JUL 26, 2016

DA1468x SDK BTLE Release Notes for version 1.0.6.968

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1.0 Introduction

1.1 Scope

This document describes the release of the Black Orca software stack from Dialog Semiconductor.

1.2 Terms and abbreviations

BLE Bluetooth Low Energy

COC Connection Oriented Channels

SDK Software Development Kit

FW Firmware

OTP One-Time Programmable memory

1.3 Release Data

PROJECT	DA1468x SDK
RELEASE DATE	26 July 2016
VERSION NR.	1.0.6.968
RELEASE TYPE[1]	FULL (GA)
RELEASE MASTER	Aristotelis Iordanidis

1.4 License

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

1.5 History

VERSION	RELEASE MASTER	DATE
1.0.6.968	**Aristotelis Iordanidis**	**26 July 2016**
1.0.5.885	Aristotelis Iordanidis	17 June 2016
1.0.4.812	**Aristotelis Iordanidis**	**22 April 2016**
1.0.4.507	**Aristotelis Iordanidis**	**17 November 2015**
1.0.3.329	Evaggelinos Mariatos	21 August 2015
1.0.3.327	Evaggelinos Mariatos	19 August 2015
1.0.3.312	Aristotelis Iordanidis	31 July 2015
1.0.2.298	**Aristotelis Iordanidis**	**24 July 2015**
1.0.1.174	Aristotelis Iordanidis	05 June 2015

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

2.0 Release Description

2.1 Major Changes

#	DESCRIPTION
OVERVIEW	
This is a full release of DA1468x SDK, which supports the new DA14680/1-01 as well as the DA14680/1-00 devices. This release includes a number of modifications to achieve wider interoperability. New characteristics include: - Compatibility with ARM GCC 4.9 2015 Q3 - Support for L2CAP COC, including an option to use the feature for SW upgrade - LE Data Packet Length Extension - BLE API functions can be called from multiple tasks - Provision for calibrated ADC readout on DA14680/1-01 devices	
NEW FEATURES	
110_02	Support for L2CAP COC
111_02	Support and API for LE Data Packet Length Extension
320_14	PDM Driver for Audio
430_04	Updated SUOTA supports L2CAP COC
FIXES / IMPROVEMENTS	
812.13	Removed limitation on changing advertising data faster than the advertising interval.
885.02	Fixed connection parameter update procedure to prevent interoperability issues and unexpected disconnections.
885.03	Reduced size of binary image of PLT firmware to fit in RAM.
968/01	Updated BLE Manager so that BLE API can be called from multiple tasks.
968/02	New ADC Value Calibration procedure to support DA14680/1-01 devices.
968/03	Added hooks for advertising and connection BLE event interrupts.
968/04	Added skip slave latency API.
968/05	Added support for ARM GCC 4.9 2015 q3 toolchain.
968/06	Revised drivers for serial peripheral devices (I2C, SPI, UART).
968/07	Added option to execute flash erase/program within the CPM idle time.
968/08	Added support for using an external 32K clock as LP clock.
968/09	Updated cli_programmer.
968/10	Refactored and extended programming scripts.
968/11	Added Windows and Linux launchers to automate the collection of debug information.
968/12	Removed support of old ProDK motherboards (Rev-A, B, C).
968/13	Added support for SmartSnippets Studio v1.2.
968/14	Added support for tracking the handles of the tasks registered to the watchdog service.
968/15	Added ad_ble_stay_active() API so application can temporary disable/enable BLE sleep.
968/16	Renamed suota_1_1_loader to ble_suota_loader.
968/17	Added keyboard scanner adapter.
968/18	Deprecated ble_l2cap_conn_param_update() and dg_configBLE_CONN_PARAM_REQ_DISABLE (not needed in 1.0.6).
968/19	Removed per-project .launch files, in favor of global ones.
968/20	Replaced dg_configUSE_HW_USB_WKUP with dg_configUSE_HW_WKUP.
968/21	Added support for latching wakeup source.
968/22	Fixed unaligned symbols in linker scripts.
968/23	Improved calculation of wakeup time by CPM.

