

# AIROC™ Bluetooth® SDK 3.1 technical brief

## About this document

### Scope and purpose

ModusToolbox™ software with the AIROC™ Bluetooth® SDK provides a complete development environment that allows you to quickly create an IoT solution utilizing world-class Bluetooth® Low Energy (LE)/Bluetooth® connectivity technologies. This document provides the details of various features, modes, and limitations associated with the supported hardware development platforms.

### Intended audience

This document is intended for developers who are looking to create Bluetooth®-enabled IoT solutions like beacons, trackers, smart watches, audio devices (headsets, speakers), HID devices (remotes, mice, keyboard), medical devices, and home automation platforms.

## Table of contents

<b>About this document.....</b>	<b>1</b>
<b>Table of contents.....</b>	<b>1</b>
<b>1 Software development environment.....</b>	<b>2</b>
1.1 Supported platforms.....	2
<b>2 AIROC™ Bluetooth®.....</b>	<b>4</b>
2.1 Functional support.....	4
2.1.1 Core Bluetooth® LE/Bluetooth® technologies.....	4
2.1.1.1 Bluetooth® standards .....	4
2.2 Features, profiles, and protocols.....	6
2.2.1 Bluetooth® LE/Bluetooth® features, code examples .....	6
2.2.2 AIROC™ Bluetooth® SDK Pro packages.....	26
<b>3 Technical support .....</b>	<b>29</b>
<b>4 Learning resources.....</b>	<b>30</b>
<b>5 Software licensing.....</b>	<b>31</b>
<b>Revision history.....</b>	<b>32</b>

**Software development environment**

**1 Software development environment**

ModusToolbox™ software with the AIROC™ Bluetooth® SDK is a software development environment allowing rapid application development of Bluetooth®-enabled IoT solutions. A steady release cadence is provided for the AIROC™ Bluetooth® SDK, enabling new features, fixes, and improvements. The releases and their features are tested on platforms defined in this document to provide easy migration from one version to the next. If you choose to create solutions, platforms, or both that are not defined in this document, you are responsible for testing and technical support of these platforms.

ModusToolbox™ software with the AIROC™ Bluetooth® SDK includes the following features and capabilities:

- A cross-platform installer supporting Windows, Linux, and macOS environments
- An Eclipse-based IDE with integrated programming and debugging support
- Build system infrastructure, configurators, and utilities
- Bluetooth® firmware
- Platform and board support packages
- A rich set of connectivity APIs that allow for simplified programming of Bluetooth® LE/Bluetooth® connectivity
- Various sample applications that serve as examples on how to utilize the Bluetooth® LE/Bluetooth® APIs
- More complex code examples that utilize various APIs and middleware to create a more complete solution

**1.1 Supported platforms**

The AIROC™ Bluetooth® SDK includes support for several kits and platforms. Platforms listed in [Table 1](#) are tested with the AIROC™ Bluetooth® SDK 3.1 release. For support on platforms not listed, contact the Sales team for details on the release appropriate for your project.

**Table 1 Platforms tested during AIROC™ Bluetooth® SDK 3.1 release**

Board	MCU	Connectivity	On-chip flash (OCF)	RAM
CYW920819EVB-02	CYW20819	CYW20819	256 KB	160 KB
CYW920819REF-KB-01	CYW20819	CYW20819	256 KB	160 KB
CYBT-213043-MESH	CYBT-213043-02	CYW20819	256 KB	160 KB
CYBT-213043-EVAL	CYBT-213043-02	CYW20819	256 KB	160 KB
CYBT-223058-EVAL	CYBT-223058-02	CYW20819	256 KB	160 KB
CYW920820EVB-02	CYW20820	CYW20820	256 KB	160 KB
CYBT-243053-EVAL	CYBT-243053-02	CYW20820	256 KB	160 KB
CYBT-253059-EVAL	CYBT-253059-02	CYW20820	256 KB	160 KB
CYW920835REF-RCU-01	CYW20835	CYW20835	None	320 KB
CYW920835M2EVB-01	CYW20835	CYW20835	None	320 KB
CYBLE-333074-EVAL-M2B	CYBLE-333074-02	CYW20835	None	320 KB
CYBLE-343072-EVAL-M2B	CYBLE-343072-02	CYW20835	None	320 KB
CYW920739M2EVB-01	CYW20739	CYW20739	1 MB	448 KB
CYW920736M2EVB-01	CYW20736	CYW20736	None	60 KB
CYW920735Q60EVB-01	CYW20735	CYW20735	None	320 KB
CYBT-343052-EVAL	CYBT-343052-02	CYW20735	None	320 KB

