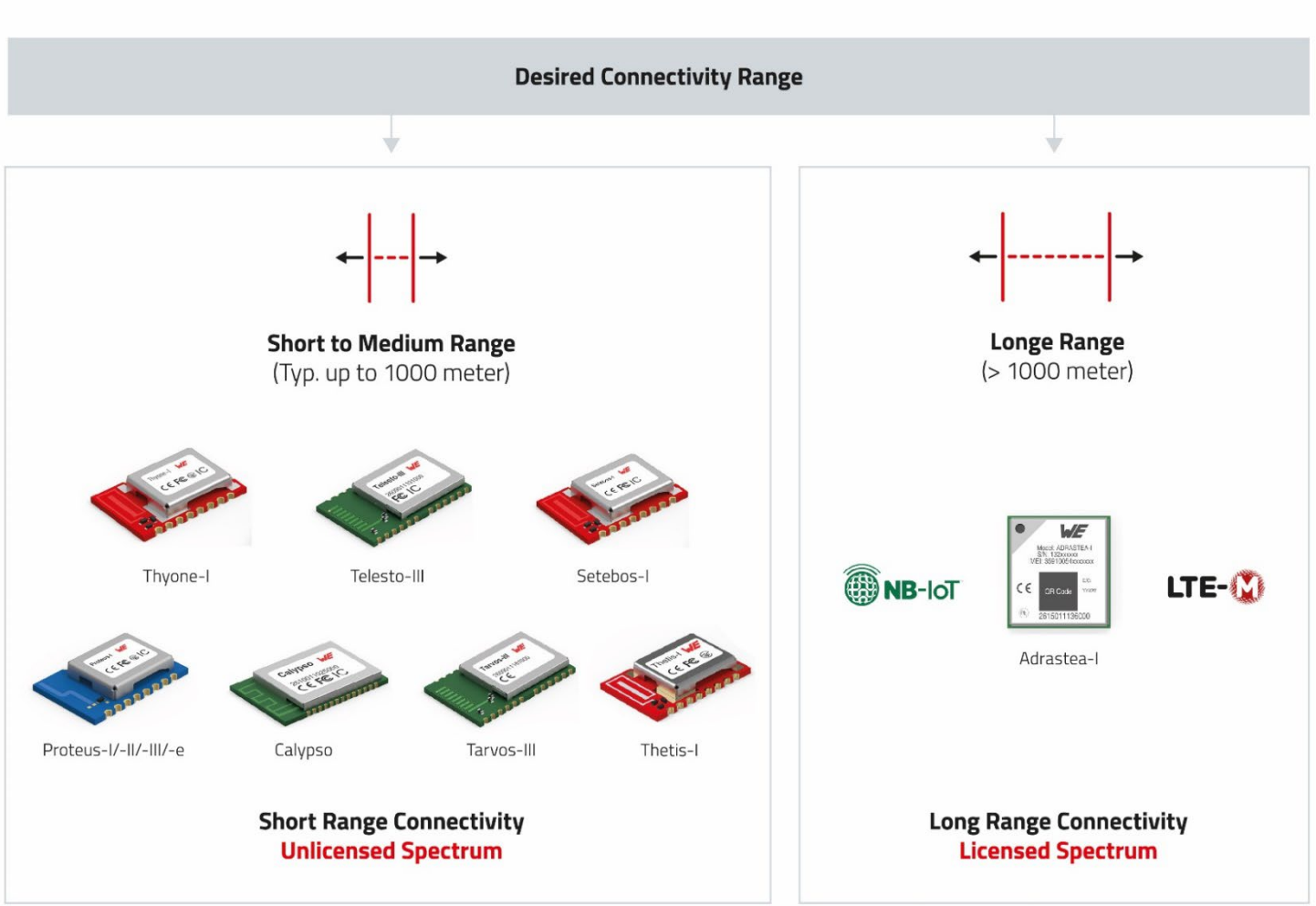
Mulitlayer chip antennas having many benefits including:

- Multilayer ceramic structure
- High permittivity ceramic mix
- Omni-directional radiation pattern
- Easy to integrate
- Low profile

For more information on multilayer chip antennas, check out our app note.

IOT – INTERNET OF THINGS

Connectivity Range



IOT – INTERNET OF THINGS

Further Information

- Wireless Connectivity & Sensors Product Guide
- Webinars:
  - Retrofitting for Industrial IoT using Wi-Fi
  - Accelerate your IoT development project with our MEMS 3-axis sensor
  - Making your industrial device IoT compatible with Wi-Fi
  - Sunset of 2G/3G: Accelerate Migration of Your Cellular IoT Products Into 5G