968/24	Added support for custom VES partitions.
Documentation	
UM-B-047	DA1468x Getting Started – Version 3.0
UM-B-056	DA1468x Software Developer's Guide – Version 3.1
UM-B-044	DA1468x Software Platform Reference – Version 3.0

2.2 Issues or Limitations

#	OPEN ISSUES & LIMITATIONS
507.03	Upon performing a channel map update procedure, if the master does not wait for at least 6 connection events (as defined in vol6, 5.1.2 of the BLE 4.1 specification) the DA1468x device will disconnect. Still an issue only on DA14680/1-00 devices.
507.09	Flash partition sector has to be erased if NVMS partition table needs to be changed.
507.14	Release does not include a data throughput example.
968.01	On MS Windows, the cli_programmer application can be only statically linked with the libprogrammer library. Please use Debug_static_win32 or Release_static_win32 build configuration if there is a need to rebuild cli_programmer.

2.3 MAJOR Release Files

#	File Name	Description
1	DA1468x_SDK_BTLE_SDK_v_1.0.6.968.zip	RELEASE FILE
2	DA1468x_SDK_BTLE_SW_Release_Notes_v_1_0_6_968.doc	RELEASE NOTES

3.0 Release History

3.1 Version 1.0.5.885

#	Major Changes from last Release
OVERVIEW	
This is the engineering release of DA1468x SDK, which supports the new DA14680/1-01 Devices	
NEW AND UPDATED FEATURES	
-	No new features added –release only adds support for new DA14680/1-01 Devices
FIXES / IMPROVEMENTS	
507.03	Channel map update issue fixed in ROM of DA14680/1-01 devices.
885.01	Patch added to fix null pointer dereference in 4.2 library of DA14680/1-01 devices.
885/01	Added support for collecting debug information.
885/02	Updated CMN_TIMING_DEBUG macro to speed up critical section functions in ISRs
885/03	Removed per-project .launch files, in favor of global ones
885/04	Integrated functionality of bin2image in cli_programmer
885/05	Added configuration macros to set the cache configuration at startup.
885/06	Updated GPADC driver to take ADC Gain Calibration into account.
OPEN ISSUES & LIMITATIONS	
507.03	On channel map update if a master does not wait for at least 6 connection events (as defined in vol6, 5.1.2 of the BLE 4.1 specification) the DA1468x device will disconnect. Still an issue on DA14680/1-00 devices.
507.09	Flash partition sector has to be erased if NVMS partition table needs to be changed
507.14	Release dos not include data throughput example
812.13	The application should not change advertising data faster than the advertising interval on DA14680/1-00 devices.
885.02	Connection Update may trigger unexpected disconnections
885.03	The plt_fw project size increased beyond 64K, cannot be auto-loaded at device boot
885.04	Time from boot to 1st advertising increased by 25ms. Need to disable ECC startup.

