

Four Nordic Semiconductor boards, programmed and tested by FLSEMI with our own full-function DECT NR+ (ETSI TS 103 636) firmware, so a US developer starts on a working network instead of a bare board. All four kits run the **same DECT NR+ stack** and join the **same network**: a Thingy:91 X kit can be the sink that carries every node to your cloud, and nRF9151 DK, nRF9151 SMA DK and nRF9131 EK kits can sit in that network as relays or leaves driven from your PC or MCU. Every capability below is implemented in the current source code; where something is not yet characterised, we say so.

4 kits

one stack: an enclosed, battery-powered gateway and node, and three bench boards for host integration



Mesh + star

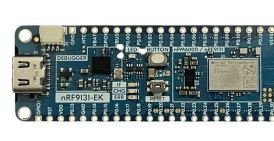
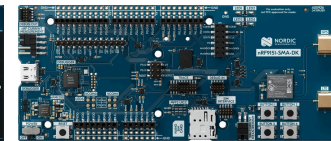
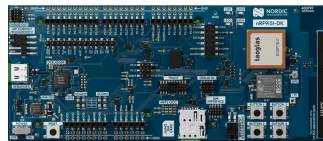
self-forming multi-hop mesh with relays, or a star with no forwarding

9 nodes · 5 hops

our reference network running on Band 9 on our bench, link security enabled

Band 9 · Band 4

1.9 GHz and 915 MHz, selected by carrier; 915 MHz not yet characterised



Thingy:91 X kit — US\$112

nRF9151 (DECT NR+) + nRF5340 (gateway, Bluetooth LE) + nRF7002 (Wi-Fi) · battery and enclosure

Roles	Sink (gateway to your PC or cloud), relay or leaf — chosen at commissioning, same image
Configure	Over USB serial or Bluetooth LE from Windows, macOS or Linux: Wi-Fi, cloud, DECT NR+ network, role, keys, sensors. No account needed. Open-source host tool (BSD-3-Clause) with a local dashboard
Bluetooth LE	A configuration window opened on the device (button or USB) that closes by itself; pairing and encryption required. The same configuration commands, a command shell over the Nordic UART Service, and firmware updates of both chips
Cloud	Wi-Fi, IPv6, ThingsBoard CoAP device API to <i>your</i> server. Each mesh node becomes its own device, created automatically; server-side commands to the network. Ships with no cloud connection
Uplink protection	Built-in WireGuard client carries the uplink through an encrypted tunnel to your own WireGuard server. Without a tunnel the CoAP uplink is plaintext
Sensors	Temperature, humidity, pressure, air quality (IAQ, eCO ₂ , bVOC), attitude and motion (IMU + magnetometer), battery and charger state; reported per node
Updates	Both chips over USB or Bluetooth LE, no debugger: the nRF5340 test-boots a new image and keeps it only once confirmed; the sink can also hand a new nRF9151 image to the nodes of the mesh over the air

DK US\$111 · SMA DK US\$138 · EK US\$72

nRF9151 or nRF9131 running the FLSEMI stack · driven by your PC or MCU

Host link	FLSEMI UART host interface (HIF-UART): framed opcode protocol with CRC-16, 1 Mbaud over the board's USB virtual serial port. The wired link to your host, not the radio data rate
Control	The whole stack as a register map: identity, role (hub, member, relay, sink), carrier, security policy, parent preference, topology
Data path	Send and receive datagrams with a delivery result per datagram; direct, routed to the sink, or routed down to a node; events and an interrupt for pending data
Visibility	Per-peer link quality, counters for every layer, boot and fault records, routing tables, a production radio test mode
In a network	Joins Thingy:91 X kits as relay or leaf; its health report (die temperature, supply) reaches the sink's cloud like any node's
Tooling	Reference Python host tool and the register-level documentation for kit holders
Updates	Firmware updates are sent to kit holders on request
nRF9151 SMA DK	Same firmware as the nRF9151 DK, with SMA antenna connectors; fit an antenna for your band
nRF9131 EK	The same host interface and register map; joins the mesh as relay or leaf, and the Embedded SDK runs in all five roles with link security enabled, verified on hardware. 1.9 GHz only: in the US, Band 9; no 915 MHz. For evaluation and demonstration; for new product designs we work with the nRF9151

Evaluation kits for developers. Not FCC-authorized end products: supplied under 47 CFR §2.803 to product developers, software developers and system integrators only. Not a certified DECT NR+ stack: the firmware has not yet been through DECT NR+ certification or formal conformance testing. US customers only. Order online at flsemi.us/dect-eval-kit: US\$12 shipping per order; usually ships within two weeks.

