

Live NB-IoT test system from Endrich on Electronica 2018

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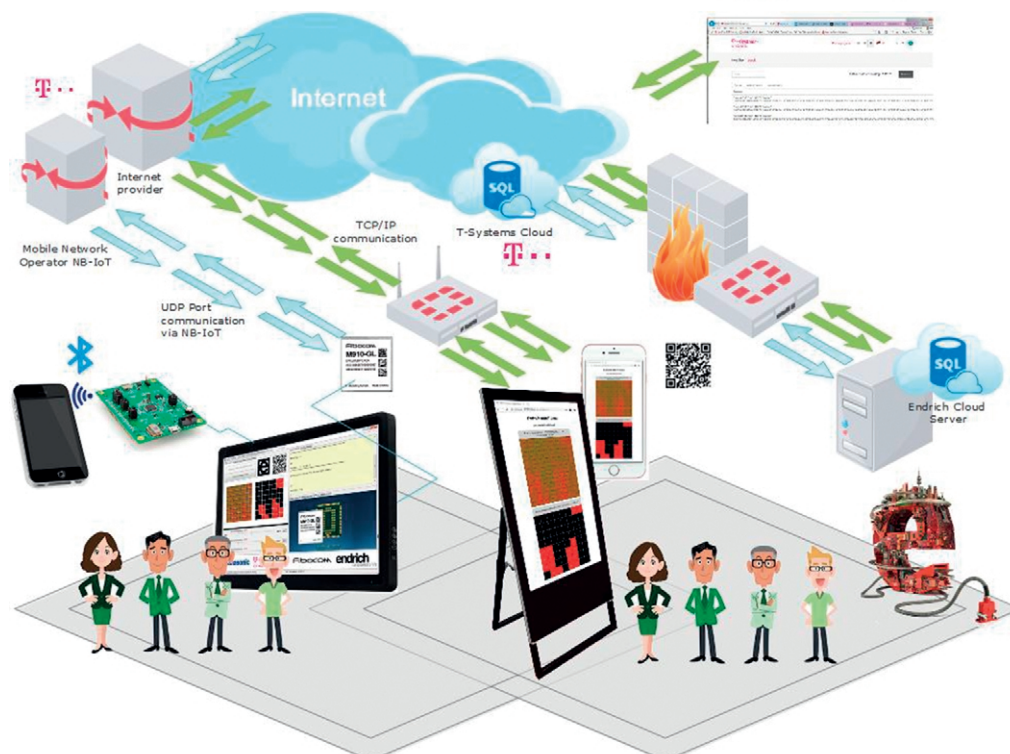
Networked objects such as smart devices contain a kind of sensor and a communication module that connects them to the Internet of Things. How can we achieve an economical, technically matching and standardized network solution – "The Right Network"?

In case of short transmission paths, local area networks such as LAN, Wi-Fi or other WLAN solutions (Bluetooth, ZigBee etc.), even near-field technologies can link devices, but for longer ranges only LoRaWAN or mobile networks can be used. When data should be routed to cloud databases and later accessed by mobile devices like laptops, tablets and cellphones, existing cellular broadband networking solutions are more convenient. However, this technology soon reaches its limits, the traditional mobile spectrum of a radio cell cannot be overloaded by adding huge numbers of new non-voice subscribers (wearables, connected cars, smart meters etc.)

Serving low data rates of usual smart devices via existing mobile broadband networks such as GPRS, UMTS or LTE would be too expensive, the expected revolution of M2M & IoT requires a solution with the optimal ratio of technical features and cost efficiency.

One of the technological answers of leading providers for low power wide area networking for the M2M communications is the narrow band IoT.

It is a new cellular standard of LPWAN radio networking technology based on existing LTE infrastructure. It offers connectivity of a mass of simple devices within a mobile cell, with a low data rate of 600 bits/s – 250 kbit/s as a compromise, developed primarily for transferring small amounts of (sensor) data occasionally, having low energy consumption.



Advantages and key selling points are **COVERAGE, BATTERY LIFE, DEVICE COST and DEEP INDOOR PENETRATION**

As cellular networks already offer very good area coverage in cities, the advantage of NB-IoT appears on field and indoor, where - due to the weaker signal-, traditional modules consume more energy. The deep indoor penetration is achieved by a higher power density, as radio transmissions are concentrated into a narrower carrier bandwidth, and also repetitions are possible in case of poor coverage at the expense of lower data rate. The small packages transferred in long intervals require minimal energy, thus offering the key feature of NB-IoT, the extreme long battery life. The broadband (GSM/3G/4G) modules utilize services like mobile voice, messaging and high-speed data transmission, which are not required when only low-speed but reliable data transfer is the requirement. Leaving out these functions make the modules cheaper and energy efficient.

In summary, there are strong market trends pointing at growing demand for NB-IoT applications, Endrich, together with its cellular module manufacturer Fibocom would like to be pioneers of this technology. To introduce how the infrastructure can be set up, the Endrich booth on Electronica 2018 will offer a working NB-IoT application:

Panasonic's state-of-the-art GridEye thermopile array sensor detects humans approaching the booth, and its 64 pixels thermal image will be transferred by Fibocom's M910-GL LTE CAT-NB1 module via T-SYSTEMS' NB-IoT network to different cloud services. One of the cloud servers is run by T-SYSTEMS, where the average temperature of the sensor pixels and the ambient temperature is stored. Endrich has also set up a cloud server, where all pixel temperatures are sent to (via UDP port) and stored in a database. The transferred thermal picture will be displayed on visitors' Internet enabled cellular phones and a huge kiosk display from one of Endrich's panel PC supplier, Faytech.

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