AB1565/AB1568 Pairing Tool Users Guide

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Document revision history

Revision	Date	Description
1.0	7 May 2021	Initial version
1.1	19 May 2022	Modify Chapter 1.3

Table of contents

Lists of tables and figures

1. Introduction

1.1. Overview

This document describes the AB1565/AB1568 Pairing Tool provided by Airoha Technology. The goal of the Pairing Tool is to provide a utility to let the AB1565 & AB1568 devices pairing and without the need for additional equipment.

The Pairing Tool contains the following hardware and software items:

- One-Wire UART Board – Enables communication with the Pairing Tool application.
- Development Pairing Tool – A software application running on the Microsoft Windows operating system.

The following functionality is provided by this pack:

- MCSync Pairing
- LE Audio
- Dongle Headset
- Dongle MCSync

Table 1-1. Difference between standard UART and One-Wire UART.

	Standard UART	1-Wire UART
Number of lines	Tx, Rx, GND	Data, GND
Type of communication	Full duplex	Half duplex
Data rate	Up to 3M	Up to 3M
Dongle	USB to UART(1Port)[C295] or USB to UART(4Port)[C714]	USB to UART(4Port)[C714] And 1-Wire UART Adapter(4Port)[C757]

1.2. Supported chips

The Airoha AB1565/AB1568 Pairing Tool supports AB1565/AB1568 chipsets.

1.3. Required Software

Before using the Airoha Tool Kit (ATK), you need to install all of the following software on your computer.

Click the following link to download Microsoft .NET Framework 3.5:
https://www.microsoft.com/en-US/download/details.aspx?id=21

Click the following link to download Microsoft .NET Framework 4.5:
https://www.microsoft.com/en-US/download/details.aspx?id=30653

Click the following link to download Microsoft Visual C++ 2012 Update 4 Redistributable Package(x86):

https://www.microsoft.com/en-US/download/details.aspx?id=30679

Click the following link to download Microsoft Visual C++ 2015/2017/2019 Redistributable Package(x86):
https://aka.ms/vs/17/release/vc_redist.x86.exe

You may be asked to restart your computer when you complete the installation process. Please make sure to do so before running the Pairing Tool.

2. Environment Setup

A complete set of a testing suite includes:

- PC x 1 (running Windows XP operating system or later)
- 1-to-4 one-wire UART board for AB1565 & AB1568 (provided by Airoha)
- Micro-USB-5P cables x 1
- 5V/3A adapter (provided by Airoha)
- Pairing Tool (provided by Airoha)

Figure 2-1 shows a 1-to-4 one-wire UART board for AB1565 & AB1568. The user must connect the DC 5V/3A adapter to supply power to the 1-to-4 one-wire UART board. To avoid any instability caused by supply-related issues, we suggest using the 5V/3A adapter that is provided by Airoha.

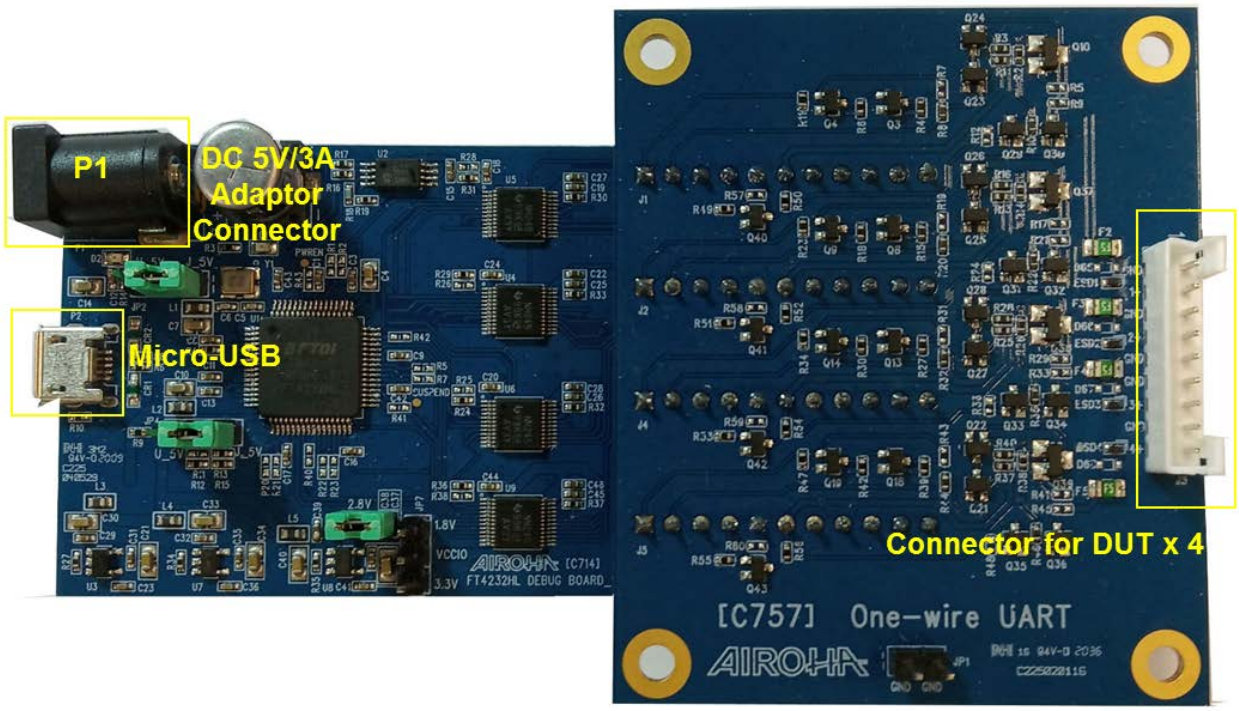


Figure 2-1. Connectors on 1-to-4 one-wire UART board

Figure 2-2 shows a reference connection setup between a PC, 1-to-4 one-wire UART board, and the DUT.

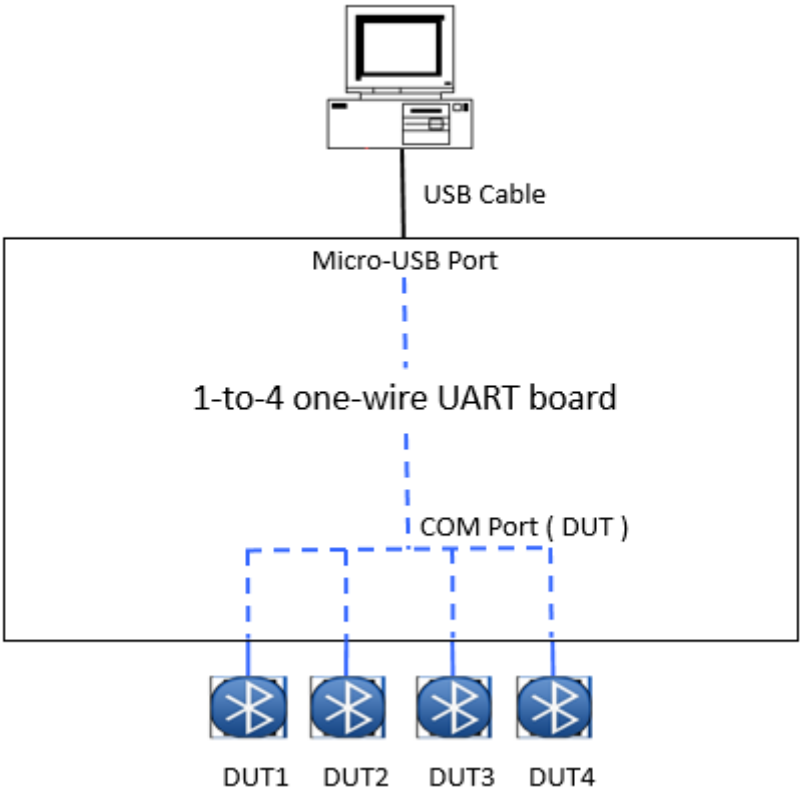


Figure 2-2. 1-to-4 Connection block diagram

2.1. Hardware setup

To set up the 1-to-4 one-wire UART is to connect the micro-USB port on the 1-to-4 one-wire UART board to the USB port on the PC. You must use a DC 5V/3A adaptor to supply power to the 1-to-4 one-wire UART board before you connect the micro-USB port to the PC. There is one micro-USB port on the 1-to-4 one-wire UART board for the connection to the PC. There is a USB-to-UART bridge IC after the micro-USB port on the 1-to-4 one-wire UART board. Four virtual UART ports (as USB-to-Serial bridges) appear in Windows Device Manager when the USB port is connected to the PC. Four UART ports are then detected when the 1-to-4 one-wire UART board is connected to the PC through the micro-USB port. The software settings use the COM port number of each device.

One way to set up the 1-to-8 one-wire UART is to connect the micro-USB port on the second 1-to-4 one-wire UART board to another USB port on the PC. You must use a DC 5V/3A adaptor to supply power to the second 1-to-4 one-wire UART board before you connect the micro-USB port to a USB port on the PC. When the micro-USB port on the second 1-to-4 one-wire UART board is connected to a USB port on the PC, eight virtual UART ports (as USB-to-Serial bridges) appear in Windows Device Manager. Eight UART ports are then detected when the two one-wire UART boards are connected to the PC through the micro-USB ports. The software settings use the COM port number of each device. Figure 2-3 shows the setup between the PC, two 1-to-4 one-wire UART boards, and the DUT.

