CTHINGS.CO®
EDGE IOT SOLUTIONS

CONNECTIVITY CARD
NRF9161 M.2

Datasheet. Release 1.0

Remote monitoring of critical infrastructure with edge computing

The nRF91 Connectivity Cards from CTHINGS.CO® are extension cards based on the Nordic® Semiconductor nRF9161 SoC. They are multi-protocol chips designed to empower IoT integrators to implement DECT NR+, LTE Cat-M1/NB1/NB2 protocol stacks.

The extension card allows for full-fledged utilisation of the on-board Arm® Cortex®-M33 CPU with FPU. In addition, the ARM TrustZone® CryptoCell 310 cryptographic unit brings an extensive range of cryptography options.

The product comes with full CE class-B and RED certification and can be used to quickly and reliably add LTE or DECT NR+ protocol stack support to any existing device with an **M.2** without worrying about certification or radio performance. A full J-Trace connector is available on a programming jig for convenient firmware development.

CTHINGS.CO also provides various pre-flashing options, and tested support for Wirepas 5G Mesh firmware profile.

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SPECIFICATIONS

Hardware Features	• M.2 connector pinout compliant • Single-ended U.FL antenna connector • Based on Nordic® Semiconductor nRF9161 • 64 Mbit flash memory • Ultra-low power consumption • Arm® Cortex®-M33 processor with FPU, 64 MHz • Communicating with host device via USB interface • Compatible with CTHINGS.CO Programming Jig
Software Features	• Compatible with Wirepas Mesh 5G NR+ profile firmware (including sink) • Compatible with nRF Connect SDK
Electrical Specification	• 3.3 V nominal supply voltage (electrically mini-PCIe compliant) • 3.0 V - 3.5 V supply voltage range • ESD protected • Ultra-low power consumption
Modem features	• 3GPP LTE release 14 Cat-M1 compliant • 3GPP LTE release 14 Cat-NB1 and Cat-NB2 compliant • Power Saving Modes: DRX, eDRX, PSM • **DECT NR+** band: 1, 2, 9

RF transceiver for global coverage	• Up to 23 dBm output power
	• RX sensitivity:
	  • -108 dBm sensitivity (Cat-M1) for low band
	  • -107 dBm for mid band
	• Supports LTE bands from 700 MHz to 2.2 GHz through a single 50 Ω antenna pin

LTE band support in hardware:	• Cat-M1: B1, B2, B3, B4, B5, B8, B12, B13, B18, B19, B20, B25, B26, B28, B66, B85 • Cat-NB1/NB2: B1, B2, B3, B4, B5, B8, B12, B13, B17, B19, B20, B25, B26, B28, B65, B66, B85
Embedded Security	• ARM® TrustZone® Cryptocell 310 security subsystem • Secure boot ready • Secure erase

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SPECIFICATIONS

Certifications	The CTHINGS.CO® nRF91 M.2 Edge IoT Connectivity Card is CE Class-B, Radio Equipment Directive (RED), & EU RoHS directive compliant. US FCC and UK CA certification is planned. The device has been tested to meet the following electromagnetic compatibility standards: Electromagnetic emissions: • EN 55032:2015+A1:2020 • test method according to EN 55016-2-3:2017+A1:2019 Immunity to electromagnetic interference (EMI): • Electrostatic discharge immunity test (ESD) according to EN61000-4-2:2009 • Radiated, electromagnetic field immunity test according to EN61000-4-3:2020
Use Cases	• IoT Gateways • Workstations and Laptops • Cellular backhaul systems for non-cellular Wirepas meshes • Gateways for Nordic® Semiconductor nRF91 based IoT systems

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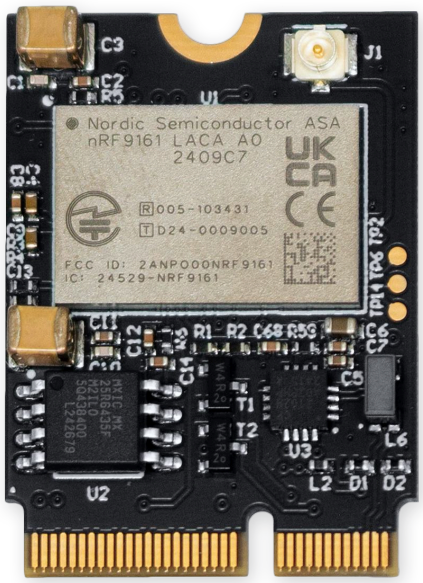
Wirepas 5G Mesh	Plug-and-play support for Wirepas 5G / NR+ profile mesh networks
Cellular LTE Network	Cat. M1, NB-IoT (Cat. NB1/NB2)
Certified Radio Equipment	Full CE Class-B & Radio Equipment Directive (RED) certification
Zephyr support	Out-of-the-box support for Zephyr RTOS
M.2 Pinout Compliance	Small and standardised form factor compliant with common hardware
Multiprotocol	LTE-M/NB-IoT, DECT NR+, Wirepas 5G Mesh,
Performant CPU	32-bit ARM Cortex-M33 CPU with floating-point unit

External appearance



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