AIROC™ Bluetooth® SDK 4.0 release notes

About this document

Scope and purpose

This release is an update for AIROC™ Bluetooth® SDK 3.3.

AIROC™ Bluetooth® SDK 4.0 is targeted for the CYW20706, CYW20719B2, CYW20721B2, CYW20736, CYW20835B1, CYW20819, CYW20820, CYW30739, CYW89820, CYW43012 AIROC™ Wi-Fi & Bluetooth® combo chips (for embedded Bluetooth® development only), and CYW5557x AIROC™ Wi-Fi & Bluetooth® combo chips. ModusToolbox™ software with the Bluetooth® SDK software library provides a complete development environment to allow you to quickly create Bluetooth®-enabled IoT solutions such as smartwatches, medical devices, or home automation platforms. This document describes the features and known limitations of Bluetooth® SDK 4.0.

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1 What's changed

- Removed support for the CYW920735Q60EVB-01 evaluation board. The CYW920835M2EVB-01 is the replacement for this board.
- Removed support for the CYBT-343052-EVAL platform. The CYBT-343072-EVAL-M2B is the replacement evaluation board.
- Updated the CYW20819/20820 to address the Braktooth vulnerabilities (CVE-2021-34145, CVE-2021-34148, CVE-2021-34146, CVE-2021-34147)
- Updated CYW20819/CW20820 firmware to address an issue where there was a 2 second delay between reset button press and the teraterm log wasn't being reflected in the teraterm log for two seconds
- Firmware update of the CYW89820 to optimize LE-2M settings
- Updated CYW30739 firmware to add 15.4 alarms for sleepy end device
- Added FM25Q04 patch lib into the CYBT-343026-EVAL and CYBT-353027-EVAL-BSP
- Added MAP error propagation when notification is disabled
- Tuned SRAM usage on CYW20706 for mesh applications
- Improved Mesh time model processing for tx and rx
- Mesh server side-API /event changes

As part of an effort to fix an inconsistency where certain Mesh server models sent SET events up to the MCU or Mesh server-side applications after processing the SET events instead of STATUS events, a new uniform approach is implemented across most of the Mesh Models, where when a Mesh Server-side model receives a SET request from the Mesh client-side model, the SET request is processed, and a response is sent to the Mesh client-side application if acknowledgement is required, and the resulting STATUS event for the state is also sent up to the MCU / Mesh server-side application using WICED HCI events.

Mesh server models that are generic models will send STATUS events corresponding to the generic states up to the MCU / Mesh server-side application.

Mesh server models that are derived from generic models will receive the STATUS events from the generic models. These STATUS events, corresponding to the generic states, are then processed and translated by the derived model to the relevant STATUS events corresponding to the derived states of the model and sent up to the MCU / Mesh server-side application.

These changes are implemented in BTSDK 4.0 Mesh libraries, Mesh-Snip, Mesh-Demo and customer-specific applications available as part of the SDK.

Existing mesh applications built against previous versions of the mesh libraries must make the following modifications:

1. Change any instance of SET events listed in the Old Event column to the corresponding STATUS event in the New Event Column
2. Change any instance of the wiced_bt_mesh_sensor_server_config_callback_t used in calls to wiced_bt_mesh_model_sensor_server_init() API to update to the new prototype and parameters. Specifically, the void* p_data new parameter should be cast to the corresponding structure for each event handled in the callback. Those structures contain the replaced property_id and setting_property_id parameters from the older version of the prototype.

For example, Mesh Server-side application based on the generic property server will receive WICED_BT_MESH_USER_PROPERTY_STATUS instead of WICED_BT_MESH_USER_PROPERTY_SET event when a SET event is received and processed from the Mesh Client-side Property Client.