1-to-8 Setup

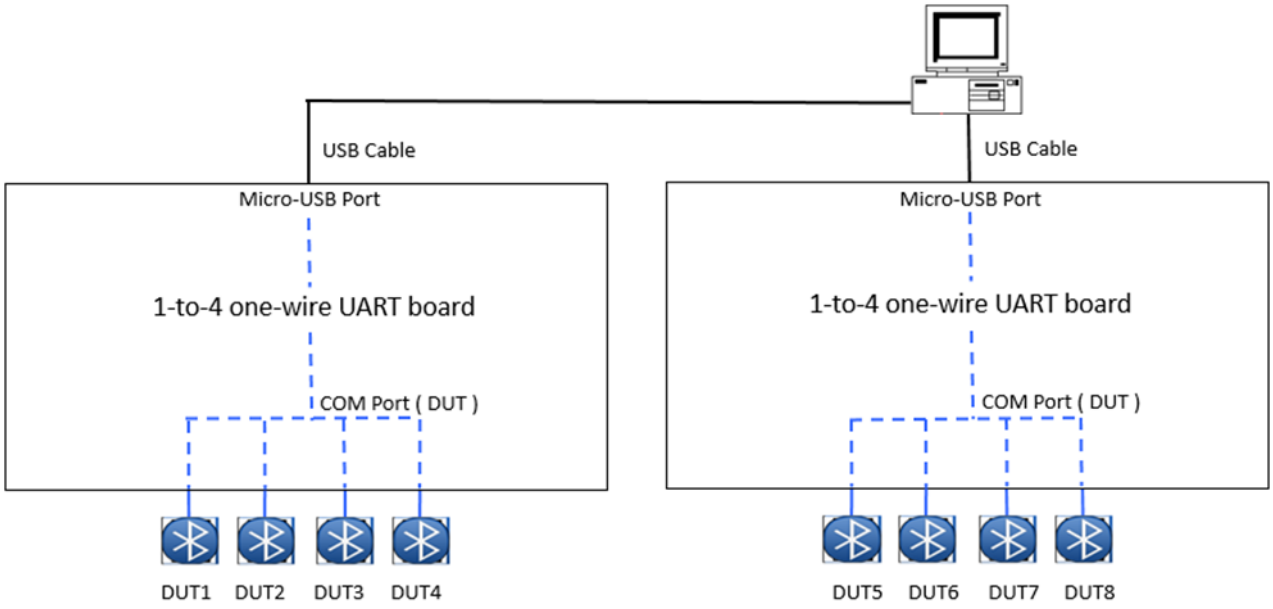


Figure 2-3. 1 to 8 connection block diagram

2.2. Power supply of 1-to-4 one-wire UART board

Power is supplied to the 1-to-4 one-wire UART board by a 5V/3A DC power supply. You must use a DC 5V/3A adaptor to supply power to 1-to-4 one-wire UART board before you connect the micro-USB port to the PC. We strongly recommend using the 5V/3A power adaptor provided by Airoha for the 1-to-4 one-wire UART board to prevent any instability problem that can be caused by supply-related issues.

Figure 2-4 shows the top view of the 1-to-4 one-wire UART board.

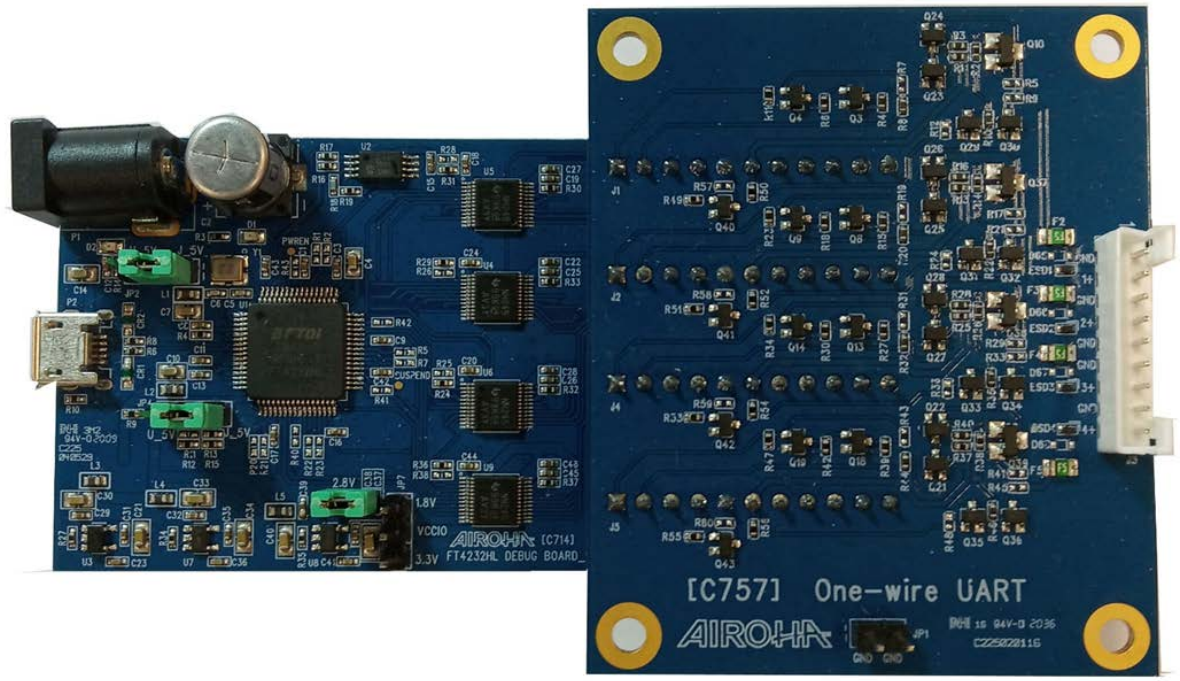


Figure 2-4. Top view of 1-to-4 one-wire UART board

When using AB1565 & AB1568 EVKs with 1-to-4 one-wire UART board, supply power should follow the sequence as below:

1. Connect 1-to-4 one-wire UART board to AB1565 & AB1568 EVKs through One-wire UART 1+ ~ 4+ and GND.
2. Use a DC 5V/3A adapter to supply power to AB1565 & AB1568 EVKs, then turn on the switch on each AB1565 & AB1568 EVK.
3. Use a DC 5V/3A adapter to supply power to the 1-to-4 one-wire UART board.
4. Connect the 1-to-4 one-wire UART board to PC through an USB cable.

Figure 2-5 shows the connection between the 1-to-4 one-wire UART board and AB1565 EVK.

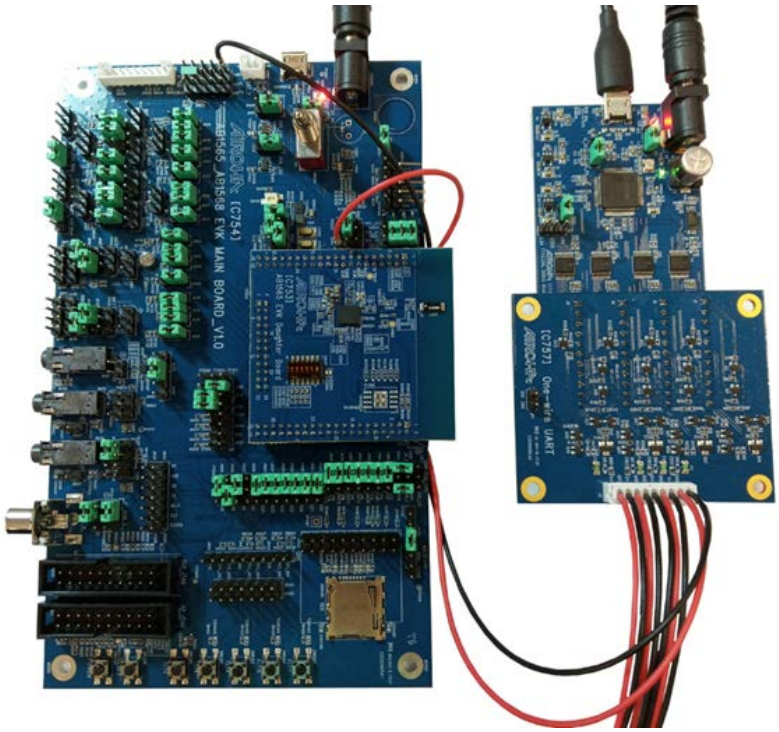


Figure 2-5. Connect AB1565 EVK to 1-to-4 one-wire UART board

Figure 2-6. Connect AB1568 EVK to 1-to-4 one-wire UART board is an example which shows the connection between the 1-to-4 one-wire UART board and an AB1568 EVK.

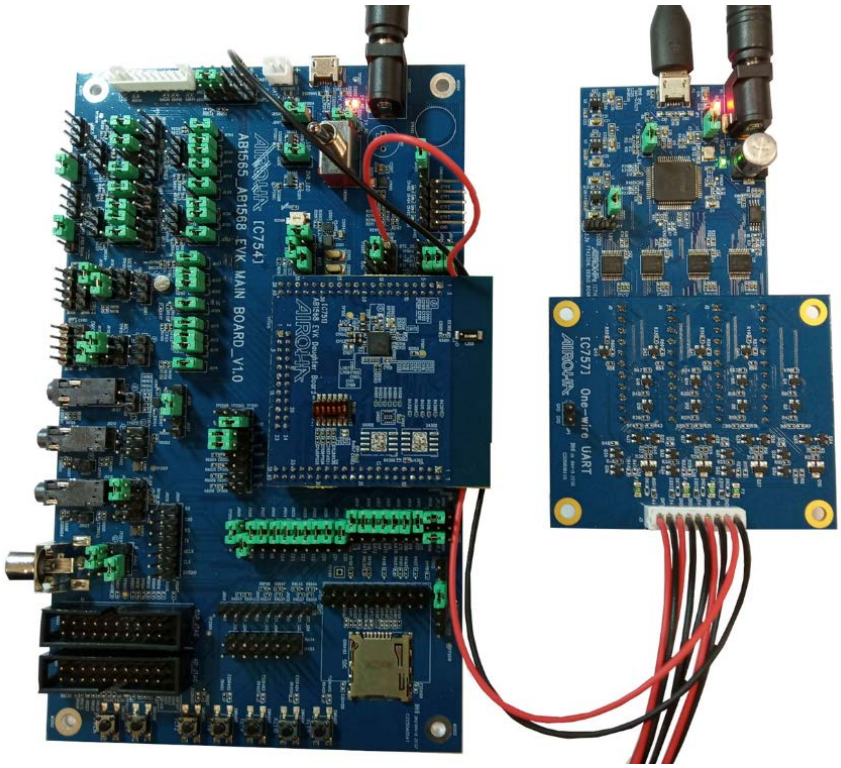


Figure 2-6. Connect AB1568 EVK to 1-to-4 one-wire UART board

Figure 2-7. AB1565 EVK jumper settings and Table 2-1 show the AB1565 EVK (C754) jumper settings for the EVK connected to the 1-to-4 one-wire UART board.

