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AN205330

F²MC-8FX Family MB95200H/210H Series Flash Memory with Security

This application note describes the flash security features and principle and how to reprogram by examples.

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1 Introduction

This application note describes the Flash Security.

This application note describes the flash security features and principle and how to reprogram by examples.

2 Flash Security

The Flash Security features on protecting the content of the Flash Memory. The features of the flash memory are described in the following paragraphs.

There are numerous occasions when the content of the Flash Memory shall be protected from being read-out. The 8FX Family MCUs offer the Flash Security feature to meet that need. When the flash security is enabled, flash memory cannot be read by.

Program activated by an external boot vector fetch
External parallel flash programmer
Serial communication mode

2.1 Flash Memory Security Work Principle

Writing protection code "0x01" to flash memory address (0xFFFC) restricts the access to the flash memory, barring read/write access to flash memory from any external pin. Once flash memory is protected, the function cannot be unlocked until the chip erase command is executed.

The default is that the Flash Security is disabled. The Flash Security can be enabled by writing a protection code to a fixed flash memory address.

3 Usage and Example

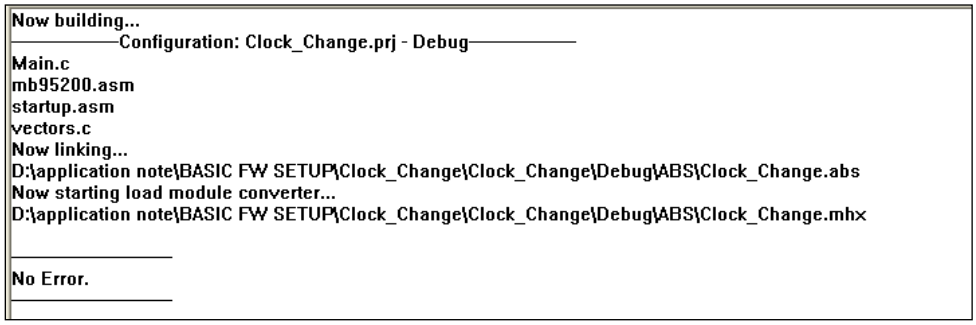
This chapter describes two methods on setting the flash memory security in SOFTUNE Workbench.

3.1 How to Set Flash Security

3.1.1 Method 1

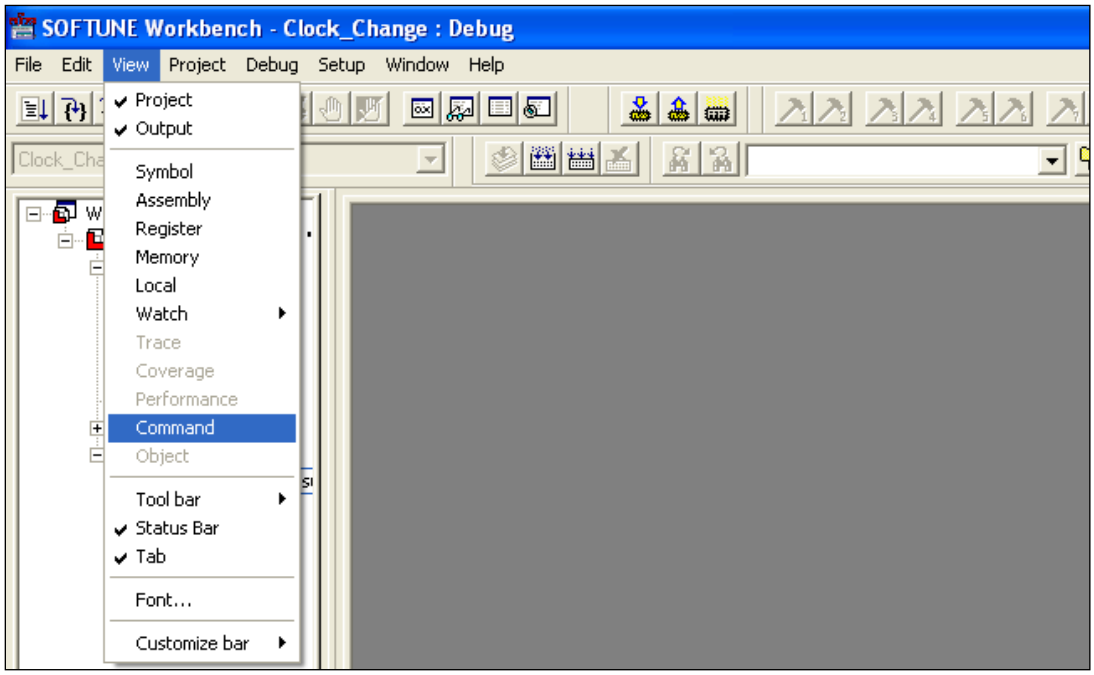
1. Create a new project on SOFTUNE, building all files and compile no error.