3.2 Version 1.0.4.812

#	Major Changes from last Release
OVERVIEW	
This is the third full (GA) release of Black Orca SDK, suitable for mass production, with the following characteristics: - Fixes a number of issues of previous (1.0.4.507) release - Uses an updated partitioning scheme to enable more flexibility - Implements a new SW upgrade over the air mechanism (SUOTA1.1) - Improvements in various modules including radio, ADC, wakeup - Example projects for: Proximity Reporter, Multilink BLE, BLE External Host et al. Full separation between SDK and application code, moving startup code in SDK folders	
NEW AND UPDATED FEATURES	
311_10	Charger Library for Li-ion/Polymer batteries – added in pxp_reporter example
FIXES / IMPROVEMENTS	
507.01	Added support for higher pre-charge current at start of charge. This allows e.g. to blink a LED.
507.02	Added an application-layer configuration parameter for BLE Heap size
507.04	ANCS demo application: support handling a large number of notifications
507.05	Improved stability of operation at 96MHz. PCB & Flash type still need to be taken into account.
507.06	Watchdog service enabled by default in example projects. It should be used in all apps
507.07	Refactored the CPM so that it cooperates with the brown-out detection hardware
507.08	Fixed stability of the BMS demo when reaching the number of connected devices limit
507.10	Add support for using RCX as the low power clock
507.11	Fixed ble_gap_address_get() to return the actual BDA from flash and not the default
507.12	Fixed pairing issues of BMS demo with Win10 and Android6.0 host devices
507.13	Corrected a memory leak in the peripherals_demo project
812.01	Patches added on the BLE stack to improve stability and interoperability
812.02	Modified product shipping mode to avoid power drain on peripheral supply
812.03	Fixed calculation of FreeRTOS tick count
812.04	Fixed a corner case which compromised VES reliability
812.05	Added API to read battery voltage from the application
812.06	Fixed a bug that could prevent watchdog from triggering a reset when handling a hardfault
812.07	SUOTA 1.1 is faster (needs to transfer only one image) and more reliable
812.08	Updated radio driver to improve FCC compliance at very low temperatures
812.09	Add API to support Directed Advertising
812.10	Updated wakeup controller to fix wakeup from a GPIO
812.11	New ADC adapter to allow non-blocking radio calibration, charger and battery voltage reading
812.12	Modified radio mixer firmware to fix a DC offset in the radio, caused by some dipole antennas
812.14	Removed dependency on Visual Studio for host applications. All can now be built with Eclipse
812.15	Added support for NVPARAM, to store/retrieve application parameters in flash.
OPEN ISSUES & LIMITATIONS	
507.03	On channel map update if a master does not wait for at least 6 connection events (as defined in vol6, 5.1.2 of the BLE 4.1 specification) the DA1468x device will disconnect.
507.09	Flash partition sector has to be erased if NVMS partition table needs to be changed
507.14	Release dos not include data throughput example
812.13	The application should not change advertising data faster than the advertising interval

3.3 Version 1.0.4.507

#	Major Changes from last Release
OVERVIEW	
This is the second full (LA) release of Black Orca SDK, suitable for mass production, with the following characteristics: - Supports AD silicon version of DA14681 - Implements a full flash access mechanism using partitions, wear leveling and write/erase during XiP - BLE Services included with the release are SIG certified - Example projects for: Charging, Proximity Reporter, Multilink BLE, ANCS, BMS et al. - Added gdbserver (JTAG) support in CLI programmer and QSPI programming over JTAG in Eclipse	
NEW AND UPDATED FEATURES	
311_10	Charger Library for Li-ion/Polymer batteries – added in pxp_reporter example
320_22	NVMS Library for QSPI Access using new Flash partitioning scheme
126_08	Bond Management Service and example project
320_10	Quadrature decoder Low Level Driver
320_15	Keyboard scanner Low level Driver
430_04	Example project for software upgrade over BLE (SUOTA)
520_02	Firmware to support production line tests
610_14	Multilink BLE example
320_11	Basic USB low level driver
FIXES / IMPROVEMENTS	
1	Updated Charger, uses battery level & USB detection to trigger and control charge/pre-charge
2	Sleep functions optimized to achieve <14uA average when BLE advertises every 1.5sec
3	Bug fixes in BLE stack to improve stability
4	Watchdog service to protect from one FreeRTOS task stalling while other are still alive
NEW ISSUES & LIMITATIONS	
507.01	Pre-charging current is statically defined
507.02	No app-level parameter to set BLE stack heap size. If needed, heap must be increased in SDK
507.03	On channel map update if a master does not wait for at least 6 connection events (as defined in vol6, 5.1.2 of the BLE 4.1 specification) the DA1468x device will disconnect.
507.04	ANCS demo application needs increased BLE event queue and/or heap size if too many notifications are expected
507.05	Projects by default do not operate flash at 96MHz - very sensitive to PCB design and flash type
507.06	The sys_watchdog_init() function has to be explicitly called if the watchdog service (dg_configUSE_WDOG) is enabled
507.07	No reliable implementation exists to enable BOD when BLE is used – still under investigation
507.08	BMS demo application does not check if max connection is reached
507.09	Flash partition sector (flash offset 0x7F000-0x80000) has to be erased if NVMS partition table needs to be changed
507.10	RCX implementation is not stable enough for BLE operation
507.11	The ble_gap_address_get() function does not return the BD address written in flash but returns the default address in the application source code
507.12	BMS application not stable when pairing with Windows 10
507.13	Memory leak in the peripherals configuration of the peripherals_demo project
507.14	Data transfer project (SPS demo) is not optimized for maximum throughput

