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WRENBOARD USER MANUAL

# General USB-I2C/GPIO/PWM Tool Kit

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August 2022

[www.richtek.com](http://www.richtek.com)

## Table of Contents

1. Introduction .....	3
2. Getting Started .....	3
3. Hardware Description.....	5
4. Firmware Update.....	7
<i>More Information</i> .....	10
<i>Important Notice for Richtek Reference Design</i> .....	10

## 1. Introduction

Nowadays, most of ICs contain digital interface in order to control increasingly complex ICs easily. Richtek Technology developed a bridge board to control the device with digital interface. The bridge board, Wrenboard, provides I<sup>2</sup>C and GPIO, which can be utilized as 1-wire/PWM. In addition, we also provide the PC-based software (Richtek Bridgeboard Utilities). Users can control the devices by graphical user interface (GUI). This user manual describes the hardware setting and how to update the firmware on the Wrenboard. For the information about software operation, please refer to “Bridgeboard Control Panel User Manual”.

## 2. Getting Started

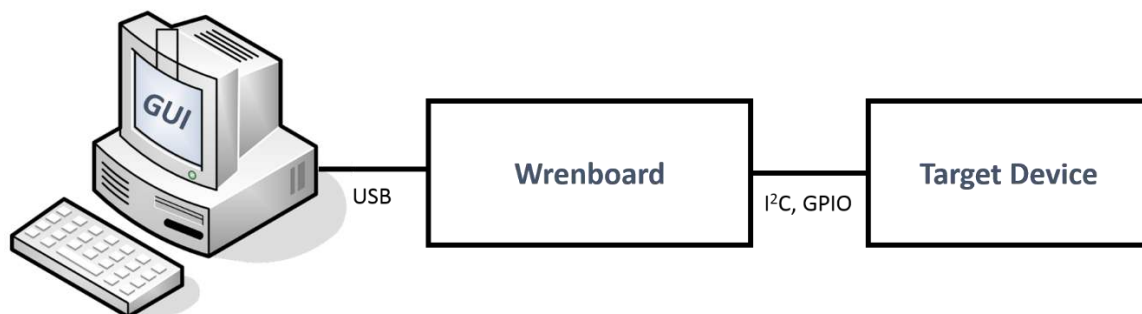


Figure 1. The Connection of Wrenboard

Figure 1. Summarizes the purpose of Wrenboard. This section describes how to install the required components.

### 2.1 System requirements

- ◆ Operating system: Windows 7, or Windows 10.

### 2.2 Software installation

Install Richtek Bridgeboard Utilities downloaded from

<http://www.richtek.com/shareEVB/RTBridgeboardUtilities.exe>

### 2.3 Hardware installation

1. Connect Wrenboard and target device via connect cable.
2. Insert Wrenboard into a USB port.

## 2.4 Graphical User Interface

After software and hardware installation, you can run Richtek Bridgeboard Control Panel to control the target device by GUI (Figure 2). For details regarding the operation, please refer to “Bridgeboard Control Panel User Manual”.

