Bluetooth® LE SDK 8.3.0.0 GA

Simplicity SDK Suite 2024.6.3

April 23, 2025

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 5.4-compliant stack that provides all of the core functionality along with multiple APIs to simplify development. The core functionality offers both standalone mode, allowing a developer to create and run their application directly on the SoC, or NCP mode, allowing for the use of an external host MCU.

These release notes cover SDK version(s):

8.3.0.0 GA released April 23, 2025
8.2.0.0 GA released September 18, 2024
8.1.0.0 GA released July 24, 2024
8.0.0.0 GA released June 5, 2024

Bluetooth

KEY FEATURES

Bluetooth

- Auto-connect feature to enable connecting to any device on the accept list
- Common Memory and Clock Manager integration
- Electronic Shelf Label (ESL) related improvements
- Removed support for Series 0/1

Multiprotocol

- Alpha support for OpenWRT on host processor of multiprotocol RCP solution
- Alpha support for Concurrent Zigbee and Matter over OpenThread, with DMP BLE

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 on https://www.silabs.com/developers/bluetooth-low-energy. Silicon Labs also strongly recommends that you subscribe to Security Advisories for up-to-date information. For instructions as well as notes on using Secure Vault features, or if you are new to the Silicon Labs Bluetooth 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 should carefully verify that the correct files are being used.

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

Contents

1 New Items

1.1 New Features

Added in release 8.3.0.0

GATT Client for ATT MTU Exchange Only

Added component bluetooth_feature_gatt_client_att_mtu_request_only. This component provides a minimal GATT Client to automatically initiate an ATT MTU exchange procedure when the GATT connection is open. This component does not provide the GATT Client API. Use the GATT Server API sl_bt_gatt_server_set_max_mtu to set the maximum size of ATT MTU in the BLE Host Stack.

Components for Specific Connection roles

Added new components bluetooth_feature_connection_role_central and bluetooth_feature_connection_role_peripheral. These components provide support for a specific connection role. When an application includes bluetooth_feature_connection, the application should also include one or both of the role-specific components based on the application's needs. If the application includes only bluetooth_feature_connection, both connection roles will be supported for backwards compatibility.

Better Code Optimization in Bluetooth Security Manager

The Bluetooth security manager now automatically drops the central or peripheral state machine if either the bluetooth_feature_connection_role_central or the bluetooth_feature_connection_role_peripheral component is not included, respectively, in the application.

Added in release 8.2.0.0

New Scanner Option

Added a new scanner option SL_BT_SCANNER_IGNORE_BONDING for use with sl_bt_scanner_set_parameters_and_filter command. If the application doesn't need the bonding information in advertisement reports, it can set this scanner option to avoid unnecessary searching of the bondings.

Added in release 8.0.0.0

Auto connection establishment procedure

The GAP auto connection establishment procedure is supported by the bluetooth stack when component bluetooth_feature_accept_list is included by the application. Use command sl_bt_connection_open_with_accept_list to connect any device in the accept list.

PTI support in Apploader

The AppLoader plugin for Gecko Bootloader now supports PTI.

Common Memory Manager Used by Bluetooth stack

The Bluetooth stack now uses the platform common memory manager component for memory management. See the common memory manager documentation for the design details of the component.

Clock Initializations for Bluetooth

The Bluetooth stack no longer requires the device_init component for initializing clocks. The new platform component Clock Manager supersedes the clock initializations of device_init and is used by Bluetooth sample applications since this release.

1.2 New APIs

Added in release 8.0.0.0

sl_bt_system_reboot() command: Reboot the system into user application mode.

sl_bt_connection_get_remote_address() command: Get the remote Bluetooth address of a connection.

sl_bt_user_cs_message_to_target() command: Send a message from the NCP host to the Channel Sounding service component on target device.

sl_bt_evt_user_cs_message_to_host() event: Send a message from the Channel Sounding service component on target device to the NCP host.

