Airoha IoT SDK for BT Audio HID Dongle User Guide

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Document Revision History

Revision	Date	Description
1.0	26 May 2023	Initial version

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1 Introduction

1.1 Platform Architecture

Airoha HID dongle platform consists of application, middleware and BSP layers as shown in Figure 1. HID profiles and services are implemented in the middleware and the connection logic is implemented in the application dongle_ref_design.

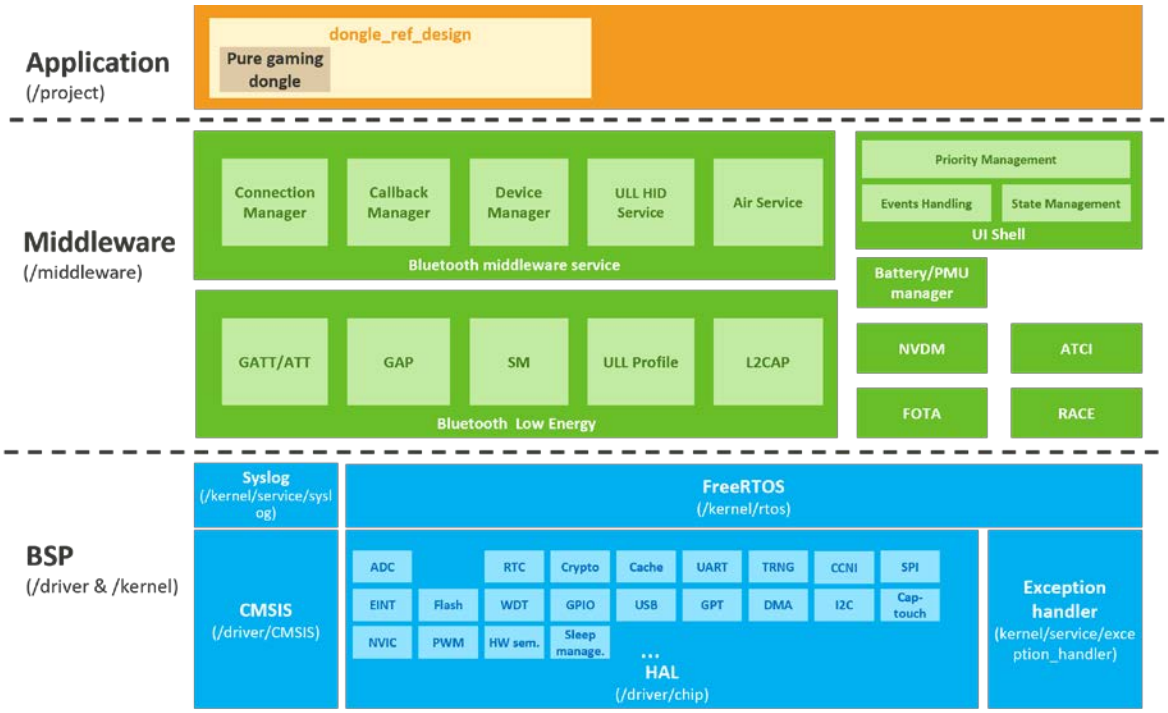

Figure 1. Software architecture

1.2 EVK Settings

Power is usually supplied to the HID dongle via the USB port. To power the AB1627 EVK via the USB port, you must connect the USB port to a PC. Do not use the power adaptor.

