AB1565/AB1568 Mass Production Pack Users Guide

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Document revision history

Revision	Date	Description
1.0	13 July 2020	Initial version
1.1	19 May 2022	Modify Chapter 1.3

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Table of contents

1. Introduction 1
1.1. Overview 1
1.2. Supported chips 1
1.3. Required Software 1
2. Environment Setup 2
2.1. Hardware setup 4
2.2. Power supply of 1-to-8 TCB 5
2.3. Software setup 12
3. Mass Production Tool User Interface 15
4. Parameter Setting 18
4.1. Test items 18
4.2. Crystal trim 18
4.3. BD address management 19
4.4. Write/Verify SPI flash 19

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Lists of tables and figures

Table 2-1. EVK jumper functions 10
Table 2-2. 1-to-8 TCB jumper functions 10
Table 2-3. 1-to-8 TCB jack list 11
Table 2-4. 1-to-8 TCB switch list 11

Figure 2-1. Connectors on 1-to-8 TCB 2
Figure 2-2. 1-to-8 Connection block diagram 3
Figure 2-3. 1 to 16 connection block diagram 4
Figure 2-4. 1 to 16 connection block diagram 5
Figure 2-5. Top view of 1-to-8 TCB 6
Figure 2-6. Top view of 1-to-8 TCB for AB1565/AB1568 7
Figure 2-7. Connect AB1565/AB1568 EVK to 1-to-8 TCB 7
Figure 2-8. Connect AB1565/AB1568 PCBA to 1-to-8 TCB 8
Figure 2-9. EVK jumper settings 8
Figure 2-10. 1-to-8 TCB jumper settings 10
Figure 2-11. Driver install prompt dialog 12
Figure 2-12 FTDI driver 13
Figure 2-13. Driver installed device manager 14
Figure 3-1. Launch mass production tool 15
Figure 3-2. Log list in file manager 15
Figure 3-3. Tool setup progress 16
Figure 3-4. Test pass result 17
Figure 3-5. Test fail result 17
Figure 4-1. Setting dialog 18
Figure 4-2. Task item crystal trim settings 19
Figure 4-3. Task BD address settings 19
Figure 4-4. Task write flash settings 20

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1. Introduction

1.1. Overview

This document describes the AB1565 AB1568 Mass Production Pack provided by Airoha Technology. The goal of the Mass Production Pack is to provide a utility to test an AB1568 device's functionality while on a production line and without the need for additional equipment.

The Mass Production Pack contains the following hardware and software items:

- 1-to-8 Test Control Board (TCB) – Enables communication with the Mass Production Tool application.
- Mass Production Tool (MP Tool) – A software application running on the Microsoft Windows operating system.

The following functionality is provided by this pack:

- Write/Verify Flash
- Crystal Trim

1.2. Supported chips

The Airoha AB1565 AB1568 Mass Production Tool supports AB1565 and AB1568.

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 Mass Production Tool.

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2. Environment Setup

A complete set of a testing suite includes:

- PC x 1 (running Windows XP operating system or later)
- Dedicated 1-to-8 TCB for AB1565/AB1568 only (provided by Airoha)
- Mini-USB-5P cables x 1
- 5V/3A adapter (provided by Airoha)
- MP Tool application (provided by Airoha)

Figure 2-1 shows a dedicated 1-to-8 TCB forAB1565/AB1568. The user must connect the DC 5V/3A adapter to supply power to the TCB. To avoid any instability caused by supply-related issues, we suggest using the 5V/3A adapter that is provided by Airoha.

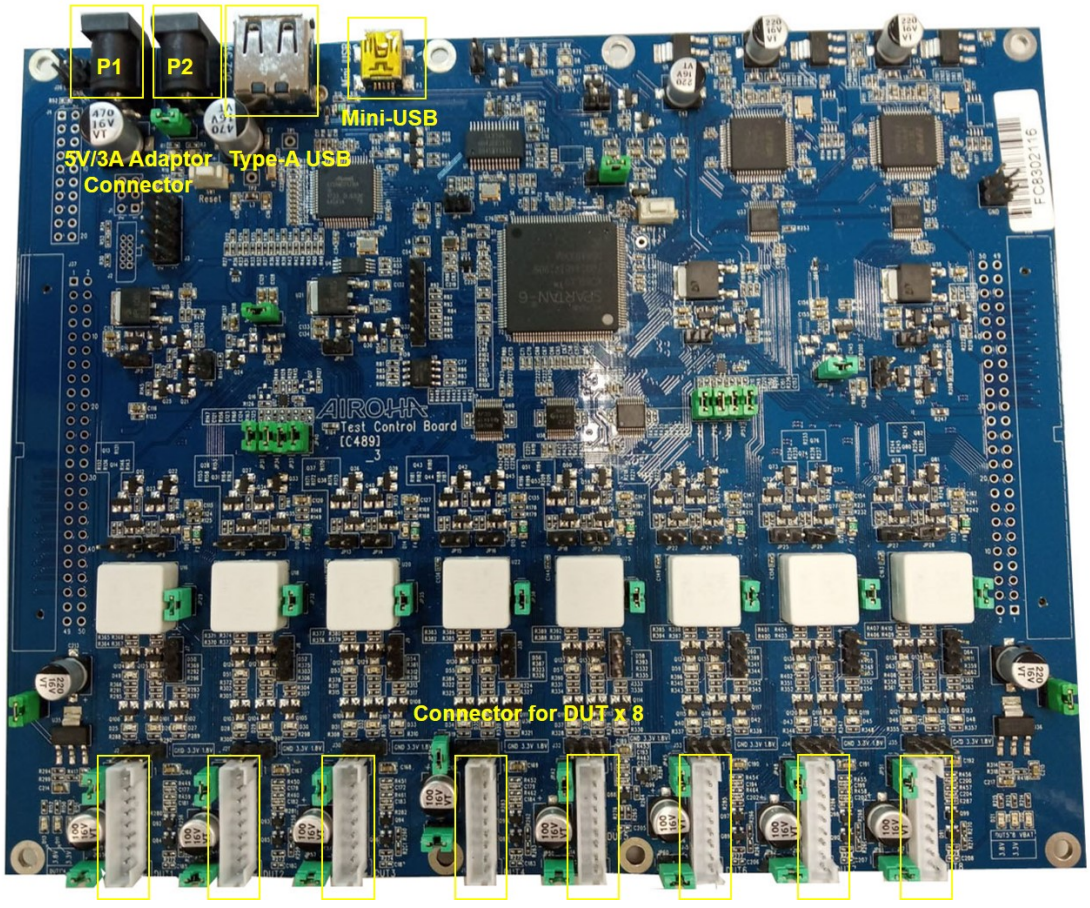

Figure 2-1. Connectors on 1-to-8 TCB

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Figure 2-2 shows a reference connection setup between a PC, the 1-to-8 TCB, and the DUT.

