

### NEXT GENERATION BLUETOOTH LE PORTFOLIO FOR YOUR IOT DEVICES



The latest addition to Laird Connectivity's extensive Bluetooth Low Energy (BLE) product range is the **Lyra 24 Series**, based on Silicon Labs **EFR32BG24 SoC**. This range of flexible modules, adapters and DVKs 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 continues to provide customers with multiple software development options suited to their resources and skillsets in Bluetooth LE-enabled product development.

The Lyra 24 Series includes multiple small form factor PCB modules, as well as ultra-compact SIP options, to suit any host board footprint. These module options are accompanied by low cost, easy to use development kits and the addition of a certified, packaged USB Adapter to add Bluetooth LE connectivity to a plethora of additional products in your application set. 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<sup>2</sup>C, SPI, ADC, GPIO, PWM, 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 EFR32BG24** chipset
- **Extended Industrial Temp Rating** (-40° to +105 °C)
- **Hostless & Hosted operation** – Internal MCU reduces BOM
- **Powerful Core Cortex-M33**
  - 1,536 kB Flash
  - 256 k RAM
- **Fully featured development kits** - Everything needed to start Bluetooth LE development

## 1 Choose Your Hardware



### LYRA 24P - PCB MODULE

- Upto +10 dBm Output Power
- 12.9 x 15.0 x 2.15 mm
- Integrated Antenna



### LYRA 24P - PCB MODULE

- Upto +20 dBm Output Power
- 12.9 x 15.0 x 2.15 mm
- Integrated Antenna  
Or RF Trace Pad



### LYRA 24S - SIP MODULE

- Upto +10 dBm Output Power
- 7 x 7 x 1.18 mm
- Integrated antenna OR external via pinout
- Pre certified range of antennas

### LYRA 24P – USB ADAPTER

- Upto +20 dBm Output Power
- Integrated antenna
- Ready to add to any PC, laptop or any embedded device with a virtual COM port

## 2 Two 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



**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 24S 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 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 °C to +105 °C for every component utilized.



### GLOBAL APPROVALS – MAKE YOURSELF AT HOME

Carries several modular FCC, ISED, EU, UKCA, MIC, KC, RCM and BT 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 EFR32BG24

Secure Boot, ARM Trustzone, Hardware Cryptographic Acceleration & more!



