Silicon Labs *Bluetooth* Software 2.9.1

Software Version	2.9.1
Software Status	GA
Release Date	22nd of June, 2018
Affected Products	xGM11x Bluetooth low energy and mesh modules xGM12x Bluetooth low energy and mesh modules xGM13P Bluetooth low energy and mesh modules EFR32[B|M]G1 EFR32[B|M]G12 EFR32[B|M]G13 EFR32[B|M]G14

Changes: 2.9.1 compared to 2.9.0

New Features

Feature	Explanation
N/A	N/A

Notes

Note	Explanation
OTA	AN1086 has been updated for clarifying partial and full update.

Quality Improvements

Nothing in addition to the bug fixes mentioned in the next chapter.

Fixed Known Issues since the previous Release

ID	Issue	Explanation
4291	Connection	When AFH is enabled, Bluetooth connection becomes unstable after scanning is started.

ID	Issue	Explanation
4299	DTM	Transmitting unmodulated carrier does not work at the beginning of a DTM session. Workaround is to first test a different carrier type, e.g., PRBS9, then start unmodulated carrier test.

Known Issues in this Release

ID	Issue	Explanation
1835	GCC breakpoints	With certain events, GCC breakpoints cannot be set.
1992	BTDS plug-ins	BTDS plug-ins do not handle multiple instances of the same service.
3894	Robustness issue on closing connection	Eventually out of memory error will be returned if application repeats closing a connection while a GATT procedure is outstanding.
4215	Scanning	In passive scanning, the scanner should not report anything related to scannable extended advertising packets.
4292	Advertising	After an advertiser has been enabled, it stops advertising after some time.
4297	OTA	Updating user application (partial update) with an old version of the Apploader may fail. Workaround is to perform full update.

Silicon Labs *Bluetooth* Software 2.9.0

Software Version	2.9.0
Software Status	GA
Release Date	25th of May, 2018
Affected Products	xGM11x Bluetooth low energy and mesh modules xGM12x Bluetooth low energy and mesh modules xGM13P Bluetooth low energy and mesh modules EFR32[B|M]G1 EFR32[B|M]G12 EFR32[B|M]G13 EFR32[B|M]G14

Changes: 2.9.0 compared to 2.8.1

New Features

Feature	Explanation
Adaptive Frequency Hopping	The Bluetooth stack supports Adaptive Frequency Hopping (AFH), conforming to ETSI EN 300 328 - standard. To enable AFH in the Bluetooth stack, function gecko_init_afh() needs to be called following stack initialization.
Over 10 dBm TX power support	Maximum output power of Bluetooth can be +10dBm and over. The API for setting maximum TX power is gecko_cmd_system_set_tx_power(). Going over 10dBm requires enabling Adaptive Frequency Hopping.
RF Path Compensation	The Bluetooth stack allows configuring the RF path compensation for more accurate TX power control and RX RSSI value adjustment. The configuration is a new data field named rf in the Gecko configuration data structure gecko_configuration_t.
Extended advertising packet size increase	Maximum 191 bytes of advertising data or scan response data can be advertised in extended adverting packets. Use existing command gecko_cmd_le_gap_bt5_set_adv_data() to set the advertising data or scan response data.

Feature	Explanation
Advertising TX power	New command gecko_cmd_le_gap_set_advertise_tx_power() can be used to set the maximum advertising TX power for each individual advertisement set.
Include TX power in extended advertising packet header	New configuration flag has been added for the option of including TX power in extended advertising packet headers.

Notes

Note	Explanation
IAR compiler version	This SDK supports IAR compiler version 7.80.4. Other versions have not been tested.
GCC compiler version	This SDK supports GCC compiler version 7.2.1. Other versions have not been tested.
Command gecko_cmd_system_set_tx_power()	The functionality of this command has been clarified for setting maximum TX power. Same as earlier versions, the system will try to use the given value as actual TX power. In v2.9 SDK, actual TX power selection is additionally affected by other factors like AFH enabling status and RF path compensation. Please refer to the API reference manual for the detail.
Command gecko_cmd_le_gap_set_advertise_configuration()	This command has been extended for supporting new configuration flag to include TX power in extended advertising packet headers.
Command gecko_cmd_le_gap_start_advertising()	This command has been extended for supporting 191 bytes advertising data. It will automatically switch to extended advertising if connectable mode allows and advertising or scan response data is more than 31 bytes.
Event gecko_evt_le_gap_scan_response()	This event has been extended to support 191 bytes advertising and scan response data.
Command gecko_cmd_le_gap_bt5_set_adv_data()	This command has been extended to support 191 bytes advertising and scan response data.

Note	Explanation
OTA	When upgrading from earlier versions to v2.9 stack, the Apploader needs to be updated first.

Quality Improvements

Performance improvement to decrease radio idle time after receiving packet in passive scanning
Generic API document update for clarity and consistency
API document is also available in C header files

Fixed Known Issues since the previous Release

ID	Issue	Explanation
3712	OTA	OTA fails on devices that do not support high power PA.
3907	Connection timeout	When operating multiple coded advertisement sets and coded connections, timeout may happen on connection.
3939	PS Store	The Bluetooth stack used to de-initialize MSC after it accesses PS Store. This is now fixed by restoring the previous state.
3944	Pairing	The Bluetooth stack is unable to bond more than 5 devices.
3963	NCP	In NCP host, the message frame received from UART can be out of sync.
4055	Advertising	The stack does not support anonymous advertising.
4065	Advertising	When advertising on LE Coded PHY, the advertiser does not respond to scan requests.
4142	DTM	test_dtm_tx with PN9 as packet type always returns error.
4147	GATT Compiler	The GATT database compiler may generate incorrect GATT database if a characteristic is missing “properties” XML element.
4183	BGTool	The BGTool on Mac is unable to save log files.

ID	Issue	Explanation
4220	Advertising	The Bluetooth stack uses incorrect advertising intervals if the interval is set to a value larger than 41 seconds. This has been fixed by limiting maximum interval to 41 seconds.
4260	GATT	The Bluetooth stack may not send out service changed indications even the GATT database have been changed when using polymorphic GATT functionality.

Known Issues in this Release

ID	Issue	Explanation
1835	GCC breakpoints	With certain events, GCC breakpoints cannot be set.
1992	BTDS plug-ins	BTDS plug-ins do not handle multiple instances of the same service.
3894	Robustness issue on closing connection	Eventually out of memory error will be returned if application repeats closing a connection while a GATT procedure is outstanding.
4215	Scanning	In passive scanning, the scanner should not report anything related to scannable extended advertising packets.
4291	Connection	When AFH is enabled, Bluetooth connection becomes unstable after scanning is started.
4292	Advertising	After an advertiser has been enabled, it stops advertising after some time.
4297	OTA	Updating user application with an old version of the Apploader will fail. Workaround is to update Apploader to the version in v2.9 SDK first.
4299	DTM	Transmitting unmodulated carrier does not work at the beginning of a DTM session. Workaround is to first test a different carrier type, e.g., PRBS9, then start unmodulated carrier test.

Silicon Labs *Bluetooth* Software 2.8.1

Software Version	2.8.1
Software Status	GA
Release Date	23rd of March, 2018
Affected Products	xGM11x Bluetooth low energy and mesh modules xGM12x Bluetooth low energy and mesh modules xGM13P Bluetooth low energy and mesh modules EFR32[B|M]G1 EFR32[B|M]G12 EFR32[B|M]G13 EFR32[B|M]G14

Changes: 2.8.1 compared to 2.8.0

New Features

Feature	Explanation
N/A	N/A

Notes

Note	Explanation
Advertising	In SDK 2.8.0 and 2.8.1, a new feature is long range connection opening on LE Coded PHY. For supporting this feature, the stack is able to advertise on primary and secondary channels using extended advertising PDUs on LE Coded PHY. The stack does not support other extended advertising features in these releases.
Extension to event le_gap_scan_response	Bit 7 in packet_type parameter is now used for indicating the packet has extended advertising PDU type: Bit 7: legacy or extended advertising 0: Legacy advertising PDUs used 1: Extended advertising PDUs used Please refer to the API Reference Manual document for the details.

Quality Improvements

Nothing in addition to the bug fixes mentioned in the next chapter.

Fixed Known Issues since the previous Release

ID	Issue	Explanation
3226	Connection	In packet length negotiation, the device may use a maximum packet length that is unsupported by the remote device. This may cause IOP problems, e.g., disconnection with connection timeout error. This issue has actually been fixed since SDK 2.8.0.
3964	Advertising	The advertiser does not trigger timeout when advertising on LE Coded PHY.
3968	Connection opening	In some cases the default scan parameters may still be used for connection opening even though the application has set scan parameters.
3970	BGTool	The connection tabs are failed to open in the user interface after new connections are established.
3974	Connection opening	The stack may leak some memory when it connects to a remote device that is advertising using extended advertising PDUs.
3994	PTI	PTI may miss Bluetooth packets.
4042	Advertising	Restart advertising in user data mode right after disconnection does not work. User data does not present in the advertising data packets.
4052	Advertising	Event le_gap_scan_response does not indicate if a received packet is using legacy or extended adverting PDUs.
4058	Connection	When the device is the slave in a connection it may map to wrong channels if some channels have been blocked by the master. This will cause packet loss, or connection timeout in worst scenario.
4059	Advertising	When the device is advertising on LE Coded PHY, a scan request from the scanner may cause the device freezing.

Known Issues in this Release

ID	Issue	Explanation
1835	GCC breakpoints	With certain events, GCC breakpoints cannot be set.
1992	BTDS plug-ins	BTDS plug-ins do not handle multiple instances of the same service.
3894	Robustness issue on closing connection	Eventually out of memory error will be returned if application repeats closing a connection while a GATT procedure is outstanding.
3907	Connection timeout	When operating multiple coded advertisement sets and coded connections, timeout may happen on connection.
4055	Advertising	The stack does not support anonymous advertising.
4065	Advertising	When advertising on LE Coded PHY, the advertiser does not respond to scan requests.

