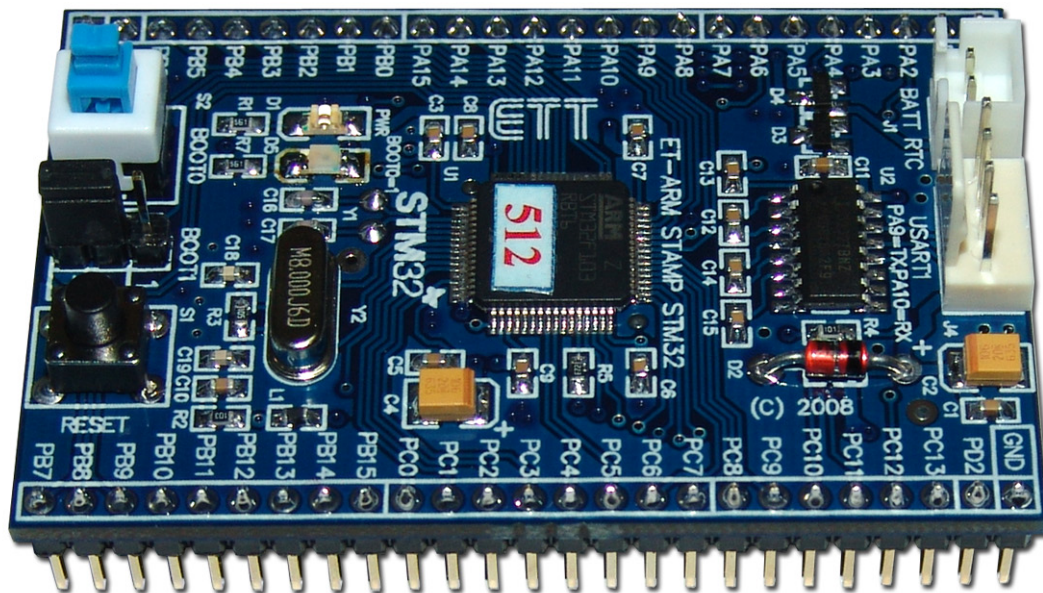


คู่มือการใช้งาน User's manual

STM32

ET-ARM STAMP STM32F103/128
ET-ARM STAMP STM32F103/512



ETT

บริษัท อีทีที จำกัด ETT CO., LTD.

1112/96-98 ถนนสุขุมวิท แขวงพระโขนง เขตคลองเตย กรุงเทพฯ 10110 <http://www.etteam.com>