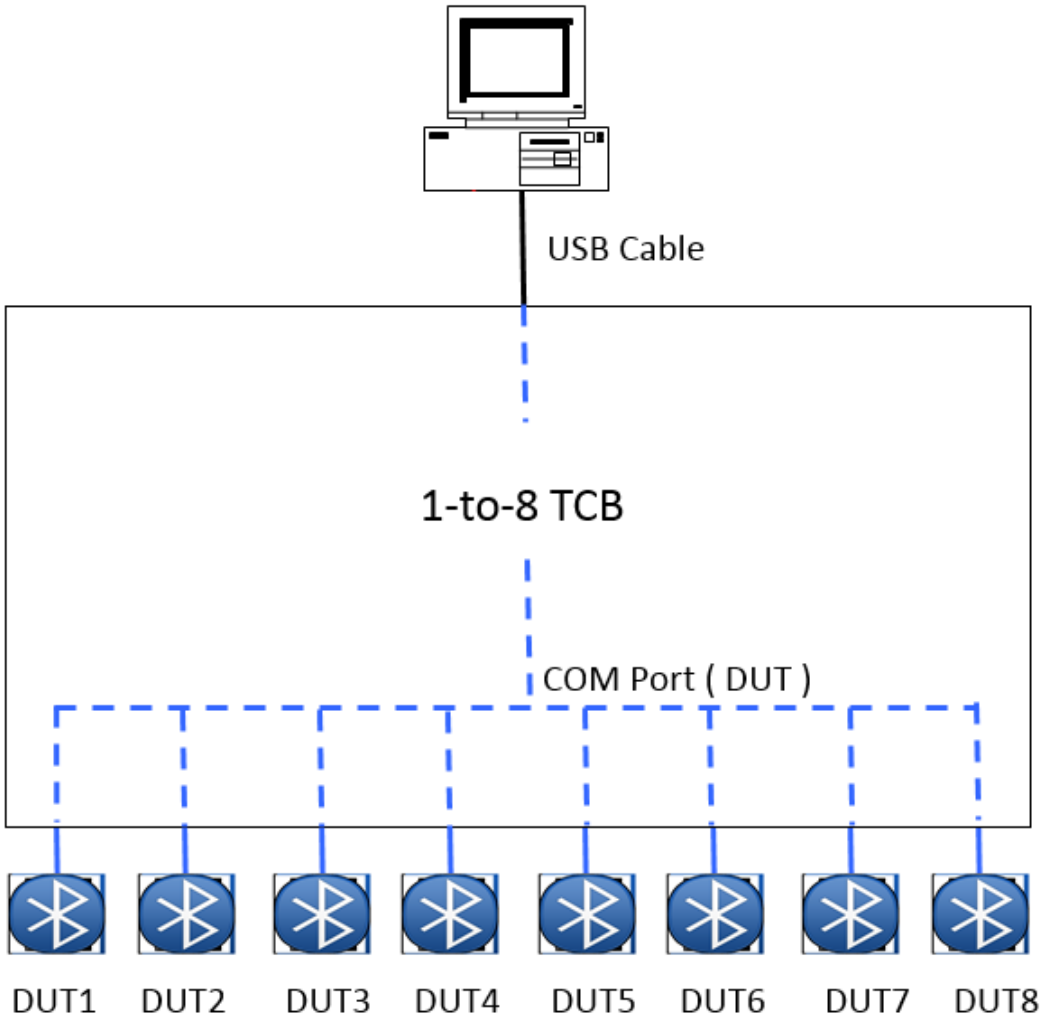

Figure 2-2. 1-to-8 Connection block diagram

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2.1. Hardware setup

There is one mini-USB port on the 1-to-8 TCB for the connection to the PC. You must use a DC 5V/3A adaptor to supply power to the 1-to-8 TCB before you connect the mini-USB port to the PC. There is a USB-to-UART bridge IC after the mini-USB port on the 1-to-8 TCB. Eight virtual UART ports (as USB-to-Serial bridges) appear in Windows Device Manager when the USB port is connected to the PC. Eight UART ports are then detected when the 1-to-8 TCB is connected to the PC through the mini-USB port. The software settings use the COM port number of each device.

There is one Type-A USB port on the 1-to-8 TCB and it can be connected to the second 1-to-8 TCB. You must use a DC 5V/3A adaptor to supply power to the second 1-to-8 TCB before you connect the mini-USB port to the Type-A USB port on the first 1-to-8 TCB. When the mini-USB port on the second 1-to-8 TCB is connected to the Type-A USB port on the first 1-to-8 TCB, 16 virtual UART ports (as USB-to-Serial bridges) appear in Windows Device Manager. 16 UART ports are then detected when the TCB is connected to the PC through the mini-USB port. The software settings use the COM port number of each device. Figure 2-3 shows the setup between the PC, two 1-to-8 TCBs, and the DUT.

1-to-16 TCB Setup

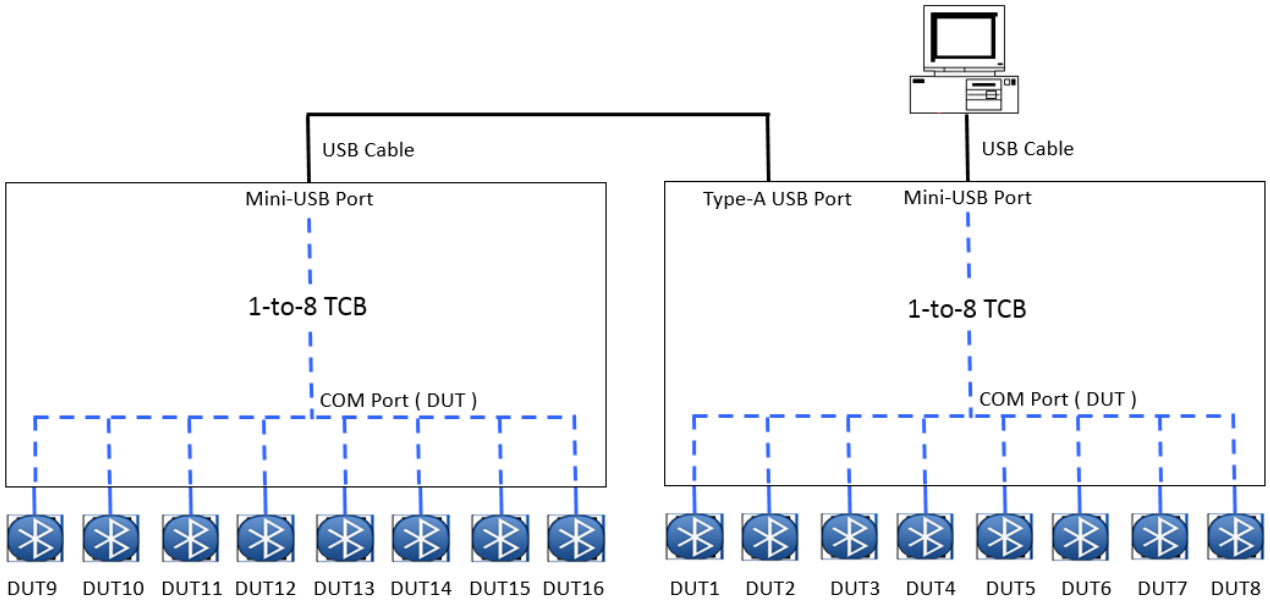

Figure 2-3. 1 to 16 connection block diagram

The other way to set up the 1-to-16 TCB is to connect the mini-USB port on the second 1-to-8 TCB to another USB port on the PC. You must use a DC 5V/3A adaptor to supply power to the second 1-to-8 TCB before you connect the mini-USB port to a USB port on the PC. When the mini-USB port on the second 1-to-8 TCB is connected to a USB port on the PC, 16 virtual UART ports (as USB-to-Serial bridges) appear in Windows Device Manager. 16 UART ports are then detected when the two TCBs are connected to the PC through the mini-USB ports. The software settings use the

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COM port number of each device. Figure 2-4 shows the setup between the PC, two 1-to-8 TCBs, and the DUT.

1-to-16 TCB Setup

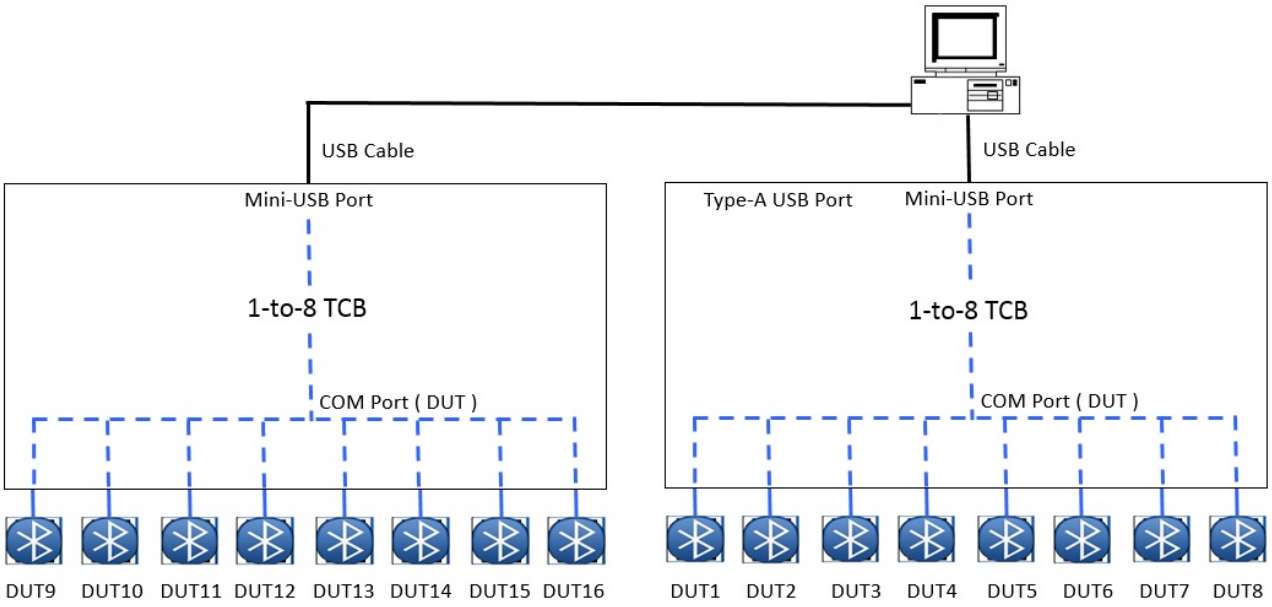

Figure 2-4. 1 to 16 connection block diagram

2.2. Power supply of 1-to-8 TCB

Power is supplied to the 1-to-8 TCB by a 5V/3A DC power supply. You must use a DC 5V/3A adaptor to supply power to the 1-to-8 TCB before you connect the mini-USB port to the PC. We strongly recommend using the 5V/3A power adaptor provided by Airoha for the 1-to-8 TCB to prevent any instability problem that can be caused by supply-related issues.