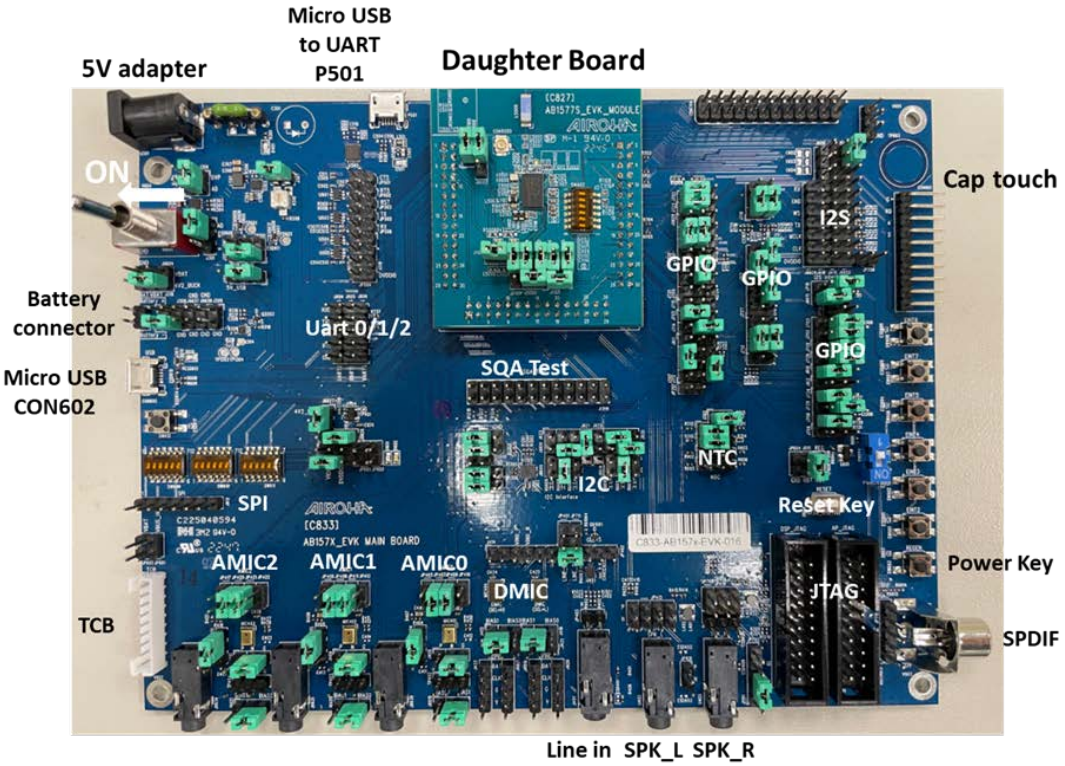

Figure 2. EVK settings

1.3 Scenario

HID dongle must be inserted to USB port of PC, and it can connect with remote mouse by BT.

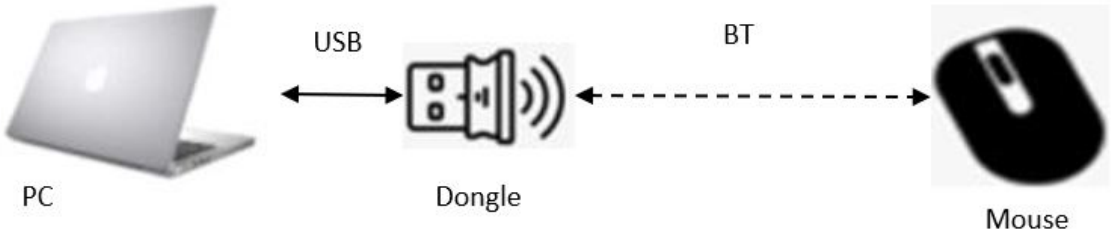

Figure 3. Dongle scenario

2 Getting Started

2.1 Feature Options

Set the feature options below to 'y' in the feature makefiles of the MCU project to enable the HID dongle.
Feature makefile path for MCU project:

- mcu\project\ab157x\apps\[MCU_project_name]\GCC

For pure gaming HID dongle, please refer feature_71d_evk_pure_gaming.mk

Table 1. HID Dongle Feature Options

Feature option	Note
AIR_PURE_GAMING_ENABLE = y	Set this option to 'y' for MCU project to enable pure gaming feature.

2.2 Setup

2.2.1 Preparation

Airoha HID dongle turns BT on when USB resumes and turns BT off when USB is suspended. For example, if the dongle is plugged into a notebook via USB, BT turns on at first. For a period of time, if the notebook goes into the sleep mode, BT turns off.
Then user should use UT app to connect dongle in PC:

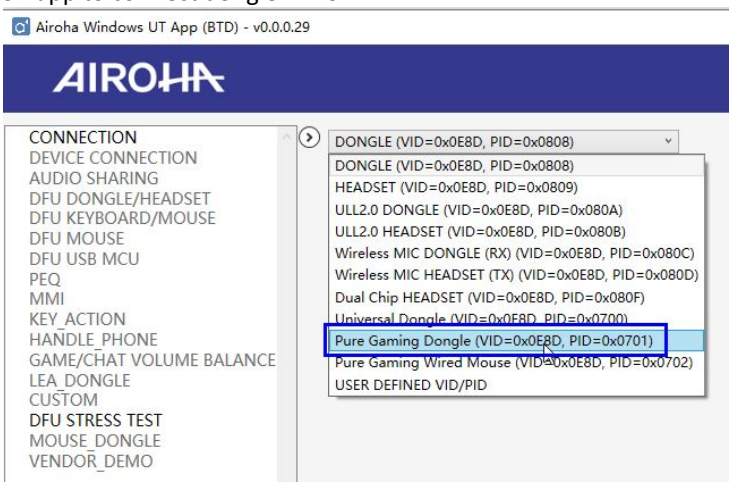

Figure 4. Tool connect dongle

2.2.2 Scan

The HID dongle scans the advertisement of HID devices(such as mouse or keyboard) whenever a new connection is allowed.

