

DECT NR+ Embedded SDK — Overview

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What it is

The DECT NR+ Embedded SDK gives you FLSEMI's DECT NR+ stack as a **prebuilt library with an embedded C API**. Your application runs on the nRF9151 itself, next to the stack. No host processor is needed.

The stack implements the ETSI DECT NR+ standard:

- the MAC layer (TS 103 636-4);
- the DLC and Convergence layers (TS 103 636-5);
- configuration distribution across the network;
- mesh routing;
- Mode 1 link security, when enabled.

What you can build

One application image can take any of five roles, chosen at run time. The SDK ships a sample application for each.

Role	Topology	What the node does
Sink	Mesh	The root of the mesh. Receives every node's routed traffic.
Relay	Mesh	Joins a parent and serves children of its own, forwarding both ways.
Leaf	Mesh	Joins a sink or a relay and sends routed traffic.
Hub (FT)	Star	Members associate with it directly; nobody forwards.
Member (PT)	Star	Talks to its hub directly.

Boards and status

Board	Status
Nordic Semiconductor nRF9151 DK	verified on hardware All five roles, with link security enabled.
Nordic Semiconductor Thingy:91 X	verified on hardware All five roles, with link security enabled. Needs an SWD debug probe; see below.
Nordic Semiconductor nRF9131 EK	verified on hardware All five roles, with link security enabled. 1.9 GHz only (no 902–928 MHz); in the US, Band 9.
LooUQ MTC.2 N9151	supported (build) Needs an SWD debug probe, such as a second nRF9151 DK or a SEGGER J-Link.

"Supported (build)" means the samples are compiled and linked for that board but have not yet been run on it.

Using the Thingy:91 X

- **An SWD debug probe is required.** Use, for example, a second nRF9151 DK as the debugger, or a SEGGER J-Link.
- **The nRF5340 needs attention first.** Your application replaces the kit's nRF9151 firmware, and the nRF9151's UART is wired to the board's nRF5340. Either restore the nRF5340 to Nordic Semiconductor's USB–UART bridge (Connectivity Bridge), or use an RTT console through the debug probe.
- **Kit features pause.** While your application runs on the nRF9151, the kit's own gateway features are unavailable: DECT NR+ configuration over USB, cloud forwarding, and nRF9151 updates over USB. Reprogramming FLSEMI's kit images

restores them.

A development cycle

1. **Install the toolchain.** Install Nordic Semiconductor's nRF Connect SDK at the version the SDK names, and a debug probe's software.
2. **Build a sample.** Pick one of the five sample applications and build it for your board.
3. **Program the board.** Flash it over SWD: the DK's on-board probe, or an external probe for the Thingy:91 X and module boards.
4. **Run two nodes.** Program a second board with the matching role, for example a sink and a leaf. Watch them associate, and watch the leaf's reports arrive, on the console.
5. **Make it yours.** Copy the sample, keep the SDK configuration it starts from, and add your own sensors, logic and threads.

The SDK checks at build time that your application uses the stack configuration the library was built with. A mismatch is reported by name, instead of failing on the air.

The API at a glance

Area	What your application does
Bring-up	Start the whole stack with one call, in the right order.
Network and role	Set the network identity and carrier, choose mesh or star, and start a role. Optionally prefer a parent.
Data	Send and receive datagrams on your own endpoints: routed to the sink, routed down to a node, or direct between neighbours. Get flow control and a delivery result per datagram.
Events	Learn when a link comes up or goes down, when a routing child appears or leaves, and when the site configuration changes.
Security	Install the network key, require secured links, cipher beacons, and rotate the key without taking the network down.
Status	Read each link's quality and protection, the node's role and parent, and counters for every layer.
Persistence	Save the provisioning so the node returns in its role after a power cycle; the key is kept in the chip's secure storage.

How to get the SDK

The SDK is provided to DECT NR+ evaluation-kit holders, together with its developer guide. It is not a download.

To request it, leave your company details at flsemi.us/downloads#sdk.

Notes.

- The HIF and the Embedded SDK are supported only on nRF91 devices and related products shipped by FLSEMI, or shipped under licence from FLSEMI.
- The SDK is a prebuilt library. Source code is not provided.
- FLSEMI's DECT NR+ firmware has not yet been through DECT NR+ certification or formal conformance testing.
- Boards running it are evaluation platforms, not FCC-authorized end products.
- In the United States, operate on Band 9 (1.9 GHz) or Band 4 (902–928 MHz) only; the nRF9131 EK supports 1.9 GHz only.
- No throughput or range figures are stated.

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