CYPRESS FLASH MCU Programmer for F^2MC-16FX

Specifications

CYPRESS FLASH
MCU Programmer for F^2MC-16FX
Specifications
Version 1.20 06 January 2016
Software version: V01L18
©2007-2016 Cypress Semiconductor Corp. Printed in Japan

1. Circuit diagrams utilizing Cypress products are included as a mean of illustrating typical semiconductor applications. Complete information sufficient for construction proposes is not necessarily given.

2. The information contained in this document has been carefully checked and is believed to be reliable. However, Cypress assumes no responsibility for inaccuracies.

3. The information contained in this document does not convey any license under the copy right, patent right to trademarks claimed and owned by Cypress.

4. Cypress reserved the right to change products or specifications without notice.

5. No part of this publication may be copied or reproduced in any form or by any means, or transferred to any third party without prior written consent of Cypress.

6. The products described in this document are not intended for use in equipment requiring high reliability, such as marine relays and medical life-support systems. For such applications, contact your Cypress sales representative.

7. If the products and technologies described in this document are controlled by the Foreign Exchange and Foreign Trade Control Act established in Japan, their export is subject to prior approval based on the said act.

Ver	date	page	contents
1.00	2007/2/1	---	New
1.01	2008/1/23	---	Suffix is Changed Add MB96F326A/R/Y,MB96F338R/U/Y,MB96F356A/R/Y
1.02	2008/2/20	P4 P12	Serial data I/O pins for MB96F326A/R/Y is corrected. Internal motorola S decoder specification is added.
1.03	2008/3/26	---	Add MB96F379R/Y
1.04	2008/06/06	P2,P4,P8 P14,P18	Add MB96F388H,MB96F389R MD0,1,2 COM1-20 OS:Windows 2000 SP3, Windows XP SP2 Caution change
1.05	2008/9/12	---	Software version: V01L05
1.06	2008/12/17	Chapter 3 Chapter 8	Add Flash Security function explanation Remove note of yokogawa digital's programmer Add MB96F385R/Y,MB96F395R/Y
1.07	2009/6/1	Chapter 7	Add IntelHex format Change Copy function interface Add Check Sum function
1.08	2009/6/22	Chapter 2,4,7	Add MB96F313A/R/Y Add MB96F315A/R/Y Add MB96F336U Add MB96F353A/R Add MB96F355A/R/Y
1.09	2009/9/1	Chapter 2,4,7,9	Add MB96F378C/H/T Chapter7-1 , The correction leakage of the 1.08th edition was corrected. Chapter9; The described information were updated.
1.10	2009/9/15	Chapter 2,4,7	Add MB96F343D/F Add MB96F345D/F
1.11	2009/12/7	Pii	The software version was updated.
1.12	2010/3/23	Pii	The software version was updated.
1.13	2011/4/18	Chapter 2,4,7 P24	Add MB96F675AA/RA Add MB96F673AA/RA Add MB96F685AA/RA Add MB96F683AA/RA Add error message explanation

1.14	2012/6/5	Chapter
		2,4,7
			Add MB96F612AA/RA,MB96F622AA/RA
			Add MB96F613AA/RA,MB96F623AA/RA
			Add MB96F615AA/RA,MB96F625AA/RA
			Add MB96F636RA,MB96F637RA
			Add MB96F646RA,MB96F647RA
			Add MB96F656RA,MB96F657RA
			Add MB96F696RA,MB96F6B6RA
			Add MB96F6A6RA,MB96F6C6RA
			The software version was updated.

1.15	2012/8/16	Chapter
		2,4,7
			Suffix is Changed
			Add MB96F633A/R,MB96F635A/R,MB96F643A/R
			Add MB96F645A/R,MB96F653A/R,MB96F655A/R
			Add MB96F693A/R,MB96F695A/R,MB96F6A5A/R
			Add MB96F6B5A/R,MB96F6C5A/R,MB96F326A/R/Y
			Add MB96F338R/U/Y,MB96F356A/R/Y

1.16	2013/1/4	Chapter
		2,3,4,7,8
			Add MB96F8D5K3/4,MB96F8D5KD/E/F/U/V/W
			Add MB96F8E5K3/4,MB96F8E5KD/E/F/U/V/W
			Add MB96F8D3K3/4,MB96F8D3KD/E/F/U/V/W
			Add MB96F8E3K3/4,MB96F8E3KD/E/F/U/V/W

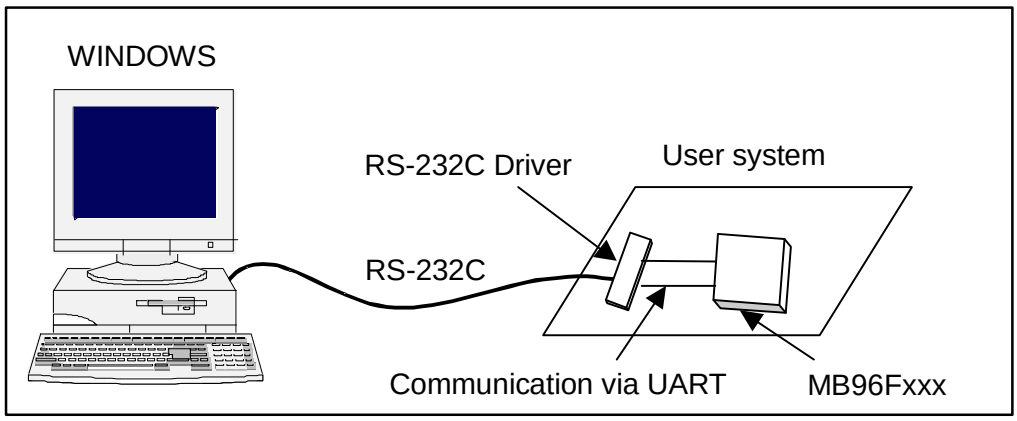
1.17	2013/4/11	Chapter 7	The sector select function is added for MB96610 series. ・MB96F612A/R,MB91F613A/R,MB91F615A/R

1.18	2013/7/10	Pii	The trimming data area is changed for MB96800 series.
1.19	2013/11/08	Pi,Pii Chapter 7,8	The name and logo of company are changed from FUJITSU to SPANSION.
1.20	2016/01/06	---	The name and logo of company are changed from SPANSION to CYPRESS

Contents

1. CONFIGURATION DIAGRAM 2
2. COMPATIBLE MICROCONTROLLERS 3
3. EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER 4
3.1 Setting for MB96300 Super Series 5
3.2 Setting for MB96600 Super Series 6
3.3 Setting for MB96800 Super Series 7
4. PINS USED FOR ON-BOARD REPROGRAMMING 8
5. TIMING CHART FOR EACH PIN 10
6. INSTALLATION AND EXECUTION OF SOFTWARE 11
7. PROGRAMMER FUNCTIONS 12
7.1. Downloading 13
7.2. Erasing and Programming 16
7.3. Motorola-S format decoder specification 19
7.4. Intel-Hex format decoder specification 20
7.5. Special specification 22
8. FLASH SECURITY FUNCTION SETTING 23
8-1. Flash security function 23
8-2. Not to specify the security setting 23
8-3. To specify the security setting 23
9. OPERATING ENVIRONMENT 24
10. OTHERS 25
11. CAUTIONS 28

1. CONFIGURATION DIAGRAM



Using RS-232C cable connected to the personal computer (Windows PC), flash memory data in the microcontroller mounted in the user system can be reprogrammed. Note that the user system must have an RS-232C driver for communication with the microcontroller UART.

