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	Project Name:	CONFIDENTIAL			Date:	6 Nov 17
Document ID	Release	Model	Version	Prepared by		
TJM-17-002	1.0	BSC & SC	1.0	HAZMAN		

Power , Flash Firmware & Functional Test For PCBA with Micro USB Connector

Test Jig Manual(TJM)

Document ID: TJM-17-002

Release: 1.0

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Remarks:	APPROVED	CHECKED	PREPARED

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Revision History

Revision	Date	Author	Comment
1.0	6 Nov 17	Hazman	First Release

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1 INTRODUCTION

This document provides the detail instruction and guideline for testing the BSC & SC PCBA for Power, Flash Firmware & Functional Test using Test Jig.

1.1 Objective

This document is to serve the following objectives.

Ensure that all related parts and components are working properly after the PCBA process.

To described clearly the operation of the Test apparatus and the setup.

1.2 Scope of Testing

The followings are the lists of the test required.

Power Short Test

Voltage Level Test

Flashing Firmware Test

Smart Card Test

Fingerprint Test

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2 FUNCTIONAL TEST PROCEDURE

2.1 Test Apparatus

Hardware:

Functional Test Jig

PCBA with Micro USB Connector

PC workstation with USB port

USB Cable (Mini USB to USB Type A Cable) (inside Test Jig)

USB Cable (Micro USB Female to USB Type A Cable) (inside Test Jig)

USB Cable (Micro USB Male to USB Type A Cable) (inside Test Jig)

Smart Card Cards x 1pcs (3.58MHz) (inside Test Jig)

Fingerprint Module and Cable (inside Test Jig)

ST Micro Discovery Board (inside Test Jig)

Digital Multimeter

Software:

STM32 MCU Firmware Downloading Programmer (STM32 ST-LINK UTILITY.exe)

Firmware:

ST Micro STM32512RET6 MCU Firmware (**kridentia plugin v0.1b.hex**)

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2.2 Setup

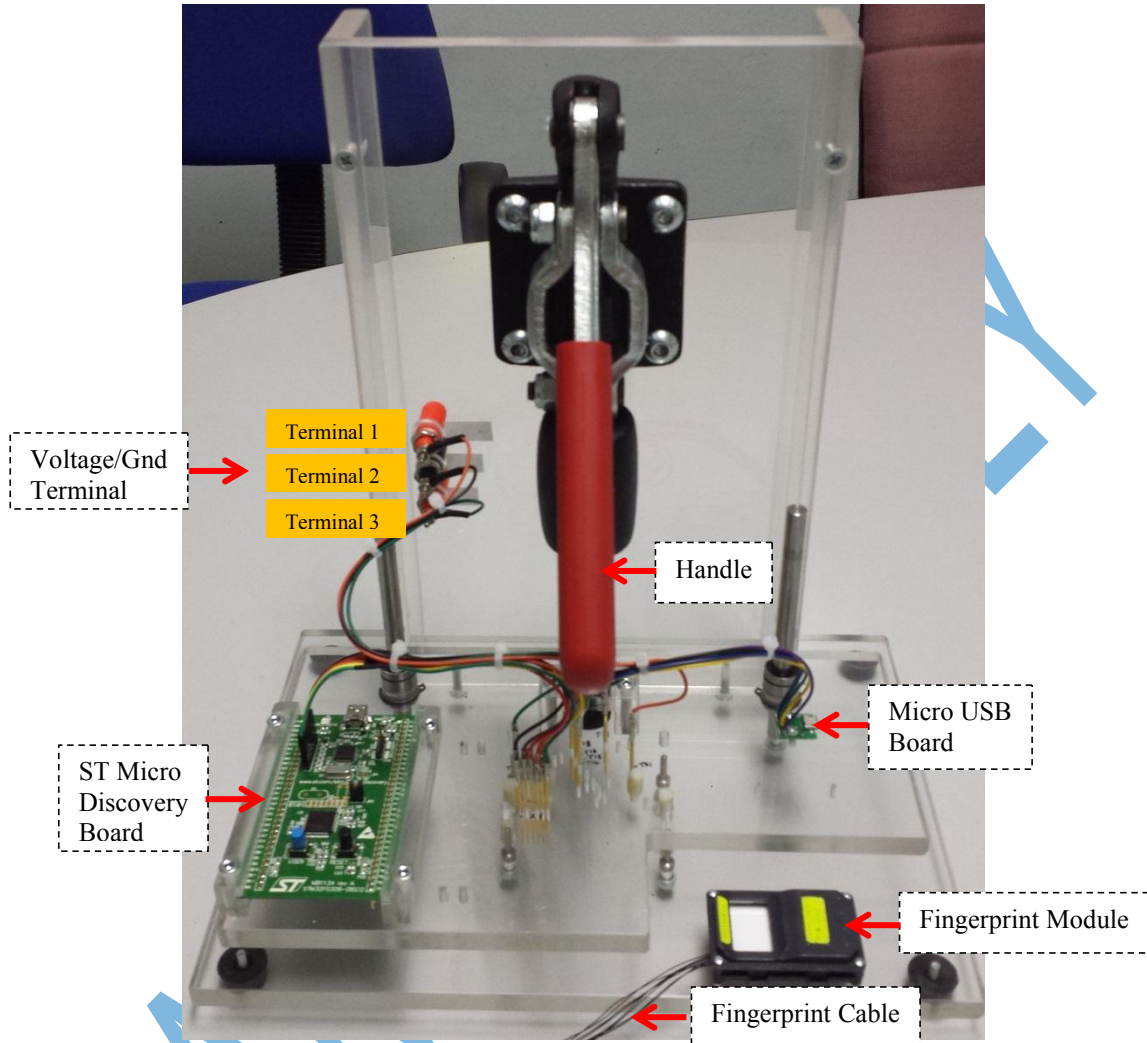
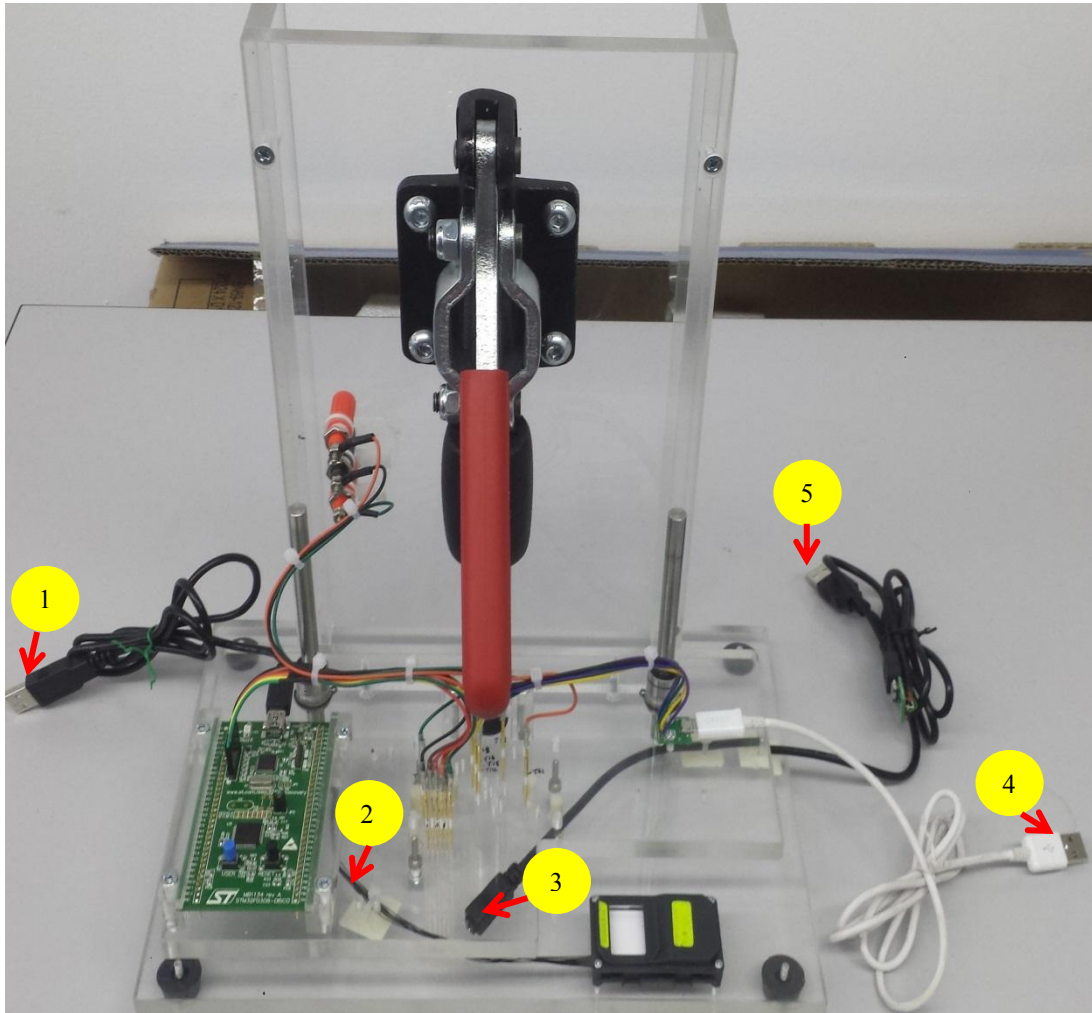


