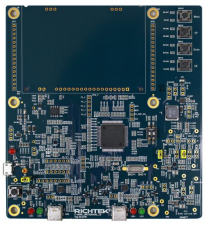

RICHTEK RD0005-03 E-Marker Write Board User Manual

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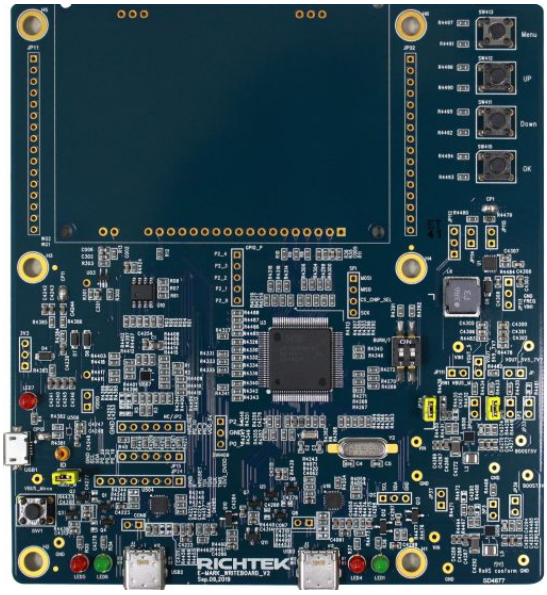
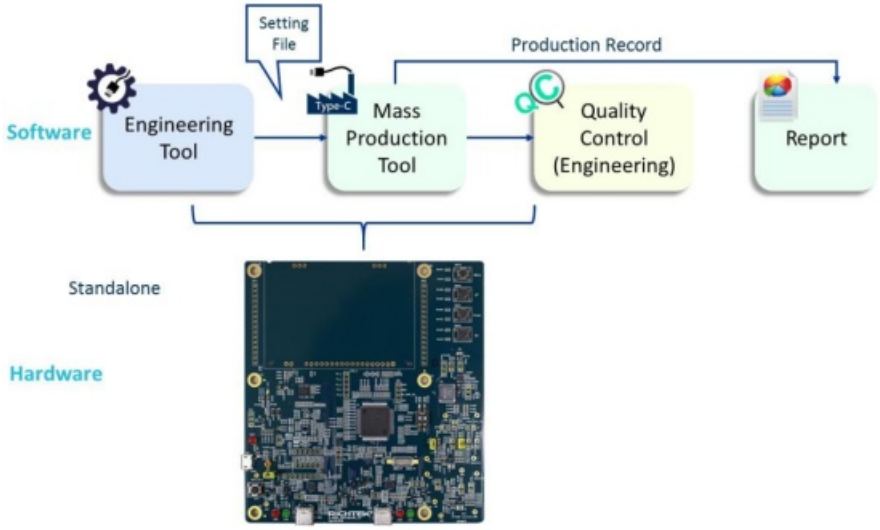


Contents

Solution Overview

- E-Marker write board can program E-Marker IC along with Richtek's future products
- E-Marker write board provides LED to indicate system status
  - Please refer to the appendix for more information
- The production can be managed from cable setting to quality control with the software tools
- PD protocol version support
  - PD2 passive
  - PD2 active cable
  - PD3 passive
  - PD3 active cable (PD3 Version 1.1, where Cable VDO version = 1.2)
  - Without supporting VbusCurrent = USB Type-C Default Current

