

# 32-bit MCU SDK 5.7.3.0

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This document contains a description of changes from version 5.6.0.0 to 5.7.3.0 of the 32-bit MCU Software Development Kit (SDK). The 32-bit MCU SDK is installed with Gecko SDK Suite 2.5.3 in Simplicity Studio for EFM32 and EZR32 products.

## 1 Release Highlights

### 1.1 Gecko Platform:

- New product support for the EFM32 Giant Gecko 12 family.
- EFM32 Giant Gecko 12 Thunderboard development kit with sample applications, featuring the new PDM interface and more.
- ARM mbed TLS: updated to release v2.7.6.
- Bugfixes and feature improvements.
- New Software License Agreement.

### 1.2 Gecko Platform Beta Features:

- NVM3 External SPI Flash support. This feature is Beta tested only. Not supported for production deployments.

### 1.3 Gecko Bootloader: Critical Security Update

Gecko Bootloader has been updated to version 1.8.0 to fix a critical security issue. We strongly recommend all customers to upgrade their products to this latest version which was introduced in Gecko SDK Suite 2.5.0 (Q4 2018 release in December). Customers may upgrade the bootloader without updating their protocol stack or application code to the latest SDK version.

### 1.4 New EFM32 example applications:

- USB microphone example applications for the new EFM32 Giant Gecko 12 Thunderboard (SLTB009A\_EFM32GG12) board featuring the new PDM peripheral.
- USB and Micrium Net Gecko Bootloader example applications for EFM32 Giant Gecko 11 Starter Kit (SLSTK3701A\_EFM32GG11).
- Updated all Micrium OS based example applications to use OS v5.06.00.
- New Software License Agreement.

## 1.5 Using This Release

32-bit MCU SDK 5.7.3.0 is installed with Gecko SDK Suite 2.5.3 in Simplicity Studio for EFM32 and EZR32 products. This release contains the following.

- Gecko Platform components
- EFM32 and EZR32 example applications

### 1.5.1 Compatible Software

This version of the 32-bit MCU SDK is compatible with the following tool chains.

- IAR Embedded Workbench for ARM (IAR-EWARM) version 8.30.1
- GCC (The GNU Compiler Collection) version 7.2.1 is provided with Simplicity Studio
- Keil MDK V5.25 for ARM

## 1.6 Support

Development Kit customers are eligible for training and technical support. You can use the Silicon Laboratories web site <https://www.silabs.com/products/mcu/32-bit> to obtain information about all EFM32 Microcontroller products and services, and to sign up for product support.

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

## 2 Added Items

### 2.1 Gecko Platform:

- EMLIB
  - Added general support for EFM32GG12.
  - em\_dbg: Added `DBG_DisableDebugAccess()` for debug lock abstraction.
  - em\_cmu: Added `CMU_USHFRCOFreqGet()` function for getting current USHFRCO frequency on Series 0 and 1.
  - em\_pdm: New module supporting PDM (Pulse Density Modulation) peripheral.
  - em\_ldma: Added PDM signal and source selector, added new LDMA descriptor template for word (32bit) peripheral to memory transfers.
  - em\_rtc: Added support for all 6 compare channels on Series 1.
  - em\_cmu: Added support for HFBUSPRESC in `CMU_ClockPrescSet()` and `CMU_ClockPrescGet()`.
  - em\_cmu: Added missing RTCC prescaled clock freq calculation.
  - em\_cmu: Added missing support for LETIMER1.
  - em\_adc: Added support for prescaler and timebase calculation in SYNC mode for HFPERCCLK driven ADC.
  - Updated multiple modules to use correct HFPER clock tree (A, B or C) when calling `CMU_ClockFreqGet()` function.
  - em\_se: New module, contains API for interfacing with the Secure Element (SE) peripheral on Series 2. Module contains functions to get status information from the SE, interact with debug locks, and write keys and user data. The module is also used by mbed TLS when performing accelerated crypto operations.
- EMDRV

- SPIDRV: Added support for 9 bit frames using TXDATAx and RXDATAx registers.
- NVM3 Beta feature: Added support for storing data in SPI connected external Flash using Gecko Bootloader APIs and drivers. This feature is Beta tested only. In this Beta feature, data is encrypted in a format that is not compatible with mbed TLS. Not supported for production deployments.
- mbed TLS
  - Added support for AES, SHA, ECDSA, ECDH and EC-JPAKE Series 2 hardware accelerators.
  - Added RTOS support for Series 2.

