



# **FUJITSU FLASH MCU Programmer for FR Specifications**

FUJITSU FLASH  
MCU Programmer for FR Sector Select  
Specifications  
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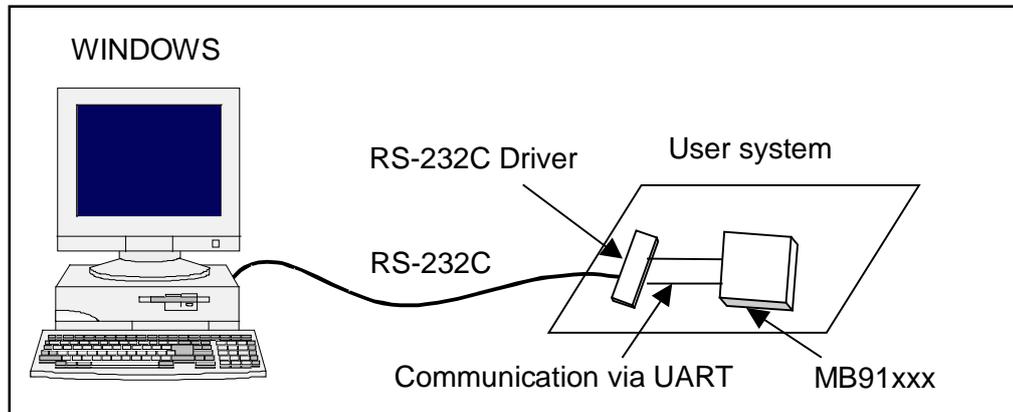
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## 1. CONFIGURATION DIAGRAM



It is possible to rewrite it from the personal computer (Windows PC) for the FLASH memory that RS232C is being mounted by the use user system by way of the microcontroller. Note that the user system must have an RS-232C driver for communication with the microcontroller UART.



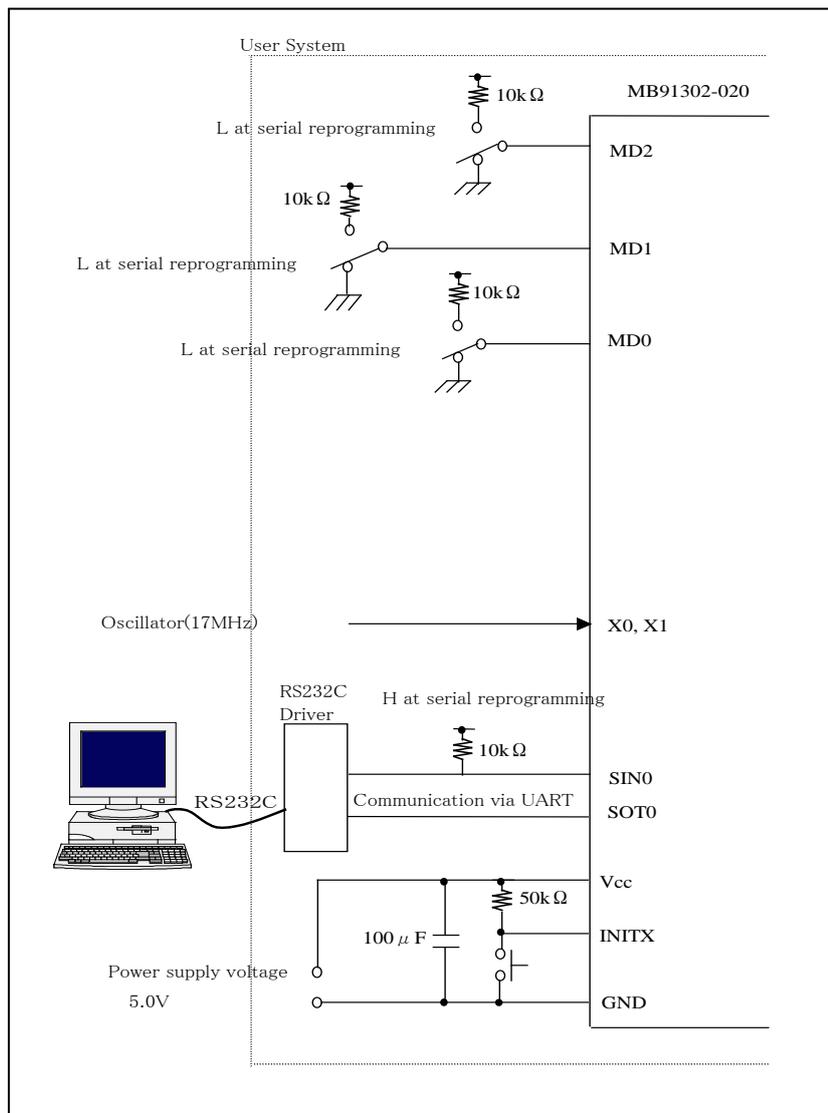
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### 3. EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER

