

This document is used for the user guide of “ArduinoDue_SpiFlashProgramWithSdCard”. By pressing the push button which is connected on the Arduino Due MCU Board, user is able to start reading the image data from the indicated “All_Pic.bin” file which is stored in the SD card and write the image data into the serial flash of RA8876/RA8877 through the SPI interface. The programming procedures can be observed through the serial monitor of Arduino IDE. Regarding the detailed information of this application, please refer to the following description:

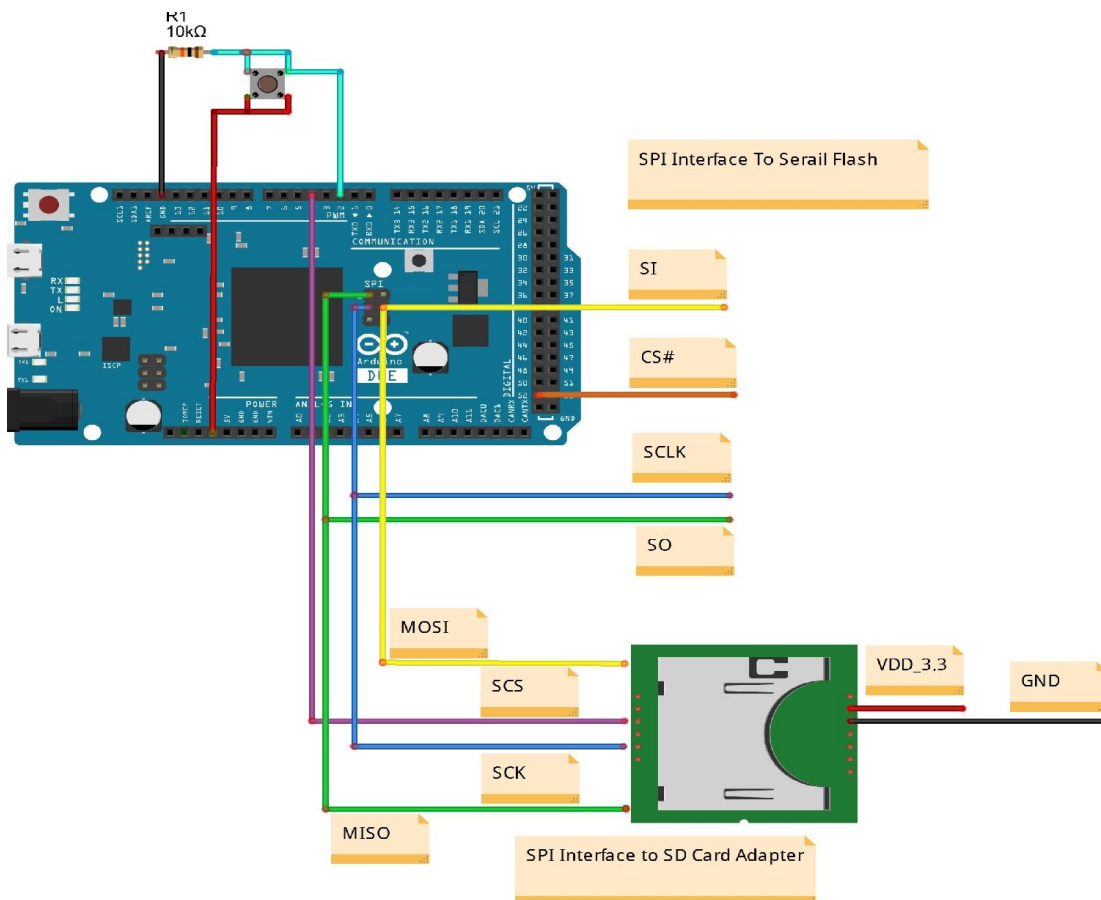
Hardware Requirements

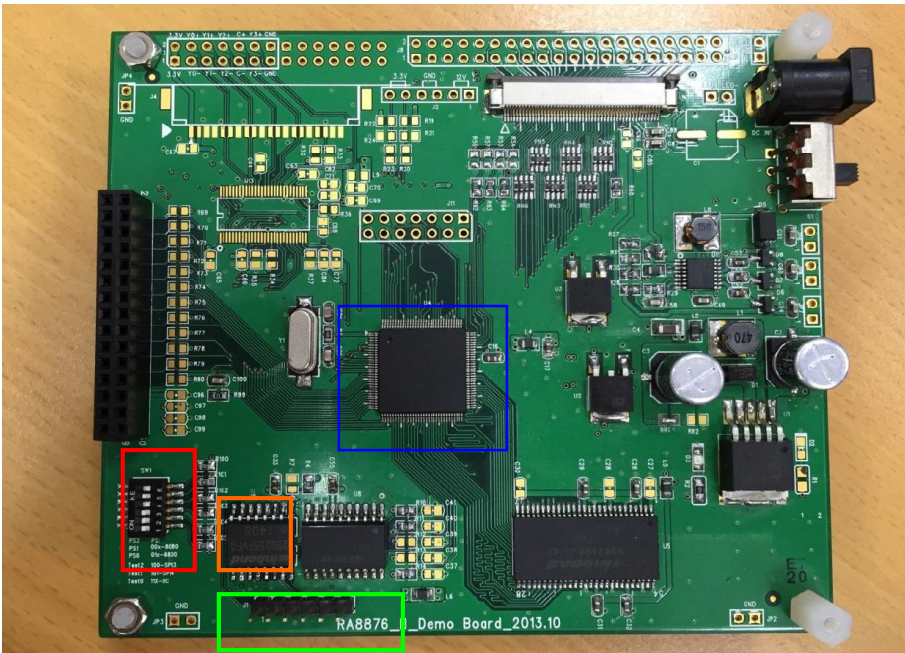
1. Arduino Due Board
2. SD Card Adapter
3. Push Button
4. RA8876/RA8877 Evaluation Board

For programming the serial flash, RA8876/RA8877 Evaluation Board should previously keep a serial flash programming port and the setting switch “TEST [2:1]” pin.

5. SD card (the maximum memory capacity is 4GB)

Circuitry connection:





— RA8876 or RA8877 CHIP

— Set RA8876 or RA8877 TEST[2:1] PIN to [01]:

Force SPI master interface pin is kept the floating state. (This manipulation is used for in-system programming of serial flash)

— Serial Flash ROM for DMA function

— SPI Flash external programming port

1	SPI_CS1
2	SPI_SO
3	SPI_SI
4	SPI_SCLK
5	3.3V
6	GND

Note:

