Outline

- **800 Series Overview – 15min**
  - SoC & Module
  - New features
  - Secure Vault
- **Getting Started with Z-Wave 800**
  - Z-Wave 800 Series available Radio Board & Pro Kit
  - Simplicity Studio SLC Overview
- **ZWAVE-PK800A Dev Kit Unboxing and Demonstration – 30min (recorded)**
  - What's in the box
  - Simplicity Studio v5
  - Bootloader & SerialAPI
  - Build a DoorLockKeyPad Z-Wave Long Range
  - PC Controller (PCC) and Zniffer
  - Inclusion & keys
- **References**
- **Questions and Answers – 15min**

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800 Series Overview

SoC: EFR32ZG23
Module: ZGM230S

The Z-Wave 800 IoT Solution

Z-Wave Certified Application

- Application Framework
- S2 Security with SmartStart
- Mesh Routing | LR Network
- Mesh Network | LR Network
- MESH MAC | LR MAC
- MESH PHYs | LR PHYs
- EFR32 Platform: RAIL | Gecko bootloader | NVM3

HARDWARE

- **SoCs & SiP Modules**
- **Supports all Z-Wave frequencies**
- **Mesh & Long Range**
- **Z-Wave & Proprietary support**

STACK

- **Based on open specification**
- **Complete solution - PHY to App**
- **Controller reference design**
- **SecureVault integration**

CERTIFICATION

- **Ensures interoperability & backwards compatibility**
- **Z-Wave LR certification is part of Z-Wave Plus V2**
- **Certification is mandatory for all products**

DEVELOPMENT TOOLS

- **Packet sniffer & analyzer**
- **Energy Profiler**
- **Network controller**
- **Installation & maintenance tool**

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Introducing ZG23 and ZGM230S

Low Power Long Range Secure

Sub-GHz Wireless Optimized for Smart Home, Hospitality & MDU

High Performance Radio

Up to +20 dBm TX (SoC)
Up to +14 dBm TX (SiP)
-109.8 dBm RX @ 100 kbps O-QPSK
-110 dBm RX @ 40 kbps FKS

Low Power

9.8 mA TX @ 0 dBm
25.0mA TX @ +14 dBm
4.0 mA RX (GFSK)
26 µA/MHz
1.2 µA EM2 with 16 kB RAM

World Class Software

Z-Wave Mesh
Long Range
Proprietary (SoC)

Certifications

Z-Wave (SoC and SiP)
FCC/IC/CE/MIC (SiP Test Reports)

