JULY 29, 2016

DA1458x SoC Platform
Software Release Notes for version 5.0.4

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1.0 Introduction

1.1 Scope

This document authorizes an official software release that supports Dialog Semiconductor's DA1458x System-on-Chip (SoC) Platform, currently consisting of the DA14580, DA14581 and DA14583 devices.

1.2 Terms and Abbreviations

BLE Bluetooth low energy
SDK Software Development Kit

1.3 Release Data

PROJECT	BLE-SDK
RELEASE DATE	29-Jul-2016
VERSION NR.	5.0.4
RELEASE TYPE[1]	Full Release (Appendix I)
RELEASE MASTER	Anastasios Kokkinis

1.4 History

Version	Release master	Date
5.0.3	Anastasios Kokkinis	16 Oct 2015
5.0.2.1	Anastasios Kokkinis	25 Aug 2015
3.0.10	Anastasios Kokkinis	10 Jun 2015
3.0.8	**Ioannis Papanikos**	**09 Mar 2015**
3.0.6	**Ioannis Papanikos**	**02 Oct 2014**
3.0.4	**Ioannis Papanikos**	**18 Jul 2014**
3.0.2.1	**Ioannis Papanikos**	**20 Jun 2014**
3.0.2.0	**Ioannis Papanikos**	**28 Mar 2014**
3.0.1.65	**Ioannis Papanikos**	**20 Feb 2014**
2.0.4	**Ioannis Papanikos**	**23 Dec 2013**
2.0.3.115	**Ioannis Papanikos**	**11 Dec 2013**
2.0.3.111	**Ioannis Papanikos**	**06 Dec 2013**
2.0.3.102	**Ioannis Papanikos**	**29 Nov 2013**
2.0.2.92	**Ioannis Papanikos**	**8 Nov 2013**
2.0.1.39	**Ioannis Papanikos**	**11 Oct 2013**
2.0.1.38	**Ioannis Papanikos**	**07 Oct 2013**
2.0.1.25	**Ioannis Papanikos**	**24 Sep 2013**

[1] Releases can be of the following types: FULL, RELEASE CANDIDATE, ENGINEERING, PATCH or BINARY

2.0 Release Description

2.1 Major Changes

FIXES	
1.	Provided a software workaround for the wakeup timer HW de-bouncing issue. The wakeup timer's de-bouncing time is ~3 times longer than the expected one when RCX is the LP clock because the HW de-bouncing mechanism assumes that the LP clock frequency is 32KHz. Function wkupct_tweak_deb_time() was added to correct the wakeup timer de-bouncing time when the system enters sleep using RCX as LP clock. The user must call this function when the system is about to go to sleep (do the tweak) and when the system wakes up (undo the tweak).
2.	Fixed side effect related to arch_printf() processing that did not allow the system to enter sleep mode.
3.	Renamed main-loop callback app_on_sytem_powered() to app_on_system_powered().
4.	The default XTAL16M frequency trim value is selected depending on the target board.
5.	The retention mode of RETRAM memory blocks is now only set in SystemInit() function which is called during platform initialization. If an application does not need to retain all RETRAM blocks during deep sleep mode then PMU_CTRL_REG[RETENTION_MODE] should be set accordingly in SystemInit().
6.	Replaced floating point arithmetic with integer arithmetic in the RCX frequency calculations, in order to decrease the code size.
7.	Fixed a kernel timer corner case in rwip_sleep().
8.	Correction in I2C eeprom driver: - Placed the I2C commands inside critical section. The I2C commands need to be consistent in a whole and not influenced by an ISR. - Removed the critical section around reading the received data out of the RX FIFO. The RX FIFO is 32 bytes and there is no reason to treat access to this as a critical section. - Added a timeout when the I2C master polls the slave's ACK.
9.	Enabled watchdog timer in the integrated processor projects.
10.	Improved RCX stability (set 'RCX20K_BIAS = 0').
11.	Added support for lower than 4800bps UART baud rates. In such cases the user must replace the call to ROM function uart_init() with a call to arch_uart_init_slow().
12.	The UART2 interrupt priority was lowered to 3.
13.	Added support for lower than 4800bps baud rates for UART2.
14.	Fixed a buggy if condition in HRPC profile.
15.	Removed FindMe profile related code from Proximity Reporter application.
16.	SUOTA procedure terminates BLE connection before rebooting.
17.	Windows proximity reporter host application cleanup.
18.	Windows proximity monitor host application minor fixes.
19.	Fixed flash programmer to detect if the I2C EEPROM is not connected.
20.	Flash programmer supports 1Mbit UART baud rate.
21.	Flash programmer was modified to support large SPI flash memories.
22.	Several fixes in Custom Service mechanism (code size optimization, missing code for 2nd custom service, user defined permission settings)
23.	Application API change: Added argument to app_on_scanning_completed() to pass the status value.
24.	Application configuration API changes: - Removed default message configuration (advertising, gapm, parameter update, central, etc) from 'app.c'. All user configuration parameters are kept in 'user_config.h' file only. - Modified all the 'user_config.h' files in the SDK application projects. - Added structure in 'app_user_config.h' for user central device configuration. - Added advertising filter policy selection in 'app_user_config.h' and 'user_config.h'. - Added white list feature in central configuration parameters - Cleared the correct pointer to the gapm_start_connection_cmd message structure. start_connection_cmd is NULLed after sending the message.
25.	Removed redundant call to default_advertise_stop_operation() call from default_app_on_connection().
26.	Added the *drift_value_in_ppm* enumeration type which contains possible values for the

	CFG_NVDS_TAG_LPCLK_DRIFT setting.
27.	Application API change: - Added the 'app_on_adv_nonconn_complete()' callback which handles the completion event of the non-connectable advertising operation.
28.	Removed the 'default_app_on_adv_undirect_complete()' default handler.
29.	Application configuration change: - Removed CSRK and TK from 'user_config.h'. These values must not be exposed in the user configuration file.
30.	Removed default security configuration parameters from 'app_easy_security.c'.
31.	Corrected inconsistent type assignment, bool to uint8_t, in 'app_mid.h' to be typically correct.
32.	Added utility function that generates the CSRK randomly.
33.	Removed redundant access to NVDS to read the security enable flag during application initialization.
34.	API change: void app_easy_security_tk_exch(uint8_t connection_idx) changed to void app_easy_security_tk_exch(uint8_t connection_idx, uint8_t *key, uint8_t length). The key and the length of the TK key are passed as arguments. The TK key may be the 6-digit passkey or the provided OOB.
35.	API change: Removed 'app_easy_security_set_tk()'. The TK key is generated when the TK exchange message is ready to be sent.
36.	Added assertions for boundary delay values in app_easy_timer API.
37.	Fixed corner case in app_easy_timer_modify().
38.	Fixed wrong array index in app_easy_timer_cancel_all().
39.	Fixed application layer FSM when starting non connectable advertising while connected.
40.	Fixed bug issue with the renewal of the Static Random Address every ~2.5 minutes. The Static Random Address is not renewed after the bug fix.
41.	Removed addr member from advertise_configuration structure. This address value must not be exposed to the user.
42.	API change: - Added support for the GAPC_SEC_IND message which is triggered on the master side when a slave requests to have a certain level of authentication. The application layer handles this message in gapc_security_ind_handler() and triggers the user defined callback app_on_security_req_ind() in the application callbacks structure.
43.	API change: - Changed enum arch_main_loop_callback_ret to typedef enum {...} arch_main_loop_callback_ret_t. - Changed the return value of functions app_asynch_trm() and app_asynch_proc() from bool to arch_main_loop_callback_ret_t.
44.	Fixes in app_easy_gap_directed_advertise_start(): - Corrected app_easy_gap_undirected_advertise_start_create_msg() to app_easy_gap_directed_advertise_start_create_msg(). - Added cmd->intv_min = LLM_ADV_INTERVAL_MIN and cmd->intv_max = LLM_ADV_INTERVAL_MAX. These values do not have any effect in the computation of the advInterval. The advInterval must be within the above range, otherwise an error will be raised. The advInterval for ADV_DIRECT_IND is set to 1.25ms by the BLE stack.
45.	Fixed the comparison of the returned buffer length against the maximum permissible size of the advertising or scan response data in function app_easy_gap_adv_read_from_NVDS().
46.	API cleanup: - Moved the PROXR application initialization from app_default_handlers.c to app_prox_init() which is responsible for handling PROXR initialization. - Removed arguments from app_proxr_init().
47.	Fixed skip_slave_latency_patch() which was reading the MD bit from wrong RX descriptor.
48.	Fixed skip_slave_latency_patch() which was not always detecting correctly which packet was the last one of the connection event.
49.	The DA14580/3 specific flag CFG_MEM_LEAK_PATCH was removed. The respective patch is applied unconditionally.
50.	Patch code refactoring to save some code space.
51.	Added missing DA14581 object code for log_ke_malloc() and log_ke_free() patches.
52.	Production Test FW – Audio test support is disabled for all targets by default since it was causing conflicts on GPIO P0_4. Audio tests should only be enabled when testing DA14582 devices.

