Release Notes

DA1469x SDK

SW-B-001

Abstract

This document contains the release notes for Renesas' DA1469x Software Development Kit, version 10.0.10.119.1

Contents

Tables

1 Terms and Definitions

API	Application Programming Interface
Bluetooth® LE	Bluetooth® Low Energy
DMA	Direct Memory Access
FPGA	Field Programmable Gate Array
FW	Firmware
GA	General Access
HCI	Host Controller Interface
IRQ	Interrupt Request
LA	Limited Access
NVMS	Non-Volatile Memory Storage
OS	Operating System
OTP	One-Time Programmable Memory
PLT	Production Line Tool
SDK	Software Development Kit
SNC	Sensor Node Controller
SUOTA	Software Update Over-the-Air
TRNG	True Random Number Generator
TX	Transmit
USB	Universal Serial Bus

2 Release Data

Table 1: Information Table

Software	SDK10 (DA1469x SDK)
Device Number	DA14691, DA14695, DA14697, DA14699
Software Release Date	4 October 2022
Software Version Number	10.0.10.119.1
Software Release Type (Note 1)	FULL (GA)

Note 1 Releases can be of the following types: FULL (GA), FULL (LA), RELEASE CANDIDATE, ENGINEERING, PATCH or BINARY

3 License

Licenses covering this SDK release are listed in the license.txt file in SDK doc folder.

4 Related Documentation and References

[1] UM-B-090, DA1469x Getting Started with the Development Kit , Revision 2.0, User Manual, Renesas

[2] UM-B-092, DA1469x Software Platform Reference , Revision 5.0, User Manual, Renesas

[3] UM-B-105, DA1469x Application Porting Guide, Revision 1.0, User Manual, Renesas

5 Release Description

5.1 Overview

This is a full release of SDK 10.0.10 for the DA1469x family of devices. It is an update release of 10.0.10.118.6 release which includes a fix for radio calibration.

5.2 Fixes and Improvements since 10.0.10.118.6

Table 2: 10.0.10.119.1 Fixes and Improvements

Fix Number	Description
118.01	Trim values are not used on first radio calibration.

5.3 Known Issues of 10.0.10.119.1

Table 3: 10.0.10.119.1 Known Issues

Issue Number	Description
118.02	ANCS Bluetooth® LE profile application hits assertion when Bluetooth® LE service on Apple Device is enabled/disabled while notifications are sent.
118.03	While operating as peripheral device, if Link Layer procedure collision involving Encryption procedure occurs, then the Link Layer does not restart the flow of LE-ACL Logical Transport in the direction from slave to master on completion of the Link Layer Encryption procedure. This can lead to connection being terminated unneccessarily or the clogging of application data transmission.
118.04	QSPI reset sequence will fail if device operates in continuous or QPI mode.
105.01	PLT_FW hci_gpio_wd and hci_gpio_set commands may result in unexpected behavior when PWM option is used. Also hci_cmd_sleep command should not be called after these commands when PWM option is used.
105.02	PLT_FW hci_sensor_test command fails to write register values over the SPI bus.
105.03	Changing system clock speed is not thread safe (cm_sys_clk_set() should not be concurrently called by mutliple tasks).
105.04	Voltage monitoring service (sys_adc) always monitors temperature sensor near radio (sys_adc_config() temperature sensor selection is ignored).
105.05	PMU adapter loads default settings to BOD.
105.06	ANCS application becomes unresponsive in out of range and stress tests.
66.02	Assertion will hit during USB suspend/resume if reset is received before resume.
28.04	Detaching from Eclipse Debugger is not always successful.

5.4 Known Limitations of 10.0.10.119.1

Table 4: 10.0.10.119.1 Known Limitations

Limitation Number	Description
118.6.01	Operating at highest SWD frequency may result in corruption of the debug session. Reduced SWD frequency to 1MHz as a workaround.
118.6.02	Process spread may result in XTAL32K frequency deviations across silicon causing Bluetooth® LE disconnections at low temperatures. Increased default XTAL32K ppm setting (dg_configLP_CLK_DRIFT) as a workaround.

Limitation Number	Description
118.6.03	The following voltage levels are no longer supported ● 3V0 rail : 3V45 ● 1V2 rail during sleep : 0V95, 1V0 Deprecated the support of the respective API configuration options from hw_pmu_da1469x driver : ● HW_PMU_1V2_SLEEP_VOLTAGE_0V95 ● HW_PMU_1V2_SLEEP_VOLTAGE_1V0 ● HW_PMU_3V0_VOLTAGE_3V45
118.05	While operating as peripheral device, Bluetooth Host stack does not uphold the Security Manager Protocol Timeout (SMP Timeout) when sending SM_Security_Request Command. This may lead to more than one request to central device to initiate security (either pairing or encrypting) on the same connection. This behaviour does not compromise the security aspects of the product.
118.06	Bluetooth Host stack unnecessarily delays the start of Security Manager Protocol Timeout (SMP Timeout) when receiving SM_Pairing Request Command while operating as peripheral device or when receiving SM_Security_Request Command when operating as central.
118.07	Abnormalities with HCI_LE_Transmit_Power_Reporting event: ● PHY parameter may not correctly reflect the PHY for which the power level is reported. ● the event may be sent to Bluetooth Host stack with erroneous reason "Remote transmit power changed", when the remote transmit power level is not changed. ● the event may be missing as a response to host issued HCI_LE_Read_Remote_Transmit_Power_Level command when the peer device rejects the relevant Link Layer command or does not support LE Power Control.
105.07	Only 8 set of Identity Resolving Key (IRK) is supported in the resolving list at Link Layer when privacy feature is used.
105.08	Controller stack does not alter the minimum and maximum connection interval provided by the application for LL_CONNECTION_PARAM_REQ. This can lead to scheduling conflicts during multi-connection. Workaround: Set identical value for minimum and maximum connection interval from application to trigger controller to choose a value with minimal scheduling conflicts in multi-connection scenarios.
105.11	The APIs for supporting haptic and audio are in beta state. API's may change in future SDK releases.
16.10	Default version of Segger debugger does not support Watchpoints.

6 Release History

6.1 Version 10.0.10.118.6

6.1.1 Overview

This is a full release of SDK 10.0.10 for the DA1469x family of devices. It is an update release of 10.0.10.118 release which adds support for the PCN 2021_901.

6.1.2 New and Updated Features of 10.0.10.118.6

Table 5: 10.0.10.118.6 New Features

Feature Number	Description
118.6_01	Support PCN 2021_901.

6.1.3 Fixes and Improvements since 10.0.10.118

Table 6: 10.0.10.118.6 Fixes and Improvements

Fix Number	Description
118.6/01	Improved RC32K accuracy by re-calibrating RC32K clock during runtime, on temperature drift.
118.6/02	Clock & time calculation improvements : - Improved XTAL32M clock settling checks - Moved calculations of time spent during sleep in critical sections
118.6/03	Improved configuration of QSPIC2 data pads when controller is disabled.
118.6/04	Fixed: Bluetooth Controller may become instable when deletion of Link Layer driver event is pre-empted by an interrupt service routine (ISR) related to another Link Layer driver event. This may rarely occur when Bluetooth Controller is set to perform concurrent operation of Link Layer operational states.
118.6/05	Fixed: Bluetooth Controller may become instable when preparation of advertising report is pre-empted by an interrupt service routine (ISR) related to the same scanning state.

6.1.4 Known Issues of 10.0.10.118.6

Table 7: 10.0.10.118.6 Known Issues

Issue Number	Description
118.01	Trim values are not used on first radio calibration. Workaround when using plt_fw: Trigger a calibration using HCI command.
118.02	ANCS Bluetooth® LE profile application hits assertion when Bluetooth® LE service on Apple Device is enabled/disabled while notifications are sent.
118.03	While operating as peripheral device, if Link Layer procedure collision involving Encryption procedure occurs, then the Link Layer does not restart the flow of LE-ACL Logical Transport in the direction from slave to master on completion of the Link Layer Encryption procedure. This can lead to connection being terminated unneccessarily or the clogging of application data transmission.
118.04	QSPI reset sequence will fail if device operates in continuous or QPI mode.