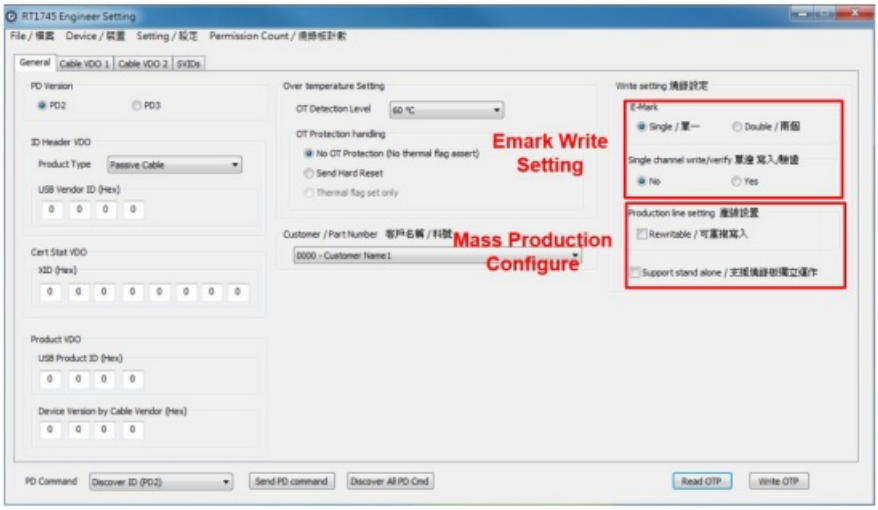


Engineer Tool

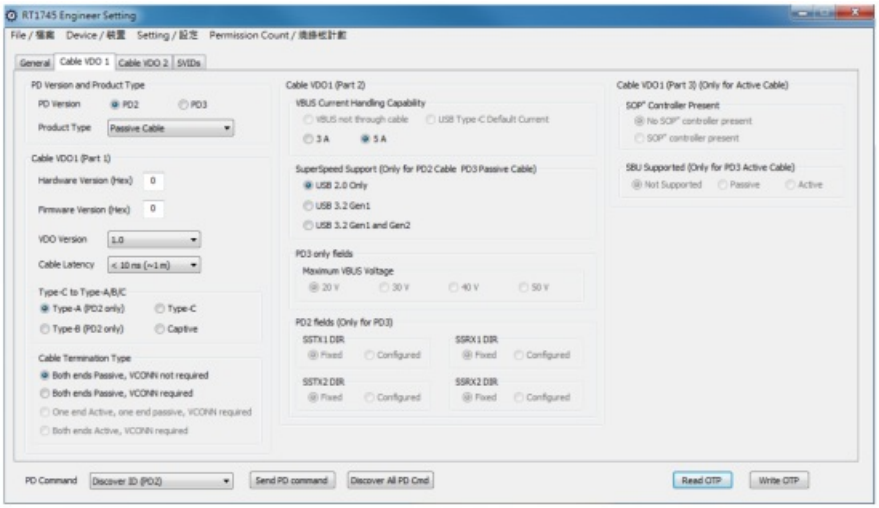
Overview

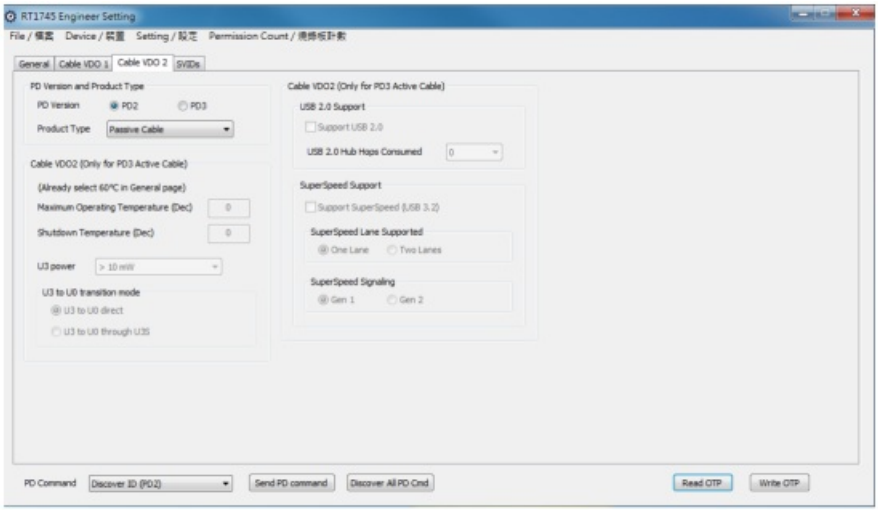
- Read the E-Marker IC data from cable
- Write the E-Marker IC data with
  - Cable VDM data setting
  - Writer board setting
- Save / Load all setting into / from binary file
- Save / Load setting to writer board
  - For the standalone mode
- Set vendor production information
  - Customer id (can be defined by the customer)
  - Date and time
  - Cable serial number
  - Execute VDM command to check the correctness
- Save the setting to Vendor Information File (VIF file)

    - The file can be open with “USB Vendor Info File Generator” provided by USB-IF
- Set the cable VDM data and writing page in the first tab