ARM® Cortex®-M33 with TrustZone®

78 MHz (FPU and DSP)
512kB of flash
64kB of RAM

Security

Supports Z-Wave S2
Secure Vault™ – Mid/High

Low-power Peripherals

EUSART, USART, I2C
16-bit ADC, 12-bit VDAC, ACMP
20 x 4 LCD Controller
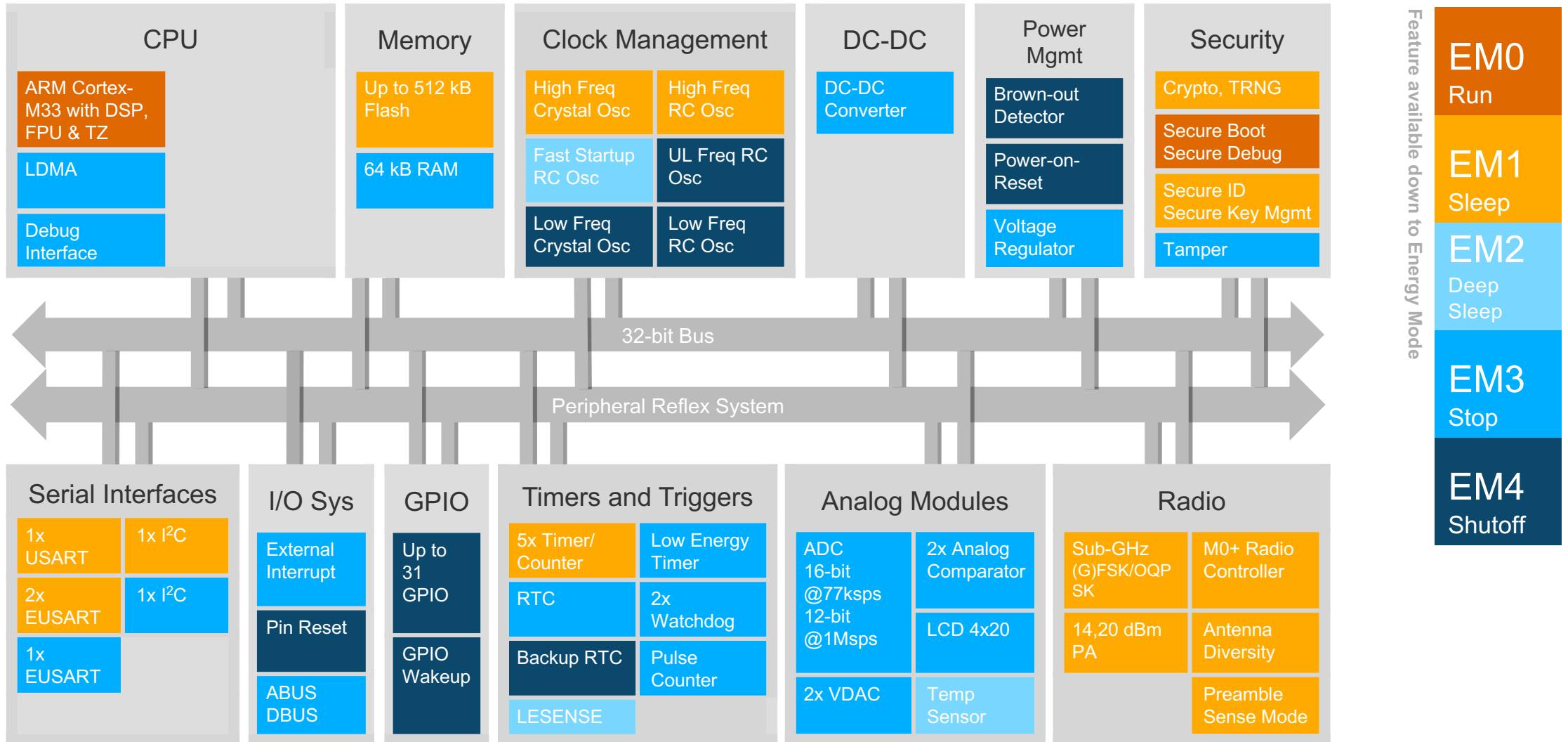LESENSE, PCNT
Temperature sensor +/- 1.5º C