Issue Number	Description
105.01	PLT_FW hci_gpio_wd and hci_gpio_set commands may result in unexpected behavior when PWM option is used. Also hci_cmd_sleep command should not be called after these commands when PWM option is used.
105.02	PLT_FW hci_sensor_test command fails to write register values over the SPI bus.
105.03	Changing system clock speed is not thread safe (cm_sys_clk_set() should not be concurrently called by mutliple tasks).
105.04	Voltage monitoring service (sys_adc) always monitors temperature sensor near radio (sys_adc_config() temperature sensor selection is ignored).
105.05	PMU adapter loads default settings to BOD.
105.06	ANCS application becomes unresponsive in out of range and stress tests.
66.02	Assertion will hit during USB suspend/resume if reset is received before resume.
28.04	Detaching from Eclipse Debugger is not always successful.

Note 1

6.1.5 Known Limitations of 10.0.10.118.6

Table 8: 10.0.10.118.3 Known Limitations

Limitation Number	Description
118.6.01	Operating at highest SWD frequency may result in corruption of the debug session. Reduced SWD frequency to 1MHz as a workaround.
118.6.02	Process spread may result in XTAL32K frequency deviations across silicon causing Bluetooth® LE disconnections at low temperatures. Increased default XTAL32K ppm setting (dg_configLP_CLK_DRIFT) as a workaround.
118.6.03	The following voltage levels are no longer supported - 3V0 rail : 3V45 - 1V2 rail during sleep : 0V95, 1V0 Deprecated the support of the respective API configuration options from hw_pmu_da1469x driver : - HW_PMU_1V2_SLEEP_VOLTAGE_0V95 - HW_PMU_1V2_SLEEP_VOLTAGE_1V0 - HW_PMU_3V0_VOLTAGE_3V45
118.05	While operating as peripheral device, Bluetooth Host stack does not uphold the Security Manager Protocol Timeout (SMP Timeout) when sending SM_Security_Request Command. This may lead to more than one request to central device to initiate security (either pairing or encrypting) on the same connection. This behaviour does not compromise the security aspects of the product.
118.06	Bluetooth Host stack unnecessarily delays the start of Security Manager Protocol Timeout (SMP Timeout) when receiving SM_Pairing Request Command while operating as peripheral device or when receiving SM_Security_Request Command when operating as central.
118.07	Abnormalities with HCI_LE_Transmit_Power_Reporting event: - PHY parameter may not correctly reflect the PHY for which the power level is reported. - the event may be sent to Bluetooth Host stack with erroneous reason ""Remote transmit power changed"", when the remote transmit power level is not changed. - the event may be missing as a response to host issued HCI_LE_Read_Remote_Transmit_Power_Level command when the peer device rejects the relevant Link Layer command or does not support LE Power Control.

Limitation Number	Description
105.07	Only 8 set of Identity Resolving Key (IRK) is supported in the resolving list at Link Layer when privacy feature is used.
105.08	Controller stack does not alter the minimum and maximum connection interval provided by the application for LL_CONNECTION_PARAM_REQ. This can lead to scheduling conflicts during multi-connection. Workaround: Set identical value for minimum and maximum connection interval from application to trigger controller to choose a value with minimal scheduling conflicts in multi-connection scenarios.
105.11	The APIs for supporting haptic and audio are in beta state. API's may change in future SDK releases.
16.10	Default version of Segger debugger does not support Watchpoints.

6.2 Version 10.0.10.118

6.2.1 Overview

This is a full release of SDK 10.0.10 which supports the DA1469x device. It adds support of Bluetooth version 5.2, LE Power Control, Advertising Channel Index, Adesto flash device, new HCI commands and a Blood Pressure Sensor application. It also adds a number of improvements and fixes as listed in the following tables.

6.2.2 New and Updated Features of 10.0.10.118

Table 9: 10.0.10.118 New Features

Feature Number	Description
118_01	Blood Pressure Sensor application
118_02	Support for Adesto flash device AT25SL321
118_03	Support for LE Power Control feature. This is a v5.2 Bluetooth Low Energy feature. The feature allows the device to manage the transmit power by monitoring the received signal strength and changing the transmit power level of the connected devices to maintain an optimal receiver signal strength for both signal quality and low power perspective. Additionally, the Bluetooth Controller monitors and report path loss changes to the application using the concept of zones that can be useful in certain application related to proximity. Through this feature, the device benefits from : - the reduction of overall power consumption during transmission, - improved reliability by actively maintaining the receiver signal strength within the optimal range of the receiver, - improved coexistence with other co-located 2.4GHz wireless devices.
118_04	Support for Advertising Channel Index feature. This is a v5.1 Bluetooth Low Energy feature. The feature allows the device to send Advertising PDU on the primary advertising channel indices any order. The order can be specified by the application. Prior to this feature, the order of the primary advertising channel indices is fixed. Through this feature, the device benefit from improved reliability of Advertising PDUs in a congested environment where multiple devices simultaneously advertise.
118_05	Support for HCI_LE_Read_Transmit_Power (OGF 0x08, OCF 0x004B) command. This is a new HCI command specified since Bluetooth core specification v5.0, which allows the host to read the minimum and maximum transmit power supported by the Bluetooth Controller.
118_06	Support for HCI_LE_Transmitter_Test [v3] (OGF 0x08, OCF 0x0050) command. This is a new HCI command specified since Bluetooth core specification v5.1, which allows to start test by generating test reference packets at a fixed interval.
118_07	Support for HCI_LE_Transmitter_Test [v4] (OGF 0x08, OCF 0x007B) command. This is a new HCI command specified in Bluetooth core specification v5.2, which allows to start test by generating test reference packets at a fixed interval including Transmit Power Level

6.2.3 Fixes and Improvements since 10.0.8.105

Table 10: 10.0.10.118 Fixes and Improvements

Fix Number	Description
118/01	Improved searching and filtering of PDC look up table by intoducing hw_pdc_lut_keep() and hw_pdc_find_entry() API functions.

Fix Number	Description
118/02	Fixed naming inconsistencies of hw_rtc driver data types and functions by replacing rtc_ prefix with hw_rtc_ .
118/03	The resolution of resolvable private address generation interval (TGAP(private_addr_int)) is changed from milliseconds to seconds to align the interval to the time range defined in Bluetooth core specification v5.2. The allowed range of interval is from 1 second to 1 hour with the default interval set to 15 seconds in accordance to Bluetooth core specification v5.2. This improvement impacts the usage of ble_gap_address_set().
118/04	Added readme.md files for ble_adv and ble_external_host example applications (accessible through doxygen documentation).
118/05	Depreciated the support of HCI_Host_Number_Of_Completed_Packets (OGF 0x03, OCF 0x0035) command. Since the Bluetooth Controller does not support flow control in the direction of controller to host, this command is redundant. This command is classified as optional to support in Bluetooth core specification v5.2.
118/06	Fixed CMAC errors (CM_TS_ERR) while prolonged processing of certain Advertising PDUs.
118/07	Improved the stability of the system if the application erroneously calls ble_gap_adv_start() without calling relevant APIs to set the advertising parameters.
118/08	Improved radio calibration routines resulting in better radio performance.
118/09	Improved the handling of LL_UNKNOWN_RSP during collision caused by incompatible Link Layer procedures. Prior to this improvement, while operating as slave, the Link Layer may incorrectly handle the Link Layer Procedure Response timeout resulting in disconnection
118/10	Improved the behaviour of the Bluetooth Controller stack if the peer device (master) erroneously perform Link Layer Channel Map Update procedure while Link Layer Connection Parameters Request procedure is ongoing by processing the LL_CHANNEL_MAP_IND PDU prior to completion of Connection Parameters Request procedure. This change in behaviour may result in keeping the connection alive during this out-of-specification behaviour of the smartphone. Prior to this change, the processing of such LL_CHANNEL_MAP_IND would result in termination of the connection.
118/11	Improved the stability of the MAC layer when Bluetooth Controller processing for disabling the Scanning state is interrupted for scheduling an Advertising or a Connection event.
118/12	Improved Adaptive Frequency Hopping (AFH) support which could result in system hang when operating as LE master (central) for more than one connection.
118/13	While operating as LE slave (peripheral role), the Link Layer validates the fields in the received LL_CONNECT_IND / LL_CONNECT_REQ PDU. The connection is considered lost if the received PDU contains one or more fields which are specified as Reserved for Future Use (RFU). This improvement is in accordance of the Link Layer Part of Bluetooth core specification v5.2.
118/14	Improved the handling of incorrect SM_Pairing_Request by ignoring the PDU without sending a response. This is in accordance to the recommendation stated in Bluetooth core specification v5.2 for handling invalid behaviour of peer (remote) device.
118/15	Improved randomness of random number generator seed used by libmkimage utility when generating secure images.