Figure 1. Building All Files



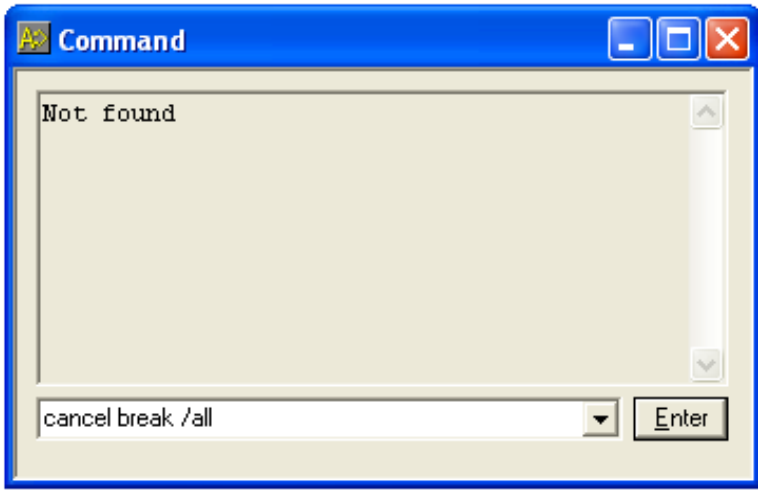
2. Be sure the flash memory address (0xFFFC) as values (0xFF) always in start.asm file.
3. Start debugging and load the target file.
4. In the SOFTUNE Workbench, select **Command** from **View** menu as follows.

Figure 2. Command Window Selected



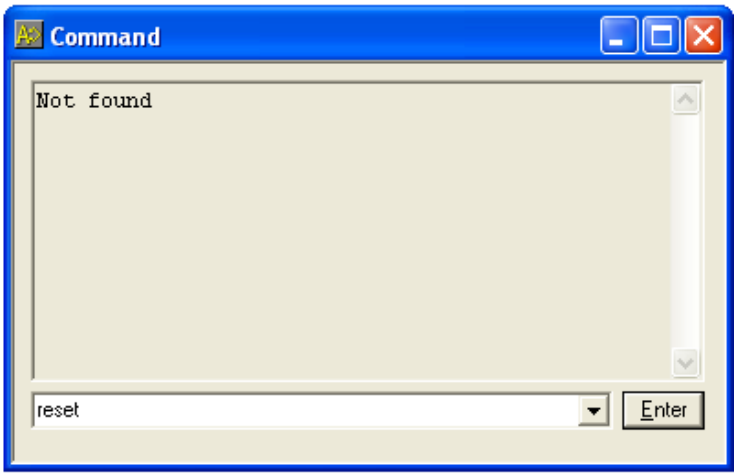
5. Add command **cancel break /all** to the **Command** window and click **Enter** as follows. It deletes all break points before the program is downloaded into flash.