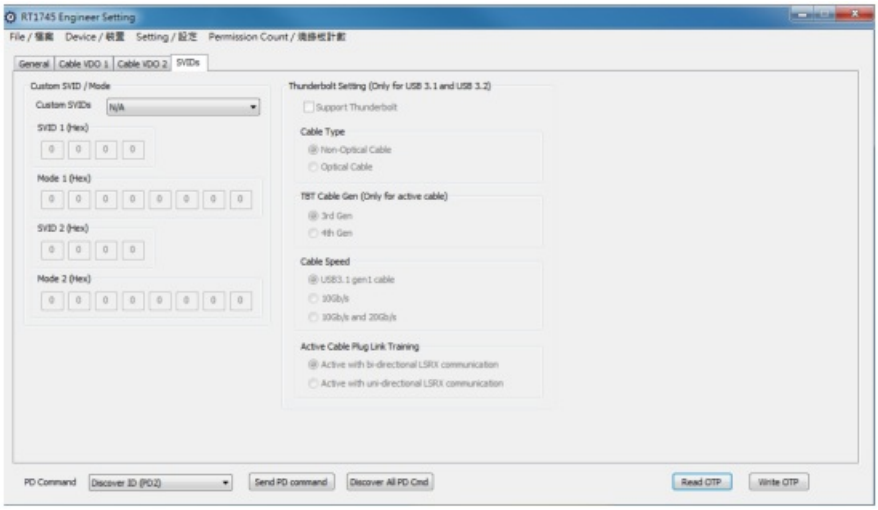


The Cable VDO1 and Cable VDO2 Setting is in the 2nd and 3rd tab





The Cable VDO1 and Cable VDO2 Setting is in the 2nd and 3rd tab

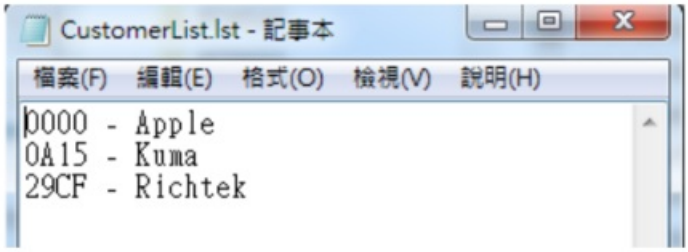


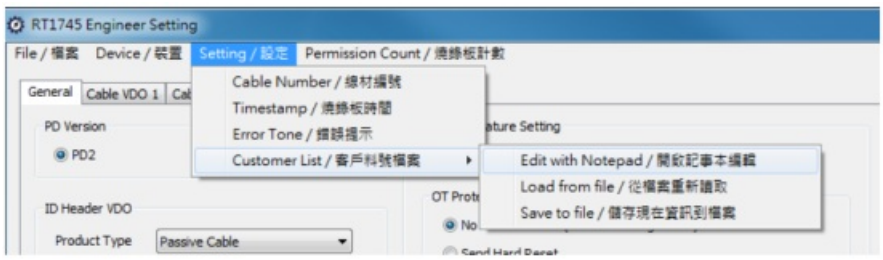
Open and edit the Customer List.lst

- File path: “MyDocument\Richtek\E-MarkerIC\CustomerList.lst”
- Format : Customer_ID (4 hexadecimal digits) – Customer_Name
- It is able to open this file through the engineer tool menu

Customer ID will be programmed in the cable

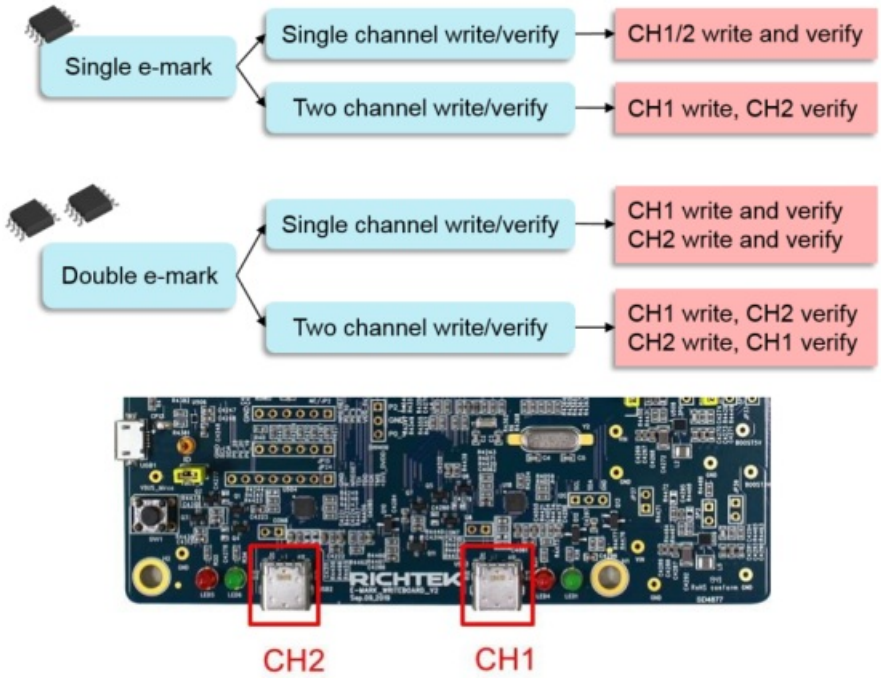
- When this cable is read by quality control tool, the correspond name is shown