- DC 5V/3A – Use a DC 5V/3A adapter to supply power to the 1-to-8 TCB.
- VCCIO – The 1-to-8 TCB MP Tool can automatically select 1.8V or 3.3V for VCCIO on the 1-to-8 TCB. However, you must manually set VCCIO to 1.8V or 3.3V on the evaluation kit (EVK).

Figure 2-5 shows the top view of the 1-to-8 TCB.

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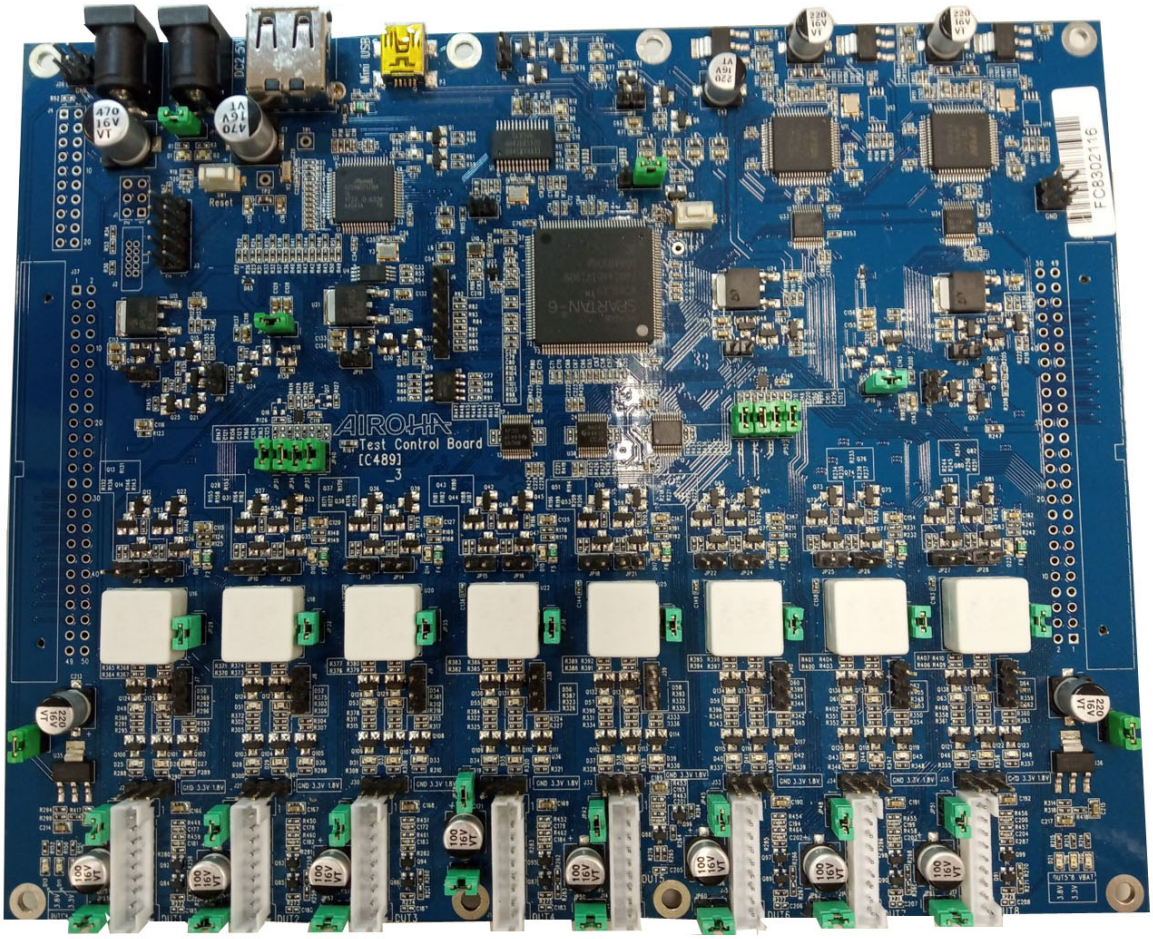

Figure 2-5. Top view of 1-to-8 TCB

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Figure 2-6 shows the top view of the 1-to-8 TCB with its case. Note that 1-to-8 TCB is only for AB1565/AB1568.

Figure 2-6. Top view of 1-to-8 TCB for AB1565/AB1568

Figure 2-7 is an example which shows the connection between the 1-to-8 TCB and AB1565 EVK.

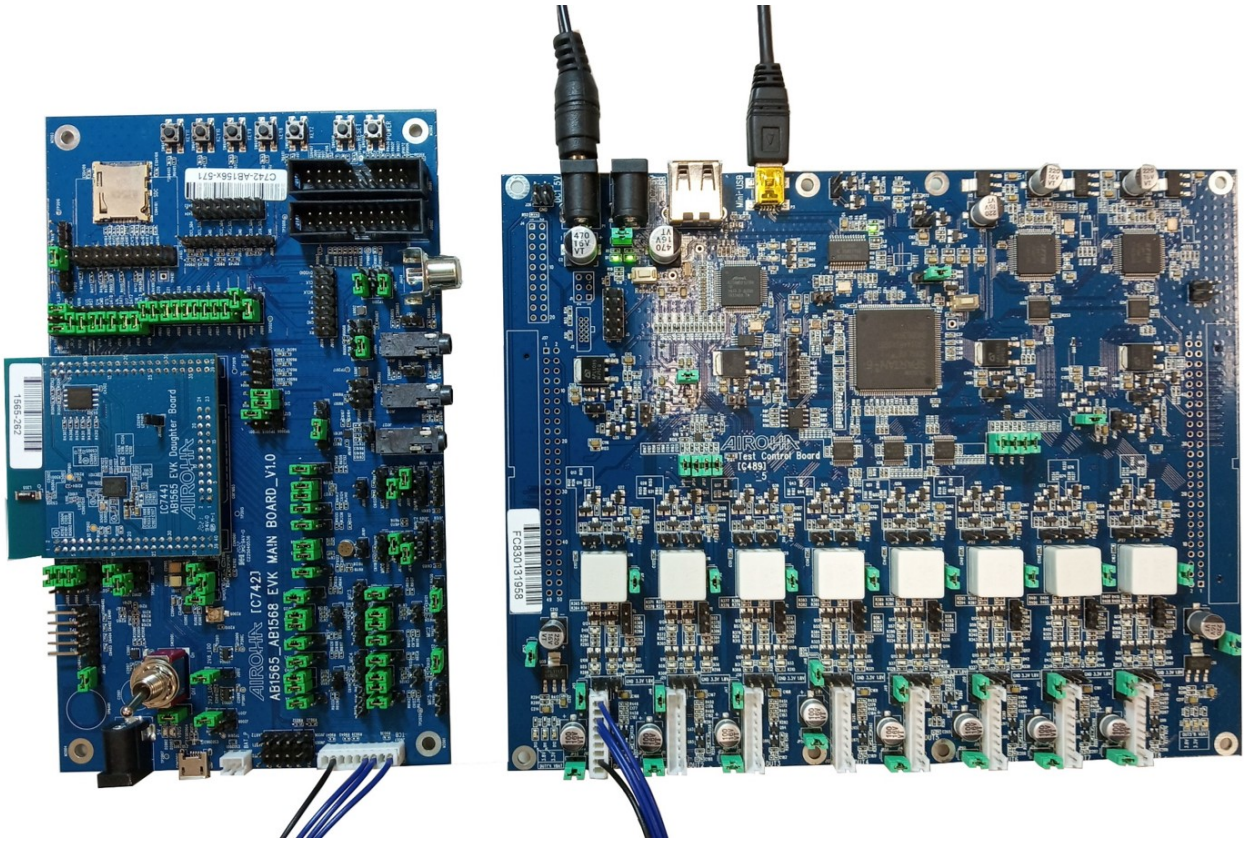

Figure 2-7. Connect AB1565/AB1568 EVK to 1-to-8 TCB

Figure 2-8 is an example which shows the connection between the 1-to-8 TCB and an AB1565/AB1568 PCBA.

