



# Gecko Platform 2.6.0 GA

## 19Q2 Gecko SDK

### June 7, 2019

The Gecko Platform provides infrastructure support for applications developed with higher-level protocols, and it provides an interface with the underlying hardware. It is composed of the following modules:

**EMLIB** is a low-level peripheral support library that provides a unified API for all Silicon Labs EFM32, EZR32 and EFR32 MCUs and SoCs. EMLIB modules are provided for all peripherals and core features.

**EMDRV** is the Gecko Platform driver library for EFM32, EZR32 and EFR32 on-chip peripherals. Drivers are typically DMA-based and use all available low-energy features.

**RAIL (Radio Abstraction Interface Layer)** provides a customizable radio interface layer that supports proprietary or standards-based wireless protocols. RAIL use by application protocols such as Silicon Labs Zigbee or Silicon Labs Connect is managed through the stack library. Direct RAIL use is exposed through the Flex SDK.

**NVM3 (Non-Volatile Memory Version 3)** is a data storage driver that provides a means to read and write data objects (key/value pairs) stored in flash memory. NVM3 can be used with the Bluetooth, Zigbee, Thread, and Connect protocol stacks.

**mbed TLS** provides an SSL library that makes it easy to use cryptography and SSL/TLS in your applications. mbed TLS is open source software licensed by ARM Limited.

This document aggregates information that was – in previous releases – spread across multiple documents. In earlier versions of the Gecko SDK, this content would have been found in: 32-bit MCU SDK Release Notes, RAIL Library Release Notes, and EmberZNet SDK Release Notes.

This document covers the following SDK versions:

Gecko SDK 2.6 GA released June 7, 2019.

#### KEY FEATURES

##### EMLIB

- Added support for PLFRCO on EFR32xG13 devices using the em\_cmu API.

##### RAIL Library

- Added support for synchronizing the RAIL time base to the PLFRCO on EFR32xG13 Rev D parts.
- Improved the configuration switch time in dynamic multiprotocol applications.
- Added a new Packet Trace (PTI) message for switching protocols in dynamic multiprotocol applications for better debugging.
- Added RAIL configuration libraries for all new EFR32xG21 based modules.
- Improved the LQI value returned for IEEE 802.15.4 based PHYs so that it is more consistent across hardware platforms and is more stable for a given set of over the air conditions.

##### mbed TLS

- Added TRNG support for EFR32xG13 rev. D.

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# 1 EMLIB

## 1.1 New Items

### Added in release 2.6

Added AES PCBC mode to `em_crypto`.

Added support for PLFRCO on EFR32xG13 devices using the `em_cmu` API. This oscillator is supported on some Rev D devices. Note that using PLFRCO on previous revisions will result in an assertion error, and code trying to enable this oscillator will block and not return.

Added support for LFRCO precision configuration for Series 2.

Added `LETIMER_CounterGet()` and `LETIMER_CounterSet()` functions to `em_letimer`.

Added `TIMER_SyncWait()` function to `em_timer`.

## 1.2 Improvements

### Changed in release 2.6

Updated handling of SYNCBUSY for EMLIB modules. Added waiting for SYNCBUSY when disabling peripherals on Series 2.

The return type of `CAN_ReadMessage()` has been changed from `void` to `Boolean`. This is to catch if the message object stored in RAM is both new (i.e., was not read earlier) and valid. The message object in RAM is read only if the message stored in it is new and valid. This is done by reading DATAVALID bit. and the function returns accordingly.

## 1.3 Fixed Issues

### Fixed in release 2.6

ID #	Description
385681	Corrected GPIO port D pin count for EFR32xG13, EFR32xG14 and xGM13 devices.
391269	In the license example for SLSTK3402A_EFM32PG12, reorder calls to <code>ACMP_Init</code> and <code>ACMP_VASetup</code> in order to avoid <code>ACMP_Init</code> overwriting registers set by <code>ACMP_VASetup</code> .
394568	Fixed GPIO availability info in CMSIS device header files for Series 2.
375136	Added a workaround for EFM32ZG and EFM32HG devices that deals with a problem reported in errata EMU_E107. (EMU_E107: An HF-IRQ received during EM2 or EM3 entry would cause the EMU to ignore the SLEEPDEEP-flag.)

## 2 EMDRV

### 2.1 New Items

#### Added in release 2.6

Added support for PLFRCO in RTCDRV.

## 3 RAIL Library

### 3.1 New Items

#### Added in release 2.6

Added new 802.15.4 RAIL APIs – `RAIL_IEEE802154_EnableEarlyFramePending()` and `RAIL_IEEE802154_EnableDataFramePending()` – to support Thread 1.2 enhanced frame pending feature.