Figure 1: Overview of Test Jig

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Test Jig and USB Cable required to connect to PC using PCBA with Micro USB Connector



- 1- Cable for ST Micro
- 2- Cable for Fingerprint Module
- 3- Cable for Micro USB(Female)
- 4- Cable for Micro USB(Type A)
- 5- Cable for Micro USB(Type A)

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2.3 Test Procedure Flow

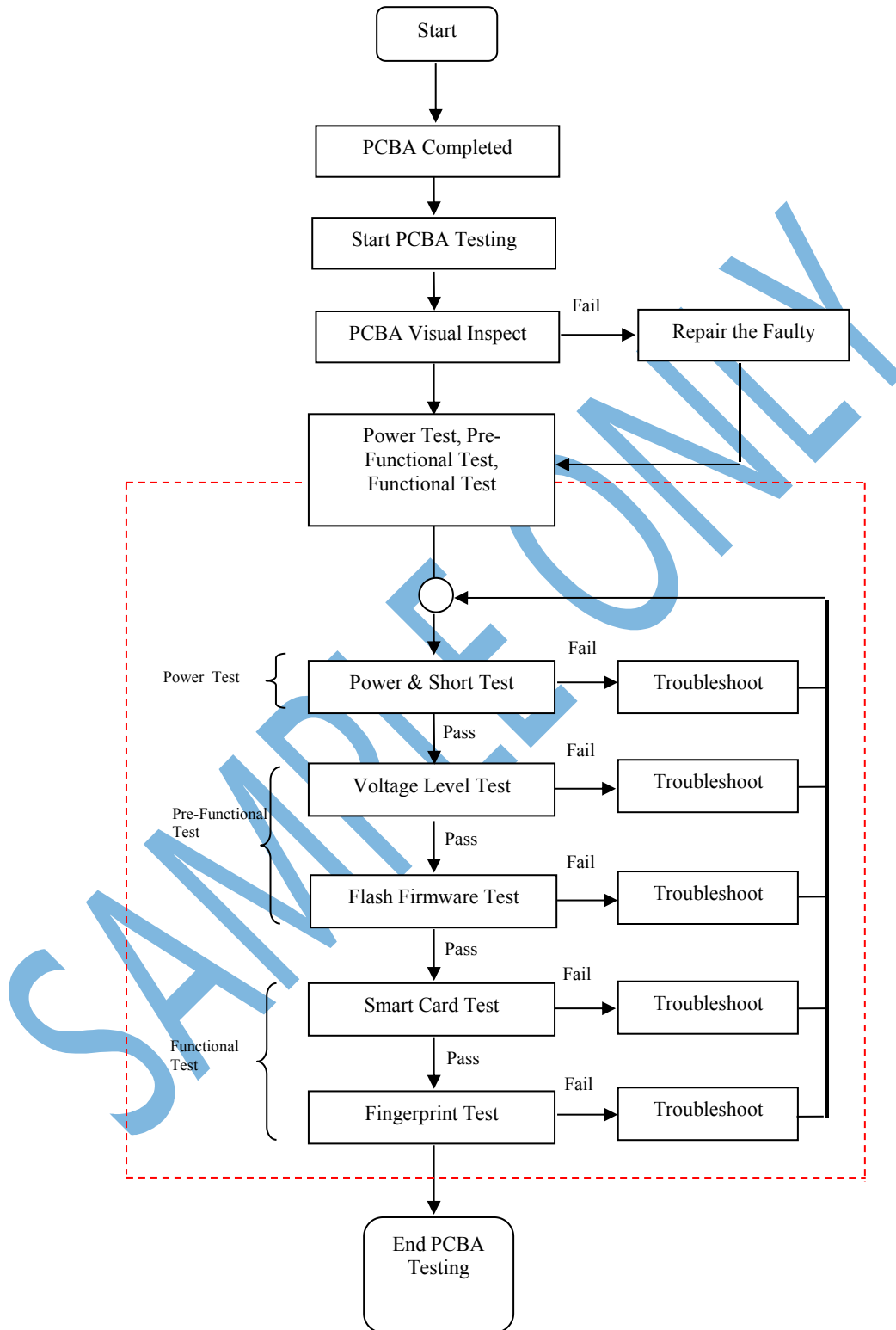


Figure 2: Test Procedure Flow

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2.4 Test Procedure

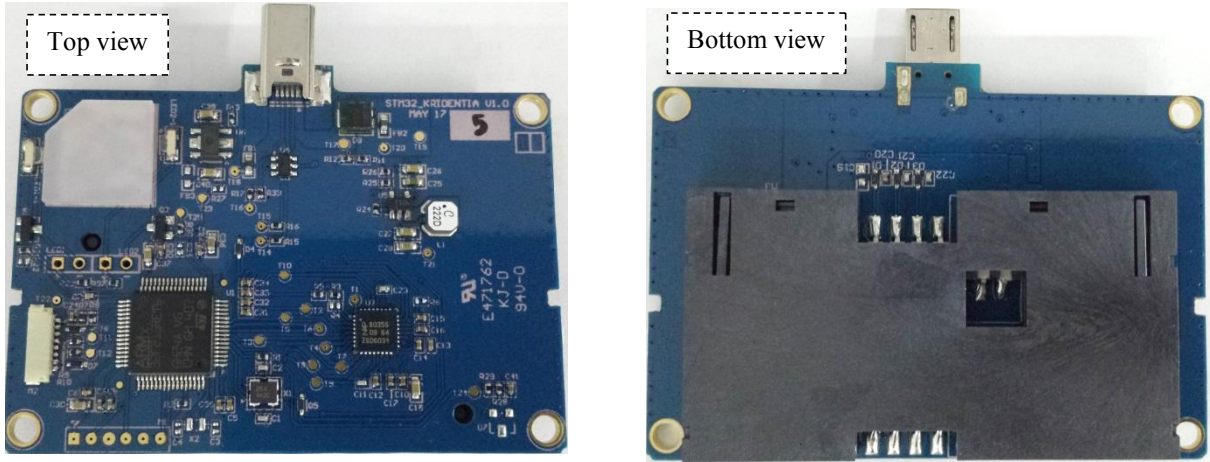


Figure 3: PCB Board after PCBA with Micro USB Connector

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2.4.1 Power Short Test – (Step 1)

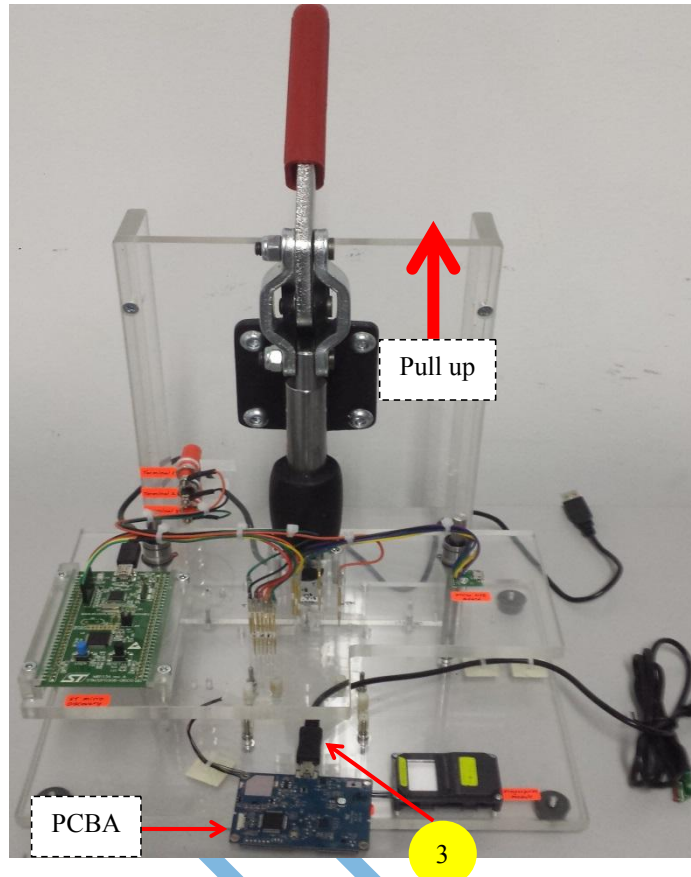
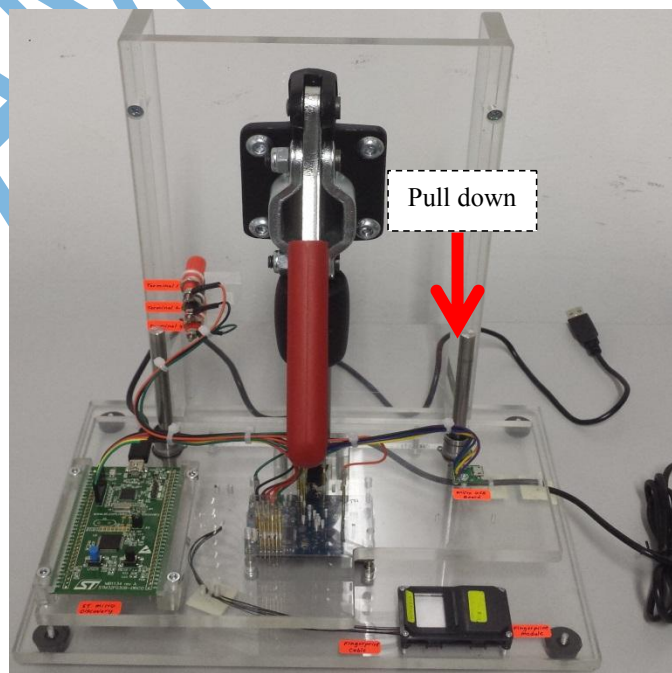


Figure 4: Insert Cable no 3 and PCBA to the Test Jig