Silicon Labs *Bluetooth* Software 2.8.0

Software Version	2.8.0
Software Status	GA
Release Date	23rd of February, 2018
Affected Products	xGM11x Bluetooth low energy and mesh modules xGM12x Bluetooth low energy and mesh modules xGM13P Bluetooth low energy and mesh modules EFR32[B|M]G1 EFR32[B|M]G12 EFR32[B|M]G13

Changes: 2.8.0 compared to 2.7.0 (build 2900)

New Features

Feature	Explanation
Extended Advertising on primary and secondary advertising channels	We now support Extended Advertising on primary and secondary advertising channels. LE 1M, 2M and Coded PHYs are supported. Relevant new commands: • cmd_le_gap_set_advertise_timing() • cmd_le_gap_set_advertise_channel_map() • cmd_le_gap_set_advertise_phy() • cmd_le_gap_set_advertise_report_scan_request() • cmd_le_gap_set_advertise_configuration() • cmd_le_gap_clear_advertise_configuration() • cmd_le_gap_start_advertising() • cmd_le_gap_stop_advertising()
Extended Scanning	We now support Extended Scanning on LE 1M and Coded PHYs. Relevant new commands: • cmd_le_gap_set_discovery_timing() • cmd_le_gap_set_discovery_type() • cmd_le_gap_start_discovery()
Opening *Bluetooth* connections on secondary advertising channels	*Bluetooth* connections can be initiated on secondary advertising channels. New command: • cmd_le_gap_connect()

Feature	Explanation
Static random address	The stack now supports using static random address as the *Bluetooth* identity address. Steps to take static random address into use: • Set the static random address in PS key FLASH_PS_KEY_LOCAL_BD_ADDR • Set value 1 in PS key FLASH_PS_KEY_IDENTITY_ADDR_TYPE • Reset the device
Bluetooth data channel classification	The stack now supports classifying data channels with cmd_le_gap_set_data_channel_classification() command.
DTM payload type 111111 support in BGTool	BGTool now supports payload 111111 for testing the LE Coded PHY.
User configurable priority tables for Link Layer operations	Link layer task priorities can be configured at device initialization.

Notes

Note	Explanation
Persistent Store command updates	We have updated the system so that some Persistent Store commands can continue to be functional for *Bluetooth* use cases in future. Thus we decided to keep these APIs and the deprecation notice on them is removed from *Bluetooth* SDK 2.8.0. These commands include: • cmd_flash_ps_erase() • cmd_flash_ps_erase_all() • cmd_flash_ps_load() • cmd_flash_ps_save()
BGAPI command removals	Following APIs have been removed from this release: • cmd_experiment_set_coded_phy_advertising() • cmd_experiment_set_coded_phy_discovery() • cmd_flash_ps_dump()
BGAPI command deprecations	Following commands are deprecated from this release onward. Please refer to the API Reference Manual document for corresponding replacements.

Note	Explanation
	• cmd_le_gap_set_adv_parameters() • cmd_le_gap_bt5_set_adv_parameters() • cmd_le_gap_set_adv_timeout() • cmd_le_gap_set_adv_data() • cmd_le_gap_set_mode() • cmd_le_gap_bt5_set_mode() • cmd_le_gap_set_scan_parameters() • cmd_le_gap_discover() • cmd_le_gap_open()
BGAPI event extensions	• evt_le_gap_adv_timeout_id: added a new parameter “handle” for indicating the advertising set handle on which the timeout has occurred. • evt_le_connection_opened_id: added a new parameter “advertiser” for indicating the advertising set handle on which the connection was opened. • evt_system_boot_id: added a new parameter “hash” for indicating the hash value of the current stack revision.
BGAPI event removals	• evt_flash_ps_key_id: This event is obsolete as cmd_flash_ps_dump() has been removed. • evt_le_gap_bt5_adv_timeout_id: This event has been removed for simplifying advertising timeout event notifications. The only advertising timeout event is evt_le_gap_adv_timeout_id. • evt_le_connection_bt5_opened_id: This event has been removed for simplifying connection opening event notifications. The only connection opened event is evt_le_connection_opened_id.
Cleanup of Persistent Store keys	Legacy Persistent Store keys that are no longer used have been removed from API headers.

Quality Improvements

Extended advertising interoperability improvements
Packet length negotiation interoperability improvements with *Bluetooth* 4.x implementations
Scanner channel switch time optimized
Bluetooth Wi-Fi co-existence improvements
Performance improvements when operating multiple connections, advertisements and scanner simultaneously
BGTool update for extended advertising and replacing PS dump with PS key read

Various fixes and improvements on API reference documentation
Other documentation updates

Fixed Known Issues since the previous Release

ID	Issue	Explanation
2987	CONNECT_REQ	CONNECT_REQ parameters are not all fully validated.
3304	Advertising scheduling	The first advertising packet scheduling always fails with dynamic multiprotocol use cases with RAIL. This has now been fixed.
3622	Unsupported value types in bgbuild	Bgbuild silently ignores unsupported value types. After the fix it will generate an error message for any unsupported value type.
3721	Device reset reason cleared	AppLoader clears device reset reason so that the reset cause read from the platform is always 0.
3737	Advertising using non-resolvable address	The stack only allows using non-resolvable address in non-connectable advertising. Now this has been fix. Non-resolvable address can also be used on scannable non-connectable advertising.
3754	Handling of non-existing output directory in bgbuild	Bgbuild does not report any error even it failed to generate GATT database output files when the output directory does not exist. After the fix it will create the output directory if it does not yet exist.
3834	Signature space reservation in AppLoader	AppLoader had an issue on handling signature space reservation which may cause application being placed in incorrect flash page.

Known Issues in this Release

ID	Issue	Explanation
1835	GCC breakpoints	With certain events, GCC breakpoints cannot be set.
1992	BTDS plug-ins	BTDS plug-ins do not handle multiple instances of the same service.
3317	Number of completed packets	Number of completed packets HCI event reports wrong packet number
3907	Connection timeout	When operating multiple coded advertisement sets and coded connections, timeout may happen on connection.
3894	Robustness issue on closing connection	Eventually out of memory error will be returned if application repeats closing a connection while a GATT procedure is outstanding.

Bluetooth Smart Software 2.7.0 build 2900

Software Version	2.7.0 build 2900
Software Status	GA
Release Date	20th of December, 2017
Affected Products	xGM11x *Bluetooth* Low Energy and Mesh Modules xGM12x *Bluetooth* Low Energy and Mesh Modules EFR32[B|M]G1 EFR32[B|M]G12 EFR32[B|M]G13

Changes: 2.7.0 (build 2900) compared to 2.6.1 (build 2848)

New Features

Feature	Explanation
Library approach	Silicon Labs *Bluetooth* stack is no longer delivered as a binary but as a set of libraries. For more information, please refer to updated UG136 document for more details.
OTA update	OTA functionality is now separated from the stack for better flexibility and more efficient flash consumption. For more information, please refer to updated AN1086 document for more details.
Long Range connections	We now have an experimental API for managing Long Range connections. The new commands are: • cmd_experiment_set_coded_phy_advertising() • cmd_experiment_set_coded_phy_discovery()
Dynamic multiprotocol	Dynamic multiprotocol support with Silicon Laboratories RAIL. For more information, please refer to updated UG305 and QSG155 documents for more details to get started.

Notes

Note	Explanation
Legacy bootloaders	Legacy OTA and NCP bootloaders for EFR32[B|M]G1 parts have been removed from the SDK. These were already deprecated earlier in 2.6.0 release.
Studio version update	This SDK is compliant with Simplicity Studio 4.1.4.6 or newer.
Simplicity Commander	This SDK is compliant with Simplicity Commander 1.0.0 or newer.

Quality Improvements

Wi-Fi co-existence bug fixes
Introduced Wi-Fi co-existence debug counters
Fixed a scanning issue, which made scanning to stop over time
Fixed an encryption issue, which prevented data writing when the data was certain length
Improved DTM implementation to return to RX state faster to prevent packet loss
Fixed procedure collisions within PHY updates
Various example application updates and improvements
Documentation updates
DTM functionality updated to better comply with the *Bluetooth* 5 specification
Improved interoperability with the latest iOS releases
Visual GATT Editor updates
GATT database robustness improvements
Race condition fixed in flash writing when RTOS is in use
Various tool improvements in the SDK
Improvements in PTI decoders for better *Bluetooth* traffic decoding with Network Analyzer

Fixed Known Issues since the previous Release

ID	Issue	Explanation
2350	Long Range connection interval	Coded PHY minimum connection interval is currently limited and documented to 40 ms, but the software does not check this.
3225	cmd_flash_ps_dump()	In the case one has more than 160 keys stored in PS Store, retrieving all values using this command may run out of memory. The right way is to use cmd_flash_ps_load() command instead and this is now properly documented.

Known Issues in this Release

ID	Issue	Explanation
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
1814	IAR and GCC compiler	One should not have both IAR and GCC toolchains active in Simplicity Studio when a new project is created. Otherwise the toolchain is automatically set to IAR, even if GCC was originally chosen.
1835	GCC breakpoints	With certain events, GCC breakpoints cannot be set.
1992	BTDS plug-ins	BTDS plug-ins do not handle multiple instances of the same service.
2987	CONNECT_REQ	CONNECT_REQ parameters are not all fully validated.
3304	Advertising scheduling	The first advertising packet scheduling always fails with dynamic multiprotocol use cases with RAIL

Bluetooth Smart Software 2.6.1 build 2848

Software Version	2.6.1 build 2848
Software Status	GA
Release Date	13th of December, 2017
Affected Products	xGM11x *Bluetooth* Low Energy and Mesh Modules xGM12x *Bluetooth* Low Energy and Mesh Modules EFR32[B|M]G1 EFR32[B|M]G12 EFR32[B|M]G13

Changes: 2.6.1 (build 2848) compared to 2.6.0 (build 2729)

New Features

Feature	Explanation
cmd_coex_get_counters()	New command to read coexistence statistic counters from the device.