Fix Number	Description
118/16	Fixed PDC LUT handling when entering Deep Sleep and Hibernation modes. The LUT now includes entries only for the wakup sources which are available in these modes, as follows: Deep Sleep: - All existing PDC entries are removed except: 1. GPIO wakeup trigger of any port and pin which wake up M33 2. RTC alarm and RTC timer peripheral trigger id that wakes up M33 - A PDC entry with type peripheral trigger, trigger id combo and wakeup master M33 is added Hibernation: - All existing PDC entries are removed - A PDC entry with type: peripheral trigger, trigger id: combo and wakeup master: M33 is added Notes: - Trigger id: combo refers to VBUS_IRQ or Debounced IO IRQ or JTAG_IRQ or CMAC2SYS_IRQ - In Deep Sleep mode, it is application's responsibility to add GPIO and/or RTC trigger PDC entries, if needed
118/17	Fixed default BOD configuration which disabled reset on BOD events. BOD detection & reset are now by default enabled on all power rails except V18F (which should be shorted with V18P, see Errata 294 - ""V18F switch resistance too high""). Deprecated hw_bod_activate_on_wakeup(). hw_bod_configure() should be used instead.
118/18	Fixed high sleep current issue observed when 1V8P is disabled. In the context of this fix, GPADC usage (driver, adapter, SNC) was revisited and a few more issues were identified & resolved.
118/19	Fixed validity check of initial Bluetooth® LE TX power configuration (dg_configBLE_INITIAL_TX_POWER)
118/20	Fixed resetting of MX25U12832F flash device & improved reset sequence for all flash devices.
118/21	Fixed input validity checks of SDK Bluetooth® LE applications' command line interface .
118/22	Fixed SDK example applications (pxp_reporter, wsp_weightscale, ble_peripheral) which attempted to start connectable advertising even after the maximum supported number of connections was reached.
118/23	Fixed watchdog expiration in hibernation when RCX is used as low power clock by disabling RCX when entering hibernation.
118/24	Fixed blocking for ever in ble_gap_conn_rssi_get() when connection is lost.
118/25	Fixed SWRESET macro used for issuing a software reset
118/26	Fixed Bluetooth Controller failures in searching White List look up table which affected Link Layer device filtering.
118/27	Fixed reporting of events from fewer scanned advertising channels when ble_gap_adv_chnl_map_set(0 is used for reducing number of channel index for advertising.
118/28	Fixed failures in generating a resolvable private address when resolvable private address generation interval is reached i.e. TGAP(private_addr_int).

Fix Number	Description
118/29	Fixed not setting the local Identity Resolving Key (IRK) to all-zero if the device does not use private device address. The issue affects compliancy Generic Access Profile (GAP) part of Bluetooth core specification.
118/30	Fixed ocasional erroneous use of L2CAP_CONNECTION_PARAMETER_UPDATE_REQ (instead of Link Layer Connection Update procedure) to request connection parameter update, when operating as peripheral device. The issue affects compliancy with Link Layer part of Bluetooth core specification.
118/31	Fixed outdated application/Bluetooth Host readings of peer resolvable private address from the Bluetooth Controller.
118/32	Fixed erroneous termination of the Link Layer Procedure Response timeout when receiving a LL_VERSION_IND during a different Link Layer procedure .
118/33	Interleaving of Advertising state and Initiating state may subsequently result in two connection, one as LE master (central role) and another as LE slave (Peripheral role) with same connection handle referenced to the local Bluetooth Host in HCI_LE_Connection_Complete Event. This may result in instability of the Bluetooth subsystem.
118/34	Fixed race between HCI_LE_Create_Connection_Cancel Command and HCI_LE_Connection_Complete Event which may result in instability of Bluetooth Host.
118/35	Fixed rare instability of the Bluetooth Controller caused by the Adaptive Frequency Hopping (AFH) Channel Assessment algorithm which either executes unnecessarily when operating as LE slave for all existing connection or fails to execute when operating as LE master for at least one connection.
105.09	Fixed: Bluetooth Controller stack reports hardware error and become unresponsive when the host sends an ACL data packet of length higher than the maximum size reported in the response of HCI_LE_Read_Buffer_Size command that the controller can receive from host. This can happen only when external host stack is used.
105.10	Fixed: Bluetooth Controller stack asserts when the ACL data packet is received from the host with the connection handle which is specified as Reserved for Future Use (RFU) in Bluetooth specification. This can happen only when external host stack is used.

6.2.4 Known Issues of 10.0.10.118

Table 11: 10.0.10.118 Known Issues

Issue Number	Description
118.01	Trim values are not used on first radio calibration. Workaround when using plt_fw: Trigger a calibration using HCI command.
118.02	ANCS Bluetooth® LE profile application hits assertion when Bluetooth® LE service on Apple Device is enabled/disabled while notifications are sent.
118.03	While operating as peripheral device, if Link Layer procedure collision involving Encryption procedure occurs, then the Link Layer does not restart the flow of LE-ACL Logical Transport in the direction from slave to master on completion of the Link Layer Encryption procedure. This can lead to connection being terminated unneccessarily or the clogging of application data transmission.
118.04	QSPI reset sequence will fail if device operates in continuous or QPI mode.
105.01	PLT_FW hci_gpio_wd and hci_gpio_set commands may result in unexpected behavior when PWM option is used. Also hci_cmd_sleep command should not be called after these commands when PWM option is used.
105.02	PLT_FW hci_sensor_test command fails to write register values over the SPI bus.

Issue Number	Description
105.03	Changing system clock speed is not thread safe (cm_sys_clk_set() should not be concurrently called by mutliple tasks).
105.04	Voltage monitoring service (sys_adc) always monitors temperature sensor near radio (sys_adc_config() temperature sensor selection is ignored).
105.05	PMU adapter loads default settings to BOD.
105.06	ANCS application becomes unresponsive in out of range and stress tests.
66.02	Assertion will hit during USB suspend/resume if reset is received before resume.
28.04	Detaching from Eclipse Debugger is not always successful.

Note 2

6.2.5 Known Limitations of 10.0.10.118

Table 12: 10.0.10.118 Known Limitations

Limitation Number	Description
118.05	While operating as peripheral device, Bluetooth Host stack does not uphold the Security Manager Protocol Timeout (SMP Timeout) when sending SM_Security_Request Command. This may lead to more than one request to central device to initiate security (either pairing or encrypting) on the same connection. This behaviour does not compromise the security aspects of the product.
118.06	Bluetooth Host stack unnecessarily delays the start of Security Manager Protocol Timeout (SMP Timeout) when receiving SM_Pairing Request Command while operating as peripheral device or when receiving SM_Security_Request Command when operating as central.
118.07	Abnormalities with HCI_LE_Transmit_Power_Reporting event: - PHY parameter may not correctly reflect the PHY for which the power level is reported. - the event may be sent to Bluetooth Host stack with erroneous reason ""Remote transmit power changed"", when the remote transmit power level is not changed. - the event may be missing as a response to host issued HCI_LE_Read_Remote_Transmit_Power_Level command when the peer device rejects the relevant Link Layer command or does not support LE Power Control.
105.07	Only 8 set of Identity Resolving Key (IRK) is supported in the resolving list at Link Layer when privacy feature is used.
105.08	Controller stack does not alter the minimum and maximum connection interval provided by the application for LL_CONNECTION_PARAM_REQ. This can lead to scheduling conflicts during multi-connection. Workaround: Set identical value for minimum and maximum connection interval from application to trigger controller to choose a value with minimal scheduling conflicts in multi-connection scenarios.
105.11	The APIs for supporting haptic and audio are in beta state. API's may change in future SDK releases.
16.10	Default version of Segger debugger does not support Watchpoints.

Note 3

6.3 Version 10.0.8.105

6.3.1 Overview

This is a full release of SDK 10.0.8 which supports the DA1469x device. It adds support from Bluetooth version 5.1, the PLT firmware project, support for haptics and audio and a number of improvements and fixes as listed in the following tables.

