SECURE BLUETOOTH LE MODULES FOR BATTERY-POWERED IOT DEVICES

The newest addition to Laird Connectivity's extensive Bluetooth Low Energy product range is the **Lyra Series**, based on Silicon Labs **EFR32BG22 SoC**. This range of flexible modules marries all the benefits of Silicon Labs hardware, software, and tools offerings with Laird Connectivity's added value application software, services, certification, and support capabilities. This seamless partnership provides customers with multiple software development options suited to their resources and skillsets in Bluetooth LE-enabled product development.

The Lyra Series includes small form factor PCB modules, as well as ultra-compact SIP options, to suit any host board footprint. Together, Silicon Labs and Laird Connectivity, will drive down your total cost of ownership, design complexity and risk, whilst ensuring you the fastest time to market for your next Bluetooth LE-enabled IoT design.

- **Bluetooth v5.3** Bluetooth Low Energy
- **Widest range of MCU peripherals**: UART, I^{2}C, SPI, ADC, GPIO, PWM, PDM, Counter, Timer, Watchdog, PRS
- **Bluetooth Low Energy**
  - Support - Peripheral/Central roles
  - Support for 2 Mbps, 1 Mbps, and 125 kbps coded
  - Support for AoA / AoD, Bluetooth LE Mesh (C code path only)

- Based on **Silicon Labs EFR32BG22C224F512IM40** chipset
- **Extended** Industrial **Temp Rating** (-40° to +105 °C)
- **Hostless & Hosted operation** – Internal MCU reduces BOM
- **Powerful Core** Cortex-M33
  - 512 kB Flash
  - 32 k RAM
- **Fully featured development kits -** Everything needed to start Bluetooth LE development

1 Choose Your Hardware

LYRA P -
PCB MODULE
- +8 dBm Output Power
- 12.9 x 15.0 x 2.2 mm
- Integrated Antenna

LYRA S -
SIP MODULE
- +6 dBm Output Power
- 6 x 6 x 1.1 mm
- Integrated antenna OR external via pinout
- Pre certified range of antennas

2 Three Firmware Options

AT Command Set – fully featured and extensible to suit any developer's needs

- Proven over 5+ years
- Basic Bluetooth LE cable replacement
- Simplest implementation possible
- Includes all key features of Wireless Xpress and more

Wireless Xpress – Frozen at current release, path for existing Silicon Labs customers

- Basic Bluetooth LE cable replacement
- Secure FOTA capable FW
- Xpress command API for iOS & Android

C Code – Full software development with Silicon Labs SDK and Toolchain

- Native C code development
- Use Simplicity Studio IDE
- Full functionality of Silicon Labs HW / SW

3 Laird Connectivity - Value-Added Support & Services

- Technical and application support for ALL available firmware options
- Continuous development of AT Command Set – extensible for new features and customer requests
- Multiple range of internal antennas, pre certified for all certification regions for Lyra S module.
- Full Service options available – Antenna, Engineering & Certification Services to support your project

FEATURES AT A GLANCE

SOFTWARE FLEXIBILITY
Choose from a simple extensible AT Command set, Silicon Labs' Wireless Xpress framework, or full software access for C code with Simplicity Studio

TRUE INDUSTRIAL OPERATING RANGE
Designed and certified to the highest industrial temperature range of -40 ºC to +105 ºC for every component utilized.

GLOBAL APPROVALS – MAKE YOURSELF AT HOME
Carries several modular FCC, ISED, EU, UKCA, MIC, KC, and Bluetooth SIG approvals.

LOW POWER OPERATION FOR BATTERY POWERED IOT
Intelligent power schemes, deep sleep mode, and low power consumption leads to long-performing IoT solutions even on a battery

SECURITY FEATURES ON EFR32BG22
Secure Boot, ARM Trustzone, Hardware Cryptographic Acceleration

PERSONAL SUPPORT FROM DESIGN TO MANUFACTURE
Our industry-renowned support is passionate about helping you speed your design to market.