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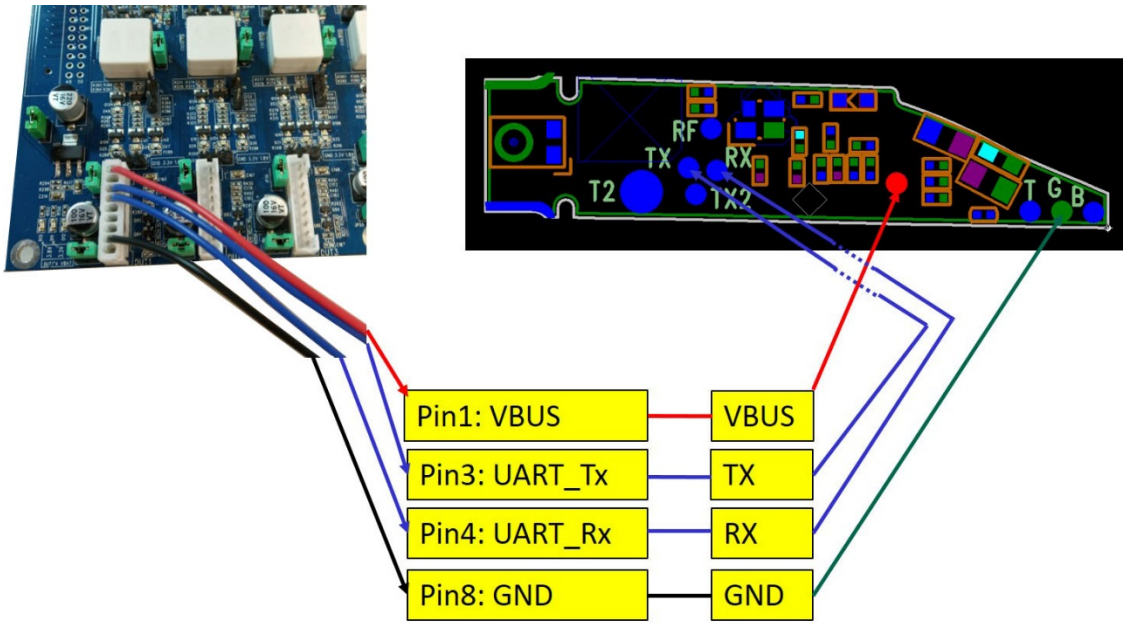

Figure 2-8. Connect AB1565/AB1568 PCBA to 1-to-8 TCB

Figure 2-9 and Figure 2-10 show the AB1565/AB1568 EVK (C732) jumper settings for the EVK connected to the 1-to-8 TCB.

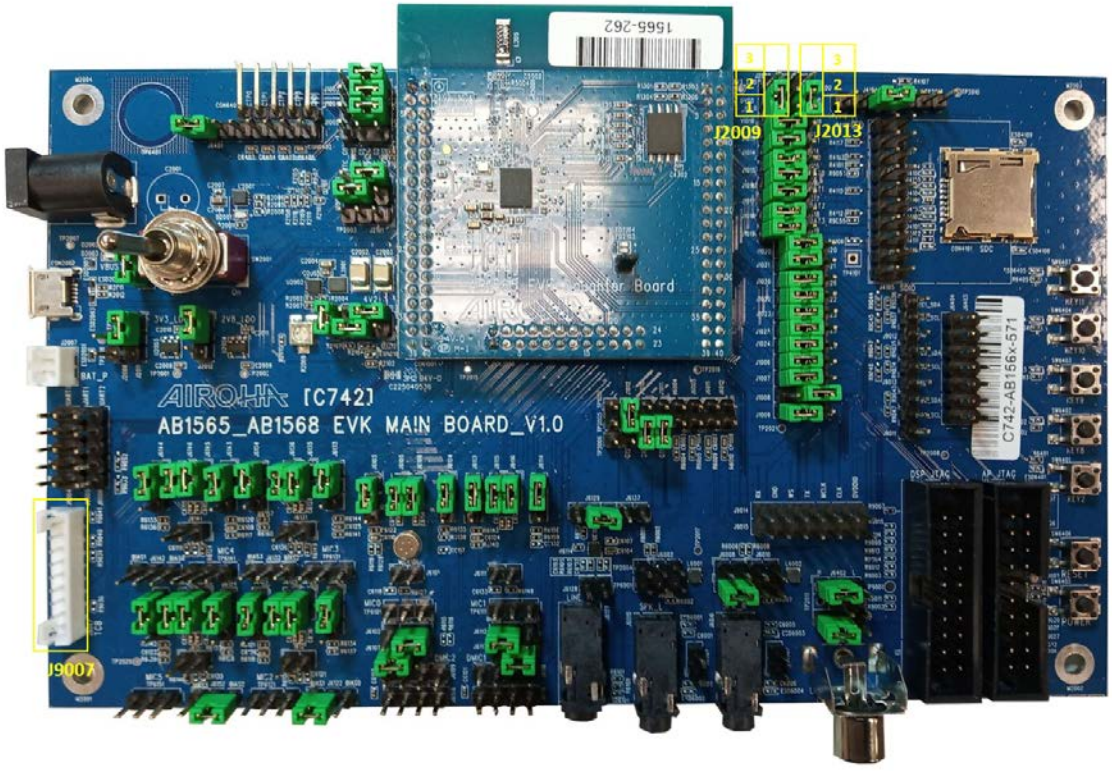

Figure 2-9. EVK jumper settings

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Table 2-1. EVK jumper functions

J9007	J2009	J2013
Connector for TCB to EVK	1-2: DVDD_IO_0 1.8V 2-3: DVDD_IO_0 3.3V	1-2: DVDD_IO_1 1.8V 2-3: DVDD_IO_1 3.3V

Figure 2-10 shows the jumpers, jacks, and power supply circuit of the 1-to-8 TCB. Please refer to Table 2-2, Table 2-3, and Table 2-4 for a detailed description of each jumper, jack, and switch.

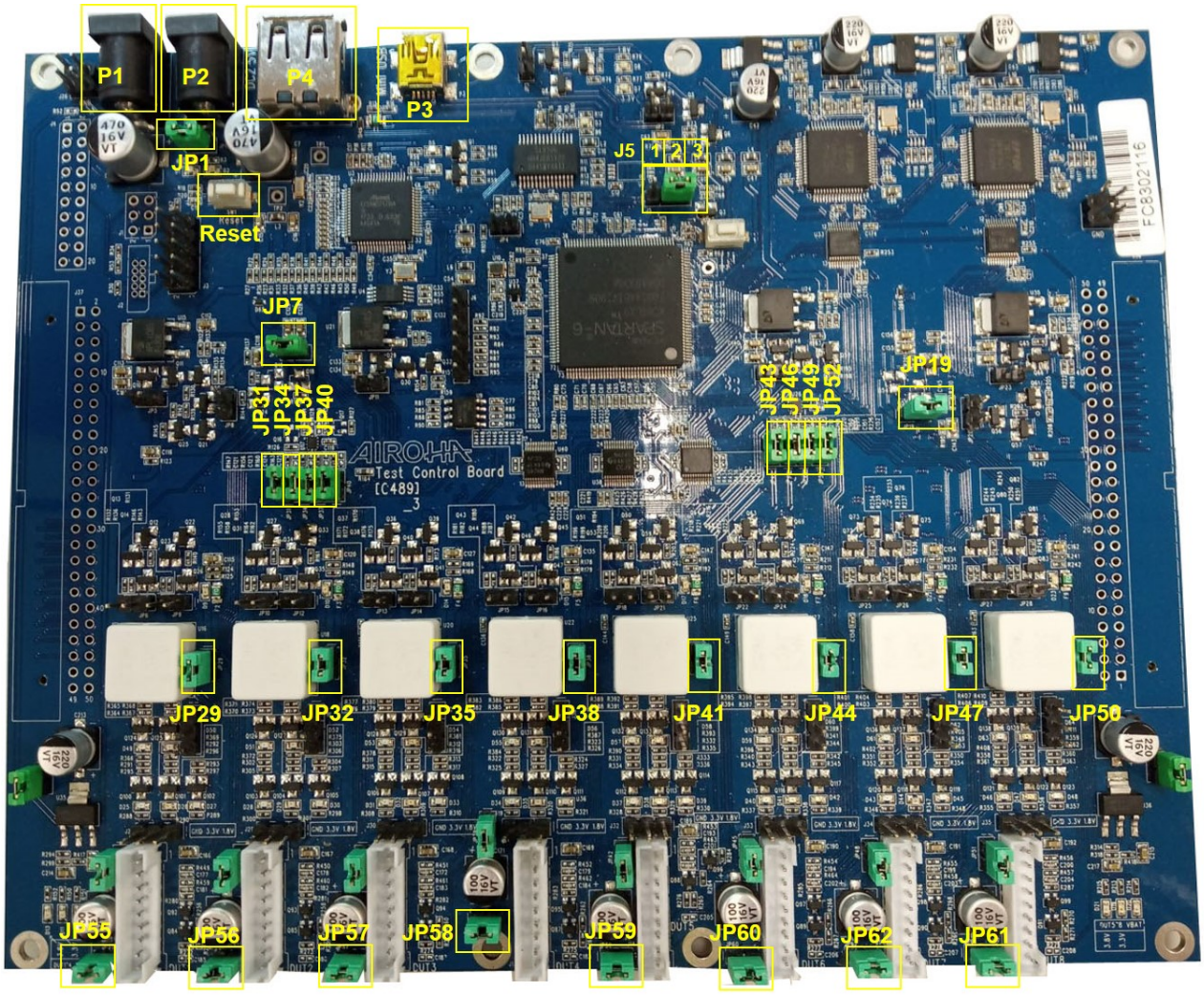

Figure 2-10. 1-to-8 TCB jumper settings

1-to-8 TCB Jumpers

Table 2-2. 1-to-8 TCB jumper functions

Block	Description
JP1	Short – Use one 5V/3A adaptor to supply power to the 1-to-8 TCB. Connect the 5V/3A adaptor to P1. Open – Use two 5V/3A adaptors to supply power to the 1-to-8 TCB. Connect one adapter to P1 and connect