1. The SPI interface, GND pin and 3.3V pin should be connected to this programming port. If the RA8876/RA8877 evaluation board has its own dependent power supply, and then the Anduino Due Board should not provide the 3.3V power to RA8876/RA8877 evaluation board.

2. RA8876/RA8877 provides 2 SPI master interfaces, it is recommended that CS0 is connected to the Genitop's Font ROM and CS1 is connected to the serial flash.
3. When the TEST[2:1] pin of RA8876/RA8877 are set as [01], the SPI master interface pin will stay in the floating state. If the CS0 is connected to Genitop's Font ROM, then the CS0 pin should be added a pull-up resistor to the 3.3V, otherwise the Arduino Due might not get the correct programming operation with serial flash through CS1.

Software Requirements

Arduino IDE 1.5.7 <http://arduino.cc/en/Main/Software>
RA8876 Image_Tool_1.0 www.raio.com.tw

Operating Procedures

1. Please connect the hardware connection as the recommended circuitry above.
2. Copy the "All_Pic.bin" and "wp1.bin" files from the "file2sdcard" folder to the SD card in the PC environment. After finishing the file copy operations, please insert the SD card into SD card slot which is already connected to the Arduino Due Board.

Note. The "All_Pic.bin(28125KB)" and "wp1.bin(938KB)" are the converted BIN files which are converted by the image converting tool "RA8876Image_Tool_1.0".