53.	Production Test FW – Fixed the case where the command completion event returned for the HCI_LE_Test_End command contained wrong number of packets.
54.	Production Test FW – Added new test command for sensor testing.
55.	Production Test FW – GPIO driver checks have been disabled so GPIOs can change dynamically through user command.
56.	Production Test FW – Fixed the XTAL16M “xtrim” calibration commands when the square pulse input pin is also a UART pin.
57.	Production Test FW – Updated XTAL trimming algorithm.
58.	PROXR message interface has changed: - PROXR_ALERT_IND message was removed. - PROXR_LLS_ALERT_IND and PROXR_LEVEL_UPD_IND messages were added.
59.	HOGPD message interface changed: report reference IDs can now be configured by the application in the HOGPD_CREATE_DB_REQ message.
60.	FindMe profile: 1. Fixed the double FINDT_DISABLE_IND sent upon disconnection by the FindMe Target profile role implementation. 2. Fixed the double FINDL_DISABLE_IND sent upon disconnection by the FindMe Locator profile role implementation.
61.	GLP profile: 1. Fixed reversed order of the "Type" and "Sample Location" fields in "Glucose Measurement" characteristic. 2. Fixed reversed order of the "Tester" and "Health" fields in "Glucose Measurement Context" characteristic.
62.	LNP profile: 1. The buffer for split notifications is allocated from the heap and not from the stack. 2. Added support for "Navigation Control" opcode parameters (see enum lanp_navi_control). 3. Take into account the current "Navigation Control" setting before sending navigation notifications.
FEATURES	
1	**Support for custom handling of ATT read requests.** Custom ATT read request handling behaves as follows: 1. When an ATT read request arrives then its validity is checked first. - if OK continue to next step - otherwise reply with an ATT error 2. Find the task that manages the service of the handle being read. 3. If the task is registered to receive ATTS_READ_REQ_IND messages then: Prepare and send the ATTS_READ_REQ_IND to the task and stop further processing. The task takes responsibility to reply by calling the dg_atts_read_cfm() function. else: Read the attribute value from the DB. Send an ATT read response (also taking the current ATT MTU into account). A task that requires this mechanism will typically register for ATTS_READ_REQ_IND messages at DB creation time using the dg_register_task_for_read_request() API. Thereafter it shall receive an ATTS_READ_REQ_IND message whenever a peer sends an ATT read request on any of the attribute handles it manages. Upon reception of the ATTS_READ_REQ_IND message a task can modify the ATT DB and then it must reply by calling dg_atts_read_cfm(). There are two use cases: 1. The task decides that the read request is valid, (optionally) modifies the value in ATT DB and finally replies by passing ATT_ERR_NO_ERROR in the status_code argument of dg_atts_read_cfm(). This results to sending the ATT read response to the peer device. 2. The task decides that the read request is invalid and responds by passing an ATT error code to dg_atts_read_cfm(). This results to sending the ATT error response to the peer device.

	NOTES: 1. This mechanism is supported on both 580 and 581. The old 581-specific GATTC_READ_CMD_IND was kept for backwards compatibility. Now it is also available for 580. 2. The atts_util.obj object file must be added in 580/583 Keil projects when porting from 5.0.2.1/5.0.3 to 5.0.4. 3. API function declarations are located in arch_patch.h. 4. Code size overhead: - dg_atts_read_cfm : 82 bytes - dg_register_task_for_read_request : 26 byte - dg_unregister_task_from_read_request : 32 bytes - atts_read_resp_patch : 126 bytes 5. Retention memory overhead: - dg_registered_tasks : 8 bytes
2	**It is not mandatory to detach the debugger when using extended/deep sleep.** This should be used only for debugging purposes and not during power measurements or sleep mode evaluation: - The debugger remains enabled always. - Keil debugger object loading scripts were modified accordingly. No need to trigger a Hard Reset each time the user wants to download a new object file to the DA1458x through Keil IDE. - Added checks that alter the watchdog timer behavior, before and after the WFI call in the extended and deep sleep cases, only if a debugger is attached to the DA1458x chip. - Removed the debugger enable command from SDK code. The state of the debugger is decided by boot rom code: in Development mode the debugger is enabled while in Normal mode, the debugger is enabled/disabled according to the value of the respective OTP header field. Additionally a user application can also enable/disable the debugger.
3	Added new BLE pillar examples**:** - ble_app_sleepmode (demonstrates the usage of the extended and deep sleep modes - sleep API). - ble_app_security (demonstrates the features of the security API). - ble_app_ota (demonstrates the usage of the SUOTA profile – software update over the air). - ble_app_all_in_one (demonstrates in one application the features of the ble_app_barebone, ble_app_profile, ble_app_peripheral, ble_app_sleepmode, ble_app_security and ble_app_ota Keil example projects). The “UM-B-050 DA1458x Software Developer's Guide” document includes details about the BLE pillar examples.
4	New profiles added: WSS, BCS, CTS, UDS and BMS. UDS server role implementation uses the custom ATT read request handling mechanism in order to return custom read error codes.
5	Replaced hex2bin.exe with ARM fromelf utility.
6	Removed Keil 4 support.
7	SUOTA initiator windows application: Added support for authenticated pairing (passkey method). In case of read or write characteristics commands, disconnect is issued after pairing has also failed.
ROM PATCHES (DA14580 and DA14583)	
1	**Kernel timer issue.** Root cause is a fault mixed 16bit/32bit arithmetic. Patched function: cmp_abs_time(). Function **app_timer_set**() must be used as wrapper of the ke_timer_set(). It ensures that the delay parameter of the call to ke_timer_set() is within limits.
2	**Rejection of Peer request issue.** **SW implementation was rejecting any peer device request (read/write) when server had sent indication and was waiting for confirmation.** Patched Function: l2cc_pdu_recv_ind_handler(). Changes applied also in the profiles (cscp, glp, rscp, prf_utils).
3	**Security manager issue** **Reserved bits checked in Pairing PDU leads to PTS test TC_BV_04_C Failure.** Patched Functions: smpc_send_pairing_req_ind(), smpc_check_pairing_feat(), smpc_pairing_cfm_handler(). smpc_pairing_cfm_handler() patch was updated to fix hard fault when SMPC_PAIRING_CFM is received after the passkey entry procedure has timed out.
4	**Channel Map update**

	When operating as a slave and the Slave Latency of an established connection is not 0 then upon reception of an LL_CHANNEL_MAP_UPD or LL_CONN_PARAMS_UPD message with a connInstant value set at a “latency anchor point”, the connection is dropped immediately at the next wake-up. If the connInstant is set at a “connection anchor point” that the 580 has scheduled to wake-up to serve it then no problem occurs. The patched functions are: llc_con_update_req_ind() and llc_ch_map_req_ind().
5	**Enable broadcast mode for connected peripheral, Support Multiple “Service Data” structures in AD** BLE 4.0 specification permits a peripheral to be connected to a central and perform non-connectable advertising at the same time (this is required by CPP tests in PTS). The stack did not allow this. BLE 4.0 specification permits multiple instances of “Service Data” structures in AD. The stack allowed only 1 instance of this AD type. The patched function is gapm_adv_op_sanity()
6	Prohibit a peripheral device from sending the LL_START_ENC_RSP LL control PDU and data packets in the same connection event.
7	Added a null pointer check in llc_llcp_tx_cfm_handler() to remedy a corner case where the connection has already been dropped when the BLE controller processes the ACK of an LL control PDU.
8	Fixed a corner case where both a supervision timeout and an LL response timeout were triggered causing a null pointer to be dereferenced and leading to a hard fault.
9	Fixed a corner case in central mode that was causing subsequent GAPC, GATTC messages to fail.
10	Added a critical section to protect kernel data structures accessed by ke_state_set() when it is called from interrupt context.
11	Fixed corner case where a BLE master device gets stuck in an infinite loop when executing a disconnection after a parameter update on a dead connection.
12	Removed the READ property from the "service changed" characteristic of the GATT service.
13	The SKDs and IVs fields of the LL_ENC_RSP message are randomly generated.
ROM PATCHES (DA14581)	
1	Patch of atts_read_resp to send GATTC_READ_CMD_IND indication message when a read request message is received. It’s needed for specific applications Patched Function: atts_read_resp_patch()
2	Patch of lld_adv_start to allow sysRAM application modify the ADV_IND interval. The interval used by lld_adv_start is the value of retained variable arch_adv_int. If the value of arch_adv_int is 0 lld_adv_start uses the default value for each advertising type. Patched Function: lld_adv_start() Minimum interval value must be calculated -and assigned it to arch_adv_int. calculate_arch_adv_time() must be used for interval calculation. The default value arch_adv_int is 0, like all retained variables. If no other value is assigned, lld_adv_start() will use the following value values for the different types of advertising: Undirected/Connectable: 1500 uSec, Directed/Connectable: 1250 uSec, Undirected/Non Connectable: 500 uSec. Detailed information will be added in the document UM-B-003.
3	Patch of smpc_pairing_cfm_handler()in order to fix hard fault when SMPC_PAIRING_CFM is received after the passkey entry procedure has timed out.
4	Added a patch for the HCI project related to the interface with bluez. When we extract the llid info from the received packet we mask pb_bc_flag with 1 (the original mask was 3)
5	Fixed a corner case in central mode that was causing subsequent GAPC, GATTC messages to fail.
6	Added a critical section to protect kernel data structures accessed by ke_state_set() when it is called from interrupt context.
7	Fixed a corner case where a BLE master device gets stuck in an infinite loop when executing a disconnection after a parameter update on a dead connection.
8	Fixed a corner case in a peripheral device when a disconnect command is sent during an ongoing connection parameter update procedure. Eventually a null pointer is dereferenced leading to a hard fault. Patched function: lld_evt_int_extract()
9	Removed the READ property from the "service changed" characteristic of the GATT service.
Supported Profiles	
1	Certified Profiles: CSCP, CSCS, GLP, GLS, HTP, HTS, RSCP, RSCS, ANP, ANS, BLP, BLS, CTS, HRP, HRS, NDCS, PASP, PASS, RTUS, TIP, CPP, LNP

Documentation	
1	UM-B-050 DA1458x Software Developer's Guide
2	UM-B-051 DA1458x Software Platform Reference

2.2 Known Issues or Limitations

#	DESCRIPTION
1	GATT events may not be sent to profile tasks in the order they happen in BLE stack 4.0. **Workaround: If an indication completion is expected, but a write request is received, profile should reschedule the write request once in order to have same number of kernel scheduling. This workaround is implemented in Glucose, CPP, RSCP, CSCP profiles**
2	Software patching with patched functions stored in OTP is not supported in SDK 5.0.4
3	Watch Dog is disabled by default in external processor solutions.
4	GATTC_WRITE_NO_RESPONSE command is not currently supported by the Connection Manager
5	In ble_app_security or ble_app_all_in_one projects the used SPI flash erase function is blocking and lasts approximately 30ms (erase cycle of the SPI Flash chip which the DKs use). If the connection interval is less than 30ms then BLE connection events may be lost. This issue can lead to disconnections under certain conditions.