2 Improvements

2.1 Changed Items

Changed in release 8.0.0.0

ID #	Description
725079	Scanning on the primary channel is continued if auxiliary packets of a received primary channel extended advertising packet have been scheduled to be received far in the future.
1187823	App Timer has been made interrupt-safe.
1231096	Increased maximum acceptance list size from 32 to 127.
1234652	The EAD Core component now takes over the role of storing the key material. The necessary new API has been created and implemented. The way the key material is stored in ESL Core has changed. Now, the EAD Core component is responsible for the storage, and the necessary new API has been introduced in EAD and used in ESL.
1245103	Bluetooth host examples require pkg-config tool for external dependencies like openssl, libmosquitto or libcpc.
1294084	The 'txsize' field of sl_bt_evt_connection_parameters has been deprecated in 23Q2 GA. Removed usage of it from application and profiles.
1297425	Channel sounding: max procedure count changed to 1.
1328786	Improved and unified formatting of the ESL AP log message for both newly discovered ESLs and previously configured ESLs.

2.2 Changed APIs

Changed in release 8.0.0.0

sl_bt_evt_connection_opened event: Parameter 'master' is renamed to 'role'.

2.3 Intended Behavior

Changed in release 8.0.0.0

None.

3 Fixed Issues

Fixed in release 8.3.0.0

ID #	Description
1328923	Fixed an issue in the dynamic GATT database feature that, after adding a new descriptor to a GATT characteristic that has been enabled as visible to remote GATT clients, the remote GATT client cannot see the new descriptor.
1362681	Fixed an issue in the Bluetooth LE controller where, with the PAwR advertiser enabled, the device would intermittently request data for subevents in an unexpected sequence.
1371005	Fixed an issue in the Bluetooth LE linklayer where an advertising device that is sending out connectable extended advertisements replies to a AUX_CONN_REQ with an invalid AUX_CONN_RSP. This issue happened when the user set a random address to the extended advertising set only.

Fixed in release 8.2.0.0

ID #	Description
1330263	Fixed an issue in the Bluetooth LE link-layer that caused the PAwR advertiser to stop accepting subevent data setting from the host.

Fixed in release 8.1.0.0

ID #	Description
1267376	Fixed an issue where RSSI-based measurement data was not logged by the Bluetooth CS host example. It is now always logged, and the optional '-r' command line parameter has been removed.
1295837	Fixed a bug that may lead to asserts during new peripheral connections. This issue only presents on Bluetooth SDK version 7.1.1 and 8.0.0.
1296939	Fixed an issue where not including the Connection component in certain projects may lead to a hard fault.
1319377	Fixed an issue in the Filter Accept List feature configuration GUI where the filter accept list size was limited to 32 instead of 127.
1321890	Improved NCP resource exhaustion handling for maximum possible connections.
1327820	Fixed a race condition in button handling of the bt_cs_soc_initiator example.
1332599	Fixed an issue where secure initialization was missing on NCP boot if ncp_sec_host component was used.

Fixed in release 8.0.0.0

ID #	Description
777299	SoC Throughput sample app TX power initialization fixed.
1217945	Fixed an issue in HCI application that could cause thread priority inversion and decrease Bluetooth connection reliability with FreeRTOS if the FreeRTOS timer task has been configured to have a lower priority than the Bluetooth tasks.
1224439	Channel Sounding initiator now logs reason for aborting.
1242491	Eliminated dependency on crypto dlls coming from Mosquitto installer that caused build failures in Bluetooth AoA host examples. From this fix on, Mosquitto has to be installed using the MSYS2 package manager tool, pacman.
1245534	Fixed an issue with address resolving that can cause bonding to fail if remote device changes its RPA and the RPA is resolved again before bonding is completed.
1279821	Fixed an issue where the Periodic Advertiser did not include the TX power value in the periodic advertising packet when configured by the host/application.

ID #	Description
1282707	If central device has lost bonding keys and peripheral has bonding confirmations enabled to allow re-bonding the connection, client supported features, settings, and subscriptions to notifications and indications are no longer erased.
1286177	Fixed an issue in Bluetooth host stack that anonymous advertising is allowed on scannable or connectable advertising.
1288445	Fixed an issue where PAwR didn't properly notify host of failed transmit
1289325	Added Power Manager logging support in the Bluetooth host stack library.
1298199	Fixed a problem in the simple_com UART component where a few bytes could be lost in high throughput edge cases.