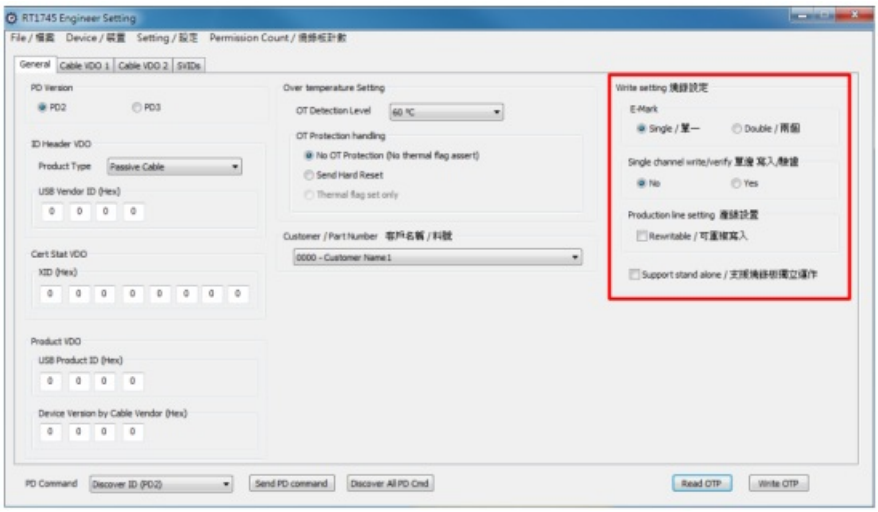




Write operation setting

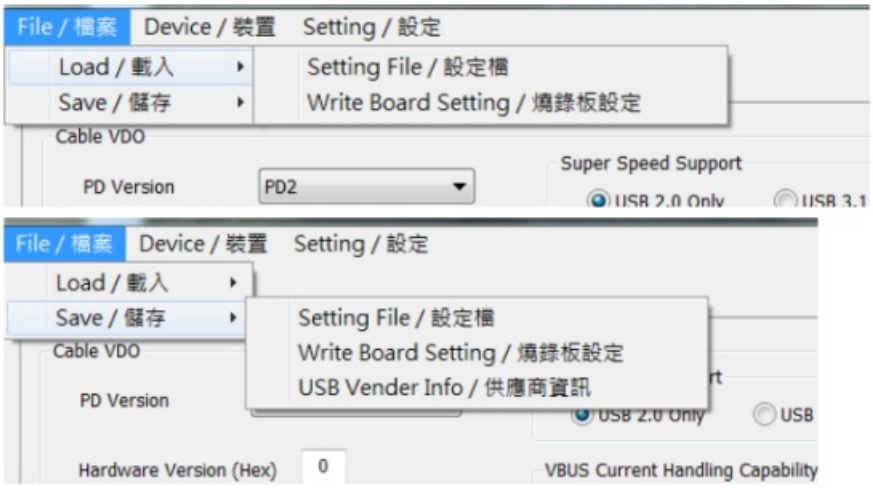
- Single / double e-mart
- Rewritable
  - Can overwrite the original data to a written cable
- Support stand alone
  - The binary file can generated can used in standalone mode
  - This option does no effect on the Mass Production Tool





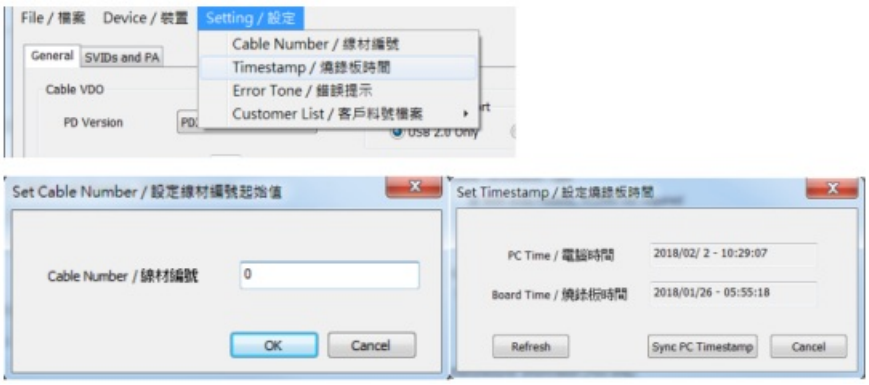
Setting file

- Save / Load all setting into / from binary file
  - Mass production tool will load this setting file



Writer board setting

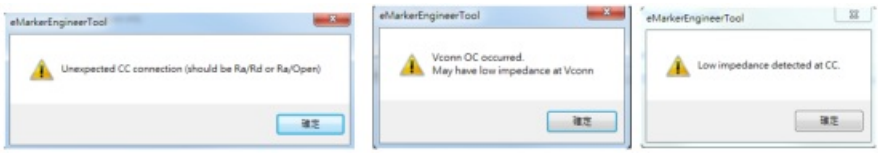
- For standalone mode
  - Program data
  - Timestamp
  - Serial number (cable number)
- Please terminate it by close button to ensure the correctness of cable number
- This number is the next serial number written to cable