2.3 Major Release Files

#	File Name	Description
1	DA1458x_SDK_5.0.4.zip	RELEASE FILE
2	DA1458x_Software_Release_Notes_v5.0.4.doc	RELEASE NOTES

Release History

2.4 Version 5.0.3

#	DESCRIPTION
FIXES	
1	Mandatory interoperability fix when Secure Pairing is requested by central devices that are based on Android 6 Marshmallow with Bluetooth Smart 4.2.
ROM PATCHES (DA14580 and DA14583)	
1	**Kernel timer issue.** Root cause is a fault mixed 16bit/32bit arithmetic. Patched function: cmp_abs_time(). Function **app_timer_set**() must be used as wrapper of the ke_timer_set(). It ensures that the delay parameter of the call to ke_timer_set() is within limits.
2	**Rejection of Peer request issue.** **SW implementation was rejecting any peer device request (read/write) when server had sent indication and was waiting for confirmation.** Patched Function: l2cc_pdu_recv_ind_handler(). Changes applied also in the profiles (cscp, glp, rscp, prf_utils).
3	**Security manager issue** **Reserved bits checked in Pairing PDU leads to PTS test TC_BV_04_C Failure.** Patched Functions: smpc_send_pairing_req_ind(), smpc_check_pairing_feat(), smpc_pairing_cfm_handler(). smpc_pairing_cfm_handler() patch was updated to fix hard fault when SMPC_PAIRING_CFM is received after the passkey entry procedure has timed out.
4	**Channel Map update** When operating as a slave and the Slave Latency of an established connection is not 0 then upon reception of an LL_CHANNEL_MAP_UPD or LL_CONN_PARAMS_UPD message with a connInstant value set at a “latency anchor point”, the connection is dropped immediately at the next wake-up. If the connInstant is set at a “connection anchor point” that the 580 has scheduled to wake-up to serve it then no problem occurs. The patched functions are: llc_con_update_req_ind() and llc_ch_map_req_ind().
5	**Enable broadcast mode for connected peripheral, Support Multiple “Service Data” structures in AD** BLE 4.0 specification permits a peripheral to be connected to a central and perform non-connectable advertising at the same time (this is required by CPP tests in PTS). The stack did not allow this. BLE 4.0 specification permits multiple instances of “Service Data” structures in AD. The stack allowed only 1 instance of this AD type. The patched function is gapm_adv_op_sanity()
ROM PATCHES (DA14581)	
1	Patch of atts_read_resp to send GATTC_READ_CMD_IND indication message when a read request message is received. It’s needed for specific applications Patched Function: atts_read_resp_patch()
2	Patch of lld_adv_start to allow sysRAM application modify the ADV_IND interval. The interval used by lld_adv_start is the value of retained variable arch_adv_int. If the value of arch_adv_int is 0 lld_adv_start uses the default value for each advertising type. Patched Function: lld_adv_start() Minimum interval value must be calculated -and assigned it to arch_adv_int. calculate_arch_adv_time() must be used for interval calculation. The default value arch_adv_int is 0, like all retained variables. If no other value is assigned, lld_adv_start() will use the following value values for the different types of advertising: Undirected/Connectable: 1500 uSec, Directed/Connectable: 1250 uSec, Undirected/Non Connectable: 500 uSec. Detailed information will be added in the document UM-B-003.
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Documentation	
1	UM-B-048 DA1458x Getting Started with the DA1458x Development Kits – Basic
2	UM-B-049 DA1458x Getting Started with the DA1458x Development Kits – Pro
3	UM-B-050 DA1458x Software Developer's Guide
4	UM-B-051 DA1458x Software Platform Reference
KNOW ISSUES AND LIMITATIONS	
DESCRIPTION	
1	Advertising random address is renewed periodically when GAPM_STATIC_ADDR is requested in GAPM_START_ADVERTISE_CMD. Workaround: A static random address can be generated by sending a GAPM_GEN_RAND_ADDR_CMD with GAP_STATIC_ADDR type and storing the generated address, returned in GAPM_DEV_BDADDR_IND message. Then GAPM_START_ADVERTISE_CMD should be sent with address source set to GAPM_PROVIDED_RND_ADDR and providing stored random address in address field.
2	GATT events may not be sent to profile tasks in the order they happen in BLE stack 4.0. Workaround: If an indication completion is expected, but a write request is received, profile should reschedule the write request once in order to have same number of kernel scheduling. This workaround is implemented in Glucose, CPP, RSCP, CSCP profiles
3	Software patching with patched functions stored in OTP is not supported in SDK 5.0.2
4	Watch Dog is disabled by default in external processor solutions.
5	GATTC_WRITE_NO_RESPONSE command is not currently supported by the Connection Manager

2.5 Version 5.0.2.1

#	DESCRIPTION
FEATURES	
1	Major folder restructuring and renaming including changes in the project structure to make more evident the user application and the sdk files.
2	Added table-driven API for easy creation of 128-bit UUID services.
3	Cleaning and renaming of numerous define options. Dead configuration options have been removed, options used for stack configuration where removed from customer view, options rarely used from customers where moved into da1458x_config_advanced.h
4	Easier inclusion of SIG profiles into an application. User adds a profile by including its header file in the user_profiles_config.h
5	Major updates to the Metrics API. Applications can get better statistics concerning received and error packets.
6	Introduced the application entry point (app_entry_point). All of the application task messages are now delivered to this function and distributed to the different application software modules or the user application.
7	Introduced the custom profile creation framework. Customer can create a profile by defining an array with the custom profile services and characteristics, plus the database create, database enable and characteristic validation function if any exists. Up to two custom profiles are supported in this release. The framework is based on the table driven method described in #2 and supports both 16-bit and 128-bit UUIDs.
8	Removed CFG_NVDS option. NVDS is configured from a single set of user configuration options.
9	Added a template for external host projects based on the new project structure.
10	Refactored the existing callback functions into a callback API.
11	Added the easy API concept. For BLE stack related messages the concept is based on a number of constants defined in user files, which are used to automatically create and fill the message sent to the stack, thus reducing the amount of code a user needs to generate to perform an action. The easy API tries to hide kernel message and kernel task functionality from the user, for functions related to timer and wakeup handling.
12	Moved the da1458x_scatter_config.h and da1458x_stack_config.h into the sdk space.
13	Added a global board selection option into a SDK file called da1458x_periph_setup.h. User can setup this option and all the BLE examples will by default use this board

	configuration. User may override this option within a single project.
14	Introduced the mid API. The mid API consists of a number of stateless macros exposing to the user how to create, fill and send a message to the stack to perform a specific operation such as undirected advertise, gap configuration etc.
15	Merged all the 580, 581 and 583 projects into a single Keil project. User can select the device he wants to target, using the Keil supported target option.
16	Refactored all the peripheral examples to multiple projects each targeted for a single peripheral device.
17	Introduced the default handler option. Those are helper functions that are hooked on the existing callbacks to implement a peripheral functionality. Customer can override, cascade or copy and reuse this functionality to extended or alter the default behavior.
18	Added audio test support in the production test firmware.
FIXES	
1	Fixed a retention memory allocation issue that has been reported in v5.0.2. The issue occurred when the Proximity Monitor (External Processor configuration) application was running from OTP in Deep Sleep mode and tried to establish more than 3 connections simultaneously.
2	SW change for correct start-up using RCX. RCX_PERIOD_MAX should be now set to 200.
3	Made sure that cs_table is alinged at a 4 byte boundary.
4	Bug in sleep duration calculation when sleep_ext_force is set. In this case sleep_duration is set to 0 but sleep_lp_cycles are calculated to be equal to 0xFFFFFFFF.
5	Updated spi_439 driver to match latest audio reference designs.
6	Change UART GPIOs command in flash programmer firmware. It can now accept different URX-UTX ports.
7	Production test firmware, XTAL16M calibration. Add a 5ppm offset due to temperature effect.
8	SKIP SL Fix The fix temporarily drops the slave latency in the peripheral when the MD flag is set in the last received packet or if the packed has been received with an error. The fix is added in rwble.c and it is enabled by the definition CFG_SKIP_SL_PATCH in da1458x_config_advanced.h. By default the patch is DISABLED. The code size overhead by this fix is 290 bytes. As a fix it resolves issue #1 of the Known Issues or Limitations of version 3.0.10.
ROM PATCHES (DA14580 and DA14583)	
1	**Kernel timer issue.** Root cause is a fault mixed 16bit/32bit arithmetic. Patched function: cmp_abs_time(). Function **app_timer_set**() must be used as wrapper of the ke_timer_set(). It ensures that the delay parameter of the call to ke_timer_set() is within limits.
2	**Rejection of Peer request issue.** **SW implementation was rejecting any peer device request (read/write) when server had sent indication and was waiting for confirmation.** Patched Function: l2cc_pdu_recv_ind_handler(). Changes applied also in the profiles (cscp, glp, rscp, prf_utils).
3	**Security manager issue** **Reserved bits checked in Pairing PDU leads to PTS test TC_BV_04_C Failure.** Patched Functions: smpc_send_pairing_req_ind(), smpc_check_pairing_feat(), smpc_pairing_cfm_handler(). smpc_pairing_cfm_handler() patch was updated to fix hard fault when SMPC_PAIRING_CFM is received after the passkey entry procedure has timed out.
4	**Channel Map update** When operating as a slave and the Slave Latency of an established connection is not 0 then upon reception of an LL_CHANNEL_MAP_UPD or LL_CONN_PARAMS_UPD message with a connInstant value set at a “latency anchor point”, the connection is dropped immediately at the next wake-up. If the connInstant is set at a “connection anchor point” that the 580 has scheduled to wake-up to serve it then no problem occurs. The patched functions are: llc_con_update_req_ind() and llc_ch_map_req_ind().
5	**Enable broadcast mode for connected peripheral, Support Multiple “Service Data” structures in AD** BLE 4.0 specification permits a peripheral to be connected to a central and perform non-connectable advertising at the same time (this is required by CPP tests in PTS). The stack