3.4 Version 1.0.3.329

#	Major Changes from last Release
OVERVIEW	
Engineering release which adds demo implementation of Apple Notification Center Service (ANCS)	
NEW AND UPDATED FEATURES	
ID	**Description**
126_08	Bond Management Service (peripheral Role)
320_17	NVM read/write/erase driver including QSPI in XiP mode
FIXES / IMPROVEMENTS	
1	Fixed a bug that would exhaust the heap in the *ble_adv_demo* project
2	Added check for empty queue when receiving BLE manager notifications in BLE demo projects
NEW ISSUES	
12	BLE adapter cannot handle double assertion of BLE_SLP_IRQ

3.5 Version 1.0.3.327

#	Major Changes from last Release
OVERVIEW	
Engineering release which: - Adds Bond Management Service - Provides QSPI Write/Erase while XiP driver - Fixes some bugs discovered in previous releases	
NEW AND UPDATED FEATURES	
ID	**Description**
126_08	Bond Management Service (peripheral Role)
320_17	NVM read/write/erase driver including QSPI in XiP mode
FIXES / IMPROVEMENTS	
1	Fixed speed of QSPI Erase while XiP (limitation #7 from previous release)
2	Enabled Permanent storage of keys through the BMS (limitation #5 from previous release)
NEW ISSUES	
11	BMS: Behavior if storage area by a non-BMS task is invalidated is not tested

3.6 Version 1.0.3.312

#	Major Changes from last Release
OVERVIEW	
Engineering release which: - Adds HID Profile - Adds HW reset in Segger debugger project (.jdebug) files. - Improve compilation time of BLE applications. - Refactoring of some core BLE configuration files. - Fixes some bugs discovered on 1.0.2	
NEW AND UPDATED FEATURES	
ID	**Description**
125_01	HID over GATT (Device Role)
FIXES / IMPROVEMENTS	
1	Fix a bug with SDP port detection in USB charger.
2	Fix compilation of QSPI_Dual_Image_Bootloader project.
3	Prevent access to ADC when it is being used by the USB charger.
4	Added BLE API to start an MTU exchange
5	Update dual-image boot example to operate in development boot (no OTP writes).