**Software development environment**

<b>Board</b>	<b>MCU</b>	<b>Connectivity</b>	<b>On-chip flash (OCF)</b>	<b>RAM</b>
CYW920721B2EVK-02	CYW20721	CYW20721	1 MB	448 KB
CYW920721M2EVK-01	CYW20721	CYW20721	1 MB	448 KB
CYW920721M2EVK-02	CYW20721	CYW20721	1 MB	448 KB
CYBT-413061-EVAL	CYBT-413061-02	CYW20721	1 MB	448 KB
CYBT-423060-EVAL	CYBT-423060-02	CYW20721	1 MB	448 KB
CYBT-483062-EVAL	CYBT-483062-02	CYW20721	1 MB	448 KB
CYW920719B2Q40EVB-01	CYW20719	CYW20719	1 MB	448 KB
CYBT-423054-EVAL	CYBT-423054-02	CYW20719	1 MB	448 KB
CYBT-413055-EVAL	CYBT-413055-02	CYW20719	1 MB	448 KB
CYBT-483056-EVAL	CYBT-483056-02	CYW20719	1 MB	448 KB
CYW989820EVB-01	CYW89820	CYW89820	256 KB	160 KB
CYW920706WCDEVAL	CYW20706	CYW20706	None	352 KB
CYBT-343026-EVAL	CYBT-343026-02	CYW20706	None	352 KB
CYBT-353027-EVAL	CYBT-353027-02	CYW20706	None	352 KB
CYW943012BTEVK-01	CYW43012	On-chip Bluetooth®	None	324 KB
CYW9M2BASE-43012BT	CYW43012	On-chip Bluetooth®	None	324 KB

## 2 AIROC™ Bluetooth®

AIROC™ Bluetooth® APIs are designed to reduce the number of steps needed to create connections over Bluetooth®. Developers do not need to be experts in connectivity technologies, because the APIs will program most settings for the type of connections that the developers are trying to create. Therefore, the functionality that often takes dozens of commands and domain-specific knowledge can be done with a few APIs.

The AIROC™ Bluetooth® SDK includes documentation for the APIs that are derived directly from the AIROC™ Bluetooth® SDK source code. As new APIs are created or as existing APIs are augmented, the documentation remains synchronized.

### 2.1 Functional support

The AIROC™ Bluetooth® SDK provides functionalities in several areas including:

- Core Bluetooth® LE/Bluetooth® technologies
- Bluetooth® LE/Bluetooth® protocols and profiles
- Kit/platform support

This technical brief provides in-depth details on these functionalities.

#### 2.1.1 Core Bluetooth® LE/Bluetooth® technologies

##### 2.1.1.1 Bluetooth® standards

Bluetooth® LE/Bluetooth® cores and chipsets supported in the AIROC™ Bluetooth® SDK support one or both of the following set of Bluetooth® functionalities:

- BR and EDR data rates
- Bluetooth® Low Energy

Additionally, each chip supports one of the several Bluetooth® SIG specification revisions. The following are the major features supported in each specification:

- Bluetooth® 4.2
  - LE Secure Connections
  - LE Privacy 1.2
  - Data Length Extension
- Bluetooth® 5.0
  - 2 Mbps LE PHY data rate
  - Slot Availability Mask (SAM)
  - LE Channel Selection
  - High Duty Cycle Non-Connectable Advertisement

*Note: Chips or cores that support a later Bluetooth® specification also include the supported features of previous specifications.*