APPLICATION AREAS

Professional Lighting

Asset Tags and Beacons

Secure Medical Peripherals

Industrial IoT Sensors

Specifications

Category	Feature	Specification	
Hardware	System-on-Chip	Silicon Labs EFR32BG22 SoC / High-performance 32-bit ARM Cortex-M33® with DSP instruction and floating-point unit	
	Memory	512 kB Flash, 32 kB RAM	
Wireless	Bluetooth	Bluetooth Low Energy (Bluetooth 5.3), Bluetooth Mesh Low Power Node	
	Frequency	2.4 GHz Radio	
	Tx Power	**Lyra P**: Up to +8 dBm;	**Lyra S**: Up to +6 dBm
	Power Consumption	**Lyra P** • 4.3 mA RX current at 1 Mbps GFSK • 4.8 mA TX current at 0 dBm output power • 1.40 µA EM2 DeepSleep current (RTCC running from LFXO, Full RAM retention)	**Lyra S** • 4.2 mA RX current at 1 Mbps GFSK • 4.6 mA TX current at 0 dBm output power • 1.40 µA EM2 DeepSleep current (RTCC running from LFXO, Full RAM retention)
Antenna	Options	**Lyra P**: Integrated antenna	**Lyra S:** Integrated antenna OR external via trace pin
Interfaces	Debugging	Embedded Trace Macrocell	
	Other	• Analog to Digital Converter (ADC) - 12-bit @ 1 Msps, 16-bit @ 76.9 ksps • 25 GPIO w/ output state retention and asynchronous interrupts • 8 Channel DMA Controller • 12 Channel Peripheral Reflex System (PRS) • Digital microphone interface (PDM)	• Timers: 4 × 16-bit Timer, 1 × 32-bit Timer, 32-bit Real Time Counter, 24-bit Low Energy Timer for waveform generation, 1 × Watchdog Timer • 2 × UART, 1 × EUART • 2 × I2C interface with SMBus support • RFSENSE with selective OOK mode
Programming		AT Commands, Silicon Labs Wireless Xpress, or Simplicity Studio	
FW Upgrade		FW upgrade out of the box over UART and JLink via SWD	
Supply Voltage		1.8 to 3.8 V	
Physical	Dimensions	**Lyra P**: 12.9 x 15.0 x 2.2 mm	**Lyra S:** 6 x 6 x 1.1 mm
Environmental	Temp Range	-40 to +105 °C	
Security		**Secure Boot** with Root of Trust and Secure Loader (RTSL); ARM® TrustZone®; **Hardware Cryptographic Acceleration** for AES128/256, SHA-1, SHA-2 (up to 256-bit), ECC (up to 256-bit), ECDSA, and ECDH; **True Random Number Generator** (TRNG) compliant with NIST SP800-90 and AIS-31; **Secure Debug** with lock/unlock	
Regulatory	Certifications	FCC, EU, UKCA, ISED, MIC, KC	

For full specifications on Lyra modules, please see the appropriate datasheet.

ORDERING INFORMATION

Part	Description
453-00090R	Lyra Series - Bluetooth v5.3 PCB Module with integrated antenna (Silicon Labs EFR32BG22) - Tape / Reel
453-00091R	Lyra Series - Bluetooth v5.3 SIP Module with various antenna options (Silicon Labs EFR32BG22) - Tape / Reel
453-00090C	Lyra Series - Bluetooth v5.3 PCB Module with integrated antenna (Silicon Labs EFR32BG22) – Cut / Tape
453-00091C	Lyra Series - Bluetooth v5.3 SIP Module with various antenna options (Silicon Labs EFR32BG22) – Cut / Tape
453-00090-K1	Lyra Series - Development Kit - Bluetooth v5.3 PCB Module with integrated antenna
453-00091-K1	Lyra Series - Development Kit - Bluetooth v5.3 SIP Module with various antenna options