6.3.2 New and Updated Features of 10.0.8.105

Table 13: 10.0.8.105 New Features

Feature Number	Description
105_01	Added PLT_FW (Production Line Tool) application
105_02	Added Audio Manager middleware component for configuring audio paths. A demo application (apu_demo) demonstrating its' usage was also included
105_03	Added Smartdrive and Waveform playback support for Haptics
105_04	Support for HCI_LE_Generate_DHKey [v2]. This is a new HCI command introduced as part of v5.1 Bluetooth specification, which enhances the device to initiate generation of a Diffie-Hellman key in the Controller using a pre-defined debug private key when the Security Manager is operated in Debug Mode
105_05	Support for Link Layer Privacy feature added. This is v4.2 Bluetooth feature which allows the Bluetooth Controller to generate and resolve the resolvable private address (RPA) during various Bluetooth® LE operational states. Future SDK release will provide necessary support in Bluetooth Host
105_06	Support for interleaving of non-connected Bluetooth® LE operational states (Advertising, Initiating, Scanning). This allows application to simultaneously enable all these operations
105_07	Automatic generation of Public-Private Key generation during Phase 1 of the pairing process resulting in fresh key pair at every pairing procedure and thereby increases the security of the product. This is in line with the recommendation of Bluetooth specification
105_08	New stack versioning scheme reflecting unique value for each stack library implementation that is reflected in LL_VERSION_IND
105_09	Bluetooth Controller and Host stack has been upgraded to Core Specification v5.1
105_10	Controller Subsystem: Compliant to Core Specification v5.1 with the requirements set by Test Case Reference List (TCRL) 2019-1. QDID : 139842
105_11	Host Subsystem: Compliant to Core Specification v5.1 with the requirements set by Test Case Reference List (TCRL) 2019-1. QDID : 125630

6.3.3 Fixes and Improvements since 10.0.6.90

Table 14: 10.0.8.105 Fixes and Improvements

Fix Number	Description
105/01	Improved the system behaviour of the stack while sending packets during connection establishment procedure to reduce the possibility of link loss
105/02	Improved SNC API for getting uptime ticks
105/03	Improved GD25LE series flash devices current consumption in standby mode

Fix Number	Description
105/04	Improved USB port and data contact detection
105/05	Improved IS_OTP_ADDRESS macro implementation
105/06	Fixed bus error in SDADC adapter
105/07	Fixed system not going to sleep when adapters fail to open (return error)
105/08	Fixed P0_23 GPIO pin configuration as external LP_CLK input
105/09	Extended QSPI memory configuration API for setting fast read opcode
105/10	Fixed OTP CS BD_ADDRESS mapping in SmartSnippets Toolbox
105/11	Removed configurations which are not applicable for the DA1469x family of devices from SDK application configuration files
105/12	Fixed breakpoints not set when debugging in PRODUCTION MODE
105/13	Aligned Hibernation and Deep Sleep power configuration with datasheet description
105/14	Removed ASSERT_WARNING halting execution (in Development Mode) when an unknown CS group id is found in OTP
105/15	Improved device configuration: splited bsp defaults per device and refactored device selection (dg_configDEVICE macro)
105/16	Set cli_programmer default uart baudrate to 1MBps
105/17	Improved GPADC driver implementation and fixed API typos
105/18	Fixed ad_sdadc input validity checks
105/19	Fixed program_qspi_nvparam script failing to program nv params when no application specific NV parameters exist
105/20	Fixed wrong calculation of watchdog margin resulting in spontaneous ASSERT_WARNING hit when going to sleep
105/21	Fixed SDK Bluetooth® LE applications requesting to start adevertise when max supported number of connections is reached
105/22	Improved the stack behaviour during setting of data length (HCI_Set_Data_Length command) and Data Length Update procedure to address to improve interoperability
105/23	Improved the system behaviour of the stack to address the collisions during link layer Procedures using Instants
105/24	Improved the handling of LL_REJECT_IND and LL_REJECT_EXT_IND PDUs during various Link layer procedures resulting in better interoperability against the devices which rejects the link layer commands
105/25	Added a true number generated from TRNG block as a seed to the random number generator for CMAC. This prevents the controller to generate same random private device address.
105/26	In RF Test mode, only packets with correct CRC is used for estimating RSSI
105/27	The upper limit (maximum length) of duplicate filtering list is added to the CMAC Configuration table allowing SDK to set the value statically from dg_configBLE_DUPLICATE_FILTER_MAX. This means the upper limit (maximum length) of duplicate filtering list can not be set through HCI_DBG_Wr_Filt_Dup_Size command
105/28	Initiation of Link layer procedures honours the remote device Link layer FeatureSet
105/29	Re-initiation of LE Ping Procedure even after receiving LL_UNKNOWN_RSP PDU for previously initiated LL_PING_REQ (Bluetooth Specification v5.1 Errata 12901)
105/30	Optimal usage of Connection Event to allow maximum time between receiving and transmitting packet within an connection event when operating in slave role for a Bluetooth® LE connection. This increases the data throughput while receiving bulk data in slave role for a Bluetooth® LE connection

Fix Number	Description
105/31	Fixed issue : Possible occurrence of hard fault in CMAC, when the LL_CONNECTION_PARAM_REQ for the second Bluetooth® LE connection was sent immediately after the connection establishment and was rejected by the peer device
105/32	Fixed issue : Bluetooth® LE Connection was deemed as lost (i.e. link lost) even before the expiry of link supervision timeout due to 10 msec resolution of the timer
105/33	Fixed issue : Termination of Pairing Procedure due to DH Key mismatch is not communicated to peer device
105/34	Fixed issue : A Data Physical Channel Packet was not considered as "received" when the Access Address is correct, but fails CRC. This can lead to Bluetooth® LE Connection prematurely classified as lost (i.e. link lost)
105/35	Fixed issue : Incorrect handling of Link Layer Procedure collisions resulting in abnormal handling of future Link Layer procedure which rarely can lead to link loss
105/36	Fixed issue : Incorrect usage of variable/operator results in assertion of PLT firmware immediately after HCI_DBG_GET_CAL_RESULT command
105/37	Fixed issue : As master of the Bluetooth® LE Connection, the slave's symmetrical PHY request is incorrectly handled during PHY Update Procedure
105/38	Fixed issue : Premature changing of internal state prior to validating all the parameters of Test command in PLT firmware can lead to incorrect or missing response for HCI_DBG_Tx_Test_Enh command
105/39	Fixed issue : Crossover (allowed collision) of Link layer procedures can lead to non-handling of link layer PDU
105/40	Fixed issue : Initial full RF calibration is performed when XTAL32M is in TRACKING mode rather than in HOLD mode. This may affect RF calibration if booting of CMAC happens under low temperatures
105/41	Fixed issue : Incorrect response sent for the ATT PDU Requests received with unsupported Attribute Opcode
105/42	Fixed issue : Incorrect handling on reception of wrongly formed Security Manager Protocol PDU (i.e packet which are less than what is expected for a specific opcode but with correct L2CAP length)
105/43	Fixed issue : Pairing may succeed with peer device supporting only lower security levels when Secure Connections Only Mode (Security Mode 1 Level 4 as defined by GAP specification) is selected
105/44	Fixed issue : When LE Secure Connection is used for pairing, the pairing succeeds even if the required key size of 16 bytes is not met
105/45	Fixed issue : When privacy feature is enabled, the host stack asserted if a wrong device addressing (static device address) is set during passive scanning
105/46	Fixed issue : Minimum and maximum connection interval parameter specified in LL_CONNECTION_PARAM_REQ may be different to that specified by the application
88.01	Compensate RTC when RCX is used as LP clock
88.02	Fixed generation of same Private Random Resolvable Address after system reset

6.3.4 Known Issues of 10.0.8.105

Table 15: 10.0.8.105 Known Issues

Issue Number	Description
105.01	PLT_FW hci_gpio_wd and hci_gpio_set commands may result in unexpected behavior when PWM option is used. Also hci_cmd_sleep command should not be called after these commands when PWM option is used
105.02	PLT_FW hci_sensor_test command fails to write register values over the SPI bus
105.03	Changing system clock speed is not thread safe (cm_sys_clk_set() should not be concurrently called by mutliple tasks)
105.04	Voltage monitoring service (sys_adc) always monitors temperature sensor near radio (sys_adc_config() temperature sensor selection is ignored)
105.05	PMU adapter loads default settings to BOD
105.06	ANCS application becomes unresponsive in out of range and stress tests
66.02	Assertion will hit during USB suspend/resume if reset is received before resume
28.04	Detaching from Eclipse Debugger is not always successful