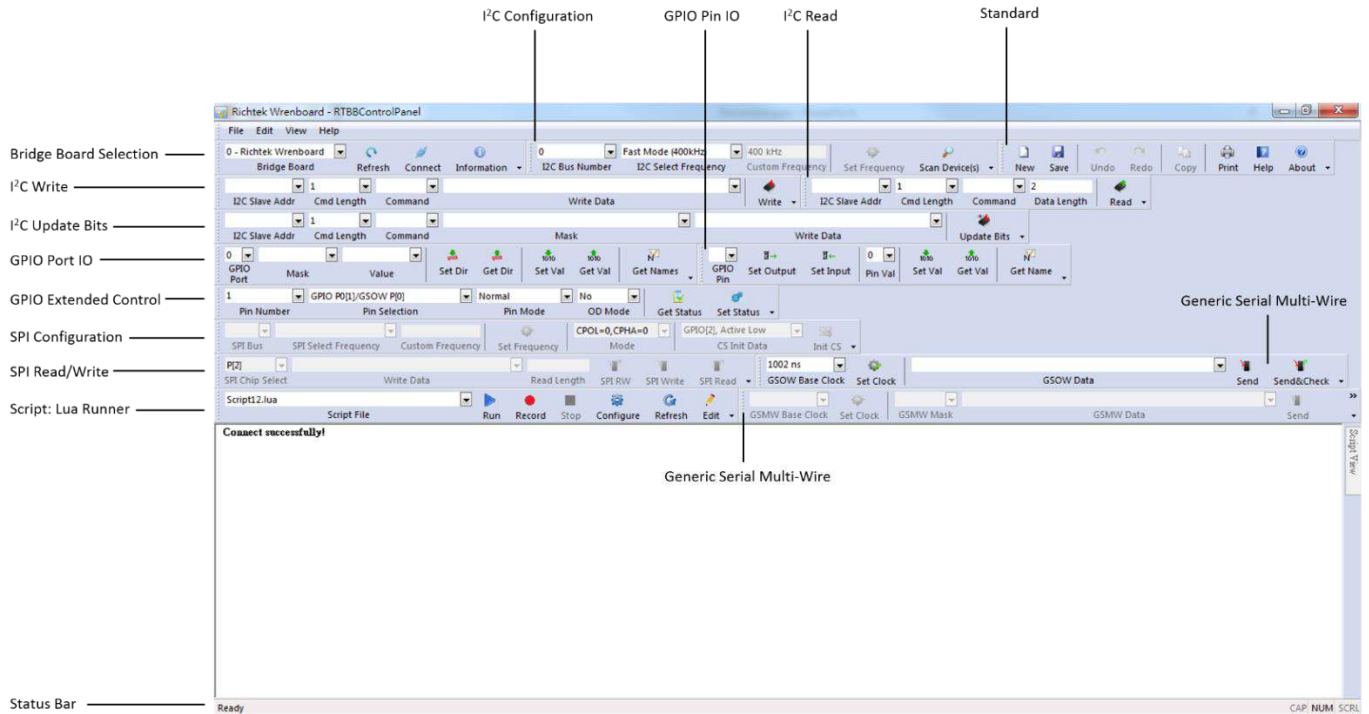
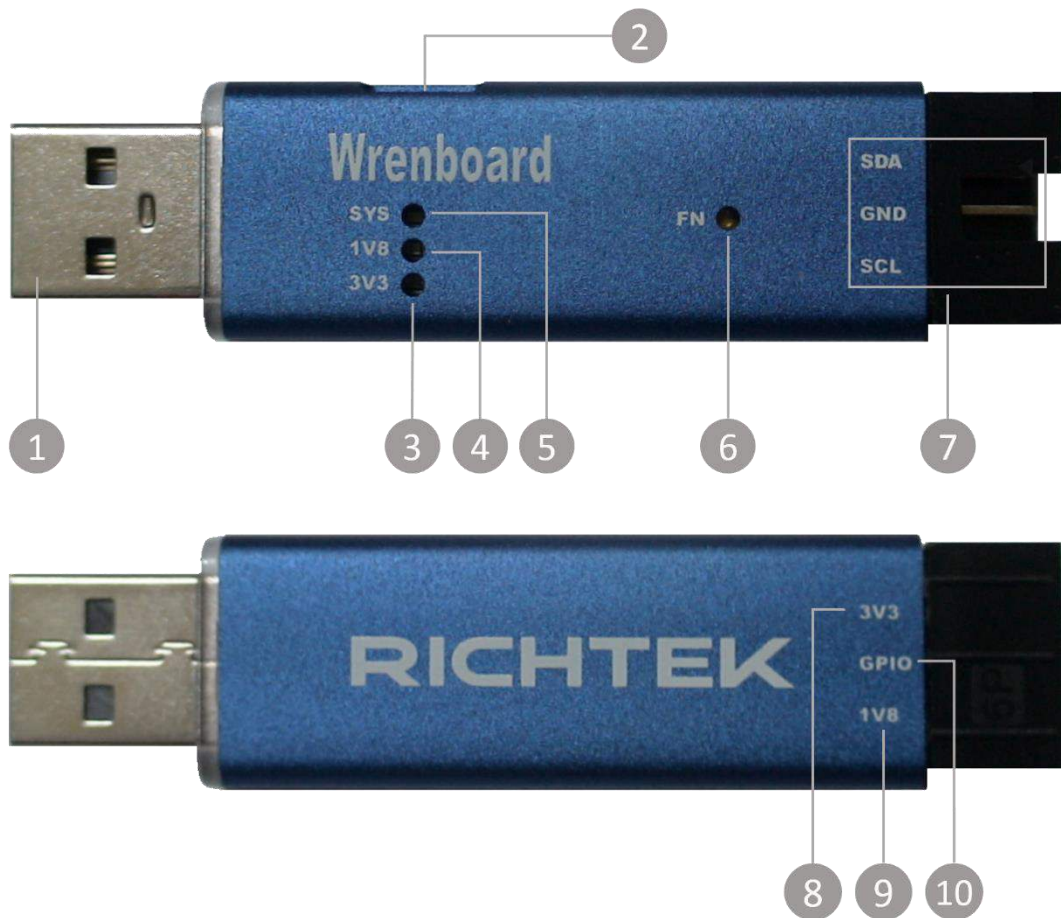