2. COMPATIBLE MICROCONTROLLERS

MB96F313A/R/Y, MB96F315A/R/Y, MB96F326A/R/Y,
MB96F336U, MB96F338R/U/Y, MB96F343D/F,
MB96F345D/F, MB96F346A/R/Y, MB96F347A/R/Y,
MB96F348A/R/Y, MB96F348C/H/T, MB96F353A/R,
MB96F355A/R/Y, MB96F356A/R/Y, MB96F378C/H/T,
MB96F379R/Y, MB96F385R/Y, MB96F386R/Y,
MB96F387R/Y, MB96F388H/T, MB96F389R/Y,
MB96F395R/Y,

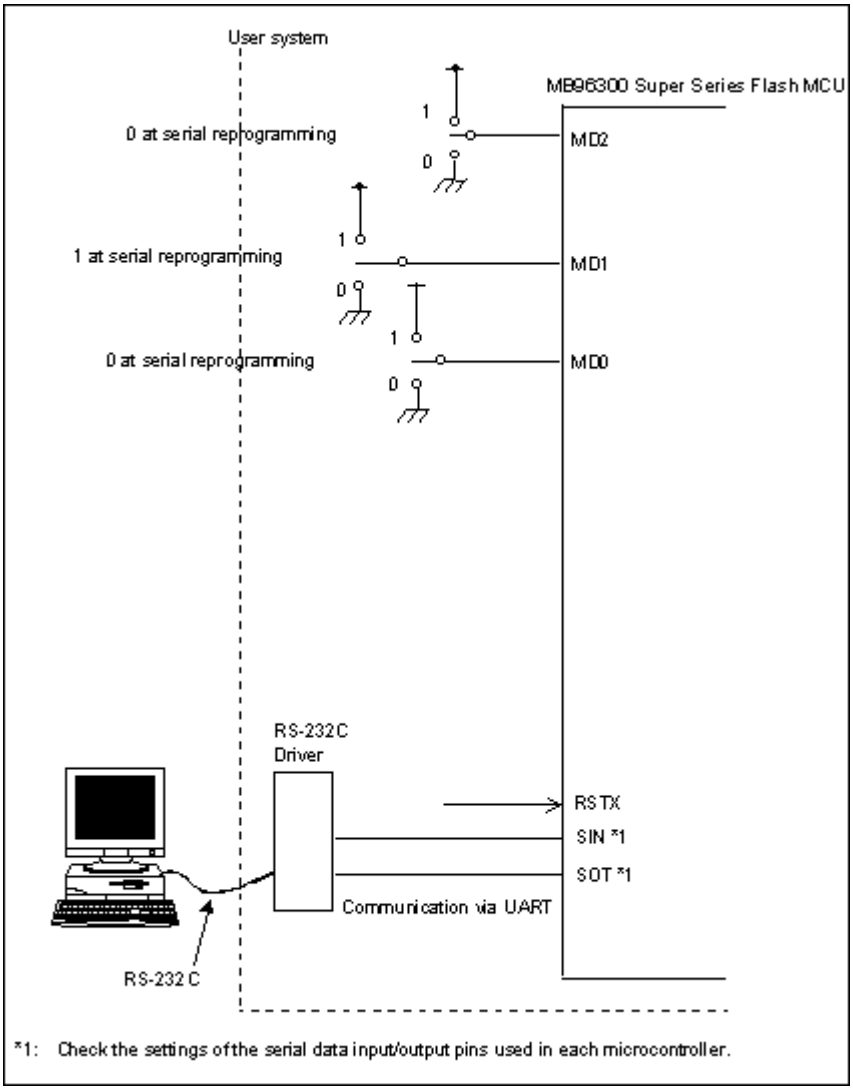
MB96F612A/R, MB96F613A/R, MB96F615A/R,
MB96F622A/R, MB96F623A/R, MB96F625A/R,
MB96F633A/R, MB96F635A/R, MB96F636R,
MB96F637R, MB96F643A/R, MB96F645A/R,
MB96F646R, MB96F647R, MB96F653A/R,
MB96F655A/R, MB96F656R, MB96F657R,
MB96F673A/R, MB96F675A/R, MB96F683A/R,
MB96F685A/R, MB96F693A/R, MB96F695A/R,
MB96F696R, MB96F6A5A/R, MB96F6A6R,
MB96F6B5A/R, MB96F6B6R, MB96F6C5A/R,
MB96F6C6R,

MB96F8D5K3/4, MB96F8D5KD/E/F/U/V/W,
MB96F8E5K3/4, MB96F8E5KD/E/F/U/V/W,
MB96F8D3K3/4, MB96F8D3KD/E/F/U/V/W,
MB96F8E3K3/4, MB96F8E3KD/E/F/U/V/W

3. EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER

This chapter explains a pin setup which must be set up for every kind series.

3.1 Setting for MB96300 Super Series



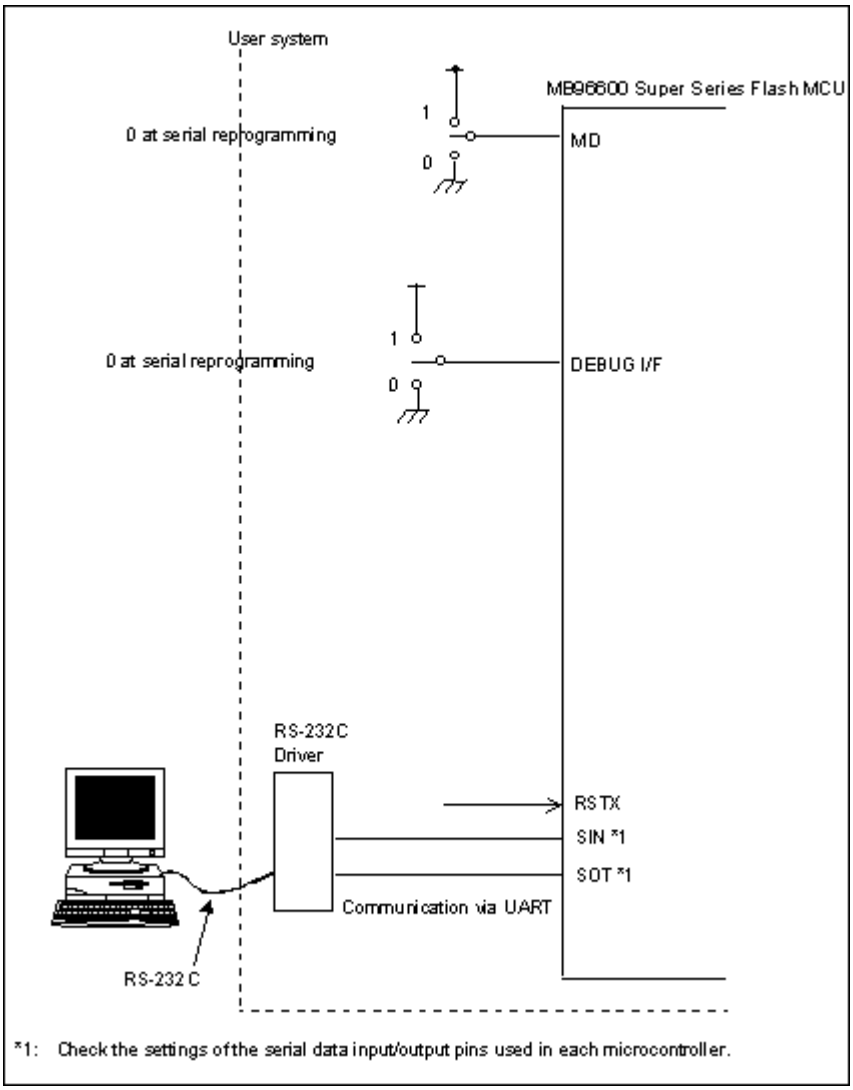
The MD2, MD1, MD0 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from “Low” to “High” level after setting the MD2, MD1, MD0 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming, control is shifted to the normally-used mode as for MD2, MD1 and MD0 pins. Then RSTX pin set from “Low” to “High” level executes user program.