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

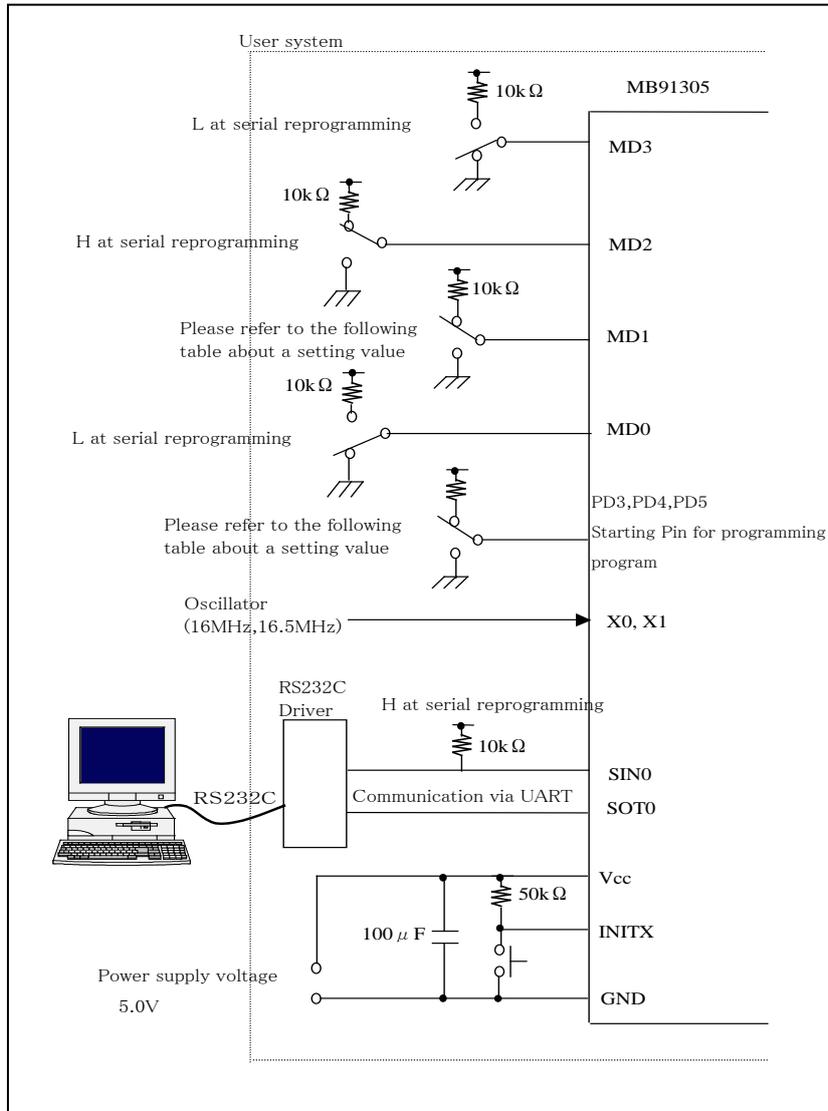
When programming data to mass-produced products using the Yokogawa Digital Computer serial programmer some time in the future, it is best to generate the patterns for serial clock pins on the printed circuit board according to the connection example for serial programming described in the ***hardware manual*** for each microcontroller.

### 3.1 Setting for MB91302-020



The MD2, MD1 and MD0 pins, and SIN0 pin cannot be controlled by the PC and should be set in the user system. During serial reprogramming, when the RSTX pin is set from “Low” to “High” level after setting the MD2, MD1 and MD0 pins, and SIN0 pin, the microcontroller enters the serial reprogramming mode(reference of the upper figure), enabling serial reprogramming from the PC. In addition, please use an oscillator (17MHz) at the time of FLASH reprogramming. The oscillator of the other frequency cannot use it at FLASH reprogramming.