Notes

Note	Explanation
-	-

Quality Improvements

Wi-Fi co-existence bug fixes
Introduced Wi-Fi co-existence debug counters
Fixed a scanning issue, which made scanning to stop over time
Fixed an encryption issue, which prevented data writing when the data was certain length
Improved DTM implementation to return to RX state faster to prevent packet loss

Fixed Known Issues since the previous Release

ID	Issue	Explanation
-	-	-

Known Issues in this Release

ID	Issue	Explanation
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
1814	IAR and GCC compiler	One should not have both IAR and GCC toolchains active in Simplicity Studio when a new project is created. Otherwise the toolchain is automatically set to IAR, even if GCC was originally chosen.
1835	GCC breakpoints	With certain events, GCC breakpoints cannot be set.
1992	BTDS plug-ins	BTDS plug-ins do not handle multiple instances of the same service.
2350	Long Range connection interval	Coded PHY minimum connection interval is currently limited and documented to 40 ms, but the software does not check this.
2987	CONNECT_REQ	CONNECT_REQ parameters are not all fully validated.
3225	cmd_flash_ps_dump()	In the case one has more than 160 keys stored in PS Store, retrieving all values using this command may run out of memory. Workaround is to use cmd_flash_ps_load() command instead.

Bluetooth Smart Software 2.6.0 build 2729

Software Version	2.6.0 build 2729
Software Status	GA
Release Date	27th of October, 2017
Affected Products	xGM11x *Bluetooth* Low Energy and Mesh Modules xGM12x *Bluetooth* Low Energy and Mesh Modules EFR32[B|M]G1 EFR32[B|M]G12 EFR32[B|M]G13

Changes: 2.6.0 (build 2729) compared to 2.6.0 (build 2673)

New Features

Feature	Explanation
-	-

Notes

Note	Explanation
Studio version update	This SDK is compliant with Simplicity Studio 4.1.4 or newer.
Simplicity Commander	This SDK is compliant with Simplicity Commander 0.25.2 or newer.
HW Configurator	The tool is no longer used in *Bluetooth* SDK.

Quality Improvements

Example applications updated based on Beta feedback
Documentation updates
Wi-Fi coexistence fixes based on Beta feedback
Memory handling robustness fix for high baud rate UART
system_set_device_name() response fixed (was a Beta specific issue, not present in previous releases)
SDK tooling fixes based on Beta feedback

Visual GATT Editor backwards compatibility fixed
SDK Missing EFR32BG13 product variants added
Link layer is no longer disconnects if the remote device rejects Data Length Update request, so backwards compatibility with 4.2 controllers is better

Fixed Known Issues since the previous Release

ID	Issue	Explanation
-	-	-

Known Issues in this Release

ID	Issue	Explanation
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
1814	IAR and GCC compiler	One should not have both IAR and GCC toolchains active in Simplicity Studio when a new project is created. Otherwise the toolchain is automatically set to IAR, even if GCC was originally chosen.
1835	GCC breakpoints	With certain events, GCC breakpoints cannot be set.
1992	BTDS plug-ins	BTDS plug-ins do not handle multiple instances of the same service.
2350	Long Range connection interval	Coded PHY minimum connection interval is currently limited and documented to 40 ms, but the software does not check this.
2987	CONNECT_REQ	CONNECT_REQ parameters are not all fully validated.
3225	cmd_flash_ps_dump()	In the case one has more than 160 keys stored in PS Store, retrieving all values using this command may run out of memory. Workaround is to use cmd_flash_ps_load() command instead.

Bluetooth Smart Software 2.6.0 build 2673

Software Version	2.6.0 build 2673
Software Status	Beta
Release Date	4th of October, 2017
Affected Products	xGM11x *Bluetooth* Low Energy and Mesh Modules xGM12x *Bluetooth* Low Energy and Mesh Modules EFR32[B|M]G1 EFR32[B|M]G12 EFR32[B|M]G13

Changes: 2.6.0 (build 2673) compared to 2.4.2 (build 2500)

New Features

Feature	Explanation
Link layer qualification	Link layer qualification updated to *Bluetooth* 5.
Host stack qualification	Host stack qualification updated to *Bluetooth* 5.
Dynamic multiprotocol	Dynamic multiprotocol support with Silicon Laboratories Zigbee stack. Example reference application demonstrating the usage can be found from Zigbee 6.0.0 SDK.
Micrium OS5	Example application showing how to use Silicon Laboratories *Bluetooth* stack with Micrium OS5 kernel has been added. The example application has been tested to work on BRD4159A radio board only at this point.
Wi-Fi coexistence	PTA based 802.11 coexistence support added.
Voice over *Bluetooth*	Example application showing how to use Silicon Laboratories *Bluetooth* stack for voice use cases has been added. The example runs on BRD4160A Thunderboard Sense radio board.
Packet Extensions	This release now fully supports link layer packet size up to maximum 251 bytes.

Feature	Explanation
LNA support	This SDK now supports configuring and using LNA, used by MGM12P Mesh Module.
cmd_le_connection_close()	New command to close connections. Replaces a deprecated cmd_endpoint_close().
cmd_system_linklayer_configure()	New command to send configuration data to link layer.

Notes

Note	Explanation
Studio version update	This SDK is compliant with Simplicity Studio 4.1.4 or newer.
Simplicity Commander	This SDK is compliant with Simplicity Commander 0.25.2 or newer.
Legacy bootloaders	Legacy OTA and NCP bootloaders are deprecated, but those are not removed yet. However, Gecko Bootloader is recommended to be used with all new applications and updates of the existing applications. More information about the Gecko Bootloader can be found from UG266: Silicon Labs Gecko Bootloader User Guide.
Soft timer robustness improvements	Robustness of soft timers has been improved. Maximum number of soft timers is restricted, and up to 16 soft timers can be configured at boot time. Default configuration is 4. More details in API Reference Manual (cmd_hardware_set_soft_timer chapter).
cmd_endpoint_close()	This command is now deprecated. cmd_le_connection_close() should now be used to close connections.
cmd_endpoint_x()	All other endpoint commands, events, enumerations and defines have been removed • cmd_endpoint_read_counters() • cmd_endpoint_send() • cmd_endpoint_set_streaming_destination() • evt_endpoint_data • evt_endpoint_status • evt_endpoint_syntax_error • enum_endpoint_types

Note	Explanation
	• define_endpoint_endpoint_flags

Quality Improvements

Improvements in PTI decoders for better Bluetooth traffic decoding with Network Analyzer
Improved HCI implementation for Bluetooth 5 qualification purpose
Improvements and bug fixes in Visual GATT Editor
RAM consumption optimizations with multiple simultaneous connections
Fixed interrupts when closing connections using an endpoint
Improvements and bug fixes in SDK example applications
Robustness improvements in advertising when sending a lot of notifications
BTDS plug-ins updated
Link layer error handling optimized
Internal memory handling of the stack and link layer improved
PS Store access made more robust
Documentation and API Reference Manual improvements and additions
More GATT database validation rules added for robustness
Long Range over-deviation issues fixed
Link layer scheduler improvements to ensure robust advertising during scanning
LLCP event handling fixed in link layer
Optimized starting of listening after sending advertisement packets in link layer
PN9 signal can now be generated on all supported PHYs
Link layer scan response event handling improved
Data throughput improved by optimizing the handling of connection events in link layer
Connection termination procedure fixed for the slave side in link layer
Bonding fixed for private resolvable addresses on slave side

Fixed Known Issues since the previous Release

ID	Issue	Explanation
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
1487	Bonding with 8 slaves	8th consecutive bonding by master device fails with multiple slaves.

Known Issues in this Release

ID	Issue	Explanation
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
1814	IAR and GCC compiler	One should not have both IAR and GCC toolchains active in Simplicity Studio when a new project is created. Otherwise the toolchain is automatically set to IAR, even if GCC was originally chosen.
1835	GCC breakpoints	With certain events, GCC breakpoints cannot be set.
1992	BTDS plug-ins	BTDS plug-ins do not handle multiple instances of the same service.
2350	Long Range connection interval	Coded PHY minimum connection interval is currently limited and documented to 40 ms, but the software does not check this.
2987	CONNECT_REQ	CONNECT_REQ parameters are not all fully validated.

Bluetooth Smart Software 2.4.2 build 2500

Software Version	2.4.2 build 2500
Software Status	GA
Release Date	16th of August, 2017
Affected Products	BGM11x *Bluetooth* Smart Modules BGM12x *Bluetooth* Smart Modules EFR32[B|M]G1 EFR32[B|M]G12 EFR32[B|M]G13

Changes: 2.4.2 (build 2500) compared to 2.4.1 (build 2394)

New Features

Feature	Explanation
OTA advertisement packets	There is a new value (“2”) in the scan_resp field of the cmd_le_gap_set_adv_data() command to select data also for the OTA advertisement packets. The data is stored in FLASH_PS_KEY_OTA_ADVERTISEMENT_PACKET.

Notes

Note	Explanation
-	-

Quality Improvements

Fixed sleep wake up timing for EFR32[B|M]G1 based products
Fixed Micrium kernel integration issues preventing in-place OTA from working

Fixed Known Issues since the previous Release

ID	Issue	Explanation
-	-	-

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
1487	Bonding with 8 slaves	8th consecutive bonding by master device fails with multiple slaves.
1814	IAR and GCC compiler	One should not have both IAR and GCC toolchains active in Simplicity Studio when a new project is created. Otherwise the toolchain is automatically set to IAR, even if GCC was originally chosen.
1835	GCC breakpoints	With certain events, GCC breakpoints cannot be set.
1992	BTDS plug-ins	BTDS plug-ins do not handle multiple instances of the same service.
2350	Long Range connection interval	Coded PHY minimum connection interval is currently limited and documented to 40 ms, but the software does not check this.

Bluetooth Smart Software 2.4.1 build 2394

Software Version	2.4.1 build 2394
Software Status	GA
Release Date	14th of July, 2017
Affected Products	BGM11x *Bluetooth* Smart Modules BGM12x *Bluetooth* Smart Modules EFR32[B|M]G1 EFR32[B|M]G12 EFR32[B|M]G13

Changes: 2.4.1 (build 2394) compared to 2.4.0 (build 2328)

New Features

Feature	Explanation
-	-

Notes

Note	Explanation
-	-

Quality Improvements

Fixed GATT Write Long Characteristics Value functionality in the case of multiple masters
Switched Multiprotocol trust center example application fixed to work also with Raspberry Pi
OTA DFU NCP example application fixed to work also with Mac OS X
Link layer scheduler updated to handle concurrent scanning and advertising in more robust way
Fixed scan response packets from resolvable random address
Fixed coded PHY TX packets over-deviating
Fixed DTM test issues in case of invalid parameters (like unsupported PHY)

Fixed Known Issues since the previous Release

ID	Issue	Explanation
-	-	-

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
1487	Bonding with 8 slaves	8th consecutive bonding by master device fails with multiple slaves.
1814	IAR and GCC compiler	One should not have both IAR and GCC toolchains active in Simplicity Studio when a new project is created. Otherwise the toolchain is automatically set to IAR, even if GCC was originally chosen.
1835	GCC breakpoints	With certain events, GCC breakpoints cannot be set.
1992	BTDS plug-ins	BTDS plug-ins do not handle multiple instances of the same service.
2350	Long Range connection interval	Coded PHY minimum connection interval is currently limited and documented to 40 ms, but the software does not check this.

