



Wi-SUN SDK 1.5.1.0 GA

Gecko SDK Suite 4.2

March 8, 2023

Wireless Smart Ubiquitous Network (Wi-SUN) is the leading IPv6 sub-GHz mesh technology for smart city and smart utility applications. Wi-SUN brings Smart Ubiquitous Networks to service providers, utilities, municipalities/local government, and other enterprises, by enabling interoperable, multi-service, and secure wireless mesh networks. Wi-SUN can be used for large-scale outdoor IoT wireless communication networks in a wide range of applications covering both line-powered and battery-powered nodes.

Silicon Labs' Wi-SUN hardware is certified by the Wi-SUN Alliance, a global industry association devoted to seamless LPWAN connectivity. Wi-SUN builds upon open standard internet protocols (IP) and APIs, enabling developers to extend existing infrastructure platforms to add new capabilities. Built to scale with long-range capabilities, high-data throughput and IPv6 support, Wi-SUN simplifies wireless infrastructure for industrial applications and the evolution of smart cities.

These release notes cover SDK versions:

- 1.5.1.0 released March 8, 2023
- 1.5.0.0 released February 1, 2023
- 1.4.0.0 released December 14, 2022

Compatibility and Use Notices

For information about security updates and notices, see the Security chapter of the Gecko Platform Release notes installed with this SDK or on the TECH DOCS tab on <https://www.silabs.com/developers/wi-sun-protocol-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 Wi-SUN SDK, see [Using This Release](#).

Compatible Compilers:

IAR Embedded Workbench for ARM (IAR-EWARM) version 9.20.4

- Using wine to build with the larBuild.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 should carefully verify that the correct files are being used.

GCC (The GNU Compiler Collection) version 10.3-2021.10, provided with Simplicity Studio.



KEY FEATURES

Wi-SUN Stack

- Added minimal support for FAN1.1 LFN (Limited Functional Node), including an API to configure the device role, and a new set of libraries supporting both LFN and FFN device types
- Added support for FAN 1.1 PHY mode switch
- Added support for FSK FEC
- Added support for EFR32FG25 - it supports all FAN1.1 OFDM modulation schemes and all FAN1.0 FSK configurations.
- Added support for EFF01

Wi-SUN Applications

- Added support for EFR32FG25
- Added FAN 1.1 PHY support (settings and CLI)
- Added a CoAP Advanced Resource Handler
- Added support for iPerf multicast
- Added support for CPC in Wi-SUN RCP

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1 Wi-SUN Stack

1.1 New Items

Added in release 1.5.0.0

- Added a new `SL_WISUN_SOCKET_OPTION_SEND_BUFFER_LIMIT` socket option to configure the transmission buffer length. It is the equivalent of Posix `SO_SNDBUF`.
- Added a new `SL_WISUN_PHY_CONFIG_IDS` option in `sl_wisun_join()`. It allows the selection of a specific radio configuration entry.
- Implemented LFN parent synchronization and time-out detection.
- Implemented LFN EAPOL accelerated listening schedule.

Added in release 1.4.0.0

- Added minimal support for FAN1.1 LFN (Limited Functional Node). LFN devices are able to connect and communicate but are not using any of the EFR32 energy management mode. As such, they are not optimized for battery powered devices and should only be used for evaluation and experimentation.
 - Added a new API `sl_wisun_set_device_type()` that configures the role of device. It can be either a router (FFN – Full Functional Node) or an end node (LFN)
 - Added a new set of libraries supporting both LFN and FFN device types. Those libraries are used when the new “Stack LFN Support” plugin is installed.
- Added support for FAN 1.1 PHY mode switch.
 - Added a new API `sl_wisun_set_mode_switch()` that indicates if the device can mode switch with a given neighbor.
 - Added new APIs `sl_wisun_set_pom_ie()` and `sl_wisun_get_pom_ie()` that write or read the content of the POM-IE (PHY Operating Mode Information Element). It contains the list of the PHY operating mode a node is willing to use for communication.
- Added a new API `sl_wisun_join()` that triggers a new connection. It can be used either with the old (1V08 – regulatory domain, operating class, operating mode) or the new (1VA8 – regulatory domain, channel plan id, PHY mode id) nomenclature. That new API is meant to replace `sl_wisun_connect()`.
- Added a new API `sl_wisun_set_connection_parameters()` that extends the set of the configuration parameters. Used in pair with `sl_wisun_join()`, it replaces `sl_wisun_connect()` network size parameter.
- Added support for FSK FEC. FEC can be enable either by setting `fec` field of `sl_wisun_phy_config_t` structure or by using a PHY mode id that explicitly enables FEC.
- Added support of EFR32FG25. It supports all FAN1.1 OFDM modulation schemes and all FAN1.0 FSK configurations.
- Added support of EFF01

1.2 Improvements

Changed in release 1.5.1.0

- Reduced the NS(EARO) retry period during the first connection. It reduces the time to connect in case of retransmission and improves the process's reliability.

