



Bluetooth® SDK 3.0.0.2 GA

Gecko SDK Suite 3.0

July 29, 2020

Silicon Labs is a leading vendor in Bluetooth hardware and software technologies, used in products such as sports and fitness, consumer electronics, beacons, and smart home applications. The core SDK is an advanced Bluetooth 5-compliant stack that provides all of the core functionality along with multiple API to simplify development. The core functionality offers both standalone mode allowing a developer to create and run their application directly on the SoC, or in NCP mode allowing for the use of an external host MCU.

Extensions to the SDK include Bluetooth Mesh and Apple® HomeKit® for customers seeking the additional capabilities.

These release notes cover SDK version(s):

3.0.0.2 released on July 29, 2020



KEY FEATURES

- Integrated with Gecko Platform component-based architecture
- New Bluetooth stack API
- Support for 32 simultaneous connections
- Support for Randomized Advertising Channel Indexing
- Support for BGM220P and BGM220S modules added

Compatibility and Use Notices

If you are new to the Silicon Labs Bluetooth SDK, see [Using This Release](#).

Compatible Compilers:

IAR Embedded Workbench for ARM (IAR-EWARM) version 8.30.1

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

GCC (The GNU Compiler Collection) version 7.2.1, provided with Simplicity Studio.

Contents

- 1 New Items2
 - 1.1 New Features2
 - 1.2 New APIs.....2
- 2 Improvements.....3
 - 2.1 Changed APIs3
- 3 Fixed Issues4
- 4 Known Issues in the Current Release5
- 5 Deprecated Items6
- 6 Removed Items7
- 7 Special Notices.....8
- 8 Using This Release.....9
 - 8.1 Installation and Use9
 - 8.2 Support.....9
- 9 Legal.....10
 - 9.1 Disclaimer.....10
 - 9.2 Trademark Information10

1 New Items

1.1 New Features

Added in release 3.0.0.2

32 simultaneous connections

The stack supports up to 32 simultaneous connections on EFR32[B|M]G12 and EFR32[B|M]G21. On other parts, the actual maximum number of connections is restricted by available RAM space.

For the stack to successfully maintain more than 8 simultaneous connections and to maximize data throughput, allocate enough memory buffer in the Bluetooth > Feature > Bluetooth Core component, Buffer memory size for Bluetooth stack field. The configuration can also be directly changed in `SL_BT_CONFIG_BUFFER_SIZE` in `sl_bluetooth_config.h`.

The buffer memory is allocated in heap during Bluetooth stack initialization. Due to a limitation in IAR 8.30.1, which is unable to automatically expand the heap to the end of RAM space, the minimum heap size should be explicitly increased as well in the component Platform > Toolchain > Memory Configuration (install this component if it is not installed). This configuration can also be directly changed in `SL_HEAP_SIZE` in `sl_memory_config.h`.

Roughly, for each connection, a minimum of 100 bytes should be added to `SL_BT_CONFIG_BUFFER_SIZE`, and 600 bytes to `SL_HEAP_SIZE`.

Periodic Advertiser List Support

Applications can request to open multiple periodic advertiser synchronizations in parallel.

1.2 New APIs

For additional documentation and command descriptions please refer to the *Bluetooth Software API Reference Manual* in Bluetooth SDK.

Added in release 3.0.0.2

`sl_bt_cte_receiver_set_sync_cte_type`

`sl_bt_sync_set_parameters`

2 Improvements

2.1 Changed APIs

Changed in release 3.0.0.2

The structure and overall interface of Bluetooth APIs are changed. For migrating from APIs on the v2.x SDK please refer to *AN1255: Transitioning from the v2.x to the v3.x Bluetooth® SDK*.