1112/96-98 Sukhumvit Rd., Phrakonong Klongtoey Bangkok 10110

<http://www.ett.co.th>

www.etteam.com Tel : 02-7121120 Fax : 02-3917216

email : sale@etteam.com

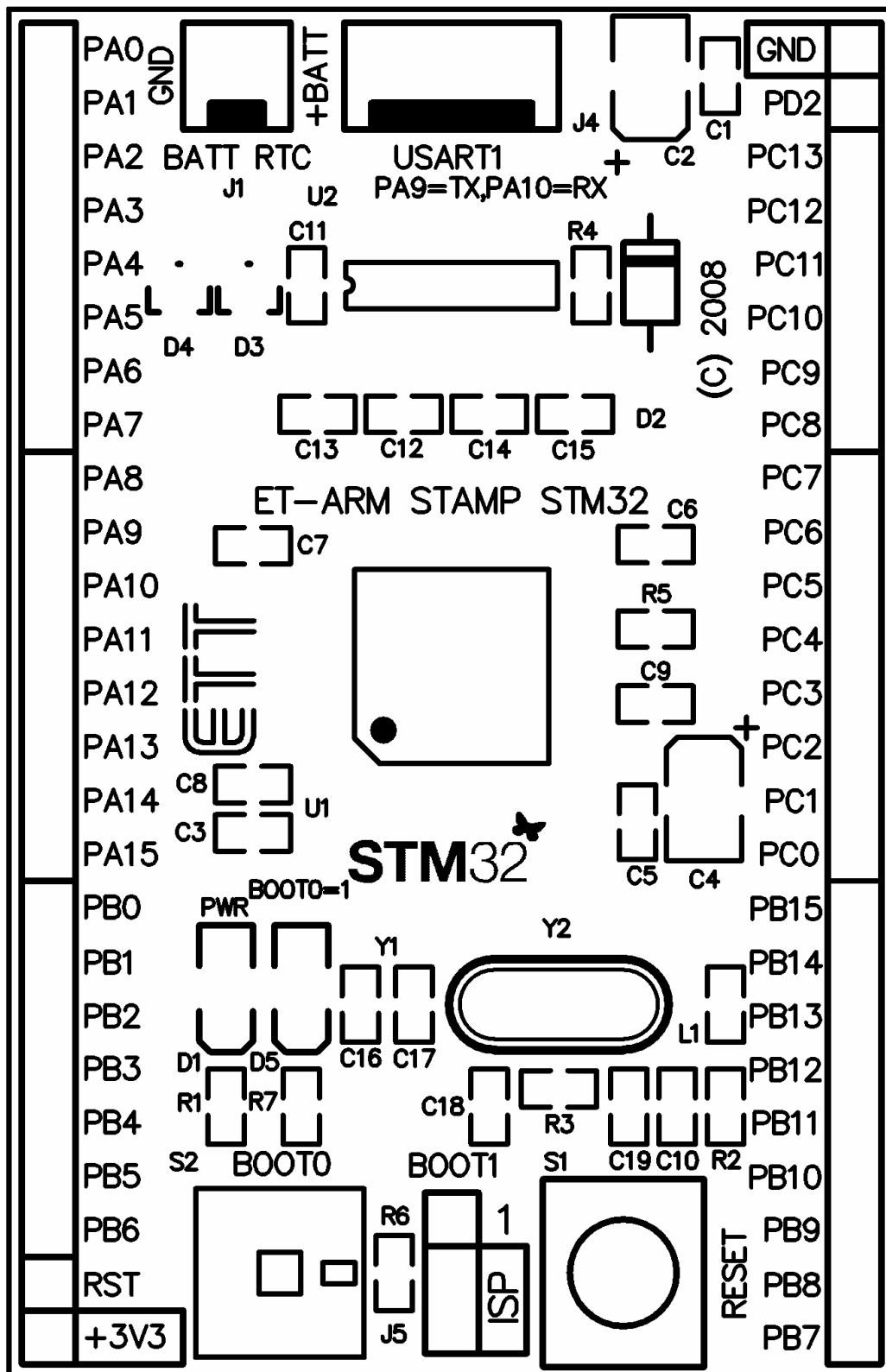


Figure displays structure of Board ET-ARM STAMP STM32.

Features of Board ET-ARM STAMP STM32

1. Use MCU 32Bit ARM Cortex-M3 64Pin (LQFP) of "STmicroelectronics"
2. Use Crystal 8.00MHz + Phase-Locked Loop (PLL), Run 72MHz frequency with speed 1.25 DMIPS/MHz to process data that is equivalent to 90MIPS
3. Has RTC (Real Time Clock) Circuit with XTAL 32.768KHz and Battery Backup
4. Support In-System Programming (ISP) and In-Application Programming (IAP) through On-Chip Boot-Loader Software via Port USART1 (RS232)
5. Has RS232 Communication Circuit that uses Connector 4-PIN 1 Channel standard ETT
6. Has 48 Bit GPIO with 5V-Tolerant for independent applications
7. Use +3.3V Power Supply
8. Connector is placed on 50 Pin Header with a distance of 2.54mm (100mil) (25 pins per side) with a distance of 1.5 inch (1500mil/38.1mm), so it is quite easy to use and expand I/O Circuit. Moreover, it can be used with Project Board and PCB.