Compact Size
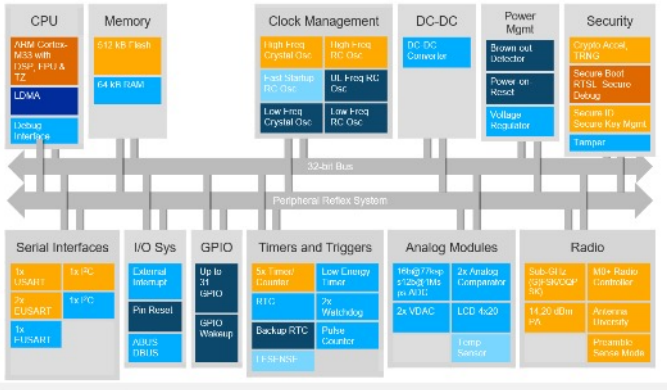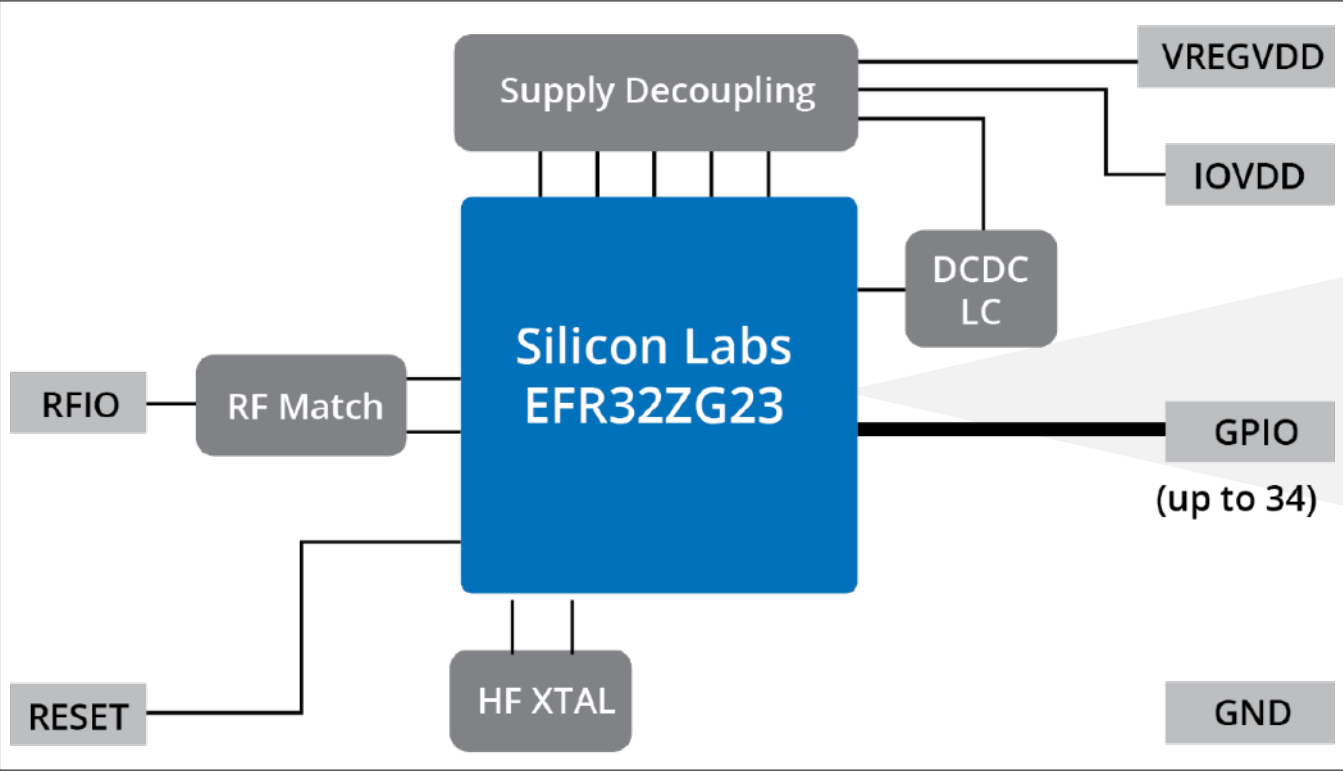
5x5 QFN40 (23 GPIO)
6x6 QFN48 (31 GPIO)
6.5x6.5 SiP (34 GPIO)

Part numbers

EFR32ZG23x (SoC)
ZGM230Sx (SiP)

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xG23 Block Diagram

CPU
- ARM Cortex-M33 with DSP, FPU & TZ
- LDMA
- Debug Interface

Memory
- Up to 512 kB Flash
- 64 kB RAM

Clock Management
- High Freq Crystal Osc
- High Freq RC Osc
- Fast Startup RC Osc
- UL Freq RC Osc
- Low Freq Crystal Osc
- Low Freq RC Osc

DC-DC
- DC-DC Converter

Power Mgmt
- Brown-out Detector
- Power-on-Reset
- Voltage Regulator

Security
- Crypto, TRNG
- Secure Boot Secure Debug
- Secure ID Secure Key Mgmt
- Tamper

32-bit Bus

Peripheral Reflex System

Serial Interfaces
- 1x USART
- 1x I^{2}C
- 2x EUSART
- 1x I^{2}C
- 1x EUSART

I/O Sys
- External Interrupt
- Pin Reset
- ABUS DBUS

GPIO
- Up to 31 GPIO
- GPIO Wakeup

Timers and Triggers
- 5x Timer/Counter
- Low Energy Timer
- RTC
- 2x Watchdog
- Backup RTC
- Pulse Counter
- LESENSE

Analog Modules
- ADC 16-bit @77ksps 12-bit @1Msps
- 2x Analog Comparator
- LCD 4x20
- 2x VDAC
- Temp Sensor

Radio
- Sub-GHz (G)FSK/OQPSK
- M0+ Radio Controller
- 14,20 dBm PA
- Antenna Diversity
- Preamble Sense Mode

Feature available down to Energy Mode

EM0 Run
EM1 Sleep
EM2 Deep Sleep
EM3 Stop
EM4 Shutoff

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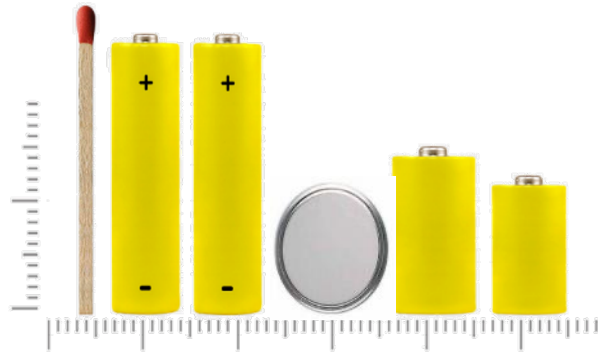# Z-Wave 800 SiP Module Block Diagram