6.3.5 Known Limitations of 10.0.8.105

Table 16: 10.0.8.105 Known Limitations

Limitation Number	Description
105.07	Only 8 set of Identity Resolving Key (IRK) is supported in the resolving list at Link Layer when privacy feature is used
105.08	Controller stack does not alter the minimum and maximum connection interval provided by the application for LL_CONNECTION_PARAM_REQ. This can lead to scheduling conflicts during multi-connection. Workaround: Set identical value for minimum and maximum connection interval from application to trigger controller to choose a value with minimal scheduling conflicts in multi-connection scenarios
105.09	Controller stack reports hardware error and become unresponsive when the host sends an ACL data packet of length higher than the maximum size reported in the response of HCI_LE_Read_Buffer_Size command that the controller can receive from host. This can happen only when external host stack is used
105.10	Controller stack asserts when the ACL data packet is received from the host with the connection handle which is specified as Reserved for Future Use (RFU) in Bluetooth specification. This can happen only when external host stack is used
105.11	The APIs for supporting haptic and audio are in beta state. API's may change in future SDK releases
16.10	Default version of Segger debugger does not support Watchpoints

6.4 Version 10.0.6.90

6.4.1 Overview

This is a full release of SDK 10.0.6 which supports the DA1469x device. It adds support in the OTP configuration script for XTAL trim values and BD address.

6.4.2 Fixes and Improvements since 10.0.6.88

Table 17: 10.0.6.90 Fixes and Improvements

Fix Number	Description
0066/01	Support XTAL32M trim settings from OTP Configuration Script
0090.02	Bluetooth BD Address can be stored in OTP Configuration Script

6.4.3 Known Issues of 10.0.6.90

Table 18: 10.0.6.90 Known Issues

Issue Number	Description
0088.01	When RCX is used as an LP clock, the RTC is not compensated according to the calculated frequency of the RCX.
0066.02	Assertion will hit during USB suspend/resume if reset is received before resume
0028.04	Detaching from Eclipse Debugger is not always successful

6.4.4 Known Limitations of 10.0.6.90

Table 19: 10.0.6.90 Known Limitations

Limitation Number	Description
0088.02	After system reset the same Private Random Resolvable Address is generated
0016.10	Watchpoints not yet supported by Segger debugger

6.5 Version 10.0.6.88

Version 10.0.4.88 of SDK was released on August 2nd, 2019

6.5.1 Overview

This is a full release (Note 1) of 10.0.6 SDK that runs on the DA1469x devices. It can be used for application development, testing and production.

6.5.2 New and Updated Features of 10.0.6.88

Table 20: 10.0.6.88 New Features

Feature Number	Description
320_03	Added support for using RCX as low power clock
322_03	Added API for controlling radio TX power
114_07	Added support for Bluetooth® LE (CMAC) reset

6.5.3 Fixes and Improvements since 10.0.4.66.2

Table 21: 10.0.6.88 Fixes and Improvements

Fix Number	Description
0088/01	Added ble_cli demo project
0088/02	Added mtb contents in memory dump (collect_debug_info script)
0088/03	Use same ccc value length (2) in all services
0088/04	Upgrade to CMSIS v5.5.1
0088/05	Improve power consumption by dynamically adjusting the level of the V12 rail.
0088/06	Improve the measurements for all the GPADC temperature channels using empirical calibration data.
0088/07	Extend the Stack Pointer (SP) range check in HardFault_Handler() taking into account the PSRAM presence.
0088/08	Allow user to explicitly issue an I2C RESTART regardless of whether or not the transfer direction is changing.
0088/09	Add flow control to Bluetooth® LE security requests
0088/10	Improve hogp_host by being able to provide the connection id as user input
0088/11	Handle improper BD address user input in ble_multi_link project
0088/12	Update the register CMSIS files to match the datasheet description
0088/13	Fixed image flashing using Toolbox
0088/14	Fixed charger's EoC current threshold values (align with chip characterization data)
0088/15	Fixed overflow in portCONVERT_MS_2_TICKS, portCONVERT_TICKS_2_MS macro calculations for timer values over 4.295 seconds (at a typical tick-rate of 1KHz).
0088/16	Fixed low level driver hw_smotor_get_fifo_command(uint8_t index) API reading of Step Motor Controller FIFO contents
0088/17	Fixed double issuing of flash power down command when entering extended sleep
0088/18	Fixed bus-fault upon re-configuration of SDADC adapter when HW_SDADC_VREF_INTERNAL is used as vref_voltage

Fix Number	Description
0088/19	Fixed check for active PLL in Power Management Unit low level driver when shutting down 1V4 rail is requested
0088/20	Fixed race condition in DMA configuration resulting in clearing DMA INT enable
0088/21	Fixed the procedure for detecting the VBUS state (attach or detach).
0088/22	Fixed overflow when converting XTAL32M Ready IRQ counter cycles to LP clock cycles
0088/23	Fixed misconfiguration of LRA haptic block improving driving performance
0088/24	Fixed hw_i2c_write_buffer_sync() to block until all bytes have been transmitted.
0088/25	Fixed not being able to start advertising for a 2nd time when a PRIVATE_RANDOM_RESOLVABLE_ADDRESS address is used.
0088/26	Fixed not being able for an application to get a BLE_EVT_GAP_CONNECTED event, if a disconnection happens while the address resolution is in progress.
0088/27	Fixed a pending update request for one connection preventing a new update procedure on another.
0088/28	Fixed hw_timer_configure_pwm() not enabling correctly the TIMER and TIMER2 PWM output pin during sleep.
0088/29	Fixed clock configuration in SNC I2C driver in order to support a transaction with high speed configuration.
0066.03	Fixed issue with L2CAP start fragments with length < 4 bytes

6.5.4 Known Issues and Limitations of 10.0.6.88

Table 22: 10.0.6.88 Known Issues

Issue Number	Description
0088.01	When RCX is used as an LP clock, the RTC is not compensated according to the calculated frequency of the RCX.
0088.02	After system reset the same Private Random Resolvable Address is generated
0066.01	OTP XTAL trim values get overwritten by default values
0066.02	Assertion will hit during USB suspend/resume if reset is received before resume
0028.04	Detaching from Eclipse Debugger is not always successful
0016.10	Watchpoints not yet supported by Segger debugger

6.6 Version 10.0.4.66.2

Version 10.0.4.66.2 of SDK was released on April 24th, 2019

6.6.1 Overview

This was a full release of 10.0.4 SDK, which added support for the DA1469x device. It can be used for application development, testing and production. This release included source code labelling corrections and updates.

6.6.2 New and Updated Features of 10.0.4.66.2

Table 23: 10.0.4.66.2 New Features

Feature Number	Description
-	No new features were added in this release

6.6.3 Fixes and Improvements since 10.0.4.66.1

Table 24: 10.0.4.66.2 Fixes and Improvements

Fix Number	Description
0066.2/01	Added workaround for errata issue 304 ("PLL calibration does not work properly")

6.6.4 Known Issues and Limitations of 10.0.4.66.2

Table 25: 10.0.4.66.2 Known Issues

Issue Number	Description
0066.01	OTP XTAL trim values get overwritten by default values
0066.02	Assertion will hit during USB suspend/resume if reset is received before resume
0066.03	L2CAP start fragments with length < 4 bytes will be ignored
0028.04	Detaching from Eclipse Debugger is not always successful
0016.10	Watchpoints not yet supported by Segger debugger

6.7 Version 10.0.4.66.1

Version 10.0.4.66.1 of SDK was released on April 17th, 2019.

6.7.1 Overview

This was a full release of 10.0.4 SDK, which added support for the DA1469x device. It can be used for application development, testing and production. This release included source code labelling corrections and updates.

6.7.2 New and Updated Features of 10.0.4.66.1

Table 26: 10.0.4.66.1 New Features

Feature Number	Description
-	No new features were added in this release

6.7.3 Fixes and Improvements since 10.0.4.66

Table 27: 10.0.4.66.1 Fixes and Improvements

Fix Number	Description
0066.1/01	Source code labelling corrections and updates
0066.1/02	Remove obsolete SD-ADC clock selection option HW_SDADC_CLOCK

6.7.4 Known Issues and Limitations of 10.0.4.66.1

Table 28: 10.0.4.66.1 Known Issues

Issue Number	Description
0066.01	OTP XTAL trim values get overwritten by default values
0066.02	Assertion will hit during USB suspend/resume if reset is received before resume
0066.03	L2CAP start fragments with length < 4 bytes will be ignored
0028.04	Detaching from Eclipse Debugger is not always successful
0016.10	Watchpoints not yet supported by Segger debugger

6.8 Version 10.0.4.66

Version 10.0.4.66 of SDK was released on February 22nd, 2019.