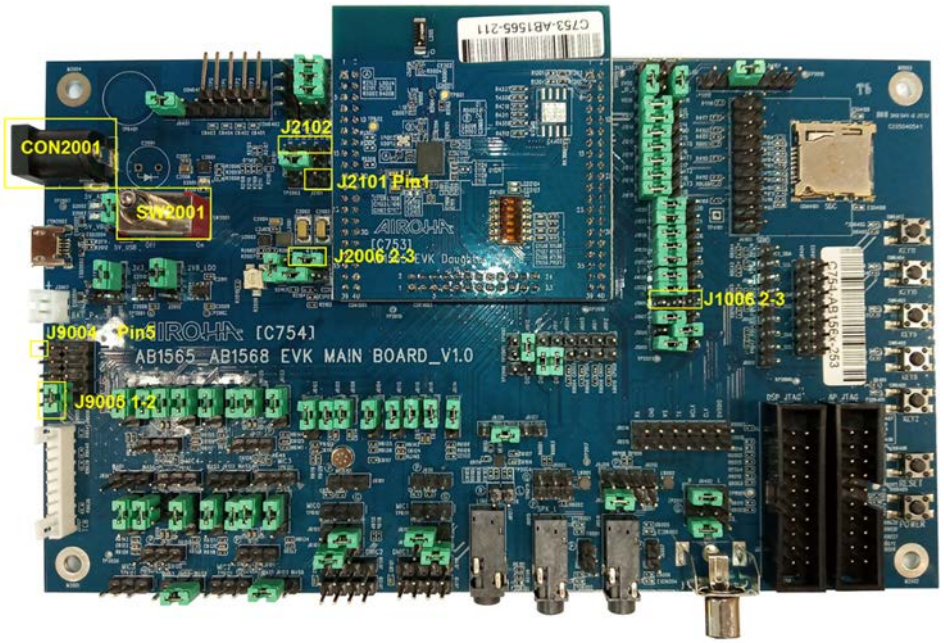


Figure 2-7. AB1565 EVK jumper settings

Table 2-1. AB1565 EVK jumper functions

CON2001	SW2001	J1006 2-3	J2006 2-3	J9005 1-2	J2102	J2101 Pin1	J9004 Pin5
DC 5V/3A adaptor jack	Turn On	Open	Short	Short	Open	VBUS_UART	GND

Figure 2-8 and Table 2-2 show the AB1568 EVK (C754) jumper settings for the EVK connected to the 1-to-4 one-wire UART board.

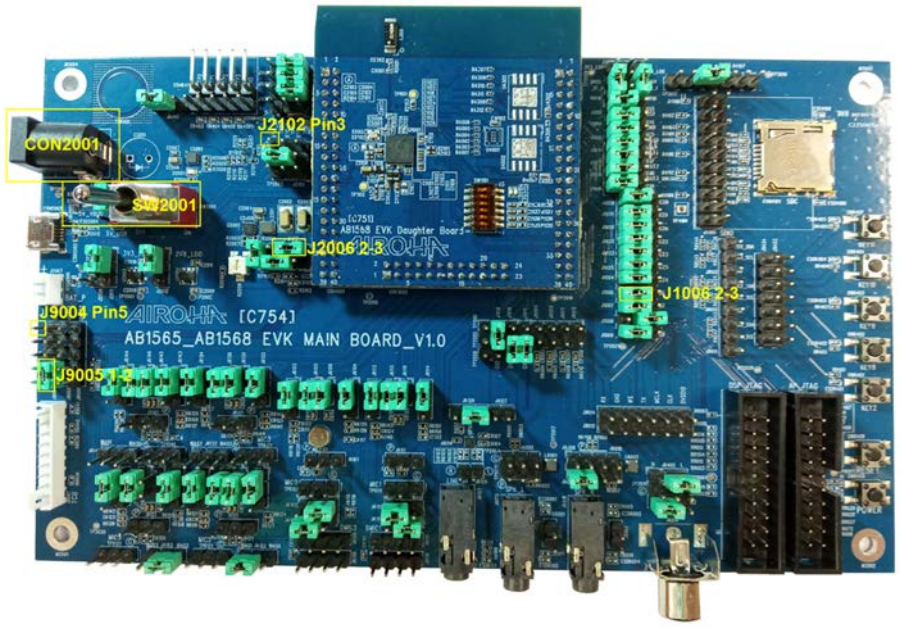


Figure 2-8. AB1568 EVK jumper settings

Table 2-2. AB1568 EVK jumper functions

CON2001	SW2001	J1006 2-3	J2006 2-3	J9005 1-2	J2102 Pin3	J9004 Pin5
DC 5V/3A adaptor jack	Turn On	Short	Short	Short	VBUS_UART	GND

Figure 2-9 shows the jumpers, jacks, and power supply circuit of the 1-to-4 one-wire UART board. Please refer to Table 2-3, Table 2-4, and Table 2-5 for a detailed description of each jumper, jack, and J3 pin define.

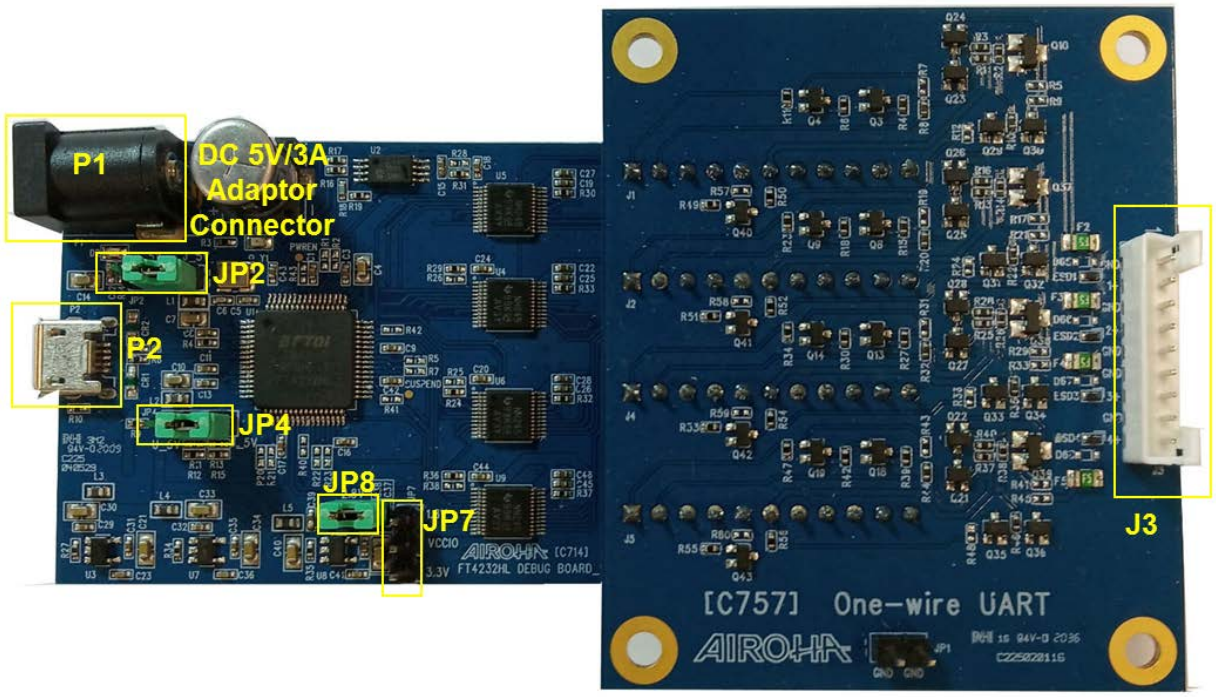


Figure 2-9. 1-to-4 one-wire UART board jumper settings

1-to-4 one-wire UART board Jumpers

Table 2-3. 1-to-4 one-wire UART board jumper functions

Block	Description
JP2	Default is 1-2 short – Use the 5V/3A adaptor to supply power to the 1-to-4 one-wire UART board. Connect the 5V/3A adaptor to P1. 2-3 short – Only use micro-USB to supply power to the 1-to-4 one-wire UART board.
JP4	Default is 2-3 short – Use the 5V/3A adaptor to supply power to the 1-to-4 one-wire UART board. Connect the 5V/3A adaptor to P1. 2-3 short – Only use micro-USB to supply power to the 1-to-4 one-wire UART board.
JP7	Open
JP8	Short

1-to-4 one-wire UART board Jacks

Table 2-4. 1-to-4 one-wire UART board jack list

Block	Description
P1	5V/3A adapter jack
P2	Micro-USB port

J3 pin define

Table 2-5. J3 pin define

Block	Description
Pin1	GND
Pin2	One-wire UART1+
Pin3	GND
Pin4	One-wire UART2+
Pin5	GND
Pin6	GND
Pin7	One-wire UART3+
Pin8	GND
Pin9	One-wire UART4+

2.3. USB-HID setup

To set up the USB-HID is to connect the micro-USB port on the AB1565/AB1568 EVK to the USB port on the PC. It is not necessary to use a 5V/3A adaptor to supply power when you connect the micro-USB port to the EVK. There is a USB-to-UART bridge IC after the micro-USB port on the EVK board. One virtual USB-HID ports appear in Windows Device Manager when the USB port is connected to the PC. The software settings use the USB-HID of EVK device.