Note: The port numbers of the SIN and SOT pins vary with the types of microcontrollers. See the ***Tables*** in ***Chapter 4*** for details.

3.2 Setting for MB96600 Super Series



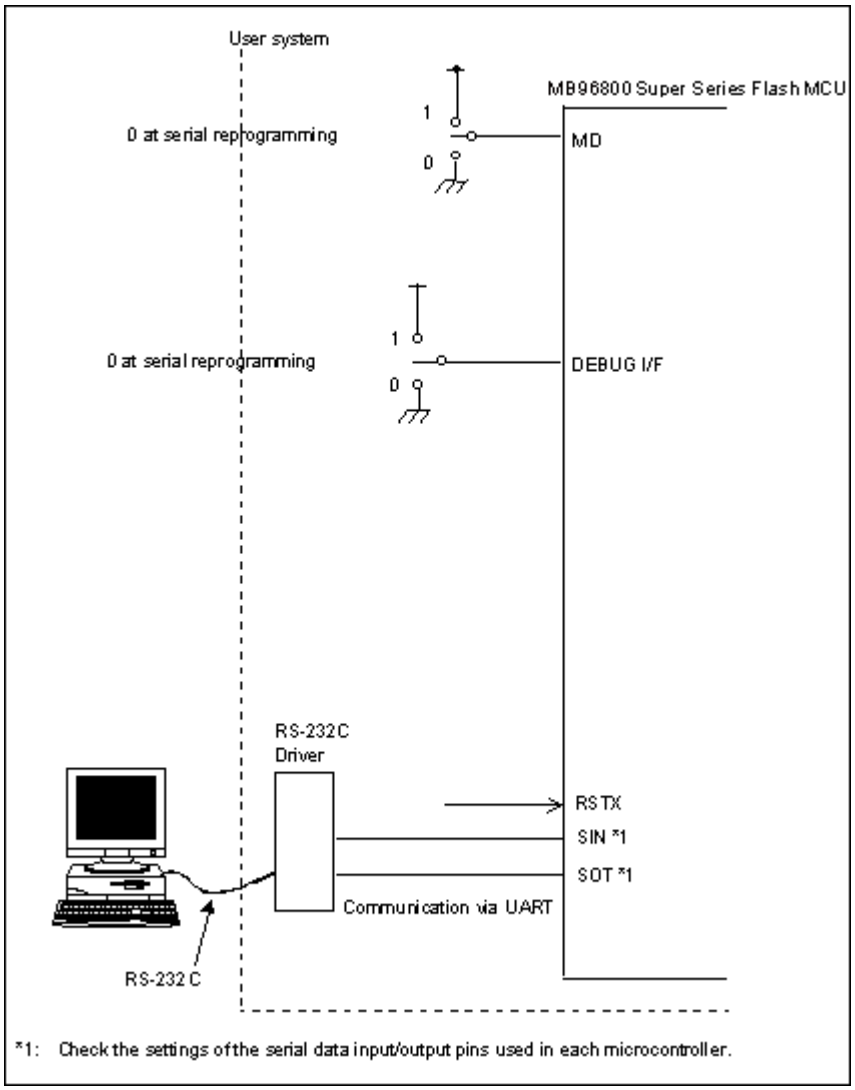
The MD, DEBUG I/F pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from “Low” to “High” level after setting the MD, DEBUG I/F pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming, control is shifted to the normally-used mode as for MD, DEBUG I/F pins. Then RSTX pin set from “Low” to “High” level executes user program.

Note: The port numbers of the SIN and SOT pins vary with the types of microcontrollers. See the ***Tables*** in ***Chapter 4*** for details.

3.3 Setting for MB96800 Super Series



The MD, DEBUG I/F pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from “Low” to “High” level after setting the MD, DEBUG I/F pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming, control is shifted to the normally-used mode as for MD, DEBUG I/F pins. Then RSTX pin set from “Low” to “High” level executes user program.

Note: The port numbers of the SIN and SOT pins vary with the types of microcontrollers. See the ***Tables*** in ***Chapter 4*** for details.

4. PINS USED FOR ON-BOARD REPROGRAMMING

(1) Control pins for on-board programming

Function	Pin	Supplementary
Mode pins (MB96300 Super Series)	MD2, MD1, MD0	Should be controlled in flash memory reprogramming mode. When MD2 and MD0 are set to “L” and MD1 is set to “H”, they enter the reprogramming mode.
Mode pins (MB96600 and MB96800 Super Series)	MD, DEBUG I/F	Should be controlled in flash memory reprogramming mode. When MD and DEBUG I/F are set to “L”, they enter the reprogramming mode.
Reset pin	RSTX	Cancel reset after setting Mode pins to the flash reprogramming mode.
Serial data input pin	SIN	Note that the pin varies with the type of microcontroller.
Serial data output pin	SOT	Note that the pin varies with the type of microcontroller.