6.8.1 Overview

This was a full release of 10.0.4 SDK, which added support for the DA1469x device. It can be used for application development, testing and production. This release included a number of fixes and improvements, as listed below.

6.8.2 New and Updated Features of 10.0.4.66

Table 29: 10.0.4.66 New Features

Feature Number	Description
-	No new features were added in this release

6.8.3 Fixes and Improvements since 10.0.2.60

Table 30: 10.0.4.66 Fixes and Improvements

Fix Number	Description
0066/01	Added support for USB Development Kit
0066/02	Support maximum image size loading over serial boot (128Kb)
0066/03	Fix unhandled pending read event in uart adapter
0066/04	Fix PM sleep_mode handling
0066/05	Fix handling of charging events on sys_charger
0066/06	Fix GPADC channel enumeration
0066/07	Fix cscp heap issues
0066/08	Fix waiting forever in I2C adapter forced close
0066/09	Fix BLE_EVT_GAP_DATA_LENGTH_SET_FAILED event in ble/mgr/gap
0066/10	Improved robustness of Bluetooth® LE controller
0066/11	Remove -wnocpp compilation flag from projects
0066/12	Fix static code analysis errors
0066/13	Fix endianess issue when writting to OTP from Toolbox
0066/14	Fix qspi_is_valid_addr() to execute from RAM
0066/15	Fix possible race condition in sdadc/uart drivers
0066/16	Fix wake up from K1 in hrp_sensor
0066/17	Fix secure SUOTA failures with CRC mismatch
0066/18	Add sleep support in DGTL
0066/19	Fix unregistering interrupt callback when force closing slave in I2C adapter
0066/20	Fix gpio power configuration in I2C/SPI/LCD adapters
0066/21	Add program_qspi_nvparam launcher
0066/22	Add support for FreeRTOS thread aware debugging in eclipse
0066/23	Add protection for race condition on XTAL32M_CTRL0_REG
0066/24	Fix cache configuration errors

Fix Number	Description
0066/25	Refactor cache initialization
0066/26	Add check for LDO_PLL_OK signal before enabling PLL
0066/27	Fix VDD voltage (0.828V) in hibernation mode
0066/28	Fix not protecting ble_storage_remove() functions
0066/29	Add API to retrieve low level stats in Bluetooth® LE adapter
0066/30	Fix issue while changing properties permission of Bluetooth® LE characteristics

6.8.4 Known Issues and Limitations of 10.0.4.66

Table 31: 10.0.4.66 Known Issues

Issue Number	Description
0066.01	OTP XTAL trim values get overwritten by default values
0066.02	Assertion will hit during USB suspend/resume if reset is received before resume
0066.03	L2CAP start fragments with length < 4 bytes will be ignored
0028.04	Detaching from Eclipse Debugger is not always successful
0016.10	Watchpoints not yet supported by Segger debugger

6.9 Version 10.0.2.60

Version 10.0.2.60 of SDK was released on Januart 14th, 2019.

6.9.1 Overview

This was a full release of 10.0.2 SDK, which added support for the DA1469x device. It can be used for application development, testing and production. This release included a number of fixes and improvements, as listed below.

6.9.2 New and Updated Features of 10.0.2.60

Table 32: 10.0.2.60 New Features

Feature Number	Description
912_02	Refactored Peripheral Adapters API
322_01	Updated radio driver

6.9.3 Fixes and Improvements since 10.0.1.52

Table 33: 10.0.2.60 Fixes and Improvements

Fix Number	Description
0060/01	Set default Vdd to 1V2
0060/02	Added automatic Bluetooth® LE security key renewal for DA1469x
0060/03	Added support for Uart 3 in UART adapter
0060/04	Added SDADC adapter
0060/05	Enable static GPIO power configuration support when SNC is used
0060/06	Added create flash image python script
0060/07	Fixed OSAL calls depending on execution context (simple task or ISR)
0060/08	Support Bluetooth® LE 2Mbit high performance radio mode
0060/09	Improved robusteness of Bluetooth® LE controller / host
0060/10	Use HW_SPI_FIFO_RX_TX in spi adapter write calls
0028.09	SDK uses TRNG for generating random numbers
0028.07	Bond Management Service (BMS) example gives a new random key after reset
0052.01	Added support for SCA and other Bluetooth® LE parameters in NVPARAMS

6.9.4 Known Issues and Limitations of 10.0.2.60

Table 34: 10.0.2.60 Known Issues

Issue Number	Description
0060.01	Removed plt_fw project from release files
0028.04	Detaching from Eclipse Debugger is not always successful.
0028.06	Parameter Update sometimes fails with LMP LL Response Timeout.
0016.10	Watchpoints not yet supported by Segger debugger.

6.10 Version 10.0.1.52

Version 10.0.1.52 of SDK was released on December 7th, 2018.

6.10.1 Overview

This was an engineering release of 10.0.1 SDK, which added support for the DA1469x device. It can be used for application development and testing.

Renesas will make every effort to maintain API compatibility. However, developed code may have to be ported to run on the official SDK release once that becomes available.

This release included a number of fixes and improvements, as well as a number of new features, as listed below.

6.10.2 New and Updated Features of 10.0.1.52

Table 35: 10.0.1.52 New Features

Feature Number	Description
131_02	AMS Client Profile
120_14	HID Service
130_14	CSCP 1.0: Cycling Speed and Cadence Profile - Collector
510_08	Micro Trace Buffer support
450_04	Support USB charging, including enumeration
440_01	CDC serial over USB
440_03	MSD over USB
420_04	Added security framework for AES/Hash/ECC/TRNG algorithms

6.10.3 Fixes and Improvements since 10.0.1.39

Table 36: 10.0.1.52 Fixes and Improvements

Fix Number	Description
0028.03	SUOTA stability issues have been observed with stress tests.
0028.05	Removed unneeded clock pulses after byte read command in SPI adapter.
0031.02	Improved stability of pxp_reporter application under stress testing.
0031.04	Improved robustness in ble_multi_link application.
0039.02	Sleep is now blocked while a DMA transfer is in progress
0039.03	Fixed transaction abort issue in Sensor Node Controller driver for I2C
0052/01	Improved robustness of Bluetooth® LE Controller & Host
0052/02	Updated Power and clock management for stability
0052/03	Updated NMVS to add power-safety
0052/04	Improved radio performance
0052/05	Added a board abstraction layer
0052/06	Refactored USB Framework
0052/07	Added support for external OSC as LP clock
0052/08	Extend & refactor SENIS API

Fix Number	Description
0052/09	Support USB suspend/resume
0052/10	Extend ERM driver API
0052/11	Add suppport for JLink Flashing tool
0052/12	Add support for secure boot in python scripts
0052/13	Restore GPADC configuration after sleep
0052/14	plt_fw: Fix code location in custom_config_ram
0052/15	aes_hash: Add support for reading keys form OTP
0052/16	Support new 4MB flash partition layout

6.10.4 Known Issues and Limitations of 10.0.1.52

Table 37: 10.0.1.52 Known Issues

Issue Number	Description
0052.01	Sleep clock accuracy can only be configured complile time, not through NVMS
0028.04	Detaching from Eclipse Debugger is not always successful.
0028.06	Parameter Update sometimes fails with LMP LL Response Timeout.
0028.07	Bond Management Service (BMS) example gives the same pin key after reset.
0028.09	TRNG is not used by the SDK for generating random numbers.
0016.10	Watchpoints not yet supported by Segger debugger.

6.11 Version 10.0.1.39

Version 10.0.1.39 of SDK was released on September 28th, 2018.

6.11.1 Overview

This was an engineering release of 10.0.1 SDK, which added support for the DA1469x device. It can be used for application development and functional testing. It is not yet fully evaluated and it cannot be used for testing final products.

Renesas will make every effort to maintain API compatibility. However, developed code may have to be ported to the official SDK release once that becomes available.

It included code for low level access to the LRA and Motrol Controller peripherals, moves to the GCC v7 and improves overall maturity.