Bluetooth Smart Software 2.4.0 build 2328

Software Version	2.4.0 build 2328
Software Status	GA
Release Date	9th of June, 2017
Affected Products	BGM11x *Bluetooth* Smart Modules BGM12x *Bluetooth* Smart Modules EFR32[B|M]G1 EFR32[B|M]G12 EFR32[B|M]G13

Changes: 2.4.0 (build 2328) compared to 2.3.2 (build 2263)

New Features

Feature	Explanation
EFR32[B|M]G13	Support for EFR32BG13 and EFR32MG13 product families added.
BGM11S	Support for BGM11S *Bluetooth* Smart Module added.
Long Range	*Bluetooth* 5 Long Range support for EFR32[B|M]13 product family.
PLFRCO	PLFRCO support for EFR32[B|M]G13 product family.
Privacy 1.2 for peripheral	*Bluetooth* 4.2 Privacy 1.2 for peripheral is now supported for random addressing.
Polymorphic GATT DB	This feature can be used to dynamically show or hide GATT features.
GCC compiler support	This SDK release contains GA level support for GCC compiler version 4.9.3.
CSA#2	*Bluetooth* 5 channel selection algorithm supported.
Bonding handling algorithm	There is a new algorithm to handle bondings in a way that flash usage is minimized.

Feature	Explanation
cmd_gatt_prepare_characteristic_value_reliable_write()	This command can be used to add a characteristic value to the write queue of a remote GATT server and verify if the value was correctly received by the server.
cmd_gatt_server_set_capabilities()	This command can be used to set which capabilities should be enabled in the local GATT database.
cmd_le_gap_set_privacy_mode()	This command can be used to enable or disable privacy feature on all GAP roles.
cmd_system_set_bt_address()	This command can be used to set the Bluetooth public address.
cmd_system_set_device_name()	This command can be used to set the device name.
cmd_user_message_to_target()	This command can be used by an NCP host to send a message to the target application on the device. Part of a new API class called user.
evt_user_message_to_host event	This event can be used by the target application on the device to send a message to NCP host. Part of a new API class called user.

Notes

Note	Explanation
Mobile applications	Silicon Labs Blue Gecko application with OTA update capability is now available for both Android and iOS devices. Downloadable via Play Store and App Store.
BGScript for EFR32[B|M]G1	BGScript is no longer supported for any product families.
Studio version update	This SDK is compliant with Simplicity Studio 4.13 or newer.
Simplicity Commander	This SDK is compliant with Simplicity Commander 0.24.1 or newer.
BGAPI HW, flash and utilities command removal	The following BGAPI commands are removed in this release: • cmd_hardware_config_adc_reference() • cmd_hardware_configure_gpio() • cmd_hardware_read_adc()

Note	Explanation
	• cmd_hardware_read_adc_channel() • cmd_hardware_read_gpio() • cmd_hardware_read_i2c() • cmd_hardware_set_uart_configuration() • cmd_hardware_stop_i2c() • cmd_hardware_write_gpio() • cmd_hardware_write_i2c() • cmd_util_atoi() • cmd_util_itoa() The following BGAPI events will be deprecated in the next major release: • evt_hardware_interrupt The following BGAPI enumerations will be deprecated in the next major release: • enum_hardware_adc_channel • enum_hardware_adc_reference • enum_hardware_gpio_mode • enum_hardware_uartparity
cmd_gatt_server_set_database()	This command is now deprecated and will be removed in future releases.
enum_le_connection_security	Extended with le_connection_mode1_level4 to be used for authenticated secure connections pairing with encryption using a 128-bit strength encryption key.
IAR libraries for building *Bluetooth* stack	*Bluetooth* SDK now includes the following libraries for IAR projects: • bgapi.a • libbluetooth.a • libembedtls.a • librail.a • libbootloader_api.a Note that in-place OTA DFU will not work when the stack is built using these libraries.

Quality Improvements

API documentation improved
General documentation updates
Example applications and demos updated in the SDK
Improvements and bugs fixes in Visual GATT Editor
Continuously modulated RF signal support added

Memory handling robustness improvements for GATT operations
HW initialization simplified
PTI decoders improved for *Bluetooth* usage
OTA DFU throughput improvements
BGAPI command handling optimized and made faster
BGTool and bgbuild tools updated
Increased encrypted PDU size for over the air packets to 160 bytes
Gecko Bootloader version is now reported in evt_system_boot event (when legacy bootloaders are used, version is reported as 0)
Improvements in Switched Multi-Protocol use cases, demos and examples
BTDS plug-ins updated
BGAPI command parsing robustness improved
iOS and Android interoperability improved
Bonding handling robustness improvements
LLCP operations handling improved

Fixed Known Issues since the previous Release

ID	Issue	Explanation
1248	Prepare write request	Prepare write request does not fail with gatt_prodecure_completed event if data is corrupted.

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
1487	Bonding with 8 slaves	8th consecutive bonding by master device fails with multiple slaves.

ID	Issue	Explanation
1814	IAR and GCC compiler	One should not have both IAR and GCC toolchains active in Simplicity Studio when a new project is created. Otherwise the toolchain is automatically set to IAR, even if GCC was originally chosen.
1835	GCC breakpoints	With certain events, GCC breakpoints cannot be set.
1992	BTDS plug-ins	BTDS plug-ins do not handle multiple instances of the same service.
2220	DTM parameters	DTM tests are not run correctly if invalid parameters (like unsupported PHY) are given to test commands.
2350	Long Range connection interval	Coded PHY minimum connection interval is currently limited and documented to 40 ms, but the software does not check this.
2364	Long Range TX packets	Coded PHY TX packets are over-deviating, causing possible IOP issues.

Bluetooth Smart Software 2.3.2 build 2263

Software Version	2.3.2 build 2263
Software Status	GA
Release Date	26th of May, 2017
Affected Products	BGM111 *Bluetooth* Smart Module BGM113 *Bluetooth* Smart Module BGM121 *Bluetooth* Smart Module EFR32BG1 Blue Gecko EFR32BG12 Blue Gecko EFR32MG1 Mighty Gecko EFR32MG12 Mighty Gecko

Changes: 2.3.2 (build 2263) compared to 2.3.1 (build 2044)

New Features

Feature	Explanation
-	-

Notes

Note	Explanation
-	-

Quality Improvements

API documentation improved
Interrupting OTA DFU does not brick the device anymore
Bluetooth 5 connection event is no longer raised when legacy API is used to open the connection
Empty data buffer handling fixed in UART
RTCC overflow fixed, enabling also multiple soft timers to work correctly
Stack initialization no longer fails because of RTCC counter values
Stack no longer freezes when calling cmd_gatt_set_characteristic_notification() when the remote GATT server has been disconnected
Pairing timeout with Mac OS fixed by adding IRK for local device so bonded device can resolve the private address

Current consumption reduced when a connection is closed immediately after opening it
BGTool fixed to build BGScript examples correctly

Fixed Known Issues since the previous Release

ID	Issue	Explanation
-	-	-

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
1248	Prepare write request	Prepare write request does not fail with gatt_prodecure_completed event if data is corrupted.
1487	Bonding with 8 slaves	8th consecutive bonding by master device fails with multiple slaves.
1814	IAR and GCC compiler	One should not have both IAR and GCC toolchains active in Simplicity Studio when a new project is created. Otherwise the toolchain is automatically set to IAR, even if GCC was originally chosen.

Bluetooth Smart Software 2.3.1 build 2044

Software Version	2.3.1 build 2044
Software Status	GA
Release Date	10th of April, 2017
Affected Products	BGM111 *Bluetooth* Smart Module BGM113 *Bluetooth* Smart Module BGM121 *Bluetooth* Smart Module EFR32BG1 Blue Gecko EFR32BG12 Blue Gecko EFR32MG1 Mighty Gecko EFR32MG12 Mighty Gecko

Changes: 2.3.1 (build 2044) compared to 2.3.0 (build 1981)

New Features

Feature	Explanation
-	-

Notes

Note	Explanation
-	-

Quality Improvements

Documentation updates
Thunderboard Sense example supports GCC as well
Fixed device reset which was caused by protocol timer wrap-around
Fixed device reset which was caused by overlapping DCDC settings when using high TX power
Fixed DTM RX issue for EFR32[B|M]G12 products
Fixed RTCC timer overflow issue, which caused cmd_hardware_get_time() command not to work correctly
Fixed in-place OTA feature to work correctly with secure boot and firmware image signing
Fixed BTDS plug-ins for Simplicity Studio and IAR projects

Fixed OTA DFU for EFR32[B|M]G12 products with Gecko Bootloader (both with security enabled and with security disabled)

Fixed Known Issues since the previous Release

ID	Issue	Explanation
-	-	-

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
1248	Prepare write request	Prepare write request does not fail with gatt_prodecure_completed event if data is corrupted.
1487	Bonding with 8 slaves	8th consecutive bonding by master device fails with multiple slaves.
1814	IAR and GCC compiler	One should not have both IAR and GCC toolchains active in Simplicity Studio when a new project is created. Otherwise the toolchain is automatically set to IAR, even if GCC was originally chosen.