3.7 Version 1.0.2.298

#	Major Changes from last Release
OVERVIEW	
This was the first Full Release of the SDK. - Updated Clock and Power Management API - Basic Security Support in BLE Framework - New Profiles/Services Added - SmartSnippets Toolbox for FW download, QSPI flash programming and Power Profiling - Projects have RAM and QSPI XiP build configurations - New example projects: Upgrade demo, Serial over BLE - User Guide	
NEW AND UPDATED FEATURES	
ID	**Description**
110_03	Low Duty Cycle Advertising
110_04	Multilink support
115_01	Updated BLE Framework
115_02	App Level Security in the BLE Framework
122_07	Heart Rate Profile/Service - Peripheral
122_13	User Data Service - Peripheral
122_14	Body Composition Service - Peripheral
123_01	Proximity Profile - Peripheral
123_02	Find Me Profile - Peripheral
124_02	Current Time Service - Peripheral
124_09	Immediate Alert Service - Peripheral
126_01	Scan Parameters Profile/Service - Peripheral
126_03	Battery Service - Peripheral
126_04	Device Information Service - Peripheral
126_05	Link Loss Service - Peripheral
129_01	Dialog Serial Port Service - Peripheral
311_09	Power and Clock Management API framework
311_10	Updated charging example
320_17	Capability to write/erase QSPI sectors while in QSPI XiP mode
420_01	AES/HASH Driver
510_02	Upgrade to GCC 4.9.3
530_01	SmartSnippets Toolbox: OTP programmer
530_03	SmartSnippets Toolbox: UART Booter
530_07	SmartSnippets Toolbox: FLASH programmer
530_08	SmartSnippets Toolbox: JTAG support for programming
610_02	Updated Integrated processor proximity reporter
610_06	Firmware upgrade with dual image demo application
610_09	Updated set of peripheral examples
610_10	Serial Data transfer over GATT

3.8 Version 1.0.1.174

#	Major Changes from last Release
OVERVIEW	
Initial Engineering release to enable early customer support. - Operating System (FreeRTOS) - Clock and Power Management - BLE Framework for Peripheral Devices - Proximity Reporter Example - Command Line interface for programming and memory access - IDE based on Pre-Configured Eclipse, and GCC toolset	
FEATURES	
ID	**Description**
112_01	Interface for HCI access over UART:H4
112_06	BLE ROM Hook for adding a Vendor Specific Command to set PWR mode
114_01	Bluetooth Smart core stack
114_02	BLE GATT/GAP Stack supports all possible MTU sizes
114_04	BLE GATT/GAP Stack supports master mode
114_05	BLE GATT/GAP Stack supports slave mode
114_06	BLE GATT/GAP Stack supports 128bit UUIDs
115_01	Dialog BLE Framework over FreeRTOS for Peripheral devices
115_03	Dialog BLE Framework has API for handling profiles and services
123_01	Proximity Profile running over Dialog BLE Framework
123_02	Find Me Profile running over Dialog BLE Framework
126_01	Scan Parameters Profile running over Dialog BLE Framework
126_02	Scan Parameters Service working in Dialog BLE Framework
126_05	Link Loss Service working in Dialog BLE Framework
310_01	FreeRTOS support with low power provisions
310_02	ROM Boot-loader
310_03	DMA Driver
311_01	System manager supporting wakeup from sleep mode
311_02	System manager supporting GPIO wakeup
311_03	System manager supporting Active mode
311_04	System manager supporting Sleep Mode
311_06	Support for system running on Li-Ion batteries (limitations: 1)
311_07	Support for system running on Dual alkaline / Coin cell batteries (limitations: 1)
311_10	Functions to start and stop charging from USB (limitations: 1)
320_01	UART Low Level driver
320_02	GPIO Low Level driver
320_03	SPI Low Level driver
320_04	OTP Low Level Driver
320_05	QSPI Low Level Flash driver
320_06	I2C Low Level driver
320_07	ADC Low Level driver
320_08	Battery Level readout (limitations: 1)
320_09	PWM Low Level driver
320_17	Non Volatile Memory Storage API (limitations: 2)
320_18	Timers Low Level Driver
320_19	Wakeup timer driver
320_20	White LED support functions
320_21	System Manager functions to control System clock
420_02	TRNG Low Level Driver
510_02	GNU / GCC toolset
510_03	JTAG debugger

510_04	Dialog configured Eclipse-based IDE
530_01	CLI Interface for OTP programming
530_02	SmartSnippets Power Profiler
530_03	CLI Interface and SmartSnippets UART Boot
530_07	CLI Interface for FLASH programming
530_09	Dual Image Boot sequence functions and example
610_02	Integrated processor proximity reporter demo
610_09	Peripheral examples application (limitations : 3)

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. major 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 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 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.