EFR32ZG23 SoC

800 Series New Features

EXTENDED WIRELESS RANGE

- ➤ **Provides 50% longer range**
- ➤ **Supports up to 1.5 Miles outdoor range**

LONG BATTERY LIFE

- ➤ **Provides significantly lower current consumption**
- ➤ **Supports up to 10 years for typical sensor use cases on a coin cell battery**

- ➤ **Secure Vault extends Z-Wave's S2 framework by protecting keys and critical IP on device**

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Secure Vault™ Support in ZG23/ZGM230S: Protecting the IoT Device

Base	Mid	High	Feature
✓	✓	✓	**True Random Number Generator**
✓	✓	✓	**Crypto Engine**
✓	✓	✓	**Secure Application Boot**
—	HSE	HSE	**Secure Engine**
—	✓	✓	**Secure Boot with RTSL**
—	✓	✓	**Secure Debug with Lock/Unlock**
—	✓	✓	**DPA Countermeasures**
—	—	✓	**Anti-Tamper**
—	—	✓	**Secure Attestation**
—	—	✓	**Secure Key Management**
—	—	✓	**Advanced Crypto**

Z-Wave 800 Supports Secure Vault

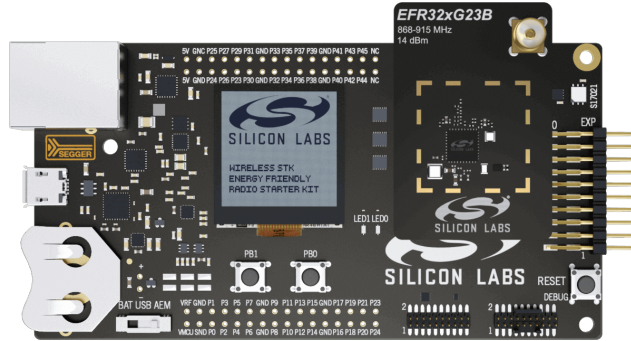**Industry Leading IoT Security**

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# Getting Started with Z-Wave 800

SoC: EFR32ZG23
Module: ZGM230S

Getting Started with Z-Wave 800 SoCs & Modules

Kit	Description	Content	Availability
xG23-RB4204D	xG23 868-915 MHz +14 dBm Radio Board	1x radio board (superset SoC OPN)	Now
xG23-RB4210A	xG23 868-915 MHz +20 dBm Radio Board	1x radio board (superset SoC OPN)	Now
ZGM230-RB4205B	ZGM230S Z-Wave SiP Module Radio Board (+14 dBm)	1x radio board (superset module OPN)	Now
<mark>**ZWAVE-PK800A**</mark>	Z-Wave 800 Series Pro Kit	2x pro kit main boards 1x ZGM230S SiP radio board 1x ZG23 SoC radio board (+14 dBm) 2x Button and LEDs expansion board 1x UZB-7 USB stick 2x Antenna 2x USB A to USB mini-B cable	Now
ZGM230-DK2603A	ZGM230S Z-Wave SiP Module Development Kit	1x dev kit board (with superset module OPN)	Q2 2022