### 3.2 Setting for MB91305

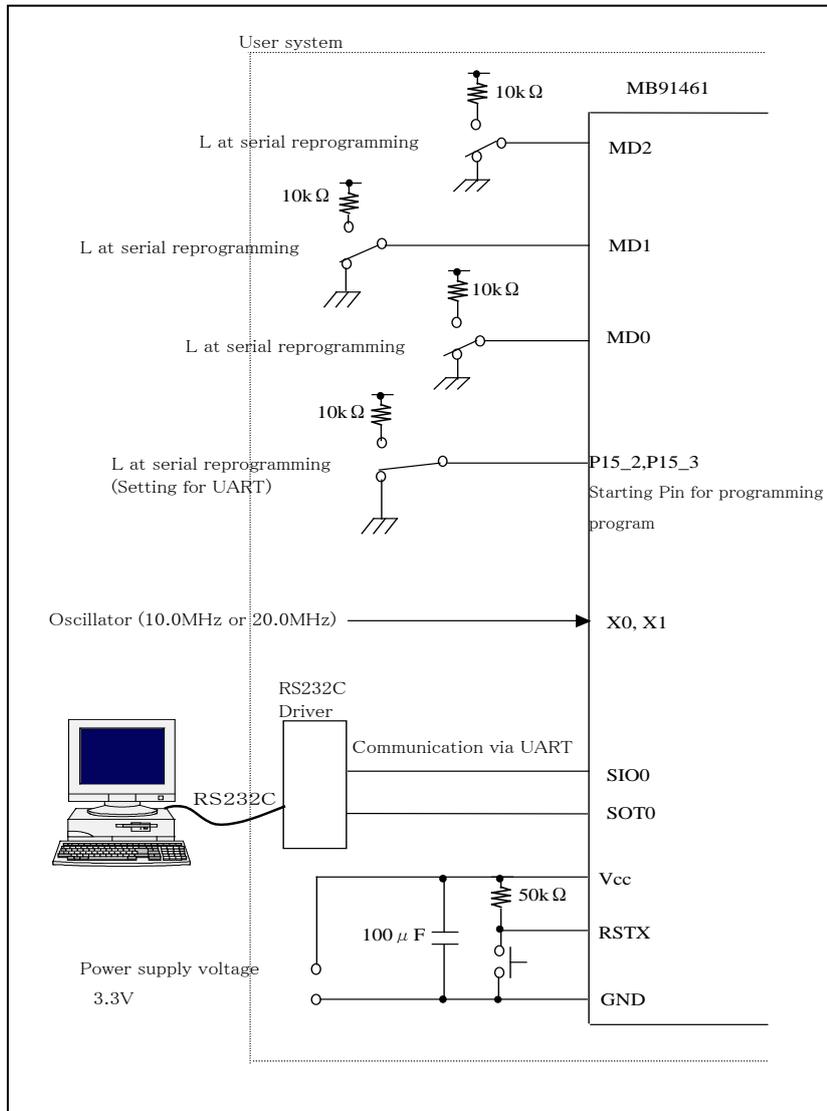


setting value for serial reprogramming

Oscillator	MD1	PD5	PD4	PD3
16MHz	H	L	L	L
16.5MHz	H	L	L	H

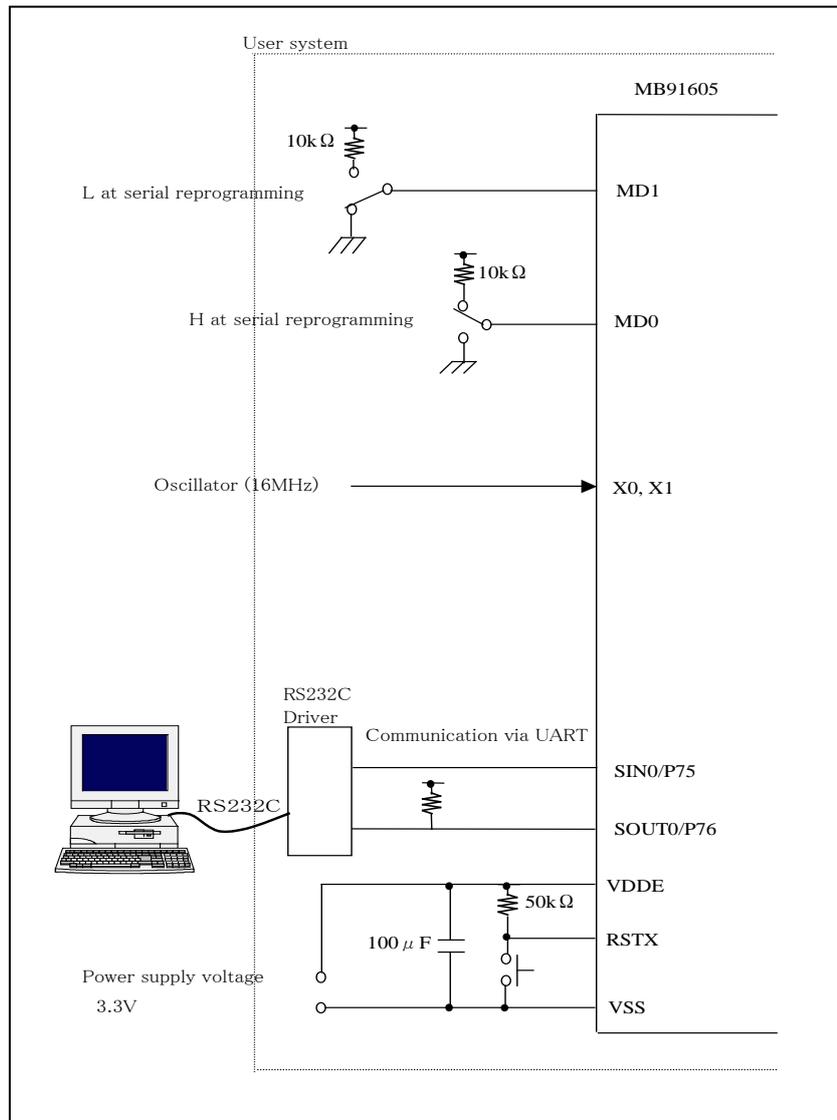
The MD2, MD1 and MD0 pins, and PD5, PD4 and PD3 pin cannot be controlled by the PC and should be set in the user system. During serial reprogramming, when the RSTX pin is set from “Low” to “High” level after setting the MD2, MD1 and MD0 pins, and PD5, PD4 and PD3 pin, the microcontroller enters the serial reprogramming mode(reference of the upper figure), enabling serial reprogramming from the PC. In addition, please use an oscillator (16MHz or 16.5MHz) at the time of FLASH reprogramming. The oscillator of the other frequency cannot use it at FLASH reprogramming.

### 3.3 Setting for MB91461



The MD2, MD1 and MD0 pins, and P15\_2 and P15\_3 pin cannot be controlled by the PC and should be set in the user system. During serial reprogramming, when the RSTX pin is set from "Low" to "High" level after setting the MD2, MD1 and MD0 pins, and P15\_2 and P15\_3 pin, the microcontroller enters the serial reprogramming mode (reference of the upper figure), enabling serial reprogramming from the PC. In addition, please use an oscillator (10.0MHz or 20.0MHz) at the time of FLASH reprogramming. The oscillator of the other frequency cannot use it at FLASH reprogramming.

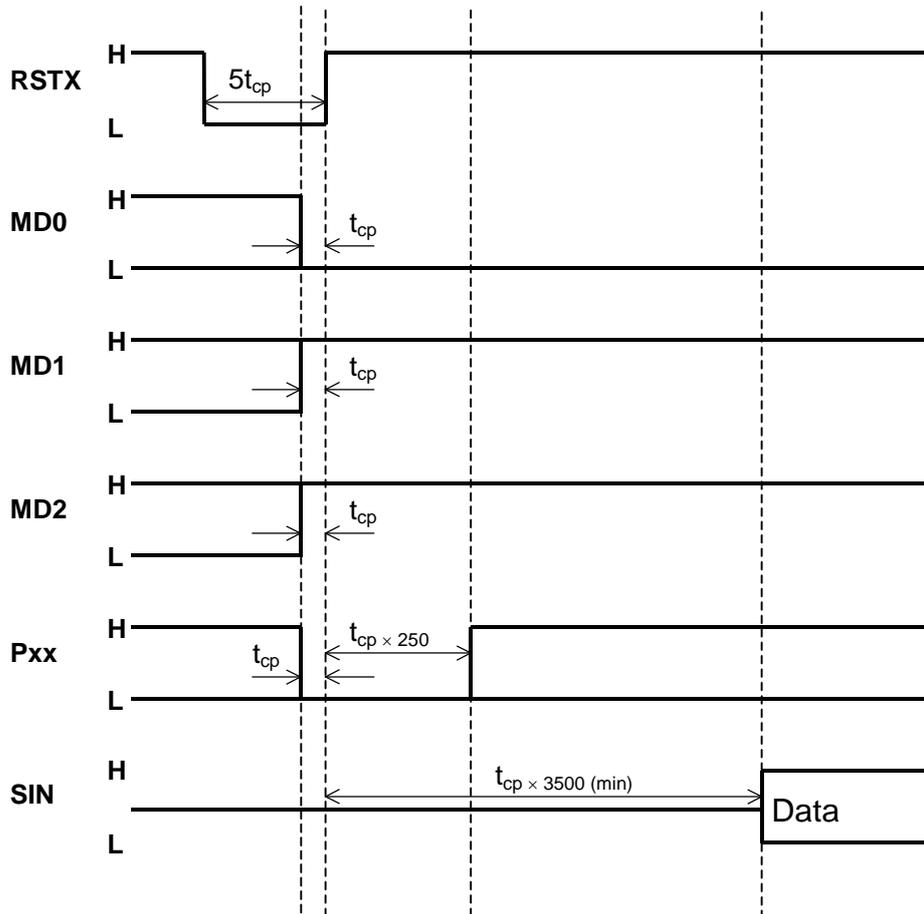
### 3.4 Setting for MB91605



The MD1 and MD0 pins, and SOUT0pin cannot be controlled by the PC and should be set in the user system. During serial reprogramming, when the RSTX pin is set from “Low” to “High” level after setting the MD1 and MD0 pins, and SOUT0 pin, the microcontroller enters the serial reprogramming mode(reference of the upper figure), enabling serial reprogramming from the PC. In addition, please use an oscillator (16MHz) at the time of FLASH reprogramming. The oscillator of the other frequency cannot use it at FLASH reprogramming.