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.si-labs.com/developers/bluetooth-low-energy in the Tech Docs tab.

ID #	Description	Workaround
361592	The sync_data event does not report TX power.	None
368403	If setting CTE interval to 1, a CTE request should be sent in every connection interval. But it is sent only in every second connection interval.	None
641122	The Bluetooth stack component does not provide a configuration for RF antenna path.	This is an issue specifically for BGM210P. One workaround is to manually update the configuration in sl_bluetooth_config.h in text edit mode. If the OTA with Apploader is used, include the bluetooth_feature_ota_config component in application project. Call command sl_bt_ota_set_rf_path() to set the RF path for OTA mode.
650079	LE 2M PHY on EFR32[B|M]G12 and EFR32[B|M]G13 doesn't work with smartphones using the Mediatek Helio chip due to an interoperability issue.	No workaround exists. For application development and testing, the disconnection can be avoided by disabling 2M PHY with sl_bt_connection_set_preferred_phy() or sl_bt_connection_set_default_preferred_phy().
682198	The Bluetooth stack has an interoperability issue on the 2M PHY with a Windows PC.	No workaround exists. For application development and testing, the disconnection can be avoided by disabling 2M PHY with sl_bt_connection_set_preferred_phy() or sl_bt_connection_set_default_preferred_phy().
730692	4-7% packet error rate is observed on EFR32M|BG13 devices when RSSI is between -25 and -10 dBm. The PER is nominal (as per the datasheet) both above and below this range.	None
756253	The RSSI value on a Bluetooth connection returned by the Bluetooth API is incorrect on EFR32M|B1, EFR32M|B12, EFR32M|B13, and EFR32M|B21 devices. On EFR32M|B21 devices. It is about 8~10 dBm higher than the actual value, according to a measurement.	Install the "RAIL Utility, RSSI" component in the application project. This component provides a default RSSI offset for the chip that is applied at the RAIL level and can help to achieve more accurate RSSI measurements.
845506	When the Bluetooth_feature_afh component for AFH is included, the feature initialization always enables AFH.	To include the component but not to enable AFH at device boot, change the parameter value from 1 to 0 in the function call of sl_btctrl_init_afh() in sl_bt_stack_init.c.
1031031	Changing the configuration in the bt_aoa_host_locator application results in the application crashing.	None
1227955	amazon_aws_soc_mqtt_over_ble and amazon_aws_soc_gatt_server examples don't advertise after booting up.	Increase configTIMER_TASK_STACK_DEPTH to 600 or above in config/FreeRTOSConfig.h in the project.

5 Deprecated Items

Deprecated in release 8.0.0.0

sl_bt_system_reset command

sl_bt_sm_set_bonding_key command

6 Removed Items

Removed from release 8.0.0.0

Feature bluetooth_feature_whitelisting

API types without the prefix "sl_bt" or "SL_BT"

sl_bt_advertiser_connection_mode_t type

sl_bt_advertiser_non_connectable type

sl_bt_advertiser_connectable_scannable type

sl_bt_advertiser_scannable_non_connectable type

sl_bt_advertiser_connectable_non_scannable type

sl_bt_advertiser_broadcast type

sl_bt_advertiser_user_data type

sl_bt_advertiser_set_phy() command

sl_bt_advertiser_set_configuration() command

sl_bt_advertiser_clear_configuration() command

sl_bt_advertiser_set_data() command

sl_bt_advertiser_set_long_data() command

sl_bt_advertiser_start() command

sl_bt_advertiser_start_periodic_advertising() command

sl_bt_advertiser_stop_periodic_advertising() command

sl_bt_sync_set_parameters() command

sl_bt_sync_open() command

sl_bt_scanner_set_timing() command

sl_bt_scanner_set_mode() command

sl_bt_ota_set_device_name() command

sl_bt_ota_set_advertising_data() command

sl_bt_ota_set_configuration() command

sl_bt_ota_set_rf_path() command

sl_bt_gap_enable_whitelisting() command

sl_bt_sm_add_to_whitelist() command

sl_bt_evt_scanner_scan_report event

sl_bt_evt_system_hardware_error event

sl_bt_evt_sync_opened event

sl_bt_evt_sync_transfer event

sl_bt_evt_sync_data event

7 Multiprotocol Gateway and RCP

7.1 New Items

Added in release 8.0.0.0

OpenWRT alpha support has been added for zigbeed, OTBR and Z3Gateway applications. Zigbeed and OTBR are now provided in IPK package format as well. See *AN1333: Running Zigbee, OpenThread, and Bluetooth Concurrently on a Linux Host with a Multiprotocol Co-Processor* for details.