Step 1: Unlock the handle(pull up). Connect Cable no 3 to the Micro USB Connector on PCBA.



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Figure 5: PCBA inside the Test Jig

Step 2: Insert the PCBA to the Test Jig. Lock the handle(pull down).

Using the Multimeter to perform the Power Short Test. Set the Multimeter as below picture. Make sure it has sound when you touch both probe together(Black and Red).

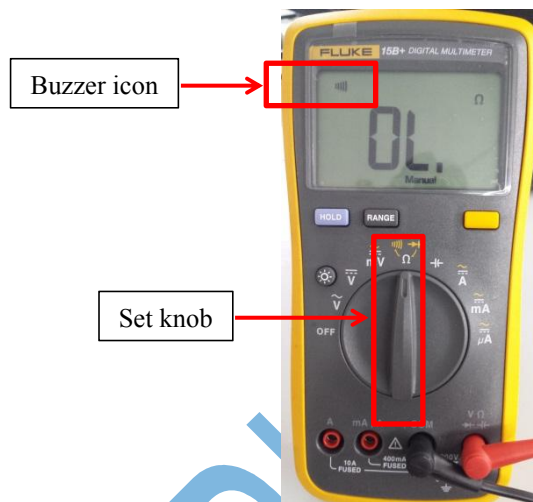


Figure 6: Setup Multimeter

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1st Check Point

- 1) Take the Black(-ve) Probe of Multimeter and Touch at Ground (**Terminal 2**) and stay
- 2) Take the Red(+ve) Probe of Multimeter and Touch at 5V (**Terminal 3**) and stay
- 3) By right it should be no buzzer sound comeout from Multimeter, which mean the signal line is open, the result is PASS