Figure 2-10 shows the jumpers of AB1565 USB-HID

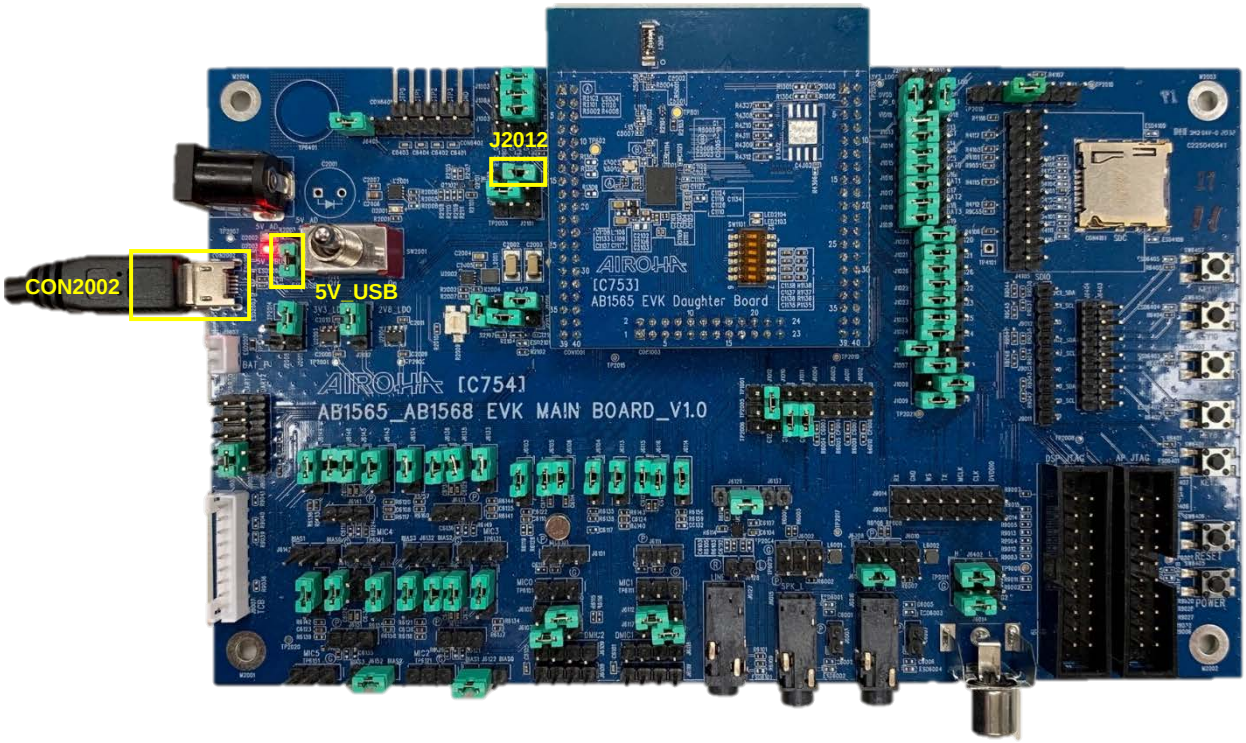


Figure 2-10 AB1565 EVK USB-HID jumper settings

Figure 2-11 shows the jumpers of AB1568 USB-HID

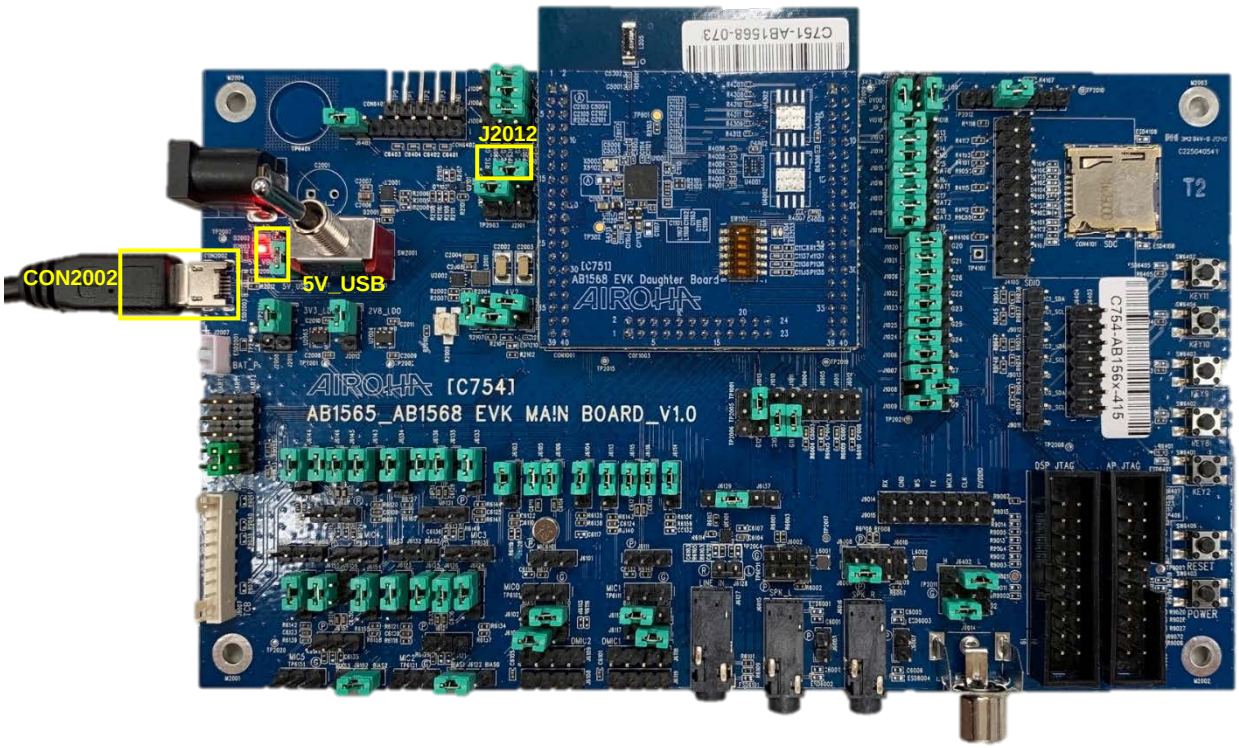


Figure 2-11 AB1568 EVK USB-HID jumper settings

Jumper define can refer to Table 2-1 and Table 2-2.

2.4. Software setup

A third-party driver must be installed because there is one micro-USB port and USB-to-RS232 converter on the 1-to-4 one-wire UART board (CDM v2.12.00 WHQL Certified.exe).

To install the driver:

1. Open the drivers folder.
2. Double-click “CDM v2.12.00 WHQL Certified.exe”
    a. Follow the prompts to install the FTDI driver.

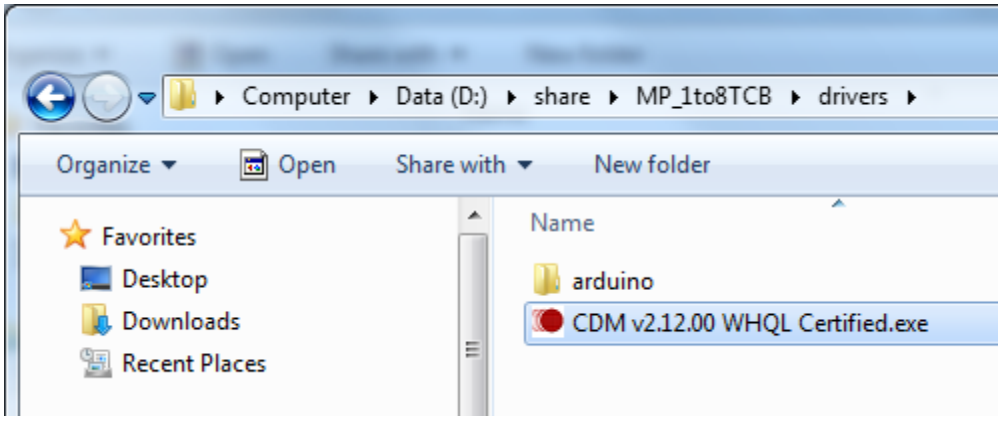


Figure 2-12 FTDI driver

Four COM ports appear when the 1-to-4 one-wire UART board is connected, as shown in Figure 2-13.