	did not allow this. BLE 4.0 specification permits multiple instances of “Service Data” structures in AD. The stack allowed only 1 instance of this AD type. The patched function is gapm_adv_op_sanity()
ROM PATCHES (DA14581)	
1	Patch of atts_read_resp to send GATTC_READ_CMD_IND indication message when a read request message is received. It’s needed for specific applications Patched Function: atts_read_resp_patch()
2	Patch of lld_adv_start to allow sysRAM application modify the ADV_IND interval. The interval used by lld_adv_start is the value of retained variable arch_adv_int. If the value of arch_adv_int is 0 lld_adv_start uses the default value for each advertising type. Patched Function: lld_adv_start() Minimum interval value must be calculated -and assigned it to arch_adv_int. calculate_arch_adv_time() must be used for interval calculation. The default value arch_adv_int is 0, like all retained variables. If no other value is assigned, lld_adv_start() will use the following value values for the different types of advertising: Undirected/Connectable: 1500 uSec, Directed/Connectable: 1250 uSec, Undirected/Non Connectable: 500 uSec. Detailed information will be added in the document UM-B-003.
3	Patch of smpc_pairing_cfm_handler()in order to fix hard fault when SMPC_PAIRING_CFM is received after the passkey entry procedure has timed out.
4	Added a patch for the HCI project related to the interface with bluez. When we extract the llid info from the received packet we mask pb_bc_flag with 1 (the original mask was 3)
Supported Profiles	
1	Certified Profiles: CSCP, CSCS, GLP, GLS, HTP, HTS, RSCP, RSCS, ANP, ANS, BLP, BLS, CTS, HRP, HRS, NDCS, PASP, PASS, RTUS, TIP, CPP, LNP
Documentation	
1	UM-B-048 DA1458x Getting Started with the DA1458x Development Kits – Basic
2	UM-B-049 DA1458x Getting Started with the DA1458x Development Kits – Pro
3	UM-B-050 DA1458x Software Developer’s Guide
4	UM-B-051 DA1458x Software Platform Reference
KNOW ISSUES AND LIMITATIONS	
DESCRIPTION	
1	Advertising random address is renewed periodically when GAPM_STATIC_ADDR is requested in GAPM_START_ADVERTISE_CMD. Workaround: A static random address can be generated by sending a GAPM_GEN_RAND_ADDR_CMD with GAP_STATIC_ADDR type and storing the generated address, returned in GAPM_DEV_BDADDR_IND message. Then GAPM_START_ADVERTISE_CMD should be sent with address source set to GAPM_PROVIDED_RND_ADDR and providing stored random address in address field.
2	GATT events may not be sent to profile tasks in the order they happen in BLE stack 4.0. Workaround: If an indication completion is expected, but a write request is received, profile should reschedule the write request once in order to have same number of kernel scheduling. This workaround is implemented in Glucose, CPP, RSCP, CSCP profiles
3	Software patching with patched functions stored in OTP is not supported in SDK 5.0.2
4	Watch Dog is disabled by default in external processor solutions.
5	GATTC_WRITE_NO_RESPONSE command is not currently supported by the Connection Manager

2.6 Version 3.0.10.0

#	DESCRIPTION
FEATURES	
1	Support for DA14583 device. Added DA14583 specific Keil project files for all example BLE applications.
2	Initialization of public BD address from internal SPI flash memory for DA14583 devices. The behavior is as follows: • Try to read the BD address from the internal flash. • If a valid product header and BD address are found then use this address.

	• Otherwise read the BD address from OTP header (as is the default for DA14580). Note: This feature can be disabled by defining the BDADDR_FROM_DA14583_FLASH_DISABLED flag in the application specific configuration file (da14580_config.h).
3	Support for Keil 4.74.
4	Support for Keil 5.14.
5	Keil 5 specific .uvprojx files added for example BLE applications.
6	Added support for MX25V1006E in SPI flash driver. Note: MX25V1006E is the 1 Mbit SPI flash memory that is embedded in DA14583.
7	GPIO driver: 583 SPI flash dedicated GPIOs are automatically reserved when building for DA14583.
8	Wakeup Capture Timer driver: Added helper macros for pin "selection" and pin "polarity" parameters of function wkupct_enable_irq().
9	UART driver: Added #define values for several baud rate options including 2400 bps.
10	makeImage tool: Added support for BD address field in product header.
11	Changed the default value of DIS “device model number” characteristic to "DA1458x".
12	Removed RTS/CTS flow control from "throughput evaluation" SDK apps.
13	Added sample application level files for the SAMPLE128 profile.
FIXES	
1	Fixed a corner case that happens when sync is detected at the same time the Rx Enable signal is deactivated in the BLE core. In this case the BLE core might stop being able to receive packets in subsequent air operations. This corner case can most likely happen during the Scanning, Advertising and Initiating states and has been previously reported as the “SCAN issue” in v3.0.8. The fix is implemented in the BLE EVENT interrupt service routine (function $Sub$$BLE_EVENT_Handler in rwble.c). The code size overhead for this fix is 36 bytes.
2	Fixed a corner case where memory gets corrupted when the firmware processes a descriptor (reported by the BLE core) which has zero packet length and no errors. The fix implementation entry point is the patch_llm_task() function (in arch_patch.c). The code size overhead for this fix is ~500 bytes.
3	Updated the fix for the memory leak that happens when a disconnection event comes while a connection parameter update procedure is in progress (initially introduced in SDK 3.0.8). The 3.0.8 version of this fix can lead to hard fault errors which have been corrected in the 3.0.10.1 release. The fix is still enabled by default (see MEM_LEAK_PATCH_ENABLED flag) and its entry point is function patch_llc_task() (defined in dk_apps\patch_code\DA14580\obj\llc.obj).The code size overhead for this fix is 744 bytes (was 712 bytes in SDK 3.0.8).
4	Fixed error in sleep time calculation with RCX LP clock. When the sleep period is large the calculation of sleep time and consequently the compensation at system wakeup are wrong due to an overflow of a local variable. Patched function: lld_sleep_lpcycles_2_us_rcx_func() (arch_system.c)
5	BLE wakeup time was adjusted for the RC16M minimum frequency which is ~12MHz. This affects the case where the power optimizations are NOT enabled. Modified the XTAL_TRIMMING_TIME_USEC and XTAL_TRIMMING_TIME constants in arch.h. Note that power optimizations are enabled by default since SDK 3.0.8.
6	Function rf_nfm_disable() (rf_580.c) sets wrong value in RF_ENABLE_CONFIG13_REG. The NFM API restores RF_ENABLE_CONFIG13_REG to its preferred setting when near field mode is disabled instead of erroneously setting it to its reset value.
7	Fixed a bug when using SUOTA with an I2C EEPROM memory under Deep Sleep: The "Valid Flag" may not be written correctly to the image header. Patched function: app_set_image_valid_flag() (app_spotar.c)
8	Removed hardcoded UART RX pin in the main() function of the secondary bootloader.
9	Flash programmer: Fixes in ACTION_SPI_GPIOS, ACTION_I2C_GPIOS action handling when they are

	received through JTAG. Both ACTION_SPI_GPIOS and ACTION_I2C_GPIOS accept GPIOs from different ports. The flash programmer firmware sends a "release from power down" command to an SPI flash memory before executing an action on it.
10	Fixed hardcoded interrupt pin in app_button_enable() of Proximity Reporter application. The button pin defined in periph_setup.h (see GPIO_BUTTON_PORT, GPIO_BUTTON_PIN) is used instead of the hardcoded P1_1.
11	Renamed XTAL16_BIAS_SH_DISABLE to XTAL16_BIAS_SH_ENABLE in datasheet.h
12	Windows SPOTA initiator application: P2_9 at command line was interpreted as P2_0.
13	Windows SUOTA initiator application: P2_9 at command line was interpreted as P2_0.
14	Production test firmware: improvements in XTAL16M trim value calibration algorithm. Changes to protect the algorithm from going to an endless loop if crystal is too way off.
ROM PATCHES (DA14580 and DA14583)	
1	**Kernel timer issue.** Root cause is a fault mixed 16bit/32bit arithmetic. Patched function: cmp_abs_time(). Function **app_timer_set**() must be used as wrapper of the ke_timer_set(). It ensures that the delay parameter of the call to ke_timer_set() is within limits.
2	**Rejection of Peer request issue.** **SW implementation was rejecting any peer device request (read/write) when server had sent indication and was waiting for confirmation.** Patched Function: l2cc_pdu_recv_ind_handler(). Changes applied also in the profiles (cscp, glp, rscp, prf_utils).
3	**Security manager issue** **Reserved bits checked in Pairing PDU leads to PTS test TC_BV_04_C Failure.** Patched Functions: smpc_send_pairing_req_ind(), smpc_check_pairing_feat(), smpc_pairing_cfm_handler(). smpc_pairing_cfm_handler() patch was updated to fix hard fault when SMPC_PAIRING_CFM is received after the passkey entry procedure has timed out.
4	**Channel Map update** When operating as a slave and the Slave Latency of an established connection is not 0 then upon reception of an LL_CHANNEL_MAP_UPD or LL_CONN_PARAMS_UPD message with a connInstant value set at a “latency anchor point”, the connection is dropped immediately at the next wake-up. If the connInstant is set at a “connection anchor point” that the 580 has scheduled to wake-up to serve it then no problem occurs. The patched functions are: llc_con_update_req_ind() and llc_ch_map_req_ind().
5	**Enable broadcast mode for connected peripheral, Support Multiple “Service Data” structures in AD** BLE 4.0 specification permits a peripheral to be connected to a central and perform non-connectable advertising at the same time (this is required by CPP tests in PTS). The stack did not allow this. BLE 4.0 specification permits multiple instances of “Service Data” structures in AD. The stack allowed only 1 instance of this AD type. The patched function is gapm_adv_op_sanity()
ROM PATCHES (DA14581)	
1	Patch of atts_read_resp to send GATTC_READ_CMD_IND indication message when a read request message is received. It’s needed for specific applications Patched Function: atts_read_resp_patch()
2	Patch of lld_adv_start to allow sysRAM application modify the ADV_IND interval. The interval used by lld_adv_start is the value of retained variable arch_adv_int. If the value of arch_adv_int is 0 lld_adv_start uses the default value for each advertising type. Patched Function: lld_adv_start() Minimum interval value must be calculated -and assigned it to arch_adv_int. calculate_arch_adv_time() must be used for interval calculation. The default value arch_adv_int is 0, like all retained variables. If no other value is assigned, lld_adv_start() will use the following value values for the different types of advertising: Undirected/Connectable: 1500 uSec. Directed/Connectable: 1250 uSec. Undirected/Non Connectable: 500 uSec. Detailed information will be added in the document UM-B-003.

