

PRODUCTION GRADE BTv5 ADAPTER FOR NORDIC/ZEPHYR DEVELOPMENT



Building on Laird's expertise with Nordic from the BL600 and BL652 series comes the most powerful yet - the BL654 series! It provides OEMs with the maximum design flexibility and performance. A complete multi-protocol embedded wireless offering with exceptional processing capability, all at a micro power budget.

Powered by **Nordic's nRF52840** silicon, the small form factor BL654 module with integrated antenna (part # 451-00001) is embedded inside the robust, packaged USB Adapter. The **new** BL654 USB Adapter **variant # 451-00004** enables complete flexibility to utilize the hardware with the **Nordic SDK** and **Zephyr** environments.

Note: Looking for a *smartBASIC*, virtual COM version?
Choose **Laird part # 451-00003**.

- **Bluetooth v5** Bluetooth Low Energy (BLE)
 - BLE Peripheral/Central roles with DTM embedded
 - **2 Mbps and LE Long Range:** Support for 2 Mbps, 1 Mbps, and 125 Kbps coded
- Capable of **Hostless** operation – Internal MCU reduces BOM
- **Temp Range:** Industrial Temp Rating (-40° to +85° C)
- **Robust design:** Production use ready
- **Powerful Core:** Cortex-M4F (1 MB Flash, 256 KB RAM)
- **Development Choice:** Optimized for Nordic SDK or Zephyr RTOS
- **Fully certified:** FCC, IC, CE, MIC, RCM, plus Bluetooth SIG
- **White Labelling:** Options available for OEM branding

FEATURES AT A GLANCE

**SECURE PRE-PROGRAMMED BOOTLOADER**

Integrated bootloader enables use of any Nordic nRF Connect software or utility. Jump right into development out-of-the-box yet capable of secure, signed firmware images via Public/Private key.

**DEVELOPMENT FLEXIBILITY**

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

**GLOBAL APPROVALS – MAKE YOURSELF AT HOME**

Carries several modular FCC, IC, RCM, and Bluetooth SIG approvals.

**PERSONAL SUPPORT FROM DESIGN TO MANUFACTURE**

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

APPLICATION AREAS



Beacons and Proximity Applications



Secure Medical Peripherals



Industrial Monitoring



BLE Mesh

KEY SPECIFICATIONS

Category	Feature	Specification	
Wireless Specification	Bluetooth®	v5 – Single-Mode (Peripheral and Central Roles)	
	Frequency	2.402 - 2.480 GHz	
	Transmit Power	+ 8 dBm (maximum). Configurable down to -40 dBm	
	Receive Sensitivity	-95 dBm (typical @ BLE 1 Mbps) -92 dBm (typical @ BLE 2 Mbps) -103 dBm (typical @ BLE 125 Kbps)	
	Link Budget	103 dB (@ BLE 1 Mbps), 111 db (@ BLE 125 Kbps)	
	Antenna Options	PCB Trace antenna	
	Raw Data Rates (Air)	1 Mbps, 2 Mbps, 125 Kbps	
	Host Interface and Peripherals	Interface	USB
Other		Configurable LED	
Key BLE Features	Bluetooth Low Energy	<ul style="list-style-type: none"> ▪ GATT client and GATT server – Any Adopted/Custom Services ▪ Central/Peripheral roles ▪ Anything from Nordic SDK ▪ BLE mesh ▪ CODED PHY ▪ 2M PHY 	<ul style="list-style-type: none"> ▪ LE advertising extensions ▪ LE secure connections ▪ Data packet length extensions ▪ LE privacy v1.2 ▪ LE ping ▪ Anything from Zephyr RTOS
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Programmability Options	Nordic SDK	www.nordicsemi.com	
	Zephyr RTOS	www.zephyrproject.org	
	Firmware Upgrade	Via USB/Bootloader	
Support	Operating Systems	Windows 7 and 10 Mac OSX Linux and Android	
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 by standard USB port	
Physical	Dimensions	18.39 mm x 50.74 mm x 11 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	
Qualifications	Bluetooth®	Complete Declaration ID	
Regulatory	Approvals	FCC/IC/RCM/CE/MIC	

For full specifications on BL654 module on which the BL654 USB Adapter – Nordic SDK is based, please see the BL654 datasheet.

Part #	Description
451-00004	BL654 (nRF52840) Bluetooth v5 Adapter – Nordic SDK / Zephyr