Error message

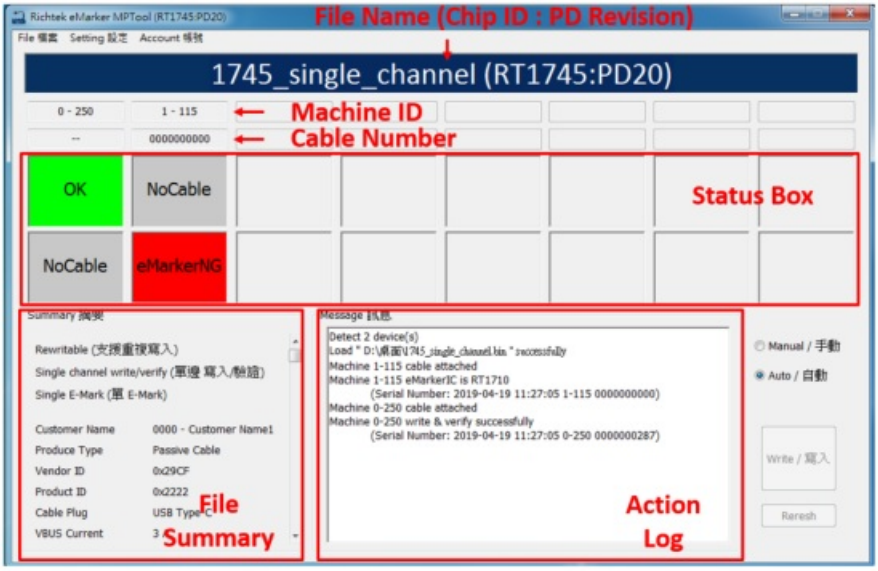
- Unexpected CC detected
  - Maybe following condition
    – EVB CC pin short to ground
    – IC CC pin damaged
- VCONN OC occurred
  - VCONN over-current detected
  - May have low impedance at VCONN
- Low impedance detected at CC

- Low impedance at VCONN

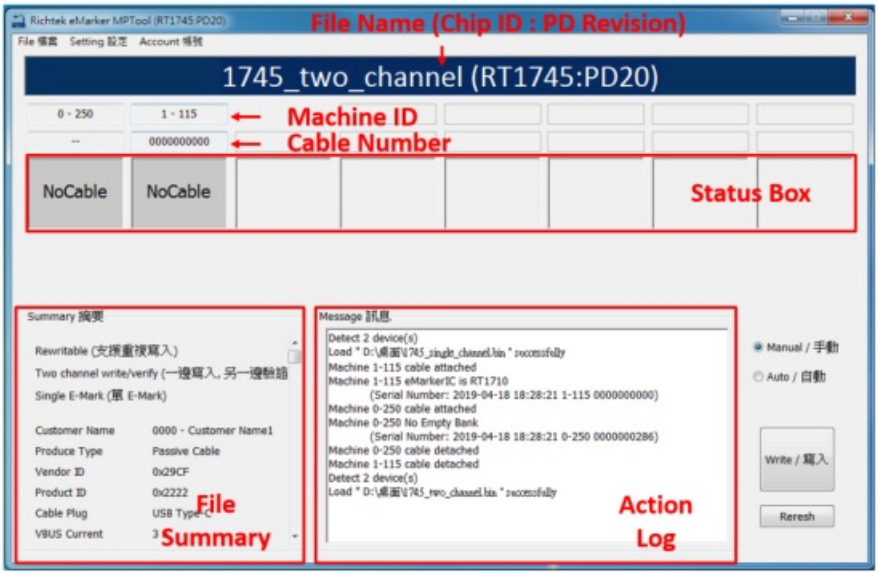


Mass Production Tool

- Load the setting file that generated by engineering tool, and start to write E-Marker cables
- When the application is turned on, it will automatically try to load the last opened setting file
- All of actions will be recorded in log file, the actions about writing will be recorded in production record
- Please terminate it by close button to ensure the correctness of cable number
- Program layout
    - Single channel write / verify



Two channel write / verify



Field Description

- Machine ID
  - The identification of write board
- Cable Number
  - The cable number will increase if the machine write successfully
- Record
  - Machine ID and Cable Number will be recorded in the E-Marker and local file
- Load setting file
  - Default password : Richtek
  - Change the password in Menu : Account
- Log file
  - MyDocument\Richtek\E-MarkerIC\xxxxxx.log
- Production record
  - MyDocument\Richtek\E-MarkerIC\ProductionRecord_x_x_xxxxxx.csv
- Status Box
  - NO CABLE :

    – There is no cable that is ready for write
  - READY

    – The machine is ready for write
  - Writing & Verifying

    – The machine is writing or verifying
  - OK

    – The machine has written and verified successfully
  - NG

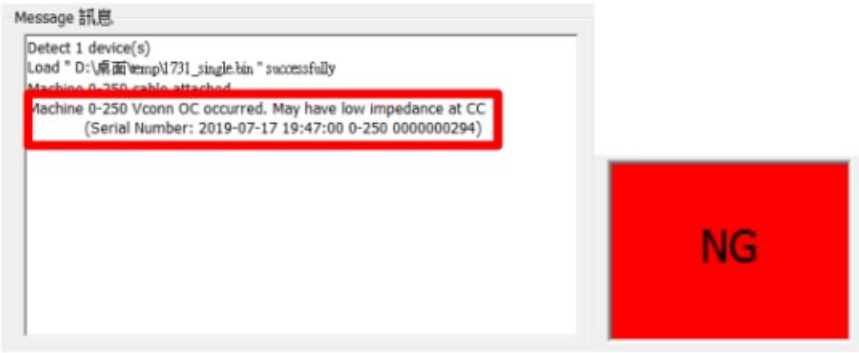
    – The machine wrote or verified failed, or E-Marker IC had been written by another vendor
  - Unavailable