**Table 2** lists the supported Bluetooth® LE/Bluetooth® chipsets and the Bluetooth® SIG specification.

**AIROC™ Bluetooth®**
**Table 2 Supported chipsets, Bluetooth® specification, and features**

Chipset	Bluetooth® SIG specification	Specification features
CYW20706A2	BT 5.2	4.2 Features: LE Secure Connections, Data Packet Length Extension (DPLE), LE Privacy 1.2
CYW20719B2	BT 5.1	5.0 Features: LE 2 Mbps, SAM, LE Channel Selection #2, High Duty Cycle Non-Connectable Adv
CYW20739	BT 5.1	5.0 Features: LE 2 Mbps, SAM, LE Channel Selection #2, High Duty Cycle Non-Connectable Adv
CYW20721B2	BT 5.1	5.0 Features: LE 2 Mbps, SAM, LE Channel Selection #2, High Duty Cycle Non-Connectable Adv
CYW20735B1	BT 5.2	5.0 Features: LE 2 Mbps, SAM, LE Channel Selection #2, High Duty Cycle Non-Connectable Adv
CYW20739	BT 5.1	5.0 Features: LE 2 Mbps, SAM, LE Channel Selection #2, High Duty Cycle Non-Connectable Adv
CYW20819	BT 5.2	5.0 Features: LE 2 Mbps, SAM, LE Channel Selection #2, High Duty Cycle Non-Connectable Adv
CYW20820	BT 5.2	5.0 Features: LE 2 Mbps, SAM, LE Channel Selection #2, High Duty Cycle Non-Connectable Adv
CYW20835	BT 5.2	5.0 Features: LE 2 Mbps, SAM, LE Channel Selection #2, High Duty Cycle Non-Connectable Adv
CYW43012	BT 5.2	5.0 Features: LE 2 Mbps, SAM, LE Channel Selection #2, High Duty Cycle Non-Connectable Adv
CYW89820	BT 5.2	5.0 Features: LE 2 Mbps, SAM, LE Channel Selection #2, High Duty Cycle Non-Connectable Adv

Due to the differences in peripheral support, memory optimization, available GPIOs, and software development life-cycle, some features of the hardware may not be available in the AIROC™ Bluetooth® SDK 3.1 release.

**Table 3** lists those limitations.

**Table 3 Features not supported by platform**

Chipset	Platforms	Features not supported in Bluetooth® SDK 3.1
CYW20721B2	CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02	Programmable key-scan matrix interface HID-OFF low power mode MIPI DBI-C display interface Dual/Quad SPI
CYW20719B2	CYW920719B2Q40EVB-01	Programmable key-scan matrix interface HID-OFF low power mode PDM MIPI DBI-C display interface Dual/Quad SPI
CYW20819 CYW20820	CYW920819EVB-02 CYW920820EVB-02	Programmable key-scan matrix interface I <sup>2</sup> C Master/slave interface PDM Dual/Quad SPI

**2.2 Features, profiles, and protocols**

In addition to the core Bluetooth® LE/Bluetooth® functionality, the AIROC™ Bluetooth® SDK provides a proven Bluetooth® LE/Bluetooth® stack. Each profile and protocol provided within the code examples (CE) in the AIROC™ Bluetooth® SDK are validated in the System Validation Test (SVT) labs. The CEs provide examples on how to use the Bluetooth® protocols and APIs.

**2.2.1 Bluetooth® LE/Bluetooth® features, code examples**

**Table 4** lists the features and CEs (organized by application area) that are actively supported in AIROC™ Bluetooth® SDK 3.1.

**Table 4 Actively supported Bluetooth® LE/Bluetooth® profiles and features**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
Bluetooth® Mesh	Dimmer	Bluetooth® Mesh CE of a simple dimmer based on the Level Client model.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-MESH CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYBT-343052-EVAL CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYBT-423054-EVAL CYBT-413055-EVAL CYBT-483056-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW920706WCDEVAL CYW920719B2Q40EVB-01 CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920735Q60EVB-01 CYW920835M2EVB-01

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
Bluetooth® Mesh	Dimmer self config	Bluetooth® Mesh CE of a dimmer with a self-configuration feature that allows fast configuration of the device.	CYBT-213043-MESH CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYBT-423054-EVAL CYBT-413055-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW920706WCDEVAL CYW920719B2Q40EVB-01 CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02
Bluetooth® Mesh	Light dimmable	CE of a dimmable light based on the Bluetooth® Mesh Light Lightness Server model.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-MESH CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYBT-343052-EVAL CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYBT-423054-EVAL CYBT-413055-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW920706WCDEVAL CYW920719B2Q40EVB-01 CYW920721M2EVK-02 CYW920735Q60EVB-01 CYW920835M2EVB-01