Bluetooth Smart Software 2.3.0 build 1981

Software Version	2.3.0 build 1981
Software Status	GA
Release Date	10th of March, 2017
Affected Products	BGM111 *Bluetooth* Smart Module BGM113 *Bluetooth* Smart Module BGM121 *Bluetooth* Smart Module EFR32BG1 Blue Gecko EFR32BG12 Blue Gecko EFR32MG1 Mighty Gecko EFR32MG12 Mighty Gecko

Changes: 2.3.0 (build 1981) compared to 2.1.1 (build 1691)

New Features

Feature	Explanation
EFR32[B|M]G12	Support for EFR32BG12 and EFR32MG12 product families with maximum 256 kB of RAM and maximum 1024 kB of flash added.
2M PHY	Implementation for *Bluetooth* 5 2M PHY feature added. Supported in EFR32BG12 and EFR32MG12 parts.
Switched multiprotocol support	This SDK supports switched multiprotocol use cases with EFR32[B|M]G12 parts, enabling switching between Bluetooth and mesh stacks at boot time and allowing data exchange between the stacks. For more information, please see UG267: Multiprotocol User Guide.
BGAPI command size	BGAPI command size is fixed to the maximum size of 256 bytes in stand-alone and NCP modes.
ATT MTU size	ATT MTU maximum size has been increased to 250 bytes.

Feature	Explanation
GCC compiler support	This SDK release contains Beta level support for GCC compiler.
Advertisement Sets	This release contains support for *Bluetooth* 5 Advertisement Sets feature.
cmd_le_gap_bt5_set_adv_data()	This command is the same as cmd_le_gap_set_adv_data, but it has been extended to support *Bluetooth* 5 advertisement sets feature.
cmd_le_gap_bt5_set_adv_parameters()	This command is the same as cmd_le_gap_set_adv_parameters, but it has been extended to support *Bluetooth* 5 advertisement sets feature.
cmd_le_gap_bt5_set_mode()	This command is the same as cmd_le_gap_set_mode, but it has been extended to support *Bluetooth* 5 advertisement sets feature.
evt_le_connection_bt5_opened	This event is the same as evt_le_connection_opened, but it has been extended to support *Bluetooth* 5 advertisement sets feature.
evt_le_gap_scan_request	This event reports any scan request received in advertisement mode if scan request reporting is enabled.
enum_le_gap_adv_address_type	Identity and non-resolvable advertisement address types added.
cmd_system_halt()	This command forces radio to idle state and allows device to sleep. Advertising, scanning, connections and software timers are also halted.

Notes

Note	Explanation
Studio version update	This SDK is compliant with Simplicity Studio 4.11 or newer.

Note	Explanation
Simplicity Commander	This SDK is compliant with Simplicity Commander 0.22.1 or newer.
Gecko Bootloader	This SDK contains support for the new Gecko Bootloader, supporting also secure DFU. For Bluetooth SDK, Gecko Bootloader is the only supported bootloader for EFR32[B|M]G12 product families for now on. For EFR32[B|M]G1 product families, the legacy OTA and UART bootloaders are also supported still. More information about the new bootloader can be found from UG266: Silicon Labs Gecko Bootloader User Guide.
bgapi.a	All applications using BGAPI must now be linked with bgapi.a library.
DTM extensions	New parameter phy added to the following DTM commands: • test_dtm_rx(channel) => test_dtm_rx(channel, phy) • test_dtm_tx(packet_type, length, channel) => test_dtm_tx(packet_type, length, channel, phy) Using test_phy_1m as the phy parameter value will produce the same behavior as before.
Crypto cores	EFR32[B|M]G12 product family supports two crypto cores. Core 0 is always used by the *Bluetooth* stack, leaving core 1 for the application.
BRD4156A and BRD4157B	These radio boards are no longer supported by this SDK. These are replaced by BRD4164A and BRD4163A.
BGScript with EFR32[B|M]G12	BGScript is no longer supported in these product families.

BGScript changes for EFR32[B|M]G1	The following commands and events have changed to comply with the new features and improvements, and user applications must be changed accordingly.
	• sent_len parameter added to the response message:
	  ○ gatt_prepare_characteristic_value_write(connection, characteristic, offset, value_len, value_data)(result, sent_len)
	  ○ gatt_write_characteristic_value_without_response(connection, characteristic, value_len, value_data)(result, sent_len)
	  ○ gatt_server_send_user_read_response(connection, characteristic, att_errorcode, value_len, value_data)(result, sent_len)
	  ○ gatt_server_send_characteristic_notification(connection, characteristic, value_len, value_data)(result, sent_len)
	• max_mtu parameter added to the response message:
	  ○ gatt_set_max_mtu(max_mtu)(result, max_mtu)

Note	Explanation
	• txsize (maximum Data Channel PDU payload size the controller can send in an air packet) parameter has been added to le_connection_parameter event ◦ le_connection_parameters(connection, interval, latency, timeout, security_mode, txsize)
BGScript deprecation	BGScript support, also in EFR32[B|M]G1 products, will be discontinued in the next major release.
BGAPI HW, flash and utilities command deprecation	The following BGAPI commands will be deprecated in the next major release: • cmd_flash_ps_dump() • cmd_flash_ps_erase_all() • cmd_flash_ps_save() • cmd_flash_ps_load() • cmd_flash_ps_erase() • cmd_hardware_config_adc_reference() • cmd_hardware_configure_gpio() • cmd_hardware_enable_dcdc() • cmd_hardware_get_time() • cmd_hardware_read_adc() • cmd_hardware_read_adc_channel() • cmd_hardware_read_gpio() • cmd_hardware_read_i2c() • cmd_hardware_set_uart_configuration() • cmd_hardware_stop_i2c() • cmd_hardware_write_gpio() • cmd_hardware_write_i2c() • cmd_util_atoi() • cmd_util_itoa() The following BGAPI events will be deprecated in the next major release: • evt_hardware_interrupt The following BGAPI enumerations will be deprecated in the next major release: • enum_hardware_adc_channel • enum_hardware_adc_reference • enum_hardware_gpio_mode • enum_hardware_uartparity

Quality Improvements

Documentation updates
Example applications and demos ported also to the new products
Link layer packet size increased to 128 bytes
LEUART functionality verified
HCI packet handling improved
When using OTA DFU, firmware size is pre-checked prior to writing it to flash
Thunderboard Sense demo added to the SDK
Data corruption prevented in BGAPI by making the API level data checks more robust
GATT local database now supports attribute value and user-handled characteristic length up to 512 bytes
GATT compiler and parser, handling gatt.xml files, have been improved
DTM updated to comply with new *Bluetooth* 5 features
Maximum number of stored bondings have been increased to 14
Memory overflows prevented in internal memory handling
Connection closed events are no longer lost, even if the connection is lost in the middle of bonding
Scan response handling improved
GATT server memory overflow fixed
ATT level buffer handling improved
Windows 10 interoperability improved
gatt_prepare_characteristic_value_write command does not anymore silently discard too long data
BGTool updated to comply with new *Bluetooth* 5 features
Data size is now reported within le_connection_parameters event for better application level throughput optimization
J-Link interface changed from JTAG to SWD for the legacy bootloader IAR project to enable bootloader code debugging
OTA DFU can now utilize larger ATT MTU size for better throughput
Visual GATT Editor updated
Security Manager robustness improvements

Fixed Known Issues since the previous Release

ID	Issue	Explanation
681	gatt_server_send_user_write_response()	If a user application tries to send a user write response greater than 128 bytes, the stack crashes.
1431	gap_set_mode()	The command does not return an error if the device is being set to connectable mode and the maximum number of connections has been reached.

ID	Issue	Explanation
1432	le_gap_open()	The command stalls if device is advertising as connectable and has reached max_connections – 1.
1445	ATT MTU size	To avoid a possible memory overflow in BGAPI, the maximum ATT MTU size should be limited to 121 bytes.

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
1248	Prepare write request	Prepare write request does not fail with gatt_prodecure_completed event if data is corrupted.
1487	Bonding with 8 slaves	8th consecutive bonding by master device fails with multiple slaves.
1814	IAR and GCC compiler	One should not have both IAR and GCC toolchains active in Simplicity Studio when a new project is created. Otherwise the toolchain is automatically set to IAR, even if GCC was originally chosen.

Bluetooth Smart Software 2.1.1 build 1691

Software Version	2.1.1 build 1691
Software Status	GA
Release Date	21st of December, 2016
Affected Products	BGM111 *Bluetooth* Smart Module BGM113 *Bluetooth* Smart Module BGM121 *Bluetooth* Smart Module EFR32 Blue Gecko EFR32 Mighty Gecko

Changes: 2.1.1 (build 1691) compared to 2.1.0 (build 1638)

New Features

Feature	Explanation
-	-

Notes

Note	Explanation
-	-

Quality Improvements

Fixed a memory leak in pairing procedure using secure connections
Fixed a firmware update issue, which prevented updating the software from 2.0.x version to 2.1.x version
Fixed BGTool Commander path in OS X version of the SDK
Removed obsolete 2.0.x SDK documentation

Fixed Known Issues since the previous Release

ID	Issue	Explanation
-	-	-

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
681	gatt_server_send_user_write_response()	If a user application tries to send a user write response greater than 128 bytes, the stack crashes. The limitation is now properly documented, but the root cause has not been fixed yet in this release.
1248	Prepare write request	Prepare write request does not fail with gatt_prodecure_completed event if data is corrupted.
1431	gap_set_mode()	The command does not return an error if the device is being set to connectable mode and the maximum number of connections has been reached.
1432	le_gap_open()	The command stalls if device is advertising as connectable and has reached max_connections – 1.
1445	ATT MTU size	To avoid a possible memory overflow in BGAPI, the maximum ATT MTU size should be limited to 121 bytes.

Bluetooth Smart Software 2.0.3 build 1690

Software Version	2.0.3 build 1690
Software Status	GA
Release Date	21st of December, 2016
Affected Products	BGM111 *Bluetooth* Smart Module BGM113 *Bluetooth* Smart Module BGM121 *Bluetooth* Smart Module EFR32 Blue Gecko EFR32 Mighty Gecko

Changes: 2.0.3 (build 1690) compared to 2.0.2 (build 1604)

New Features

Feature	Explanation
-	-

Notes

Note	Explanation
-	-

Quality Improvements

Fixed a memory leak in pairing procedure using secure connections
Fixed a firmware update issue, which prevented updating the software from 2.0.x version to 2.1.x version

Fixed Known Issues since the previous Release

ID	Issue	Explanation
-	-	-

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
681	gatt_server_send_user_write_response()	If a user application tries to send a user write response greater than 128 bytes, the stack crashes. The limitation is now properly documented, but the root cause has not been fixed yet in this release.