## 4. 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 signal

Although the Pxx signal indicates a starting pin for programming program and the SIN signal a serial data input pin. The value of the above-mentioned figure [ timing / setting / of each of these setting pins / to reset input ] is only an example. Refer to the hardware manual for the detailed value over each kind.

Moreover, the above Although it is the chart figure for kinds set as Pxx = MD0 = L and MD1 = MD2 = H, since an input level setup of these setting pins changes with kinds, please set up the input level corresponding to each kind with reference to the individual connection figure of Chapter 3.

## 5. 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.

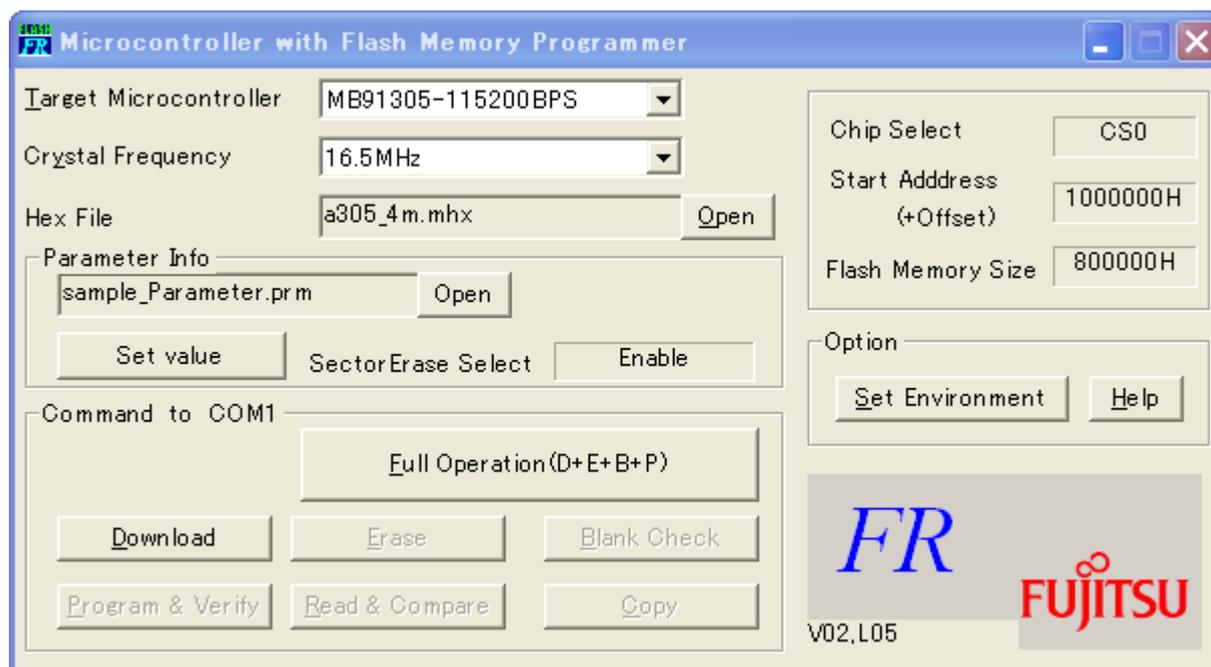
After installation, click the Windows **Start** button => **Program** => **FUJITSU FLASH MCU Programmer** => **FR CS SECTOR** to start the programmer software.

## 6. PROGRAMMER FUNCTIONS

Erase, Blank Check, Program&Verify, Read&Compare, and Copy can be processed to the FLASH memory connected with the microcomputer. Each.

- 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**). In starting or when setting has been changed, it is necessary to perform downloading (described later).

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

## 6.1 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. Please read **Chapter2** about the kind which can be chosen.
- (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)
MB91302	17
MB91302(a terminal WR use version)	15,17
MB91305	16,16.5
MB91461	10,20
MB91605	16