(2) Serial data I/O pins for each type of microcontroller

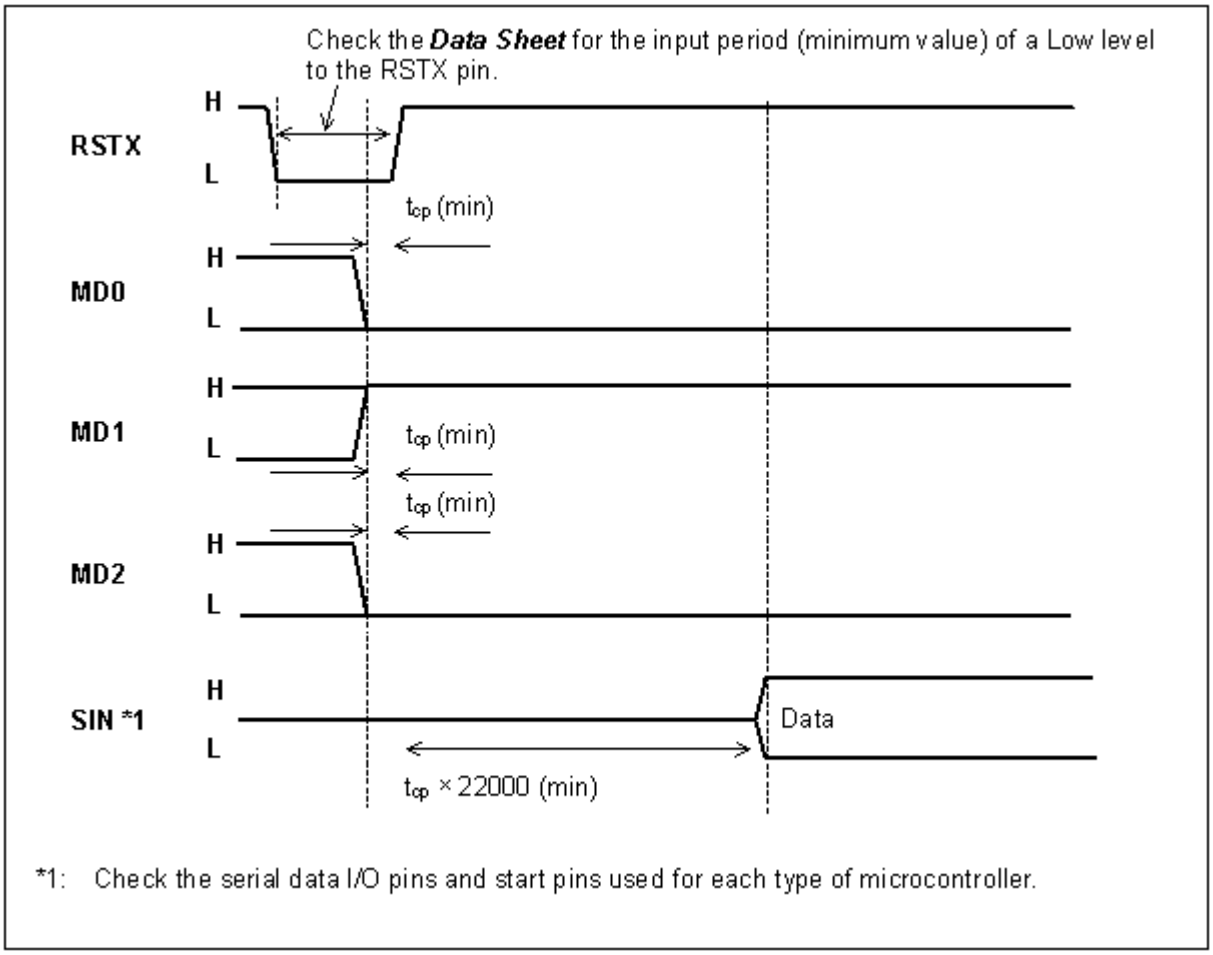
Type	UART Ch	Serial Data Input Pin	Serial Data Output Pin	Supply Voltage
MB96F646R MB96F647R MB96F656R MB96F657R MB96F696R MB96F6A6R MB96F6B6R MB96F6C6R MB96F633A/R MB96F635A/R MB96F643A/R MB96F645A/R MB96F653A/R MB96F655A/R MB96F693A/R MB96F695A/R MB96F6A5A/R MB96F6B5A/R MB96F6C5A/R	UART0	P12_4/SIN0	P13_5/SOT0	3V E5V product
	UART1	P03_7/SIN1	P13_0/SOT1	
	UART2	P10_0/SIN2	P10_1/SOT2	
	UART4	P01_4/SIN4	P01_5/SOT4	
MB96F338R/U/Y MB96F343D/F MB96F345D/F MB96F346A/R/Y MB96F347A/R/Y MB96F348A/R/Y MB96F348C/H/T MB96F378C/H/T MB96F379R/Y	UART0	P08_2/SIN0	P08_3/SOT0	3V E5V product
	UART1	P08_5/SIN1	P08_6/SOT1	
	UART2	P05_0/SIN2	P05_1/SOT2	
	UART3	P01_2/SIN3	P01_3/SOT3	

MB96F353A/R MB96F355A/R/Y	UART2	P05_0/SIN2	P05_1/SOT2	3V E5V product
	UART3	P01_2/SIN3	P01_3/SOT3	
	UART7	P00_2/SIN7_R	P00_1/SOT7_R	
	UART8	P00_5/SIN8_R	P00_4/SOT8_R	
MB96F313A/R/Y MB96F315A/R/Y MB96F612A/R MB96F613A/R MB96F615A/R MB96F622A/R MB96F623A/R MB96F625A/R	UART2	P05_0/SIN2	P05_1/SOT2	3V E5V product
	UART7	P00_2/SIN7_R	P00_1/SOT7_R	
	UART8	P00_5/SIN8_R	P00_4/SOT8_R	
MB96F385R/Y MB96F386R/Y MB96F387R/Y MB96F388H/T MB96F389R/Y MB96F395R/Y	UART0	P13_4/SIN0	P13_5/SOT0	3V E5V product
	UART1	P03_7/SIN1	P13_0/SOT1	
	UART2	P10_2/SIN2	P10_1/SOT2	
MB96F636R MB96F637R	UART0	P13_4/SIN0	P13_5/SOT0	3V E5V product
	UART2	P10_0/SIN2	P10_1/SOT2	
	UART4	P01_4/SIN4	P01_5/SOT4	
MB96F336U	UART0	P08_2/SIN0	P08_3/SOT0	3V E5V product
	UART1	P08_5/SIN1	P08_6/SOT1	
	UART2	P05_0/SIN2	P05_1/SOT2	
MB96F673A/R MB96F675A/R MB96F683A/R MB96F685A/R	UART0	P13_3/SIN0	P13_4/SOT0	3V E5V product
	UART1	P03_7/SIN1	P13_0/SOT1	
MB96F326A/R/Y MB96F356A/R/Y	UART2	P05_0/SIN2	P05_1/SOT2	3V E5V product
	UART3	P01_2/SIN3	P01_3/SOT3	
MB96F8D5K3/4 MB96F8D5KD/E/F/U/V/W MB96F8E5K3/4 MB96F8E5KD/E/F/U/V/W MB96F8D3K3/4 MB96F8D3KD/E/F/U/V/W MB96F8E3K3/4 MB96F8E3KD/E/F/U/V/W	UART7	P17_2/SIN7_R	P00_0/SOT7_R	6V E18V product
	UART8	P17_3/SIN8_R	P00_2/SOT8_R	

(attention) Please select and use one of UART ch shown in the right of the correspondence kind.

5. TIMING CHART FOR EACH PIN

Input data to each pin of the microcontroller with the following timing on the basis of the input of the RSTX pin.



Minimum values of setup and hold times of each signal on rising edge of RSTX

6. INSTALLATION AND EXECUTION OF SOFTWARE

If the old software version is installed, uninstall it first before installation.

Starting the installer to operate as instructed will complete the installation. Note that the install might not be performed when a directory in a deep nest is specified as the install directory.