Added new 802.15.4 RAIL APIs – `RAIL_IEEE802154_ConfigGOptions()` and `RAIL_IEEE802154_ConfigEOptions()` – for configuring certain 802.15.4E-2012 and G-2012 features needed by GB868.

Added support for Z-Wave node ID based packet filtering via the `RAIL_ZWAVE_OPTION_NODE_ID_FILTERING` option.

Added support to `RAIL_Sleep()` for the PLFRCO on EFR32xG13 Rev D parts.

Added information to packet trace for every protocol switch in dynamic multiprotocol, telling the user what protocol we have changed to, as well the radio event that triggered this switch. This information is visible in Network Analyzer for better debugging of DMP applications.

Added support for the radio sending an ACK packet automatically when in Z-Wave mode as long as node ID filtering and `Auto_Ack` features are enabled and a packet requesting an ACK is sent to the device.

Added a new API – `RAIL_UseDma()` – which can be used to enhance RAIL startup speed, if called before `RAIL_Init()`.

### 3.2 Improvements

#### Changed in release 2.6

Reduced switch time overhead for dynamic multiprotocol applications. The new switch times as well as information about them are documented in the `rail_multiprotocol` page.

Changed the LQI metric for the 2.4GHz IEEE802.15.4 PHY configurations to be scaled from 0 - 255 and to include more data to make it more stable. This can impact existing applications that are using the LQI values returned in prior RAIL versions.

In `RAILTest`, if receive was entered because of a transmit state transition, we would not change the channel when calling `setChannel` and would ignore calls to `rx 1` to enter normal receive mode.

Improved documentation of `RAIL_RxPacketStatus_t` values and their corresponding `RAIL_Events_t` events.

Use of the unsafe enum `GPIO_Port_TypeDef` within RAIL aggregate types `RAIL_PtiConfig_t` and `RAIL_AntennaConfig_t` has been replaced by safe `uint8_t`.

Clarified that `RAIL_EVENT_TX_BLOCKED` and `RAIL_EVENT_TX_CHANNEL_BUSY` leave the TX FIFO intact without consuming any of its packet data.

### 3.3 Fixed Issues

#### Fixed in release 2.6

ID	Description
360371	Fixed an issue where calling <code>RAIL_GetTxPowerDbm</code> prior to calling <code>RAIL_SetTxPower</code> would return -500 (i.e., -50dBm). As a part of the fix, we now return an invalid dBm value, <code>RAIL_TX_POWER_MIN</code> , if <code>RAIL_SetTxPower</code> was not called before calling <code>RAIL_GetTxPowerDbm</code> or if <code>RAIL_SetTxPower</code> it returns an error status.
370805	Fixed an issue with the EFR32xG21 reporting a phantom packet on PTI after reset.
376229	Fixed an issue with Rx antenna diversity operation that prevented CCA from working, causing CSMA failures.
392350	Corrected an issue where the radio might be left in receive after a <code>RAIL_EVENT_TX_BLOCKED</code> or <code>RAIL_EVENT_TX_CHANNEL_BUSY</code> when the transmit <code>RAIL_StateTransitions_t::error</code> is <code>RAIL_RF_STATE_IDLE</code> .

ID	Description
400303	Corrected an issue where RAIL_EVENT_TX_CHANNEL_BUSY due to RAIL_CsmaConfig_t::csmaTimeout or RAIL_LbtConfig_t::lbtTimeout would prevent further transmits.
400303	Corrected an issue where an invalid RAIL_CsmaConfig_t::ccaDuration or RAIL_LbtConfig_t::lbtDuration too large for the radio configuration to handle would not fail the respective transmit; this now returns RAIL_STATUS_INVALID_PARAMETER.

## 4 NVM3 (Non-Volatile Memory Version 3)

### 4.1 New Items

#### Added in release 2.6

Added two new functions: `nvm3_enumDeletedObjects` and `nvm3_countDeletedObjects`.

## 5 mbed TLS

### 5.1 New Items

#### Added in release 2.6

Added TRNG support for EFR32xG13 and xGM13 revD devices.

### 5.2 Improvements

#### Added in release 2.6

Upgraded to mbed TLS 2.7.10.

### 5.3 Fixed Issues

#### Added in release 2.6

ID	Description
396073	Fixed an issue where hardware accelerated implementations were not removed if not included through configuration. Hardware accelerated implementations are now excluded if the corresponding *_C define is not present in the configuration file.



## 6 Legal

### 6.1 Disclaimer

Silicon Labs intends to provide customers with the latest, accurate, and in-depth documentation of all peripherals and modules available for system and software implementers using or intending to use the Silicon Labs products. Characterization data, available modules and peripherals, memory sizes and memory addresses refer to each specific device, and "Typical" parameters provided can and do vary in different applications.

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