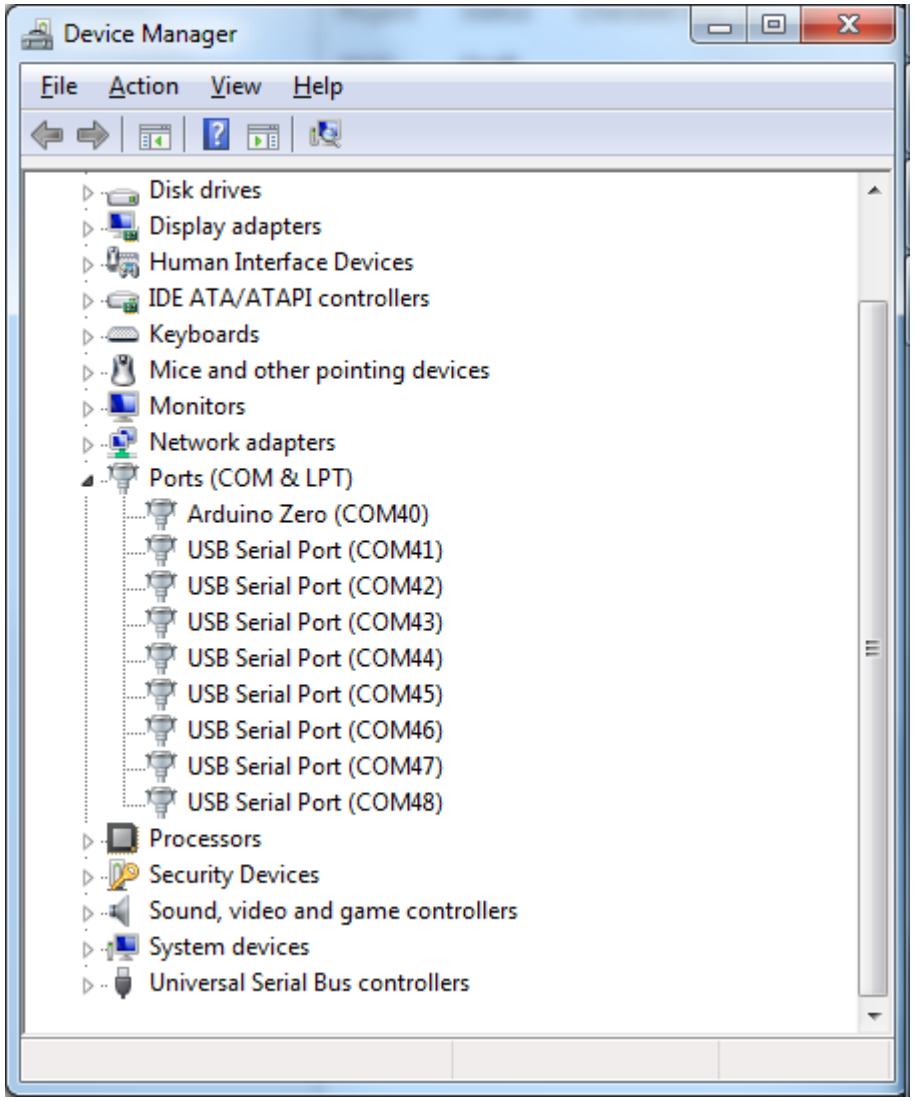


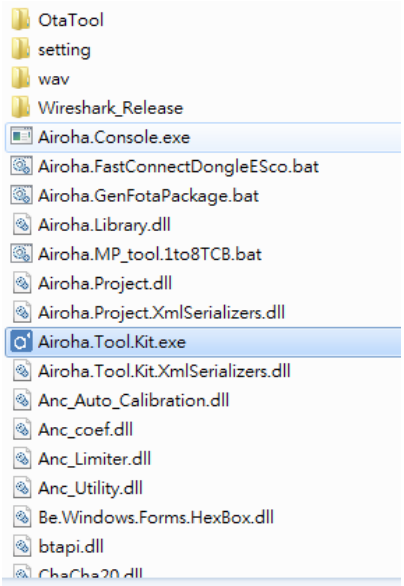
Figure 2-13. Driver installed device manager

3. Pairing Tool User Interface

The Pairing Tool is used for pairing devices with an Airoha chip. The processes include MCSync Pairing, LE Audio, dongle headset and dongle MCSync. The following procedure and images show how to operate the Pairing Tool on AB1565 and AB1568.

To operate the Pairing Tool:

1) Open the AB1565_AB1568 _Airoha_Tool_Kit(ATK) folder.
2) Double click Airoha.Tool.Kit.exe.
3) Click the “Pairing Tool” icon as shown in the following image.



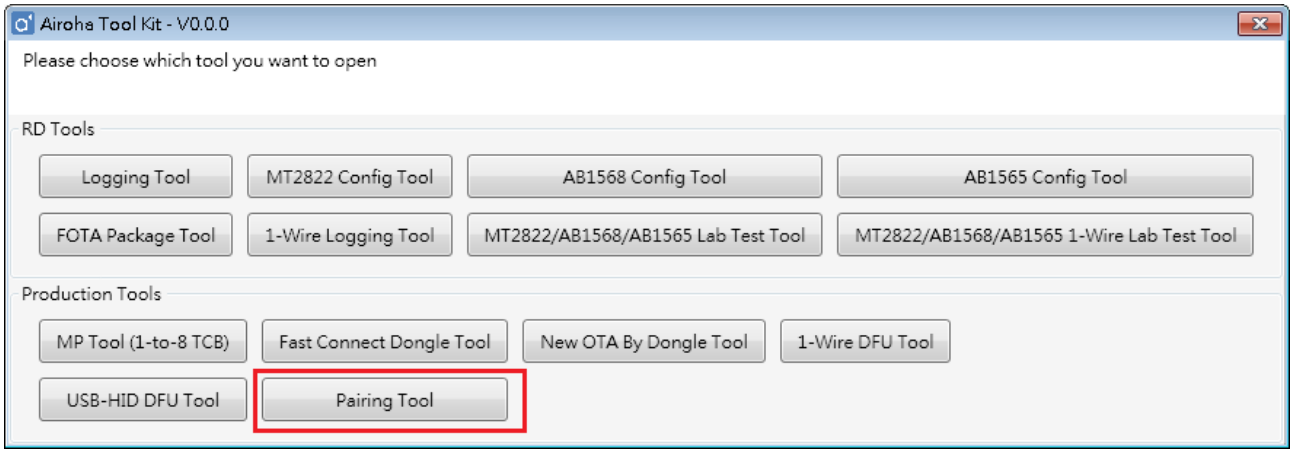


Figure 3-1. Launch Pairing tool

The Pairing Tool creates a log file for each DUT. The log files are saved in the working folder, as shown in Figure 3-2.

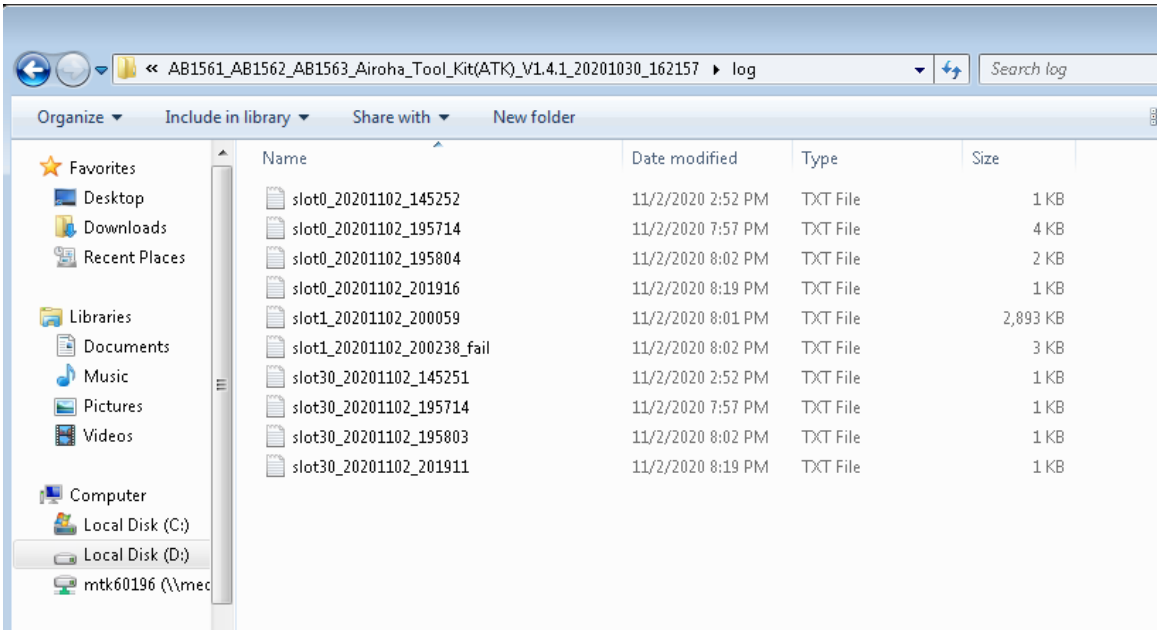


Figure 3-2. Log list in file manager

Figure 3-3 shows the process of pairing tool. Please select first.

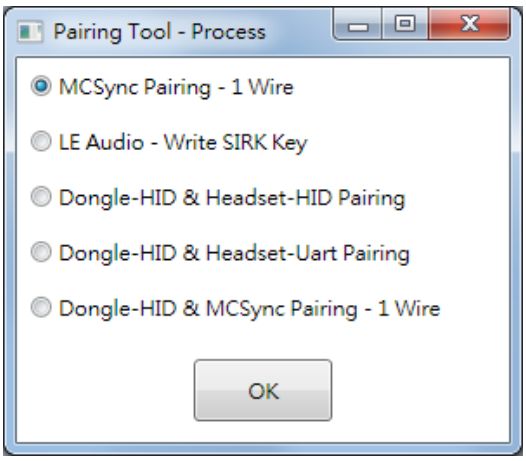


Figure 3-3. Tool test progress

Figure 3-4、Figure 3-5、Figure 3-6、Figure 3-7、Figure 3-8 show the setup progress of each process.

