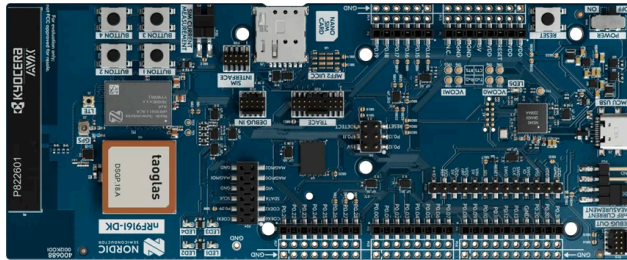
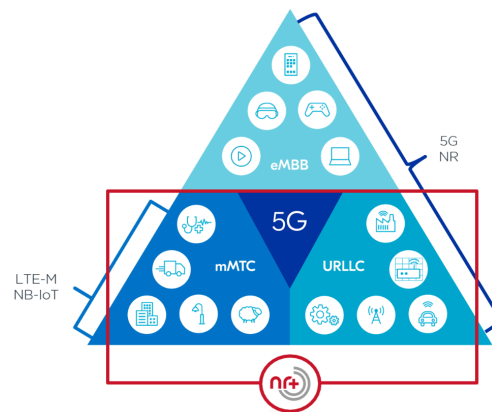


# A Study on DECT NR+ as Access Network for 3GPP 5G/6G

*Project topic adaptable for Oberseminar, Student Thesis, Bachelor, or Master/Diploma-Thesis*



**nRF9161 DK (DECT NR+ development kit)**



**The 5G triangle (IMT-2020)**

image credits: Nordic Semiconductor (left), DECT Forum (right)

## Objective of Work

DECT NR+ (New Radio Plus) is the first and only non-cellular 5G technology approved by the ITU, designed to meet the demanding requirements of industrial and enterprise communications. It brings 5G-grade performance — including ultra-reliable low-latency communication (URLLC) and massive machine-type communication (mMTC) — to private, license-exempt networks.

Built on proven cellular principles, NR+ should deliver low latency (down to 1 ms), high reliability, and flexible network topologies such as point-to-point, star, and mesh. This makes it suitable for diverse applications including industrial automation, smart metering, building management, and professional audio.

The technology emphasizes affordability, scalability, and ease of deployment, featuring self-organizing and self-healing mesh networks, automatic joining, and minimal maintenance. Operating in a dedicated spectrum below 6 GHz, it avoids interference common in ISM bands.

Technically, NR+ employs OFDM modulation, HARQ and Turbo coding for reliability, and supports IPv6 for secure, direct IP connectivity without complex gateways. With

adaptive transmission power and coexistence with classic DECT systems, DECT NR+ offers a future-proof, global standard for robust wireless communication in professional and industrial environments.

## Focus of Work

In the project work, the following tasks should be addressed:

- extensive literature research towards non-3GPP access networks
- design of a testbed to study the performance (of selected KPIs) of DECT NR+
- implementation of the testbed including integration of Nordic Semiconductor nRF9161 DECT NR+ devices
- measurement, analysis, discussion
- documentation of the work in a scientific way
- presentation of the results in a scientific way

In the project work, the following tasks can be addressed if time allows:

- integration in a 5G/6G network, including development of required features to support DECT NR+
- development of a (simple) MAC layer protocol to support multi-user access

## Material for Further Reading

- <https://www.nordicsemi.com/Products/Development-hardware/nRF9161-DK>
- <https://www.dect.org/nrplus>, see linked files below the text as well!

## Keywords

DECT NR+, 3GPP 5G/6G, measurement, literature study

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