**LPWAN** means low power wide area network. LPWAN technology is perfectly suited for connecting devices that need to send small amounts of data over a long range, while maintaining long battery life.

power usage

|  |  |
| --- | --- |
| Wifi ,  Bluetooth | satellite  cellular |
| Bluetooth Low energy  Zigbee  Z-wave  NFC | **LPWAN** |

<10 m range kilometer range

**LPWAN spec:**

* Low power (between 5 to 10 years)
* Range in kilometers (up to 10Km)
* Low bitrate: Less than 5,000 bits per second. Often only 20-256 bytes per message are sent several times a day.
* Clever modulation
* Cheap

**LPWAN technologies:**

1. UNB
2. (NB-iot, NB-Ciot, LTE-iot)
3. Lora

|  |  |  |
| --- | --- | --- |
| **UNB** | **Cellular NB (narrowband)** | **Lora** |
| Sigfox | NB-iot | Lora Alliance |
| Telensa | NB-Ciot | LinkLabs |
| Nwave | LTE-iot |  |
| eightless |  |  |
| Investors | | |
| Texas instruments (Sigfox) | Qualcomm | ST electronics |
| Atmel (Sigfox) | Intel | Microchip |
| Samsung (Sigfox) |  |  |
| Silicon labs (Sigfox) |  |  |

Lora : is the phy layer patented by semtech and they will provide the license to others

LoraWan: is the MAC layer (lower sublayer of the Data Link Layer ) maintained by Lora Alliance fully open source