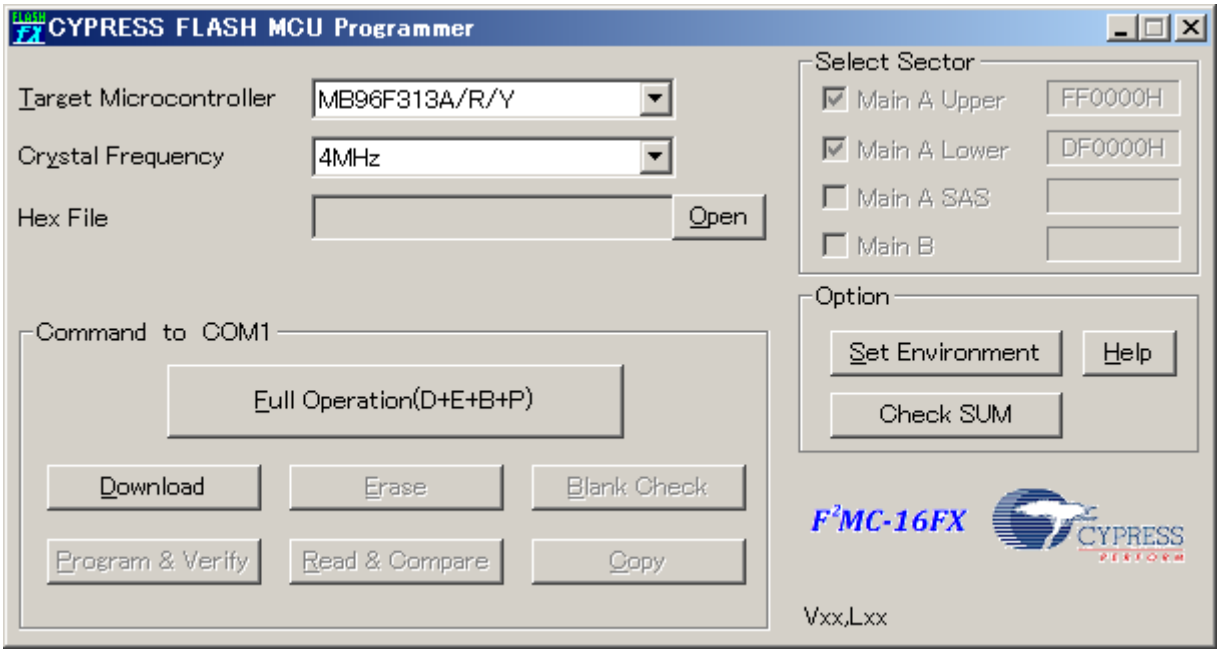
After installation, click the Windows ***Start*** button ***=> Program => CYPRESS FLASH MCU Programmer => FMC16FX*** to start the programmer software.

7. PROGRAMMER FUNCTIONS

Erase, Blank Check, Program & Verify, Read & Compare, and Copy can be executed for flash memory integrated into the microcontroller.

Main dialog box

Programmer software is started to open the dialog box as shown below.



Overview of operating procedure

First, complete setting of the user system (microcontroller board) that data is programmed to (see ***Chapter 3***). When the programmer software has been started or when setting (setting of Target Microcontroller or Crystal Frequency) has been changed, it is necessary to perform downloading (described later).

After downloading terminates normally, perform procedures such as Erase and Programming.

7.1. Downloading

This section describes the operating procedure for downloading and the operating state of the program.

(a) Specify the type of microcontroller used in the user system in ***Target Microcontroller*** of the main dialog box.

(b) Specify the frequency of the crystal oscillator input to the microcontroller in ***Crystal Frequency*** of the main dialog box.

The frequency of the crystal oscillator that can be specified for each type of microcontroller is limited as follows.

Product Type	Frequency of Crystal Oscillator (MHz)
MB96F313A/R/Y	4,5,8,10,16
MB96F315A/R/Y	4,5,8,10,16
MB96F326A/R/Y	4,5,8,10,16
MB96F336U	4,5,8,10,16
MB96F338R/U/Y	4,5,8,10,16
MB96F343D/F	4,5,8,10,16
MB96F345D/F	4,5,8,10,16
MB96F346A/R/Y	4,5,8,10,16
MB96F347A/R/Y	4,5,8,10,16
MB96F348A/R/Y	4,5,8,10,16
MB96F348C/H/T	4,5,8,10,16
MB96F353A/R	4,5,8,10,16
MB96F355A/R/Y	4,5,8,10,16
MB96F356A/R/Y	4,5,8,10,16
MB96F378C/H/T	4,5,8,10,16
MB96F379R/Y	4,5,8,10,16
MB96F385R/Y	4,5,8,10,16
MB96F386R/Y	4,5,8,10,16
MB96F387R/Y	4,5,8,10,16
MB96F388H/T	4,5,8,10,16
MB96F389R/Y	4,5,8,10,16
MB96F395R/Y	4,5,8,10,16
MB96F675A/R	4,5,8
MB96F673A/R	4,5,8
MB96F685A/R	4,5,8
MB96F683A/R	4,5,8
MB96F612A/R	4,5,8
MB96F613A/R	4,5,8
MB96F615A/R	4,5,8
MB96F622A/R	4,5,8
MB96F623A/R	4,5,8
MB96F625A/R	4,5,8
MB96F636R	4,5,8

MB96F637R	4,5,8
MB96F646R	4,5,8
MB96F647R	4,5,8
MB96F656R	4,5,8
MB96F657R	4,5,8
MB96F696R	4,5,8
MB96F6A6R	4,5,8
MB96F6B6R	4,5,8
MB96F6C6R	4,5,8
MB96F633A/R	4,5,8
MB96F635A/R	4,5,8
MB96F643A/R	4,5,8
MB96F645A/R	4,5,8
MB96F653A/R	4,5,8
MB96F655A/R	4,5,8
MB96F693A/R	4,5,8
MB96F695A/R	4,5,8
MB96F6A5A/R	4,5,8
MB96F6B5A/R	4,5,8
MB96F6C5A/R	4,5,8
MB96F8D5K3/4	4,5,8
MB96F8E5K3/4	4,5,8
MB96F8D3K3/4	4,5,8
MB96F8E3K3/4	4,5,8
MB96F8D5KD/E/F/U/V/W	4,5,8
MB96F8E5KD/E/F/U/V/W	4,5,8
MB96F8D3KD/E/F/U/V/W	4,5,8
MB96F8E3KD/E/F/U/V/W	4,5,8

Notice: This program will not operate normally if the microcontroller uses a crystal oscillator frequency not listed in the above table.

(c) Select the COM port of the PC connected to the user system.

Click the ***[Set Environment]*** button in the main dialog box to open the setup window. When the ***[COM PORT]*** tab in the setup window is clicked, the specifying window is opened. Select any of the following COM ports.

COM1, COM2, COM3, COM4, COM5, COM6, COM7, COM8, COM9, COM10

COM11, COM12, COM13, COM14, COM15, COM16, COM17, COM18, COM19, COM20

(d) Flash Security Function Setting

It is **necessary** to set the flash security function. Please refer to Chapter 8 for details.

(e) Specify the target sectors in the ***Select Sector*** area of the main dialog box.

Specify the target sectors for each operation from any combination of Flash A Upper, Flash A Lower, Flash A SAS and Flash B in the ***Select Sector*** area of the main dialog box. The ***Select Sector*** area is available for some microcontrollers, and it is unavailable for the other microcontrollers. When the ***Select Sector*** area is unavailable, the target sectors can't be specified by users and all sectors are selected by default.