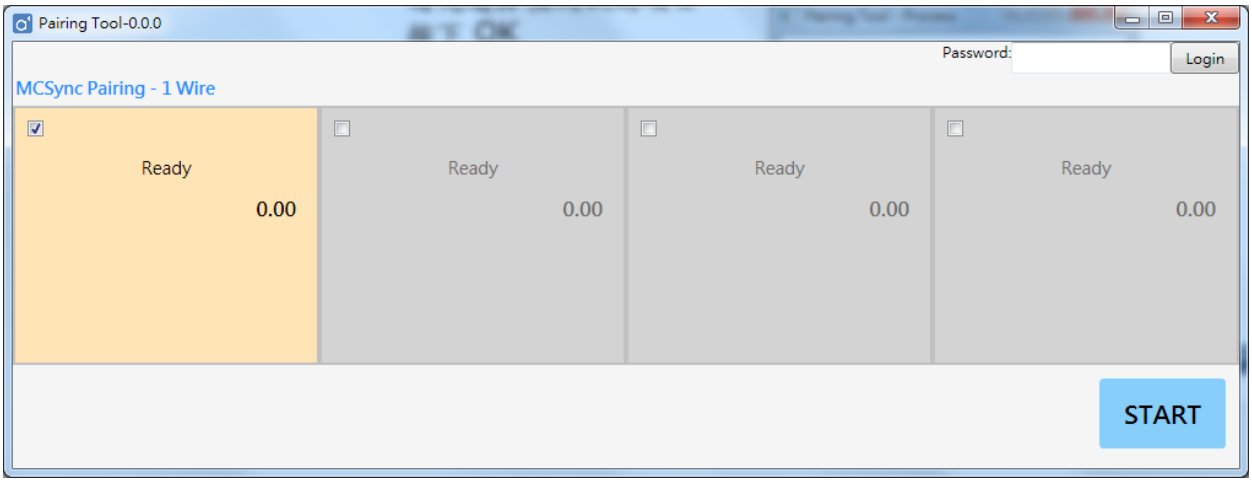


Figure 3-4. Tool setup progress – MCSync Pairing 1 Wire

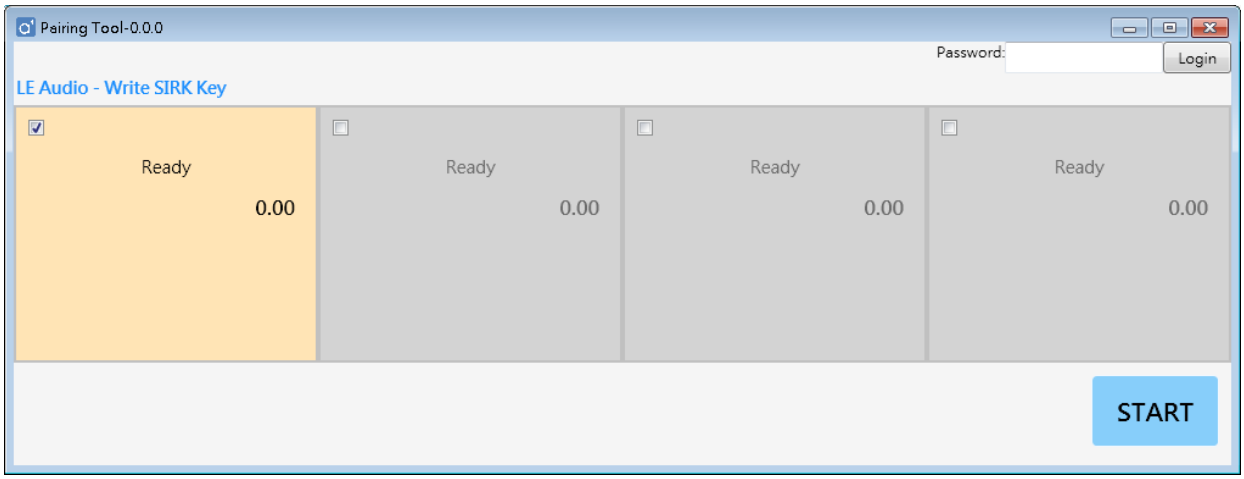


Figure 3-5. Tool setup progress – LE Audio Write SIRK Key

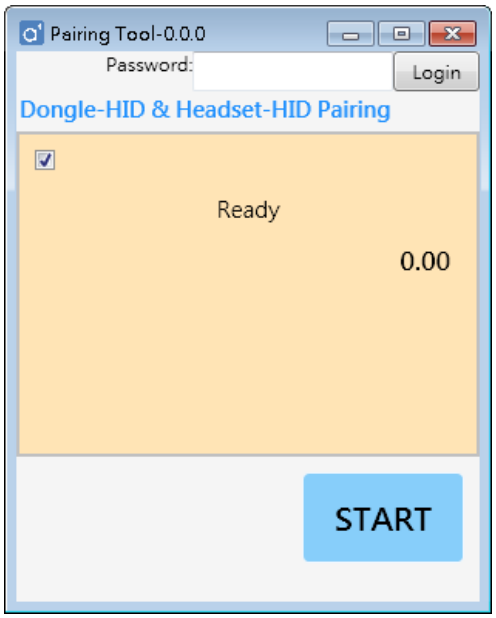


Figure 3-6. Tool setup progress – Dongle HID & Headset HID Pairing

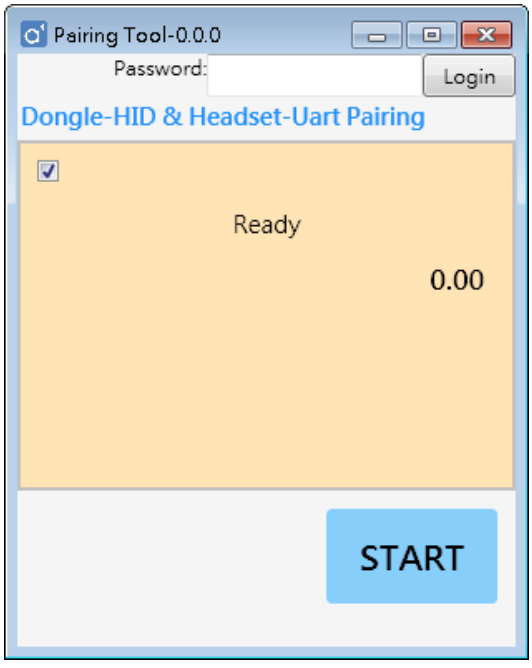


Figure 3-7. Tool setup progress - Dongle HID & Headset Uart Pairing

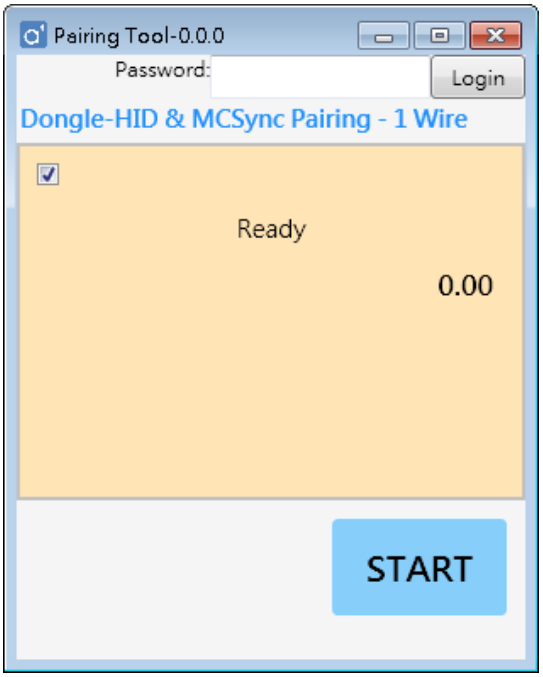


Figure 3-8. Tool setup progress- Dongle HID & MCSync Pairing 1 Wire

The quick start procedure is as follows:

1. Log in. A password is necessary. The default password is 11111.
2. Set the test parameters on the **Setting Form** for the selected test item(s).
3. Select the checkbox to select the DUT for testing. The DUTs are shown in the same sequence as the COM port settings and Dongle settings.
4. Click the "**START"** button to start testing the DUTs.
5. Set up the second panel if necessary.
6. Select the DUT testing checkbox.
7. Click the "**START**" button to start testing DUTs.

If the DUT passes all tests, the corresponding DUT button is green, as shown in Figure 3-9、 Figure 3-10 and Figure 3-11.