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# Simplified Developer Experience
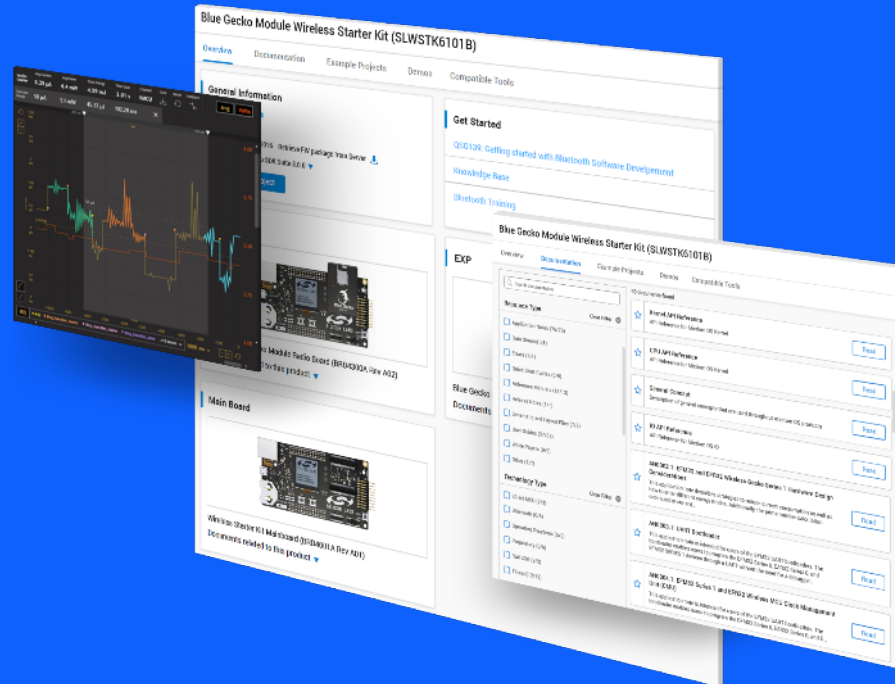
Simplicity Studio 5

- **Interface**
  - ‣ Fresh, new & simplified
  - ‣ Intuitive out-of-the-box experience
  - ‣ Fast access to developer resources
  - ‣ Linux, Mac & Windows
- **Tools**
  - ‣ Configuration utilities
  - ‣ Compiler
  - ‣ Error & validation
  - ‣ IDE & command line support
  - ‣ Graphical hardware configurator
  - ‣ Energy Profiler – visual energy analysis
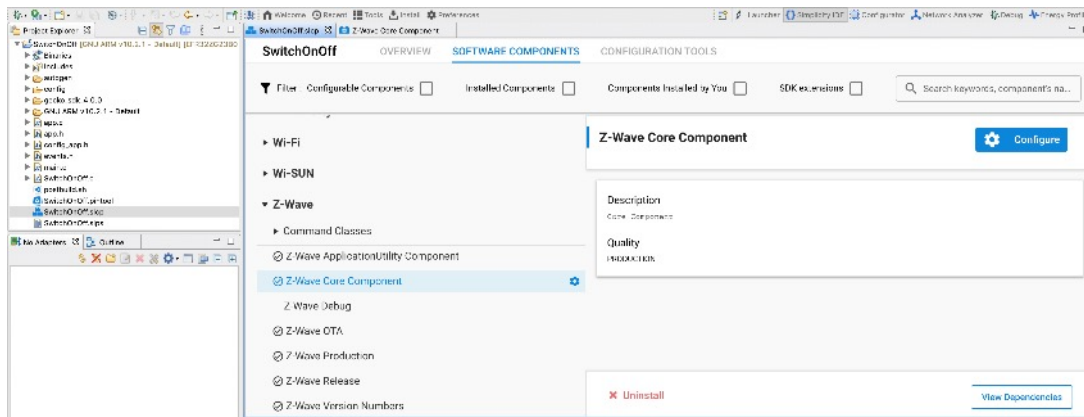 - ‣ Network Analyzer – packet capture & decode

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Simplicity Studio – Silicon Labs Configurator

<app name>.slcp

Software Components
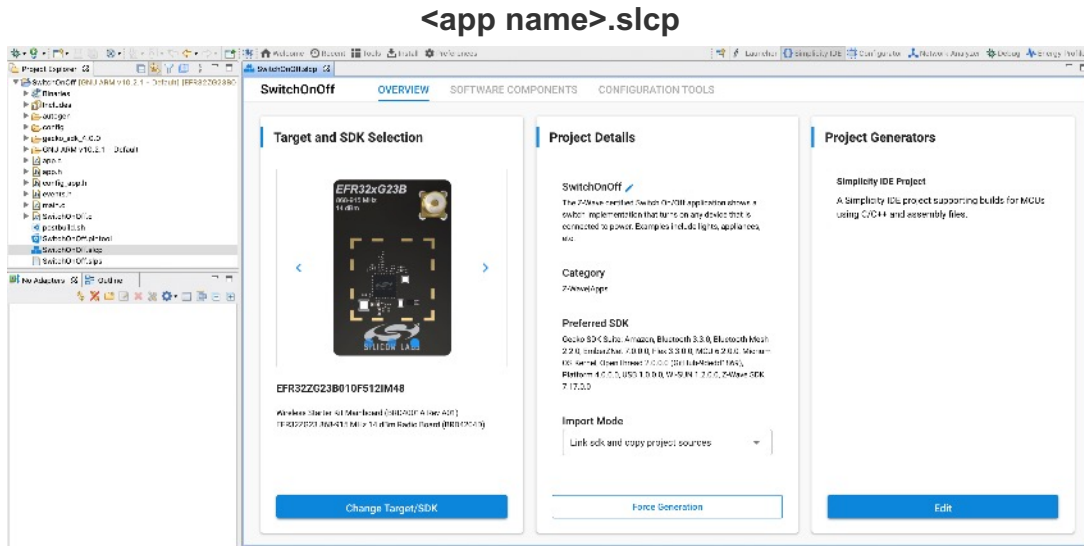
- The Gecko SDK 4.0 introduces a new underlying platform architecture based on components.