Figure 2. The GUI of Richtek Bridgeboard Control Panel

### 3. Hardware Description



- 1 Standard USB A plug

It can be connected to PC directly.

- 2 Micro-B USB port

It is an alternative to connect Wrenboard to PC when the long distance between Wrenboard and PC is needed.

- 3 I<sup>2</sup>C voltage LED

The Red LED indicates that the I<sup>2</sup>C pins are operated in 3.3V.

- 4 I<sup>2</sup>C voltage LED

The Blue LED indicates that the I<sup>2</sup>C pins are operated in 1.8V.

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**5** System LED

If the Wrenboard execute a command, the white LED will be switched on / off.

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**6** I<sup>2</sup>C voltage exchange / Firmware update button

- ◆ To exchange I<sup>2</sup>C voltage  
Click FN button in normal operation mode, the I<sup>2</sup>C voltage will be exchanged between 3.3V and 1.8V level.
  - ◆ To enable firmware download mode  
Connect Wrenboard to PC and press FN button. If the red and blue LEDs are blinking alternatively, it means firmware download mode is ready.
- 

**7** I<sup>2</sup>C and GND pins

- ◆ SCL (Serial Clock Line)  
SCL is a serial clock line with a 2.7k $\Omega$  pull-up resistor. It is used to synchronize the data transfers on the I<sup>2</sup>C bus.
  - ◆ SDA (Serial Data Line)  
SDA is a serial data line with a 2.7k $\Omega$  pull-up resistor. It is used to send data and address.
- 

**8** 3.3V power pin

It is suggested to limit the output current within 100mA.

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**9** 1.8V power pin

It is suggested to limit the output current within 100mA.

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**10** GPIO

The GPIO pin can be configured as GPIO (P0.1), 1-wire (GSOW) and PWM function according to programming setting. User can connect this pin to control device in either function.

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## 4. Firmware Update

Step 1. Connect Wrenboard to PC

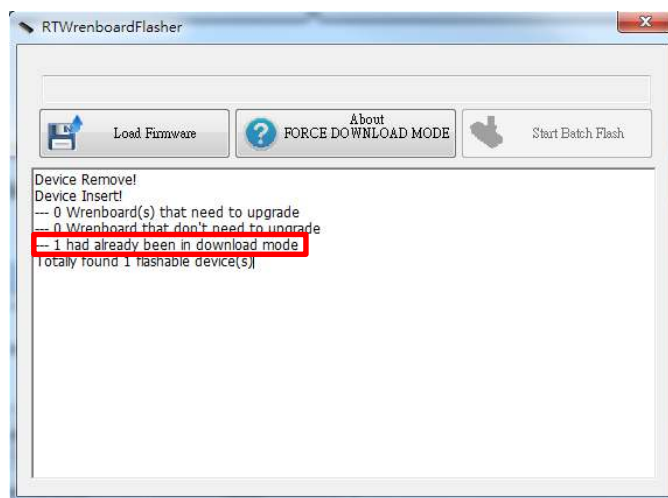
To avoid impacting the other device, please disconnect all available pins on the Wrenboard.