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
Bluetooth® Mesh	Light smart	Bluetooth® Mesh CE of a smart light based on the Light Lightness and LC models.	CYBT-213043-MESH CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYBT-423054-EVAL CYBT-413055-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW920719B2Q40EVB-01 CYW920721B2EVK-02 CYW920721M2EVK-02
Bluetooth® Mesh	Low power led	Bluetooth® Mesh CE of a low-power LED system, includes Low Power Server and Friend node.	CYBT-213043-MESH CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02



**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
Bluetooth® Mesh	on off switch	Bluetooth® Mesh CE of an on/off switch.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-MESH CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYBT-343052-EVAL CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYBT-423054-EVAL CYBT-413055-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW920719B2Q40EVB-01 CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920735Q60EVB-01 CYW920835M2EVB-01
Bluetooth® Mesh	Sensor hub	CE of Mesh Sensor model with Ambient Light and Temperature sensor.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYW920835M2EVB-01
Bluetooth® Mesh	Sensor motion	CE showing implementation of the Bluetooth® Mesh Sensor Server model.	CYW920819EVB-02 CYBT-213043-MESH CYW920820EVB-02
Bluetooth® Mesh	Sensor temperature	CE showing the implementation of the Bluetooth® Mesh Sensor Server model.	CYBT-213043-MESH CYW920819EVB-02 CYW920820EVB-02

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
Bluetooth® Mesh	Switch smart	Bluetooth® Mesh CE of a motion sensor combined with ON/OFF button functionality.	CYBT-213043-MESH CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYBT-423054-EVAL CYBT-413055-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW920719B2Q40EVB-01 CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02
Bluetooth® Mesh	Embedded_provisioner	CE of a self-configured Mesh network that includes one node that acts as a Provisioner.	CYBT-213043-MESH CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYBT-423054-EVAL CYBT-413055-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW920719B2Q40EVB-01 CYW920721B2EVK-02 CYW920721M2EVK-02

**AIROC™ Bluetooth®**

Application area	Feature/ code example	Description	Board
Bluetooth® Mesh	Bluetooth® Mesh snip examples	Sample applications based on SIG Mesh models (Client and Server, power ON/OFF, level, battery, light control, transition location, property, time, scene, scheduler, provision, sensor, and so on).	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-MESH CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYBT-343052-EVAL CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYBT-423054-EVAL CYBT-413055-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-353027-EVAL CYW920719B2Q40EVB-01 CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920735Q60EVB-01 CYW920835M2EVB-01

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
Bluetooth® LE	hello_client	Hello client CE shows an implementation of a Bluetooth® LE vendor-specific GATT Client profile.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-343052-EVAL CYBT-353027-EVAL CYW920736M2EVB-01 CYW920721B2EVK-02 CYW920721M2EVK-02 CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYW920719B2Q40EVB-01 CYBT-413055-EVAL, CYBT-423054-EVAL CYBT-483056-EVAL CYW920735Q60EVB-01 CYW920736M2EVB-01 CYW920835M2EVB-01

**AIROC™ Bluetooth®**

Application area	Feature/ code example	Description	Board
Bluetooth® LE	hello_sensor	CE shows an implementation of a Bluetooth® LE vendor-specific GATT device and service.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-343052-EVAL CYBT-353027-EVAL CYW920736M2EVB-01 CYW920721B2EVK-02 CYW920721M2EVK-02 CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYW920719B2Q40EVB-01 CYBT-413055-EVAL, CYBT-423054-EVAL CYBT-483056-EVAL CYW920735Q60EVB-01 CYW920736M2EVB-01 CYW920835M2EVB-01

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
Bluetooth® LE	Beacon	CE demonstrates implementation of Apple iBeacon and Google Eddystone.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-343052-EVAL CYBT-353027-EVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYW920719B2Q40EVB-01 CYBT-413055-EVAL CYBT-423054-EVAL CYBT-483056-EVAL CYW920735Q60EVB-01 CYW920835M2EVB-01 CYW943012BTEVK-01 CYW9M2BASE-43012BT
Bluetooth® LE	lbeacon	CE demonstrates a Bluetooth® LE iBeacon application.	CYW920736M2EVB-01
Bluetooth® LE	env sensing temp	CE demonstrates the implementation of a simple Bluetooth® LE Environmental Sensing profile.	CYW920819EVB-02 CYW920820EVB-02 CYW920719B2Q40EVB-01 CYBT-413055-EVAL CYBT-423054-EVAL CYBT-483056-EVAL