Figure 3. Add Command “cancel break /all”



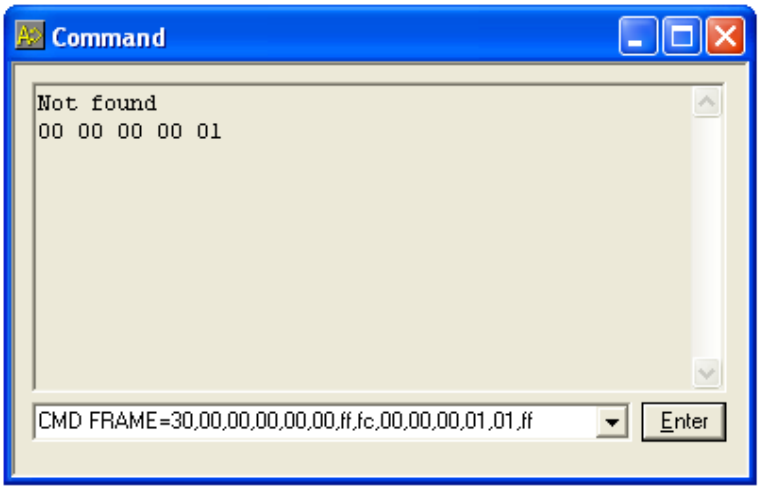
6. Add command **reset** to the **Command** window, and then click **Enter** as follows. It downloads program to flash.

Figure 4. Add Command “reset”



7. Add the command **CMD FRAME=30,00,00,00,00,00,ff,fc,00,00,00,01,01,ff** to the **Command** window and click **Enter** as follows to modify the values of address (0xFFFC) to “0x01”.

Figure 5. Add Command “CMD FRAME”.

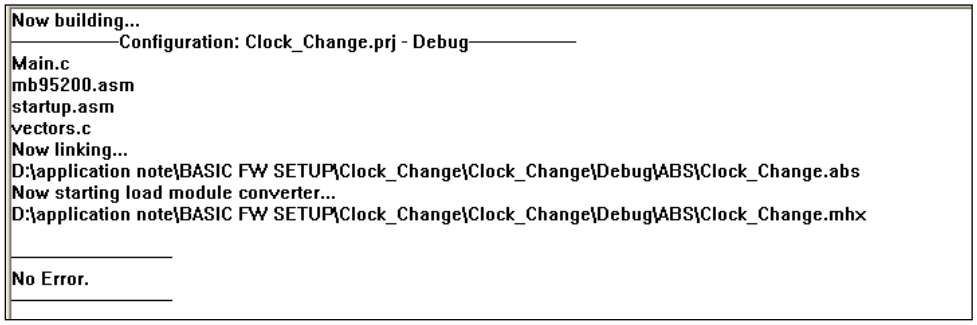


8. After above steps, the flash memory security setting succeeds.

3.1.2 Method 2

1. Create the new project on SOFTUNE, building all files and compile no error.

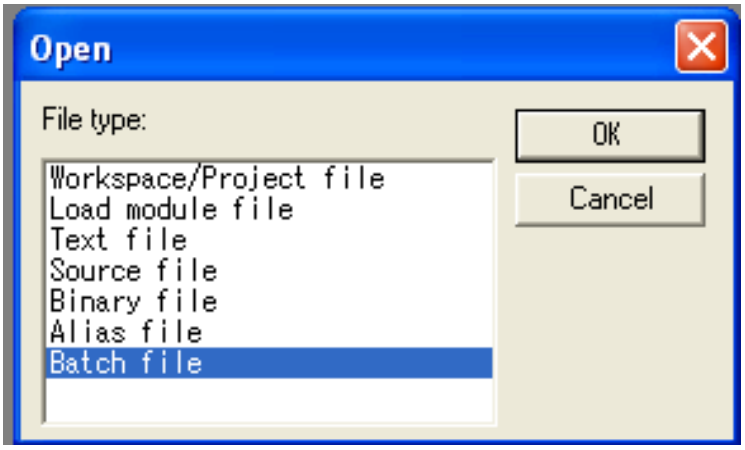
Figure 6. Building All Files



2. Be sure the flash memory address (0xFFFC) as values (0xFF) always in start.asm file.
3. Start debug and load the target file.