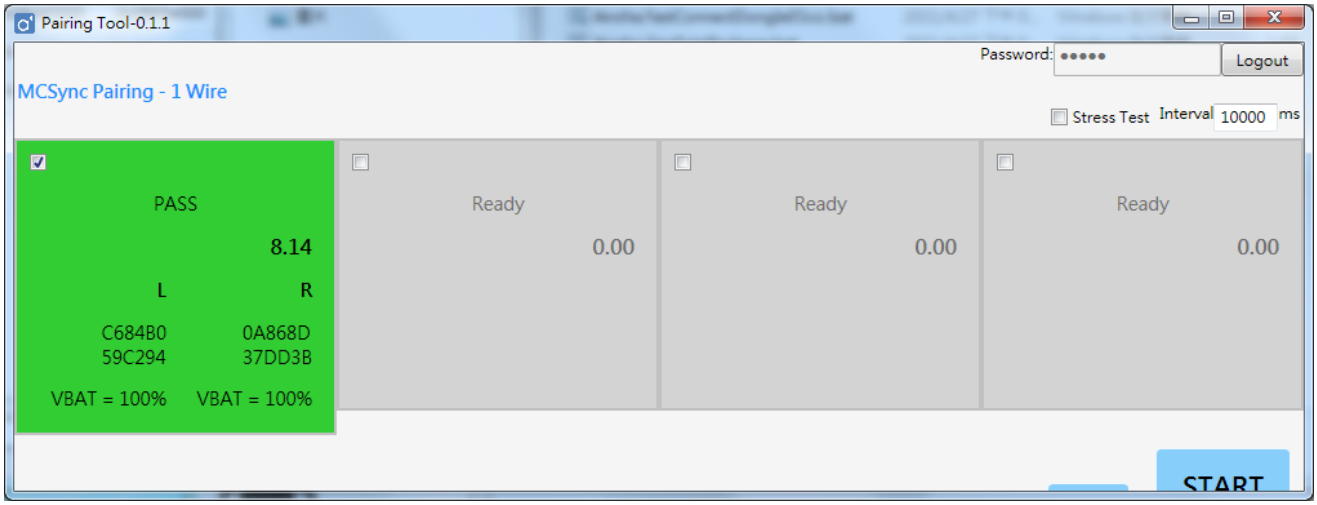


Figure 3-9. Test pass result of MCSync Pairing – 1 Wire and LE Audio SIRK

Figure 3-10. Test pass result of Dongle HID Headset HID(Uart) Pairing

Figure 3-11. Test pass result of Dongle HID & MCSync Pairing -1 Wire

If the DUT fails a test, the corresponding DUT button is red, as shown in Figure 3-12 and Figure 3-13.

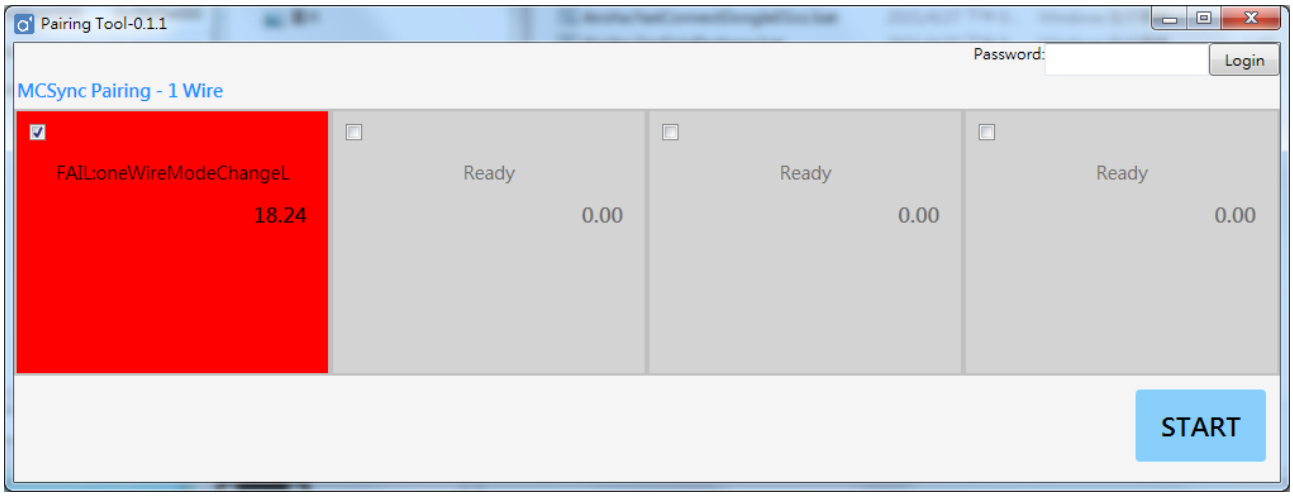


Figure 3-12. Test fail result of MCSync Pairing – 1 Wire and LE Audio SIRK

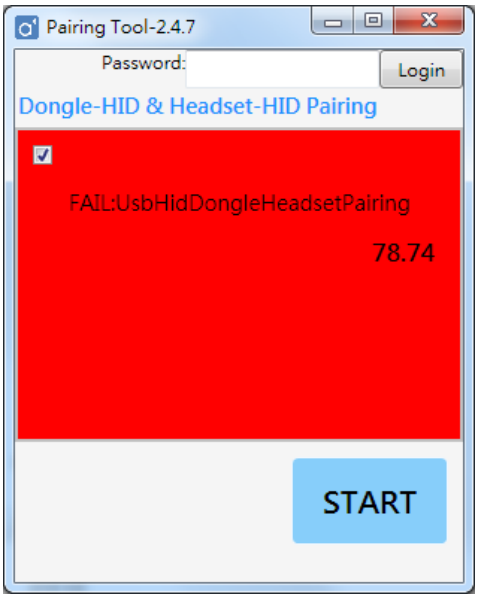


Figure 3-13. Test fail result of Dongle HID Headset HID(Uart) Pairing and Dongle HID & MCSync Pairing -1 Wire

4. Parameter Setting

4.1. Test items

The Pairing Tool operation procedure is explained as below. Please refer to Figure 4-1, Figure 4-2, Figure 4-3, Figure 4-4 and Figure 4-5.

1. Select a specific COM port on the Device1WireUart-down list and Device's Headset_Uart-down list.
2. DeviceUSBHID and Device's Dongleis fixed and need to set Vender ID and Product ID.
3. Set detail item for each test.

4.2. MCSync Pairing - 1 Wire Uart

MCSync setting is saved by NV key 0xF2B0.

The operating environment is described as follows. Please refer to Figure 4-1.

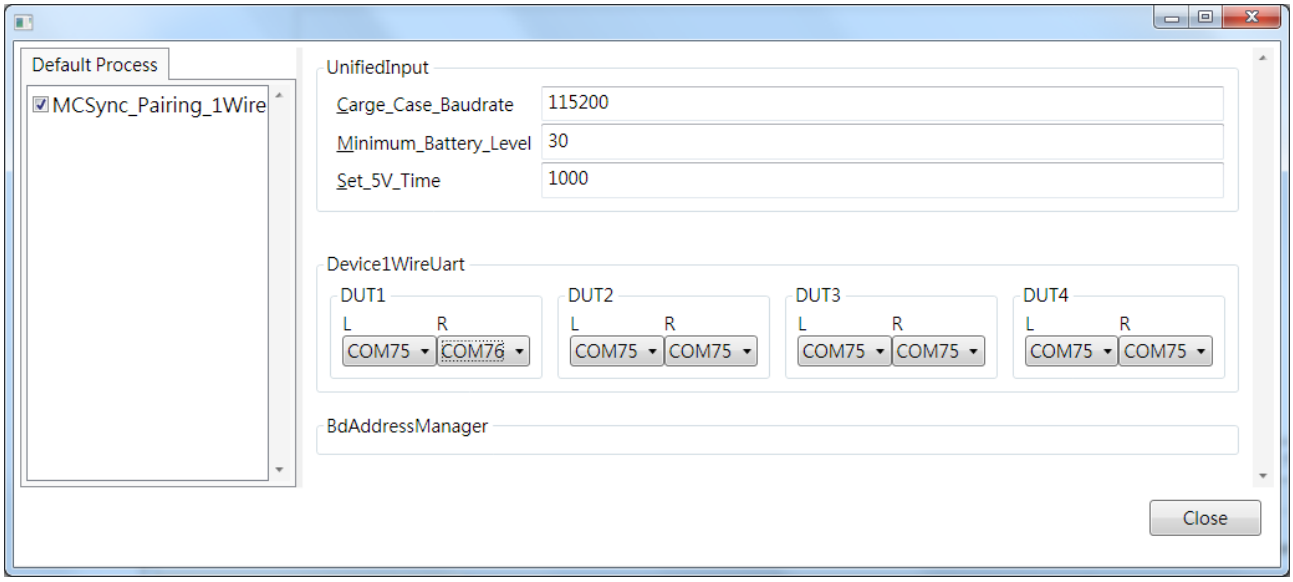


Figure 4-1. Task item - MCSync Pairing 1Wire settings

4.3. LE Audio Write SIRK Key

SIRK Key is saved by NV key 0x1900.

This process is to write SIRK Key, it is random 16 bytes as shown in Figure 4-2.

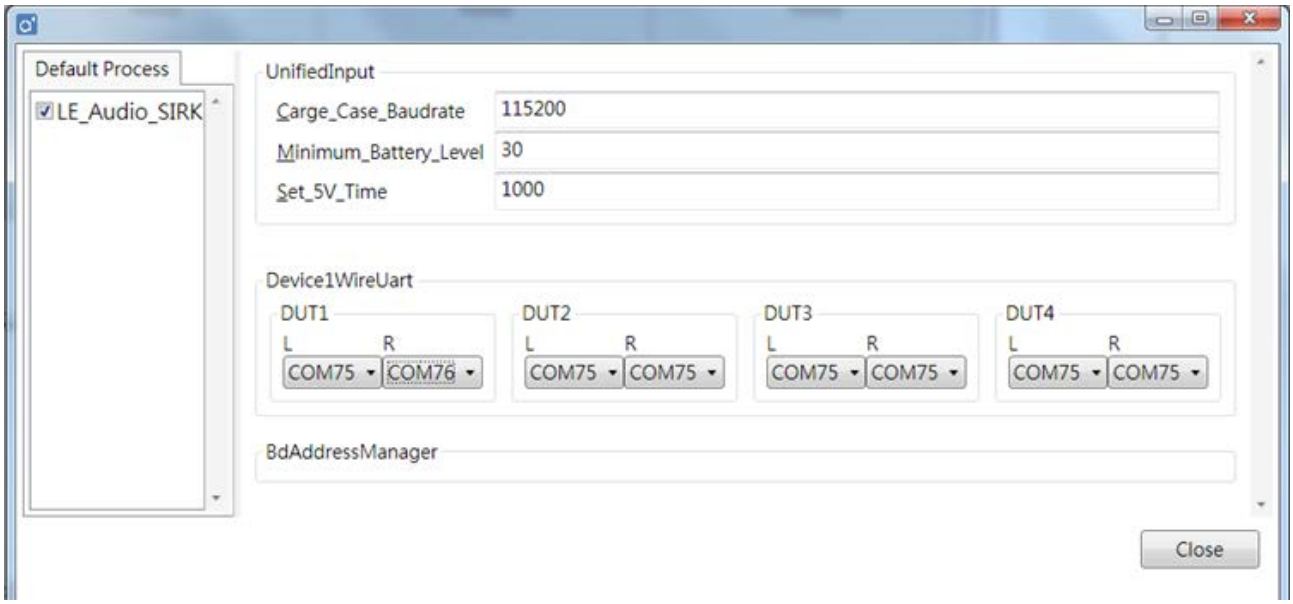


Figure 4-2. Task item - LE Audio SIRK settings

4.4. Dongle HID & Headset HID Pairing

This pairing setting is saved by NV key 0x1815.

