

DECT NR+ Host Interface (HIF) — Overview

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What it is

With the host interface, the Nordic Semiconductor nRF91x1 runs FLSEMI's complete DECT NR+ stack as a **module**, and your own processor drives it over a serial bus. Your host can be a microcontroller, a Linux board or a PC, in any language. It never handles radio timing: it reads and writes the module's registers, and the module reports events by itself.

If you would rather run your application on the nRF91x1 itself, the **embedded C API** reaches the same stack; a separate overview describes it.



Figure 1. Two ways to integrate the same stack

The link

Bus	Use
UART	Two wires (TX, RX), 8N1, no hardware flow control. Used by the nRF9151 DK evaluation kit, through the DK's USB serial port, and by module builds whose only exposed UART goes to the host.
SPI with an interrupt line	The module is the SPI peripheral; it raises the interrupt line when it has a response or an event. Used inside the Thingy:91 X kit, where the on-board nRF5340 is the host.

The same register map is served on either bus, so host code moves between them unchanged above the transport.

Frames



Figure 2. Request and response frames

- **Request.** A start byte, an operation (read or write), a register address, a length, the payload of a write, and a CRC-16 (CCITT) over everything after the start byte.
- **Response.** The same shape, with the read data and a status byte: zero for success, otherwise an error code that says why (busy, invalid, not supported).
- **Events.** The module pushes event frames by itself: link up and down, routing changes, received data waiting, and others. A host that cannot listen continuously can read the event queue instead.
- **Robustness.** One request is in flight at a time. A short silence resynchronises the module's parser, so a lost or corrupted byte costs one retry, not a reset.

The register map

The module looks to the host like one chip with two register blocks.

Block	What the host finds there
MAC block	Identification and capabilities; network identity, carrier and role; link security and the network key (write-only); the link table with each neighbour's quality and protection; the event queue; counters for every MAC procedure; a boot profile, so the module starts in its role at power-up without a host; radio test functions for production.

DLC / Convergence block	Topology (mesh or star); the data path: a send ring with one delivery result per message, and a receive ring with peek-then-pop reads, so a datagram is never lost between two host reads; endpoints; routing state; site configuration published at the sink and distributed across the mesh; counters for both layers.
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A typical host session

1. **Identify.** Read the identification register: it proves the link and the protocol version.
2. **Provision.** Write the network identity, the carrier and the network key, and require secured links.
3. **Start a role.** One write starts a mesh sink, relay or leaf, or a star hub or member.
4. **Wait for the link event.** Association, a new child or a new route arrives as an event frame.
5. **Exchange data.** Write a message to the send ring and read its delivery result; read received messages from the receive ring.
6. **Save (optional).** Store a boot profile, and the module rejoins in its role after every power cycle, even with no host attached.

Products that use it

Product	Bus	Status
Nordic Semiconductor nRF9151 DK evaluation kit	UART (USB serial)	in use Our reference network runs on it.
Nordic Semiconductor Thingy:91 X evaluation kit	SPI with interrupt, from the on-board nRF5340	in use The kit's gateway firmware is the host.
LooUQ MTC.2 N9151	UART	supported (build) Not yet run on the module.

What you receive

The HIF-UART specification, with every register, field and event; a register quick reference; a reference host driver in C; a one-file Python host for bench work; and ready-to-flash module images. 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.
- Link security is Mode 1 of ETSI TS 103 636-4, when enabled.
- 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. No throughput or range figures are stated.

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