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Block	Description
	the other adapter to P2.
J5	Default is 2-3 short
JP31/JP34/JP37/JP40	Short
JP43/JP46/JP49/JP52	Short
JP29/JP32/JP35/JP38	Short
JP41/JP44/JP47/JP50	Short
JP55/JP56/JP57/JP58	Short
JP59/JP60/JP61/JP62	Short

1-to-8 TCB Jacks

Table 2-3. 1-to-8 TCB jack list

Block	Description
P1	5V/3A adapter jack
P2	5V/3A adapter jack
P3	Mini-USB port
P4	Type-A USB port

1-to-8 TCB Switch

Table 2-4. 1-to-8 TCB switch list

Block	Description
RESET	Reset key for the 1-to-8 TCB

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2.3. Software setup

A third-party driver must be installed because there is one mini-USB port and USB-to-RS232 converter on the 1-to-8 TCB (Arduino and CDM v2.12.00 WHQL Certified.exe).

To install the driver:

1. Open the drivers/arduino folder.
2. Double-click "dpinst-x86.exe" for a 32-bit version of Windows, or "dpinst-amd64.exe" for a 64-bit version of Windows.
    a. Follow the prompts to install the Arduino driver.

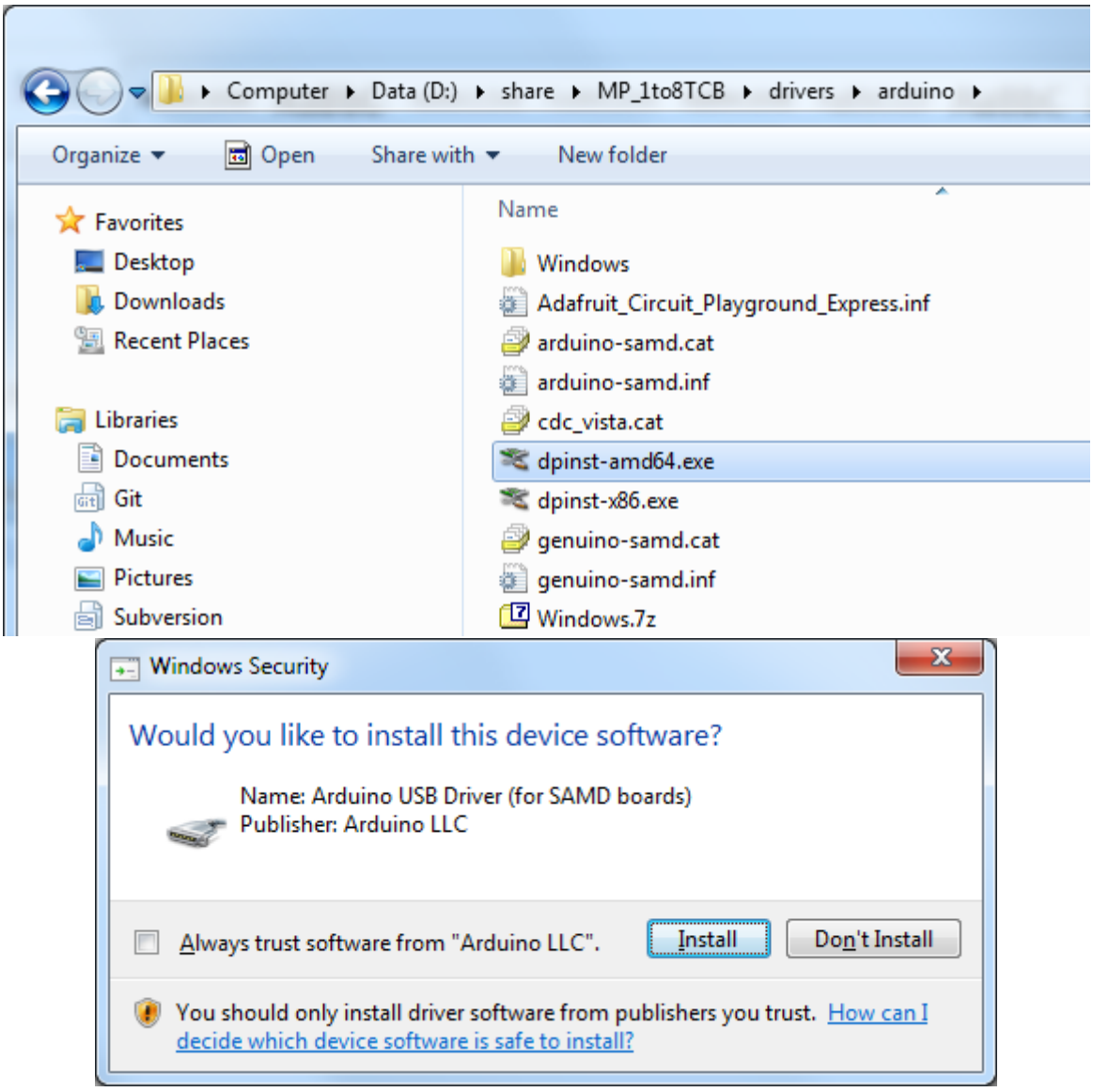

Figure 2-11. Driver install prompt dialog

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3. Double-click “CDM v2.12.00 WHQL Certified.exe”
    a. Follow the prompts to install the FTDI driver.

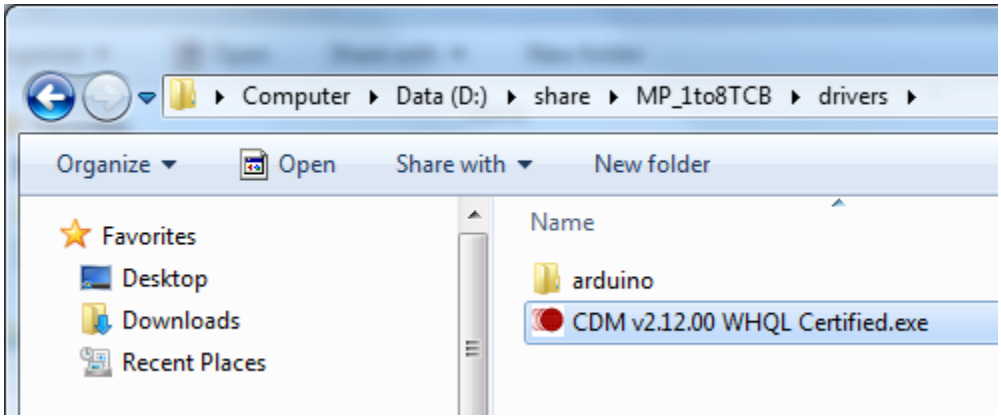

Figure 2-12 FTDI driver

Nine COM ports appear when the 1-to-8 TCB is connected, as shown in Figure 2-13.