3. Open the project "ArduinoDue_SpiFlashProgramWithSdCard.ino" and select the flash type. Now Compiles your code and uploads it to the configured board.

```

13 boolean VerifyDataFlash32BitAddr(char * filename);
14
15 /*sd card scs*/
16 const int SD_CARD_SCS = 4;
17 /*spi flash scs*/
18 const int ENSCS = 52;
19 /*ra8876 xnsocs and xnreset*/
20 //const int RA8876_ENSCS = 52;
21 const int RA8876_XNRESET = 51;
22
23 /*select falsh type*/
24 //define FLASH_24BIT_ADDR
25 #define FLASH_32BIT_ADDR
26
27 /*LED pin*/
28 const int ledPin = 13; // LED connected to digital pwm pin 13
29 /*push button*/
30 const int buttonPin = 2; // the number of the pushbutton pin
31 // variables will change:
32 int buttonState = 0; // variable for reading the pushbutton status
33
34 Spi_Flash_Program SFP(ENSCS);
35

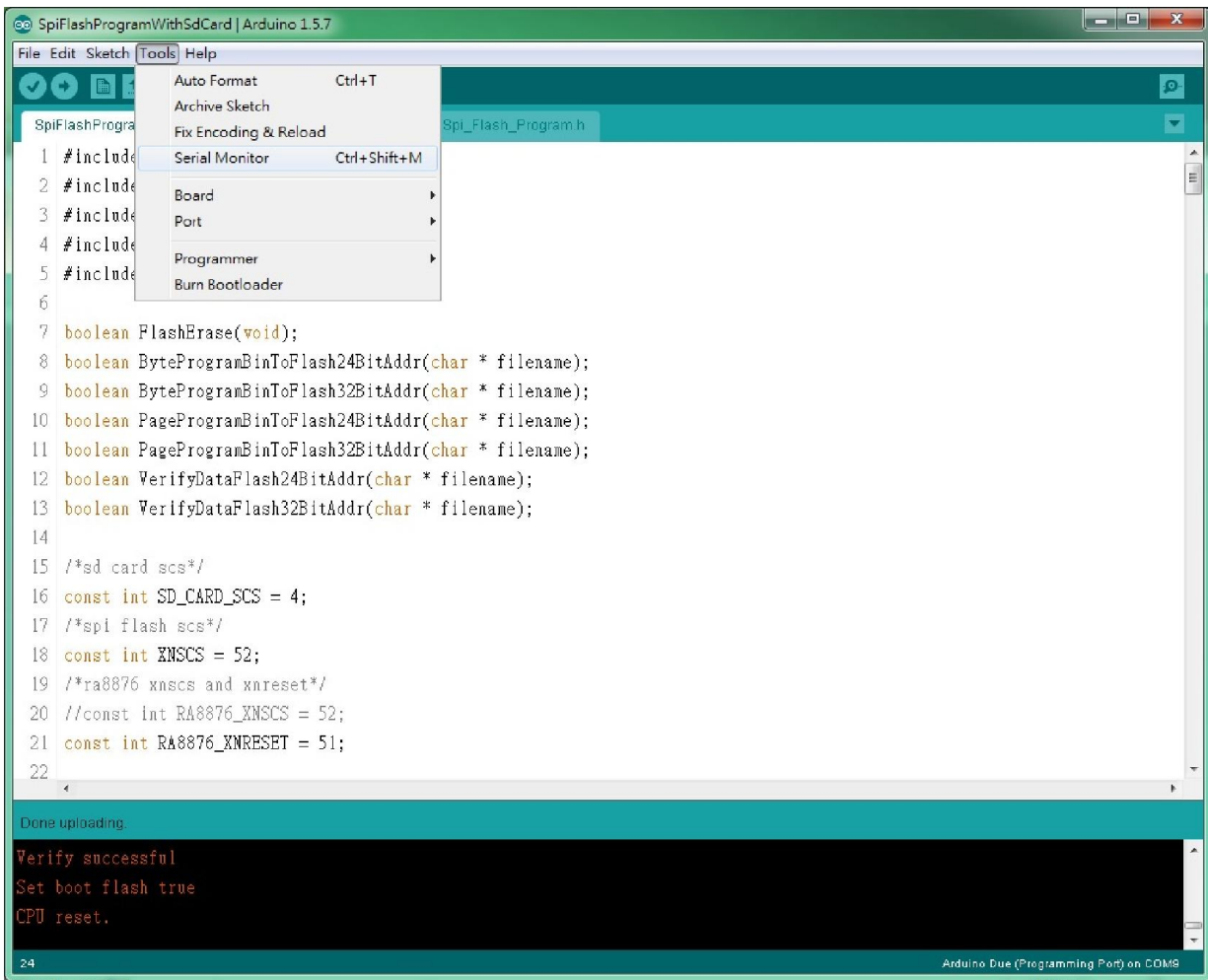
```

