

SILICON LABS RAIL SDK 2.18.0.0 GA Simplicity SDK Suite User Guide

[Home](#) » [SILICON LABS](#) » SILICON LABS RAIL SDK 2.18.0.0 GA Simplicity SDK Suite User Guide 

Contents

- 1 SILICON LABS RAIL SDK 2.18.0.0 GA Simplicity SDK Suite
- 2 Product Information
- 3 Product Usage Instructions
- 4 RAIL APPS AND LIBRARY KEY FEATURES
- 5 Compatibility and Use Notices
- 6 RAIL Applications
- 7 Using This Release
- 8 Simplicity Studio
- 9 Disclaimer
- 10 Documents / Resources
 - 10.1 References



SILICON LABS RAIL SDK 2.18.0.0 GA Simplicity SDK Suite



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☐ Voice

☐ Microcontrollers

☐ Wireless

☐ 8-bit MCUs

☐ Bluetooth Classic

☒ 32-bit MCUs

☐ Bluetooth Low Energy

☐ Timing

☒ Proprietary

☐ Clocks

☐ Wi-Fi

☐ Buffers

☐ ZigBee and Thread

☐ Oscillators

☐ Z-Wave

☐ CDR and PHY

Product Information

The RAIL SDK is a software development suite designed for proprietary wireless applications, offering an intuitive and easily customizable radio interface layer to support wireless protocols. It includes extensive documentation and sample applications for developers.

Specifications

- **Product Name:** RAIL SDK 2.18.0.0 GA
- **SDK Suite Version:** Simplicity SDK Suite 2024.12.0 December 16, 2024
- **Description:** A complete software development suite for proprietary wireless applications supporting both proprietary and standards-based wireless protocols.

Product Usage Instructions

Compatibility and Use Notices

Ensure to refer to the Security chapter of the Platform Release Notes for security updates and notices. Subscribe to Security Advisories for up-to-date information. Verify the use of compatible compilers, such as GCC version 12.2.1 provided with Simplicity Studio.

RAIL Applications

• New Items

This release introduces new features like receiver node support and runtime PHY change during measurement.

• Improvements

Enhancements include the ability to switch between more Profiles/PHYs during measurement and adding more PHYs to the Range Test application with the Radio Configurator UI.

• Fixed Issues

Release 2.18.0.0 addresses known issues related to power consumption optimization and Range Test DMP instabilities.

- **Known Issues in the Current Release**

Issues like power consumption optimization on the DK2600 board and Range Test DMP instabilities are documented along with recommended workarounds.

- **Deprecated Items**

No items have been deprecated in this release.

- **Removed Items**

No items have been removed in this release.

Using This Release

- The SDK relies on the Simplicity Platform, providing functionality for protocol plugins and APIs through components like EMLIB, EMDRV, RAIL Library, NVM3, and mbedTLS. Refer to Simplicity Platform release notes for detailed information.
- For more information on the Flex SDK v3.x, refer to RAIL Fundamentals and Silicon Labs Connect Fundamentals documentation. New users can consult the Quick Start Guide for a smooth start with the SDK.

FAQ

- **Q: Where can I find the latest security updates for the RAIL SDK?**

A: Refer to the Security chapter of the Platform Release Notes or visit <https://www.silabs.com/developers/flex-sdk-connect-networking-stack> for security updates.

- **Q: What compilers are compatible with the RAIL SDK?**

A: The RAIL SDK is compatible with GCC version 12.2.1 provided with Simplicity Studio.

- **Q: How can I optimize power consumption on the DK2600 board?**

A: Update the UART baud rate to 9600 bps at Simplicity Studio Admin Console to optimize power consumption on the DK2600 board.

The RAIL SDK is a complete software development suite for proprietary wireless applications. It was previously part of the Proprietary SDK. Starting with the RAIL SDK 2.18.0.0 release, the Proprietary SDK is split into RAIL SDK and Connect SDK.

- Silicon Labs RAIL (Radio Abstraction Interface Layer) is an intuitive and easily customizable radio interface layer designed to support both proprietary and standards-based wireless protocols.
- The RAIL SDK is supplied with extensive documentation and sample applications.
- These release notes cover SDK version(s): 2.18.0.0 GA released December 16, 2024.