**AIROC™ Bluetooth®**

Application area	Feature/ code example	Description	Board
Bluetooth® LE	anc and ans	Sample applications for Alert Notification profile (ANC: Client; ANS: Service).	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-343052-EVAL CYBT-353027-EVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYW920719B2Q40EVB-01 CYBT-413055-EVAL CYBT-423054-EVAL CYBT-483056-EVAL CYW920735Q60EVB-01 CYW920835M2EVB-01 CYW943012BTEVK-01 CYW9M2BASE-43012BT

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
Bluetooth® LE	bas and bac	Sample applications for Battery Service profile (BAS - Service; BAC - Client).	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-343052-EVAL CYBT-353027-EVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYW920719B2Q40EVB-01 CYBT-413055-EVAL CYBT-423054-EVAL CYBT-483056-EVAL CYW920735Q60EVB-01 CYW920835M2EVB-01



**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
Bluetooth® LE	hrs and hrc	Sample applications for Heart Rate Profile (HRC - Client; HRS - Service).	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYBT-343052-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW920706WCDEVAL CYW920721B2EVK-02 CYW920721M2EVK-02 CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYW920719B2Q40EVB-01 CYBT-413055-EVAL CYBT-423054-EVAL, CYBT-483056_EVAL CYW920735Q60EVB-01 CYW920835M2EVB-01
Bluetooth® LE	le coc	Sample application for Bluetooth® LE connection-oriented channel (CoC).	CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYW920719B2Q40EVB-01 CYBT-413055-EVAL CYBT-423054-EVAL CYBT-483056-EVAL

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
Bluetooth® LE	find me	Sample application for Bluetooth® LE FindMe Service.	CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920721B2EVK-02 CYW920721M2EVK-02 CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYW920719B2Q40EVB-01 CYBT-413055-EVAL CYBT-423054-EVAL CYBT-483056-EVAL
Audio	watch	CE demonstrates Bluetooth® Advanced Audio Distribution Profile (A2DP) source, Audio/Video Remote Control Profile (AVRCP) controller/target, Apple Media Service (AMS) and Apple Notification Center Service (ANCS), Bluetooth® GATT, handling of the UART protocol, Service Discovery Protocol (SDP) and GATT Descriptor/Attribute configuration. Note that the watch CE is limited to one Bluetooth® LE client connection.	CYW920819EVB-02 CYW920820EVB-02 CYW920706WCDEVAL
Audio	watch	CE demonstrates Bluetooth® Advanced Audio Distribution Profile (A2DP) source, Audio/Video Remote Control Profile (AVRCP) controller/target, Apple Media Service (AMS) and Apple Notification Center Service (ANCS), Bluetooth® GATT, handling of the UART protocol, Service Discovery Protocol (SDP), GATT Descriptor/Attribute configuration, and audio gateway profile or Hands-Free Profile (HFP). Note that the watch CE is limited to one Bluetooth® LE client connection.	CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920719B2Q40EVB-01 CYW943012BTEVK-01 CYW9M2BASE-43012BT

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
Audio	audio gateway	CE demonstrates the use of Bluetooth® Audio Gateway profile – Handsfree and Headset, handling of the UART protocol, and setting of the local Bluetooth® device address from the host MCU.	CYW920706WCDEVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920719B2Q40EVB-01
Audio	headset and speaker	CE of a Bluetooth® headset and speaker device including A2DP sink (SBC and AAC decoding), AVRCP, Hands-Free Profile (HFP), and Google Fast Pair support.	CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW943012BTEVK-01
Audio	headset and speaker	CE of a Bluetooth® headset device including A2DP sink (SBC decoding), AVRCP, Hands-Free Profile (HFP), and Google Fast Pair support.	CYW943012BTEVK-01 CYW9M2BASE-43012BT
Audio	headset	CYW20706 CE for headset device that combines A2DP sink (SBC decoding) and AVRCP controller and AVRCP target.	CYW920706WCDEVAL
Audio	a2dp sink	CE of a Bluetooth® A2DP sink (SBC decoding) device.	CYW920706WCDEVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW943012BTEVK-01 CYW9M2BASE-43012BT
Audio	hands-free	CE of a Bluetooth® handsfree device. Use the Client Control application to send various commands.	CYW920706WCDEVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW943012BTEVK-01 CYW9M2BASE-43012BT
Audio	Audio_record	CE of audio record with PCM and OPUS support.	CYW920721M2EVK-01 CYW920721M2EVK-02
HID	dual_mode_keyboard	CE of a dual-mode keyboard using on-chip keyscan HW component. It can operate in both BR/EDR Bluetooth® mode and LE, HID over GATT profile (HOGP). Note that OTA FW update is not supported with this CE on CYW20819/CYW20820 due to the size of on-chip flash.	CYW920735Q60EVB-01 CYW920819REF-KB-01
HID	ble_mouse	CE of a Bluetooth® LE mouse solution based on HID over GATT profile (HOGP).	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYW920735Q60EVB-01