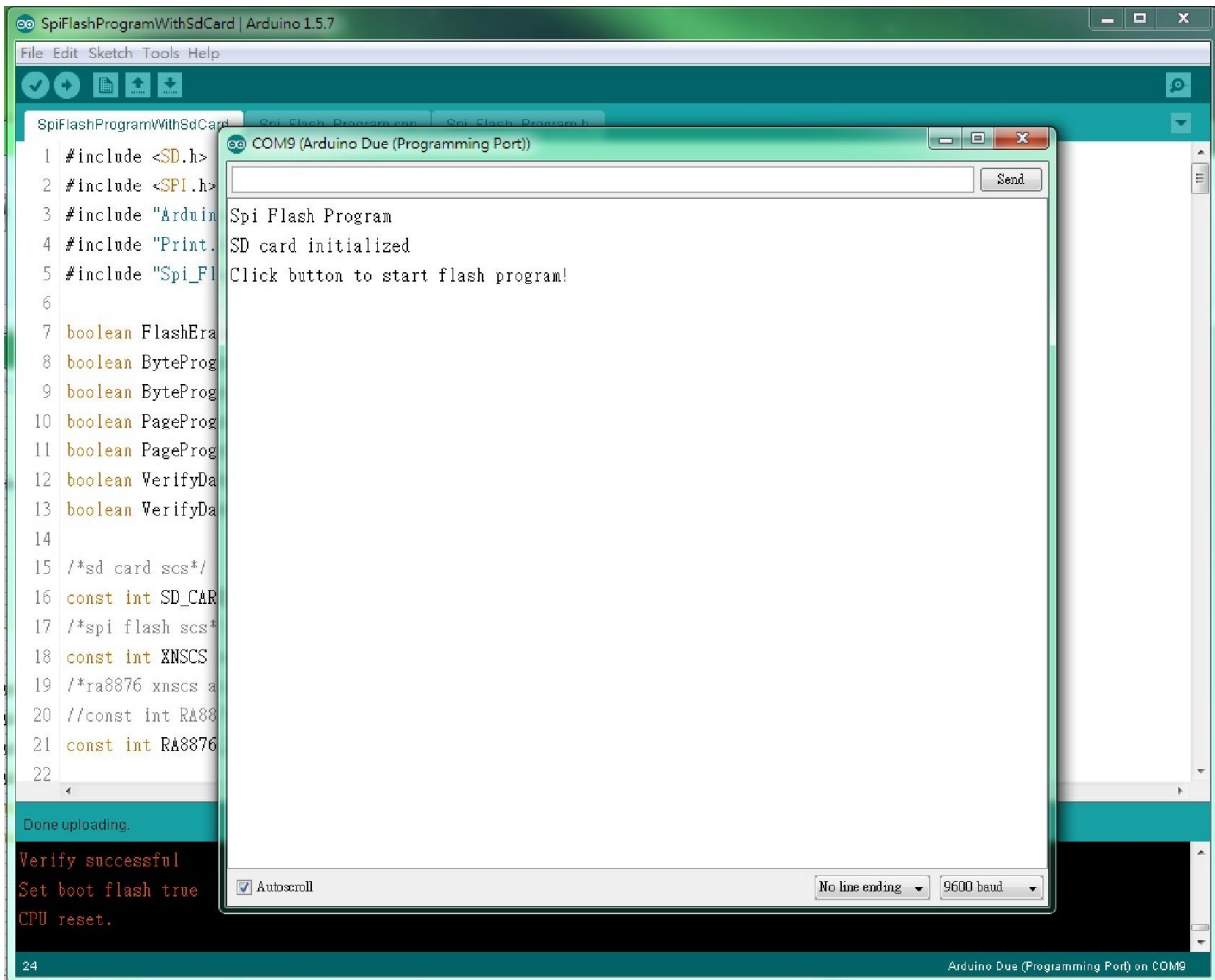
Done uploading
Verify successful
Set boot flash true
CPU reset.

25 Arduino Due (Programming Port) on COM9

Note. If the capacity of serial flash is more than 128Mbit (16MByte), please select the flash type as “#define FLASH_32BIT_ADDR”.

