DSO138mini: How to Upgrade Firmware

Applicable model: 13805K

1. Introduction

The micro-controller (STM32F103C8T6) used in DSO138mini contains a built-in booloader. This is a small piece of firmware that has been pre-stored in the chip and can communicate with a PC via serial port to write firmware into the flash ROM of the chip. This article describes how to setup the connection and how to perform firmware upgrade step by step.

2. Tools You Need

In order to complete the upgrade the following tools and file are required.

1) Serial converter that connects DSO138mini to PC

The serial port of DSO138mini (J5) uses 3.3V LVTTL level . The PC port that we need to connect to is usually a USB port. These two ports are quite different electronically and can not be connected directly. A converter (usually called TTL-USB or Uart-USB converter) is required. There are many such converters available on market. JYE119 (sku# 11901) is one of such products that JYE Tech offers (see Fig. 1). For details about the converter please visit www.jyetech.com。

Fig. 1

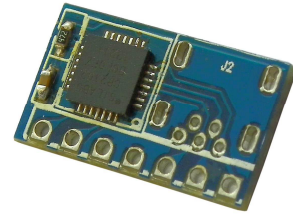### 2) PC software that can work with the bootloader

In order to work with the bootloader you need to have software that runs on PC. This software is called Flash Bootloader Demonstrator which is provided by ST. It is free software and can be downloaded at http://www.st.com/web/en/catalog/tools/PF257525#. You can also download it at JYE Tech website by the link below.

http://www.jyetech.com/Support/STM32_FlashLoaderDemonstrator_v2.7.zip

After downloading install it to your PC.

3) The firmware file (HEX file) to be written to DSO138

You can download the most updated firmware at

http://www.jyetech.com/Products/LcdScope/Firmwares_138mini.php.

Save the downloaded file to a known place on your PC for future use.

3. Connection

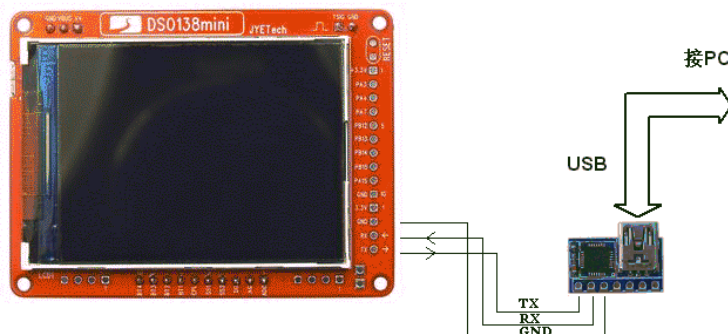Fig. 2 and Fig. 3 show the connection between DSO138mini and PC.

Fig. 2

Fig. 3

The serial port of DSO138 (J5) contains three pins, TXD, RXD, and GND. TXD is an output pin (out of DSO138mini) and RXD is a input pin (into DSO138mini). GND is the common reference. Please make sure they are connected correctly if you use a different Uart-USB converter.

4. Upgrading Steps

1) Close the jumpers JP1 and JP2 (see Fig. 4) on DSO138mini main board with solder. This will make the MCU enter bootloader instead of the main firmware at next power up.

2) Connect DSO138mini to a USB port on PC as described in section 3. Apply power to DSO138mini.

3) Launch Flash Bootloader Demonstrator and proceed to the state as shown in Fig. 5. Here you need to setup some parameters for the serial connection. Please set the parameters to what illustrated in Fig. 5. For Port Name you need to choose the one corresponding to DSO138mini.
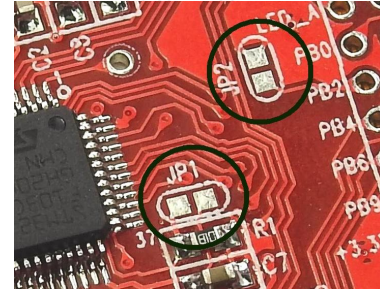
Please note that many Uart-USB converters require drivers be installed on PC before they can function properly. For JYE119 converter you need install the driver for CP2102 (the converter chip). Please use the following link to download and install the driver.