    – The cable had been written and setting file does not declare rewritable
  - E-MarkerNG

    – The E-Marker in the cable is different from the setting file

- Unexpected CC detected
  – Maybe following condition
  1. EVB CC pin short to ground
  2. IC CC pin damaged

- VCONN OC occurred
  – VCONN over-current detected
  – May have low impedance at VCONN

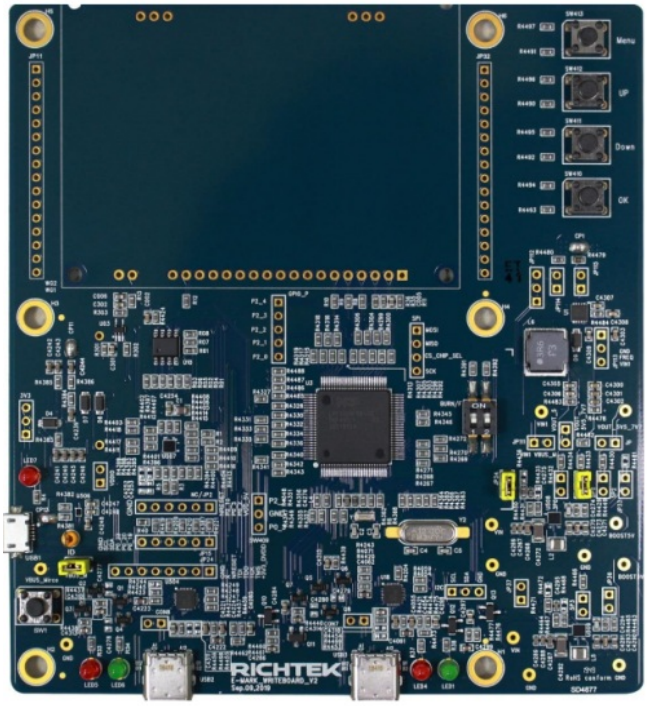


- Low impedance detected at CC
  – Low impedance at VCONN

Standalone Mode

Write the cable automatically when the writer board is powered by DC.

1. Connect to Dedicated Charging Port (DCP).
   i. This mode will not be entered when the writer board is connected to PC.
2. The data written is from the command “Save Writer Board Setting” in Engineer Tool.
3. Notice that there is no production record saved with this mode.



Quality Control Tool

Read the cable information

- Via reading OTP with engineering mode
- Via VDM Commands (Discover ID, …)

Read the data from CH1 and CH2 automatically

- The output data is show in the screen simultaneously

Compare with setting file generated by engineer tool

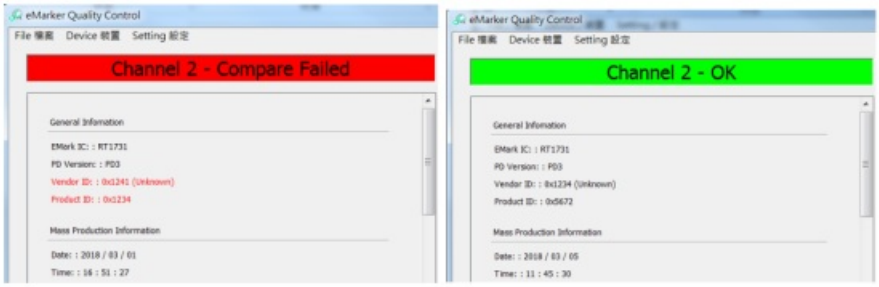
- The different fields will be shown in the color red

E-Marker verification

- Verify by OTP comparison in default
- Check “Force using VDM discovery” to verify with VDM commands, the status bar will show “PD”

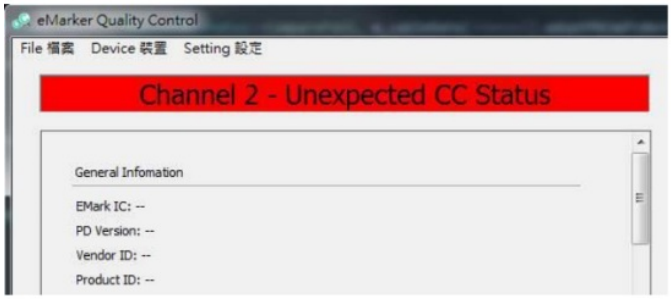
Comparison with binary setting

- Load binary by File -> Load Setting File
- If verification is failed, the different fields are shown in red

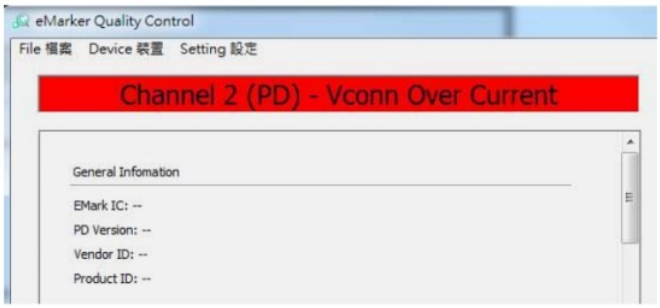


Unexpected CC detected

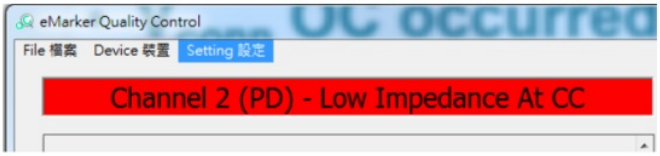
- Maybe following condition
    1. EVB CC pin short to ground
    2. IC CC pin damaged