The USB-HID of Dongle and Headset Pairing, it is necessary for setting the Vender_ID_Dongle、Product_ID_Dongle and Vender_ID_Headset、Product_ID_Headset as shown in Figure 4-3.

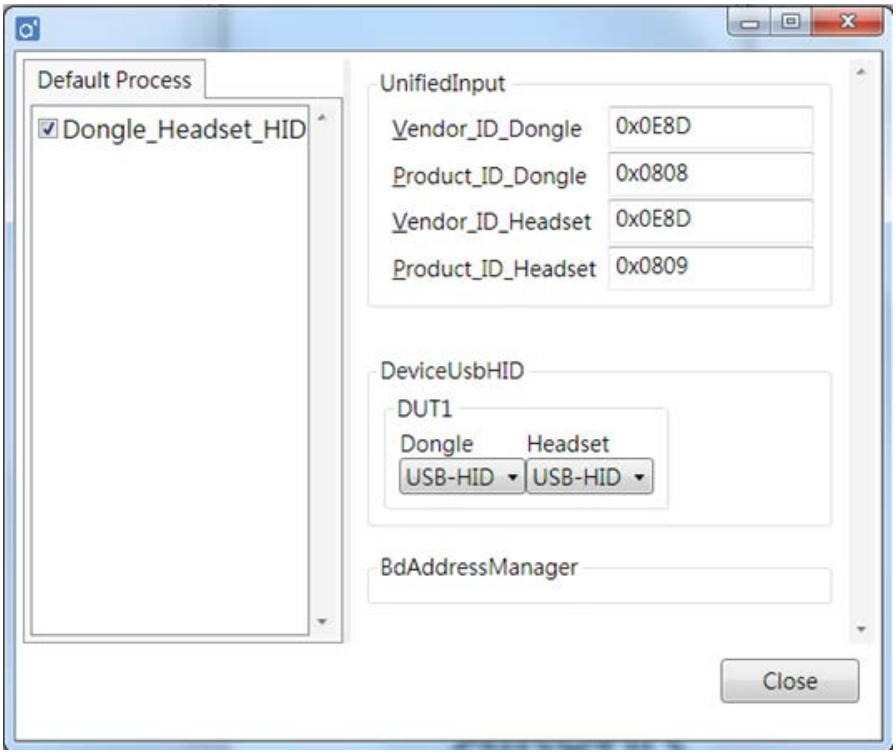


Figure 4-3. Task item - Dongle Headset HID Settings

4.5. Dongle HID & Headset Uart Pairing

This pairing setting is saved by NV key 0x1815.

Dongle HID & Headset Uart Pairing, it also needs to set Vendor_ID_Dongle and Product_ID_Dongle as shown in Figure 4-4.

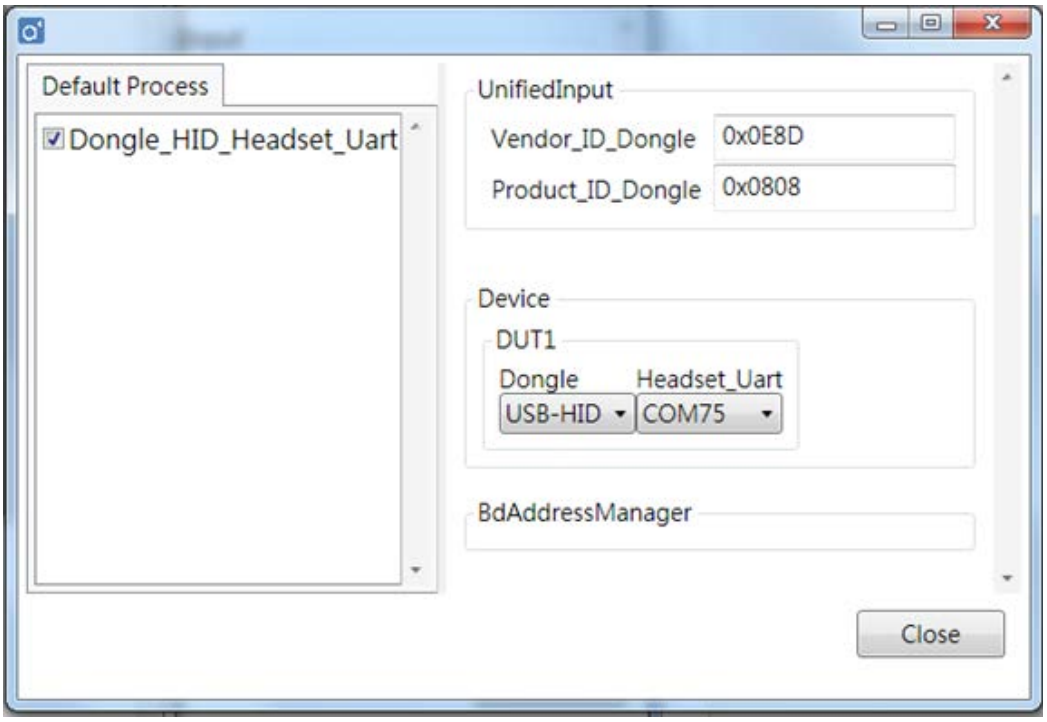


Figure 4-4. Task item - Dongle HID Headset Uart Settings

4.6. Dongle HID & MCSync Pairing 1Wire

This pairing setting is saved by NV key 0x1815 and NV Key 0xF2B0.

Dongle HID & MCSync Pairing 1Wire, it also needs to set Vendor_ID_Dongle and Product_ID_Headset as shown in Figure 4-5.

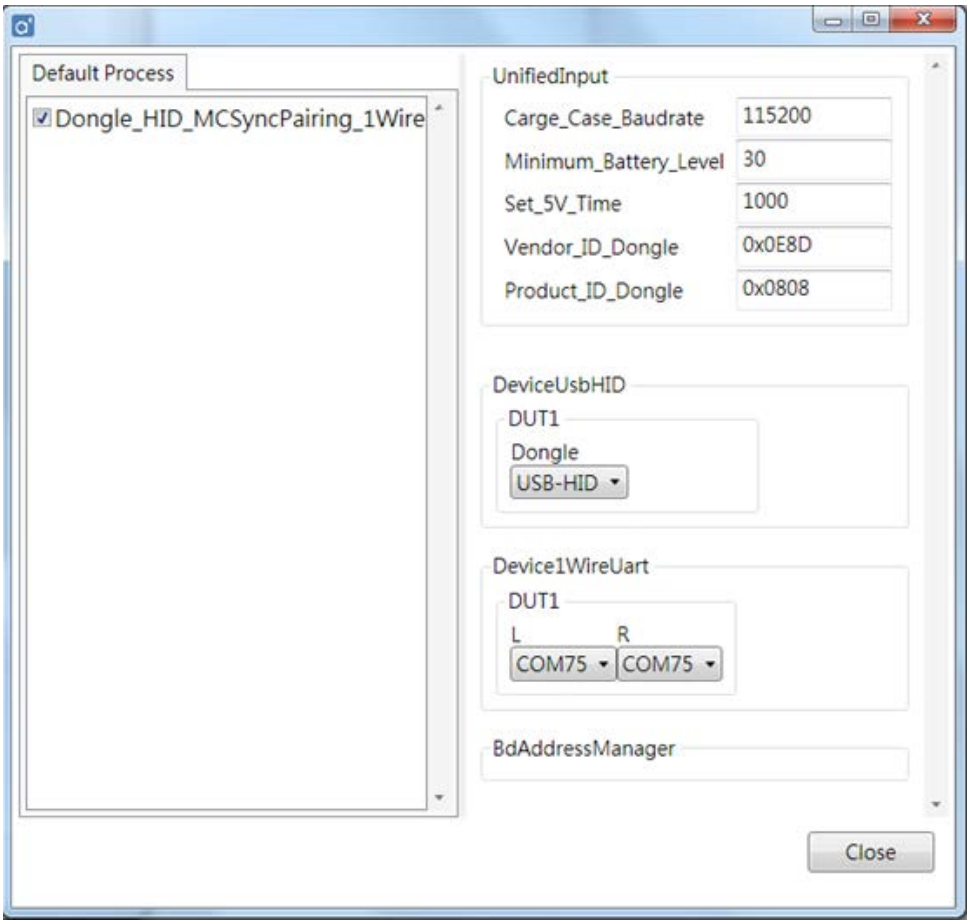


Figure 4-5. Task item - Dongle HID MCSync Pairing 1Wire Settings

4.7. Summary

Please make sure to pay attention to the following items:

Please use AB1565_AB1568_Airoha_Tool_Kit(ATK)_v2.4.3 or a newer version to AB1565/AB1568 series chipsets.