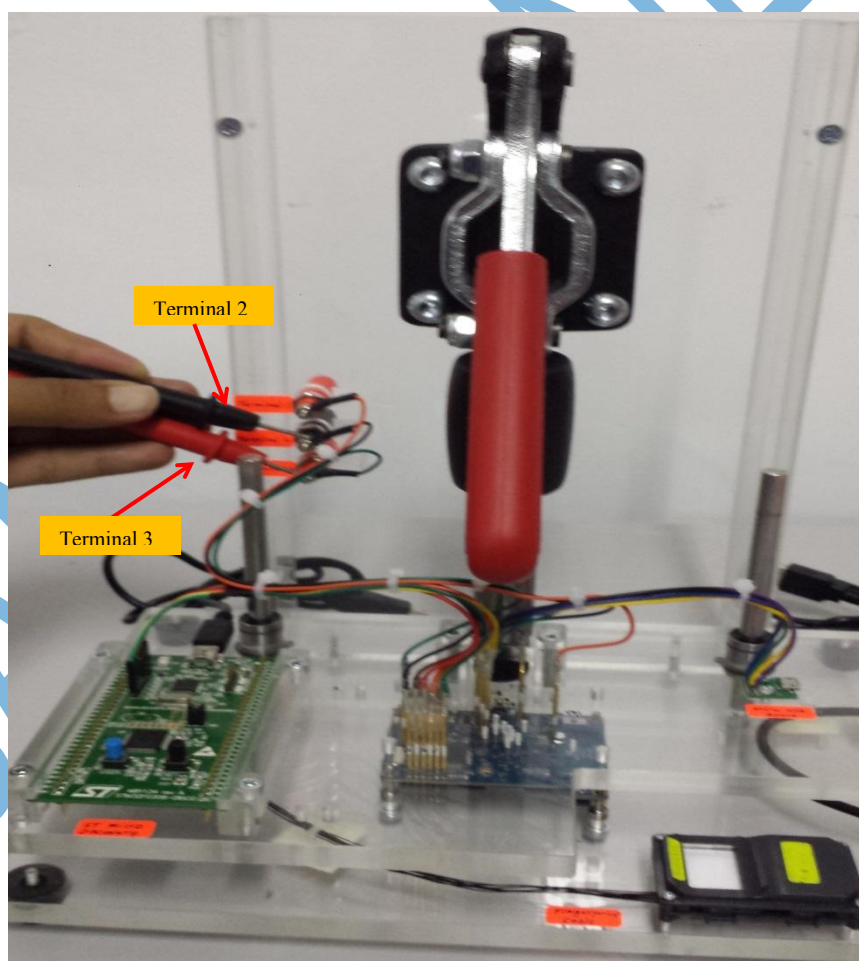


Figure 7: Check 5V signal

Note: If power lines are shorted to Ground, there will be sound comeout from

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Multimeter, consider FAIL.

2nd Check Point

- 1) Take the Black(-ve) Probe of Multimeter and Touch at Ground (**Terminal 2**) and stay
- 2) Take the Red(+ve) Probe of Multimeter and Touch at 3.3V (**Terminal 1**) and stay
- 3) By right it should be no buzzer sound comeout from Multimeter, which mean the signal line is open, the result is PASS

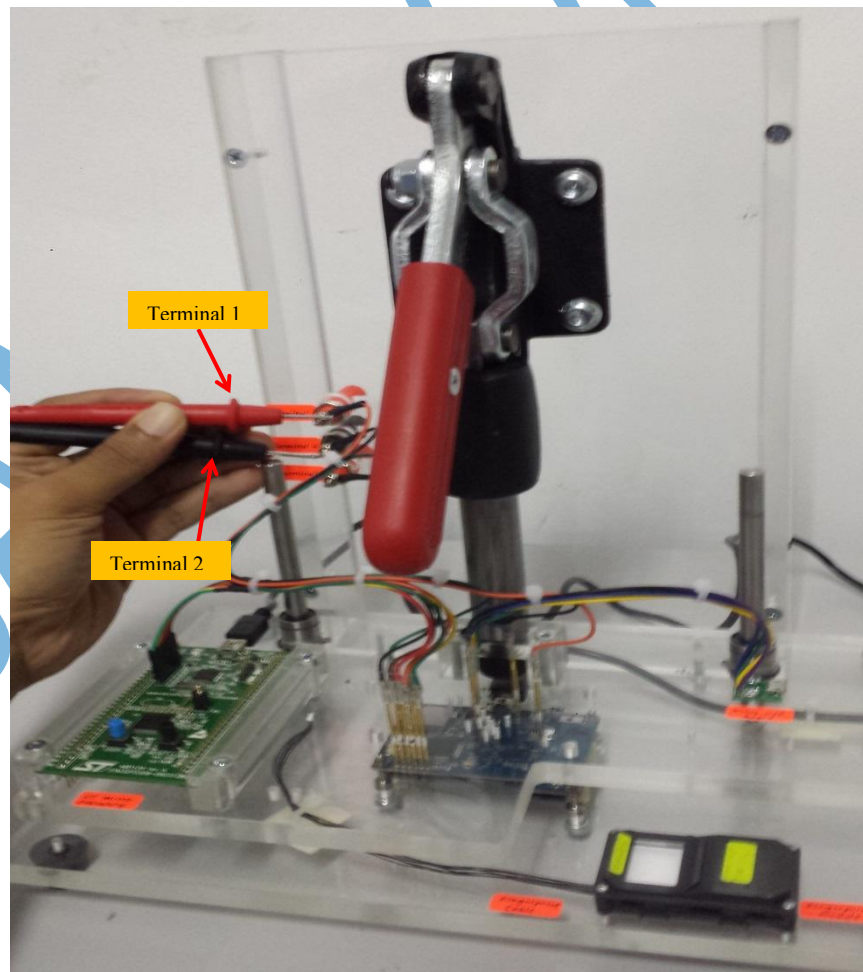


Figure 8: Check 3.3V signal

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Note: If the power lines are shorted to Ground, there will be sound comeout from Multimeter, consider FAIL.

2.4.2 Voltage Level Test – (Step 2)

Once completed the Power Short Test, then can perform Voltage Level Test. This Voltage Level Test required visually checking at Multimeter whether the particular voltage line meets the desired voltage level or not through the display at Multimeter.