2.2.2.1 Scan with no Bonded List

The scan behavior depends on whether there is a bonded list. When there is no bonded list, for a pure gaming mouse, the HID dongle scans the advertisement with RSSI and specific manufactory name to discover HID devices. User can use UT app to scan and connect remote mouse:

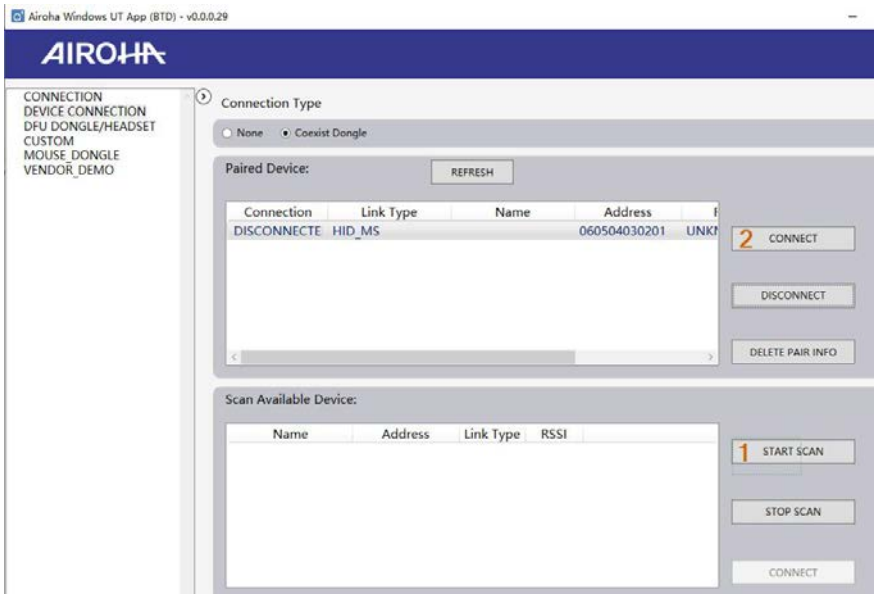

Figure 5. Dongle scan and connect DUT

2.2.2.2 Scan with a Bonded List

When there is a bonded list, the dongle sets the bond list into the white list and scans for advertisements from the white list.

2.3 Connection

The HID dongle automatically initiates an HID connection when it discovers a target device.
If there is a HID device enabled, the HID dongle enters pair mode and creates a CIS connection to connect with HID device, as Figure 5.
UT app detail steps please refer to “AB16xx_Gmouse_Reference_Design_User_Guide”

2.4 Report Rate

The mouse return rate is the transmission frequency between the mouse's MCU and the computer. The common return rate is 125Hz, which means that the MCU sends data to the computer every 8ms, 500Hz sends data every 2ms, and 1000Hz sends data every 1ms, also known as 1ms response. The higher the return rate, the higher the CPU usage. Currently, in game scenarios where there are many extreme operations. Having a higher return rate on the mouse can make our operations more precise.
Dongle can switch report rate to mouse in wireless connection, support below report rate:

Table 2. Dongle Support Report Rate

Report Rate
125 Hz
250 Hz
500 Hz
1000 Hz
2000 Hz
4000Hz

User can use UT app to set report rate, as Figure 6

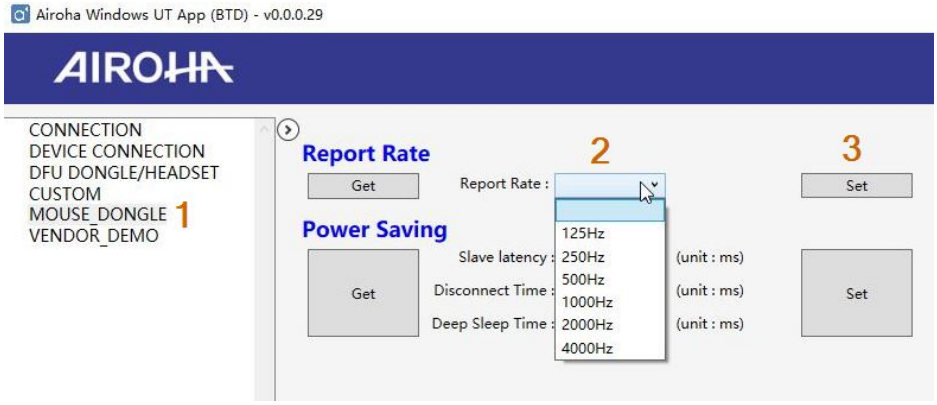

Figure 6. Tool Set RR

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