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
HID	ble_remote	CE of a Bluetooth® LE remote control solution based on HID over GATT profile (HOGP).	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYW920735Q60EVB-01
HID	ble_rcu	CE of a Bluetooth® LE reference remote control based on HID over GATT profile (HOGP).	CYW920835REF-RCU-01
RFCOMM	pbap_client	CE of a Bluetooth® Phone Book Access Profile (PBAP) client. It can connect to mobile phones that support PBAP server profile and download the phone book and call logs.	CYW920706WCDEVAL CYBT-343026-EVAL CYBT-353027-EVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920719B2Q40EVB-01
RFCOMM	map_client	Message Access Client application is designed to connect and access service on the Message Access Server device. It can be used to access SMS-MMS messages or emails received on the Message Access Server device such as a smartphone. Note that the MAP client is limited to four Bluetooth® LE connections.	CYW920819EVB-02 CYW920820EVB-02 CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920719B2Q40EVB-01

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
RFCOMM	spp	Sample application that uses Serial Port Profile (SPP) library to establish, terminate, send, and receive SPP data over BR/EDR. This application supports a single SPP connection.	CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-343052-EVAL CYBT-353027-EVAL CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYBT-423054-EVAL CYBT-413055-EVAL CYBT-483056-EVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920719B2Q40EVB-01 CYW920735Q60EVB-01 CYW9M2BASE-43012BT
RFCOMM	spp multi-port	Sample application that demonstrates the implementation of a RFCOMM-based SPP that can support up to two SPP connections, and interfaces to an external host using HCI.	CYW920819EVB-02 CYW920820EVB-02 CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920719B2Q40EVB-01 CYW920706WCDEVAL
RFCOMM	opp_server	CE of Object Push Profile (OPP) used to receive object files (vCard, Image, text, ...) and send object files from the OPP client (mobile phone or PC).	CYW920706WCDEVAL CYBT-343026-EVAL CYBT-353027-EVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920719B2Q40EVB-01

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
HAL	ADC	Application demonstrates how to configure and use an ADC to measure the DC voltage on DC input channels.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-343052-EVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920719B2Q40EVB-01 CYW920735Q60EVB-01 CYW920835M2EVB-01
HAL	PUART	Application demonstrates how to use PUART APIs to read data.	CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-343052-EVAL CYW920721B2EVK-02 CYW920719B2Q40EVB-01 CYW920735Q60EVB-01
HAL	uart_raw_mode	Application demonstrates how to use the HCI UART in raw data mode.	CYW920819EVB-02 CYW920820EVB-02 CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920719B2Q40EVB-01
HAL	uart_spi_bridge	Application implements the SPI master and acts as UART-SPI Bridge.	CYW920706WCDEVAL
HAL	spi master	Application initializes an SPI interface to communicate with a peer device as a SPI master.	CYW920736M2EVB-01

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
HAL	spi slave	Application initializes a second SPI interface to communicate with the primary peer device as a SPI slave.	CYW920736M2EVB-01
HAL	rtc	Application provides sample code for interfacing with the on-chip RTC clock.	CYW920736M2EVB-01
HAL	PWM	Application demonstrates how to configure and use PWM in AIROC™ Bluetooth® evaluation boards.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-343052-EVAL CYW920736M2EVB-01 CYW920735Q60EVB-01
HAL	GPIO	Demonstrates the use of APIs to configure GPIOs as input/output.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-343052-EVAL CYW920721B2EVK-02 CYW920721M2EVK-02 CYW920719B2Q40EVB-01 CYW920735Q60EVB-01