Specification Peripheral	ET-ARM STAMP STM32F103/128	ET-ARM STAMP STM32F103/512
MCU	STM32F103RBT6	STM32F103RET6
Flash	128K	512K
RAM	20K	64K
SPI	2	3 (I2S x 2)
I2C	2	2
USART	3	5
USB	1	1
CAN	1	1
SDIO	-	1
ADC 12 Bit	16	16
DAC 12 Bit	-	2

Structure of Board ET-ARM STAMP STM32

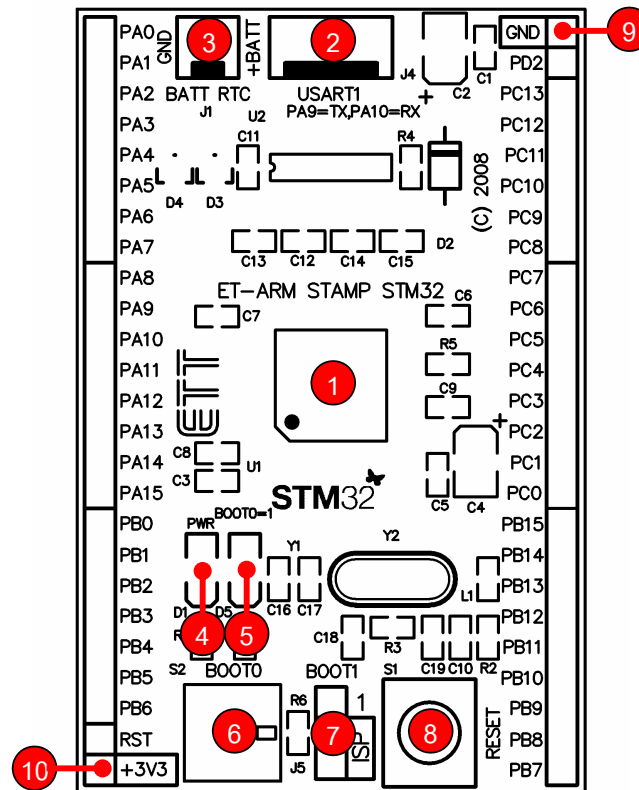
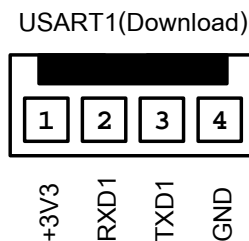


Figure Show positions of components on Board ET-ARM STAMP STM32.

- **No.1** is MCU on board.
- **No.2** is Connector USART1 (RS232) for use and download.
- **No.3** is Connector +3V Battery Backup-RTC.
- **No.4** is LED Power.
- **No.5** is LED BOOT0 (BOOT0=1).
- **No.6** is Switch BOOT0 that can be used with Jumper J1 to choose operation mode of Board between Download from USART1 or Normal RUN. In this case, if it is ON, it is Download; on the other hand, if it is OFF, it is RUN.
- **No.7** is Jumper (BOOT1) that can be used with BOOT0 to choose operation mode of board between Download from USART1 or Normal RUN. In this case, it always is set at ISP position.
- **No.8** is Switch RESET for RESET operation of MCU.
- **No.9** is connecting point of GND.
- **No.10** is +3.3V Power Supply.

Application of RS232

Port RS232 is signal RS232 that has already been converted signal MAX3232, so USART1 can be connected with signal RS232 to receive-transmit data. Moreover, USART1 can be used to be ISP Download to download Hex File into MCU. In this case, it must be used with Jumper (BOOT1) SW (BOOT0) and SW (RESET) to reset CPU to start running in Boot-Loader Mode to download Hex File into CPU (see more detail from "To Download Hex File into MCU of Board").



- USART1 uses signal Pin from PA9(TXD1) and PA10(RXD1).