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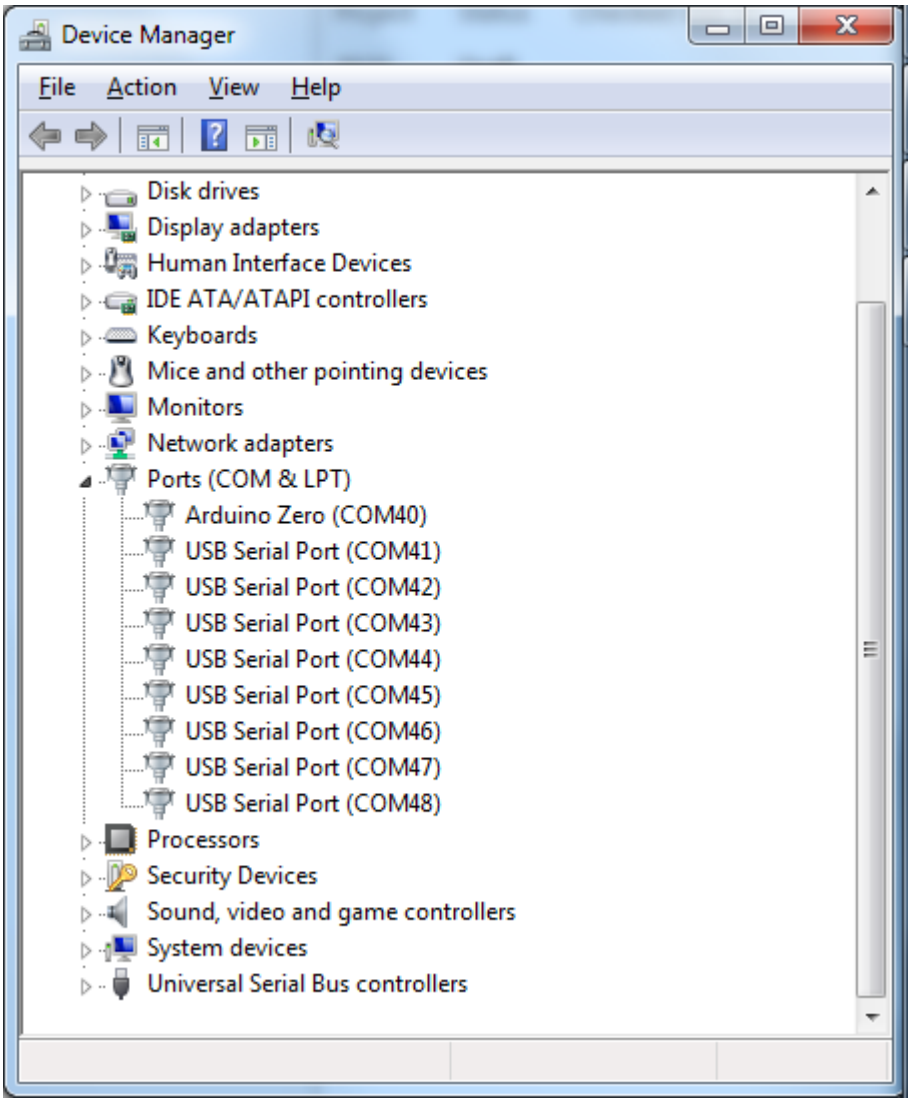

Figure 2-13. Driver installed device manager

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3. Mass Production Tool User Interface

The Mass Production Tool (MP Tool) is used for mass production tests on devices with an Airoha chip. The mass production processes include flash write/verify and crystal trim. When the installation is complete, the user can double-click “Airoha.MP_tool.1to8TCB.bat” in the file directory to start the application, as shown in Figure 3-1.

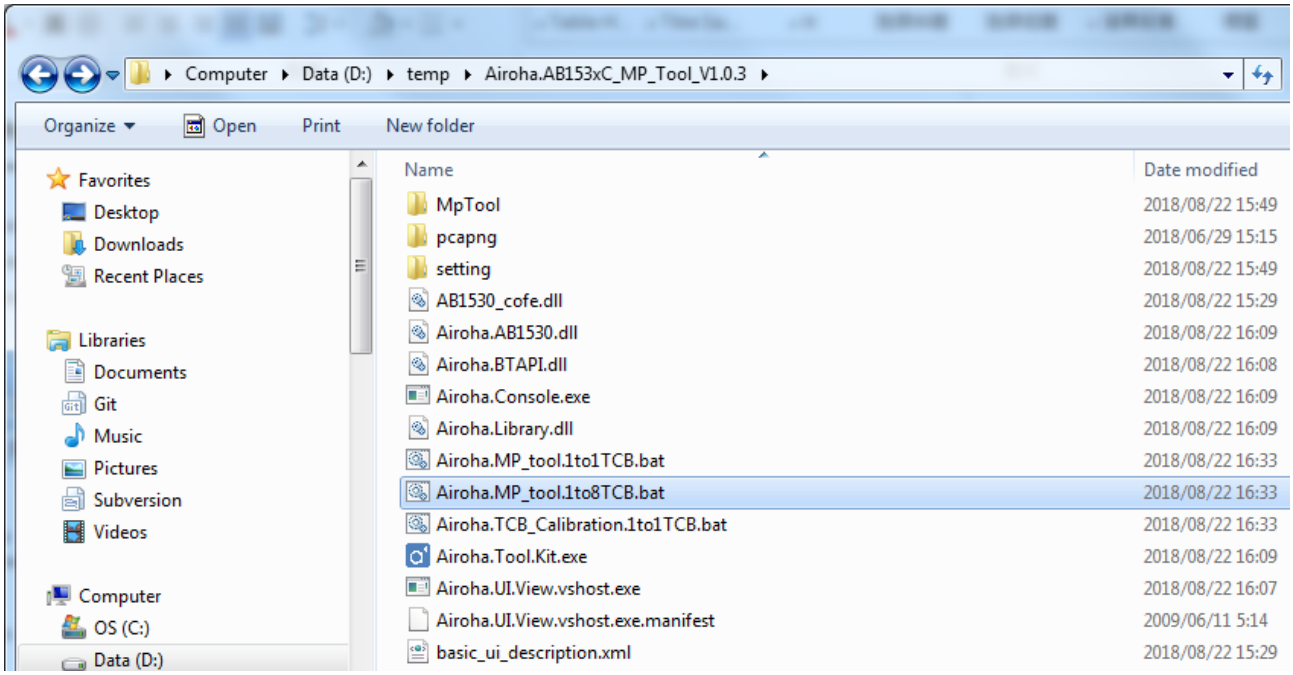

Figure 3-1. Launch mass production tool

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

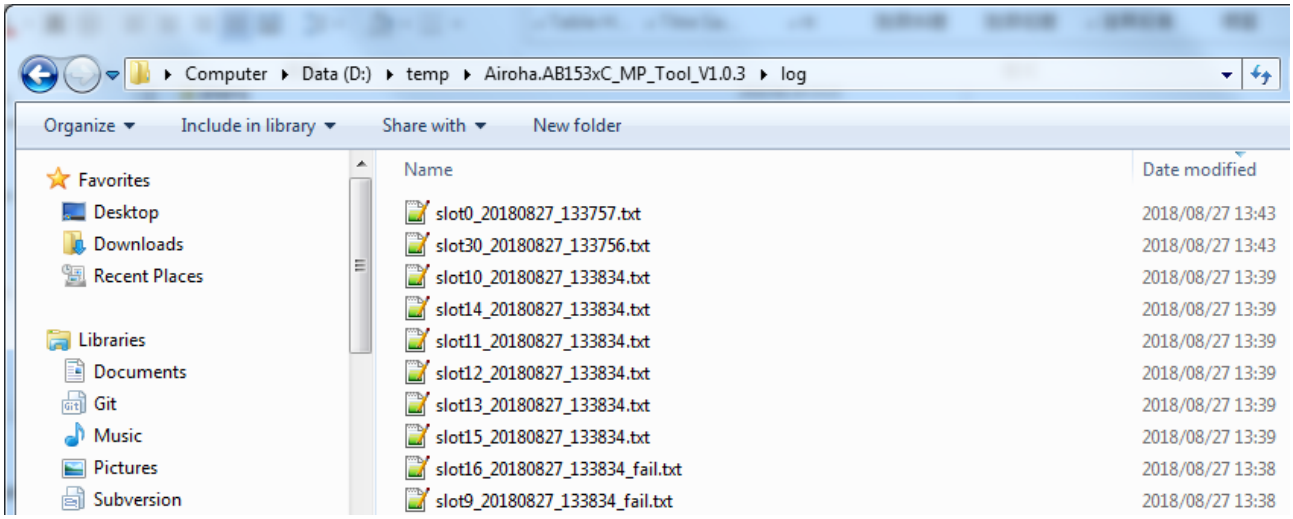

Figure 3-2. Log list in file manager

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Figure 3-3 shows the MP Tool interface.