Old Event	New Event	Comments p_data pointer received in the callback should be interpreted as a pointer to the data-structure mentioned below which contains event data for the event
WICED_BT_MESH_USER_PROPERTY_SET	WICED_BT_MESH_USER_PROPERTY_STATUS	wiced_bt_mesh_property_status_data_t
WICED_BT_MESH_SENSOR_SETTING_SET	WICED_BT_MESH_SENSOR_SETTING_STATUS	wiced_bt_mesh_sensor_setting_status_data_t
WICED_BT_MESH_SENSOR_CADENCE_SET	WICED_BT_MESH_SENSOR_CADENCE_STATUS	wiced_bt_mesh_sensor_cadence_status_data_t
WICED_BT_MESH_ONOFF_SET	WICED_BT_MESH_ONOFF_STATUS	wiced_bt_mesh_onoff_status_data_t
WICED_BT_MESH_LIGHT_HSL_SET	WICED_BT_MESH_LIGHT_HSL_STATUS	wiced_bt_mesh_light_hsl_status_data_t
WICED_BT_MESH_LIGHT_CTL_SET	WICED_BT_MESH_LIGHT_CTL_STATUS	wiced_bt_mesh_light_ctl_status_data_t
WICED_BT_MESH_LIGHT_XYL_SET	WICED_BT_MESH_LIGHT_XYL_STATUS	wiced_bt_mesh_light_xyl_status_data_t
WICED_BT_MESH_LIGHT_LIGHTNESS_SET	WICED_BT_MESH_LIGHT_LIGHTNESS_STATUS	wiced_bt_mesh_light_lightness_status_t
WICED_BT_MESH_POWER_LEVEL_SET	WICED_BT_MESH_POWER_LEVEL_STATUS	wiced_bt_mesh_power_level_status_data_t
WICED_BT_MESH_LOCATION_GLOBAL_SET	WICED_BT_MESH_LOCATION_GLOBAL_STATUS	wiced_bt_mesh_location_global_data_t
WICED_BT_MESH_LOCATION_LOCAL_SET	WICED_BT_MESH_LOCATION_LOCAL_STATUS	wiced_bt_mesh_location_local_data_t
WICED_BT_MESH_LEVEL_SET	WICED_BT_MESH_LEVEL_STATUS	wiced_bt_mesh_level_status_data_t

Sensor Server Configuration callback

The following API change was made to sensor server to align with other server callbacks.

From:

```
/*
 * \brief Sensor server Config callback is called by the Mesh Models library to notify cadence and
setting changes.
 *
 * @param       element_idx Device element to where model is used
 * @param       event. The event that the application should process (see @ref SENSOR_EVENT "Sensor
Events")
 * @param       property_id Property ID of the sensor for which Sensor Cadence change shall be reported
 * @param       setting_property_id Setting Property ID of the sensor for which Sensor setting change
shall be     reported
 *
 * @return      None
 */
typedef void(wiced_bt_mesh_sensor_server_config_callback_t) (uint8_t element_idx, uint16_t event,
uint16_t property_id, uint16_t setting_prop_id);
```

To:

```
 * \brief Sensor server Config callback is called by the Mesh Models library to notify cadence and
setting changes.
 *
 * @param       element_idx Device element to where model is used
 * @param       event. The event that the application should process (see @ref SENSOR_EVENT "Sensor
Events")
 * @param       p_data Pointer to the data portion of the message
 *
 * @return      None
 */
typedef void(wiced_bt_mesh_sensor_server_config_callback_t) (uint8_t element_idx, uint16_t event, void*
p_data);
```

What's changed

wiced_bt_mesh_light_lightness_status_t structure

The wiced_bt_mesh_light_lightness_status_t structure has been modified to remove the following member variables as they are no longer used in the STATUS events.

```
1) uint32_t lux_level_present; /**< The present value of the Lux Level to be
   produce by the device, only valid if used in LC */
2) uint32_t lux_level_target; /**< The target value of the Lux Level to be produce
   by the device, only valid if used in LC */
```

wiced_bt_mesh_core_config_t structure

The wiced_bt_mesh_core_config_t structure has been modified to remove the following member variable as it is no longer configurable.

```
1) uint16_t  replay_cache_size;  /**< Number of replay protection entries, i.e.
   maximum number of mesh devices that can send application messages to this
   device. */
```