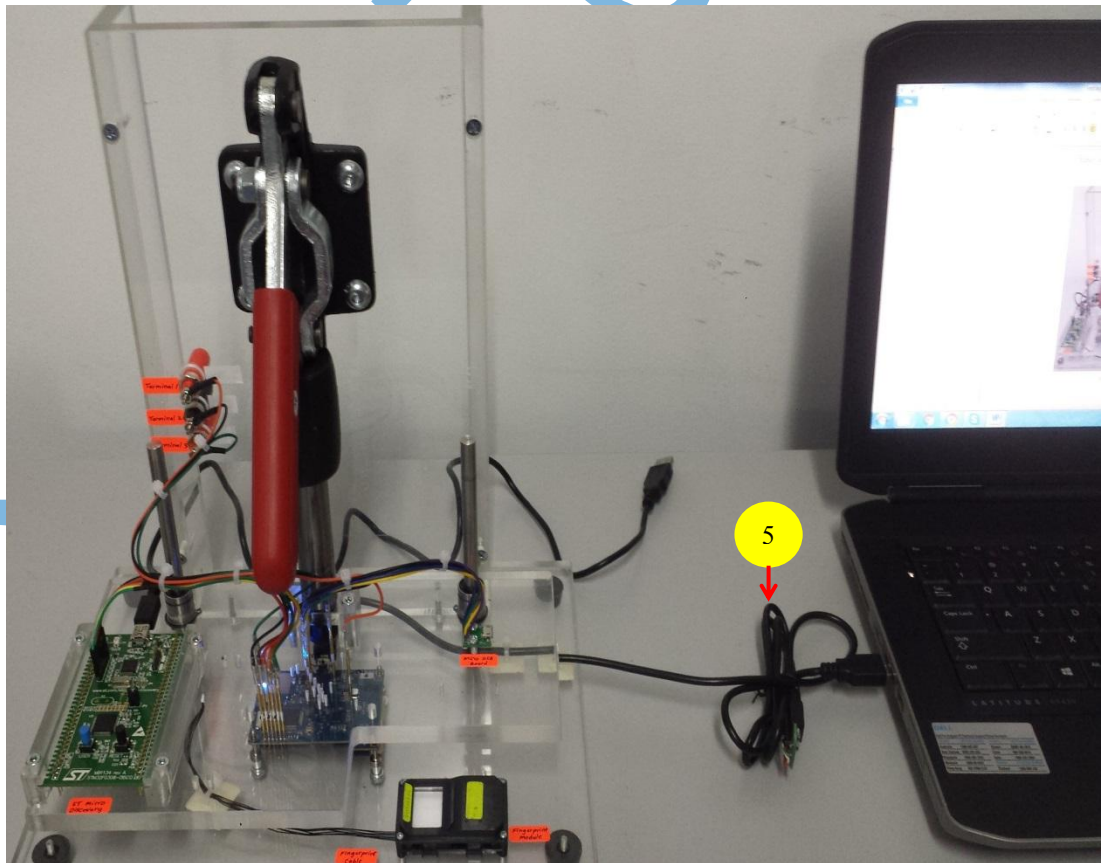


Figure 9: Cable no 5 connect to PC workstation

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Step 1: Plug in Cable no 5 to PC workstation.

Step 2: Set the Multimeter as below picture for measuring Voltage(V).

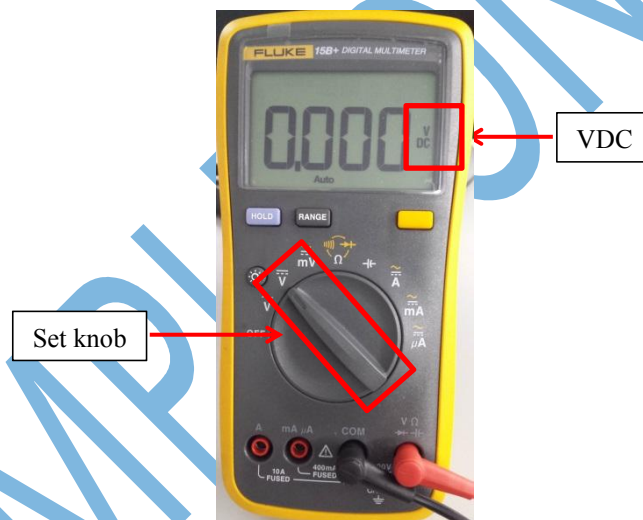
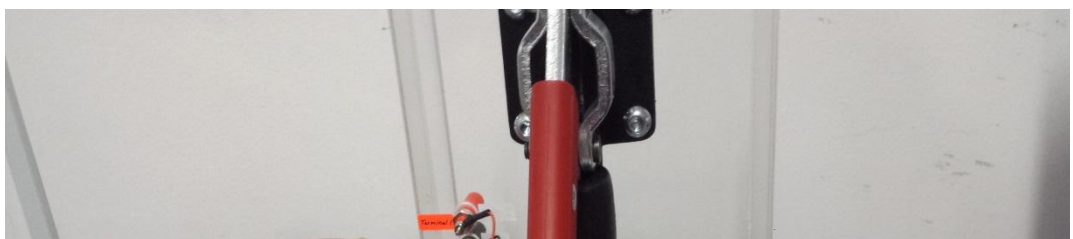


Figure 10: Setup Multimeter

1st Check Point

- 1) Take the Black(-ve) Probe of Multimeter and Touch at Ground (**Terminal 2**) and stay
- 2) Take the Red(+ve) Probe of Multimeter and Touch at 5V (**Terminal 3**) and stay
- 3) Observe the Multimeter display, it should be **5V +/- 0.1** (**if the reading not correct possible some component malfunction, consider FAIL**)



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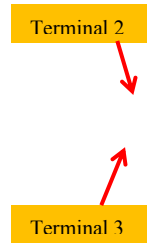
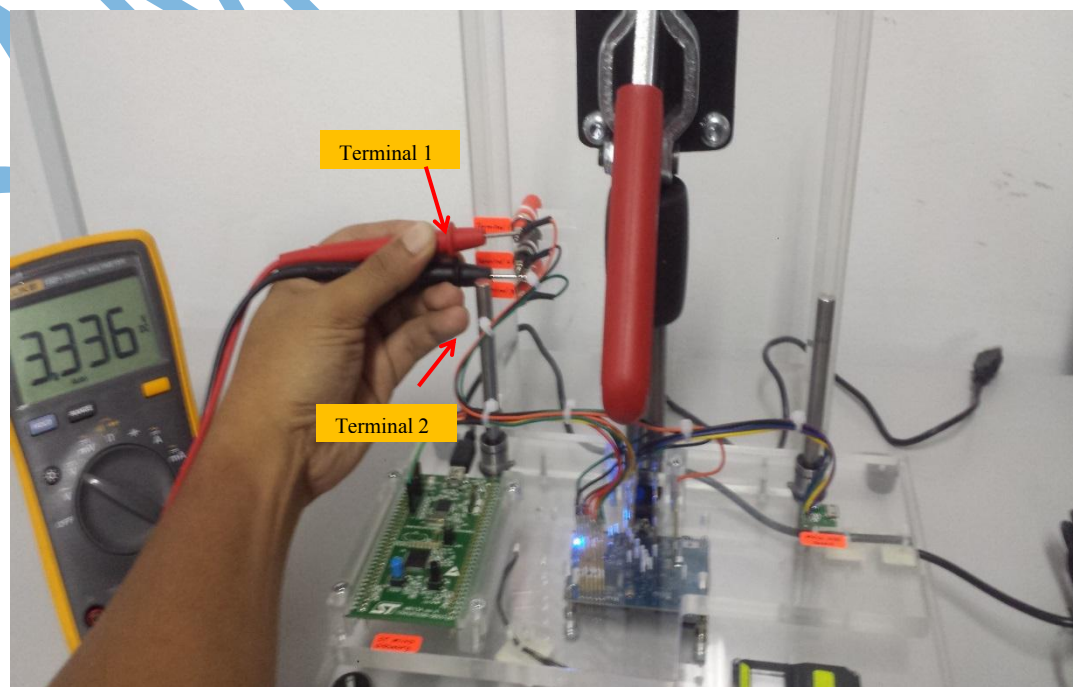