The DECT NR+ stack — on all four kits

Standard	FLSEMI's own implementation of ETSI TS 103 636-4 (MAC) and TS 103 636-5 (DLC and Convergence layer), with IPv6 over DECT NR+ per TS 103 874-3. Engineering runs against the ETSI test descriptions of TS 104 047-2 on our bench — not a certified test system
MAC	Fixed and portable terminations, cluster and network beacons, random access and scheduled data channels, HARQ, link adaptation, transmit power control, hand-off between parents
Topology	Point-to-point; star with no forwarding; self-forming multi-hop mesh with relays and a sink, routed uplink and downlink. A preferred parent can be set and the node falls back to any parent if it is lost
Data	Segmentation and reassembly, retransmission (ARQ), lifetime control, flow control and endpoints at the Convergence layer
Site configuration	The sink distributes a site plan over the air (TS 103 636-5 Annex C): which nodes relay and on which carrier, each node's parent, sensor reporting, security policy, IPv6 prefix and service addresses. Every node adopts it hop by hop
Bands	Band 9 (1.9 GHz, North America) and Band 4 (902–928 MHz); the carrier selects the band. Band 4 verified on air on the Thingy:91 X and the nRF9151 DK; the nRF9131 EK is Band 9 only; throughput and range at 915 MHz not yet characterised; no coverage distance is claimed
Firmware	Signed images; mesh-wide update: the sink offers a new image and each node of the same board type pulls it, installs it and serves its own children

Security — when enabled

Default	Off. A kit runs unsecured links until you install a network key
Link security	Mode 1 of TS 103 636-4: AES-CMAC integrity and AES-CTR ciphering from a 128-bit network key; integrity checked before a PDU is acted on
Policy	Unsecured associations can be refused; captured unicast traffic is refused if replayed; beacons can be ciphered so only keyed nodes can read them
Keys	Write-only on every interface; rotation to a new key without taking the network down; held in the nRF9151's secure storage, encrypted with the chip's hardware-unique key
Scope	Protects the DECT NR+ radio hops. The gateway deciphers; the WireGuard tunnel (Thingy kit) protects the gateway-to-your-server leg only. No DTLS. Not end-to-end

For IT and integration teams

Network	IPv6 only (SLAAC); outbound UDP to your ThingsBoard (CoAP) or WireGuard server; no inbound connection; no FLSEMI-hosted cloud
Interfaces	Thingy kit: SMP-based configuration over USB or Bluetooth LE (scriptable, documented), command shell over USB or Bluetooth (NUS), ThingsBoard telemetry, attributes and server-side commands. DK and EK kits: HIF-UART register map
Operations	Whole-kit settings backup and restore (secrets excluded), site snapshot of who is attached to whom, health counters for uplink, links and faults
Documents	Setup and system integration guide, command and register quick reference, host-interface specification — leave your company details at flsemi.us/downloads#sdk

What these kits are not — yet

- Not FCC-authorized end products and not certified DECT NR+; for evaluation by developers and integrators
- Bluetooth LE is reachable only inside a window opened on the device, one connection at a time
- Link security is off until you install a key; keys are installed per node, not sent over the air
- No GNSS while DECT NR+ runs: node positions are what you enter
- No throughput or range figures are stated for these kits; 915 MHz is not yet characterised
- The CoAP uplink is not encrypted by itself; use the WireGuard tunnel
- Firmware is not offered for download; updates go to kit holders on request
- Battery runtime and temperature range are not yet characterised

Engineering services**Your DECT NR+ product**

Port the stack to your nRF9151 hardware, or run it as module firmware under your host MCU

Integration

Gateway, cloud and host-interface integration with your software; site plans and commissioning for your site

Site evaluation

A complete DECT NR+ network — nodes, relays, sink and cloud — evaluated on your own site

Company**FL Semiconductor LLC (dba FLSEMI)**

Kissimmee, Florida · DECT NR+ and Bluetooth LE firmware, gateways and sensing systems, developed in the United States · Nordic Semiconductor Solution Partner

Registration

UEI KRRRZ4V2BGW9 · CAGE 11U64
NAICS 541330 (primary), 334220, 334290, 541511, 541715
Minority-owned small business