The Cable that is used to connect RS232 between Comport of computer PC and Connector USART-1 and USART-2 of Board ET-ARM STAMP STM32 is shown as follows;

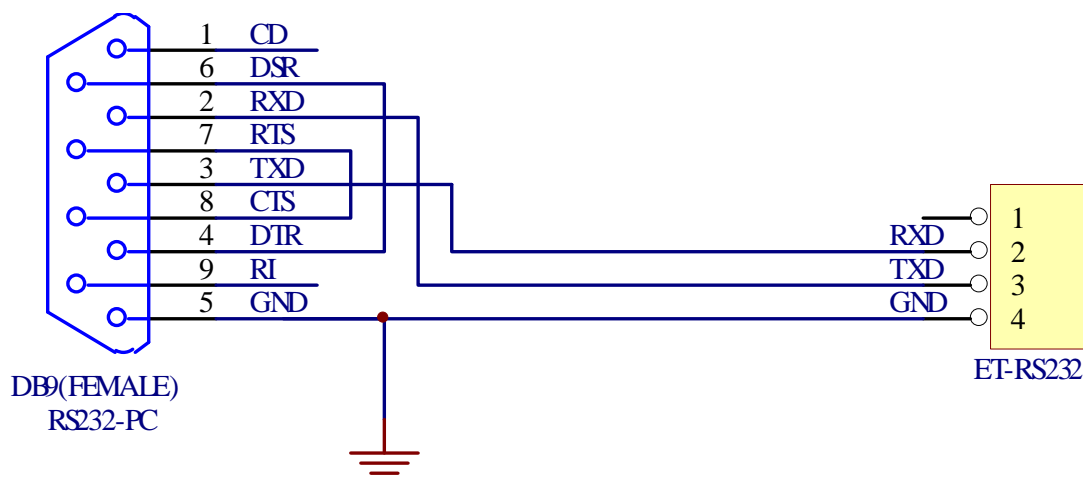


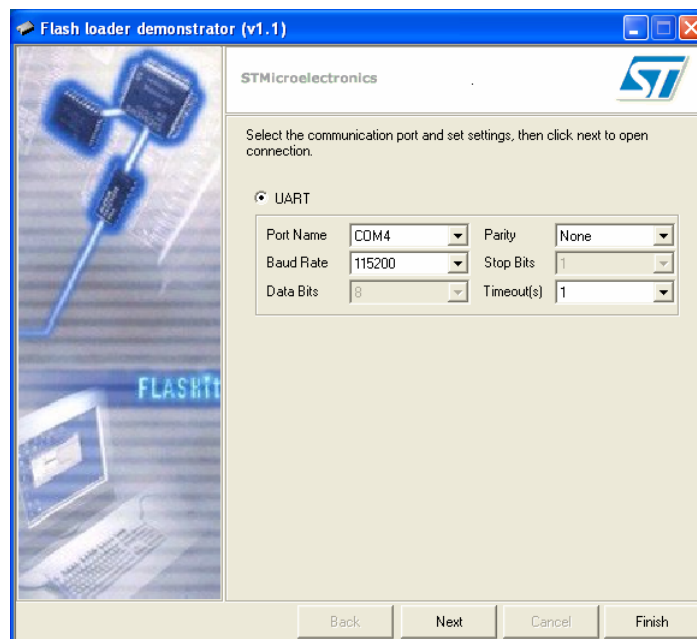
Figure display the Cable circuit for RS232.

Download Hex File into MCU of Board

To download Hex File into Flash Memory of MCU inside board is to use Program Flash Loader of "STMicroelectronics" that is connected to MCU through Serial Port of Computer PC. This program can be downloaded free from website www.st.com.

