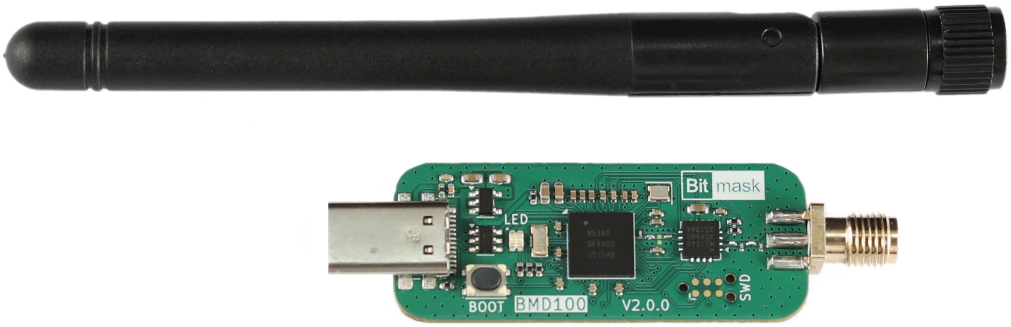
BMD100 Datasheet

Long-range wireless dongle

Datasheet · Rev. 1.0 · June 2026



KEY FEATURES

- ✓ Nordic nRF5340 SoC + nRF21540 RF front-end
- ✓ Bluetooth LE, 802.15.4, Thread, Zigbee, LE Audio & Bluetooth mesh
- ✓ Up to 4 km range in ideal outdoor conditions
- ✓ USB-C connection — plug-and-play
- ✓ Native support in nRF Connect SDK / Zephyr
- ✓ 2.4 GHz whip antenna included

OVERVIEW

The BMD100 is a long-range wireless dongle designed with LE Audio and Auracast™ applications in mind. Built around the Nordic nRF5340 SoC and the nRF21540 RF front-end, it delivers up to 4 km of range in ideal outdoor conditions.

It is intended for engineers and product teams that require a known-good wireless platform — whether for evaluating range performance, prototyping a connected product, or shipping inside a finished device.

The firmware is built on the nRF Connect SDK / Zephyr RTOS, a modern and flexible software ecosystem with frontier support for the LE Audio standard.

SOLUTIONS

Applications & use cases

LE Audio & Auracast™

Broadcast and receive LE Audio streams; build and demonstrate Auracast transmitters, receivers, and assistants over extended range.

Network Monitor

Sniff and capture Bluetooth LE and 802.15.4 traffic to debug wireless systems — inspect advertising, connection events and packet timing, with the nRF21540 front-end extending capture range across the air.

Long-range Bluetooth dongle

Flash the USB HCI firmware to turn the BMD100 into a standard Bluetooth LE controller for any host — adding the nRF21540's PA/LNA range extension to a laptop, gateway or embedded system over plain USB-C.

Matter controller

Commission and control Matter devices over Thread — use the BMD100 as a Matter controller or 802.15.4 radio co-processor for a border router, bridging smart-home nodes into your application.

ARCHITECTURE

Functional description

The BMD100 pairs the dual-core nRF5340 wireless SoC with the nRF21540 range extender on a compact USB-C board. The nRF5340's application core runs the host application and protocol stack, while its dedicated network core drives the 2.4 GHz radio. The nRF21540 front-end adds a power amplifier (PA) on transmit and a low-noise amplifier (LNA) on receive, improving link budget in both directions before the signal reaches the external SMA antenna. The device enumerates over USB-C for power, data and firmware update.