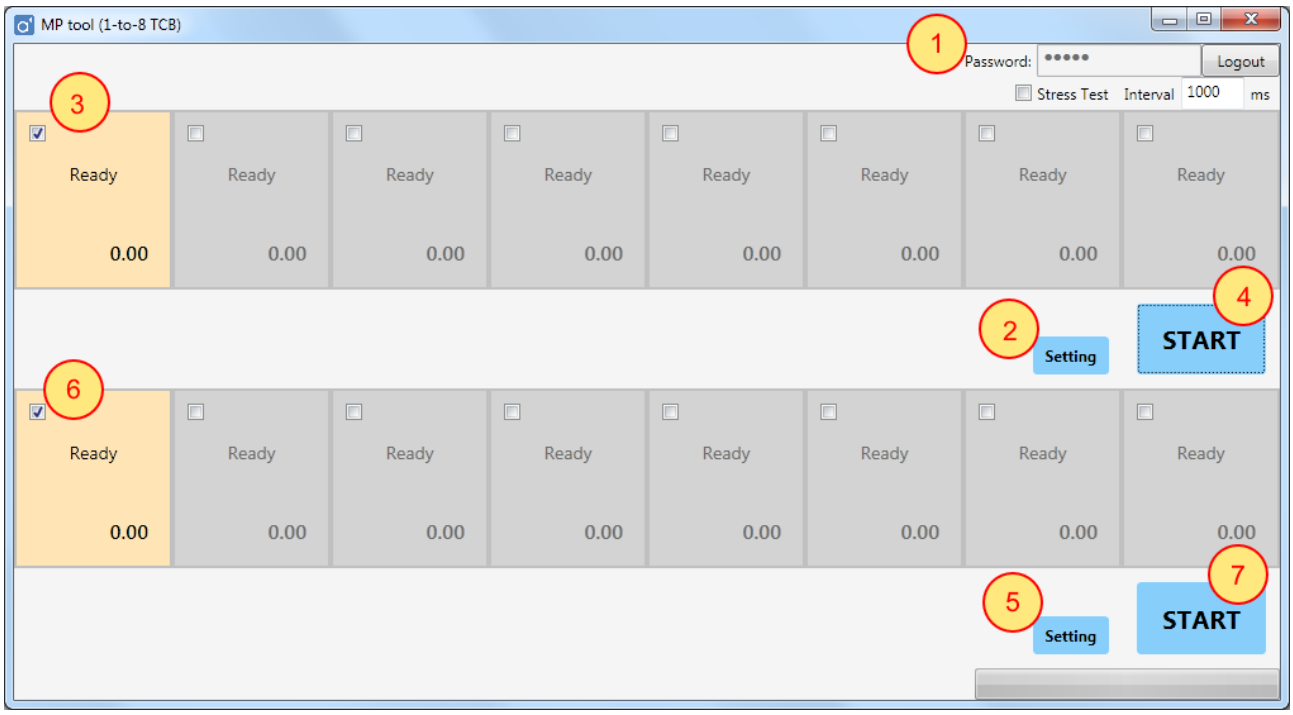

Figure 3-3. Tool setup progress

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.
4. Click the "**START"** button to start testing the DUTs.
5. Set up the second 1-to-8 TCB panel if necessary.
6. Select the DUT testing checkbox for the second 1-to-8 TCB.
7. Click the "**START**" button to start testing DUTs through the second 1-to-8 TCB.

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If the DUT passes all tests, the corresponding DUT button is green, as shown in Figure 3-4.

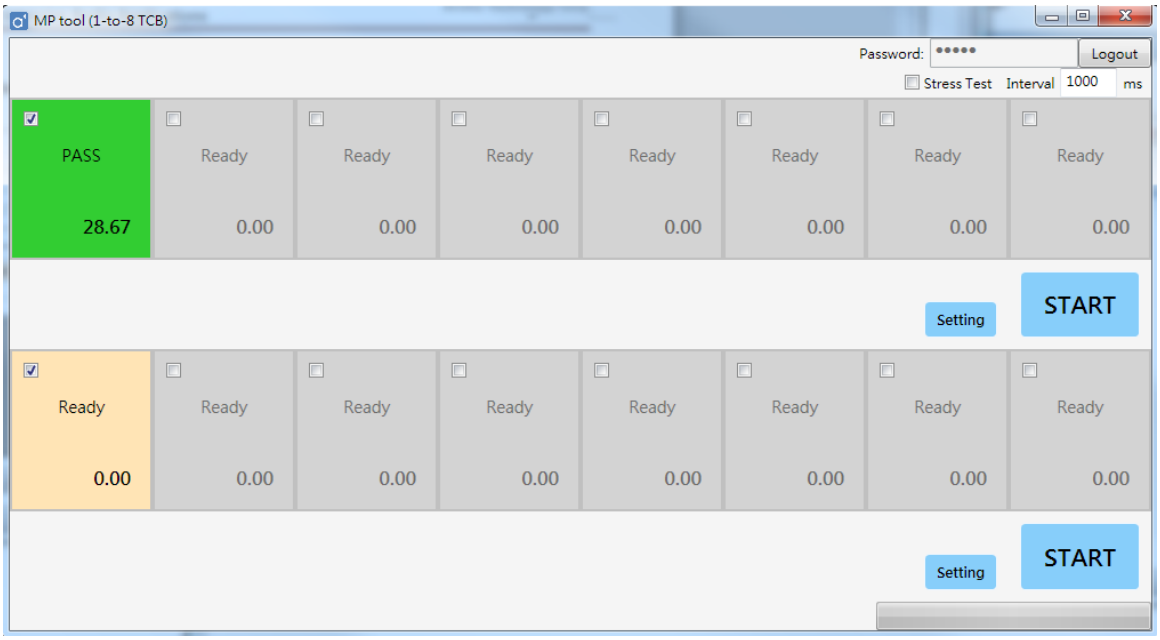

Figure 3-4. Test pass result

If the DUT fails a test, the corresponding DUT button is red, as shown in Figure 3-5.

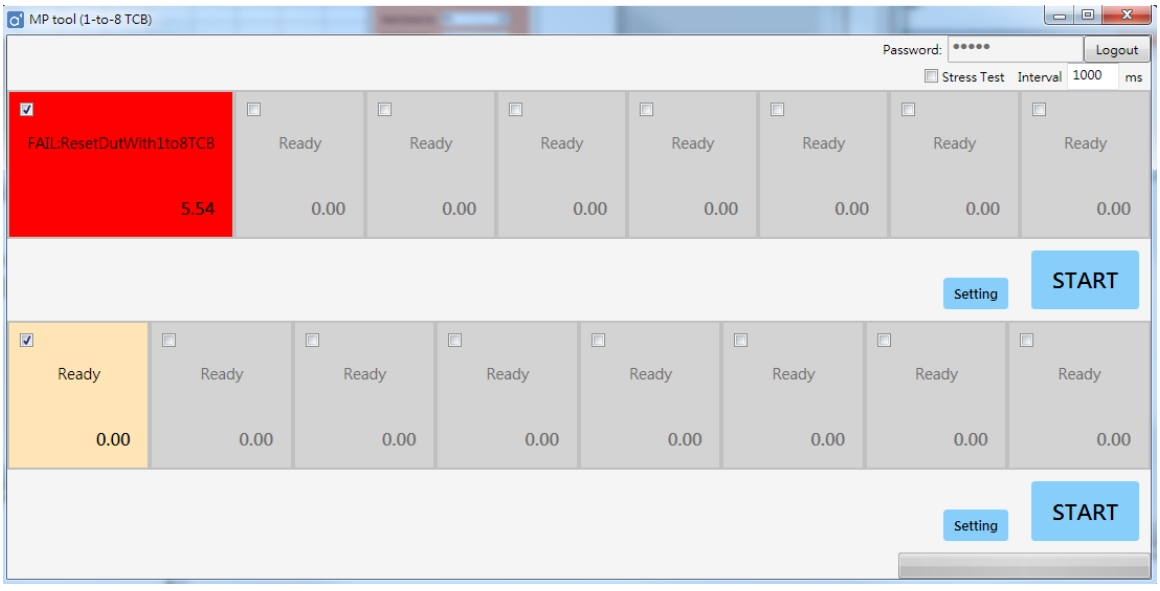

Figure 3-5. Test fail result

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4. Parameter Setting

4.1. Test items

The MP Tool operation procedure is explained as below. Please refer to Figure 4-1.

1. Select a specific COM port on the Tcb1to8Port drop-down list.
2. Click the **"Sync Tcb1to8Port"** button to confirm DUTs COM port setting is correct.
3. Select the checkboxes for each test item. Note that calibration data is written to the DUT when the **"WriteFlash1to8TCB"** task checkbox is selected.
4. Set detail item for each test.

