Wi-SUN SDK 1.5.0.0 GA
Gecko SDK Suite 4.2
February 1, 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:

1.5.0.0 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 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 should carefully verify that the correct files are being used.

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

None

1.3 Fixed Issues

<table>
<thead>
<tr>
<th>ID #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1078454</td>
<td>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.</td>
</tr>
<tr>
<td>1090805</td>
<td>Fixed timing drift calculation error that would lead to temporary desynchronization of broadcast frequency hopping.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>ID #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1063593</td>
<td>Fixed a race in the border router RCP UART DMA driver on FG25. It was causing CRC errors and packet losses.</td>
</tr>
</tbody>
</table>
2.4 Known Issues in the Current Release

Issues in bold were added since the previous release.

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

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.

### 3.3 Support

Development Kit customers are eligible for training and technical support. Contact Silicon Laboratories support at [http://www.silabs.com/support](http://www.silabs.com/support).
Simplicity Studio
One-click access to MCU and wireless tools, documentation, software, source code libraries & more. Available for Windows, Mac and Linux!

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