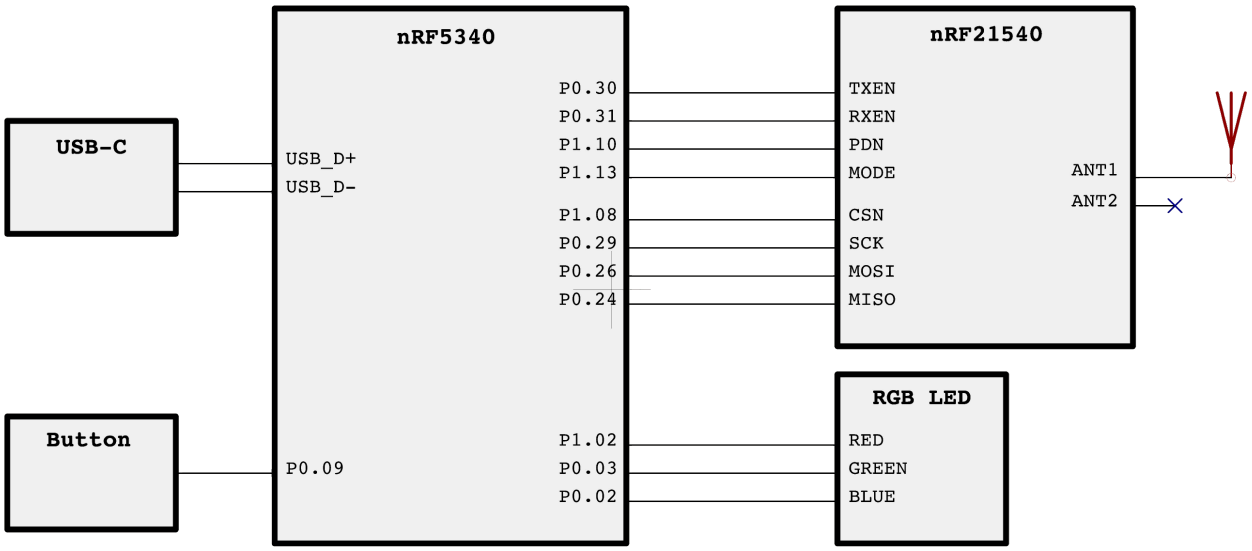


Figure 1 — BMD100 block diagram.

SPECIFICATIONS

Technical details

HARDWARE	
SoC	Nordic nRF5340 — dual-core Arm Cortex-M33
Application core	Arm Cortex-M33 @ up to 128 MHz, FPU + DSP, 1 MB flash, 512 KB RAM
Network core	Arm Cortex-M33 @ 64 MHz, 256 KB flash, 64 KB RAM
RF front-end	Nordic nRF21540 (PA / LNA range extender)
Security	Arm TrustZone, CryptoCell-312, secure key storage
Connector	USB-C
Antenna	External 2.4 GHz antenna via SMA (included)
WIRELESS & RF	
Frequency band	2.4 GHz ISM
Protocols	Bluetooth LE, 802.15.4, Thread, Zigbee, LE Audio, Bluetooth mesh
Bluetooth PHYs	1 Mbps, 2 Mbps, Coded (long range)
TX power	–20 dBm to +21 dBm
RX gain	≈ 13 dB LNA, ≈ 2.7 dB noise figure
Range	Up to 4 km (ideal outdoor, line of sight, non-audio applications)
SOFTWARE	
SDK	nRF Connect SDK / Zephyr RTOS
Libraries	Bitmask Zephyr Module
Firmware updates	USB DFU, Bluetooth LE OTA
PHYSICAL & ENVIRONMENTAL	
Dimensions	17.8 × 61.5 × 6.5 mm (excluding antenna)
Weight	5.5 g
Interface	USB-C (USB 2.0 full speed)
Supply	5 V via USB-C
Operating temperature	–20 °C to +70 °C

TX power, gain and range figures reflect the capability of the nRF5340 + nRF21540 chipset; achievable range depends on antenna, environment and regulatory power limits in the region of operation.

ORDERING

Ordering information

Order using the part numbers below. For volume pricing, custom firmware or a tailored hardware variant, contact info@bitmask.co.uk.

Ordering code	Description
`BMD100`	BMD100 dongle with 2.4 GHz whip antenna — single unit
`BMD100-NA`	BMD100 dongle, no antenna (bring your own SMA antenna)
`BMD100-T5`	BMD100 developer five-pack (5 × dongle + antenna)
`BMD100-T25`	BMD100 volume tray (25 × dongle, antennas separate)

PART NUMBER CONVENTION

`BMD100 - T5`

BMD100 Base product
Suffix *(none)* single unit with antenna · `NA` no antenna · `T5` / `T25` multi-packs

DOCUMENT

Revision history

Revision	Date	Description
1.0	June 2026	Initial release.

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