Please specify the target sectors for each operation (Full Operation, Erase, Blank Check, Program & Verify, Read & Compare, Copy) by operating the checkboxes in the ***Select Sector*** area of the main dialog box.

[Notes concerning sector select]

At least one sector should be selected in the ***Select Sector*** area of the main dialog box. If the ***[Download]*** button is clicked without selecting any sector, the warning message "Please Select the area of writing" will be opened.

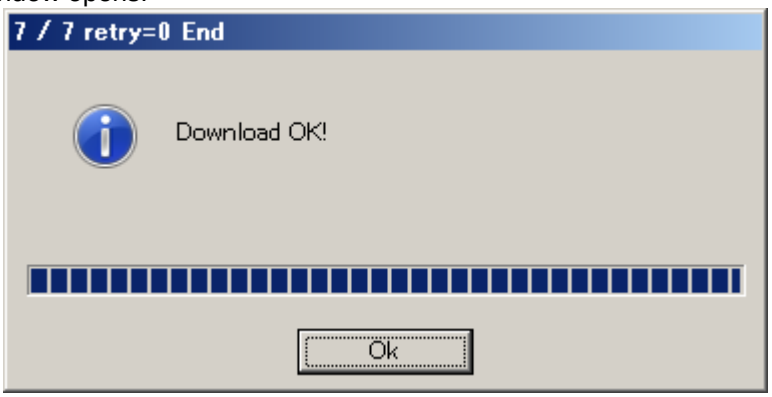
(f) Execution of downloading

Click the ***[Download]*** button.

If the following dialog window is opened, Input a reset signal to the microcontroller to start the program in the flash programming mode and then click the ***[OK]*** button.



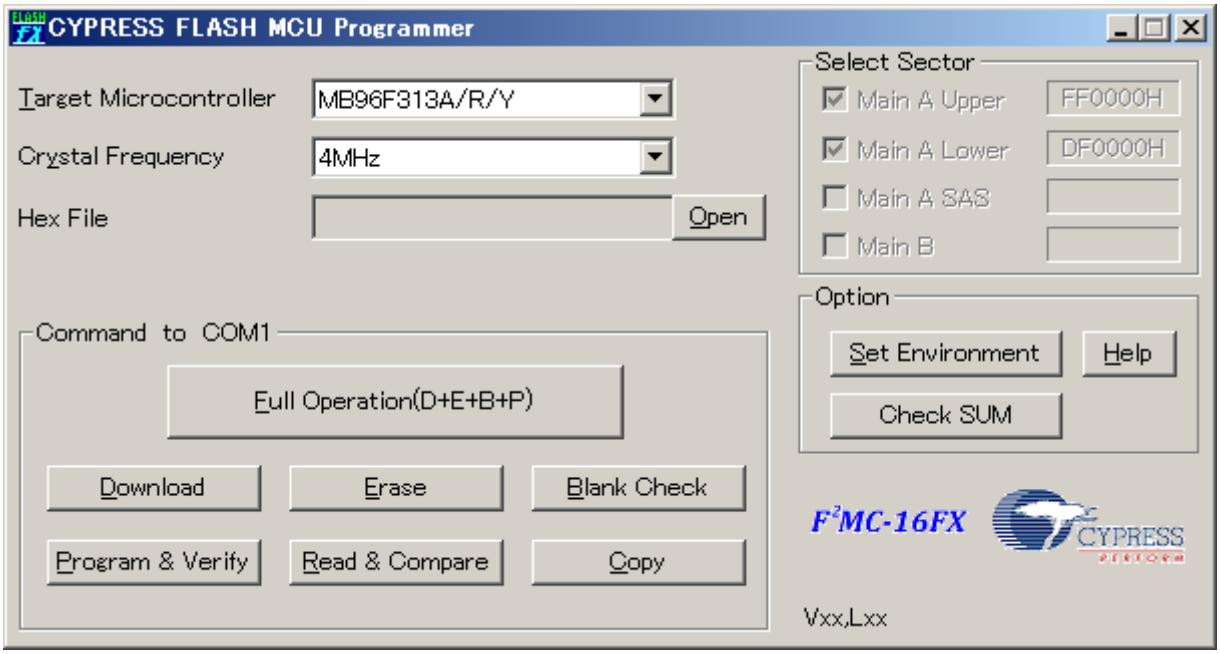
Downloading is performed to open the "Download" window. When downloading is completed normally, the following dialog window opens.



When the ***[OK]*** button is clicked to close the dialog window, the ***[Erase], [Blank Check], [Program & Verify], [Read & Compare]*** and ***[Copy]*** buttons are enabled. At the same time, all checkboxes in the ***Select Sector*** area of the main dialog box are disabled, and can't be operated. You can enable the ***Select Sector*** area in the main dialog box by reselecting the type of the microcontroller in ***Target Microcontroller*** of the main dialog box, and then the state of the main dialog box will return to the state before the ***[Download]*** button clicking.

7.2. Erasing and Programming

This section explains how to specify ***Hex File*** and the processing and operation performed when the ***[Erase]***, ***[Blank Check]***, ***[Program & Verify]***, ***[Read & Compare]***, ***[Copy]*** and ***[Full Operation (D+E+B+P)]*** buttons are clicked.



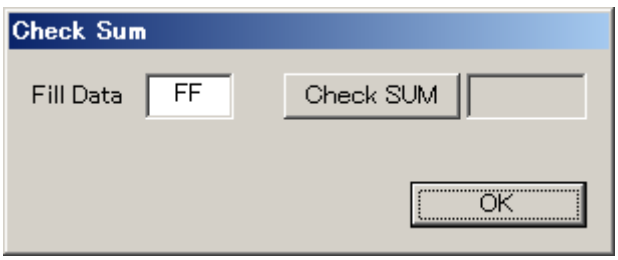
(a) ***Hex File***: Select the file to be programmed to flash memory

Specify the Motorola-S or Intel-HEX format file to be programmed to flash memory in the microcontroller. Although the specification method by drags and drops a direct file from Explorer etc. is recommended, it can specify also by the file appointed window displayed by pushing the ***[Open]*** button.

Hex File must be specified to execute ***[Program & Verify]***, ***[Read & Compare]*** and ***[Full Operation (D+E+B+P)]***. Since it is decoded at the head of these processings each time, even if the specified Motorola-S or Intel-HEX format file changes specification of a file just before processing, it is OK.

After Hex File is specified, checksum **to ROM image** after Motorola-S format file or Intel-HEX format file shown in Hex File is deciphering done can be calculated.

The dialog box to calculate checksum when a lower right [Check SUM] button is pushed opens.



The range of the calculation of checksum is limited to the Flash area shown in the upper right of the main dialog. When the area has divided into plural block, the empty area between blocks is not added, and the total of each block is calculated.

The calculation method is simple addition of every one byte, and the result shows the last 4 digits (It is not a complement representation) by the hexadecimal number.

ROM value in the Flash area not shown in Hex File is calculated assuming that it is a value indicated by Fill Data at the left of the dialog. When starting, FF is set here. Please specify it by two hexadecimal number digits when changing.