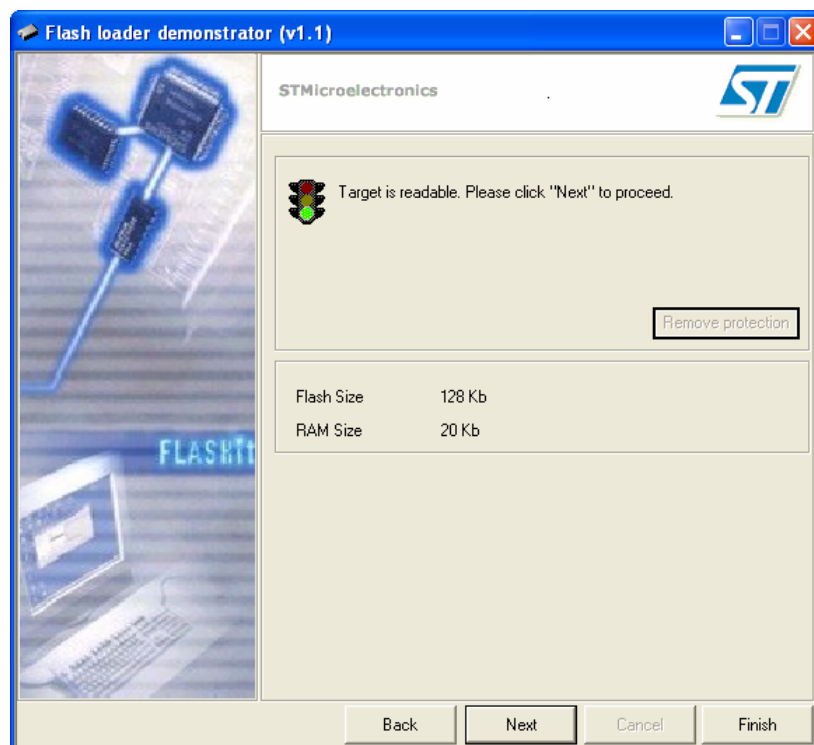
Procedures to Download HEX File into MCU

1. Interface RS232 Cable between RS232 Serial Port Communication of PC and Board USART1.
2. Supply power into board and user can see that LED PWR is in status ON.
3. Run Program Flash Loader; if it is version demo 1.1, it will show the result as shown in the picture below;

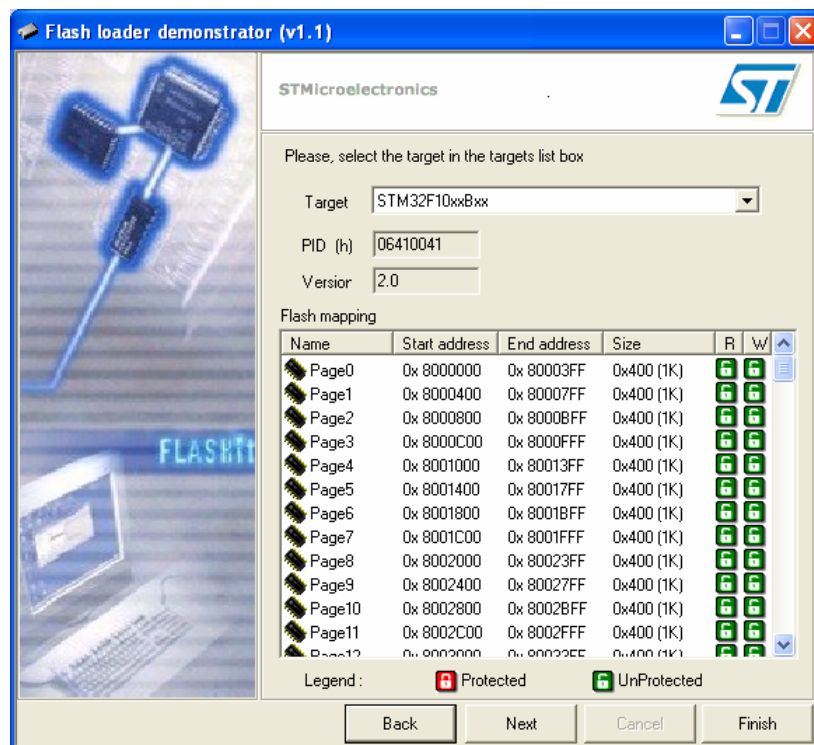


4. Set initial values for program; if using with Board ET-ARM STAMP STM32 of ETT, please set values into program as follows;
 - 4.1 Set COM Port according to the actually used COM Port number (in the example, it is COM4).