7.2 Improvements

Changed in release 8.2.0.0

In Zigbeed, the halCommonGetInt32uMillisecondTick() tick API is now updated to use MONOTONIC clock so that it does not get affected by the NTP in a host system.

Changed in release 8.1.0.0

The zb_ble_dmp_print_ble_connections() API is defined in the zigbee_ble_event_handler component and referenced in the zigbee_ble_dmp_cli component. For applications that use the zigbee_ble_dmp_cli component, but NOT the zigbee_ble_event_handler, you will need to add an empty stub for this function in your app.c file as follows:

```
void zb_ble_dmp_print_ble_connections(void)

{

}
```

Changed in release 8.0.0.0

None.

7.3 Fixed Issues

Fixed in release 8.3.0.0

ID #	Description
1221299	Fixed an issue where RSSI Energy Scan offset showed a larger value on CMP RCP compared to NCP firmware. (Other ref: 1351125)
1275378	Fixed an issue where calling sl_802154_radio_set_scheduler_priorities() prior to sli_mac_lower_mac_init() could result in a crash. (Other ref: 1345866)
1346849	Adding the rail_mux components to a project will now cause it to automatically build with the associated stack library variants. (Other ref: 1349101)
1365665	Fixed an issue where the host would report receiving a packet with an invalid checksum on end-point 12. (Other ref: 1366153)

Fixed in release 8.2.0.0

ID #	Description
1332330	Fixed an issue where a 15.4+BLE RCP operating in an environment with heavy network traffic could occasionally encounter a race condition that would leave it unable to send messages up to CPCd until rebooting the device. (Other ref: 1333150)

ID #	Description
1337228	In Zigbeed the halCommonGetInt32uMillisecondTick() tick API is now updated to use MONOTONIC clock, so that it does not get affected by the NTP in a host system. (Other ref: 1346711)

Fixed in release 8.1.0.0

ID #	Description
1300848	An issue was fixed where Z3Gateway in OpenWRT environment couldn't start EZSP communication caused by mismatching termios control characters running on OpenWRT and other environments.

Fixed in release 8.0.0.0

ID #	Description
1231021	Avoid an OTBR assert by recovering the RCP rather than passing unhandled transmit errors to the sub mac.
1242948	Removed spurious test asserts from zigbeed.
1244459	Fixed issue where MAC-retried Indirect transmissions via RCP can result in a source match table entry for child being removed despite messages pending.
1245988	Fixed an issue where Zigbeed did not restart when performing a Trust Center Backup and Restore Reset Node action.
1282264	Fixed issue that could have interrupted radio transmit operations by clearing the transmit fifo prematurely, causing underflow.
1288653	Zigbee/OT/BLE SOC app will now print connection info upon receiving the CLI command "plugin ble gap print-connections".
1292537	Zigbee/BLE NCP application is now properly showing up in Simplicity Studio UI.
1252365	Added Coexistence plugin back into Zigbee NCP/OpenThread RCP sample application.
1293853	Reduced RAM footprint for zigbee_ncp-ot_rcp-spi and zigbee_ncp-ot_rcp_uart on MG21.
1124140	Fixed an issue where setting SL_OPENTHREAD_RADIO_RX_BUFFER_COUNT to a value other than 1 caused z3-light_ot-ftd_soc to not send Zigbee beacons after the OpenThread network is up.

7.4 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.si-labs.com/developers/simplicity-software-development-kit.

ID #	Description	Workaround
937562	Bluetoothctl ‘advertise on’ command fails with rcp-uart-802154-blehci app on Raspberry Pi OS 11.	Use btmgmt app instead of bluetoothctl.
1209958	The ZB/OT/BLE RCP on MG24 and MG21 can stop working after a few minutes when running all three protocols.	Will be addressed in a future release.