2 What's included

2.1 AIROC™ Bluetooth® SDK

This SDK includes the following:

- Bluetooth® firmware
- Platform and board support packages
- Utilities including BTSpy trace, Manufacturing Bluetooth® test tool, Client Control, and Mesh Client Control
- Peer apps for OTA and Mesh
- A rich set of connectivity APIs that allow for simplified programming of Bluetooth®/Bluetooth® LE connectivity
- Various sample applications that demonstrate how to use the Bluetooth®/Bluetooth® LE APIs
- More complex code examples that use various APIs and middleware to create a complete solution

2.2 Supported devices

The AIROC™ Bluetooth® SDK is targeted for the following devices with ModusToolbox™ software 2.4 and 3.0:

- AIROC™ CYW20706 Bluetooth® & Bluetooth® LE system on chip
- AIROC™ CYW20719B2 Bluetooth® & Bluetooth® LE system on chip
- AIROC™ CYW20721B2 Bluetooth® & Bluetooth® LE system on chip
- AIROC™ CYW20736 Bluetooth® LE system on chip
- AIROC™ CYW30739 Bluetooth® LE & 802.15.4 multi-protocol system on chip
- AIROC™ CYW20835 Bluetooth® LE system on chip
- AIROC™ CYW20819A1 Bluetooth® LE system on chip
- AIROC™ CYW20820A1 Bluetooth® LE system on chip
- AIROC™ CYW89820 Automotive Bluetooth® chip
- AIROC™ CYW43012C0 Wi-Fi & Bluetooth® combo chip (for embedded Bluetooth® development only)
- AIROC™ CYW5557x Wi-Fi & Bluetooth® combo chip (for embedded Bluetooth® development only)
- AIROC™ CYBLE-333074-02 Bluetooth® LE module
- AIROC™ CYBLE-343072-02 Bluetooth® LE module
- AIROC™ CYBT-213043-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-223058-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-243053-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-253059-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-263065-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-273063-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-333047-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-343026-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-353027-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-483056-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-413055-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-423054-02 Bluetooth® & Bluetooth® LE module

What's included

- AIROC™ CYBT-483062-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-413061-02 Bluetooth® & Bluetooth® LE module
- AIROC™ CYBT-423060-02 Bluetooth® & Bluetooth® LE module

3 Design impact

3.1 Updating from Bluetooth® SDK 3.3

AIROC™ Bluetooth® SDK 4.0 code examples can be acquired from the **Infineon GitHub repository**.

Note: *If you must keep a Bluetooth® SDK 3.x or an earlier version, create a new workspace project to pull in Bluetooth® SDK 4.0 and to avoid overwriting previous versions.*

Do the following in the initial setup of AIROC™ Bluetooth® SDK 4.0 with ModusToolbox™ software 2.4:

3. In the IDE, click the **New Application** link in the Quick Panel (or use **File** > **New** > **ModusToolbox™ Application**).
4. In **Project Creator**, click **AIROC™ Bluetooth® BSPs**.
5. Pick your board for Bluetooth® SDK.
6. Select a template application.
7. Click **Create** and wait for Project Creator to close.