- VCONN OC occurred
    - VCONN over-current detected
    - May have low impedance at VCONN



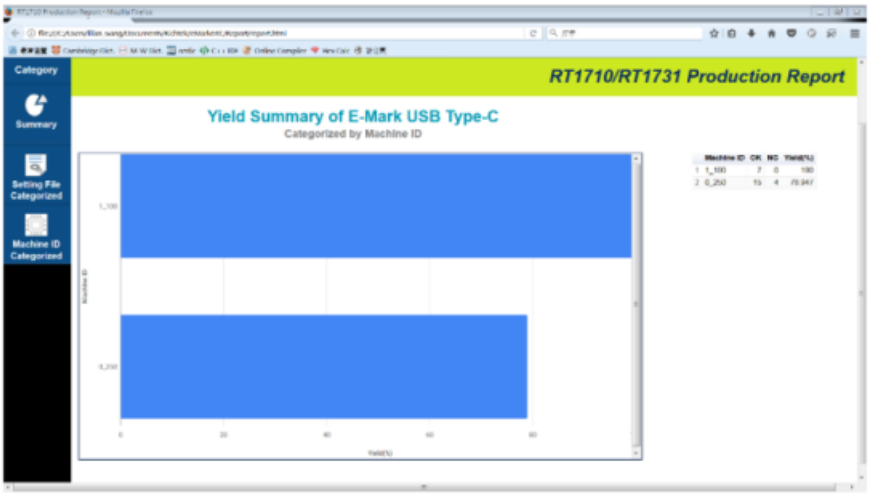
- Low impedance detected at CC
    - Low impedance at VCONN



