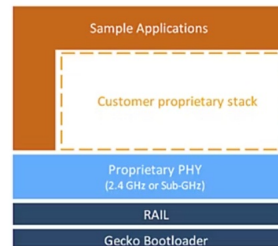



SILICON LABS
**SILICON
LABS RAIL
SDK
Complete
Software**



SILICON LABS RAIL SDK Complete Software User Guide

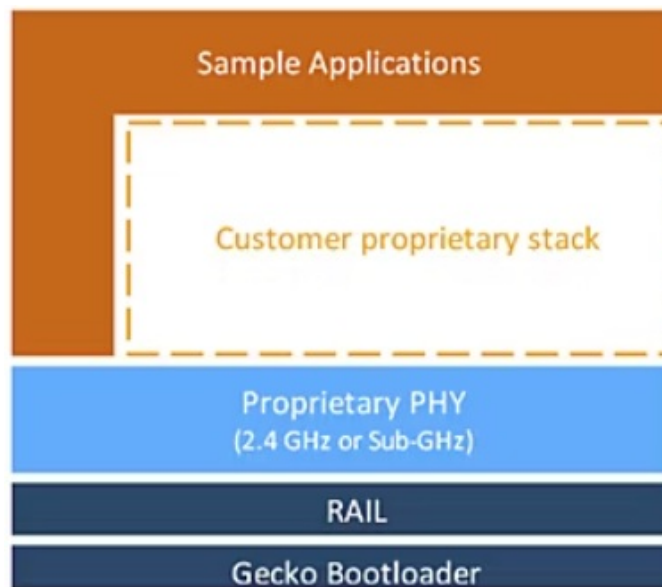
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SILICON LABS RAIL SDK Complete Software



Specifications

- Product Name: RAIL SDK 2.18.2.0 GA
- Simplicity SDK Suite Version: 2024.12.2 April 1, 2025
- Features: Complete software development suite for proprietary wireless applications, supports both proprietary and standards-based wireless protocols, supplied with extensive documentation and sample applications

Product Usage Instructions

RAIL Applications

New Items

- Receiver 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.

Improvements

Changed in release 2.18.0.0

Fixed Issues

Fixed in release 2.18.0.0

- ID # 1322797
- ID # 1375449
- ID # 1401181

Known Issues in the Current Release

- ID # 1268208
- ID # 1268301
- ID # 1274248

- ID # 1375450

Description:

- The power consumption of DK2600 can't be optimized if configuration time for EM2 if UART is being used, as the value of `SL_IOSTREAM_USART_{instance}_BAUDRATE` doesn't take effect.
- Range Test DMP instabilities in case of LTO.
- Wi-SUN HAN phys aren't supported by Standard packet assembler and Packet Assistant components.

Workaround: Update UART baud rate to 9600 bps at Simplicity Studio Admin Console. This is necessary for EM2.

Do not use LTO. Do not use Wi-SUN HAN phys with RAIL SDK sample applications.

Deprecated Items

Deprecated in release 2.18.0.0 None.

Removed Items

Removed in release 2.18.0.0 None.

Using This Release

- 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.

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 receiver 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 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 Wireless M-Bus – Meter.
1375449	Support for Long Range phy has been fixed for Range Test and Simple TRX applications.
1401181	Fixed OFDM PA setting in Range Test Application for XG25 boards.

Known Issues in the Current Release

ID #	Description	Workaround
12682081268301	The power consumption of <i>DK2600</i> can't be optimized if configuration time for EM2 if UART is being used, as the value of <i>SL_IOSTREAM_USART_{instance}_BAUDRATE</i> doesn't take effect. The default value used instead is 115200 bps. Typical use case is 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.
1375450	Wi-SUN HAN phys aren't supported by Standard packet assembler and Packet Assistant components.	Do not use Wi-SUN HAN phys with RAIL SDK sample applications.

Deprecated Items

Deprecated 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/SiliconLabs/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 is available on <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:

The screenshot shows the 'Update Preference' page in the Silicon Labs customer portal. The page has a header with the Silicon Labs logo, a search bar, and a user profile. Below the header is a navigation bar with 'HOME', 'CASES', and 'SOFTWARE RELEASES'. The main content area is titled 'Update Preference' and contains two sections: 'WHAT EMAILS WOULD YOU LIKE TO RECEIVE?' and 'SELECT THE PRODUCTS TO RECEIVE UPDATES FOR'. In the email section, the 'Software/Security Advisory Notices & Product Change Notices (PCNs)' checkbox is checked and highlighted with a red box. In the product selection section, the 'Microcontrollers' category is selected, and the '32-bit MCUs' sub-category is checked and highlighted with a red box. Additionally, the 'Wireless' category is selected, and the 'Proprietary' sub-category is checked and highlighted with a red box.