6.11.2 New and Updated Features of 10.0.1.39

Table 38: 10.0.1.39 New Features

Feature Number	Description
112_04	Support for Channel Selection Algorithm #2
328_01	Initial implementation of a low level driver for LRA
328_06	Initial implementation of a low level driver fo Motor Controller
460_03	QSPI Flash/RAM Adapter
510_02	Upgrade to GNU/GCC version 7

6.11.3 Fixes and Improvements since 10.0.1.32

Table 39: 10.0.1.39 Fixes and Improvements

Fix Number	Description
0031.01	Configuration option allows to select TX power of 0dB or 6dB for a project
0031.03	Increased application stability seen in stress tests.
0016.04	Cleanup of release files to minimise references to DA1468x SDK.
0016.05	Restructured Doxygen documentation
0016.09	Added calibration support for values returned by the GPADC driver.
0039/01	Improved RSSI read command
0039/02	Upgraded to latest version of Bluetooth® LE Stack Library
0039/03	Enable reading configuration data from OTP as default.
0039/04	Restructured SDK folders
0039/05	Fixed high speed transaction issue in SNC i2c driver

6.11.4 Known Issues and Limitations of 10.0.1.39

Table 40: 10.0.1.39 Known Issues

Issue Number	Description
0039.01	Qspi LLD Api changed to support QSPI2 interface (impacts backwards compatibility)
0039.02	Sleep is not blocked while a DMA transfer is in progress.

Issue Number	Description
0039.03	Issue in Sensor Node Controller driver for I2C with transaction abort.
0031.02	pxp_reporter application stability issues have been observed in stress tests.
0031.04	ble_multi_link application sometimes fail to report device disconnection.
0028.01	Charger configuration is only tested with wall plug adapters at room temperature.
0028.03	SUOTA stability issues have been observed with stress tests.
0028.04	Detaching from Eclipse Debugger is not always successful.
0028.05	SPI adapter creates unneeded clock pulses after byte read command.
0028.06	Parameter Update sometimes fails with LMP LL Response Timeout.
0028.07	Bond Management Service (BMS) example gives the same pin key after reset.
0028.09	TRNG is not used by the SDK for generating random numbers.
0016.10	Watchpoint support for debugging is not included.

6.12 Version 10.0.1.32

Version 10.0.1.32 of SDK was released on May 25th, 2018.

6.12.1 Overview

This was an engineering release of 10.0.1 SDK, which added support for the DA1469x device. It can be used for application development and functional testing. It is not yet fully evaluated and it cannot be used for testing final products.

Renesas will make every effort to maintain API compatibility. However, developed code may have to be ported to the official SDK release once that becomes available.

It included more Bluetooth® LE examples, moves to the latest FreeRTOS v10.0.1 and improves overall maturity. A detailed list of new features is given below.

6.12.2 New and Updated Features of 10.0.1.32

Table 41: 10.0.1.32 New Features

Feature Number	Description
111_04	Efficient non connectable advertising – CSSv6
111_01	LE Secure Connection
112_05	High duty cycle non connectable advertising
114_01	Multilink support
400_01	Update to FreeRTOS 10.0.1
120_09	CSCS 1.0: Cycling Speed and Cadence Profile
130_24	HRP 1.0:: Heart Rate Profile - Collector
130_21	HOGP 1.0: HID Over GATT Profile - HID Device
130_22	HOGP 1.0: HID Over GATT Profile - Host
520_01	Production test firmware Bluetooth® LE test commands
610_07	Bluetooth® LE Multilink
610_06	Bluetooth® LE External Host

6.12.3 Fixes and Improvements since 10.0.1.28

Table 42: 10.0.1.32 Fixes and Improvements

Fix Number	Description
0031/01	Enabled –werror (warnings are reported as errors) compiler option and cleaned up warnings in SDK apps.
0028.08	Fixed BMS stability issues observed when more than 1 connection is active.
0028.10	Fixed support for PRODUCTION mode.
0028.11	Fixed waking up from button in SDK apps.
0016.07	Added temperature-triggered calibration in Radio driver.

6.12.4 Known Issues and Limitations of 10.0.1.32

Table 43: 10.0.1.32 Known Issues

Issue Number	Description
0031.01	Radio TX power is fixed to 0dB.
0031.02	pxp_reporter application stability issues have been observed in stress tests.
0031.03	hogp_device application stability issues have been observed in stress tests.
0031.04	ble_multi_link application sometimes fail to report device disconnection.
0028.01	Charger configuration is only tested with wall plug adapters at room temperature.
0028.03	SUOTA stability issues have been observed with stress tests.
0028.04	Detaching from Eclipse Debugger is not always successful.
0028.05	SPI adapter creates unneeded clock pulses after byte read command.
0028.06	Parameter Update sometimes fails with LMP LL Response Timeout.
0028.07	Bond Management Service (BMS) example gives the same pin key after reset.
0028.09	TRNG is not used by the SDK for generating random numbers.
0016.04	Release files may include code copied from DA1468x SDK, not yet ported for DA1469x.
0016.05	Doxygen documentation still includes references to DA1468x SDK.
0016.09	Values returned by the GPADC driver are not calibrated.
0016.10	Watchpoint support for debugging is not included.

6.13 Version 10.0.1.28

Version 10.0.1.28 of SDK was released on March 22nd, 2018.

6.13.1 Overview

This was an engineering release of 10.0.1 SDK, which added support for the DA1469x device. It can be used for application development and functional testing. It is not yet fully evaluated and it cannot be used for testing final products.

Renesas will make every effort to maintain API compatibility. However, developed code may have to be ported to the official SDK release once that becomes available.

It included more Bluetooth® LE features, a set of crypto algorithms, and more low level drivers for peripherals on DA1469x, It also adds configuration of the integrated HW charger and system support for sleep mode. A detailed list of delivered features is given below.

6.13.2 New and Updated Features of 10.0.1.28

Table 44: 10.0.1.28 New Features

Feature Number	Description
110_01	LE Scatter net.
111_01	LE Secure Connection.
111_03	Enhanced Privacy 1.2.
120_32	WSS 1.0 : Weight Scale Service.
130_23	HRP 1.0: Heart Rate Profile.
130_43	WSP 1.0: Weight Scale Profile.
131_01	Apple Notification Center Service (ANCS) Client.
320_01	Clock and Power Management Low Level Driver.
320_02	Charger Low Level Driver.
321_02	AES Low Level Driver.
321_03	HASH Low Level Driver.
321_04	TRNG Low Level Driver.
326_06	USB Charger Low Level Support.
326_09	UART3 Low Level Driver.
328_06	ADC 1 Low Level Driver.
328_07	ERM Low Level Driver.
328_08	ADC 2 Low Level Driver.
400_02	FreeRTOS Tick-less Mode.
420_04	Security Framework (AES/ECC Crypto, TRNG).
420_05	Algo - Random Number Generation.
420_06	Algo - Hash Bytes.
420_07	Algo - Hash - Key Derivation.
420_08	Algo - Hash - HMAC Generation.
420_09	Algo - AES - Encrypt/Decrypt.
420_12	Algo – ECDH Generate/Verify Public/Session Key

Feature Number	Description
450_03	System Management – Watchdog Service.
450_04	System Management – Charger Service.
460_02	Crypto Adapter.

6.13.3 Fixes and Improvements since 10.0.1.16

Table 45: 10.0.1.28 Fixes and Improvements

Fix Number	Description
0016.01	Added support for sleep mode. Demonstrated in pxp_reporter example.
0016.02	Improved test coverage for the Bluetooth Framework.
0016.03	Improved test coverage for drivers and SDK core.
0016.08	Added implementation of Bluetooth® LE Secure Connections and Enhanced Privacy features.
0016.06	Added support for multiple Bluetooth® LE connections.

6.13.4 Known Issues and Limitations of 10.0.1.28

Table 46: 10.0.1.28 Known Issues

Issue Number	Description
0028.01	Charger configuration is only tested with wall plug adapters at room temperature.
0028.02	Radio TX power is fixed to 6dB.
0028.03	SUOTA stability issues have been observed with stress tests.
0028.04	Detaching from Eclipse Debugger is not always successful.
0028.05	SPI adapter creates unneeded clock pulses after byte read command.
0028.06	Parameter Update sometimes fails with LMP LL Response Timeout.
0028.07	Bond Management Service (BMS) example gives the same pin key after reset.
0028.08	BMS stability issues have been observed when more than 1 connections are active.
0028.09	TRNG is not used by the SDK for generating random numbers.
0028.10	PRODUCTION mode is not supported and should not be used.
0028.11	Waking up from button is not supported in SDK apps.
0016.04	Release files may include code copied from DA1468x SDK, not yet ported for DA1469x.
0016.05	Doxygen documentation still includes references to DA1468x SDK.
0016.07	Radio driver does not yet include calibration. Performance may be suboptimal.
0016.09	Values returned by the GPADC driver are not calibrated.
0016.10	Watchpoint support for debugging is not included.