**AIROC™ Bluetooth®**

<b>Application area</b>	<b>Feature/ code example</b>	<b>Description</b>	<b>Board</b>
HAL	I <sup>2</sup> C Master	Demonstrates how to use the I <sup>2</sup> C interface to send and receive data.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920719B2Q40EVB-01 CYW920735Q60EVB-01 CYBT-343052-EVAL
HAL	Low power	Demonstrates low-power modes.	CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02
DFU	Firmware upgrade via OTA	Demonstrates Bluetooth® LE-based over-the-air firmware upgrade functionality.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-MESH CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-343052-EVAL CYBT-353027-EVAL CYW920736M2EVB-01 CYW920721B2EVK-02 CYW920719B2Q40EVB-01 CYW920735Q60EVB-01
DFU	Firmware upgrade via HCI	Demonstrates the use of HCI firmware upgrade APIs.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920719B2Q40EVB-01 CYW920735Q60EVB-01



**AIROC™ Bluetooth®**

Application area	Feature/ code example	Description	Board
EMPTY	empty_wiced_bt	Empty starter application that is a starting point for adding new code and functionality.	CYBLE-333072-EVAL-M2B CYBLE-343072-EVAL-M2B CYBT-213043-EVAL CYBT-223058-EVAL CYBT-243053-EVAL CYBT-253059-EVAL CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYBT-343026-EVAL CYBT-343052-EVAL CYBT-353027-EVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYBT-413061-EVAL CYBT-423060-EVAL CYBT-483062-EVAL CYW920719B2Q40EVB-01 CYBT-413055-EVAL CYBT-423054-EVAL CYBT-483056-EVAL CYW920735Q60EVB-01 CYW920736M2EVB-01 CYW920835M2EVB-01 CYW943012BTEVK-01 CYW9M2BASE-43012BT

**AIROC™ Bluetooth®**

**2.2.2 AIROC™ Bluetooth® SDK Pro packages**

In addition to the code examples that are available in the AIROC™ Bluetooth® SDK, there are optional sets of packages that add extra features to the AIROC™ Bluetooth® SDK. These are typically more complex applications or require special licensing. The Pro CEs are not available on GitHub repositories. Contact the Sales team to request Pro CEs.

**Table 5** provides a list of CEs that are available with AIROC™ Bluetooth® SDK Pro packages.

**Table 5 AIROC™ Bluetooth® SDK Pro code examples**

<b>Application</b>	<b>Feature/ Code example</b>	<b>Description</b>	<b>Supported platforms</b>
audio pro	headset_speaker_pro_ama	CE of a headset or speaker device including A2DP sink (SBC and AAC decoding), AVRCP, HFP, and button-initiated Alexa Mobile Accessory (AMA) support.	CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02
audio pro	headset_standalone	CE of a Bluetooth® headset device via audio libraries with a UART as the audio transport between the AIROC™ Bluetooth® device and a system MCU.	CYW920721M2EVK-01 CYW920721M2EVK-02 CYW943012BTEVK-01
audio pro	watch_ama	CE demonstrates Bluetooth® Advanced Audio Distribution Profile (A2DP) source, Audio/Video Remote Control Profile (AVRCP) controller/target, Apple Media Service (AMS) and Apple Notification Center Service (ANCS), Bluetooth® GATT, handling of the UART protocol, Service Discovery Protocol (SDP), GATT Descriptor/Attribute configuration, audio gateway profile or HFP, and button-initiated Alexa Mobile Accessory (AMA) support. Note that the watch_ama CE is limited to one Bluetooth® LE client connection.	CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02
audio pro	watch_dual_a2dp	CE demonstrates Bluetooth® dual A2DP source, handling of the UART Protocol, hand Hands-free profile.	CYW920721M2EVK-01 CYW920721M2EVK-02