Step 2. Run Richtek Wrenboard Flasher

(Start > Richtek Technology Corporation > Richtek Bridgeboard Utilities > Firmware Update Tool > Richtek Wrenboard Flasher)

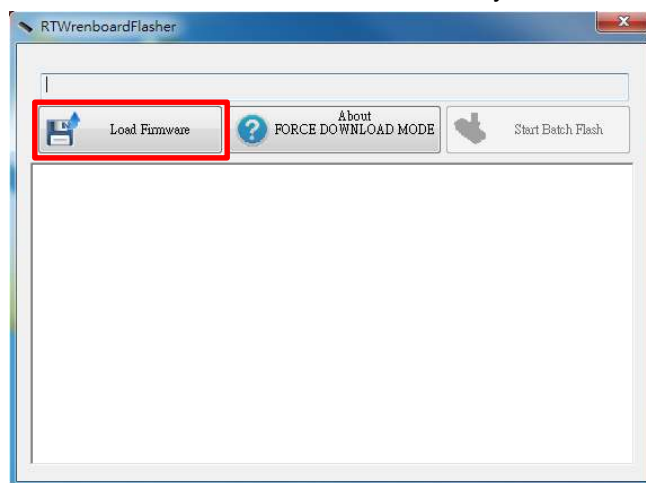
Step 3. Use force download mode if the firmware cannot operate normally. Otherwise go to Step 4.

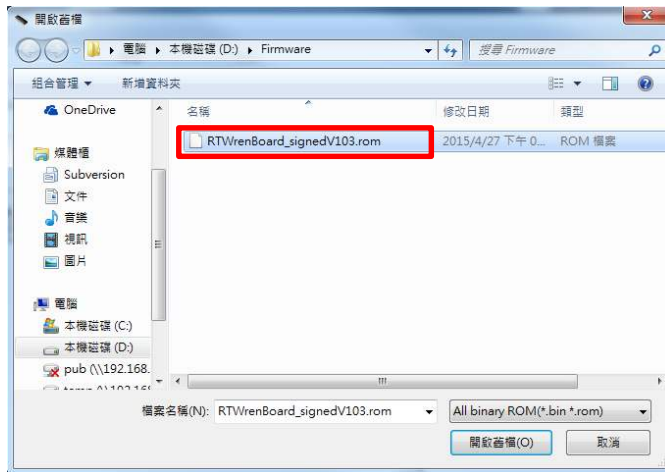
Press FN button until the red and blue LEDs are blinking alternatively.



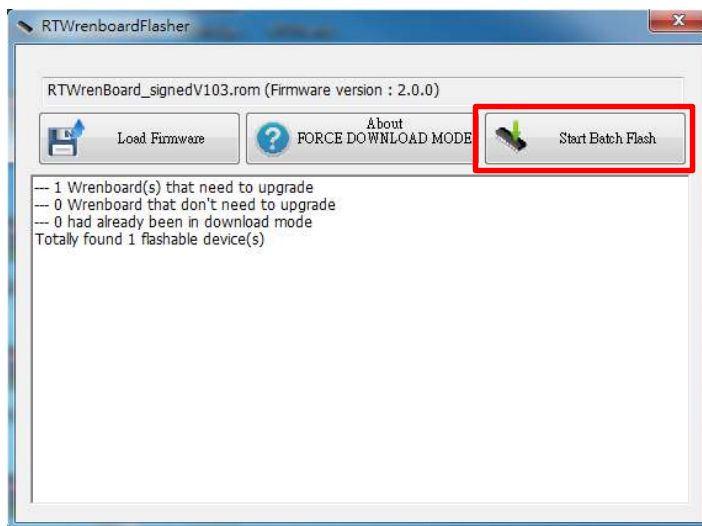
Step 4. Load firmware

Click "Load Firmware" and select the file you want to install on the Wrenboard.