### 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 EFR32BG24 SoC / High-performance 32-bit ARM Cortex-M33® with DSP instruction and floating-point unit
	Memory	1536 kB Flash, 256 kB RAM
Wireless	Bluetooth	Bluetooth Low Energy (Bluetooth 5.3), Bluetooth Mesh
	Frequency	2.4 GHz Radio
	Tx Power	<b>Option 1 – Lyra 24P:</b> Up to +10dBm; <b>Lyra 24S:</b> Up to +10 dBm <b>Option 2 – Lyra 24P</b> Up to +20 dBm;
	RX Sensitivity	-98.5dBm (0.1% PER) BLE 1Mbps -95.7dBm (0.1% PER) BLE 2Mbps -102.2dBm (0.1% PER) BLE 500kbps coded PHY -106.5dBm (0.1% PER) BLE 125kps coded PHY -97.0dBm (0.1% PER) BLE 1Mbps -94.3dBm (0.1% PER) BLE 2Mbps -100.7dBm (0.1% PER) BLE 500kbps coded PHY -105.1dBm (0.1% PER) BLE 125kps coded PHY
	Power Consumption	<b>Lyra 24P (+10dBm variant)</b> <ul style="list-style-type: none"> <li>33.4uA/MHz in active mode (EM0) at 39MHz</li> <li>4.5 mA RX current at 1 Mbps GFSK</li> <li>4.8 mA TX current at 0 dBm output power</li> <li>18.8 mA TX current at 10 dBm output power</li> <li>1.30 µA EM2 DeepSleep current (RTCC running from LFRCO, 16kB RAM retention)</li> </ul> <b>Lyra 24S</b> <ul style="list-style-type: none"> <li>33.4uA/MHz in active mode (EM0) at 39MHz</li> <li>5.1 mA RX current at 1 Mbps GFSK</li> <li>4.6 mA TX current at 0 dBm output power</li> <li>23.4 mA TX current at 10 dBm output power</li> <li>1.30 µA EM2 DeepSleep current (RTCC running from LFRCO, 16kB RAM retention)</li> </ul>
Antenna	Options	<b>Lyra 24P:</b> 10dBm Integrated antenna <b>Lyra 24P:</b> 20dBm Integrated <b>OR</b> External antenna (via RF trace pin) <b>Lyra 24S:</b> Integrated antenna OR external via RF trace pin
	GPIO	<ul style="list-style-type: none"> <li>Up to 26 GPIO with output state retention and asynchronous interrupts</li> <li>Up to 32 GPIO with output state retention and asynchronous interrupts</li> </ul>
	Other	<ul style="list-style-type: none"> <li>Analog to Digital Converter (ADC) - 12-bit @ 1 Msps, 16-bit @ 76.9 kcps</li> <li>8 Channel DMA Controller</li> <li>16 Channel Peripheral Reflex System (PRS)</li> <li>Optional 32.768kHz crystal support</li> <li>Timers: 3 × 16-bit Timer, 2 × 32-bit Timer, 2 × 32-bit Real Time Counter, 24-bit Low Energy Timer for waveform generation, 2 × Watchdog Timer</li> <li>1 × UART, 2 × EUART</li> <li>2 × I2C interface with SMBus support</li> </ul>
Interfaces	Debugging	Embedded Trace Macrocell
Programming		AT Commands 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 <b>Note:</b> To achieve +20 dBm for Lyra 24P, 3.3 V minimum required
Physical	Dimensions	<b>Lyra 24P:</b> 12.9 x 15.0 x 2.15 mm <b>Lyra 24S:</b> 7 x 7 x 1.18 mm
Environmental	Temp Range	-40 to +105 °C
Security		<b>Secure Boot</b> with Root of Trust and Secure Loader (RTSL); ARM® TrustZone®; <b>Hardware Cryptographic Acceleration</b> for AES128/256, SHA-1, SHA-2 (up to 256-bit), ECC (up to 256-bit), ECDSA, and ECDH; <b>True Random Number Generator</b> (TRNG) compliant with NIST SP800-90 and AIS-31; <b>Secure Debug</b> with lock/unlock
Regulatory	Certifications	FCC, EU, UKCA, ISED, RCM, MIC, KC, Bluetooth SIG

For full specifications on Lyra 24 modules, please see the appropriate datasheet.

## ORDERING INFORMATION

Part	Description
453-00142R	Lyra 24P - Bluetooth v5.3 PCB Module (10dBm) with integrated antenna (Silicon Labs EFR32BG24) - Tape / Reel
453-00142C	Lyra 24P - Bluetooth v5.3 PCB Module (10dBm) with integrated antenna (Silicon Labs EFR32BG24) – Cut / Tape
453-00145R	Lyra 24P - Bluetooth v5.3 PCB Module (20dBm) with integrated antenna (Silicon Labs EFR32BG24) - Tape / Reel
453-00145C	Lyra 24P - Bluetooth v5.3 PCB Module (20dBm) with integrated antenna (Silicon Labs EFR32BG24) – Cut / Tape
453-00148R	Lyra 24P - Bluetooth v5.3 PCB Module (20dBm) with RF Trace Pad (Silicon Labs EFR32BG24) - Tape / Reel
453-00148C	Lyra 24P - Bluetooth v5.3 PCB Module (20dBm) with RF Trace Pad (Silicon Labs EFR32BG24) – Cut / Tape
453-00170R	Lyra 24S - Bluetooth v5.3 SIP Module with various antenna options (Silicon Labs EFR32BG24) - Tape / Reel
453-00170C	Lyra 24S - Bluetooth v5.3 SIP Module with various antenna options (Silicon Labs EFR32BG24) – Cut / Tape
453-00142-K1	Lyra 24P - Development Kit - Bluetooth v5.3 PCB Module (10dBm) with integrated antenna
453-00145-K1	Lyra 24P - Development Kit - Bluetooth v5.3 PCB Module (20dBm) with integrated antenna
453-00148-K1	Lyra 14P - Development Kit - Bluetooth v5.3 PCB Module (20dBm) with RF Trace Pad
453-00170-K1	Lyra 24S - Development Kit - Bluetooth v5.3 SIP Module with various antenna options
450-00184	Lyra 24P - Bluetooth v5.3 USB Adapter (20dBm) with integrated antenna (Silicon Labs EFR32BG24)