7.5 Deprecated Items

None.

7.6 Removed Items

Removed in release 8.0.0.0

None.

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 https://docs.silabs.com/bluetooth/latest/ . If you are new to Bluetooth see UG103.14: Bluetooth LE Fundamentals.

8.1 Installation and Use

The Bluetooth 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 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, 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 Simplicity 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/.

8.2 Security Information

Secure Vault Integration

When deployed to Secure Vault High devices, sensitive keys such as the Long Term Key (LTK) are protected using the Secure Vault Key Management functionality. The table below shows the protected keys and their storage protection characteristics.

Wrapped Key	Exportable / Non-Exportable	Notes
Remote Long Term Key (LTK)	Non-Exportable	
Local Long Term Key (legacy only)	Non-Exportable	
Remote Identity Resolving Key (IRK)	Exportable	Must be Exportable for future compatibility reasons
Local Identity Resolving Key	Exportable	Must be Exportable because the key is shared with other devices.

Wrapped keys that are marked as "Non-Exportable" can be used but cannot be viewed or shared at runtime.

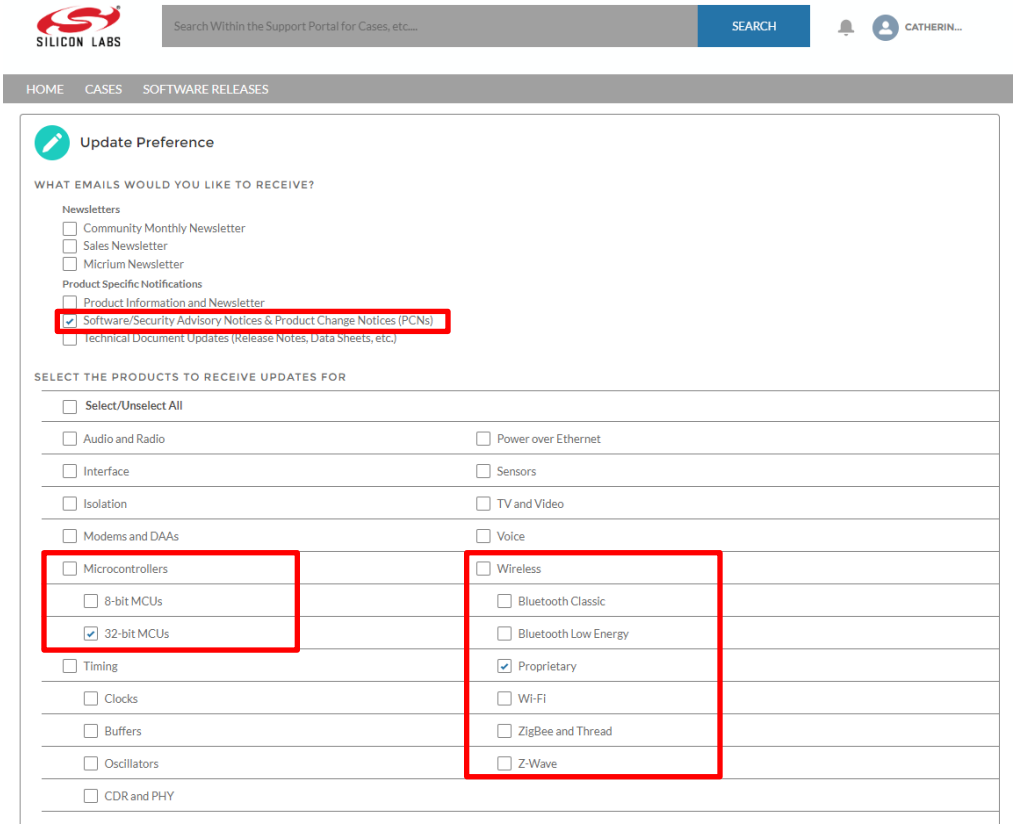
Wrapped keys that are marked as "Exportable" can be used or shared at runtime but remain encrypted while stored in flash.

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:



8.3 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.

Simplicity Studio

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SILICON LABS

Silicon Laboratories Inc.
400 West Cesar Chavez
Austin, TX 78701
USA

www.silabs.com