- The Z-Wave SDK 7.17.x is now using the Silicon Labs Configurator (SLC) for project generation and build

- The software components can be found in the SOFTWARE COMPONENTS tab in the simplicity project view.

- The Z-Wave software components can be found under the Z-Wave section.

xG23 Dev Kit Unboxing and Demonstration

SoC: EFR32ZG23
Module: ZGM230S

Unboxing Pro Kit

Z-Wave 800 Pro Kit (ZWAVE-PK800A)

2 WSTK

ZG23 SoC

2 BTN/LED boards

UZB7

ZGM130S Module

2 Antennas

2 USB Cables

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References

- **[UG506](): xG23 868-915 MHz 14 dBm Radio Board User's Guide**
- **[UG507](): xG23 868-915 MHz 20 dBm Radio Board User's Guide UG510**
- **[UG510](): ZGM230S Z-Wave 800 SiP Module Radio Board User's Guide**
- **[UG517](): Z-Wave 800 Series Integration Guide**
- **[UG523](): Bring-Up/Test HW Development User's Guide**
- **[Z-Wave 500 vs. 700 vs. 800]() - Why Use the New 800 Series for Smart Home Devices**
- **[Z-Wave Alliance]()**
- **[Simplicity Studio 5]()**
- **[Silicon Labs Github - Gecko SDK 4.0]()**
- **[DrZWave.blog]() – Eric's blog on all things Z-Wave**

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Q&A

Continue Discussion in Our Community!
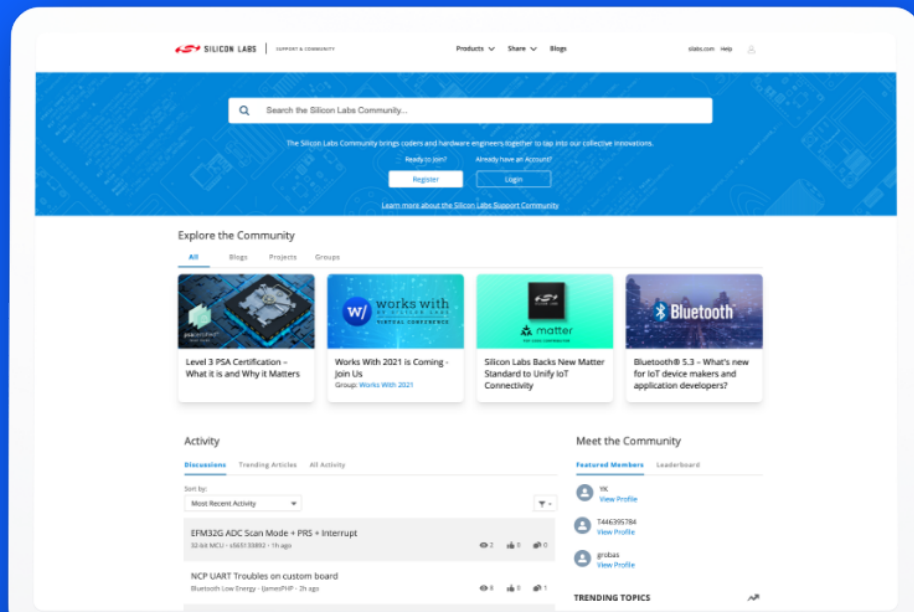
How to Navigate:

- "Products" to troubleshooting forums

- "Applications" to discuss IoT

- "Share" to view example projects and existing groups

- "Blogs" to view and discuss thoughts from our specialists

https://community.silabs.com

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Thank You