RAIL APPS AND LIBRARY KEY FEATURES

- RAIL Tutorial moved to [docs.silabs.com](https://docs.silabs.com/rail/latest/rail-start/rail-training): <https://docs.silabs.com/rail/latest/rail-start/rail-training>
- RAIL SDK supported on BRD4276A radio board with EFR32FG25 and SKY66122-11 frontend module for high TX power applications
- Improved RangeTest Sample Application to fully support multi-PHY configurations and added a new feature to

control measurements on the RX side – in alpha quality

- Sigfox TX PHYs and RX PHYs supported on EFR32FG23 and EFR32FG28 parts for EU and NA region

Compatibility and Use Notices

- For information about security updates and notices, see the Security chapter of the Platform Release Notes installed with this SDK or on the TECH DOCS tab at <https://www.silabs.com/developers/flex-sdk-connect-networking-stack>.
- Silicon Labs also strongly recommends that you subscribe to Security Advisories for up-to-date information. For instructions, or if you are new to the Silicon Labs Flex SDK, see Using This Release.

Compatible Compilers:

IAR Embedded Workbench for ARM (IAR-EWARM) version 9.40.1

- Using wine to build with the IarBuild.exe command line utility or IAR Embedded Workbench GUI on macOS or Linux could result in incorrect files being used due to collisions in Wine's hashing algorithm for generating short file names.
- Customers on macOS or Linux are advised not to build with IAR outside of Simplicity Studio. Customers who do so should carefully verify that the correct files are being used.

GCC (The GNU Compiler Collection) version 12.2.1, provided with Simplicity Studio.

RAIL Applications

New Items

Added in release 2.18.0.0

- simplicity_sdk/app/flex is split into two:
 - simplicity_sdk/app/rail (RAIL SDK)
 - simplicity_sdk/app/connect (CONNECT SDK)
- RAIL SDK Services are documented at <https://docs.silabs.com/rail/latest/rail-start/>

Improvements

Changed in release 2.18.0.0

- The Range Test Applications are extended with 2x new features:
 - Remote Control: The receiver node can configure the transmitter node. Also, the measurement can be started by the re-ceiver node (only).
 - Runtime PHY change: During measurement, the user can switch between more Profiles/PHYs. To ensure this, more PHYs must be added to the particular Range Test application with the Radio Configurator UI.
- Improve sleep by using the Power Manager Integration component for all sleeping-capable applications

Fixed Issues

Fixed in release 2.18.0.0

ID #	Description
1322797	Absolute time overflow has been fixed for the Wireless M-Bus – Meter.

Known Issues in the Current Release

ID #	Description	Workaround
1268208 1268301	The power consumption of DK2600 can't be optimized if configuration time for EM2 if UART is used, as the value of SL_IOSTREAM_USART_{instance}_BAUDRATE doesn't take effect. The default value used instead is 115200 bps. The typical use case is the RAIL – SoC Wireless M-bus Meter with DK2600 board.	Update UART baud rate to 9600 bps at Simplicity Studio Admin Console. This is necessary for EM2.
1274248	Range Test DMP instabilities in case of LTO.	Do not use LTO.

Deprecated Items

Deprecated in release 2.18.0.0

- None.

Removed Items

Removed in release 2.18.0.0

- None.

Using This Release

This release contains the following:

- RAIL and Connect Sample Applications
- RAIL and Connect Components and Application Framework
- This SDK depends on the Simplicity Platform. The Simplicity Platform code provides functionality that supports protocol plugins and APIs in the form of drivers and other lower-layer features that interact directly with Silicon Labs chips and modules. Simplicity Platform components include EMLIB, EMDRV, RAIL Library, NVM3, and mbedTLS. Simplicity Platform release notes are available through Simplicity Studio's Documentation tab.
- For more information about the Flex SDK v3.x see [UG103.13: RAIL Fundamentals](#) and [UG103.12: Silicon Labs Connect Fundamentals](#). If you are a first-time user, see [QSG168: Proprietary Flex SDK v3.x Quick Start Guide](#).