4. Click the serial monitor button in the toolbar for observing the operating status.



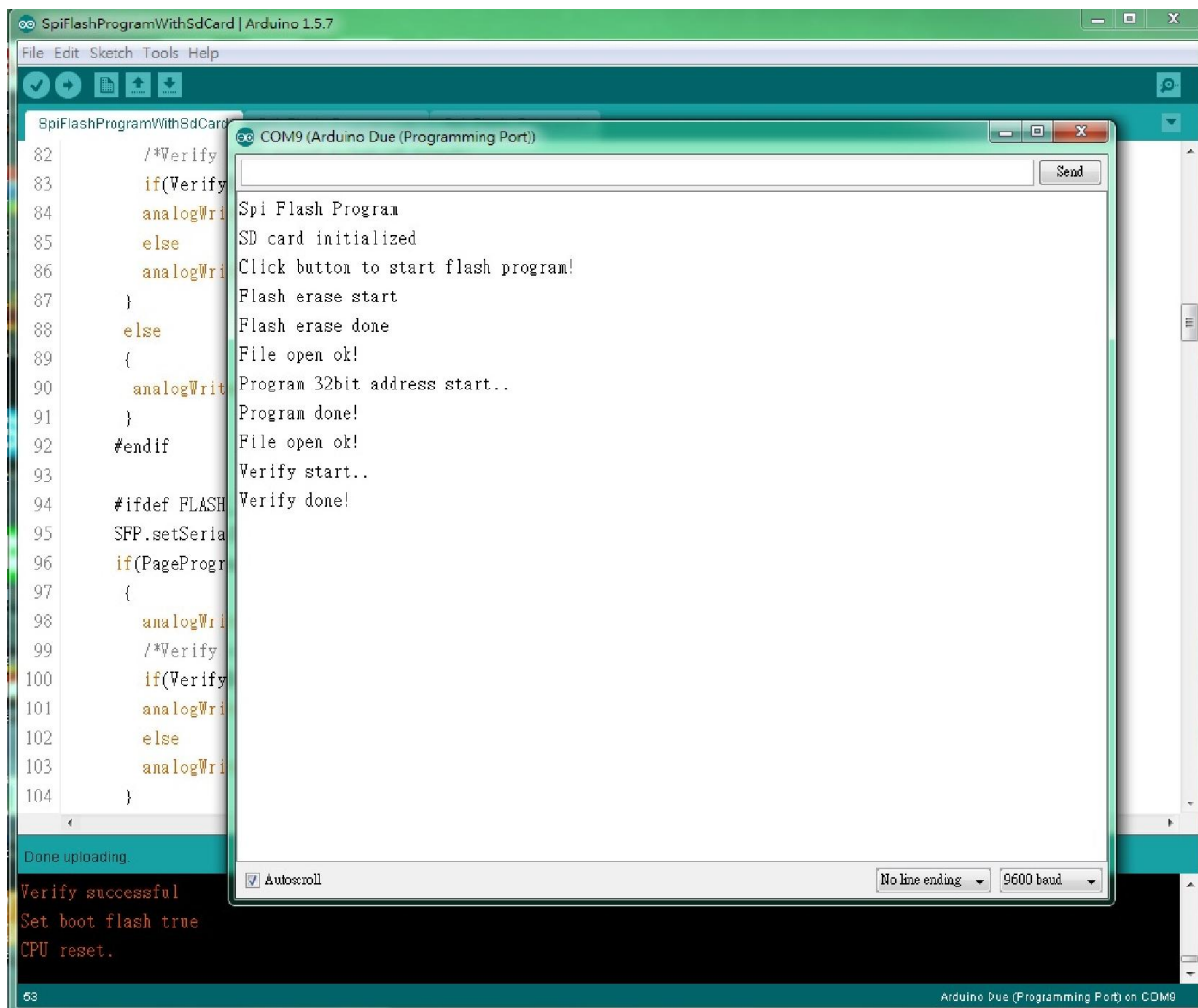


In the regular case, we should have gotten a Message Box as shown in the figure above. If not, please check the hardware circuitry connection.