4. Select **Open** from the **File** menu, select file type **Batch file** and click **OK**.

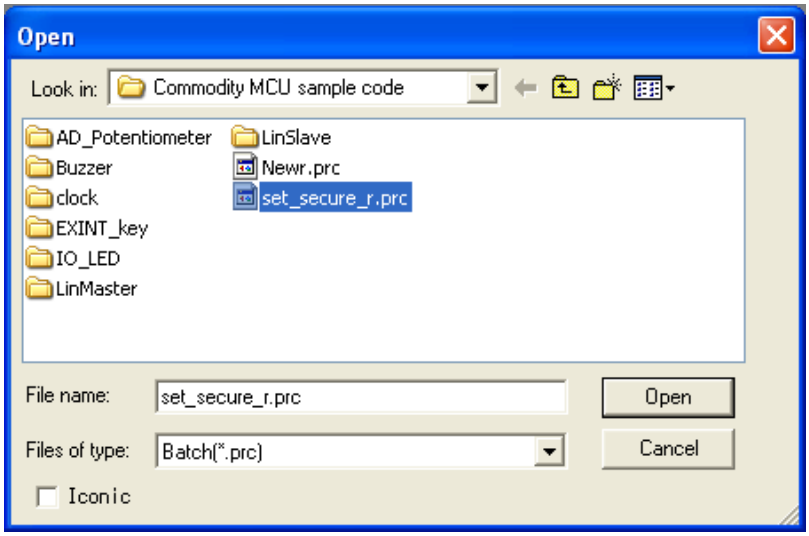
Figure 7. Open the “Batch file”



5. Select the “set_secure.prc” file and open it.

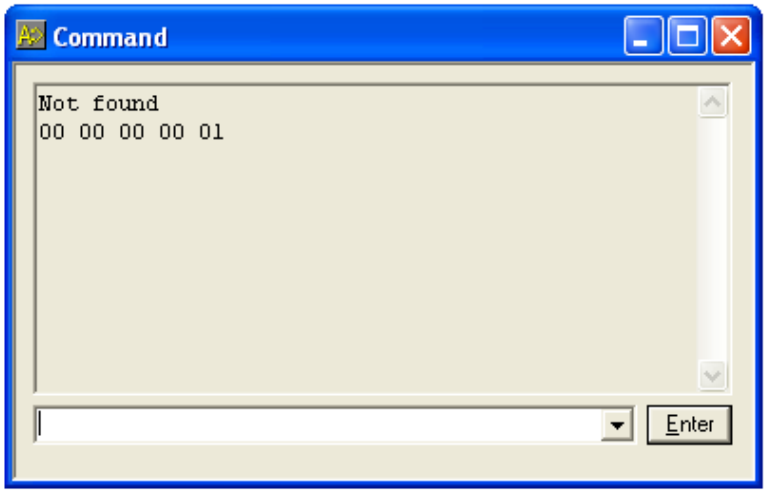
Note: Refer to the Appendix for the methods on creating the “set_secure.prc” file.

Figure 8. Open the File “set_secure_r.prc”



6. Display the **Command** window.

Figure 9. Display the Command Window



7. After above steps, the flash memory security setting succeeds.

3.2 How to Reprogram

When the flash memory is protected, the flash security function cannot be unlocked until the chip erase command is executed.

After the flash security, if read or write flash in SOFTUNE, the dialog box below will pop-up.

Figure 10. The flash memory is protected.