1.3 Fixed Issues

Added in release 1.5.1.0

ID #	Description
1098801	Unencrypted LPC were accepted by LFN when they shouldn't have been.
1094861	Fixed FEC support in Linux Border Router RCP.

Fixed in release 1.4.0.0

ID #	Description
1078454	The wrong radio entry could be used if a radio configuration file contained the same PHY more than once. It was always selecting the first entry found that matched the PHY characteristics. It was causing a single PHY to be selected instead of a multi-PHY and made the use of mode switch impossible.
1090805	Fixed timing drift calculation error that would lead to temporary desynchronization of broadcast frequency hopping.

1.4 Known Issues in the Current Release

None

1.5 Deprecated Items**Deprecated in release 1.4.0.0**

- `sl_wisun_connect()` is replaced by `sl_wisun_join()`.
- `sl_wisun_set_channel_plan()` is replaced by `sl_wisun_join()`.
- `sl_wisun_set_network_size()` is replaced by `sl_wisun_set_connection_parameters()`

1.6 Removed Items

None

2 Wi-SUN Applications

2.1 New Items

Added in release 1.4.0.0

- Added support of EFR32FG25
- FAN 1.1 PHY support (settings and CLI)
- CoAP Advanced Resource Handler
- Added support of CPC in Wi-SUN RCP

2.2 Improvements

Added in release 1.5.0.0

- Border router RCP
 - Added support of firmware updates without CPC
 - Added support of IAR

Added in release 1.4.0.0

- iPerf Improvements
 - CLI component is separated
 - Multicast support
- CoAP Improvements
 - Resource Discovery Query Improvement
 - Extended resource support (CoAP Meter update also)
- Network Measurement Application Improvements
 - Multicast support for ping and iPerf
 - Remote CLI control over CoAP
 - LCD GUI improvements
 - PHY selection
 - iPerf test visualization
 - GUI refactor
- Wi-SUN Configurator
 - FAN1.1 PHY support beside FAN1.0
 - Default PHY Selection
- Refactor memory management (Os objects and their allocations are organized into heap)

2.3 Fixed Issues

Fixed in release 1.5.0.0

ID #	Description
1063593	Fixed a race in the border router RCP UART DMA driver on FG25. It was causing CRC errors and packet losses.

2.4 Known Issues in the Current Release

Issues in bold were added since the previous release.

ID #	Description	Workaround
1067236	The border router RCP SPI interface is unstable when used with a throughput higher than 1 Mbytes/s	The use of border router RCP SPI interface is not recommended for the time being.
	Simplicity Studio – Network Analyzer: Wi-SUN Encrypted Packets are not supported.	

2.5 Deprecated Items

None

2.6 Removed Items

None

3 Using This Release

This release contains the following

- Wi-SUN stack library
- Wi-SUN sample applications
- Wi-SUN border router pre-compiled demos
- Documentation

If you are a first time user, see *QSG181: Silicon Labs Wi-SUN Quick-Start Guide*.

3.1 Installation and Use

The Wi-SUN SDK is provided as part of the Gecko SDK (GSDK), the suite of Silicon Labs SDKs. To quickly get started with the GSDK, install [Simplicity Studio 5](#), which will set up your development environment and walk you through GSDK 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, Gecko SDK may be installed manually by downloading or cloning the latest from GitHub. See https://github.com/SiliconLabs/gecko_sdk for more information.

Simplicity Studio installs the GSDK by default in:

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

Documentation specific to the SDK version is installed with the SDK.

3.2 Security Information

Secure Vault Integration

This version of the stack does not integrate Secure Vault Key Management.

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.

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3.3 Support

Development Kit customers are eligible for training and technical support. Contact Silicon Laboratories support at <http://www.silabs.com/support>.

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