Figure 11: Check 5V voltage level

2nd Check Point

- 1) Take the Black(-ve) Probe of Multimeter and Touch at Ground (**Terminal 2**) and stay
- 2) Take the Red(+ve) Probe of Multimeter and Touch at 3.3V (**Terminal 1**) and stay
- 3) Observe the Multimeter display, it should be **3.3V +/- 0.1** (if the reading not correct possible some component malfunction, consider **FAIL**)



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Figure 12: Check 3.3V voltage level

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2.4.3 Flashing Firmware Test – (Step 3)




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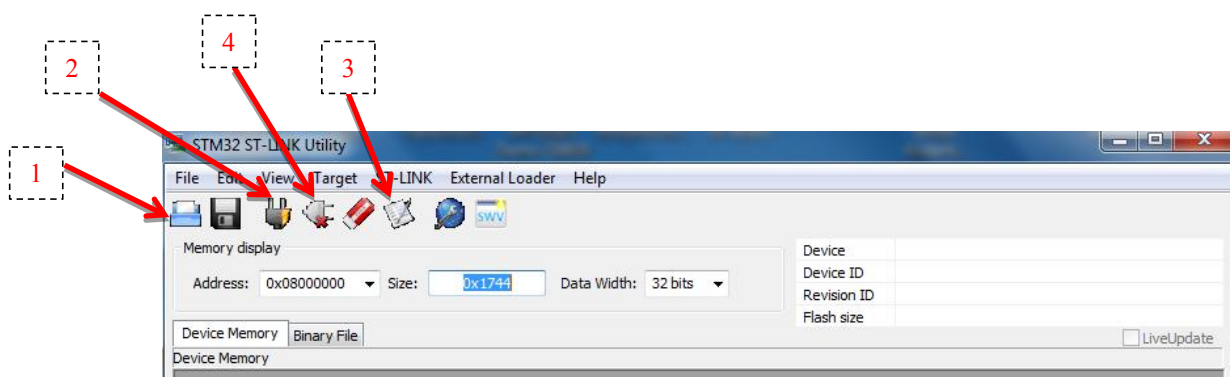


Figure 13: Cable no 1 connect to PC workstation

Step 1: Plug in Cable no 1 to PC workstation (previously Cable no 5 already connected).

To download the firmware, launch the  STM32 ST-Link program at PC workstation (**after complete the first time installation, if not PC workstation will not recognized**).

Following are the steps to download the firmware.



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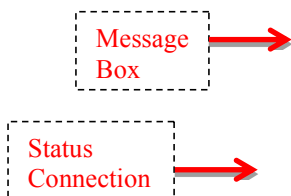




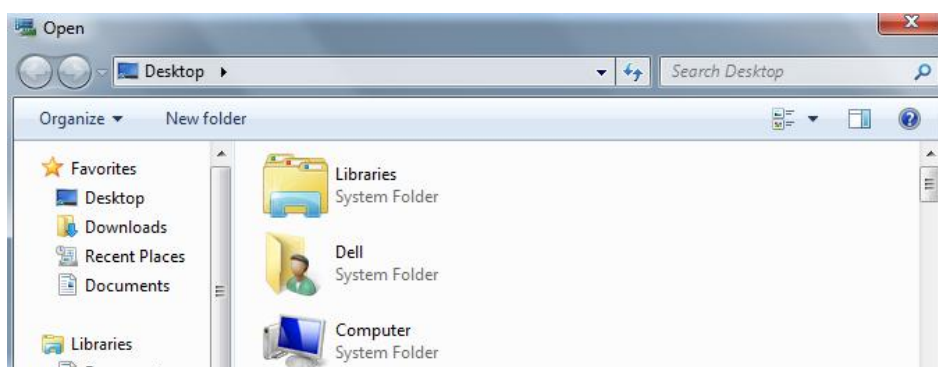


Figure 14: STM32 ST-Link Utility window

1. Click the  icon to load the “XXXXXX.*.hex” file from the folder (refer to *Figure 15*). Only one time.
2. Click the  icon to establish the connection. If connection is ok, there will be message at the Message Box which show connected. (refer to *Figure 16*).
3. Click the  icon to start downloading the firmware. The Download box appear. Press Start. Shown in *Figure 17*.
4. If the firmware downloading process is OK, at Message Box will write, Verification...OK as shown in *Figure 18*.
5. Once completed the flashing process. Click the  icon to disconnect the connection of STM32 as shown in *Figure 19*.



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Figure 15: Browse to find firmware file at Desktop

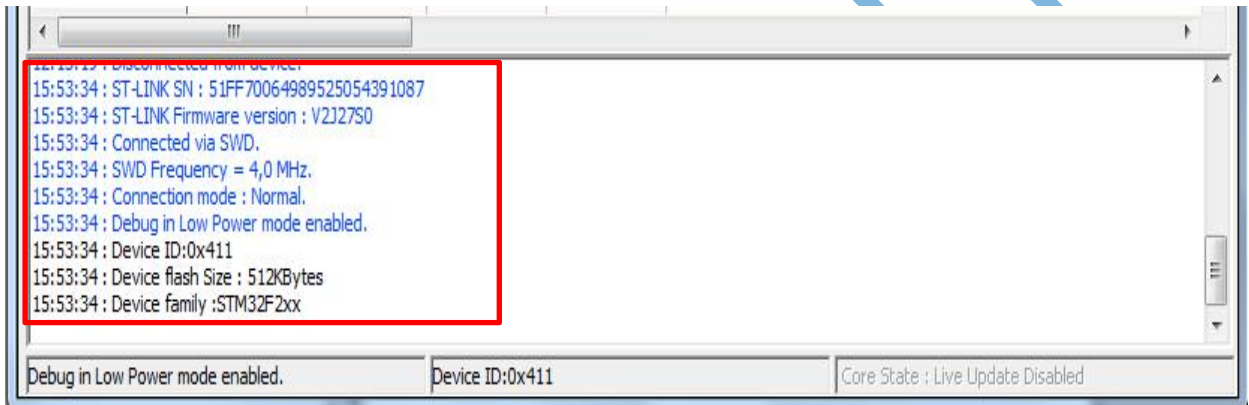
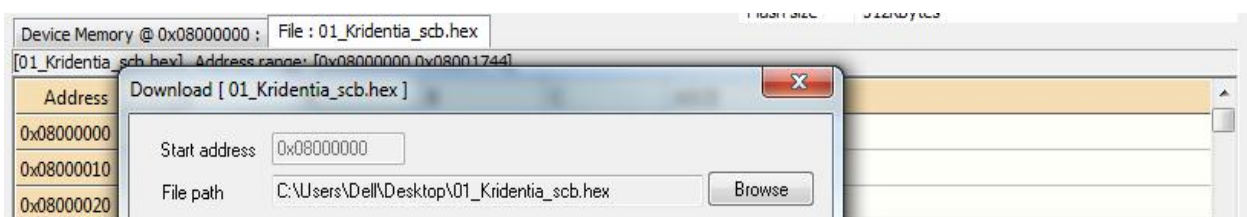