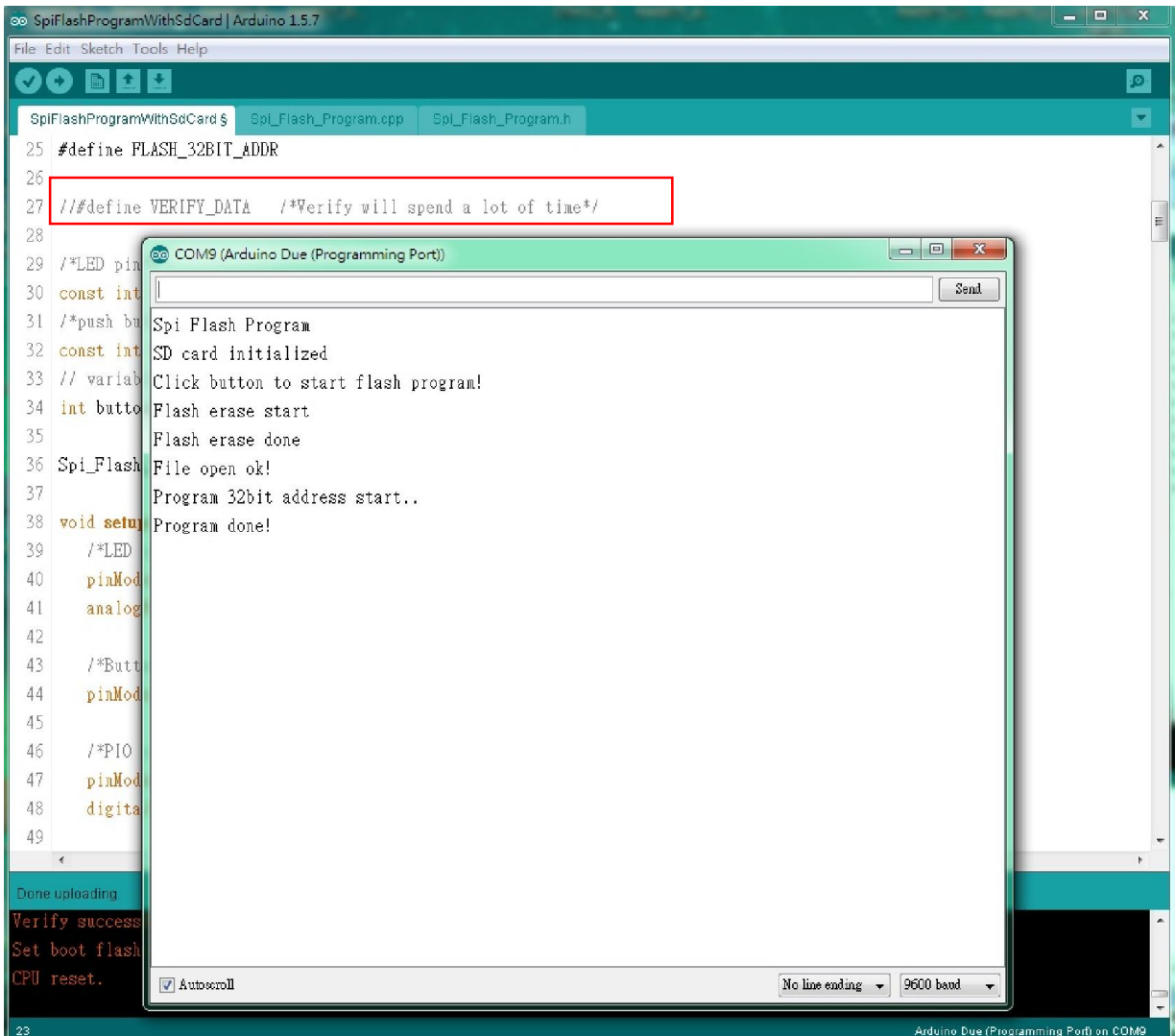
- After pressing the push button, the serial flash programming will be started, the programming procedures includes “Erase”, “Program” and “Verify”. In this example, is trying to write a 28125KByte image data into the 256Mbit serial flash memory. Please refer to the following table for the related operating time.

Flash erase	60 seconds
Flash erase + Program 28125KByte	375 seconds
Flash erase + Program 28125Kbyte + Verify	848 seconds

The regular operation should be shown as following.



If user wants to save the serial flash programming time, and then can skip the verify procedure.



6. If we have done the serial flash programming procedures, we can display the image data on LCD with the "RA8876_Lite_DMA.ino".