

BL654 USB Adapter – Nordic SDK/Zephyr

Bluetooth® v5 USB Adapter

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, 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 LE advertising extensions LE secure connections Data packet length extensions LE privacy v1.2 LE ping Anything from Zephyr RTOS |
| 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 |

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 |