## 2.2 EFM32 example applications:

- For the new EFM32 Giant Gecko 12 Thunderboard development kit (SLTB009A\_EFM32GG12):
  - blink
  - pdm-led
  - usbdhidkbd
  - usbdpdmnic
  - vcom
- For EFM32 Giant Gecko 11 Starter Kit (SLSTK3701A\_EFM32GG11):
  - qspi\_direct
  - qspi\_indirect
  - micriumos\_httploader
  - usbdloader
  - usbhloader

## 3 Fixed Issues

### 3.1 Gecko Platform:

- EMLIB
  - em\_wdog: Changing default oscillator for the watchdog from 1 kHz ULFRCO to the 32.768 kHz LFRCO. This change is inside WDOG\_INIT\_DEFAULT. Make sure we wait for previous operations to complete before applying any new configurations to work correctly with the asynchronous peripheral.
  - Adding a timeout so operations started when SYNCBUSY stays high will complete.
  - em\_msc: Unlock the MSC before write/erase operations and return to the previous state before the function returns.
  - em\_adc: GPBIASACC is set to LOWACC when reading the internal temperature sensor for Series 2.
  - em\_cmu: Fixed bug where HFRCODIV2 remains selected for certain configurations after the DPLL is initialized.
  - em\_can: Updated CAN\_ReadMessage() to read ID of the arriving CAN message when receiving a message object.
  - em\_can: Added CAN\_DataValid() for reading DATAVALID bit from CANn\_MITx\_CTRL register.
  - em\_can: Fixed bug where CAN\_AbortSendMessage() modifies the ARB register with a value destined to the CTRL register of the message object.

- em\_emu: Fixed bug in EMU\_EnterEM3() where LF oscillators were not disabled before entering EM3 on Series 0 and 1 devices.
- EMDRV
  - Fixed UARTDRV build issue under Keil MDK.
- mbed TLS
  - Fixed TRNG underflow bug.
  - mbedtls\_ccm\_encrypt\_and\_tag() and mbedtls\_ccm\_auth\_decrypt() allows additional data pointer to be NULL when add\_len is zero.
- NVM3
  - Fixed issue where repacks were executed prematurely when NVM3 is using 3 flash pages on parts with 8k flash page size.
  - Fixed issue where counter objects used more flash than needed.
  - If the device was reset during a call to nvm3\_eraseAll(), the NVM3 data could get corrupted. Subsequent calls to nvm3\_open() could fail as a result of the data corruption.
  - Fixed a bug where a reset during write, increment or repack of a counter object could result in a corrupted counter value.

## 3.2 EFM32 example applications:

- EFM32 Giant Gecko 11 (SLSTK3701A\_EFM32GG11)
  - can\_board: Fixed CAN bit timing issue.
  - micriumos\_shell: Fixed interrupt pointer check on program memory.
  - helges\_demo: Fixed CSEN DATA being read before it was ready at the initialization phase.
- EFM32 Tiny Gecko 11 (SLSTK3301A\_EFM32TG11)
  - can\_board: Fixed CAN bit timing issue.
  - helges\_demo: Fixed CSEN DATA being read before it was ready at the initialization phase.
- EFM32 Tiny Gecko (EFM32TG\_STK3300)
  - touch: Fixed warning introduced by sprintf.
- EFM32 Pearl Gecko 1 (SLSTK3401A\_EFM32PG)
  - micriumos\_wifi\_whiteboard: Fixed warning introduced by calling undefined functions.

## 4 Changed Items

### 4.1 Gecko Platform:

- All source files
  - New Software License Agreement. See individual source files for more information.
- EMLIB
  - em\_cmu: CMU\_OscillatorEnable() will wait for the RDY flag to go low when enable is false and wait is true for Series 1.

- em\_cmu: CMU\_LFXOInit() will now check if configuration is necessary before disabling the LFXO. On a soft reset, the LFXO might already be ready for use with correct tuning values.
- em\_cmu: CMU\_HFXOInit() now returns early if HFXO is already selected as SYSCLK.
- em\_cmu: Updated max frequency for WS2/1.0V scaling according to latest datasheets.
- EMDRV
  - NVM3: HAL handle added to NVM3 init structure to allow selecting HAL at run time.
  - RTCDRV: Changed the prescaler used in RTCDRV from 8 to 1 for devices with the RTCC peripheral. This means that we now configure the RTCC to use a 32768 Hz clock instead of 4096 Hz in RTCDRV\_Init().
- mbed TLS
  - Updated to version 2.7.6. Full changelog: <https://tls.mbed.org/tech-updates/releases/mbedtls-2.13.0-2.7.6-and-2.1.15-released>

## 4.2 EFM32 example applications:

- All source files
  - New Software License Agreement. See individual source files for more information.
  - Updated all Micrium OS examples to use OS v5.6.0.

## 5 Removed Items

### 5.1 Gecko Platform:

- EMLIB
  - em\_cmu: Removed CMU\_HFCLKLEPRESC\_REG case from switch statement inside the function CMU\_ClockPrescSet(). This switch case is unnecessary since HFCLKLE prescaler is automatically set when the HF clock is changed.
- Third-party/Middleware software
  - Micrium Classic (uC/OS-II and III). New designs should use Micrium OS.
  - Keil RTX 4 because of incompatibility with Embedded Workbench for ARM (IAR-EWARM) version 8.30.1.

### 5.2 EFM32 example applications:

- All Micrium Classic based example applications (uC/OS-II and III).
- All Keil RTX 4 based example applications.
- All TouchGFX based example applications.

## 6 Deprecated Items

### 6.1 Gecko Platform:

Complete list of deprecated APIs can be found here: <http://devtools.silabs.com/dl/documentation/doxygen/5.7/efm32gg11/html/deprecated.html>

## 7 Open Issues

### 7.1 Gecko Platform:

- None

### 7.2 EFM32 example applications:

- None