4 Supported boards

Board	MCU	Connectivity
CYW920819EVB-02	CYW20819	CYW20819
CYW920819REF-KB-01	CYW20819	CYW20819
CYBT-213043-MESH	CYBT-213043-02	CYW20819
CYBT-213043-EVAL	CYBT-213043-02	CYW20819
CYBT-223058-EVAL	CYBT-223058-02	CYW20819
CYBT-263065-EVAL	CYBT-263065-02	CYW20819
CYBT-273063-EVAL	CYBT-273063-02	CYW20819
CYW920820M2EVB-01	CYW20820	CYW20820
CYW920820EVB-02	CYW20820	CYW20820
CYBT-243053-EVAL	CYBT-243053-02	CYW20820
CYBT-253059-EVAL	CYBT-253059-02	CYW20820
CYW920835REF-RCU-01	CYW20835	CYW20835
CYW920835M2EVB-01	CYW20835	CYW20835
CYBLE-333074-EVAL-M2B	CYBLE-333074-02	CYW20835
CYBLE-343072-EVAL-M2B	CYBLE-343072-02	CYW20835
CYBLE-343072-MESH	CYBLE-343072-02	CYW20835
CYW930739M2EVB-01	CYW30739	CYW30739
CYW920736M2EVB-01	CYW20736	CYW20736
CYW920721M2EVK-01	CYW20721B2	CYW20721B2
CYW920721M2EVK-02	CYW20721B2	CYW20721B2
CYW920721M2EVB-03	CYW20721B2	CYW20721B2
CYBT-413061-EVAL	CYBT-413061-02	CYW20721B2
CYBT-423060-EVAL	CYBT-423060-02	CYW20721B2
CYBT-483062-EVAL	CYBT-483062-02	CYW20721B2
CYW920719B2Q40EVB-01	CYW20719B2	CYW20719B2
CYBT-423054-EVAL	CYBT-423054-02	CYW20719B2
CYBT-413055-EVAL	CYBT-413055-02	CYW20719B2
CYBT-483056-EVAL	CYBT-483056-02	CYW20719B2
CYW920706WCDEVAL	CYW20706	CYW20706
CYBT-353027-EVAL	CYBT-353027-02	CYW20706
CYBT-343026-EVAL	CYBT-343026-02	CYW20706
CYBT-333047-EVAL	CYBT-333047-02	CYW20706
CYW989820EVB-01	CYW89820	CYW89820
CYW943012BTEVK-01	CYW43012	CYW43012
CYW9M2BASE-43012BT	CYW43012	CYW43012
CYW955572BTEVK-01	CYW55572	CYW55572

5 Fixes for the known issues

This section lists the known issues from the AIROC™ Bluetooth® SDK 3.3 release that were fixed in this release.

Platform/Bluetooth® firmware / application	Fix
[CYW920719B2Q40EVB-01] Bluetooth® Mesh conformance	Latest PTS version fixed conformance issue where Command receive field (timeout) in MESH/NODE/RLY/BV-02-C

6 Known issues/limitations

Table 1 Documentation

Problem	Workaround
Various documents included with the release may contain incomplete information or may not have up-to-date screen captures or information.	New versions of documents, including these release notes, may be available **online**.

Table 2 Platform

Limitation	Workaround
ModusToolbox™ software 2.4 supports Arm® GCC, Arm® compiler v6, and IAR toolchain. The Bluetooth® SDK supports only Arm® GCC.	None.
The following kits have limited availability: • CYW920820M2EVB-01 • CYW920835REF-RCU-01 • CYW920835M2EVB-01 • CYW930739M2EVB-01 • CYW920736M2EVB-01 • CYW920721M2EVK-01 • CYW920721M2EVK-02 • CYW920721M2EVB-03 • CYW989820EVB-01 • CYW943012BTEVK-01 • CYW9M2BASE-43012BT • CYW955572BTEVK-01 • CYBLE-333074-EVAL-M2B • CYBLE-343072-MESH	Contact Sales to request access.
CYW920820EVB-02 has limited availability. Note that support for this platform will be removed in a future Bluetooth® SDK release.	Contact sales to request access to the CYW920820M2EVB-01.
iAP2 code examples are not included by default in Bluetooth® SDK 4.0.	Get the MFi license and contact Sales to request access to the additional code example.
PEPS code examples for the CYW89820 are not included by default in Bluetooth® SDK 4.0.	Contact Sales to request access to the additional code examples available for CYW89820.