Step 5. Install firmware

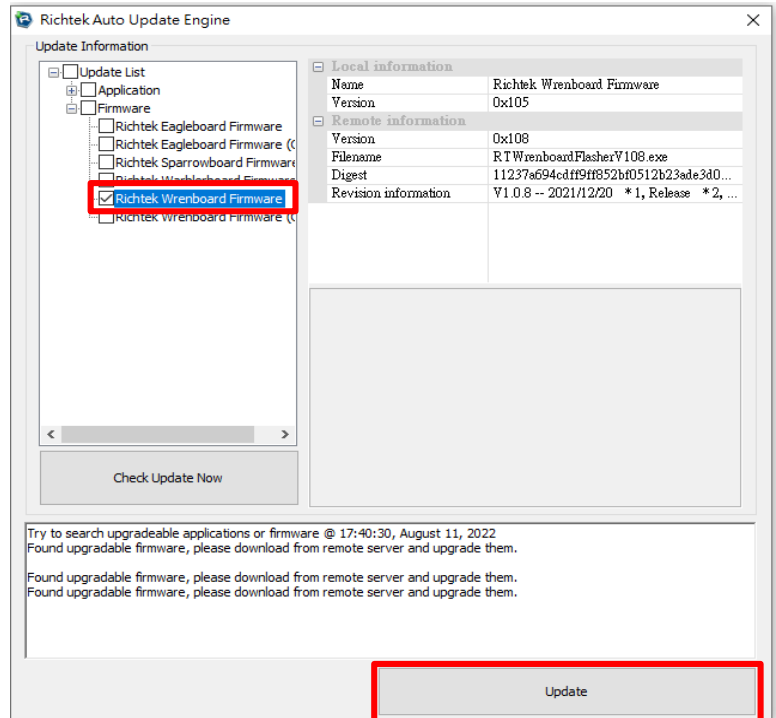
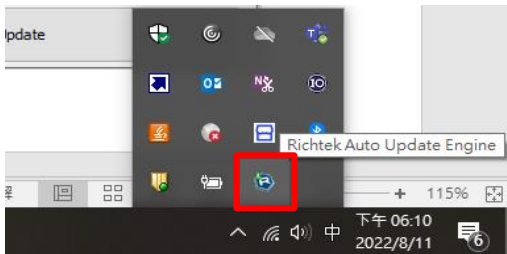
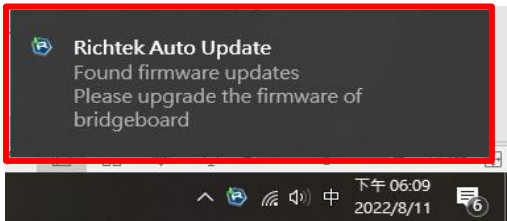




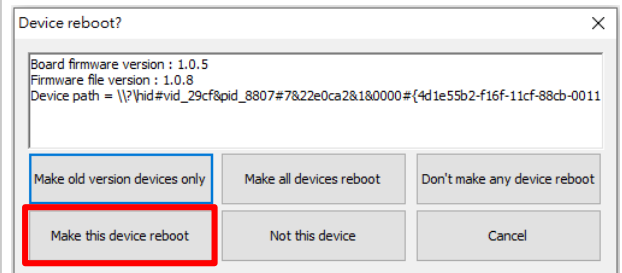
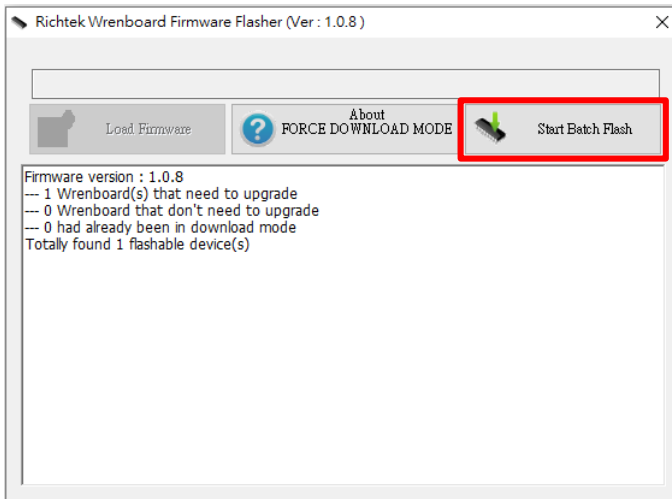
Notes :

When popup following message. It is suggested to update newest firmware.

Click Richtek Auto Update Engine icon in lower right corner.



Click “Start Batch Flash” and “Make this device reboot”.



## **More Information**

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

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**Window : RDC / SRD**