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

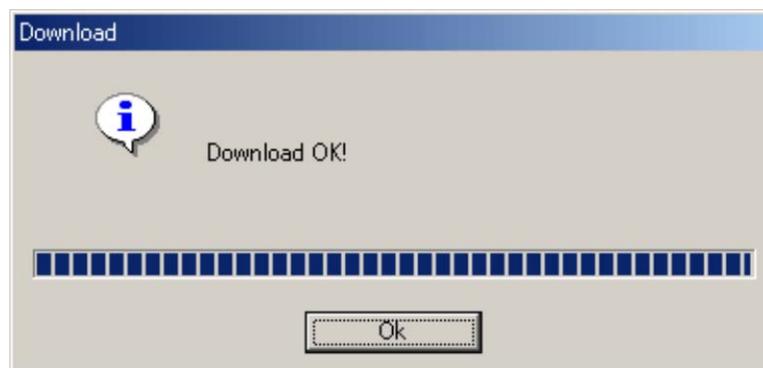
- (d) Execution of downloading

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



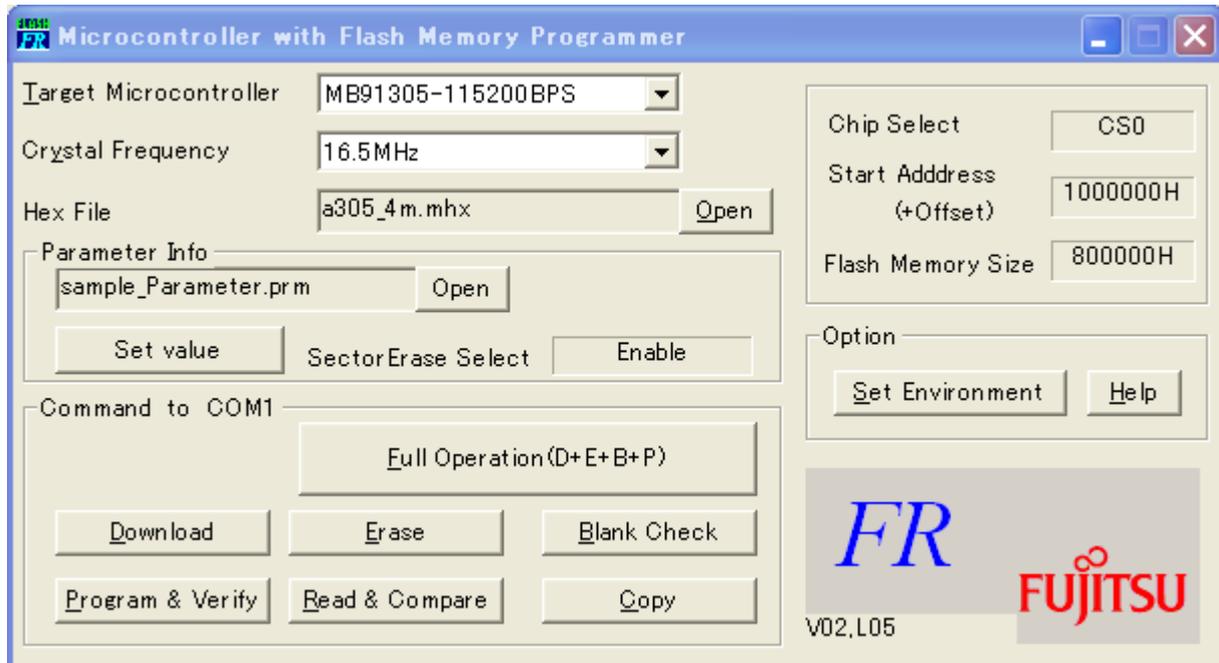
Downloading is performed to open the "Download" window. When downloading is completed normally, the following dialog window opens.



When the **[OK]** button is clicked to close the dialog window, the **[Erase]**, **[Blank Check]**, **[Program & Verify]**, **[Read & Compare]** and **[Copy]** buttons are enabled.

## 6.2 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 format file or binary file to be programmed to flash memory. 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.

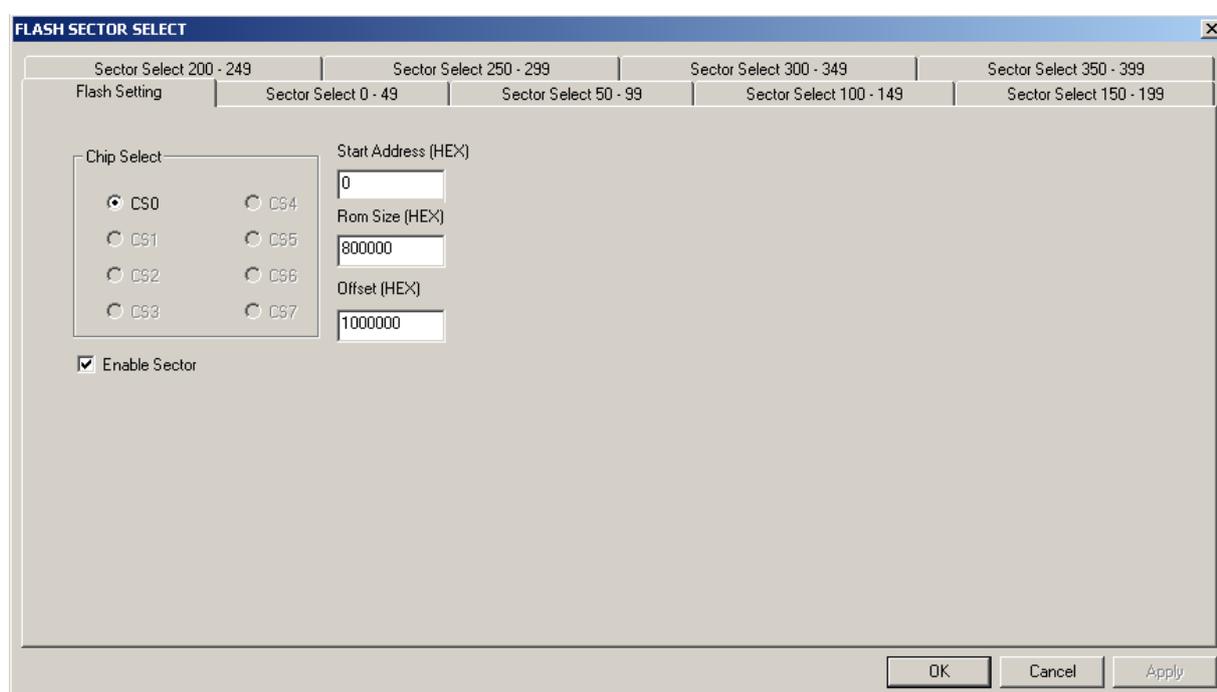
**Hex File** must be specified to execute **[Program & Verify]**, **[Read & Compare]** and **[Full Operation (D+E+B+P)]**. Since it is decoded at the head of these processings each time, even if the specified Motorola-S format file or binary file changes specification of a file just before processing,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

When the binary file is treated, it is necessary to note that address information is not included for the binary file. Please see Chapter 6.4.

**(b) Parameter Info Group Box**

Here, the parameter of the connected FLASH chip is set. The parameter file selection is done with the **Open** button in the group box. (The purpose is for another file to distinguish, and it is not especially regulated though the mask is done with prm as for the extension. )Please select sample configuration file (Parameter.prm) included in this software when executing it for the first time. (However, after it selects it, it is necessary to change the setting.)

When it finishes selecting the file, the **Set Value** button is made effective. The following dialogs open when this button is pushed, and the setting can be changed.