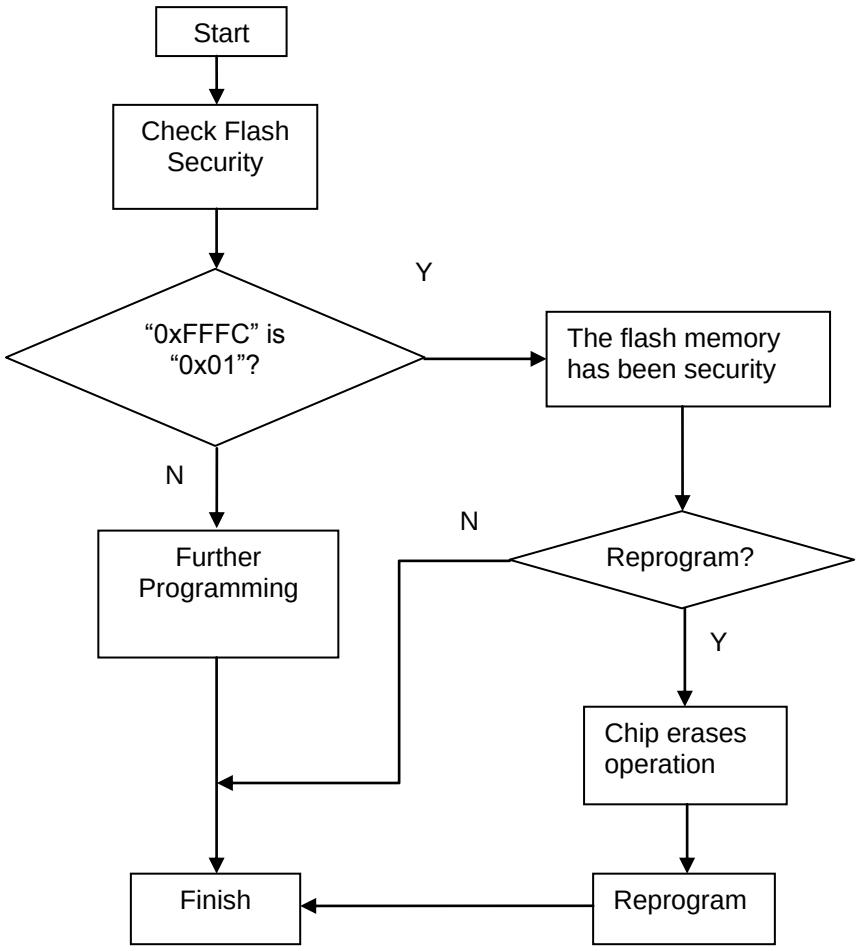
If **No** is selected, it cannot debug and program, and will quit current debug session.

If **Yes** is selected, it will erase all contents in the flash memory and can be reprogrammed.

After erase of the flash memory, it can be reprogrammed. That is to say, once the flash memory is protected, the chip erase operation is required before its reprogramming.

3.3 Flow for Program Flash With Security

Figure 11. Flow for Program Flash with Security



Note: For details on flash operation routine, please refer to Chapter 20 of *MB95200H/210H Series Hardware Manual*.

4 Precautions

- Only addresses 0x5554 and 0x2AAA can be read as exceptions.
- It is advisable to code the protection code at the end of the flash programming. This is to avoid unnecessary protection during programming.
- 1. Be sure the security bit (0xFFFC:0) is 1 before the setting of flash security. Because the flash operation cannot write “0” to “1”, writing “0x01” to “0xFFFC” is forbidden if the security bit (0xFFFC:0) is “0”.
  2. For the above reasons, it is recommended that the flash address (0xFFFC) value is set to 0xFF.
  3. For example, please ensure startup.asm file including the following code:

```
      .SECTION    RESET CONST LOCATE=0xFFFC
      .DATA.B     0Xff        //set flash address (0xFFFC) value to 0xFF
      .DATA.B     0
      .DATA.H     __START
```

5 Additional Information

For more information on Cypress Microcontrollers Products, please visit the following website:

www.cypress.com/documentation/application-notes/mb95200-flash-meory-security

A Appendix

A.1 How to Create File “set_secure.prc”

Create a “new.txt” file and add the following command in it. Save the file and modify the file name and types to “set_secure.prc”.

```
cancel break /all
reset
CMD FRAME=30,00,00,00,00,00,ff,fc,00,00,00,01,01,ff
```

Add below content into text file.

Note: It’s highly recommended to follow the above sample’s format and style.

Document History

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Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	—	HUAL	03/20/2008	Initial release.
			07/21/2008	Modify the website and note.
*A	5260316	HUAL	05/09/2016	Migrated Spansion Application note from MCU-AN- 500010-E-11 to Cypress format.

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