3	Patch of smpc_pairing_cfm_handler()in order to fix hard fault when SMPC_PAIRING_CFM is received after the passkey entry procedure has timed out.
Supported Profiles	
1	Certified Profiles: CSCP, CSCS, GLP, GLS, HTP, HTS, RSCP, RSCS, ANP, ANS, BLP, BLS, CTS, HRP, HRS, NDCS, PASP, PASS, RTUS, TIP, CPP, LNP
Documentation	
1	Software documentation is available on the Dialog customer support portal.

	Known Issues or Limitations
#	**DESCRIPTION**
1	Disconnection caused by LL_CHANNEL_MAP_REQ with a connection instant referring to the past: This behavior has been observed when a DA14580/581/582/583 (slave) device is connected as a slave to a specific Android device (Master) and slave latency is used. There are two cases how the problem is triggered: Case 1: The master sends an empty data packet with MD=1 before transmitting the LL_CHANNEL_MAP_REQ. The slave acknowledges the empty data packet and applies slave latency. The master transmits the LL_CHANNEL_MAP_REQ at the next connection event. Case 2: The slave receives the LL_CHANNEL_MAP_REQ with an error (CRC, sync, length, type) so it ignores this packet and applies slave latency. In both cases, the master keeps trying to retransmit the already prepared LL_CHANNEL_MAP_REQ at every connection event. Eventually the slave will wake up and receive the LL_CHANNEL_MAP_REQ but, depending on the connection slave latency, its connection event counter may have exceeded the instant contained in the request and the slave's BLE stack closes the connection since it cannot handle a connection instant that refers to a past connection event. This issue has been reproduced for slave latency values of 31 and 299.
2	**Advertising random address is renewed periodically when GAPM_STATIC_ADDR is requested in GAPM_START_ADVERTISE_CMD.** **Workaround: A static random address can be generated by sending a GAPM_GEN_RAND_ADDR_CMD with GAP_STATIC_ADDR type and storing the generated address, returned in GAPM_DEV_BDADDR_IND message. Then GAPM_START_ADVERTISE_CMD should be sent with address source set to GAPM_PROVIDED_RND_ADDR and providing stored random address in address field.**
3	GATT events may not be sent to profile tasks in the order they happen in BLE stack 4.0. Workaround: If an indication completion is expected, but a write request is received, profile should reschedule the write request once in order to have same number of kernel scheduling. This workaround is implemented in Glucose, CPP, RSCP, CSCP profiles.
4	Software patching with patched functions stored in OTP is not supported in SDK 3.0.10.1
5	Watch Dog is disabled by default in external processor solutions.
6	GATTC_WRITE_NO_RESPONSE command is not currently supported by the Connection Manager.

2.7 Version 3.0.8.0

#	DESCRIPTION
FEATURES	
1	Power Consumption Optimization. The power consumed during a BLE event has been reduced by reducing the active time of the event. This reduction has been achieved through optimization of the programming procedure of the BLE events. The settling procedure of the XTAL16 has been modified so that time measurement does not depend on the (variable) RC16. Power optimization is enabled by default by the flag USE_POWER_OPTIMIZATIONS in da14580_config.h
2	TRNG driver for the initialization of random number seed. More information is provided in user manual UM-B-015 available on http://support.dialog-semiconductor.com/
3	WiFi Coexistence API. More information is provided in UM-B-015
4	Crypto API. More information is provided in UM-B-015

5	API for setting DCDC_VBAT3V voltage level. More information is provided in UM-B-015 Flag SUPPORT_1_8_V removed. 1.8V DCDC output voltage of boost converter is no longer supported
6	API for enabling the Nearfield mode. More information is provided in UM-B-015
7	CFG_CALIBRATED_AT_FAB flag has been removed from all SDK reference example applications
8	SDK reference applications folder, project name and output file have been renamed
9	Improved secondary booter
10	ADC calibration added in ADC driver
11	Added an API for measuring the Packet Error Rate (PER)
12	SPI flash API update. Return type of spi_flash_read_data() changed to int32_t. spi_read_flash_memory_man_and_dev_id() returns 0 on error. spi_read_flash_unique_id() returns 0 on error
13	New commands added in the flash programmer application for future use
14	Patch related code moved from arch_main.c to new file arch_patch.c. Patch code partitioned per chip type.
15	mkimage tool improvements. It now supports active image id, setting it automatically to 01 for the first listed image in multifunction. An issue when file size was a multiple of AES_BLOCKSIZE has been fixed. MS C++ compiler is supported
16	Added API support for GPIOn_IRQs. Added API for setting each GPIO to either VBAT3V rail or VBAT1V rail
17	Added compilation warning when building for Deep Sleep while DEVELOPMENT_DEBUG is set to 1
18	SPOTA/SUOTA. Added new parameter in function app_spotar_init(), to register a call back function pointer to inform application about SPOTAR START/STOP session. An application can register a callback for powering on/off an external NV memory
19	Production test tool. The XTAL16 trim calibration commands detect if the external square pulse is absent and report an error status instead of blocking forever. Updated xtal trim calc algorithm to be faster. Accuracy from 1.2ppm to 2.5ppm. One test pulse instead of two. Production test application accepts P1_4 and P1_5 pins as arguments in xtrim cal/caltest commands
20	Hogpd profile. An improvement for supporting more than 8 reports
21	Various improvements for code size optimization
FIXES	
1	Software patch fixing a memory leak issue happening in BLE stack when a disconnection event comes when parameter update procedure is in progress. The patch is enabled by default (MEM_LEAK_PATCH_ENABLED)
2	Fixed SPI CS handling in the secondary booter
3	Fixed an issue in BLE permanent sleep. When the BLE was requested to enter into permanent sleep but there were kernel timers pending then the timers would not be served because the BLE would not wake up to serve them. The fix solves this problem. The BLE will sleep as long as necessary to serve the timer and when all timers have been served and permanent sleep is still active, it will enter into permanent sleep
4	XTAL32K is disabled when RCX is the selected low power clock
5	prodtest tool accepts P1_4 and P1_5 pins as arguments in xtrim cal/caltest commands
6	The RSSI value returned with GAPC_CON_RSSI_IND is half the raw RSSI value. The application must double the param->rssi value before applying the raw RSSI to dBm formula. Updated the raw RSSI to dBm formula for the GAPC_CON_RSSI_IND case to: dBm = 0.474* RSSI -112.4
7	Fixed GTL over SPI driver issue manifested when receiving messages with large payload size, using in-reception DREADY assertion to temporarily prevent the master from transmitting. More information is provided in UM-B-013.
ROM PATCHES (DA14580)	
1	**Kernel timer issue.** Root cause is a fault mixed 16bit/32bit arithmetic. Patched function: cmp_abs_time(). Function **app_timer_set**() must be used as wrapper of the ke_timer_set(). It ensures that the delay parameter of the call to ke_timer_set() is within limits.
2	**Rejection of Peer request issue.**

	SW implementation was rejecting any peer device request (read/write) when server had sent indication and was waiting for confirmation. Patched Function: l2cc_pdu_recv_ind_handler(). Changes applied also in the profiles (cscp, glp, rscp, prf_utils).
3	**Security manager issue** **Reserved bits checked in Pairing PDU leads to PTS test TC_BV_04_C Failure.** Patched Functions: smpc_send_pairing_req_ind(), smpc_check_pairing_feat(), smpc_pairing_cfm_handler(). smpc_pairing_cfm_handler() patch was updated to fix hard fault when SMPC_PAIRING_CFM is received after the passkey entry procedure has timed out.
4	**Channel Map update** When operating as a slave and the Slave Latency of an established connection is not 0 then upon reception of an LL_CHANNEL_MAP_UPD or LL_CONN_PARAMS_UPD message with a connInstant value set at a “latency anchor point”, the connection is dropped immediately at the next wake-up. If the connInstant is set at a “connection anchor point” that the 580 has scheduled to wake-up to serve it then no problem occurs. The patched functions are: llc_con_update_req_ind() and llc_ch_map_req_ind().
5	**Enable broadcast mode for connected peripheral, Supporrt Multiple “Service Data” structures in AD** BLE 4.0 specification permits a peripheral to be connected to a central and perform non-connectable advertising at the same time (this is required by CPP tests in PTS). The stack did not allow this. BLE 4.0 specification permits multiple instances of “Service Data” structures in AD. The stack allowed only 1 instance of this AD type. The patched function is gapm_adv_op_sanity()
ROM PATCHES (DA14581)	
1	Patch of atts_read_resp to send GATTC_READ_CMD_IND indication message when a read request message is received. It’s needed for specific applications Patched Function: atts_read_resp_patch()
2	Patch of lld_adv_start to allow sysRAM application modify the ADV_IND interval. The interval used by lld_adv_start is the value of retained variable arch_adv_int. If the value of arch_adv_int is 0 lld_adv_start uses the default value for each advertising type. Patched Function: lld_adv_start() Minimum interval value must be calculated -and assigned it to arch_adv_int. calculate_arch_adv_time() must be used for interval calculation. The default value arch_adv_int is 0, like all retained variables. If no other value is assigned, lld_adv_start() will use the following value values for the different types of advertising: Undirected/Connectable: 1500 uSec. Directed/Connectable: 1250 uSec. Undirected/Non Connectable: 500 uSec. Detailed information will be added in the document UM-B-003.
3	Patch of smpc_pairing_cfm_handler()in order to fix hard fault when SMPC_PAIRING_CFM is received after the passkey entry procedure has timed out.
Supported Profiles	
1	Certified Profiles: CSCP, CSCS, GLP, GLS, HTP, HTS, RSCP, RSCS, ANP, ANS, BLP, BLS, CTS, HRP, HRS, NDCS, PASP, PASS, RTUS, TIP, CPP, LNP
Documentation	
1	Software documentation is available on the Dialog customer support portal.
Known Issues or Limitations	
#	DESCRIPTION
1	SCAN issue: After a number of repetitions of scan operation, scanning is getting stuck on DA14580 and DA14581. Specifically no advertising device is discovered (no ADV_REPORT_IND is received), and RX_EN signal is toggling during the scan window.
2	Advertising random address is renewed periodically when GAPM_STATIC_ADDR is requested in GAPM_START_ADVERTISE_CMD. Workaround: A static random address can be generated by sending a GAPM_GEN_RAND_ADDR_CMD with GAP_STATIC_ADDR type and storing the generated address, returned in GAPM_DEV_BDADDR_IND message. Then GAPM_START_ADVERTISE_CMD should be sent with address source set to GAPM_PROVIDED_RND_ADDR and providing stored random address in address field.
3	GATT events may not be sent to profile tasks in the order they happen in BLE stack 4.0.