Known issues/limitations

Table 3 Bluetooth® SDK

Problem	Workaround
[CYW920835M2EVB-01] LE Mouse, LE Remote: When creating HID apps an extra BSP (CYW920735Q60EVB-01) is created.	This issue will be fixed when the LE Mouse and LE Remote applications are updated in a future release.
[CYW920721M2EVK-01] HAL_ADC: Incorrect voltage values are displayed when GPIO pin P0 is connected to 3.3V	This issue is targeted to be addressed in a future Bluetooth® SDK release.
[CYW920721M2EVK-01] MAP: There is no provision in client control UI to download emails with Samsung Note 8	The option to display email service is limited to what the peer device (phone) can support. Choose another peer device that supports the MAP server with email service.
[CYW920721M2EVK-02] Headset_wass: Glitches are heard on PRI and no audio on SEC during audio streaming when OTA upgrade through the OTA SPP app is running.	This issue is targeted to be addressed in a future Bluetooth® SDK release.
[CYW920721M2EVK-02] Headset_wass: No voice prompt is working when the time SEC is reset during headset reconnection from PRI.	This issue is targeted to be addressed in a future Bluetooth® SDK release.
[CYW920721M2EVK-02] Headset_wass: Discoverability reduces to zero when the DUT is disconnected before pairing mode is allowed to zero.	This issue is targeted to be addressed in a future Bluetooth® SDK release.
[CYW920721M2EVK-02] BT Speaker Pro AMA: Need to put the DUT in discoverable mode to perform LE reconnection	This issue is targeted to be addressed in a future Bluetooth® SDK release.
[CYW55572BTEVK-01] Handsfree: Echo can be observed with high mic gains on eval kit.	Customers should implement echo cancellation algorithms on the DSP audio hardware codec vendor of choice.
[CYW920736M2EVB-01] Downloads: Back-to-back download of applications is not supported.	After downloading an application to a device, the reset recovery operation must be performed on the device before a new application can be downloaded.
[CYW920819EVB-02] Watch: Current spikes of 200 µA on J15 (VDDIO)	This issue will not be fixed.
[CYW920820EVB-02] The Spi_master functionality does not work after changing the pin configuration through the Device Configurator.	Device Configurator should be used only for reserving pins and not assigning functionality. This issue will not be fixed.
[CYW920820EVB-02] The Spi_slave functionality does not work after changing the pin configuration through the Device Configurator.	Device Configurator should be used only for reserving pins and not assigning functionality. This issue will not be fixed.
[CYW920820EVB-02] homekit_lightbulb: Characteristics datatype is displayed as “unknown”.	This issue will be addressed in a future Bluetooth® SDK release.
[CYBT-213043-MESH] Mesh snip light LC server is advertising as SmartLight	This issue will be addressed in a future Bluetooth® SDK release.

Known issues/limitations

Problem	Workaround
[CYBT-213043-EVAL] MC receives bad packets when HCI tracing is enabled due to the low baud rate and buffer settings with Linux.	Decrease logging on the UART for Linux. This issue will not be fixed.
[CYBT-213043-EVAL] Lecoc: Intermittently observed bad packets	This issue is due to CY serial bridge software. This issue will not be fixed.
When using the ANS application, the UI does not allow generating all possible alerts simultaneously.	This is a current UI limitation; the application can handle generating alerts. The UI can generate individual alerts.

7 Open source

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8 Further reading

See ModusToolbox™ software documents (including but not limited to the following):

- ModusToolbox™ software installation guide
- Bluetooth® API documentation
- Eclipse IDE for ModusToolbox™ software quick start guide
- Eclipse IDE for ModusToolbox™ software user guide
- ModusToolbox™ software configurator guides (for each configurator)

Other documentation includes (but is not limited to):

- Device datasheets
- Application notes
- Training

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