(b-1) [Start Address] : Starting address of FLASH memory area seen from microcontroller

(b-2) [Rom Size] : Size of FLASH memory

(b-3) [Offset] : Offset address

(b-4) [Enable Sector] : Specifying the address for writing or erasing by putting the check becomes possible.

[Start Address] specifies the starting address of the FLASH memory area seen from the microcontroller. Because the FLASH memory area seen from the microcomputer is decided depending on the user side software, it is necessary to change to the setting additionally.

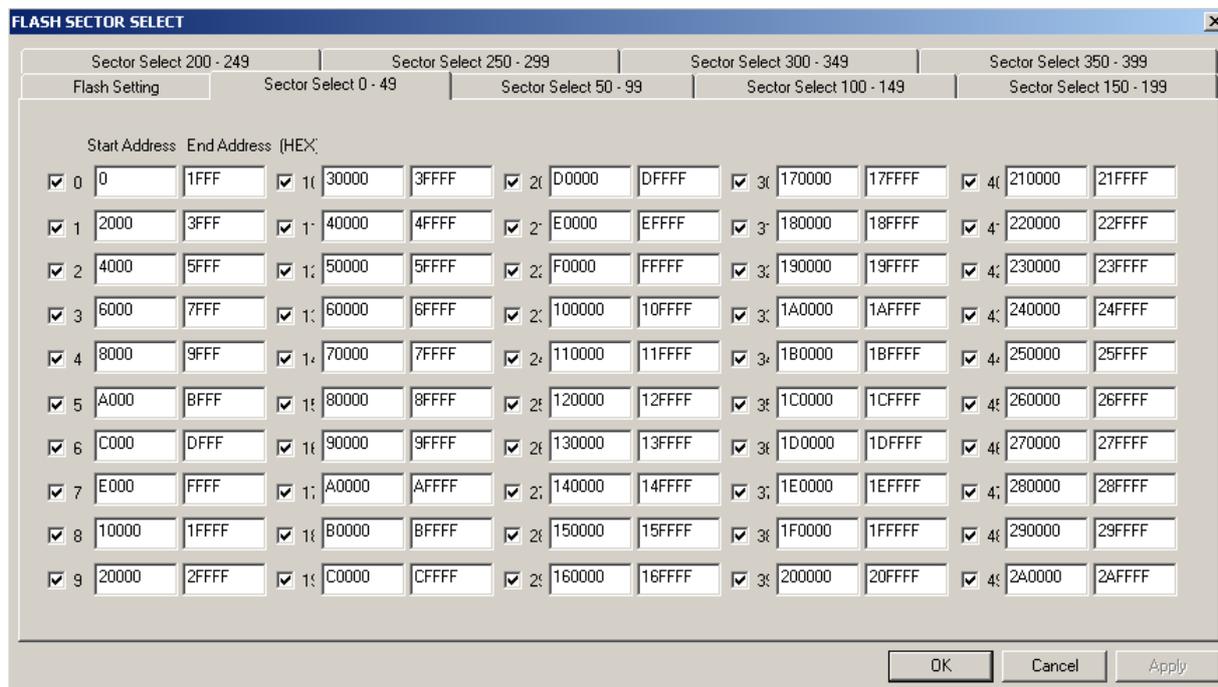
**[Offset] cannot be used now. Please set the value of Offset to 0.**

### Setting example

As follows, the FLASH memory area seen from the microcontroller sets it from 400000 for the range of 7FFFFFFF.

Start Address(HEX) 400000  
 Rom Size(HEX) 400000  
 Offset(HEX) 0

(b-5) [Sector select 0-399] : It is possible to register to the sector in 400 places. It becomes effective by putting the check.



Sector Select 200 - 249		Sector Select 250 - 299		Sector Select 300 - 349		Sector Select 350 - 399					
Flash Setting		Sector Select 0 - 49		Sector Select 50 - 99		Sector Select 100 - 149		Sector Select 150 - 199			
	Start Address	End Address (HEX)		Start Address	End Address (HEX)		Start Address	End Address (HEX)		Start Address	End Address (HEX)
<input checked="" type="checkbox"/>	0	1FFF	<input checked="" type="checkbox"/>	30000	3FFFF	<input checked="" type="checkbox"/>	200000	20FFFF	<input checked="" type="checkbox"/>	300000	30FFFF
<input checked="" type="checkbox"/>	2000	3FFF	<input checked="" type="checkbox"/>	40000	4FFFF	<input checked="" type="checkbox"/>	220000	22FFFF	<input checked="" type="checkbox"/>	320000	32FFFF
<input checked="" type="checkbox"/>	4000	5FFF	<input checked="" type="checkbox"/>	50000	5FFFF	<input checked="" type="checkbox"/>	240000	24FFFF	<input checked="" type="checkbox"/>	340000	34FFFF
<input checked="" type="checkbox"/>	6000	7FFF	<input checked="" type="checkbox"/>	60000	6FFFF	<input checked="" type="checkbox"/>	260000	26FFFF	<input checked="" type="checkbox"/>	360000	36FFFF
<input checked="" type="checkbox"/>	8000	9FFF	<input checked="" type="checkbox"/>	70000	7FFFF	<input checked="" type="checkbox"/>	280000	28FFFF	<input checked="" type="checkbox"/>	380000	38FFFF
<input checked="" type="checkbox"/>	A000	BFFF	<input checked="" type="checkbox"/>	80000	8FFFF	<input checked="" type="checkbox"/>	300000	30FFFF	<input checked="" type="checkbox"/>	400000	40FFFF
<input checked="" type="checkbox"/>	C000	DFFF	<input checked="" type="checkbox"/>	90000	9FFFF	<input checked="" type="checkbox"/>	320000	32FFFF	<input checked="" type="checkbox"/>	420000	42FFFF
<input checked="" type="checkbox"/>	E000	FFFF	<input checked="" type="checkbox"/>	A0000	AFFFF	<input checked="" type="checkbox"/>	340000	34FFFF	<input checked="" type="checkbox"/>	440000	44FFFF
<input checked="" type="checkbox"/>	10000	1FFFF	<input checked="" type="checkbox"/>	B0000	BFFFF	<input checked="" type="checkbox"/>	360000	36FFFF	<input checked="" type="checkbox"/>	460000	46FFFF
<input checked="" type="checkbox"/>	20000	2FFFF	<input checked="" type="checkbox"/>	C0000	CFFFF	<input checked="" type="checkbox"/>	380000	38FFFF	<input checked="" type="checkbox"/>	480000	48FFFF

note:

0~399 is a registration number. It need not agree to the sector number.