	Workaround: If an indication completion is expected, but a write request is received, profile should reschedule the write request once in order to have same number of kernel scheduling. This workaround is implemented in Glucose, CPP, RSCP, CSCP profiles.
4	Software patching with patched functions stored in OTP is not supported in SDK 3.0.8
5	Watch Dog is disabled by default in external processor solutions.
6	GATTC_WRITE_NO_RESPONSE command is not currently supported by the Connection Manager.

2.8 Version 3.0.6.0

#	DESCRIPTION
FEATURES	
1	Add support for DA14581 IC. In DA14581: Support up to 8 connections, patches have been merged in ROM, Bootup time from OTP has been improved. NVDS_FLASH_ADDRESS =0x0350 for DA14581
2	Added support for the SUOTA in the external processor proximity reporter application (fe_proxr_uvproj).
3	Production test tool. UART communication is not lost after waking up from deep sleep
4	Add SPOTA/SUOTA service UUID in advertising data
5	Compilation option CFG_CALIBRATED_AT_FAB is defined by default
6	Expanded DIS info to contain firmware and software revisions
7	Improved version of the mkimage tool to support encrypted images, dual images, change pad byte for EEPROM to 0xFF. Open source library axTLS is used
8	Task type re-organization. Task types introduced by Dialog (or its customers) are conditionally defined in the 54-59 range without a fixed number id. Also task type 62 is free for future use
9	Updated proximity reporter host app over the SPI to support 581.
10	Added AES encrypted image support in dual image boot-loader. Open source library axTLS is used.
11	Support ADV_IND interval optimization in 581 projects .
12	In DA14581, the parameters of the GAPC_PARAM_UPDATE_CMD and GAPC_PARAM_UPDATE _CFM messages have changed. Existing external host code must be recompiled in order to function correctly with DA14581.
13	In SPI flash driver: Added support for the AT25Dx011 (x:N,F) family of devices, automatic recognition of the supported SPI FLASH devices by the JEDEC ID.
14	Added HW_CONFIG_PRO_DK flag which indicates that the application runs on a Pro-DK and it is by default commented out.
BUG FIXES	
1	Wrong usage of KE_MSG_NO_FREE instead of KE_MSG_SAVED in several profiles.
2	Fix a potential bug in case the RCX was used as low power clock. If waking up is delayed and the system is late to serve the first BLE pending event, then the event is simply rescheduled for the future (considered as "missed"). Previously, the code would stuck at this point.
3	Various compilation bug fixes.
4	Fix external wake-up SPI GPIO assignment.
5	Added *.uvopt files for all Keil project for fixing Keil stability issues.
6	Fix compilation issues in the secondary bootloader.
7	Moved critical global variables of the uart2 and sample128 profile in retention memory.
8	Added check_gtl_state() check before GLOBAL_INT_STOP to fix lost bytes when SPI is used as external interface, in an external processor configuration
9	Bug fix in PASPC profile. Fixed operation code in PASPC_CMP_EVT events returned after PASPC_ENABLE_CMD
ROM PATCHES (DA14580)	
1	**Kernel timer bug.** Root cause is a fault mixed 16bit/32bit arithmetic. Patched function: cmp_abs_time(). Function **app_timer_set**() must be used as wrapper of the ke_timer_set(). It ensures that the delay parameter of the call to ke_timer_set() is within limits.
2	**Rejection of Peer request bug.** **SW implementation was rejecting any peer device request (read/write) when server had sent indication and was waiting for confirmation.** Patched Function: l2cc_pdu_recv_ind_handler(). Changes applied also in the profiles (cscp, glp, rscp, prf_utils).
3	**Security manager bug**

	Reserved bits checked in Pairing PDU leads to PTS test TC_BV_04_C Failure. Patched Functions: smpc_send_pairing_req_ind(), smpc_check_pairing_feat(), smpc_pairing_cfm_handler().
4	**Channel Map update** When operating as a slave and the Slave Latency of an established connection is not 0 then upon reception of an LL_CHANNEL_MAP_UPD or LL_CONN_PARAMS_UPD message with a connInstant value set at a “latency anchor point”, the connection is dropped immediately at the next wake-up. If the connInstant is set at a “connection anchor point” that the 580 has scheduled to wake-up to serve it then no problem occurs. The patched functions are: llc_con_update_req_ind() and llc_ch_map_req_ind().
5	**Enable broadcast mode for connected peripheral, Supporrt Multiple “Service Data” structures in AD** BLE 4.0 specification permits a peripheral to be connected to a central and perform non-connectable advertising at the same time (this is required by CPP tests in PTS). The stack did not allow this. BLE 4.0 specification permits multiple instances of “Service Data” structures in AD. The stack allowed only 1 instance of this AD type. The patched function is gapm_adv_op_sanity()
ROM PATCHES (DA14581)	
1	Patch of atts_read_resp to send GATTC_READ_CMD_IND indication message when a read request message is received. It’s needed for specific applications Patched Function: atts_read_resp_patch()
2	Patch of lld_adv_start to allow sysRAM application modify the ADV_IND interval. The interval used by lld_adv_start is the value of retained variable arch_adv_int. If the value of arch_adv_int is 0 lld_adv_start uses the default value for each advertising type. Patched Function: lld_adv_start() Minimum interval value must be calculated -and assigned it to arch_adv_int. calculate_arch_adv_time() must be used for interval calculation. The default value arch_adv_int is 0, like all retained variables. If no other value is assigned, lld_adv_start() will use the following value values for the different types of advertising: Undirected/Connectable: 1500 uSec. Directed/Connectable: 1250 uSec. Undirected/Non Connectable: 500 uSec. Detailed information will be added in the document UM-B-003.
Supported Profiles	
1	Certified Profiles: CSCP, CSCS, GLP, GLS, HTP, HTS, RSCP, RSCS, ANP, ANS, BLP, BLS, CTS, HRP, HRS, NDCS, PASP, PASS, RTUS, TIP, CPP, LNP
Documentation	
1	Software documentation is available on the Dialog customer support portal.

2.9 Version 3.0.4.0

#	DESCRIPTION
FEATURES	
1	Support of UART2 port for Debug Logging
2	Add throughput evaluation application (UM-B-030)
3	Support Software Upgrade Over The Air (SUOTA)
	Support a dual image bootloader for system firmware upgrade. (UM-B-012).
4	Add a new tool, mkimage, for adding the header in the beginning of the application binary needed for the firmware update OTA.
5	Add CFG_PRF_SAMPLE128 in template project configuration
6	Support 6 connections in proximity monitor host application.
7	Minor changes in Peripheral Drivers and Examples
8	Support new Profiles: Cycling Power Profile & Location and Navigation Profile
9	Support of integrated processor mode with GTL interface. More information is given in UM-B-017.
10	DA14580 wakeup mechanism using an external GPIO (ie CTS or SPI EN). More information is given in AN-B-026.
11	PWM4 moved to P0_0 from P1_2
12	-Modify the HardFault and the NMI Handlers to output the stacked info (R0, R1, R3, R3, R12, LR, PC and PSR) to the console when an exception of this kind occurs. The flag PRODUCTION_DEBUG_OUTPUT must be included in the DA14580_config.h to enable this functionality. If it is enabled then the PRODUCTION_DEBUG_PORT and PRODUCTION_DEBUG_PIN must also be defined to set the

	UART Tx pin to be used. This functionality can be used only in Production Mode (DEVELOPMENT_DEBUG == 0). -Modify the HardFault handler so that, when in Production Mode, it will turn on the WDOG and set it to '1' to force an NMI interrupt after 10.24ms and an invocation of the NMI Handler (which will eventually cause a Soft Reset).
13	Add app_last_rwble_evt_get() function returning the value of the last BLE event. It can be used to synchronize application's tasks with BLE activity
14	RXRSSI to dBm conversion formula changed to dBm = 0.474 * RXRSSI - 112.4
15	Add Near Field Mode support. Set NEAR_FIELD_MODE_ENABLED flag to enable it
16	Added support for default XTAL16M trim value if it's not programmed in OTP.
BUG FIXES	
1	UART TX pending packets causing crash. When UART communication was halted or was slow related to created ADV_REPORT
2	Changed channel assessment parameters (the previous ones where creating too many channel updates)
ROM PATCHES	
1	**Kernel timer bug.** Root cause is a fault mixed 16bit/32bit arithmetic. Patched function: cmp_abs_time(). Function **app_timer_set**() must be used as wrapper of the ke_timer_set(). It ensures that the delay parameter of the call to ke_timer_set() is within limits.
2	**Rejection of Peer request bug.** **SW implementation was rejecting any peer device request (read/write) when server had sent indication and was waiting for confirmation.** Patched Function: l2cc_pdu_recv_ind_handler(). Changes applied also in the profiles (cscp, glp, rscp, prf_utils).
3	**Security manager bug** **Reserved bits checked in Pairing PDU leads to PTS test TC_BV_04_C Failure.** Patched Functions: smpc_send_pairing_req_ind(), smpc_check_pairing_feat(), smpc_pairing_cfm_handler().
4	**Channel Map update** When operating as a slave and the Slave Latency of an established connection is not 0 then upon reception of an LL_CHANNEL_MAP_UPD or LL_CONN_PARAMS_UPD message with a connInstant value set at a "latency anchor point", the connection is dropped immediately at the next wake-up. If the connInstant is set at a "connection anchor point" that the 580 has scheduled to wake-up to serve it then no problem occurs. The patched functions are: llc_con_update_req_ind() and llc_ch_map_req_ind().
5	**Enable broadcast mode for connected peripheral, Supporrt Multiple "Service Data" structures in AD** BLE 4.0 specification permits a peripheral to be connected to a central and perform non-connectable advertising at the same time (this is required by CPP tests in PTS). The stack did not allow this. BLE 4.0 specification permits multiple instances of "Service Data" structures in AD. The stack allowed only 1 instance of this AD type. The patched functions is gapm_adv_op_sanity()
PROFILES	
1	Certified Profiles: CSCP, CSCS, GLP, GLS, HTP, HTS, RSCP, RSCS, ANP, ANS, BLP, BLS, CTS, HRP, HRS, NDCS, PASP, PASS, RTUS, TIP. **CPP & LNP**
Documentation	
1	Software documentation is available on the Dialog customer support portal. New user manuals and application notes added.
Known Issues or Limitations	
#	DESCRIPTION
1	Watch Dog is disabled by default in external processor solutions.
2	GATTC_WRITE_NO_RESPONSE command is not currently supported by the Connection Manager.