Installation and Use

- The Proprietary Flex SDK is provided as part of the Simplicity SDK, the suite of Silicon Labs SDKs. To quickly get started with the Simplicity SDK, install [Simplicity Studio 5](#), which will set up your development environment and walk you through Simplicity SDK installation. Simplicity Studio 5 includes everything needed for IoT

product development with Silicon Labs devices, including a resource and project launcher, software configuration tools, full IDE with GNU toolchain, and analysis tools. Installation instructions are provided in the online [Simplicity Studio 5 User's Guide](#).

- Alternatively, Simplicity SDK may be installed manually by downloading or cloning the latest from GitHub. See https://github.com/Sili-conLabs/simplicity_sdk for more information.

Simplicity Studio installs the GSDK by default in:

- (Windows): C:\Users\<NAME>\SimplicityStudio\SDKs\simplicity_sdk
- (MacOS): /Users/<NAME>/SimplicityStudio/SDKs/simplicity_sdk

Documentation specific to the SDK version is installed with the SDK. Additional information can often be found in the [knowledge base articles \(KBAs\)](#). API references and other information about this and earlier releases are available at <https://docs.silabs.com/>.

Security Information

Secure Vault Integration

When deployed to Secure Vault High devices, sensitive keys are protected using the Secure Vault Key Management functionality. The following table shows the protected keys and their storage protection characteristics.

Wrapped Key	Exportable/Non-Exportable	Notes
Thread Master Key	Exportable	Must be exportable to form the TLVs
PSKc	Exportable	Must be exportable to form the TLVs
Key Encryption Key	Exportable	Must be exportable to form the TLVs
MLE Key	Non-Exportable	
Temporary MLE Key	Non-Exportable	
MAC Previous Key	Non-Exportable	
MAC Current Key	Non-Exportable	
MAC Next Key	Non-Exportable	

- Wrapped keys that are marked as “Non-Exportable” can be used but cannot be viewed or shared at runtime.
- Wrapped keys that are marked as “Exportable” can be used or shared at runtime but remain encrypted while stored in Flash.
- For more information on Secure Vault Key Management functionality, see [AN1271: Secure Key Storage](#).

Security Advisories

To subscribe to Security Advisories, log in to the Silicon Labs customer portal, then select Account Home. Click HOME to go to the portal home page and then click the Manage Notifications tile. Make sure that ‘Software/Security Advisory Notices & Product Change Notices (PCNs)’ is checked, and that you are subscribed at minimum for your platform and protocol. Click Save to save any changes.

The following figure is an example:

Update Preference

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<input type="checkbox"/> Modems and DAAs	<input type="checkbox"/> Voice
<input type="checkbox"/> Microcontrollers	<input type="checkbox"/> Wireless
<input type="checkbox"/> 8-bit MCUs	<input type="checkbox"/> Bluetooth Classic
<input checked="" type="checkbox"/> 32-bit MCUs	<input type="checkbox"/> Bluetooth Low Energy
<input type="checkbox"/> Timing	<input checked="" type="checkbox"/> Proprietary
<input type="checkbox"/> Clocks	<input type="checkbox"/> Wi-Fi
<input type="checkbox"/> Buffers	<input type="checkbox"/> ZigBee and Thread
<input type="checkbox"/> Oscillators	<input type="checkbox"/> Z-Wave
<input type="checkbox"/> CDR and PHY	

Support

- Development Kit customers are eligible for training and technical support. Use the [Silicon Labs Flex web page](#) to obtain information about all Silicon Labs Thread products and services, and to sign up for product support.
- You can contact Silicon Laboratories support at <http://www.silabs.com/support>.

SDK Release and Maintenance Policy

For details, see SDK Release and Maintenance Policy.

Simplicity Studio

One-click access to MCU and wireless tools, documentation, software, source code libraries & more. Available for Windows, Mac, and Linux!

- **IoT Portfolio**
www.silabs.com/iot
- **SW/HW**
www.silabs.com/simplicity
- **Quality**

www.silabs.com/quality

- **Support & Community**

www.silabs.com/community.

Disclaimer

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Documents / Resources

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References

-  [Silicon Labs](#)
-  [Silicon Labs](#)
-  [Silicon Labs Community](#)
-  [IoT – Internet of Things - Silicon Labs](#)
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