Bluetooth Smart Software 2.1.0 build 1638

Software Version	2.1.0 build 1638
Software Status	GA
Release Date	5th of December, 2016
Affected Products	BGM111 *Bluetooth* Smart Module BGM113 *Bluetooth* Smart Module BGM121 *Bluetooth* Smart Module EFR32 Blue Gecko EFR32 Mighty Gecko

Changes: 2.1.0 (build 1638) compared to 2.0.0 (build 1391)

New Features

Feature	Explanation
ATT MTU size increase	Attribute Protocol MTU maximum size is now 126 bytes.
Graphical GATT Editor	This new tool helps to automatically generate a GATT database based on user selections. It supports all *Bluetooth* profiles, services and characteristics.
Apple HomeKit	This SDK has the necessary enablers in place to support Apple HomeKit R7 compliant software development. Please see http://www.silabs.com/homekit to get started.
OOB pairing	Out of band pairing is now supported for secure connections.

Notes

Note	Explanation
Studio version update	SDK is compliant with Simplicity Studio 4.06 or newer.
Bootloader	Bootloader has been updated. Details of the changes are described in a Knowledge Base article: http://community.silabs.com/t5/Bluetooth-Wi-Fi-Knowledge-Base/Bootloader-changes-in-BLE-SDK/ta-p/183640

Note	Explanation
IAR version	In *Bluetooth* C development, one should have IAR version 7.80.2 or newer in use.
Migration guide	For easier migration from 2.0.x SDK to this one, there is a Knowledge Base article available: http://community.silabs.com/t5/Bluetooth-Wi-Fi-Knowledge-Base/Bluetooth-Smart-SDK-Migration-Guide-From-V2-0-1-to-V2-1-x/ta-p/183921

Quality Improvements

Fix for maximum input signal level (TP/RCV-LE/CA/BV-06-C) test by adjusting automatic gain control levels of the PA
Thunderboard React application improved
Simplicity Commander updated to 0.17.3 version, which generates properly formatted EBL firmware update files
Thunderboard Sense software example updated
Random number generator is now initialized properly at boot time
DTM fixed to also generate unmodulated carrier properly using the test command
BGTool updated
BTDS plug-ins updated
CRC check added to OTA firmware update
UART bootloader error reporting improved
DTM example application added
Documentation updated
Added AN1045: Bluetooth Over-the-Air Device Firmware Update Application Note
Length parameter calculated correctly for commands in NCP mode
BGAPI command size maximum (128 bytes) is now the same for SoC and NCP modes
BGAPI command payload overflow does not cause a crash anymore
DTM does not stop listening for new packets after 4 seconds anymore
Fixed waking up from EM4H mode by fixing DFU update request checking
Fixed Thermometer example for BGM121
Fixed OTA image size checking
BGAPI command handling improved to notify the user if the number of available buffers is too small
API documentation improved and updated
MITM protection works now also when slave device requests it
Slave device behavior fixed, when master device loses bonding

Fixed Known Issues since the previous Release

ID	Issue	Explanation
-	-	-

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
681	gatt_server_send_user_write_response()	If a user application tries to send a user write response greater than 128 bytes, the stack crashes. The limitation is now properly documented, but the root cause has not been fixed yet in this release.
1248	Prepare write request	Prepare write request does not fail with gatt_prodecure_completed event if data is corrupted.
1431	gap_set_mode()	The command does not return an error if the device is being set to connectable mode and the maximum number of connections has been reached.
1432	le_gap_open()	The command stalls if device is advertising as connectable and has reached max_connections – 1.
1445	ATT MTU size	To avoid a possible memory overflow in BGAPI, the maximum ATT MTU size should be limited to 121 bytes.

Bluetooth Smart Software 2.0.2 build 1604

Software Version	2.0.2 build 1604
Software Status	GA
Release Date	25th of November, 2016
Affected Products	BGM111 *Bluetooth* Smart Module BGM113 *Bluetooth* Smart Module EFR32 Blue Gecko EFR32 Mighty Gecko

Changes: 2.0.2 (build 1604) compared to 2.0.1 (build 1485)

New Features

Feature	Explanation
-	-

Notes

Note	Explanation
-	-

Quality Improvements

Fix for maximum input signal level (TP/RCV-LE/CA/BV-06-C) test by adjusting automatic gain control levels of the PA.
Thunderboard React application improved.

Fixed Known Issues since the previous Release

ID	Issue	Explanation
-	-	-

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
681	gatt_server_send_user_write_response()	If a user application tries to send a user write response greater than 128 bytes, the stack crashes. The limitation is now properly documented, but the root cause has not been fixed yet in this release.

Bluetooth Smart Software 2.0.1 build 1485

Software Version	2.0.1 build 1485
Software Status	GA
Release Date	15th of October, 2016
Affected Products	BGM111 *Bluetooth* Smart Module BGM113 *Bluetooth* Smart Module EFR32 Blue Gecko EFR32 Mighty Gecko

Changes: 2.0.1 (build 1485) compared to 2.0.0 (build 1391)

New Features

Feature	Explanation
-	-

Notes

Note	Explanation
-	-

Quality Improvements

Simplicity Commander updated to 0.17.3 version, which generates properly formatted EBL firmware update files. Workaround for the original issue in 2.0.0 GA is described in http://community.silabs.com/t5/Bluetooth-Wi-Fi-Knowledge-Base/Testing-UART-DFU-with-BLE-SDK-2-0-0-1391/ta-p/179823.
Thunderboard Sense software example updated
Random number generator is now initialized properly at boot time
DTM fixed to also generate unmodulated carrier properly using the test command

Fixed Known Issues since the previous Release

ID	Issue	Explanation
-	-	-

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
681	gatt_server_send_user_write_response()	If a user application tries to send a user write response greater than 128 bytes, the stack crashes. The limitation is now properly documented, but the root cause has not been fixed yet in this release.

Bluetooth Smart Software 2.0.0 build 1391

Software Version	2.0.0 build 1391
Software Status	GA
Release Date	16th of September, 2016
Affected Products	BGM111 *Bluetooth* Smart Module BGM113 *Bluetooth* Smart Module EFR32 Blue Gecko EFR32 Mighty Gecko

Changes: 2.0.0 (build 1391) compared to 2.0.0 (build 1353)

New Features

Feature	Explanation
-	-

Notes

Note	Explanation
Version 1.0.x	Version 2.0.0 is not backwards compatible with 1.0.x versions, meaning that an application written with 1.0.x SDK, will not work without modifications in 2.0.0 SDK and vice versa. Additionally, one cannot perform DFU, either over UART nor OTA, between the versions 1.0.x and 2.0.0.
BGM111v1.0	The first HW version (v1.0) of the BGM111 Bluetooth module is no longer supported in Simplicity Studio v4.

Quality Improvements

Examples and demos updated
Documentation updated
BGTool and bgbuild tools updated
SW flow control added to UART DFU functionality
DFU robustness improved by fixing buffer overflow situations
DFU CRC checksum calculation added
GATT parser in bgbuild warns the user if <<gatt service>> is not the first defined service

Bootloader IAR example application added to SDK
Data packet handling robustness improved to avoid possible deadlock situations in memory buffer allocation

Fixed Known Issues since the previous Release

ID	Issue	Explanation
-	-	-

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
679	HW Configurator	HW Configurator in Simplicity Studio v4 does not currently allow changing some of the HW settings like for example DCDC, LFXO, and CTUNE values.
681	gatt_server_send_user_write_response()	If a user application tries to send a user write response greater than 128 bytes, the stack crashes. The limitation is now properly documented, but the root cause has not been fixed yet in this release.

Bluetooth Smart Software 2.0.0 build 1353

Software Version	2.0.0 build 1353
Software Status	Beta
Release Date	2nd of September, 2016
Affected Products	BGM111 *Bluetooth* Smart Module BGM113 *Bluetooth* Smart Module EFR32 Blue Gecko EFR32 Mighty Gecko

Changes: 2.0.0 (build 1353) compared to 1.0.4 (build 1073)

New Features

Feature	Explanation
Secure Connections	Support for LE Secure Connections according to *Bluetooth* specification 4.2. Including ECDH key exchange and passkey comparison with MITM. When communicating with legacy devices, the implementation will fall back to 4.0 pairing.
Packet Extensions	First implementation for increasing the link layer packet size according to *Bluetooth* specification 4.2. This release supports link layer packet size up to 50 bytes instead of the default 23 bytes.
Dual Topology	Support for Dual Topology according to *Bluetooth* specification 4.1. This enables EFR32 to be a slave and master device at the same time.
Simplicity Studio v4	This build and corresponding SDK is compatible with Simplicity Studio v4. This enables for example having multiple SDKs installed at the same time, and creating for example IAR and BGScript projects in a single SDK. Earlier Simplicity Studio version 3 is no longer supported. Also former

Feature	Explanation
	“Blue Gecko Bluetooth Smart BGScript and IAR SDK 1.0.x” is discontinued.
BTDS plug-ins	This SDK build includes plug-ins, which can be used to quickly and efficiently create consistent Bluetooth profiles and applications using *Bluetooth* Developer Studio tool, developed by *Bluetooth* SIG.
sm_bonding_confirm()	This command is used to accept or reject a bonding request. A new bonding request is indicated by a corresponding sm_confirm_bonding event.
sm_passkey_confirm()	This command is used to accept or reject a reported confirm value. Corresponding event to indicate the request to display the passkey to the user and for the user to confirm the displayed passkey is sm_confirm_passkey.
sm_set_debug_mode()	This command is used to set Security Manager into debug mode, enabling encrypted packets to be opened with a *Bluetooth* protocol analyzer as the secure connections are using debug keys for bonding.
dfu_boot_failure event	This event indicates that there has been an error in bootloader and the reason is given as an error code.
gatt_read_characteristic_value_from_offset()	This command can be used to read a partial characteristic value from a remote GATT database with specified offset and maximum length.

Notes

Note	Explanation
IAR version	In *Bluetooth* C development, one should have IAR version 7.60 or newer in use.

Note	Explanation
Bootloader	Bootloader library is now separated from the stack library, and the bootloader itself has been updated as well. Application now needs to link the new bootloader library as well as include aat.h file. Please see UG136 document for details.
UART and OTA DFU	UART and OTA DFU binary files have been updated to be in EBL format. Simplicity Commander, included into SDK, can be used to flash devices. Please see UG136 document for details.
BGAPI library	BGAPI library is now separated from the stack library. It must be linked with the application if BGAPI commands are tend to be used. Please see UG136 document for details.
endpoint_closing event	This event is removed from the API documentation as it has been decided not to be implemented.