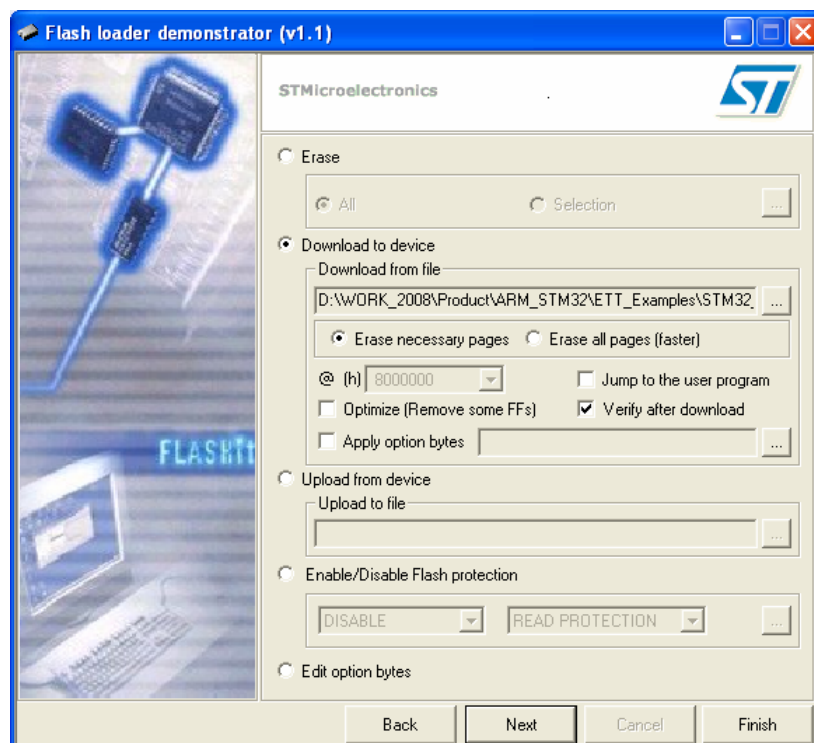
- 4.2 Set Baud Rate in the range of 1200-115200; if computer has the problem or Error when using very high Baud Rate, please reduce the Baud Rate vales; in this example, it is 115200.
 - 4.3 Set Parity Bit of Serial Port; it this case, we recommend user to choose it as None.
 - 4.4 Set Timeout of the communication; in the example, it is 1 second.
 - 4.5 RESET MCU to run in Boot Loader as following procedures;
 - Set Jumper BOOT1 on ISP side (Signal BOOT1 = 0).
 - ON Switch BOOT0 and user can see LED BOOT0 in status ON (Signal BOOT0 = 1).
 - Press Switch RESET and remove it; it makes CPU start running in Boot Mode.
5. Click "**Next**" to start downloading; if everything is OK, program will read status from CPU and report the results to user. If using STM32F103RBT6, it will display results as shown in the picture below;



6. Click "**Next**", Program Flash Loader starts displaying the statuses that are read from MCU to user. If using STM32F103RBT6, it will display results as shown in the picture below;

