Proprietary Wireless Technologies

Silicon Labs Proprietary Wireless Protocols for Sub-GHz and 2.4 GHz

Silicon Labs is a leading expert in proprietary wireless networks. Silicon Labs' extensive portfolio of Wireless SoC solutions and RF transceivers offers excellent link budgets up to 148 dBm for long-range connectivity, industry-leading integrated +20 dBm power amplifiers (PA), and fully featured radio configuration software and networking stacks. EFR32FG series of wireless solutions combine an energy-friendly microcontroller (MCU) with a highly integrated radio transceiver supporting sub-GHz (110 MHz – 920 MHz) and 2.4 GHz proprietary wireless protocols. EFR32FG series provides industry-leading energy efficiency, ultra-fast wakeup times, a scalable power amplifier, an integrated 2.4 GHz balun and extensive MCU features.

EFR32FG12 SoC Key Features (Series 1)
(110 MHz - 970 MHz and 2.4 GHz)

- 32-bit ARM® Cortex®-M4 core with 40 MHz
- Up to 1 MB of flash and 256 kB of RAM
- Autonomous Hardware Crypto Accelerator
- Integrated PA with up to 19 dBm (2.4 GHz) or 20Bm (Sub-GHz) TX power
- Integrated balun for 2.4 GHz
- Antenna Diversity
- Robust peripheral set and up to 65 GPIO

Supported Modulation Formats
- 2/4 (G)FSK with fully configurable shaping
- BPSK / DBPSK TX; OOK / ASK; Shaped OQPSK/(G)MSK Configurable DSSS and FEC

Supported Protocols
- Proprietary Protocols
- Wi-SUN; Wireless M-Bus.
  Selected IEEE 802.15.4g; SUN-FSK PHYs; LPWAN

EFR32FG23 SoC Key Features (Series 2)
(110 MHz - 970 MHz)

- 32-bit ARM® Cortex®-M33 core with 78 MHz max
- Up to 512 kB of flash and 64 kB of RAM
- Integrated PA with up to 20 dBm (Sub GHz) TX power
- Analog to Digital Converter (ADC) - 12-bit; 16-bit
- Highest Rx sensitivity -110.7 dBm sensitivity @ 100 kbps 433 MHz
- Lowest Rx current- 3.7 mA RX current at 868 MHz
- Lowest EM2 Deep Sleep current - 1.2 µA

Supported Modulation Formats
- 2/4 (G)FSK with fully configurable shaping
- OQPSK DSSS; (G)MSK; OOK.
- Secure Vault™ (highest level of IoT security) which includes PSA3, TRNG

Supported Protocols
- Proprietary Protocols
- CONNECT; Wi-SUN; WM-BUS

Proprietary Wireless Development Kits, Software, and Tools

EFR32FG23 868–915 MHz +14 dBm Development Kit

The EFR32FG23 development board is a compact feature packed development platform. It provides the fastest path to develop and prototype sub-GHz IoT products. The development platform includes support for the FG23's onboard segment LCD controller and other key features including LESENSE and pulse counter.

EFR32FG 915 MHz 2.4 GHz and Sub-GHz Starter Kit

Starter Kit is enabled through the Silicon Labs Flex SDK which contains the Connect Stack and the Radio Abstraction Interface Layer (RAIL) to simplify proprietary wireless protocol development. Modular design supports different radio boards. Supports AEM (Advanced Energy Monitor) for battery measurement and Energy Profiler
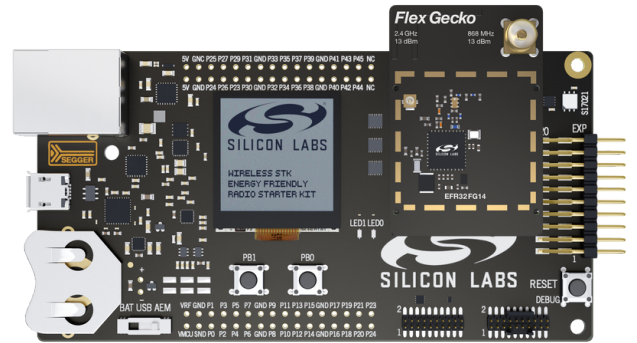
Proprietary Wireless Applications

- Home automation and security
- Garage door openers
- Public infrastructure
- Smart Meters
- Agriculture
- Asset tracking
- Electronic shelf labels (ESL)

Software and Tools - Proprietary Wireless Development

The **Flex SDK** is a complete software development suite for proprietary wireless applications that provides two paths for development. The first path begins with Silicon Labs **RAIL** (Radio Abstraction Interface Layer), which is an intuitive and easily customizable radio interface layer designed to support proprietary or standards-based wireless protocols. The second path uses **Silicon Labs Connect**, an IEEE 802.15.4-based networking stack designed for creating easily customizable broad-based proprietary wireless networking solutions optimized for devices that require low power consumption for both sub-GHz and 2.4 GHz frequency bands and targeted for simple network topologies.

The **Simplicity Studio** IDE includes a powerful suite of tools for energy profiling, Radio configurator, and wireless network analysis, as well as demos, software examples, documentation, technical support, and community forums.

FLEX SDK