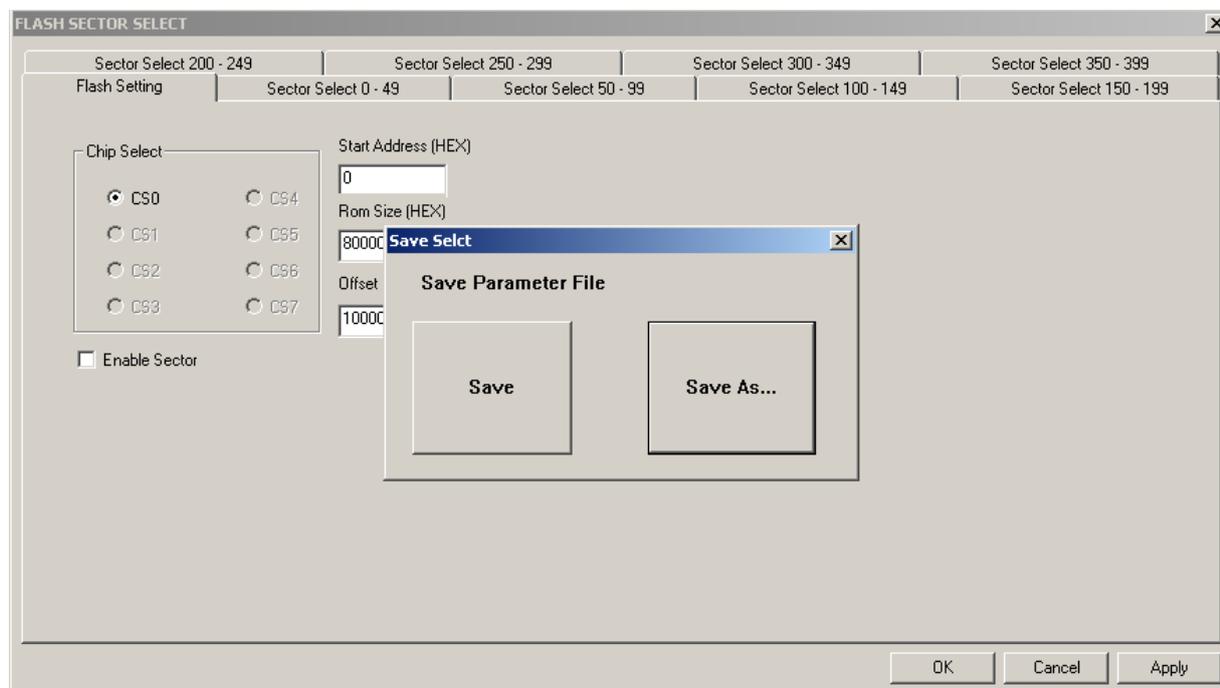
The registered sector need not be consecutive. However, please register from the sector with small address sequentially.

(b-5-1) [Start Address] : Start address of Sector that wants to register

(b-5-2) [End Address] : End address of Sector that wants to register

**As for the address set here, it is necessary to note the point to have to specify the address seen from not the address in the FLASH chip but the microcontroller.**

When **OK** or **Apply** button is pushed, it preserves putting it (Save As...) or the selected dialog is displayed as superscription (Save) shown in the following or the name. If the **Cancel** button is pushed, the parameter file edit screen is canceled. At this time, please note that the setting is not preserved.



**Save** : An existing parameter file is overwritten.

**Save As** : The file preserved naming the name becomes a parameter file.

x of dialog right shoulder : Dialog display deletion without preserving it when pushing.

#### About the mis-operation prevention of the parameter file

It is possible to put it into the state of the mis-operation prevention by opening the parameter file directly with the text editor, and changing the value of the following two parameters.

##### WRITE\_ENABLE :

It has the meaning of Flash read-only/permission (0: the prohibition and 1: permission). The button for the deletion and the writing operation is nullified when setting it to the prohibition. The reading operation is possible.

##### CHIP\_BTN\_ENABLE :

Effective invalidity of the [Set Value] button is set. (0: Invalidity and 1: Effective) It becomes impossible for the [Set Value] button to be nullified when invalidly setting it, and to push.

(c) **Erase:** Erase FLASH memory areas

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

chip erase when (b-4)[ Enable Sector] is no check

sector erase when (b-4)[ Enable Sector] and (b-5) [Sector select] is checked

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

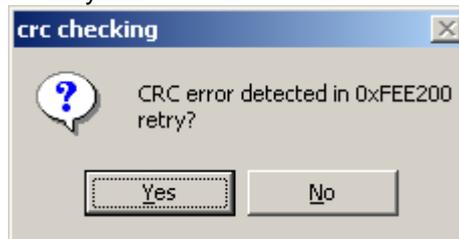
(d) **Blank Check:** Check that all flash memory areas are blank

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

All the areas are checked when (b-4)[ Enable Sector] is no check The object sector is checked when (b-4)[ Enable Sector] and (b-5) [Sector select] is checked

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

This button is clicked to program the Motorola-S format file or binary file specified in **Hex File** to flash memory concurrently with verification. An error dialog is displayed, when writing is performed for 512 bytes(MB91305:1024bytes) 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.

It writes it in all the areas when (b-4)[ Enable Sector] is no check

It writes it in the object sector when (b-4)[ Enable Sector] and (b-5) [Sector select] is checked

Please refer to Chapter 6.4 for the binary file writing operation specification.

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

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

All the areas are compared when (b-4)[ Enable Sector] is no check

The object sector are compared when (b-4)[ Enable Sector] and (b-5) [Sector select] is checked

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

The file preservation is done as Motorola-S format file or a binary file reading the data written in the FLASH memory. The file format is judged by the extension of the preservation file. It preserves it as Motorola S format file, except for Bin the extension and the binary file and Bin. Like **[Read & Compare]** processing, FLASH memory reading is performed for 512 bytes of every block, and a CRC error check is performed similarly. A preservation place folder is specified, and if a file name is inputted and **[Save]** button is pushed, processing will begin.