Fig. 4

http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx

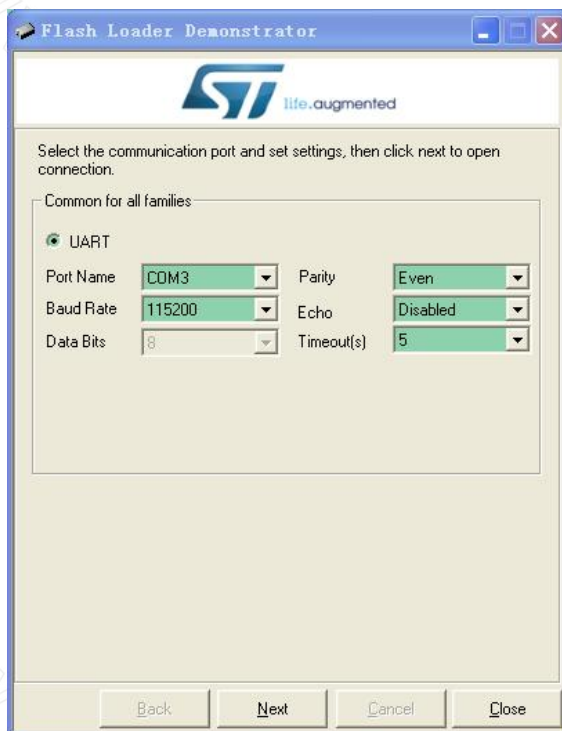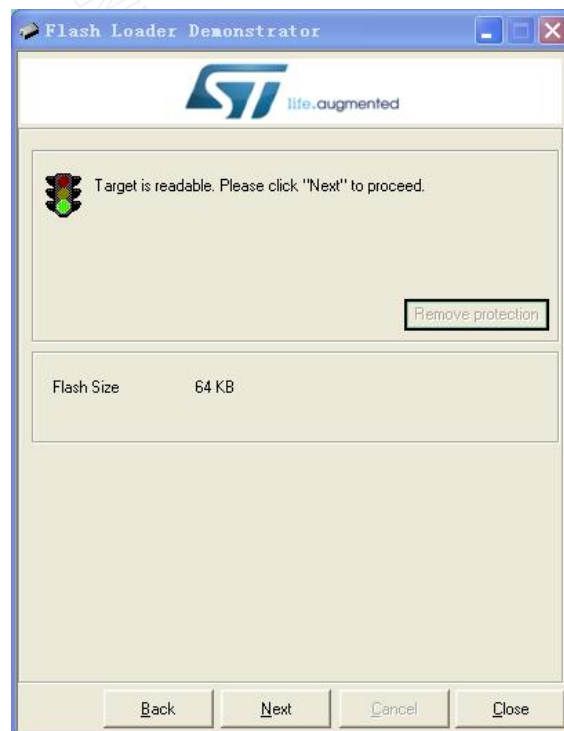After set all parameters properly click Next to continue.

Fig. 5

Fig. 6

4) If there is no error you should see Fig. 6. This is a temporary state showing that the PC has successfully detected bootloader and the flash memory is readable or not. If you have problem to enter this state you can try reset the MCU by shorting the two pads in the RESET circle at top-right corner of the main board and try again. If that still doesn't work check connections and JP1/JP2. You can try swapping TX and RX lines if you are not very sure they are connected correct. Otherwise click on Next to proceed to next step as shown in Fig. 7.

5) Fig. 7 shows information about the MCU type and its flash memory. You just need to make sure the selection at Target dropdown is the same as shown in Fig. 7. Then click Next to proceed to next step.

6) In Fig. 8 select "Download to device" and open the firmware file (HEX file) which you have saved on your PC by clicking on the "…" button. Make all the rest settings the same as shown in Fig. 8. Then click on Next to start writing.

7) You should see progress bar like that in Fig. 9. When writing is done you should see Fig. 10.

