

# BL652 Series

## Bluetooth® Smart v4.2 + NFC Module

### NEXT-GEN BLE AND NFC ON ONE MODULE



Laird's BL652 contains the latest generation silicon with Bluetooth Smart v4.2 capabilities and groundbreaking ultra-low power performance. Building on the expertise of the BL600 Series, the BL652's smaller form factor, class leading Nordic nRF52 silicon, optimized low power schemes and **smartBASIC** programming language provide a secure, stable, hostless Bluetooth environment. The BL652 introduces Bluetooth v4.2 and NFC, bringing industrial security and feature expansion to Laird's proven Bluetooth Low Energy modules. In addition, the BL652 contains Bluetooth 5 ready hardware, pending the release of the Bluetooth 5 specification. Let Laird's innovative BL652 series and decades of expertise in Bluetooth module design speed your product to market.

- **Bluetooth v4.2** Bluetooth Low Energy (BLE) plus **NFC**
- **Widest range of configurable interfaces:** UART, I2C, SPI, ADC, GPIO, PWM, FREQ, and NFC
- **Industrial Temp Rating** (-40° to +85° C)
- **Ultra-Small footprint** (1.4mm x 1.0mm x 2.1mm)
- **BLE Peripheral/Central roles** with DTM embedded
- **Major security upgrades:** AES-128, Diffie-Hellman pairing, link layer privacy
- **Hostless operation** – Internal MCU reduces BOM
- **Larger flash file systems** for data and app storage
- **Built on years of experience with Nordic** (BL600 Series BLE modules)
- **Fully featured development kit** with Arduino shield connectors, support for multiple external sensors
- **Application Design Choice:** Leverage Laird's *smartBASIC* or utilize Nordic SDK directly.

### Features at a Glance



#### TRULY HOSTLESS OPERATION FOR AUTOMATED USE CASES

On-module MCU, *smartBASIC* and simultaneous central/peripheral role support combine for a powerful hostless solution for sensor applications.



#### SPEED TO MARKET

Easily write event-driven, automated applications, no toolchain required with *smartBASIC*. Or utilize the Nordic SDK directly.



#### EXTREMELY EFFICIENT POWER MANAGEMENT

Customize to balance throughput with power usage, enabled by ultra-low power sleep mode.



#### GLOBAL APPROVALS – MAKE YOURSELF AT HOME

Carries several modular FCC, IC, CE, MIC 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



EIoT Devices and Sensors



Beacons and Proximity Applications



Secure Medical Peripherals



Industrial Monitoring

# Laird BL652 Series Bluetooth® Smart v4.2 + NFC Module

Product Brief



## Key Specifications

Category	Feature	Specification	
<b>Wireless Specification</b>	Bluetooth®	V4.2 – Single-Mode (Peripheral and Central Roles)	
	Frequency	2.402 - 2.480 GHz	
	Transmit Power	+ 4 dBm (maximum). Configurable down to -40 dBm	
	Receive Sensitivity	-96 dBm (typical)	
	Link Budget	100 dB (conducted)	
	Antenna Options	Chip antenna or IPEX MHF4 Connector	
	Raw Data Rates (Air)	1 Mbps	
<b>Host Interface and Peripherals</b>	UART Interface	TX, RX, CTS, RTS, DTR, DSR, DCD, RI possible in <i>smartBASIC</i> (GPIO) Default 115200, N, 8, 1. From 1200 bps to 1 Mbps	
	Other	GPIO (31 maximum configurable lines), I2C (1 from GPIO), SPI (1 from GPIO), ADC (8 from GPIO), PWM and FREQ (Up to 12), NFC (1 in NFC-A Listen Mode, Type 2)	
<b>Profiles</b>	Bluetooth Low Energy	GATT Client & GATT Server – Any Adopted or Custom Services	
<b>Roles</b>	Bluetooth Low Energy	Central or Peripheral Role. Programs can be loaded via UART or over the air.	
<b>Programmability</b>	<i>smartBASIC</i>	On-board BASIC programming language	
	Nordic SDK	Software / Support available from Nordic directly	
<b>Control Protocols</b>		Any that can be implemented using <i>smartBASIC</i> vSP – Virtual Serial Port for BLE	
	Bluetooth Low Energy	Max 8 connections	
<b>FW upgrade</b>		Via UART or JTAG	
<b>Supply Voltage</b>		1.8V – 3.6V	
<b>Power Consumption</b>	Current	Max Peak Radio Current (@ +4dBm TX) – 7.5mA (DCDC)	
		Standby Doze – 1.2 uA	
		Deep Sleep –0.4uA (external signal wake up)	
<b>Physical</b>	Dimensions	14mm x 10mm x 2.1mm	
<b>Environmental</b>	Temperature Range	-40°C to +85°C	
<b>Miscellaneous</b>	Lead Free	Lead-free and RoHS compliant	
	Development Kit	Development board and free software tools	
<b>Development Tools</b>	Utilities	UwTerminalX (Multi-platform) Android and iOS applications UART firmware upgrade	
	<b>Qualifications</b>	Bluetooth®	Complete Declaration ID (pending)
	<b>Approvals</b>	FCC / IC / CE / MIC	All BL652 Series (pending)

For full specifications on BL652 modules, please see the appropriate Datasheet (Hardware Integration Guide).

Part #	Description
BL652-SA	Bluetooth Smart v4.2 + NFC Module – Integrated Antenna
BL652-SC	Bluetooth Smart v4.2 + NFC Module – IPEX MHF4 Antenna Connector
DVK-BL652-SA	Development Board for BL652-SA
DVK-BL652-SC	Development Board for BL652-SC

## Did You Know?

LSR, a Laird Business, is a leader in Wireless Product Development, offering true end-to-end solutions through its array of services & technical expertise



### Design Services

- RF Hardware & Antenna Design
- Software/Firmware Development
- Mobile App / Cloud Development
- Industrial Design
- Mechanical Engineering



### EMC Testing & Certification

- On-Site FCC/IC/CE/Giteki/RCM EMC Certification
- Wireless & Antenna Testing
- EMC Emissions Testing
- International Testing Services

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For documentation, software, sample apps and more visit:  
<http://www.lairdtech.com/products/BL652-BLE-Module>