Airoha IoT SDK for BT Audio Dongle Reference Design User Guide

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Document revision history

Revision	Date	Description
1.0	30 March 2023	Initial version
1.1	24 May 2023	Added HID doc guide instruction

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1 Introduction

The man-machine interface (MMI) layer is intended to offer a well-organized interface that makes control profile services such as LE audio, BLE ultra low latency more intuitive. The MMI layer also provides a robust system environment which protects users from a negative experience (e.g., crash situation).
This guide is written to help you easily and completely understand MMI layer functionality. You must also refer to the related documentation if your dongle supports these features.

Table 1. Other user guide documents

Feature	Other documents
LE audio	under <sdk_root>\mcu\doc\Airoha_IoT_SDK_for_BT_Audio_LE_Audio_Dongle_User_Guide.pdf
BT source	under <sdk_root>\mcu\doc\Airoha_IoT_SDK_for_BT_Audio_BT_Source_Dongle_User_Guide.pdf
HID	under <sdk_root>\mcu\doc\Airoha_IoT_SDK_for_BT_Audio_HID_Dongle_User_Guide.pdf

Note: Only 1627 support the HID feature.

1.1 EVK components

Refer to the EVK user guide available via mcu\doc\<chip>\<chip>_Series_EVK_Users_Guide for more information about the EVK components.

2 MMI Functionality

This section shows the MMI layer functionality. Generally speaking, MMI functions can be partitioned into five main fields: system; connection; volume; and music. A more in-depth description of each function field is given in the function field sections.
Furthermore, the actions for the buttons must be defined in advance. The tap action is defined as a press of the button of no more than 500 milliseconds. Pressing the button for more than 500 milliseconds is defined as a “long press”. You can use Config Tool to make changes to the time settings for a tap or long press.
In the subsequent sections, the components must be used to trigger the functionality. The results indicate that the function is correctly triggered.

2.1 System

Regarding the system function field, the MMI functions related to the functions of the EVK itself are classified in this field, including how to turn the product on and off.

2.1.1 Power

If your dongle product does not contain a battery, the dongle enables BT when USB resumes and disables BT when USB is suspended. That means if you plug the dongle into the notebook and put the notebook into sleep mode, the dongle disables BT.
Currentlym only the wireless MIC project contains a battery but if your dongle product contains a battery, you can turn the product on and off by pressing the power key. BT is turned on when the dongle powers on and it is turned off when dongle powers off (as shown below).

Table 2. Power and BT enable

Functionality	Actions	Results	Requirements
Power on	Long press power key for 3 seconds.	Device powers on and BT is enabled.	Power off state.
Power off	Long press power key for 3 seconds.	Device powers off and BT is disabled.	Power on state.

2.2 Connection

This section describes the MMI functionality related to being discoverable by other devices and connecting to other devices.

2.2.1 Pairing

This functionality is used to make the product to scan connectable devices. You can press the power key to enter pairing mode.

Table 3. Enter pairing mode

Functionality	Actions	Results	Requirements

Enter pairing mode	Triple-click the power key on headset.	LED0 and LED1 on the headset are fast blinking	

2.3 Volume

This section shows the MMI functions related increasing or decreasing the volume of the speaker and microphone, and how to mute or unmute the microphone.

2.3.1 Changing the volume

You can adjust the sound level of the Line out and I2S out output of wireless MIC products,

Table 4. Speaker Volume

Functionality	Actions	Results	Requirements
Volume up	Press EINT_KEY_0.	NA	In connected or playing music.
Volume down	Press EINT_KEY_1.	NA	In connected or playing music.

You can fine-tune the volume on the PC because the uplink and downlink with the PC is through USB.

3 MMI Event

This section shows the events that are not triggered by pressing the button. But are instead triggered by other devices or the product itself. These events are divided into three types: connection; battery; and time out.

3.1 Connection

The section shows all events related to connections, such as successfully pairing, being connectable, and being connected.

Table 5. Connection event

Event	Results
Pairing	LED0 and LED1 is blinking fast.
Connected	LED0 and LED1 is off.

3.1.1 Connected

This connecting function occurs when first pairing a device or when automatically reconnecting to a paired device.

Table 6. Connected

Functionality	Actions	Results	Requirements
Connected	After paired successfully, connect the paired device.	LED0 and LED1 are off.	NA

3.1.2 Reconnecting automatically

When dongle powered on or is disconnected, it tries to reconnect the previously connected device.

Table 7. Reconnect actively

Functionality	Actions	Results	Requirements
Reconnect actively	Automatically reconnect	NA	Already connected before.

3.2 Battery

This section shows the battery events including low battery, charging, and charging full.

Table 8. Battery event

Event	Results
Low battery	LED1 flashes every 0.6 seconds
Charging	LED1 flashes every 4 seconds.
Charging full	LED1 is always on in 5 seconds.

3.3 Music

3.3.1 Playing music

The user can play music on the PC music player.

3.3.2 Pausing music

The user can pause the currently playing music on the PC music player.

3.4 Line in playback

When the line is plugged in, the auto path automatically switches to Line in. The user can triple-click a key to switch the audio path between Line in and A2DP. When the audio path is Line in, the music functions shown in Section 3.3 cannot be used.

3.5 I2S output

The wireless MIC product supports I2S output. When I2S is plugged in, the dongle outputs audio through I2S.

4 Key Mapping Table

This section shows a mapping table of the keys, actions, LEDs, voice prompts, ring tones and any related comments for specific functions. For example, for the 'Power on' function, search for 'Power on' in the 'Functionality' column in Table 9. Key mapping table. The Key, Action, LED, Voice prompt, Ring tone, and comments that are associated with the 'Power on' function (i.e. Press for three seconds; LED0 rapidly flashes three seconds; Say "Power-On"; and 'In the power off state') are shown in the adjacent cells on the same row.

Table 9. Key mapping table

Key	Functionality	Action	LED	Comment
Power Key	Power on	Long press for 3 seconds.	LED0 blink quickly. LED1 is OFF	When device is power off.
	Power off	Long press for 3 seconds.	LED0 blinks quickly. LED1 is OFF	When device is power on.
	Pairing	Triple-click	LED0 and LED1 are blink fast.	When device is power on and not connected.
EINT_KEY0	Volume up	Press	NA	In the connected, incoming/outgoing call, call active or playing music states.
EINT_KEY1	Volume down	Press	NA	In the connected, incoming/outgoing call, call active or playing music states.

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