

## **LOW-POWER WIDE-AREA NETWORK (LPWA) FOR INDUSTRIAL INTERNET OF THINGS**

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IoT technology require transferring small chunks of data over great areas and this can be do through LPWA networks. Low-Power Wide-Area (LPWA) Networks is new contender that will join classic cellular and small-range wireless technologies to provide IoT devices with required connection. LPWA technology offers a great numbers of functions, that contain a wide-area connection for a low-powered and slow data transferring devices, that classic network could not handle. LPWA can be used without mobile networks and operate over unlicensed bands, including healthcare and industrial applications. LPWA non-mobile networks are cheaper and may be optimized for low-power environment and periodical transferring mode.

LPWA networks may work on big distances, unlike traditional technologies that dominate IT today: small-range wireless networks, which have a small connection radius and high power demand. Second (2G) and third generation (3G) of the mobile networks offers good range connection but drain a lot of energy while doing it. Second-generation networks slowly making way for fourth (4G) and fifth (5G) generation, mainly the fifth generation will be the main choice for communication between people, connected device and for Industry 4.0.

LPWA/LPWAN are LTE-M (eMTC, Cat-M), NB-IoT, EC-GSM-IoT. LTE-M technologies are allowing the best range and speed of connection, which can translate to 375 kBits/sec on mobile devices. NB-IoT technology offers a low power drain and relatively small 65 kBits/sec connection speed for the mobile networks. The technologies such as LoRa and Sigfox, based on proprietary protocols and devices and services that automatically record user devices, so using such third-party devices is inconvenient and requires extra material costs. The key advantages of such technologies are that they provide communication at sufficiently big distances, including the ability to build a network of M2M (machine-to-machine).

Despite the fact that today there has been a race for the introduction of fifth-generation networks, their commercial effectiveness is still in doubt compared to fourth-generation networks. This is because the cost of data transmission in new networks (5G) is higher, and the radius of service of base stations is significantly less. In next decade the stability, the standardization, the global LTE bandwidth will be solution that is more robust for the M2M, IoT and Industry 4.0.

### **References:**

1. LPWA Infographics / Access mode: <https://www.sierrawireless.com/-/media/iot/pdf/infographic/lpwa-ingraphic-2018.pdf>