RSL10 SDK Release Notes - 2.4.1

March 25, 2019

RSL10 is a Bluetooth® 5 certified multi-protocol radio System-on-Chip (SoC) that brings the industry's lowest power Bluetooth low energy technology to wireless applications. The RSL10 Software Development Kit (SDK) includes the firmware, software, and documentation needed to evaluate this chip and develop applications based on RSL10.

This document lists new features in this release, describes known issues, and points you to more information so you can start using the product.

> **NOTE**
> The CMSIS Pack has been updated to version 2.4.1 which includes the new and improved FOTA features. There is no need to download and run the SDK installer as it remains at version 2.3.

What's New

Summary	Release Notes
New sample application for Heart Rate Peripheral FOTA	This new application (*ble_peripheral_server_hrp_fota*) is similar to the Heart Rate Bluetooth Low Energy application (*ble_peripheral_server_hrp*) but with added features to support FOTA updates.
Add new FOTA command line tool into RSL10 SDK	Replaced the previous Firmware Over-The-Air (FOTA) PC application with a new tool, named *FOTA.Console.exe*. This new tool is available in the *utility_apps.zip* package and provides support for FOTA updates using the RSL10 Dongle.
Getting Started Guide: Add Printf Debug Capabilities	An advanced Debugging section is added to the RSL10 Getting Started Guide covering PRINTF() debugging using UART and RTT.
Update Bluetooth Low Energy abstraction callback function return type to allow error propagation	Updated the return type of the Bluetooth Low Energy GATT abstraction callback function from void to uint8_t. This allows the user application to return an error during an attribute read or write. The error code is propagated to the Bluetooth Low Energy stack and peer device.
Update bootloader sample application for compatibility with FOTA	The bootloader sample application has been updated to be compatible with the Firmware Over-The-Air (FOTA) Device Firmware Update (DFU) component. Documentation is provided in the *RSL10 Bootloader Guide*.
RSL10 FOTA documentation	Added a new manual *RSL10 Firmware Over-The-Air User's Guide*. This document provides information on how to use the RSL10 tools, firmware and sample code to perform FOTA updates.

6 issues

Bug Fixes

Summary	Release Notes
Corrected the CMSIS Pack Bluetooth Low Energy applications' light/hci library variant	Bluetooth Low Energy applications in the CMSIS Pack had the incorrect library variant set by default in the *.rteconfig* file (release_light or release_hci). This bug was introduced in SDK 2.3 and has now been fixed.
Sample application ble_android_asha restored in the CMSIS Pack	The ble_android_asha sample application was released in the RSL10 Standalone SDK 2.3 but not included in the CMSIS Pack. This application is now also available in the CMSIS Pack.

2 issues

Known Issues

The following issues are known to be outstanding in release 2.4.1:

Summary	Release Notes

UART CMSIS-Driver clears busy status while last byte transfer is still ongoing	The UART CMSIS-Driver busy status flag is cleared once the hardware is ready to transmit or receive additional data. Therefore, the last byte transmission is still ongoing once the flag is cleared. If the application needs to know when the transfer has finished, it should account for additional time to complete the transmission of the last byte after the busy flag is cleared, based on the baud rate.
peripheral_server_sleep app might crash with pin wakeups	The *peripheral_server_sleep* application might crash if wakeup by DIO pins is selected.
Fix bugs in peripheral_server_standby app with pin wakeups	The *peripheral_server_standby* application randomly crashes if wakeup by DIO pins is selected.
Only one DIO interrupt debounce filter can be enabled at a time	Due to a hardware limitation, only a single DIO interrupt debounce filter can be enabled at a time.
FOTA_PC_APP: Exception: STATUS_ACCESS_VIOLATION stackdump	Occasional crashes have been observed in the Firmware Over-the-Air PC application during the scan procedure.
I2C CMSIS Driver "xfer_pending" not supported	The I2C CMSIS-Driver does not support the "xfer_pending" feature due to a hardware limitation. Therefore, generating a repeated start condition on the I2C interface using the I2C CMSIS-Driver is not possible.
Remote Mic TX with Audio Shield does not work after Supplemental Calibrate app	To make the *remote_mic_tx_raw* application work with the Audio Shield, erase the NVR3 program that is loaded by the supplemental calibrate application.
CRC limitation with 89 vector table entries	The CRC function is not valid if all 88 possible vectors are in use.
Controller privacy cannot be used with some smartphones	Because of a hardware issue, smartphones Samsung S7 and S8 do not show RSL10 advertisements when controller privacy is used. Therefore, use host privacy in these cases. When host privacy is used, you can decrease power consumption close to the level of controller privacy use by employing a new feature called "power save control". To enable it, see the new API called `GAPM_POWER_SAVE_CTRL_CMD` as specified in the GAP Interface Specification from CEVA.

Delay needed in the remote_mic_rx_raw sample application for PCM input	To have good audio quality for PCM input, add a delay in the `ASRC_out` DMA interrupt. Use a delay instruction in the `DMA_IRQ_FUNC(ASRC_OUT_IDX)(void)` function in *app_func.c* as shown below:
	
	`#if (INPUT_INTRF == PCM_RX_RAW_INPUT)`
	`  Sys_Delay_ProgramROM(100);`
	`#endif`

Remote Mic TX: smaller sub-frame causes noisy right channel	Choosing a SUBFRAME that is less than 32 samples for the DMIC and PCM ports in the Stereo Raw Audio Stream Broadcast Transmitter Custom Protocol sample application (*remote_mic_tx_raw*) causes periodic noise on the right channel for PCM and both channels for DMIC.
Investigating increase in latency for custom_protocol_trx	Configuring the RX output to SPI causes an extra 1.5 ms increase in the end-to-end latency. Now it is 8.6 ms, but it is supposed to be 7 ms.
Investigating spurious emissions for the remote mic protocol	The remote microphone protocol implementation on the transmitter side has spurious emission violation non-conformance with regulatory tests.
Installer fails if the path is too long	If the installation path is longer than 50 characters, the installer fails with an error specifying which path is too long. When the installer tries to install some of the subfolders, the entire path length exceeds the maximum allowed by Windows. If you choose a location that is different from the default installation location, ensure that it does not exceed 50 characters.
Remote microphone performance needs further evaluation	The audio stream broadcast custom protocol has not been fully characterized.

15 issues

Further Reading

See *Getting Started with RSL10* to discover:

- How to install the software development tools
- How to connect to the Evaluation and Development Board
- How to run a simple sample application that shows the board is working
- An overview of the documentation set

Release Organization

The following files are available on the same web page as these release notes:

Release Item	Description
RSL10 SDK Getting Started Guide	Second document you should read after this one. For a full description, see Further Reading
RSL10 Software Development Kit (SDK) Installer	Installer for the standard RSL10 SDK (Oxygen Eclipse)
RSL10 SDK CMSIS Pack	Arm CMSIS Pack for Oxygen and Keil
RSL10 Software Documentation Package	All manuals in one folder that can be accessed without installing or starting an IDE
RSL10 Software Utility Apps	Contains utility applications and external projects that can be used to help demonstrate and test the functionality of the RSL10 Evaluation and Development Board: ■ Standalone Flash Loader ■ Ezairo 7100-based sample audio applications ■ Firmware Over-The-Air (FOTA) Console Tool
RSL10 SDK LPDSP32 Package	Startup files, Eclipse project files, a utility to integrate LPDSP32 output code with Arm Cortex®-M3 processor code, a test suite, and documentation
RSL10 Bluetooth Mesh Package	The tools and documentation that support Mesh networking
RSL10 Software Release Notes History	An archive file containing previous versions' release notes

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