Quality Improvements

Examples and demos updated and simplified
Documentation updated
BGTool and bgbuild tools updated
Robustness, timing and other quality fixes in link layer
Stack robustness improvements, especially in GAP, GATT and Security Manager
GATT database improvements
Fixed a memory leak in GATT server
Reduced power consumption for all use cases

Fixed Known Issues since the previous Release

ID	Issue	Explanation
347	BGScript freeze	BGScript freezes, when trying to store a PS key, which is longer than 180 bytes.
495	endpoint_read_counters()	The command does not return correct data.
638	sm_store_bonding_configuration()	The command returns an error, indicating that it is not implemented.

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection update can fail if connection event is missed.
681	gatt_server_send_user_write_response()	If a user application tries to send a user write response greater than 128 bytes, the stack crashes. Update: The limitation is now properly documented, but the root cause has not been fixed yet in this release.

Bluetooth Smart Software 1.0.4 build 1073

Software Version	1.0.4 build 1073
Software Status	GA 3
Release Date	17th of June, 2016
Affected Products	BGM111 *Bluetooth* Smart Module BGM113 *Bluetooth* Smart Module EFR32 Blue Gecko EFR32 Mighty Gecko

Changes: 1.0.4 (build 1073) compared to 1.0.2 (build 755)

New Features

Feature	Explanation
hardware_set_lazy_soft_timer()	BGAPI command to allow a sliding timer to be used to let the stack optimize wake-up times and save power.
hardware_enable_dcdc()	BGAPI command to enable and disable DC/DC.

Notes

Note	Explanation
Qualification	All official *Bluetooth* qualifications are completed.
IAR version	In *Bluetooth* C development, one should have IAR version 7.40 or newer in use.
hardware_set_soft_timer()	Time parameter unit of this command has been now properly documented, and the maximum time value is approximately 18.2 hours (2147483647 clock ticks).
Windows 10 / Edge	Using Edge browser in Windows 10 to download *Bluetooth* Smart SDK for Simplicity Studio or Blue Gecko *Bluetooth* Smart BGScript and IAR SDK will result an error note “The signature of <EXE file name> is corrupt or invalid.” The file is still fully downloaded and the SDK can be installed.

Quality Improvements

Examples and demos updated
Documentation updated
BGTool and bgbuild tools updated and Linux and Mac OS compatibility improved
UART DFU and OTA DFU work correctly even if PTI is enabled
Stack and link layer robustness improvements
EM2 sleep wake-up time reduced to save power
Advertising power consumption reduced
RAM consumption optimizations and enabling more dynamic memory allocation for applications
Android and iOS interoperability improved
Connection update request instant value fixed
Advertising functionality optimizations

Fixed Known Issues since the previous Release

ID	Issue	Explanation

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Description updated: Connection update can fail if connection event is missed.
347	BGScript freeze	BGScript freezes, when trying to store a PS key, which is longer than 180 bytes.
495	endpoint_read_counters()	The command does not return correct data.
638	sm_store_bonding_configuration()	The command returns an error, indicating that it is not implemented.

ID	Issue	Explanation
681	gatt_server_send_user_write_response()	If a user application tries to send a user write response greater than 128 bytes, the stack crashes.

Bluetooth Smart Software 1.0.2 build 755

Software Version	1.0.2 build 755
Software Status	GA 2
Release Date	29th of March, 2016
Affected Products	BGM111 *Bluetooth* Smart Module BGM113 *Bluetooth* Smart Module EFR32 Blue Gecko EFR32 Mighty Gecko

Changes: 1.0.2 (build 755) compared to 1.0.0 (build 615)

New Features

Feature	Explanation
BGM113	Support and examples for BGM113 *Bluetooth* Smart Module added.
Qualification	All controller and host side qualification test are run and passed. Official *Bluetooth* listings are still pending.
RX/TX activity PIN	Possibility to observe RX/TX activity by using <obssel> tag in hardware.xml file.
ATT MTU size increase	Attribute Protocol MTU size can be increased up to 58 bytes.
system_get_random_data()	BGAPI command to get random data up to 16 bytes.
sm_set_oob_data()	BGAPI command to set out of band encryption data for the device.
sm_confirm_passkey event	New event to indicate a request to display the passkey to the user and the user to confirm it.
hardware_set_uart_configuration()	BGAPI command to configure UART interface.
hardware_get_time()	BGAPI command to get elapsed time since last reset of RTCC.
hardware_read_adc_channel()	BGAPI command to read a specific ADC channel.

Feature	Explanation
gatt_set_max_mtu()	BGAPI command to set maximum number of GATT message transfer units.
gatt_mtu_exchanged event	New event to indicate that GATT exchange procedure has been completed.
sm_configure()	sm_configure command parameter mitm_required is renamed to flags for accepting more security configurations, namely bonding_required

Quality Improvements

Examples and demos updated
Documentation updated
BGTool and other tools updated and OS X support improved
Master and slave can now increase security at the same time without other one becoming unresponsive
UART communication works reliably also for 2.4M and above baud rates
Scanning and advertising fixed to work at the same time
Improved event listening according to the transmit window setting
Improved Android OS interoperability
Memory usage optimizations for BGScript and TX queue
Memory leak fix for UART configuration
Fix for GATT client to handle long attribute data fully
Fix le_gap_set_mode() command to also restart advertising properly
Fix disable advertising to immediately also stop advertising
Robustness fixes for validating and updating advertisement data
Optimizations for startup time when waking up before advertising to save current
Access address error fixed
Current consumption optimizations for DTM, NCP mode and advertising
Memory leak fixed in scan response handling
Multi-connection error situation handling improved
DFU improvements

Fixed Known Issues since the previous Release

ID	Issue	Explanation
172	Notifications	If the devices are bonded, and then disconnected, reconnected and the connection is encrypted, no gatt_server_characteristic_status event is sent to let user know if the notifications have been enabled or not.

ID	Issue	Explanation
195	ATT MTU size	ATT MTU size is limited to its default value (23).
197	hardware_set_soft_timer()	Using hardware_set_soft_timer() with very small timeout parameter, like 1, will cause a crash.
199	Channel map request	If channel map request handling takes too long time, the connection is terminated.
223	TX power in ADV data	Even if TX power has been set with system_set_tx_power() command, it is always 0 dBm in advertisement data.
226	gatt_characteristic_value event	Even if gatt_prepare_characteristic_value_write() command succeeds, sometimes gatt_characteristic_value event is not returned.
254	Scanning events	Scanning for new devices in master mode does not work or it takes a long time if a lot of connections are active and connection interval has been defined to be very small.
277	hardware_set_soft_timer()	API Reference Manual says that timer value parameter unit should be given in milliseconds, but actually the value should be given in clock ticks, which are 1/32768 of a millisecond.
312	BGScript reconnect	If the device is changing its advertising as non-connectable while being connected, after disconnection it cannot reconnect, when BGScript application is used. This works OK when using BGAPI.
323	TX power steps	There are no intermediate TX power steps between -12.5 dBm and -26 dBm TX power settings.

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.

ID	Issue	Explanation
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
247	Connection update	Connection event can be missed if it happens at the same time as a connection update.
347	BGScript freeze	BGScript freezes, when trying to store a PS key, which is longer than 180 bytes.

Bluetooth Smart Software 1.0.0 build 615

Software Version	1.0.0 build 615
Software Status	GA 1
Release Date	20th of February, 2016
Affected Products	BGM111 *Bluetooth* Smart Module EFR32 Blue Gecko EFR32 Mighty Gecko

Changes: 1.0.0 (build 615) compared to 0.9.2 (build 446)

New Features

Feature	Explanation
gatt_server_find_attribute()	New command to find attributes of certain type from a local GATT database.
le_connection_disable_slave_latency()	Device in slave mode can temporarily disable/enable slave latency.
Host wake-up PIN support	Support for PIN configuration, which can be used to wake up external host processor.
OTA firmware update (internal flash)	Over The Air firmware update has been enabled in the stack. However, there is no automatic code generating for this feature yet in Simplicity Studio.
Bluetooth Low Energy C SDK	Necessary changes and implementation for integrating *Bluetooth* Smart Software with *Bluetooth* Low Energy C SDK in Simplicity Studio, supporting the usage of many other tools there as well.

Quality Improvements

Examples and demos updated
Documentation updated
Multi-connection robustness improvements
Lowest TX power setting is now -26 dBm instead of -12.5 dBm
Memory usage optimizations

Memory leak fixes
Multiple SW crashes fixed
PTI configuration structure fixed to enable packet trace debugging with Simplicity Studio
Improved interoperability with the latest iOS and Android devices
Updates and bug fixes for BGTool PC SW, now integrated also with Simplicity Studio
Slave latency feature fixed
Sequencer and scheduler optimizations and fixes to improve connection robustness
Bonding robustness fixes related to master and slave modes
Improvements in UART handling
Sleep optimizations for applications
Updates and improvements to DFU handling
Updates to Security Manager robustness and optimizations
Channel map handling improvements
GATT parser robustness improvements
Robustness improvements for scanning and advertising functionality
BGAPI improvements for sleep mode

Fixed Known Issues since the previous Release

ID	Issue	Explanation
113	128-bit service UUID	Automatic 128-bit service UUID advertising does not work using le_gap_set_mode() command. Workaround is to use custom advertisement packet content and build it manually.
146	Encrypted data transfer	Sending a lot of data over encrypted link to both directions will eventually fail.
164	Bonding timeout	When both devices have been set in bondable mode and master increases security and also latency value is set, bonding fails with 0x185 (timeout).
177	Multiple connections	Master cannot form multiple connections if the lowest possible connection interval is used. Workaround is to use other values.
180	Connection counter	LLCP Connection Update Request can cause connection counter to go out of sync, resulting the connection to be dropped.
185	Reconnection failure	When a connection request packet is not fully sent, the connection request will be ignored and it will fail with 0x181 (wrong state) when reconnecting is attempted.
187	LL_VERSION_IND	When queried over the air, LL_VERSION_IND indicates *Bluetooth* version to be 4.0 instead of 4.1.