Additionally the Bluetooth SDK has a component Bluetooth > Bluetooth API migration helper that provides some helper messages for old APIs. When an application includes this component, compiling warnings or errors will be generated when old APIs from the v2.x SDK are used. For example:

```
app/app.c:50:45: error: call to 'gecko_cmd_le_gap_open' declared with attribute error: Replaced by
sl_bt_connection_open()
   50 |     struct gecko_msg_le_gap_open_rsp_t* rsp = gecko_cmd_le_gap_open(addr, 0);
```

3 Fixed Issues

Fixed in release 3.0.0.0-Beta 2

ID #	Description
455119	Remove compilation warnings from Bluetooth public API.
460503	Now it is possible to set 0 MAX_CONNECTIONS and 0 MAX_ADVERTISERS in Bluetooth configuration.
463724	Fix the Network Analyzer unable to decode a connection request packet when the connection is opened on LE Coded PHY.
464918	Fix a performance issue that may cause advertising to fail if the application is compiled without optimization (-O0).
470424	Improve connection scheduling to avoid connection starving during multiple simultaneous connections.
481074	The ncp-empty application supports deep sleep now. To enable deep sleep, the wake lock component needs to be installed in ncp-empty.
489021	If a scan report data longer than 238 bytes was received by the device while being low on available buffer memory, the scan report event could get corrupted. The application could receive a scan report event with invalid field values or missing payload data. This is fixed and now the application will receive valid scan report events.
495892	Fix an issue causing the stack to hang when pairing with EFR Connect if a service in the local GATT database does not have a characteristic.
496089	Fix an issue in the stack causing NVM3 operations to fail.

4 Known Issues in the Current Release

Issues in bold were added since the previous release. If you have missed a release, recent release notes are available on <https://www.silabs.com/products/software>.

ID #	Description	Workaround
337467	MGM12P has poor signal strength when doing OTA with Aploader.	None
361592	The sync_data event does not report TX power.	None
465088	BGTool works correctly on macOS Catalina, but may not launch successfully on older macOS versions.	None
490308	The Bluetooth connection may drop when <code>sl_bt_sm_increase_security</code> is called if the application uses the RAIL <code>rail_lib_multiprotocol</code> component. This issue does not exist when the <code>rail_lib_single_protocol</code> is used.	This is caused by too much stack usage if the security operation is interrupted. Workaround is to increase the value of <code>SL_STACK_SIZE</code> . According to a test, adding 500 bytes to <code>SL_STACK_SIZE</code> could overcome the problem.
519382	The <code>ncp_empty</code> example does not send an <code>sl_bt_evt_system_error_id</code> event after receiving an incomplete API command from the NCP-host. The BGAPI transport protocol has no built-in error detection/correction. It is the user's responsibility to provide an error-free physical medium for communication between NCP and host.	None

5 Deprecated Items

None

6 Removed Items

Removed in release 3.0.0.2

Thunderboard Sense (SLTB001) and Thunderboard React (RD-0057-0201)

Support for Thunderboard Sense (SLTB001) and Thunderboard React (RD-0057-0201) is removed in this SDK release.

7 Special Notices

Silicon Labs Apple® HomeKit®

Silicon Labs implementation of Apple HomeKit is not currently available in GSDK 3. Silicon Labs is committed to providing an Apple HomeKit solution and is investigating ways to add support for it in a future release. Customers developing products targeting HomeKit applications may continue development using GSDK 2.7.x releases and upgrade to GSDK 3 when HomeKit is available.

8 Using This Release

This release contains the following

- Silicon Labs Bluetooth stack library
- Bluetooth sample applications

For more information about the Bluetooth SDK see *QSG169: Bluetooth® SDK v3.x Quick Start Guide*. If you are new to Bluetooth see [UG103.14: Bluetooth LE Fundamentals](#).

8.1 Installation and Use

A registered account at Silicon Labs is required in order to download the Silicon Labs Bluetooth SDK. You can register at https://siliconlabs.force.com/apex/SL_CommunitiesSelfReg?form=short.

Stack installation instructions are covered in the Simplicity Studio 5 online User's Guide.

Use the Bluetooth SDK v3.x with the Silicon Labs Simplicity Studio 5 development platform. Simplicity Studio ensures that most software and tool compatibilities are managed correctly. Install software and board firmware updates promptly when you are notified. Only use Simplicity Studio 4 with Bluetooth SDK v2.13.x and lower.

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/>.

8.2 Support

Development Kit customers are eligible for training and technical support. Use the [Silicon Labs Bluetooth LE web page](#) to obtain information about all Silicon Labs Bluetooth products and services, and to sign up for product support.

You can contact Silicon Laboratories support at <http://www.silabs.com/support>.

9 Legal

9.1 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.

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