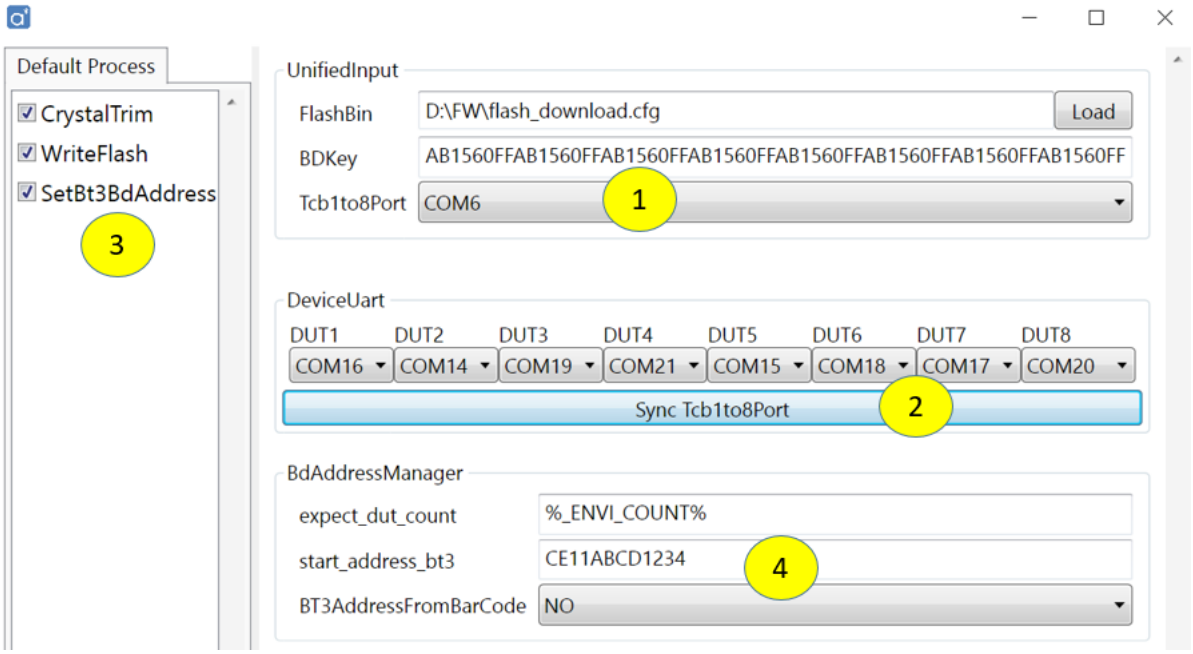

Figure 4-1. Setting dialog

4.2. Crystal trim

The Crystal Trim test adjusts the crystal offset by measuring the frequency offset of the crystal signal using the 1-to-8 TCB. The operating environment is described as follows. Please refer to Figure 4-2.

- When performing the 'Crystal Trim' test, the 1-to-8 TCB tunes the capacitance of the crystal circuit and measures the frequency offset by the 1-to-8 TCB.
- The **"WriteFlash1to8TCB"** checkbox must be selected to save the calibration results to the DUT.

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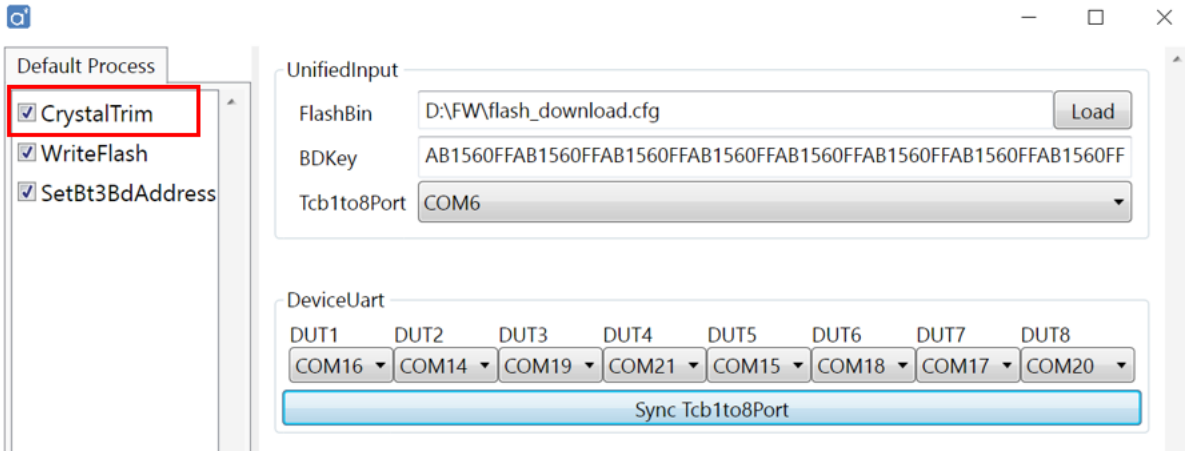

Figure 4-2. Task item crystal trim settings

4.3. BD address management

BD address management provides the BD and LE address related management policy settings, as shown in Figure 4-3.

- The **"WriteFlash1to8TCB"** task checkbox must be selected to write the address to the DUT.

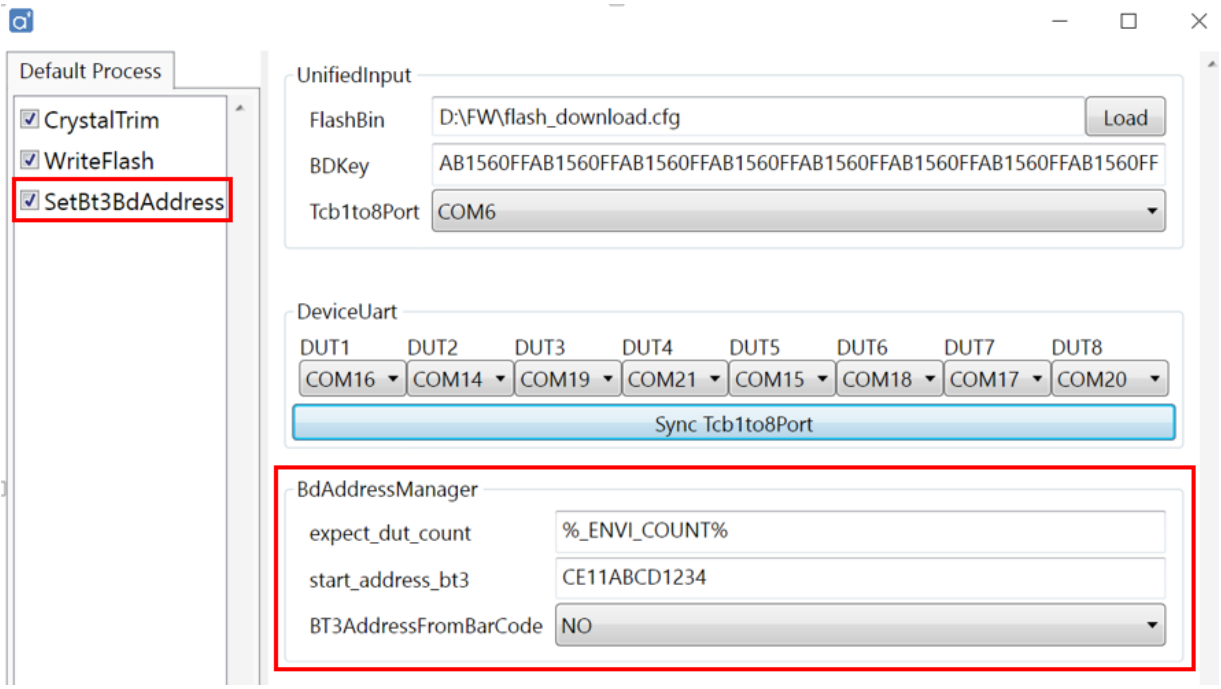

Figure 4-3. Task BD address settings

4.4. Write/Verify SPI flash

Select a flash config file (.cfg) to write to flash, as shown in Figure 4-4. Basic settings are visible when the flash image is

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loaded.

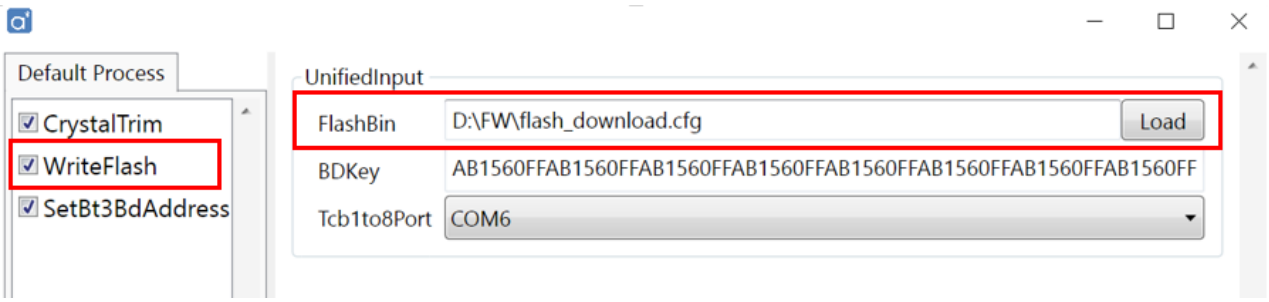

Figure 4-4. Task write flash settings

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