2.10 Version 3.0.2.1

#	DESCRIPTION
FEATURES	

1	Replaced DEVELOPMEMT__NO-OTP with DEVELOPMENT_DEBUG Replaced DEVELOPMENT__NO_OTP configuration directive with two new directives, in order to distinguish the case where project is in development/debug phase and the case of a project that the image is not programmed in OTP. New directives are: **DEVELOPMENT_DEBUG**: If defined, project is in development and debug phase. **APP_BOOT_FROM_OTP**: If defined it is denoted that applications image is programmed in OTP memory and OTP header is copied to System RAM during boot-loader's OTP copy process. If not defined application is downloaded to System RAM from a communication interface (UART, SPI, I2C) or Debugger. OTP header is not copied in System RAM and application accesses it in OTP.
2	Addition of **READ_NVDS_STRUCT_FROM_OTP** directive. When defined NVDS structure area in OTP memory will not be initialized by application image's hardcoded values. Must be written during production procedure.
3	New test added in the Production Test tool. More information can be found in document UM-B-008
4	Support Basic Development Kit. Added support for "Basic DK" UART gpio mapping through the HW_CONFIG_BASIC_DK flag in peripheral_setup.h
5	Change the data memory area in peripheral examples project from 0x20008000 to 0x8000. This is required for booting from UART in ES5
6	XTAL32 preferred setting applied: XTAL32K_CUR = 5,XTAL32K_RBIAS = 3.In Boost mode where XTAL32K_DISABLE_AMPREG is set to 1, XTAL32K_CUR is set to 1 after initialization.
7	Added flag USE_BAT_LEVEL_ALERT in peripheral_setup.h. The flag indicates if battery level alert is used. Added flag USE_PUSH_BUTTON in periph_setup.h that decides if the application will configure and use a push button. When the application is being built for Basic DK it is disabled. Otherwise it is enabled.
8	Support OTP, SPI and EEPROM programming through JTAG interface. Fix minor issues in SPI and EEPROM flash programmer. UART pin configuration is set by SnartSnippets. Support Basic DK.
9	Updated the RSSI to dBm conversion formula according to datasheet v1.63.
10	Modified the calculation of remaining battery life for CR2032.
BUG FIXES	
1	Modified sleep entry and sleep exit to correct a problem that caused loss of synchronization to the master (by 1 slot) due to delayed wakeup. The following functions have been modified: **Function BLE_WAKEUP_LP_Handler() in file rwble.c**: moved rf_reinit() to the SLP handler after the clock correction preparation has finished to reduce the transition delay from LP to SLP ISR and, consequently, the delay of the clock correction preparation **Function BLE_SLP_Handler() in file rwble.c**: rf_reinit() has been moved in here as described above **New function lld_sleep_compensate_func_patched() in file rwble.c**. This function includes the patch of the clock correction needed to solve the problem with the loss of synch to the master. **New variable rcx_slot_duration in file arch_system.c**: This variable has been added to reduce the delay of the lld_sleep_lpcycles_2_us_rcx_func() and, consequently, the overall delay of the clock correction algorithm.
2	Bug fix in ROM function uart_flow_off_func for UART RX timeout issue.
3	Changes in scatter configuration files da14580_scatter_config.h. The RW_IRAM50 section was overlapping with OTP Header data at address 0x20007F00. The section has been moved and is not starting from 0x20008000.
4	Fixing enumeration of Task ID's. The maximum number cannot exceed 63
5	RCX bug fix. One additional slot is being used for the clock correction algorithm in case of RCX clock. Without this patch it may happen that the clock correction algorithm delays too much the arrival of the CSCNT interrupt, which comes 1 slot later resulting in losing the FINEGTIM interrupt and the servicing of the BLE event
ROM PATCHES	
1	**Kernel timer bug.** Root cause is a fault mixed 16bit/32bit arithmetic. Patched function: cmp_abs_time(). Function **app_timer_set**() must be used as wrapper of the ke_timer_set(). It ensures that the delay parameter of the call to ke_timer_set() is within limits.
2	**Rejection of Peer request bug.** **SW implementation was rejecting any peer device request (read/write) when server had sent indication and was waiting for confirmation.** Patched Function: l2cc_pdu_recv_ind_handler(). Changes applied also in the profiles (cscp, glp, rscp, prf_utils).
3	**Security manager bug** **Reserved bits checked in Pairing PDU leads to PTS test TC_BV_04_C Failure.**

	Patched Functions: smpc_send_pairing_req_ind(), smpc_check_pairing_feat(), smpc_pairing_cfm_handler().
4	**Channel Map update** When operating as a slave and the Slave Latency of an established connection is not 0 then upon reception of an LL_CHANNEL_MAP_UPD or LL_CONN_PARAMS_UPD message with a connInstant value set at a “latency anchor point”, the connection is dropped immediately at the next wake-up. If the connInstant is set at a “connection anchor point” that the 580 has scheduled to wake-up to serve it then no problem occurs. The patched functions are: llc_con_update_req_ind() and llc_ch_map_req_ind().
PROFILES	
1	Certified Profiles: CSCP, CSCS, GLP, GLS, HTP, HTS, RSCP, RSCS, ANP, ANS, BLP, BLS, CTS, HRP, HRS, NDCS, PASP, PASS, RTUS, TIP.
Documentation	
1	Software documentation is available on the Dialog customer support portal.

#	**Known Issues or Limitations**
1	Watch Dog is disabled by default in external processor solutions.
2	GATTC_WRITE_NO_RESPONSE command is not currently supported by the Connection Manager.
3	In central role, disconnections may happen if multi-peripheral devices (>4) are connected and connection interval is updated.

2.11 Version 3.0.2.0

#	DESCRIPTION
FEATURES	
1	Support DA14580-01
2	New BLE Application structure (ref. to Porting Guide and document UM-B-003)
3	New Peripherals Drivers (SPI, EEPROM, ADC, battery, etc) are supported (ref. to document UM-B-004)
4	Support Channel Assessment & L2CAP fragmentation
5	CFG configuration settings have been moved to an include file (ref. to document UM-B-015)
6	Minor changes in FE API (ref. to Porting Guide)
7	Radio preferred settings are saved in a single include file (ref. to document UM-B-015)
8	Production test has been implemented as Application project 9 dk_apps\keil_projects\prod_test\prod_test_ES5)
9	New official UUID for SPOTA (0xFEF5), SPOTA initiator is also supported. 128-bit UUIDs are supported
10	Boot-loader and flash programmer application added (under /tools) .
11	Peripherals examples have been re-written and new examples have been added. (ref. to document UM-B-005)
12	An application example to demonstrate the external processor interface over SPI has been added (ref. to document UM-B-013)
13	**RCX is supported.** A configuration flag is added in projects’ da14580_config.h is added for low power **clock source selection.** **#define CFG_LP_CLK 0x00 (default setting)** **where: 0x00: XTAL32, 0xAA: RCX, 0xFF: Select LP clock from corresponding field in OTP Header.** (More details will be provided in the software architecture document). Maximum recommended connection interval (including slave latency) for the RCX usage is 2 sec
14	Scatter files structure has been changed (ref. to document UM-B-011)
15	Function custom_nvds_get_func added in jump_table[47] instead of the ROM function nvds_get_func. It reads the BT address from OTP header
16	Max supported connections is 6
17	Linker options any_placement=best_fit --datacompressor off added in keil projects
18	New test cases added in the production test tool. Production test tool binary files have been added under binaries folder (ref. to document UM-B-008) Note: In test command “stop_pkt_rx_stats”, the reported nb_packets_received_correctly is the total number of received packets
19	Dice and Keyboard reference applications will be released as separate versions
BUG FIXES	
1	SDK 2.04 patches have been fixed in ROM
2	Possible double memory free issue when GATT is executing an operation and operation message has

	been rescheduled into kernel. Rom function ke_task_schedule() replaced in SysRam
3	Memory leaks in GLPC, ANPS, TIPS profiles are fixed
4	Set rcx_period global as retained variable
ROM PATCHES	
1	**Kernel timer bug.** Root cause is a fault mixed 16bit/32bit arithmetic. Patched function: cmp_abs_time() Function **app_timer_set**() must be used as wrapper of the ke_timer_set(). It ensures that the delay parameter of the call to ke_timer_set() is within limits.
2	**Rejection of Peer request bug.** **SW implementation was rejecting any peer device request (read/write) when server had sent indication and was waiting for confirmation** Patched Function: l2cc_pdu_recv_ind_handler(). Changes applied also in the profiles (cscp, glp, rscp, prf_utils).
3	**Security manager bug** **Reserved bits checked in Pairing PDU leads to PTS test TC_BV_04_C Failure** Patched Functions: smpc_send_pairing_req_ind(),smpc_check_pairing_feat(), smpc_pairing_cfm_handler()
PROFILES	
1	Certified Profiles: CSCP, CSCS, GLP, GLS. HTP, HTS, RSCP, RSCS, ANP, ANS, BLP, BLS, CTS, HRP, HRS, NDCS, PASP, PASS, RTUS, TIP
Documentation	
	Software documentation is available on Dialog customer support portal
2	

#	Known Issues or Limitation
1	Watch Dog is disabled by default in Fully embedded applications
2	GATTC_WRITE_NO_RESPONSE command is not currently supported by Connection Manager.
3	In central role, disconnections may happen if multi-peripheral devices (>4) are connected and connection interval is updated.