WHAT EMAILS WOULD YOU LIKE TO RECEIVE?	
Newsletters	
<input type="checkbox"/>	Community Monthly Newsletter
<input type="checkbox"/>	Sales Newsletter
<input type="checkbox"/>	Micrium Newsletter
Product Specific Notifications	
<input type="checkbox"/>	Product Information and Newsletter
<input checked="" type="checkbox"/>	Software/Security Advisory Notices & Product Change Notices (PCNs)
<input type="checkbox"/>	Technical Documents Updates (datasheets, code samples, etc.)

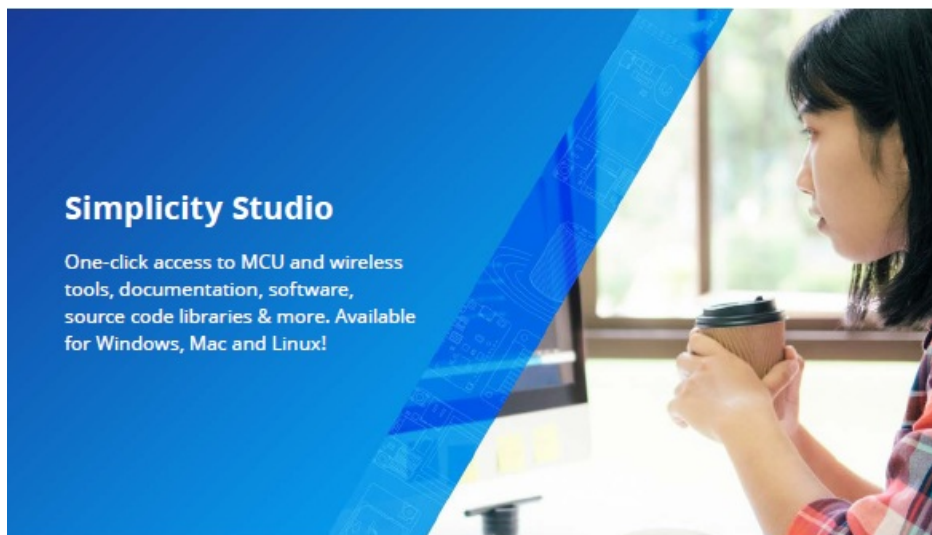
SELECT THE PRODUCTS TO RECEIVE UPDATES FOR	
<input type="checkbox"/> Select/Unselect All	
<input type="checkbox"/> Audio and Radio	<input type="checkbox"/> Power over Ethernet
<input type="checkbox"/> Interface	<input type="checkbox"/> Sensors
<input type="checkbox"/> Isolation	<input type="checkbox"/> TV and Video
<input type="checkbox"/> Modems and DAAs	<input type="checkbox"/> Voice
<input checked="" 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.



Disclaimer

Silicon Labs intends to provide customers with the latest, accurate, and in-depth documentation of all peripherals and modules available for system and software implementers using or intending to use the Silicon Labs products. Characterization data, available modules and peripherals, memory sizes and memory addresses refer to each specific device, and “Typical” parameters provided can and do vary in different applications. Application examples described herein are for illustrative purposes only. Silicon Labs reserves the right to make changes without further notice to the product information, specifications, and descriptions herein, and does not give warranties as to the accuracy or completeness of the included information. Without prior notification, Silicon Labs may update product firmware during the manufacturing process for security or reliability reasons. Such changes will not alter the specifications or the performance of the product. Silicon Labs shall have no liability for the consequences of use of the information supplied in this document. This document does not imply or expressly grant any license to design or fabricate any integrated circuits. The products are not designed or authorized to be used within any FDA Class III devices, applications for which FDA premarket approval is required or Life Support Systems without the specific written consent of Silicon Labs. A “Life Support System” is any product or system intended to support or sustain life and/or health, which, if it fails, can be reasonably expected to result in significant personal injury or death. Silicon Labs products are not designed or authorized for military applications. Silicon Labs products shall under no circumstances be used in weapons of mass destruction including (but not limited to) nuclear, biological or chemical weapons, or missiles capable of delivering such weapons. Silicon Labs disclaims all express and implied warranties and shall not be responsible or liable for any injuries or damages related to use of a Silicon Labs product in such unauthorized applications.

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- USA
- www.silabs.com

FAQ

- **Q: Where can I find more information about security updates and notices?**
 - A: 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 on <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.
- **Q: What compilers are compatible with the RAIL SDK?**
 - A: Compatible Compilers: GCC (The GNU Compiler Collection) version 12.2.1, provided with Simplicity Studio.

Documents / Resources

	<p>SILICON LABS RAIL SDK Complete Software [pdf] User Guide RAIL SDK, RAIL SDK Complete Software, Software</p>
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References

- [Software Developer Docs - Silicon Labs](#)
- [Silicon Labs](#)
- [Silicon Labs Community](#)
- [IoT – Internet of Things - Silicon Labs](#)
- [Simplicity Studio - Silicon Labs](#)
- [Technical Support - Silicon Labs](#)
- [Software Developer Docs - Silicon Labs](#)
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