ID	Issue	Explanation
192	Connection update	When maximum connection interval is used and the stack is run in slave mode, it does not respond to connection update requests.
196	LL_PING bit	LL_PING bit is not ignored properly between two controllers.
207	Bonding initialization	If the lowest connection interval is used and bonding is initialized, connection is closed.
208	GATT timeout	Random GATT timeouts are seen with multiple simultaneous connections.
212	Slave latency 1	When the stack is in slave mode and slave latency is used, connection update will cause supervision timeout, and the connection is closed.
228	Slave latency 2	Setting slave latency value to 0 after it has been set to a higher value, will cause connection failure.

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
172	Notifications	If the devices are bonded, and then disconnected, reconnected and the connection is encrypted, no gatt_server_characteristic_status event is sent to let user know if the notifications have been enabled or not.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
195	ATT MTU size	ATT MTU size is limited to its default value (23).
197	hardware_set_soft_timer()	Using hardware_set_soft_timer() with very small timeout parameter, like 1, will cause a crash.
199	Channel map request	If channel map request handling takes too long time, the connection is terminated.

ID	Issue	Explanation
223	TX power in ADV data	Even if TX power has been set with system_set_tx_power() command, it is always 0 dBm in advertisement data.
226	gatt_characteristic_value event	Even if gatt_prepare_characteristic_value_write() command succeeds, sometimes gatt_characteristic_value event is not returned.
247	Connection update	Connection event can be missed if it happens at the same time as a connection update.
254	Scanning events	Scanning for new devices in master mode does not work or it takes a long time if a lot of connections are active and connection interval has been defined to be very small.
277	hardware_set_soft_timer()	API Reference Manual says that timer value parameter unit should be given in milliseconds, but actually the value should be given in clock ticks, which are 1/32768 of a millisecond.
312	BGScript reconnect	If the device is changing its advertising as non-connectable while being connected, after disconnection it cannot reconnect, when BGScript application is used. This works OK when using BGAPI.
323	TX power steps	There are no intermediate TX power steps between -12.5 dBm and -26 dBm TX power settings.
N/A	Qualification	The following qualification test cases do not pass yet: TC/JW/BV-02-C TC/CN/BV-01-C TC/CN/BV-02-C TP/CON/MAS/BV-30-C TP/CON/MAS/BV-29-C TP/CON/MAS/BI-05-C TP/CON/SLA/BV-22-C TP/SEC/MAS/BV-14-C TP/CON/SLA/BV-23-C TP/CON/SLA/BI-06-C TP/SEC/MAS/BV-12-C TP/SEC/MAS/BV-13-C TP/DDI/ADV/BV-19-C

Bluetooth Smart Software 0.9.2 build 446

Software Version	0.9.2 build 446
Software Status	Beta 2
Release Date	18th of December, 2015
Affected Products	BGM111 *Bluetooth* Smart Module

Changes: 0.9.2 (build 446) compared to 0.9.1 (build 136)

New Features

Feature	Explanation
Energy Mode 2	Energy Mode 2 (EM2) support added for lower current consumption when sleeping
le_connection_get_rssi()	le_connection_get_rssi() command added to BGAPI
ADC commands	hardware_config_adc_reference() and hardware_read_adc() commands added to BGAPI
system_set_tx_power()	system_set_tx_power() command added to BGAPI
LFXO configuration	LFXO usage is made configurable in hardware.xml
Wake-up PIN	Wake-up PIN is made configurable in hardware.xml and gecko_system_awake event is introduced
DTM	Direct Test Mode tests implemented
PTI	Packet trace / Network Analyzer enablers added for Simplicity Studio

Quality Improvements

SDK examples updated
Documentation updated
No need to reset the device anymore between DTM tests
Default maximum amount of simultaneous connections is set to four and the value is made configurable up to eight
Support for adding external BGAPI commands added

Multiple repeating soft timers enabled for BGScript
Correct power amplifier is dynamically chosen based on TX power setting
ADC conversion waiting bit fixed
Default output power is set to 8 dBm
EM2 wake-up timings optimized
MIC failures fixed to improve secure connection robustness
HCI advertisement event fixed
Many out of memory fixes
Many memory leaks fixed
Many memory allocation optimizations
Encrypted streaming data lost fixed
Possible flash write error handled properly
Fixed RTCC usage
UART timeout interrupt removed when the device is inactive
HCI reset commands fixed
New ACL queues for link layer implemented
Crystal tuning value handling fixed
Flow control fixed for sending multiple notifications
Variable access fixed in BGScript
I2C timeouts fixed
Control packet bits fixed in HCI commands and ACL packets
HCI events do not miss data anymore
Correct dBm values used in TX power configuration
Missing IRQ flags added
Bonding fixed in slave mode and robustness increased
Create connection cancel command fixed
Scan response and advertisement handling fixed
Incoming data packet handling memory optimizations
Stack flash size optimizations
Connection close events do not randomly fail anymore
Connection events can be skipped without crashing
No link timeout errors anymore with iOS devices
TX and RX activity current consumption peaks fixed
Multiple connections in master mode fixed
Many crashes fixed
Connection parameter update does not cause connection failure anymore
Packet queueing for TX fixed for encrypted connections
Access address issues fixed for master mode
Instant checking with connection update and channel map request fixed
Endianness for connection encryption command fixed
LL_FEATURE_RSP packet fixed
Scan duty cycle fixed
Scan response events fixed
Window size fixed
Disconnecting from iOS devices works correctly
Device name is correctly advertised with iOS devices

Disconnecting a non-established connection does not break the next connection anymore
General PTS failure fixes
le_gap_set_adv_data() fixed to show the correct scan response data
Consecutive bonding does not fail anymore after a failed pairing and bonding
Advertising while connected and advertising restart fixed
GPIO interrupts fixed
Connection parameter update parameter value is checked correctly
RSSI values fixed in scan responses
BGScript utility functions added
UART data transfer hang with multiple queued L2CAP packets fixed

Fixed Known Issues since the previous Release

ID	Issue	Explanation
13	Scanning and advertising	Simultaneous scanning and advertising does not always work.
16	Bonding	Unauthenticated bonding might sometimes fail in slave mode.
92	Advertising restart	Restarting advertising too quickly does not always work.
101	Connection parameter update	In slave mode, sometimes connection parameter update causes supervision timeout.

Known Issues in this Release

ID	Issue	Explanation
112	le_gap_scan_response	Event le_gap_scan_response does not contain advertising channel information.
113	128-bit service UUID	Automatic 128-bit service UUID advertising does not work using le_gap_set_mode() command. Workaround is to use custom advertisement packet content and build it manually.
146	Encrypted data transfer	Sending a lot of data over encrypted link to both directions will eventually fail.
164	Bonding timeout	When both devices have been set in bondable mode and master increases security and also latency value is set, bonding fails with 0x185 (timeout).

ID	Issue	Explanation
172	Notifications	If the devices are bonded, and then disconnected, reconnected and the connection is encrypted, no gatt_server_characteristic_status event is sent to let user know if the notifications have been enabled or not.
177	Multiple connections	Master cannot form multiple connections if the lowest possible connection interval is used. Workaround is to use other values.
180	Connection counter	LLCP Connection Update Request can cause connection counter to go out of sync, resulting the connection to be dropped.
185	Reconnection failure	When a connection request packet is not fully sent, the connection request will be ignored and it will fail with 0x181 (wrong state) when reconnecting is attempted.
187	LL_VERSION_IND	When queried over the air, LL_VERSION_IND indicates *Bluetooth* version to be 4.0 instead of 4.1.
192	Connection update	When maximum connection interval is used and the stack is run in slave mode, it does not respond to connection update requests.
194	Connection update complete event	If a connection parameter update request is rejected by a remote device, the reject reason is not correctly returned by connection update complete event.
195	ATT MTU size	ATT MTU size is limited to its default value (23).
196	LL_PING bit	LL_PING bit is not ignored properly between two controllers.
197	hardware_set_soft_timer()	Using hardware_set_soft_timer() with very small timeout parameter, like 1, will cause a crash.
199	Channel map request	If channel map request handling takes too long time, the connection is terminated.
207	Bonding initialization	If the lowest connection interval is used and bonding is initialized, connection is closed.
208	GATT timeout	Random GATT timeouts are seen with multiple simultaneous connections.

ID	Issue	Explanation
212	Slave latency 1	When the stack is in slave mode and slave latency is used, connection update will cause supervision timeout, and the connection is closed.
223	TX power in ADV data	Even if TX power has been set with system_set_tx_power() command, it is always 0 dBm in advertisement data.
228	Slave latency 2	Setting slave latency value to 0 after it has been set to a higher value, will cause connection failure.
N/A	Qualification	The following qualification test cases do not pass yet: PTS: TC/JW/BV-02-C TP/CON/MAS/BV-30-C TP/CON/MAS/BV-29-C TP/CON/MAS/BI-05-C TP/CON/SLA/BV-22-C TP/SEC/MAS/BV-14-C TP/CON/SLA/BV-23-C TP/CON/SLA/BI-06-C TP/SEC/MAS/BV-12-C TP/SEC/MAS/BV-13-C TP/DDI/ADV/BV-19-C

Bluetooth Smart Software 0.9.1 build 136

Software Version	0.9.1 build 136
Software Status	Beta
Release Date	17th of August, 2015
Affected Products	BGM111 *Bluetooth* Smart Module

Features in the First Release

Feature	Explanation
BLE 4.1	*Bluetooth* Smart 4.1 compliant stack
ATT	Attribute Profile
GATT	Generic Attribute Profile
GAP	Generic Access Profile
SMP	Security Manager Protocol
BGAPI™	Serial protocol API over UART for modem usage
BGLIB™	Host API/library which implements BGAPI serial protocol
BGScript™	Scripting language for standalone usage

Fixed Known Issues since the previous Release

ID	Feature	Explanation
N/A	N/A	First public release

Known Issues in this Release

ID	Issue	Explanation
13	Scanning and advertising	Simultaneous scanning and advertising does not always work.

ID	Issue	Explanation
16	Bonding	Unauthenticated bonding might sometimes fail in slave mode.
92	Advertising restart	Restarting advertising too quickly does not always work.
101	Connection parameter update	In slave mode, sometimes connection parameter update causes supervision timeout.