Figure 16: Message at Message Box



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Figure 17: Flashing window

```

15:53:34 : Debug in Low Power mode enabled.
15:53:34 : Device ID:0x411
15:53:34 : Device flash Size : 512KBytes
15:53:34 : Device family :STM32F2xx
15:57:31 : [01_Kridentia_scb.hex] opened successfully.
15:57:31 : [01_Kridentia_scb.hex] checksum : 0x00086322
16:03:16 : Memory programmed in 0s and 968ms.
16:03:16 : Verification...OK
16:03:16 : Programmed memory Checksum: 0x00086322
16:03:17 : Flash memory [0x08000000:0x08080000] Checksum: 0x07E93666

```

Debug in Low Power mode enabled. Device ID:0x411 Core State : Live Update Disabled

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Figure 18: Message Box after complete programming

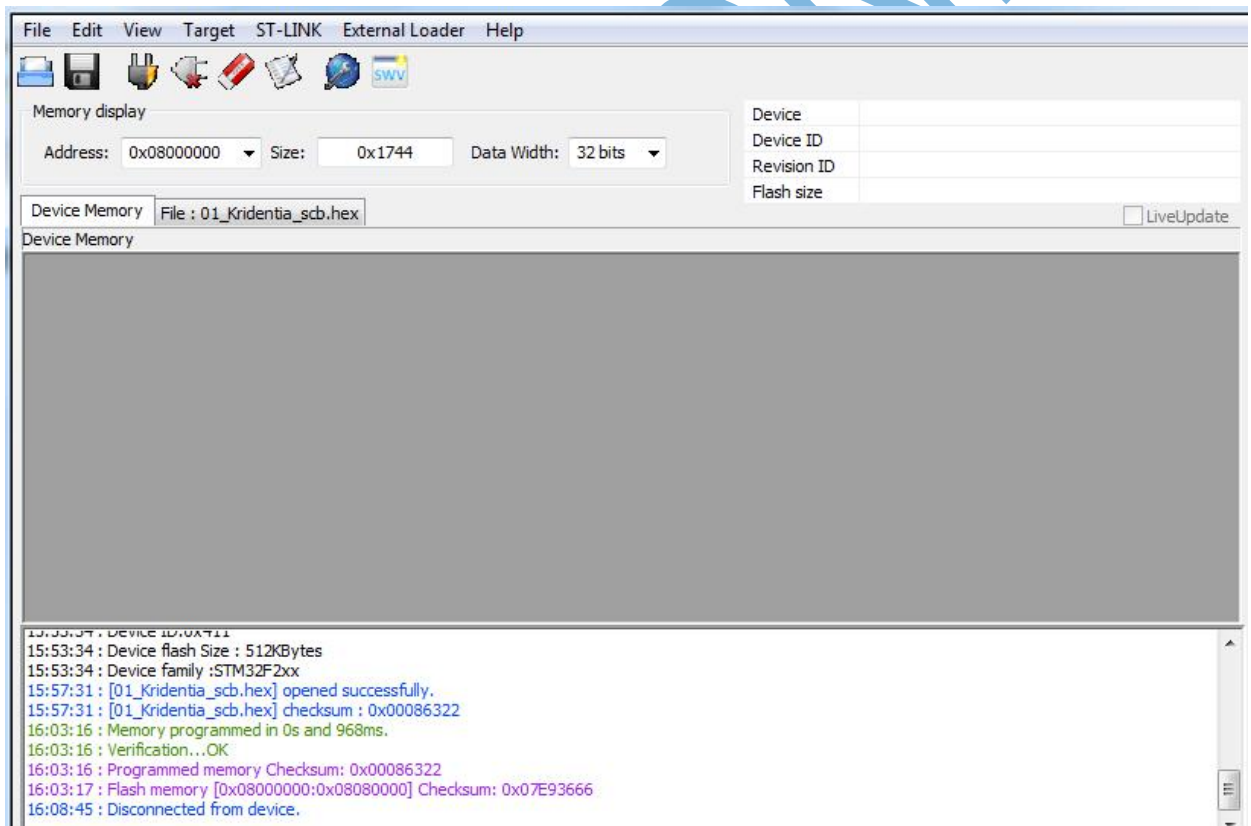
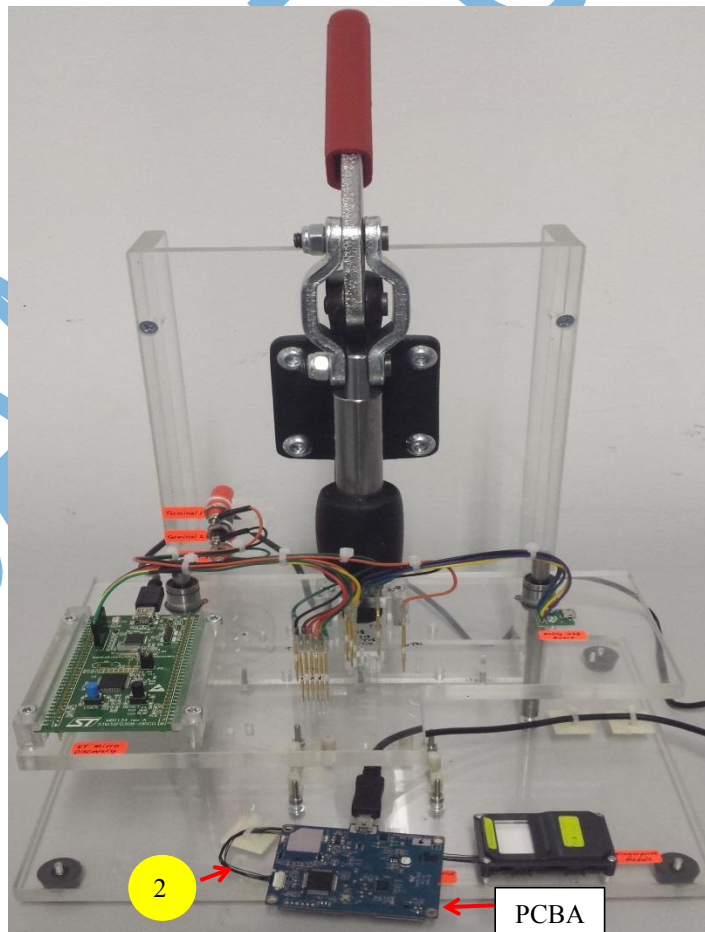