[Notes concerning checksum]

This function doesn't calculate the checksum of ROM image written in the FLASH memory in the microcontroller chip. When Hex File is not specified, and the error is detected at the decipherment of Hex File, nothing is displayed.

The SUM value calculated here is not peculiar against Hex File. When another microcontroller is selected, same Hex File might reach another value.

The value specified with Fill Data is not written at the time of writing. This value is used only for the calculation of checksum.

(b) ***Erase***: Erase flash memory areas

Flash memory must be in the blank state (0xff) when programming a new program to it. By pushing this button, an erase command is published to FLASH and elimination is performed.

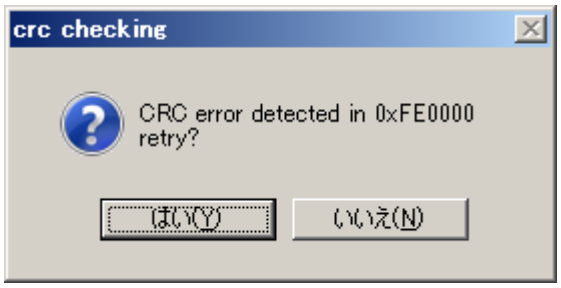
In addition, a blank check does not perform this command.

(c) ***Blank Check***: Check that flash memory areas are blank

This button is clicked to check that flash memory is in the blank state (0xff).

(d) ***Program & Verify***: Program data to flash memory

This button is clicked to program the Motorola-S or Intel-HEX format file specified in ***Hex File*** to flash memory in the microcontroller concurrently with verification. An error dialog is displayed, when writing is performed for 512 bytes of every block and a CRC error is detected by the block.



This dialog If YES is pushed, the block of an error will be resent and it will continue writing. A push on NO interrupts write-in processing.

(e) ***Read & Compare***: Compare ***Hex File*** with data in flash memory in microcontroller

This button is clicked to compare data in the Motorola-S or Intel-HEX format file specified in ***Hex File*** with data in flash memory in the microcontroller. Like the ***[Program & Verify]*** processing, the data of FLASH is transmitted for 512 bytes of every block, a CRC error check is performed, and comparison processing is performed.

(f) ***Copy***: Save data in flash memory in microcontroller to file

This button is clicked to read data from flash memory integrated into the microcontroller and save it as an Motorola-S or Intel-HEX format file. Like ***[Read & Compare]*** processing, FLASH memory reading is performed for 512 bytes of every block, and a CRC error check is performed similarly.
The output file format can be changed **by right-clicking** in the Copy button. The button name changes by ***[Copy]*** and ***[Copy_i]*** whenever right-clicking. The state of ***[Copy]*** shows Motorola-S format, and the state of ***[Copy_i]*** shows Intel-HEX format.
Processing begins when the button is **left-clicked**, the folder is specified preservation ahead, the file name is input, and the ***[Save]*** button is pushed when the form is selected.

(g) ***Full Operation (D+E+B+P)***: Automatic programming

Operation to ***[Download]*** to ***[Program & Verify]*** is performed by package.

In the case of a blank chip, processing is performed in order of ***[Download]***, ***[Blankcheck]***, and ***[Program & Verify]***. When it is not a blank chip, processing is performed in order of ***[Download]***, ***[Blankcheck]***, ***[Erase]***, ***[Blankcheck]***, and ***[Program & Verify]***.

[Notes concerning automatic programming]

At least one sector should be selected in the ***Select Sector*** area of the main dialog box. If the ***[Full Operation (D+E+B+P)]*** button is clicked without selecting any sector, the warning message “Please Select the area of writing” will be opened.

7.3. Motorola-S format decoder specification

Before programming, Motorola-S format Decoder of programmer changes Motorola S format data into binary data, according to the following specification.

(a) The decoder does not error when overlap of addresses occurs.

The decoder does not error about overlap of address. If user writes a data on an address which was already written another data before, former data is overwritten by new data.

(b) Available address

If user writes a data beyond an address range of FLASH memory, programming results in an error. But if an address range of whole FLASH memory does not continue, decoder does not give an error and programming procedure goes on. For example, user can program a FLASH memory which starts an address H'F90000 and ends an address H'FFFFFF and does not have memory function between H'FC0000-H'FCFFFF even if user tries to program on such eclipse address range.

(c) About the error detected by the decoder.

The error detected by the decoder is the following (1)-(4). When these errors are detected, processing is interrupted by the decoder. Then the line number and the cause of the error are displayed in the dialog window.

(1) file error

The start of the line is not "S".

(2) S-format error

The start of the line is not "S0","S1","S2","S3","S5","S7","S8" and "S9".

(3) decode error

- There are character except "0123456789ABCDEF".("S" is excluded. See (1) and (2).) And, the small letter "abcdef" cannot be used.
- The LENGTH data is different from the length of an actual data row.
- The SUM data is different.

(4) address error

There is data besides the FLASH area. (See b.Available address)

(d) Other detail

The decoder skips a line. even if the line is contained only new-line code NL and programming goes on.

A line beginning with "S0","S5","S7","S8" and "S9" is ignored and decoder skips such lines in S format file without error.

7.4. Intel-Hex format decoder specification

Before programming, Intel-Hex format Decoder of programmer changes Intel-Hex format data into binary data, according to the following specification.

(a) The decoder does not error when overlap of addresses occurs.

The decoder does not error about overlap of address. If user writes a data on an address which was already written another data before, former data is overwritten by new data.

(b) Available address

If user writes a data beyond an address range of FLASH memory, programming results in an error. But if an address range of whole FLASH memory does not continue, decoder does not give an error and programming procedure goes on. For example, user can program a FLASH memory which starts an address H'F90000 and ends an address H'FFFFFF and does not have memory function between H'FC0000-H'FCFFFF even if user tries to program on such eclipse address range.

(c) About the error detected by the decoder.

The error detected by the decoder is the following (1)-(4). When these errors are detected, processing is interrupted by the decoder. Then the line number and the cause of the error are displayed in the dialog window.

(1) file error

The start of the line is not ":".

(2) decode error

There are character except "0123456789ABCDEF".(":" is excluded. See (1).) And, the small letter "abcdef" cannot be used.

The record type is not 00, 01, 02, 03, 04, and 05.

The length of the data string that turns out by the number of data is different from the length of an actual data string.

The SUM data is different.

(3) record error

When not is in number 0 of data at 01 records.

When not is in number 2 of data at 02 records.

When not is in number 4 of data at 03 records.

When not is in number 2 of data at 04 records.

When not is in number 4 of data at 05 records.

(4) address error

There is data besides the FLASH area. (See b.Available address)

(d) Other detail

The decoder skips a line. even if the line is contained only new-line code NL.

The decipherment processing ends when end record (01) is processed. It is invalid no matter what it is written after this record.

The record from 01 to 05 is not used to process the offset address value. Moreover, the error judgment to it is not done.

7.5. Special specification

Now, there is no kind to which special specification is applied.

8. FLASH SECURITY FUNCTION SETTING

8-1. Flash security function

For the security setting, please set correct settings to each MCU.

Press the ***[Set Environment]*** button in the main window and select the ***[flash security]*** tab in the setting window. The FLASH memory of 16FX can individually put security of four areas (FLASH A/B and DATA A/B) or less. It differs in each kind, and see the hardware manual for details, please.