**AIROC™ Bluetooth®**

<b>Application</b>	<b>Feature/ Code example</b>	<b>Description</b>	<b>Supported platforms</b>
audio pro	headset_wass_ama	CE of an untethered Bluetooth® earbud solution demonstrating Wireless Audio Stereo Sync (WASS), A2DP sink (SBC decoding), AVRCP, HFP, Google Fast Pair support, and button-initiated AMA support.	CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02
audio pro	headset_wass_aac	CE of an untethered Bluetooth® earbud solution demonstrating Wireless Audio Stereo Sync (WASS), A2DP sink (SBC and AAC decoding), AVRCP, HFP, and Google Fast Pair support.	CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02
pro-homekit	homekit_lightbulb	CE for a HomeKit lightbulb accessory using the HomeKit library. The implementation is based on Apple's HomeKit Accessory Protocol Specification R15.	CYW920819EVB-02 CYW920820EVB-02
pro-iap2	iap2	Sample application demonstrating the use of the iAP2 protocol to communicate with an iOS device using the Bluetooth® iAP2 library.	CYW920819EVB-02 CYW920820EVB-02 CYW989820EVB-01 CYW920706WCDEVAL CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02 CYW920719B2Q40EVB-01 CYW943012BTEVK-01
pro-iap2	hci_iap2_spp	CE implements a pass-through serial application. The CE uses a standard SPP over RFCOMM if the peer supports it, or external accessory iAP2 protocol if the connection is established with an iOS device.	CYW920819EVB-02 CYW920820EVB-02 CYW920721B2EVK-02 CYW920721M2EVK-01 CYW920721M2EVK-02
pro-matter	chip_lighting	This package demonstrates the Matter lighting code example over Thread network with commissioning over Bluetooth® LE.	CYW920739M2EVB-01
pro-mesh	connected mesh	CE shows an implementation of a self-organized Bluetooth® Mesh network.	CYW920719B2Q40EVB-01 CYW989820EVB-01

**AIROC™ Bluetooth®**

<b>Application</b>	<b>Feature/ Code example</b>	<b>Description</b>	<b>Supported platforms</b>
pro-mesh	wireless_bms	CE allows the user to interface to the TLE9102 battery management analog front-end device and read measurements over the mesh. It is based on the connected Mesh example.	CYW920719B2Q40EVB-01 CYW989820EVB-01
pro-peps	Hub	Sample application demonstrating Bluetooth® LE Passive Entry Passive Start (PEPS) Hub that connects with the car key.	CYW989820EVB-01
pro-peps	key	Sample application demonstrating PEPS key usage to send localization packet (to be tracked).	CYW989820EVB-01
pro-peps	Sensor	Sample application demonstrating PEPS sensor used for Bluetooth® LE localization (to track the key).	CYW989820EVB-01

### 3 Technical support

Forums are hosted for technical support. You can search the forum to find answer to your question. If you are unable to find the answer, you can post it on the forum. These forums are manned by engineers to assist you with issues that you encounter while using the Bluetooth® SDK with platforms and features listed in this document. Click [here](#) to access Bluetooth® forums.

**Learning resources**

**4 Learning resources**

<b>Information</b>	<b>Source</b>
Wireless solutions and product offerings	<a href="#">Wireless product offerings</a>
Buy kits	<a href="#">Kit store</a>
Developer community	<a href="#">Community</a>
ModusToolbox™ software	<a href="#">ModusToolbox™ software</a>
AIROC™ Bluetooth® SDK, application notes, support blogs, and help articles	<a href="#">Bluetooth® documentation</a>

To learn about new features, devices, and platform support since previous release and to find the list of any known issues and solutions, see the release notes provided with every AIROC™ Bluetooth® SDK release.

### 5 Software licensing

Express Logic ThreadX object files and headers are licensed from Express Logic, Inc. and provided to Bluetooth® SDK users royalty-free.

---

## Revision history

## Revision history

Document version	Date of release	Description of changes
**	2021-08-20	Initial release



#### **Trademarks**

All referenced product or service names and trademarks are the property of their respective owners.

**Edition 2021-08-20**

**Published by**

**Infineon Technologies AG**

**81726 Munich, Germany**

**© 2021 Infineon Technologies AG.**

**All Rights Reserved.**

**Do you have a question about this document?**

**Go to [www.cypress.com/support](http://www.cypress.com/support)**

**Document reference**

**002-33822 Rev. \*\***

#### **IMPORTANT NOTICE**

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffheitsgarantie").

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Infineon Technologies in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office ([www.infineon.com](http://www.infineon.com)).

#### **WARNINGS**

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.