Figure 19: Message Box after disconnect the programming mode

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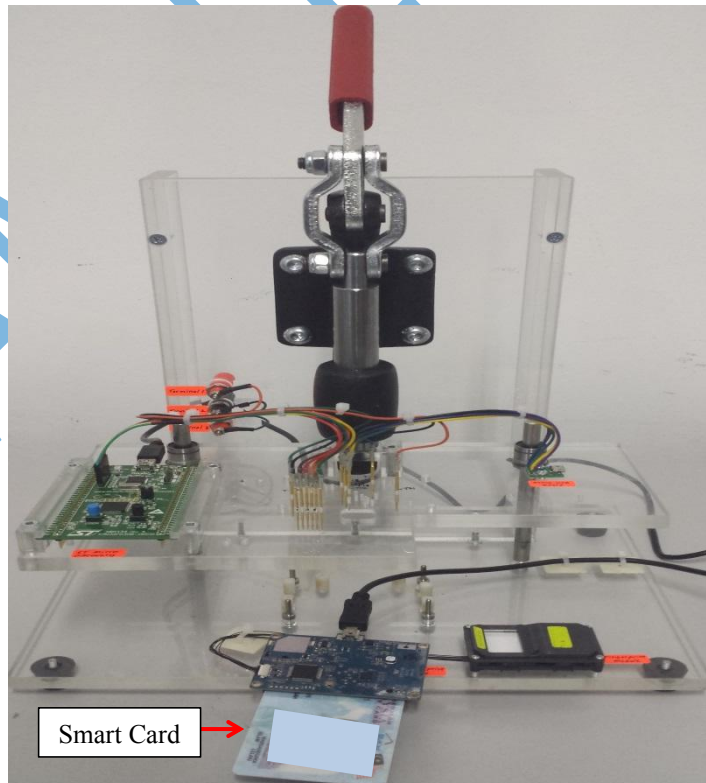
2.4.4 Smart Card Test – (Step 4)



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Figure 20: Fingerprint Cable connect to Connector on the PCBA

Step 1: Unplug the Cable no 1 and no 5 from PC workstation. Unlock the handle(pull up). Connect the Cable no 2(Fingerprint Cable) to the Connector on the PCBA(be careful during Cable insertion).



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Figure 21: Smart Card was insert to connector on the PCBA slot

Step 2: Insert the smart card to the Connector on the PCBA slot.

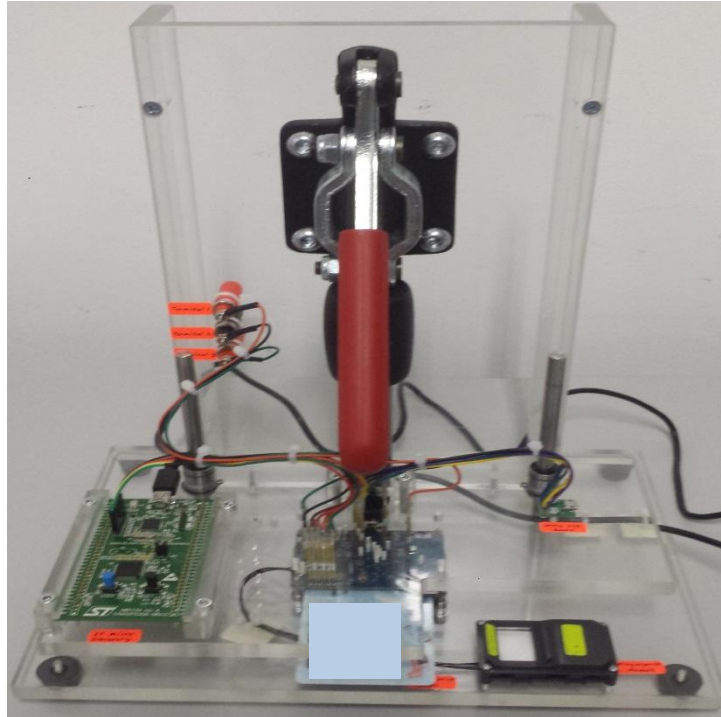
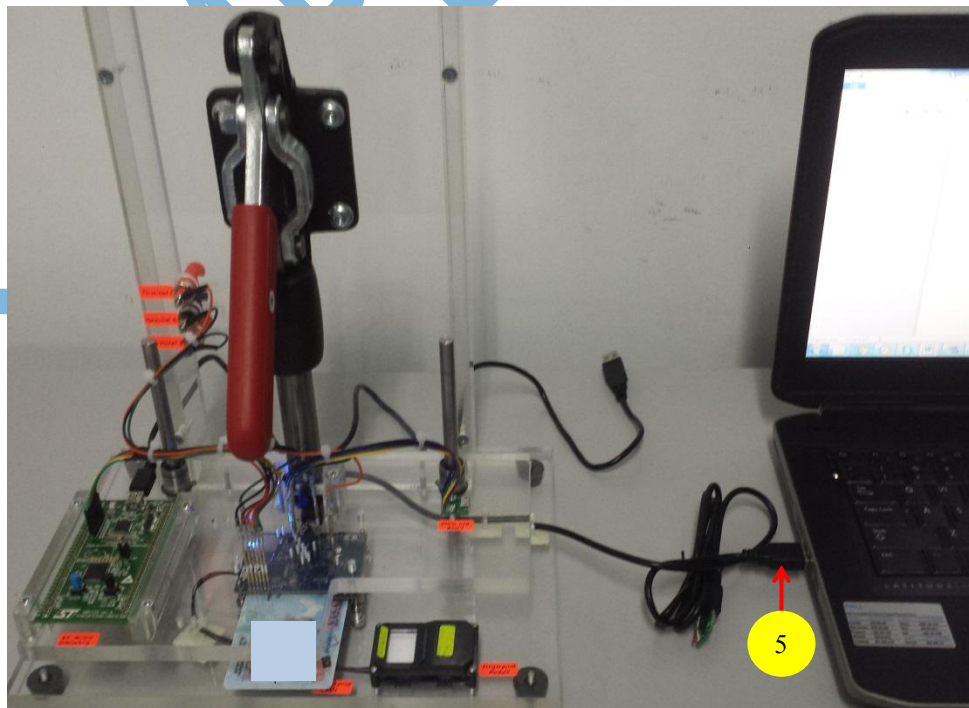


Figure 22: PCBA inside the Test Jig

Step 3: Put the Board inside the Test Jig. Lock the handle(pull down).



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Figure 23: Cable no 5 connect to PC workstation

Step 4: Connect the Cable no 5 to PC workstation.

Step 5: Refer to Document **Kridentia Test Application V1** for Functional Test.

2.4.5 Fingerprint Test – (Step 5)

Step 1: Refer to Document **Kridentia Test Application V1** for Functional Test.

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