For the MCU on which the security setting is not specified,

Any operation can be executed for a left check box of FLASH A/B and DATA A/B at any setting.

For the MCU on which the security setting is specified,

Please operate download etc. after checking only the check box for FLASH on which security is put among FLASH A/B and DATA A/B, and setting the key written in the chip respectively.

When the setting of the key is wrong even by one, download fails, and cannot be executed at all. Moreover, it is likely to become an error similarly if the check box in the area where security is not put is checked, and avoid such a setting, please.

Please do download after removing the check on all the check boxes of FLASH A/B and DATA A/B when you forget a correct key. It becomes possible to return to the blank chip because it comes to be able to execute only erase at least by this operation. In this procedure, after download, a value not correct is read about the area where security was locked though not only erase but also the button such as copy becomes effective.

8-2. Not to specify the security setting

The security becomes effective after writing a specific value to a specified address in the FLASH memory area (Refer to the hardware manual). Therefore, it is necessary to make the object file contain no specific value for security.

8-3. To specify the security setting

The security becomes effective after writing a specific value to a specified address in the FLASH memory area (Refer to the hardware manual). Therefore, it is necessary to make the object file contain a specific value for security.

9. OPERATING ENVIRONMENT

Required equipment :

- IBM PC compatible machine equipped with the RS-232C port
- RS-232C cable (commercial item)

OS :

- The Japanese version and English version of Windows XP/Vista/7

* There is fault that some characters are not displayed correctly, in Windows Vista.
  However, we are checking that the program is performing normal operation.

Memory size :

- More than the memory quantity that OS recommends

Hard disk :

- (Availability) Not less than 10 MB

NOTICE : The operations of all models that meet the above conditions may not be ensured.

10. OTHERS

(A) Setting of sound output

The setting of sound generated when an error occurs and processing is terminated normally can be changed.

Select the **[Sound]** tab in the setup window that opens when the ***[Set Environment]*** button is clicked.

- To output sound, put a check in the ***Enable sound*** checkbox.
- Next, the event to take out sound is chosen in the Event column, and the sound in the event is set up by specifying Sound Type and Wave File under it in the state.
- Select ***Wave*** or ***Beep*** as the type of sound to be output in Sound type.
- Set the wave file to be output in the Wave file column only when Wave is selected. When the ***[Open]*** button is clicked, the File Open window is opened. Select the Wave file to be output. The ***[Play]*** button is used to play the set Wave file. The ***[Stop]*** button is used to stop the Wave file.

(B) Setting of tooltips display

The tooltips display can be either “enabled” or “disabled”.

Select the **[Tooltips]** tab in the setup window that opens when the ***[Set Environment]*** button is clicked.

When a checkmark is put in the ***tooltips*** checkbox to move the mouse cursor over the contents such as buttons in the dialog window, simple help (the full path of a file for Hex File) is displayed.

(C) Error messages

Many error messages are displayed owing to the setting mistake of hardware and software. the case where an error is outputted in addition even if it checks these in detail, please tell the person in charge of software acquisition origin a detailed condition.

No.001 Download error*1
Cause: The response of download processing is unusual.
Action: Please check connection and a setup of hardware.

No.003 Timeout error
Cause: The response of a command does not come on the contrary.
Action: Please check connection and a setup of hardware.

No.006 Unable to open COM port
Cause: Another application is using COM.
Action: Please check the use situation and port number of a COM port.

No.007 Unable to open Download file
Cause: **m_flash.xxx** not found
Action: Please reinstall this software.

No.009 Unable to gain COM port info
Cause: It will be in the state where the target COM port can be used.
Action: Please check the number of a COM port and setup to be used.

No.010 Unable to change COM port setting
Cause: A communication setup cannot be set as the target COM port.
Action: Please inform support of condition.

No.011 Communication error
Cause: The unusual command response was received.
Action: Please reperform by improving connection and a setup of hardware.

No.012 Read error
Cause: The response at the time of read&compare or copy processing is unusual.
Action: Please reperform by improving connection and a setup of hardware.

No.013 Program error
Cause: The response at the time of Program&Verify processing is unusual.
Action: Please reperform by checking whether a chip is blank.

No.015 COM port write error
Cause: There is the possibility of the abnormalities of a COM port driver or the port itself.
Action: Please inform support of condition.

No.016 COM port read error
Cause: There is the possibility of the abnormalities of a COM port driver or the port itself.
Action: Please inform support of condition.

No.017 File access error
Cause: Access of a **m_flash.xxx** file went wrong.
Action: Return the folder and file configurations to the installation defaults.

No.018 Erase error *1

Cause: The response at the time of erase processing is unusual. There is the possibility that a chip is poor.

Action: Please improve a setup of hardware or exchange chips.

No.020 Trimming data read error *2

Cause: The response at the time of read trimming data processing is unusual.

Action: Please reperform by improving connection and a setup of hardware.

No.021 Trimming data write error *3

Cause: The response at the time of write trimming data processing is unusual.

Action: Please reperform by improving connection and a setup of hardware.

No.101 Please set "hex file"

Cause: “Hex file” not set

Action: Set “hex file” in the dialog box.

No.207 memory is not available

Cause: Unable to allocate memory for execution

Action: Quit any running application and retry.

Please redo from download operation *4

*1: “MCU xxH” is displayed if the error cause is returned from the microcontroller at a download error.

MCU 02H → SUM error at downloading

MCU 04H → Abnormal termination at downloading

MCU 32H → Communication check error after downloading

*2: “CRC ERROR!!”, “Data Reception Error!!”, "MCH xxH" is displayed if the error cause is returned from the microcontroller at a trimming data read error.

MCU 03H → Timeout error

MCU FFH → COM port write error

CRC ERROR → Trimming data CRC error

Data Reception Error → Trimming data receive error

*3: “CRC ERROR!!”, “Data Transmission Error!!”, "MCH xxH" is displayed if the error cause is returned from the microcontroller at a trimming data write error.

MCU 03H → Timeout error

MCU FFH → COM port write error

CRC ERROR → Trimming data CRC error

Data Transmission Error → Trimming data transmit error

*4: This is an additional message. It is displayed as necessary after other messages are displayed.

11. CAUTIONS

The PC programming software has the possibility of receiving the influence by the communications cable, the outside environment, and the PC.

Therefore, please evaluate it enough when you use the software.

Please use programming systems of programmer venders when you write two or more devices at the same time.

Please don't use the USB HUB between PC and MCU.

The specifications of the product are subject to change without notice.

See the following for the notice which differs in each kind.

(1) MB96800 Series

For this series, a trimming data which is used to suppress the dispersion of electric characteristics for each device (see hardware manual for detail) is hold in flash security sector, so the performance of PC programmer is different from other MCUs, see the following for detail.

- When you operate a flash erase, there is the automated process that the trimming data is read out and saved, and written back after chip erase. The trimming data area can’t be erased.
- When you try to write data to the trimming data area in flash memory, the message “address error” will be displayed, because the trimming data area is considered to be out of the valid address area.
- When the flash security is enabled, you can disable the flash security only by inputting the correct security key in ***[flash security]*** tab of the window which is displayed when ***[Set Environment]*** button is pressed down. And a chip erase operation can’t disable the flash security.