All the areas are read when (b-4)[ Enable Sector] is no check

The object sector are read when (b-4)[ Enable Sector] and (b-5) [Sector select] is checked

Please refer to Chapter 6.4 for the binary file reading operation specification.

(h) **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]**, **[Blank check]**, and **[Program & Verify]**. When it is not a blank chip, processing is performed in order of **[Download]**, **[Blank check]**, **[Erase]**, **[Blank check]**, and **[Program & Verify]**.

Please refer to (c)~(e) for the object area of **[Erase]**, **[Blank check]**, and **[Program & Verify]**.

### 6.3 Internal motorola S decoder specification

After it is converted into the binary with the decoder with built-in this software, the file of Motorola-S format specified for HexFile is processed. The specification of the decoder is shown in the following and refer, please.

1. It doesn't correspond to the address overlap error.

Even if it is a file that tries to set another value to the same address, it cannot be detected. In this case, it is overwritten in data that the data that appears previously appears back.

2. About the range of an effective address

The file where the address outside "Range of the address of the FLASH memory" specified in the *Parameter Info group box* is included becomes an error, and cannot write it.

3. About the detected error.

The dialog is displayed when some errors are detected at the decipherment and processing is interrupted. The line - number where the interruption reason and the error are caused is displayed in the dialog.

There are four kinds of interruption reasons as follows.

(1) file error

When the start of the line is not S.

(2) S-format error

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

(3) decode error

When there are characters other than 0123456789ABCDEF excluding the start of the line. (It makes an error of small letter abcdef. )

The data row of the line doesn't come up to the number of data specified by the length. Data at the position of SUM corresponding to the number of data specified by the length is not suitable for actual SUM.

(4) address error

The range of the address of data that the decipherment is done has not been installed on the area of FLASH. (Refer to above-mentioned 2.)

4. More details specification

It is skipped only, and it doesn't make an error of the line only of changing line.

Because the line that starts by S0, S5, S7, S8, and S9 does the decipherment of the following

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line annulling it at once, the detection of the SUM error etc. is not done. Moreover, the decipherment processing is never interrupted by these lines even if these lines are in the middle of the file. All lines are done and the decipherment is done.

## 6.4 Binary file specification

The binary file is processed among this software as follows.

### 1. About the treatment among this software

When the binary file is specified for Hex File, it treats as data of a consecutive address, and is treated from the starting address of the FLASH memory area as arranged data. The starting address of the FLASH memory area is set in Chapter (b-1) 6-2.

It is necessary to make the binary data from the starting address of the FLASH memory area even to write it from the following address the starting address of the FLASH memory area. Writing is and in the area without the necessity, there is a possibility that the writing processing ends early when setting it to 0xFF.

### 2. About the range of an effective address

When a file that is bigger than the size of the FLASH memory is written, it becomes an error.

### 3. About reading

The selection of the sector preserves it from the starting address of the FLASH memory area when it is invalid in the reading file the size of the FLASH memory.

The starting address of the FLASH memory area can be set in Chapter (b-1) 6-2.

The size of the FLASH memory can be set in Chapter (b-2) 6-2.

Please refer to "4. About the operation when the sector is selected " when the selection of the sector is effective.

### 4. About the operation when the sector is selected

It writes it if there is a write data within the range of an effective sector at the time of writing.

Only an effective sector is read one by one at the time of reading and it preserves it. At this time, even when an effective sector is not consecutive, it is necessary to note the preserved binary file because it writes it continuously.

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## 7. STATUS OF OPERATION CHECK

- Specifications for PC used for operation check

PC: FMV 6450TX2  
CPU: Pentium 450 MHz  
OS: Japanese and English version of Windows 98 SE, Windows Me,  
Windows 2000 SP3, Windows XP SP1  
Memory: 192 MB

## 8. OTHERS

### (A) Setting of voice output

The setting of voice 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.
- Check the status of sound output. Select **ERROR** or **END** in the sound column.
- Select **Wave** or **Beep** as the type of sound to be output in **Sound type**.
- Set the voice 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 “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.	Item	Description
No.001	Message	Download error *1
	Cause	The response of download processing is unusual.
	Action	Please check connection and a setup of hardware.
No.003	Message	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	Message	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	Message	Unable to open Download file
	Cause	<code>m_flash.xxx</code> not found
	Action	Please reinstall this software.
No.009	Message	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	Message	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	Message	Communication error
	Cause	The unusual command response was received.
	Action	Please reperform by improving connection and a setup of hardware.
No.012	Message	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	Message	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	Message	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.	Item	Description
No.016	Message	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	Message	File access error
	Cause	Access of a <b>m_flash.xxx</b> file went wrong.
	Action	Return the folder and file configurations to the installation defaults.
No.018	Message	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.019	Message	Unable to open KEY file
	Cause	Key file can not open.
	Action	Please create and set up right key file.
No.101	Message	Please set "hex file"
	Cause	"Hex file" not set
	Action	Set "hex file" in the dialog box.
No.105	Message	key length too short
	Cause	The minimum conditions for key length are not met.
	Action	Prepare a correct security file.
No.106	Message	key length too long
	Cause	The maximum conditions for key length are not met.
	Action	Prepare a correct security file.
No.107	Message	Illegal security file
	Cause	The security file description is invalid.
	Action	Prepare a correct security file.
No.207	Message	memory is not available
	Cause	Unable to allocate memory for execution
	Action	Quit any running application and retry.
*2	Message	Please redo from download operation.

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

"MCU xxH" means:

MCU 02H → SUM error at downloading

MCU 04H → Abnormal termination at downloading

\*2: This is an additional message. It is displayed as necessary after other messages are displayed.

## 9. CAUTIONS

No responsibility is taken about the problem which faced this software use.

The operation of this program is not assured on NEC PC98 series personal computers.

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.

When using this program, there are restrictions on frequencies that are input to the microcontroller as original oscillations. For details, see **(b)** of **Section 6.1**.