6.14 Version 10.0.1.16

Version 10.0.1.16 of DA1469x SDK was released on February 7th, 2018

6.14.1 Overview

This was the first internal engineering release of 10.0.1 SDK that runs on the DA1469x devices. It should only be used for enabling silicon bring up and getting familiar with the SDK structure.

Please do not use this release for application development because APIs might change. Renesas will make every effort to maintain API compatibility. However, developed code may have to be ported to the official SDK release once that becomes available.
The DA1469x SDK is based on the Black Orca SDK architecture that supports DA1468x devices. Similar constructs with the DA1468x SW architecture include:

i. FreeRTOS Operating System
ii. Code execution in-place from QSPI Flash
iii. Bluetooth® LE Framework that reuses the Adapter/Manager Layers and exposes the same API
iv. Abstraction layer with low level drivers and adapters for peripheral devices

This release implements basic SDK architecture, including the Bluetooth® LE framework and support for the Sensor Node Controller. A detailed list of delivered features is given below.

6.14.2 New and Updated Features of 10.0.1.16

Table 47: 10.0.1.16 New Features

Feature Number	Description
110_02	L2CAP COC
110_03	Low Duty Cycle Advertising
111_02	LE Data Packet Length Extension
112_01	LE 2Mbps
114_02	Bluetooth Host subsystem can be updated as part of full application SUOTA
114_03	Bluetooth Controller subsystem can be updated as part of full application SUOTA
120_03	BAS 1.0: Battery Service
120_04	BCS 1.0: Body Composition Service
120_06	BMS 1.0: Bond Management Service
120_10	CTS 1.1: Current Time Service
120_11	DIS 1.1: Device Information Service
120_18	IAS 1.0: Immediate Alert Service
120_16	HRS 1.0: Heart Rate Service
120_20	LLS 1.0.1: Link Loss Service
120_28	ScPS 1.0: Scan Parameters Service
120_30	TPS 1.0: Tx Power Service
121_03	Renesas Debug Service 1.1
310_04	XiP (cached) from Flash
323_06	QSPI Flash Driver
323_10	NVMS partitions

Feature Number	Description
325_01	Timers Low-Level Driver
325_02	RTC Low-Level Driver
325_03	Watchdog Low-Level Driver
326_01	GPIO Low-Level Driver
326_02	SPI 1/2/3 Low-Level Driver
326_03	I2C 1/2 Low-Level Driver
326_04	UART 1/2 Low-Level Driver
326_07	CMAC Mailbox driver included in Bluetooth® LE library
326_08	LCD Low Level Driver
328_02	White LED Low-Level Driver
328_05	Sensor Node Controller Low-Level Driver
400_01	FreeRTOS v9
400_07	OS Abstraction Layer
400_08	OS Abstraction Layer - Resource Management
430_04	Software Upgrade over Bluetooth® LE (SUOTA)
460_03	Flash Adapter
460_04	LCD Adapter
460_05	GPADC Adapter
460_06	I2C Adapter
460_07	NVMS Adapter
460_11	SPI Adapter
460_13	UART Adapter
460_16	Sensor Node Controller Adapter
510_02	Supported by GNU / GCC toolset
510_03	Supported by JTAG debugger
510_04	Supported from Eclipse-based IDE
510_06	Sensor node controller programming
530_01	Works with SmartSnippets Studio & Toolbox (version 2.0)
610_02	PXP Reporter, including SUOTA example
620_01	SUOTA example works with Renesas Android SUOTA App

6.14.3 Known Issues and Limitations of 10.0.1.16

Table 48: 10.0.1.16 Known Issues

Issue Number	Description
0016.01	SDK does not support sleep mode, all projects run in always-active configuration.
0016.02	Bluetooth Framework has been only tested for basic Bluetooth® LE4.2 functionality.
0016.03	Evaluation is limited to functional testing of the demo applications delivered with the SDK.

Issue Number	Description
0016.04	Release files may include code copied from DA1468x SDK, not yet ported for DA1469x.
0016.05	Doxygen documentation still includes references to DA1468x SDK.
0016.06	Bluetooth® LE stack may be confused if two or more connections are active. Use only one connection.
0016.07	Radio driver does not yet include calibration. Performance may be suboptimal.
0016.08	Bluetooth® LE Secure Connections and Enhanced Privacy features are not yet supported.
0016.09	Values returned by the GPADC driver are not calibrated.
0016.10	Watchpoint support for debugging is not included.

Appendix A Software Versioning Rules

This describes the software version numbers and does not apply to documentation version numbers (as found in the footer of this document).

Each software version number string consists of four numbers: MAJOR. BRANCH. MINOR. and BUILD.

#MAJOR: It is increased (by one only) if the project undergoes a major modification, for example major ROM changes. It usually changes only when the project sources undergo major restructuring affecting most of the repository. It is initialized at 1.

#BRANCH: Used in the case of concurrent projects that for special reasons need to be spun off the major repository. It corresponds to different versions of the repository code that have to be supported concurrently. In this case each branch number corresponds to a different GIT branch. The basic project has BRANCH id 0.

#MINOR: Odd numbers indicate Engineering (or Patch or Binary) versions, even numbers indicate Full release versions or Release Candidates of Full versions. Each Full release increases this number by one. After the Full release, the number is increased by one again. Therefore, Project releases correspond to release numbers like 2.0.1.xxx, 2.0.2.xxx. etc. The #MINOR number is initialized at 1.

#BUILD: The # BUILD number increases by one at every repository update and thus indicates the total number of changes since repository initialization. The BUILD number is initialized at 1.

Document Revision History

This section summarizes the changes made to this document and not to the Software that this document describes.

Revision	Date	Description
14.3	01-Nov-2022	Full Release 10.0.10.119.1
Change details: **-** Use Renesas logo		
14.2	04-Oct-2022	Full Release 10.0.10.119.1
Change details: **-** Fix radio calibration issue		
14.1	26-Jul-2022	Full Release 10.0.10.118.6
Change details: **-** Support PCN 2021_901		
14	24-Jul-2020	Full Release 10.0.10.118
Change details: - New Features,including compliance to Bluetooth LE 5.2 - Bug fixes and internal improvements		
13	17-Jan-2020	Fix typos
12	23-Dec-2019	Full Release 10.0.8.105
Change details: - New features (Haptic, Audio, Bluetooth® LE 5.1) - Bug fixes and internal improvements - Document Includes more detail on the decription of findings and improvements		
11	27-Sep-2019	Full Release 10.0.6.90
Change details: - Added OTP CS settings for XTAL Trim & BD Address - Split Issues and Limitations in two tables		
10	02-Aug-2019	Full Release 10.0.6.88
9	24-Apr-2019	Added workaround for errata issue 304. Updated Disaclaimer Text. Full release 10.0.4.66.2
8	17-Apr-2019	Remove mistaken reference to Cycling Power profile. Code Labeling fixes. Full release 10.0.4.66.1
7	22-Feb-2019	Launch of DA1469x Family of Devices. Full release 10.0.4.66
6	14-Jan-2019	Product Development Ready. Full release 10.0.2.60
5	07-Dec-2018	Product Development Ready. Engineering 10.0.1.52
4	28-Sept-2018	Improved Maturity. Engineering 10.0.1.39
3	25-May-2018	Migrate to FreeRTOS v10. Engineering 10.0.1.32
2	22-March-2018	Updated with more features. Engineering 10.0.1.28
1	07-Febr-2018	Initial version. Engineering release 10.0.1.16

Status Definitions

Status	Definition
DRAFT	The content of this document is under review and subject to formal approval, which may result in modifications or additions.
APPROVED or unmarked	The content of this document has been approved for publication.

RoHS Compliance

Renesas' suppliers certify that its products are in compliance with the requirements of Directive 2011/65/EU of the European Parliament on the restriction of the use of certain hazardous substances in electrical and electronic equipment. RoHS certificates from our suppliers are available on request.