2.12 Version 2.0.4

#	DESCRIPTION
FEATURES	
1	CFG_ES4 & CFG_LUT_PATCH compilation flags added in all applications
2	UART TX/RX ports are set to P0_4/P0_5 for all configurations. Default RTS/CTS are set to P0_3/P0_2
3	Improves switching between master devices in keyboard application. Ensure that master requesting connection is not the one that keyboard just disconnected even if a failed connection to another device has happened.
4	Supports production test tool for ES4/revC2 boards. More information can be found in document DA14580_Production_Test_Tool.doc
5	Improves the application's startup sequence: Delay loops have been removed from startup code in order to reduce time from boot to first advertise message. A startup flag is added instead of the delays to prevent system from going to sleep for 2 seconds, to ensure that low power clock is properly settled. Flag is initialized at the beginning of main_func(). rwip_sleep() checks it and clears it after if two seconds has been ticked from blecnt. With this startup time reduced to < 500ms.
BUG FIXES	
1	Fixes a bug in Keyboard application where the buffers of the last report sent to the host were not cleared in case of disconnection and could happen to enter in a new connection reporting garbage constantly.
2	Fixes a bug that caused the first connection to an iOS host to fail. ROM function smpc_handle_enc_change_evt() has been patched.
3	Applied patch in ROM code functions to fix connection failure issue in peripheral role. If packet transmitted from master in first RX window was lost, connection could not be established due to wrong scheduling of subsequent events.
Minor Changes from last Release	
1	Supports key matrix for the Microsoft Wireless 800 Keyboard
2	Modifies i2c driver for use when Watchdog is on
3	Change WDOG timer value to 0xC8
4	Renames folder fh_spotar => spotar_fh
Known ISSUES	

1	Insufficient Authentication. It fixed only for the peripheral devices.
2	Direct advertising fails when it's repeated many times.
3	Watch Dog is disabled by default as corner cases are not fully tested.

2.13 Version 2.0.3.115

#	DESCRIPTION
FEATURES	
1	Supports a first version of SPOTAR profile and a demo application for patching using SPI flash
2	Applies changes in rf registers
3	`KBD scatter file changed`
4	Adds dev_bdaddr in retention and changes NVDS to check and read BD address rom OTP
BUG FIXES	
1	Fixes a bug in UART driver. Function uart_init_func() moved to application code. File uart_init.c added in all projects using rom_symdef.txt ROM symbols file
2	Fixes a bug with BLE_CONNECTION_MAX_USER (em_map_ble_user.h
#	**Known ISSUES**
1	Insufficient Authentication. When peer is successfully authenticated and sends immediately a read request to a characteristic with "authentication required" permission, it is possible to get an Insufficient Authentication error
2	Watch Dog is disabled by default as corner cases must be tested.

2.14 Version 2.0.3.111

#	DESCRIPTION
FEATURES	
1	Supports ES4 chip with new configuration option ES4_CODE. LUT patch is enabled with the configuration option LUT_PATCH_ENABLED
2	New version of the Connection Manager (v. 2.0.3). It supports new option for the Production Tests
3	Adds PLL LUT update and updates RF calibration functionality (RF related)
4	Uses alternate ports when CFG_LUT_PATCH is defined. Adding missed GPIO reservation of ports 0_6, 07 for CTS/RTS.
5	Changes dice wakeup to only happen from accelerometer interrupt and not 10s BLE timer
6	Adds Watchdog functionality in all projects. To use it CFG_WDOG must be defined in C/C++ environment settings. More information can be found in Changes.log (commit 2.0.3.110)
BUG FIXES	
1	Fixes a bug in production tests. TX command was failing after 160 attempts
2	Fixes a stability bug in keyboard application (set_row_to_low()).

#	Minor Changes from last Release
1	Sets priority of WKUP Interrupt to 1.

#	Known Issues
1	Insufficient Authentication. When peer is successfully authenticated and sends immediately a read request to a characteristic with "authentication required" permission, it is possible to get an Insufficient Authentication error
2	Watch Dog is disabled by default as corner cases must be tested.

2.15 Version 2.0.3.102

#	Major Changes from last Release
FEATURES	
1	Data compression removed. Compression cannot be used due to OTP copy in deep sleep. Global data are overwritten by compressed in OTP
2	Removes SysRAM data memory areas above 0x7F00. Cannot be used for RW and ZI data, because OTP copy will overwrite with OTP header data.
3	Adds production test tool. Command line tool is stored under tools/prod_test/prod_test_cmds and the firmware under tools/prod_test/prod_test_es3 directory.
4	Sets safety margin of Waking up the system vs the XTAL16 trimming time.

BUG FIXES	
1	Fixes a bug that forced the user to run the debugger twice after a hard reset. sysram_case23.ini has been modified, the tick box "Load application at startup" in the debugger settings is not selected
#	**Known Issues**
1	Insufficient Authentication. When peer is successfully authenticated and sends immediately a read request to a characteristic with "authentication required" permission, it is possible to get an Insufficient Authentication error

2.16 Version 2.0.2.92

#	DESCRIPTION
FEATURES	
1	Adds Dice application. It requires specific hardware which is not included in the official HW Dev. Kit. Smart Dice application for iOS is also required and it‘s available in Apple Store.
2	Adds keyboard demo application. Hardware requirements are described in the DA14580 Keyboard Application Guide which is available in Dialog’s Customer Support portal
3	Adds engineering examples for peripherals like UART, SPI flash, I2C EEPROM, PWM timer.
4	Adds Connection Manager window application. Available in Dialog’s Customer Support portal
5	Adds Smart Snippets window application. Available in Dialog’s Customer Support portal
6	Maximum 4 connections can be supported
7	RSSI value is based on RSSI_AVG_RD instead of RSSI_PH_RD
8	Updates the API for setting the system in sleep mode. A document to explain the API is available in Dialog Customer portal
9	Integrates a Slave latency patch.
10	Data Information Service (DIS) added in proximity embedded applications
BUG FIXES	
1	Bug Fix for stop transmitting data after some disconnections. Tx buffers were not flushed.
2	Patch object files have been updated for fixing the Null pointer bug
3	Fixes a bug in arch_printf function (app_utils.c)
#	**Minor Changes from last Release**
1	Proximity window applications (monitor and reporter) prompts user to enter COM port if it’s missing
2	Fixes a compilation error when enabling CFG_PRF_CSCPC
#	**Known Issues**
1	Insufficient Authentication. When peer is successfully authenticated and sends immediately a read request to a characteristic with "authentication required" permission, it is possible to get an Insufficient Authentication error

2.17 Version 2.0.1.39

#	Major Changes from last Release
FEATURES	
1	New project (dk_apps/keil_projects/proximity/reporter_fe_usb)added for the USB Dongle
BUG FIXES	
1	none
#	**Minor Changes from last Release**
1	Minor changes of sleep CFG flags in Keil projects
2	
#	**Known ISSUES**
1	Stability issues with short connection interval
2	Deep-Sleep mode has not been fully tested
3	RF PHY settings not fully validated. This release should not be used for hardware qualification

2.18 Version 2.0.1.38

#	Major Changes from last Release
FEATURES	
1	LDO_RET_TRIM set to 0x7 for improving the stability in short connection intervals
2	Object files of the patches functions are stored into patch_obj directory under dk_apps
3	RF preferred settings has been updated
4	Proximity application ports moved to P0_6, P0_7, P0_8
BUG FIXES	
1	CFG project flags CFG_PRF_PROXM nCFG_PRF_PROXR changed to nCFG_PRF_PROXM CFG_PRF_PROXR for fixing a compilation bug for fully embedded proximity reporter
2	prf_cleanup is patched in order to solve the GATT disconnection cleanup issue
3	The patch of the lld_restart() changed in order to avoid the call when the interrupts are disabled. This was the cause for the hard fault exception.
#	**Minor Changes from last Release**
1	Added License file
2	Binaries files for the PC applications have been added under directory host_binaries\
#	**Known ISSUES**
1	Stability issues with short connection interval
2	Deep-Sleep mode has not been fully tested
3	RF PHY settings not fully validated. This release should not be used for hardware qualification

2.19 Version 2.0.1.25

#	Major Changes from last Release
FEATURES	
1	Initial version to support DA14580 – ES3
2	RW Software Version 4.0, LL v6.7.1 and HL v6.7.3 has been ported
3	DA14580 Fully Hosted proximity reporter application
4	DA14580 Fully Embedded proximity monitor application
5	DA14580 Fully Embedded proximity reporter application
BUG FIXES	
1	
2	
#	**Minor Changes from last Release**
1	Directory structure has been changed
#	**Known ISSUES**
1	Stability issues with short connection interval (<30msec)
2	Sleep mode has not been fully tested
3	RF PHY settings not fully validated. This release should not be used for hardware qualification

2.20 Version 1.0.6

#	Major Changes from last Release
FEATURES	
1	Changes to documentation Proximity example documentation has been updated
2	Extended sleep mode is added in proximity reporter application
3	Bug fix to improve radio quality

2.21 Version 1.0.2

#	Major Changes from last Release
FEATURES	
1	Changes to documentation Proximity example documentation has been added User Guide is updated with minor changes Software architecture is updated with minor changes
2	Changes to content: Added Proximity monitor application example, including a fully embedded application example on DA14580 and an windows application as a host application

2.22 Version 1.0.1

#	Major Changes from last Release
FEATURES	
1	Initial release -BETA- Peripheral demo application -User Guide - Software Architecture documentation - References for in depth knowledge

Appendix I: Versioning Rules

Each software version number string consists of 4 numbers. MAJOR.BRANCH.MINOR. BUILD
Versioning rules:
#MAJOR: It is increased by 1 only if the project undergoes a major modification, e.g. ROM changes. It practically changes only when the project sources undergo major restructuring affecting most of the repository. It is initialized at 1.
#BRANCH: Should be 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) versions, even numbers indicate Full release versions. Each release increases this number by one. After the release, the number is increased by 1 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 1 at every repository update and thus indicates the total number of changes since repository initialization. The BUILD number is initialized at 1.