

Multi-Protocol Bluetooth LE + 802.15.4 USB-C Adapter

Powered by the Nordic nRF54LM20B

The BL54LM20B USB Adapter delivers multi-protocol Bluetooth LE 6.2 and 802.15.4 (Thread and Matter) connectivity in a compact USB-C form factor. Powered by Nordic's nRF54LM20B SoC, it provides a complete platform for development, production test, and embedded deployment — combining a 128 MHz Cortex-M33 and RISC-V co-processor, 2 MB non-volatile memory, and advanced PSA Certified Level 3 security.

Ezurio's certified BL54LM20B module (part # 453-00672) — featuring an integrated chip antenna — is embedded inside the robust USB-C adapter enclosure. Using a pre-certified module eliminates chip-level radio certification, significantly reducing customer time-to-market. Full software support is provided for Nordic nRFConnect SDK, Zephyr RTOS, and Canvas.

The BL54LM20B USB Adapter is available in two variants:

- 450-00263 — BL54LM20B, USB Adapter, **NOR Flash**
- 450-00264 — BL54LM20B, USB Adapter

The standard version (450-00264) provides the complete multi-protocol wireless platform. The NOR Flash variant (450-00263) adds an optional 64 Mbit (8 MB) NOR Flash population that unlocks capabilities not available on the standard model: MCUboot single-bank OTA firmware update, application-layer data logging and telemetry storage, extended parameter and configuration storage. The NOR Flash variant is the recommended choice for applications requiring persistent on-board storage without an external host.

The BL54LM20B USB Adapter includes an **integrated Axon NPU** not found in the BL54LM20A, unlocking on-device Edge AI, including:

- Up to 15x faster AI inferencing than running the same workload on the CPU alone
- Improved power efficiency for continuous on-device machine-learning tasks
- Real-time, offline AI/ML inference without depending on cloud connectivity



- **Bluetooth Core 6.2 Bluetooth Low Energy (LE) + 802.15.4**
 - **LE Peripheral/Central roles** — Channel Sounding, LE 2M, LE Coded, Extended Advertising
 - **802.15.4:** Thread and Matter support — multi-protocol in a single USB-C dongle
- **USB-C:** Reversible, modern-platform compatible — no adapters needed
- **Integrated NPU (Neural Processing unit)** built in Edge AI Accelerator
- **Temp Range:** Industrial Temp Rating (-40° to +85°C)
- **Robust design:** Production use ready
- **Powerful Core:** Cortex-M33 @ 128 MHz + RISC-V co-processor (2 MB NVM, 512 KB RAM)
- **Optional NOR Flash:** 64 Mbit (8 MB) for data logging and extended storage (450-00263 only)
- **Development Choice:** Nordic nRFConnect SDK, Zephyr RTOS & Canvas
- **Security:** PSA Certified Level 3 — Secure Boot, Secure Storage, Secure Update
- **FCC, ISCED, CE, UKCA, RCM, MIC, KC, Bluetooth SIG** (all pending)

Key Features



Pre-Programmed Bootloader

Integrated bootloader enables use of any Nordic nRF Connect software or utility. Jump right into development by easily flashing custom firmware images directly over the USB port.



Development Flexibility

Combination of on-module MCU and preloading a Nordic/Zephyr/Canvas application enables simultaneous central/peripheral role support for powerful hostless/hosted applications.



Global Approvals – Make Yourself at Home

Carries FCC, ISCED, EU, UKCA, RCM, MIC, KC and Bluetooth SIG approvals.



Personal Support from Design to Manufacture

Ezurio's industry-renowned support is passionate about helping you speed your design to market.



NORDIC
SEMICONDUCTOR



Zephyr™ Project



Application Areas



**Bluetooth LE / 802.15.4 -
Development and Prototyping**



Smart Building and Home Automation



Industrial IoT and Production Test



**Matter and Thread Gateway
Development**

Specifications

Category	Feature	Specification
Wireless Specification	Bluetooth®	Qualified against Bluetooth Core 6.2
	802.15.4	Thread and Matter
	Frequency	2.402 – 2.480 GHz
	Transmit Power	+8 dBm (maximum). Configurable down to -40 dBm
	Receive Sensitivity	TBC dBm (typical @ Bluetooth LE 1 Mbps) TBC dBm (typical @ Bluetooth LE 125 kbps)
	Antenna Options	Integrated chip antenna via BL54LM20B module (part # 453-00586R)
	Raw Data Rates (Air)	Bluetooth LE: 1 Mbps, 2 Mbps, 125 kbps, 500 kbps 802.15.4-2006: 250 kbps
Host Interface and Peripherals	Interface	USB-C
	NOR Flash	Dual SPI/QSPI interface 450-00263 only
	Crystal Oscillator	Integrated 32.768kHz low speed crystal
	Other	Configurable LED
Through Hole Pushbutton	Start Bootloader	Bootloader invocation on power-up
Programmability Options	Nordic SDK	https://www.nordicsemi.com/Products/Development-software/nRF-Connect-SDK
	Zephyr RTOS	www.zephyrproject.org
	Canvas SW Suite	www.ezurio.com/canvas/software-suite
	Firmware Upgrade	Via USB Bootloader (MCUboot) or direct SWD connection TagConnect for cabled firmware update and debug
Support	Operating Systems	Windows
		Mac OS
		Linux
Power	Consumption – Current	Max Peak Radio Current (@ +8 dBm TX) – TBC mA (DCDC at 3V) Max Peak Radio Current (@ 0 dBm TX) – TBC mA (DCDC at 3V)
	Supply Voltage	5.0V ±10% Powered via USB-C port
Physical	Dimensions	26.1 mm × 15.1 mm × 5.5 mm
Environmental	Temp Range	-40°C to +85°C
Miscellaneous	Lead Free	Lead-free and RoHS compliant
Development Tools	Utilities	Nordic nRFConnect Tools and Utilities
		Canvas XBit Tools
Qualifications	Bluetooth®	Complete Declaration ID (Pending)
Regulatory	Approvals	FCC, ISED, CE, UKCA, RCM, MIC, KC (Pending)

For full specifications on the BL54LM20B module on which the BL54LM20B USB Adapter is based, please see the BL54LM20B datasheet.

Ordering Information

Part	Description
450-00263	USB Adapter, BL54LM20B, (Nordic nRF54LM20B), Chip Antenna, NOR Flash
450-00264	USB Adapter, BL54LM20B, (Nordic nRF54LM20B) Chip Antenna