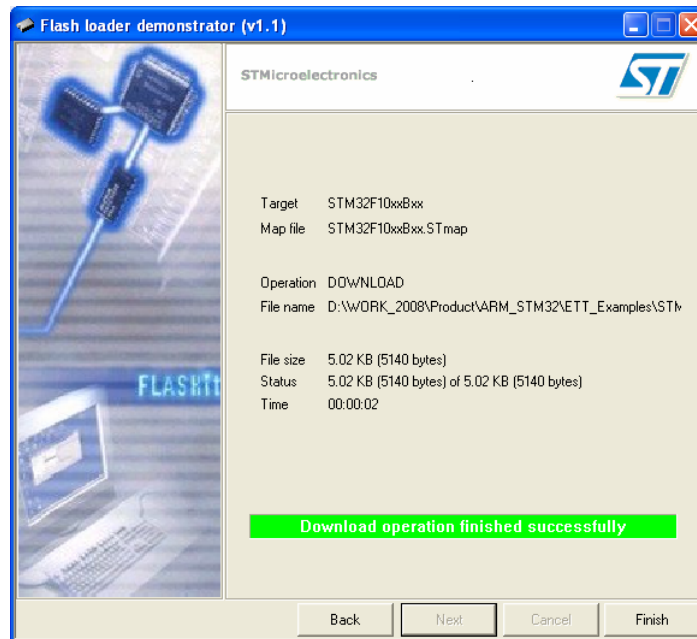


7. Click "**Next**" to go to the next step.



8. Click "**Next**", Program starts downloading data into MCU instantly and user can see its operation through Status bar. In this procedure, user must wait until

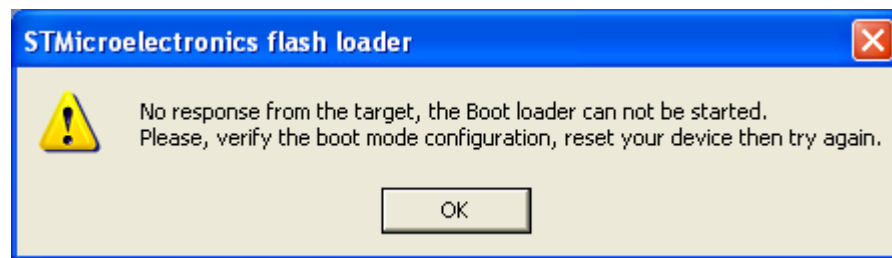
the operation of program is complete as shown in the picture below.



9. When the operation of program is complete, click "**Finish**" and OFF Switch BOOT0, user can see that LED BOOT0 is in status off. Then, press Switch RESET on board and MCU will start running follow the downloaded program instantly.

Errors while downloading by Program Flash Loader V1.1

Sometimes, when user downloads HEX File into MCU through Boot Loader by RS232, program will report the errors because it can not be connected to Boot Loader as shown in the example below.



This error is occurred because of Program Flash Loader can not communicate with MCU through Boot Loader by RS232. There are may causes as shown below;

- User does not RESET MCU to run in Boot Loader yet before click "**Next**" in the first step of command Program Flash Loader. In this case, user can check whether Jumper BOOT1 is set to ISP side and SW-BOOT0 must be set in ON position (LED BOOT0 is ON).
- Set COM port number not corresponding with the actually connected.

If user follows all procedures correctly but it remains the error, it means that the error is occurred because of Program Flash Loader. From the actually tested, the problem is occurred because of data that is junk or garbage inside Buffer of Port RS232, so it makes Program Flash Loader run incorrectly. There are many causes as described below;

- It uses the same channel of RS232 Serial Port for downloading and using but it uses different parameter values. For example, if downloading data by Program Flash Loader, it uses Baud Rate 115200; after downloading is complete, it uses Baud Rate 9600 for operating program of MCU to transmit-receive data with RS232. Moreover, if Download Cable is plugged all the time and user wants to download the new data

after user has already tested program completely, it will be error as mentioned above. We recommend user to initially solve the problem and decrease the mistake as follows;

- o Don't set Baud Rate for downloading and using with different parameter values; it is the best if setting them with the same value.
- o If user tests the operation of the written program that does not use any RS232, user must remove RS232 Cable from board instantly to reduce data that is junk or garbage in Buffer of RS232 after download code completely.
- o If Code Command in program of MCU runs as printing data through Port RS232 all the time, user must reset MCU to stop transmitting data to Port RS232 before opening Program Flash Loader to download new Code. In this case, user resets it to run in Boot Loader first and then open Program Flash Loader.
- o If it is Converter that converts Port USB/RS232, user must remove USB Cable before opening Program Flash Loader to clear data in Buffer first, re-plug USB cable and wait for awhile and finally, user can open Program Flash Loader without any problem.
- o If your computer has Port RS232 more than 1; we recommend user to separate Port RS232 for download and use independently.