8) Power off DSO138mini and disconnect the connection from PC. **Remove the solders on JP1 and JP2**. Apply power to the oscilloscope again. Check whether the oscilloscope boots up properly. Verify if the firmware versions are correct. If everything is good the upgrading is done.
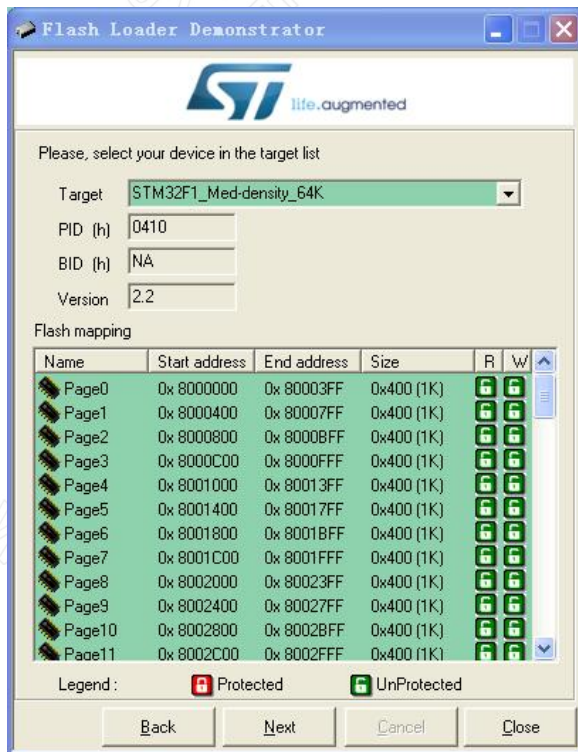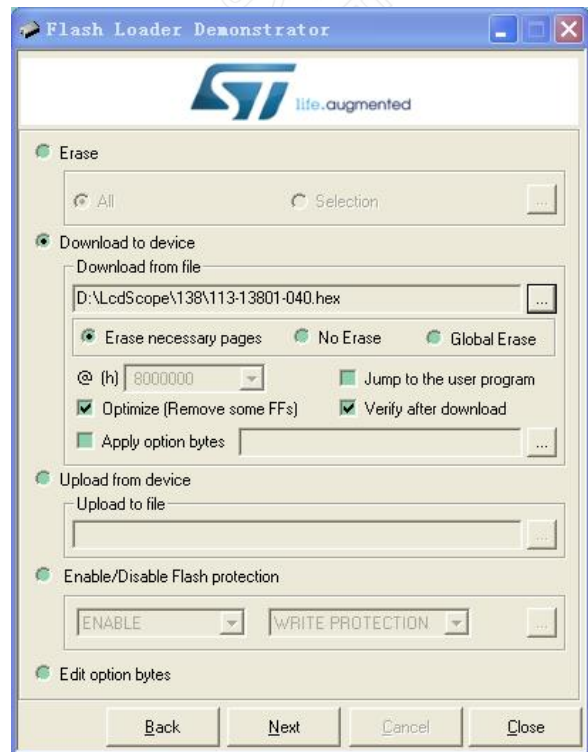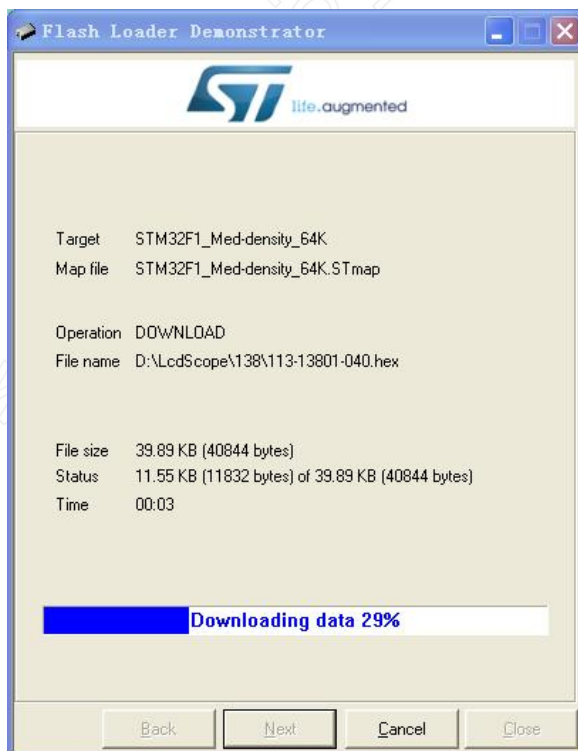
Fig. 7

Fig. 8

Fig. 9

Fig. 10

Revision History

Version	Date	Summary
v01	2018.06.04	Modified based on "DSO139: How To Upgrade Firmware".