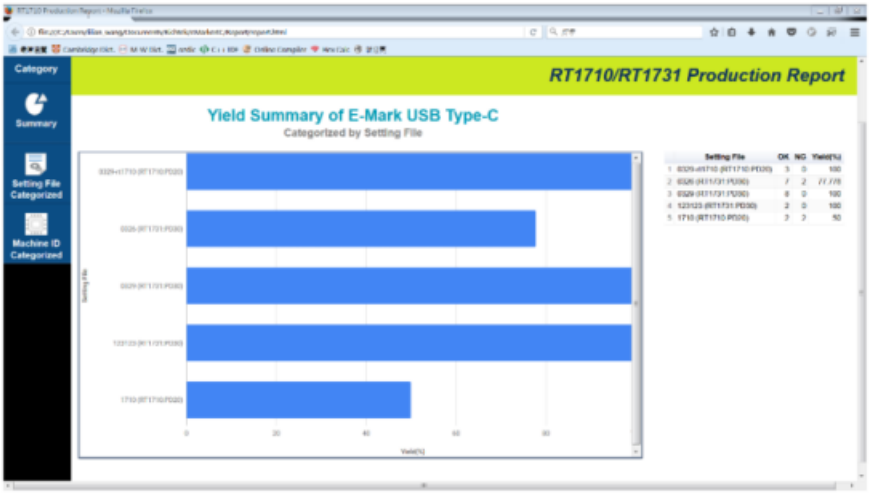
Report

Report can be grouped by

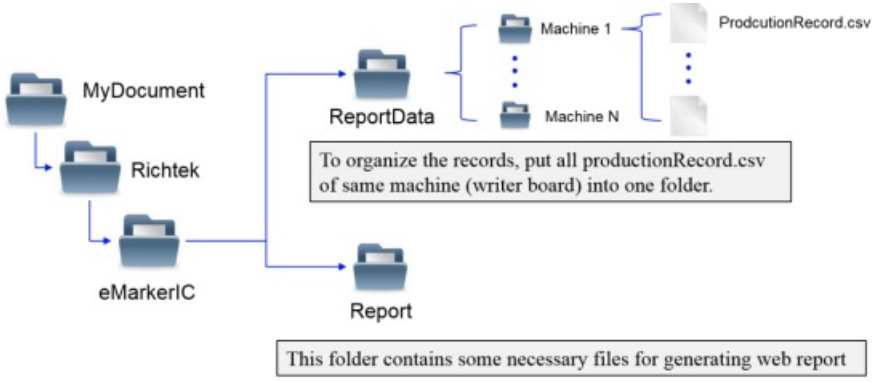
- Writer board machine id



- Cable setting file



File structure



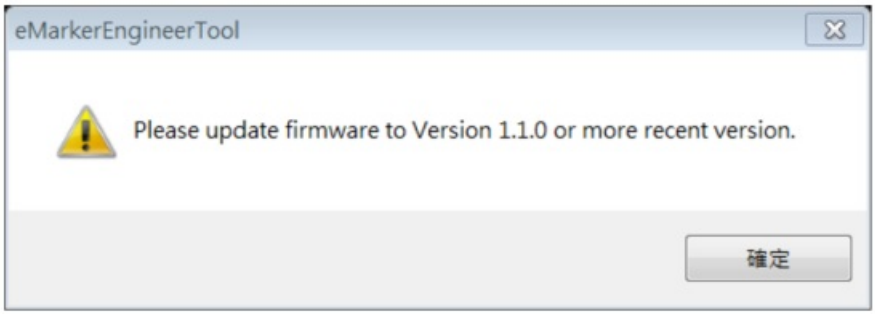
Instructions

- Create the folder “ReportData” in Document/Richtek/E-MarkerIC
- Create the filter folder in E-MarkerIC, and move the production report from Document/Richtek/E-MarkerIC to the filter folder
    - For example, create the folder Machine250, and move the ProductionRecord_0_250_201803.csv into the Document/Richtek/E-MarkerIC/Machine250
- Open E-Marker Production Report and select the parsing folders and set date filters and some other filters by clicking Options

- Click Generate Report

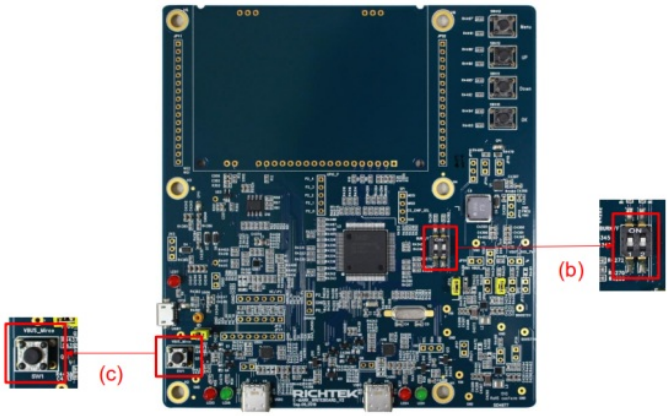
FW Update Steps

- When the tools remind to update FW, please update the FW of the board by the FW binary file provided



Steps 1

a. Connect the bridgeboard and PC
b. Pull up the switch 1 to On side
c. Press the button



Steps 2

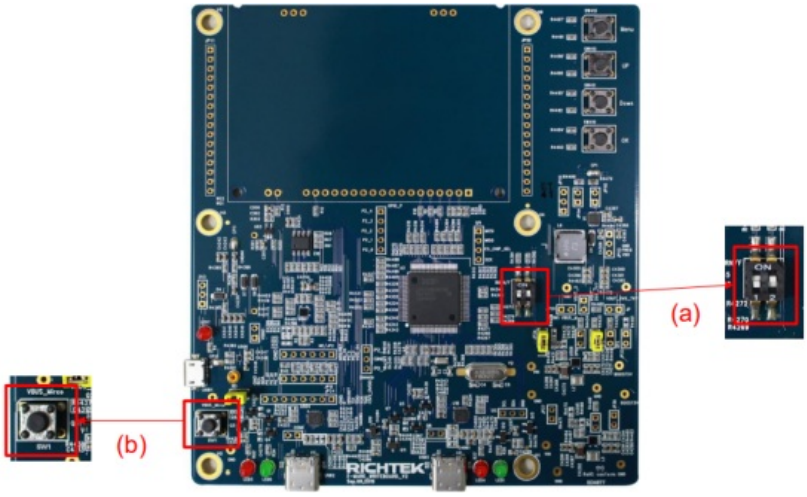
a. Open the Drive of bridge board
b. Delete the file in this drive

Steps 3

Copy the FW binary into this drive

Steps 4

a. Pull down the switch 1 to number side
b. Press the button to restart bridgeboard



Appendix

LED

Code	Meaning	LED Status	Description
Status LED : (Left / right 2 LED for left / right port)			
eLED_DETECTING	Detecting	Red and green LED flash staggered	No cable detected
eLED_DETECTED	Detected	Green LED flash	Cable detected
eLED_OK	Burn Success	Green LED keep on	Burn / read command succeed
eLED_NG	Burn Fail	Red LED keep on	Burn / read command failed
eLED_UNEXPECTED	Unexpected Device detected	Red LED flash	Unexpected device detected or cable CC pin damaged

More Information

For more information, please find the related datasheet or application notes from Richtek website http://www.richtek.com.

Important Notice for Richtek Reference Design

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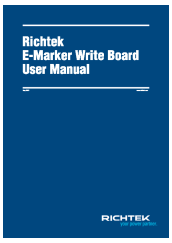
Documents / Resources

	RICHTEK RD0005-03 E-Marker Write Board [pdf] User Manual RD0005-03, E-Marker Write Board, RD0005-03 E-Marker Write Board, Write Board, Board