

New 8Fx BGM Adapter User Manual

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1. Introduction

NEW_8FX_ADATPER is a tool used for programming, emulating and debugging 8FX MCU. The adapter has inherited most functions of MB2146-07-E except the PC helper function.

The tool supports the following MCU families:

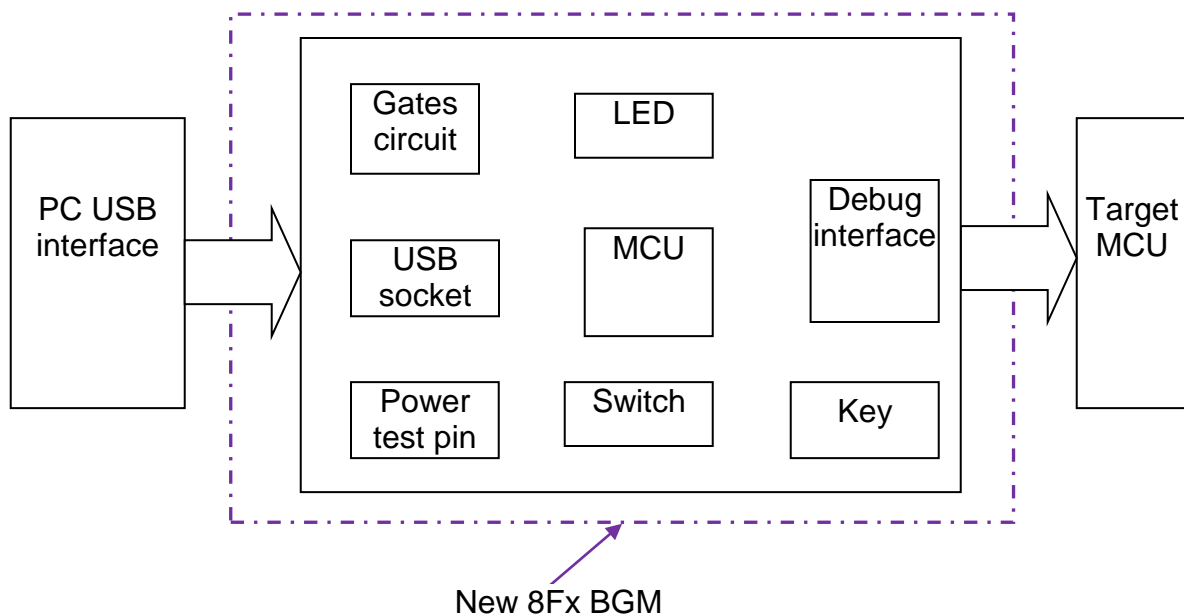
Table 1 Supported MCU Serial

MCU Category	MCU Serial
1st 0.18um	MB95F560
2nd 0.18um	MB95F630
	MB95F690
	MB95F810
	MB95F770

2. Block Diagram

This chapter describes the New 8Fx BGM Adapter block diagram.

Figure 1 New 8Fx BGM Adapter Block Diagram



3. Interface Introduction

This chapter describes the New 8Fx BGM Adapter interfaces.

3.1 The following figure illustrates the adapter interfaces:

Figure 2 New 8Fx BGM Adapter Appearance

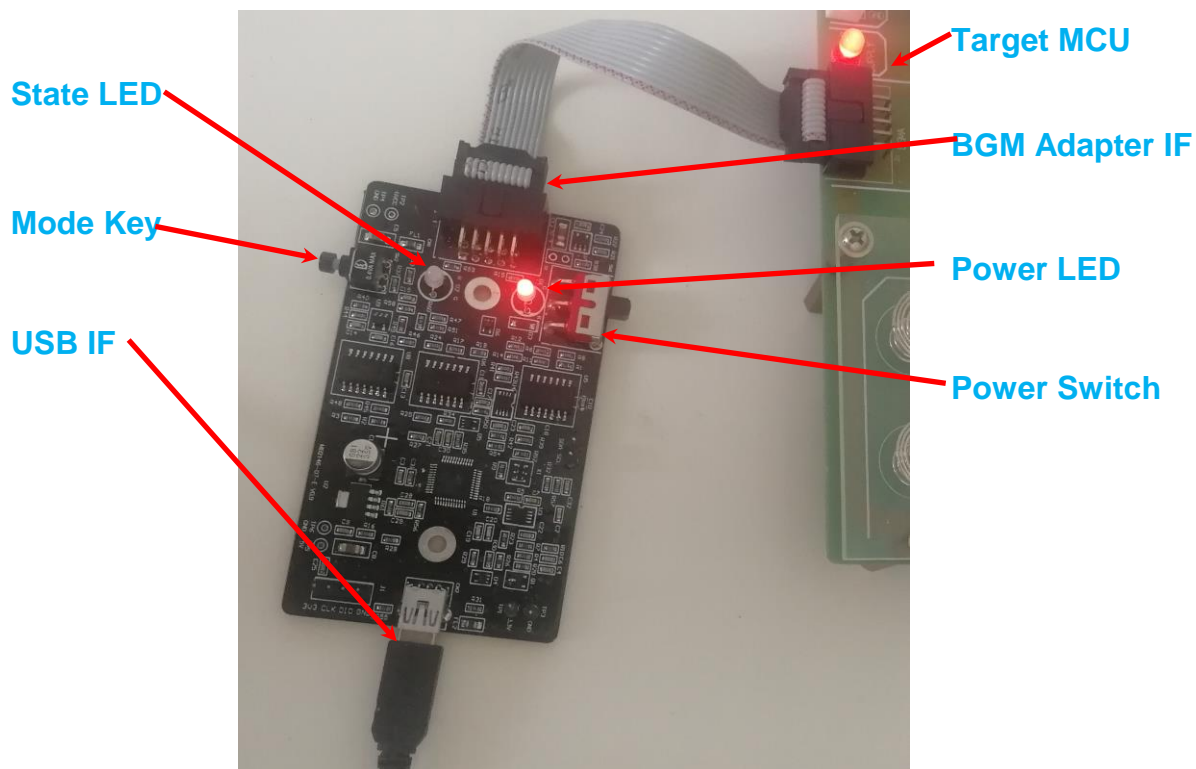


Table 2 Description of Adapter Interfaces

Name	Description
USB IF	Connects to PC USB port
Power Switch	Powers on/off the adapter
Power LED	Indicates the power supply state
Status LED	Indicates the system state
BGM Adapter IF	Connects to target MCU
Mode Key	Switches MCU work mode

3.2 BGM Adapter USB Interface

The USB is used for adapter upgrading and MCU programming, emulating and debugging.

There is a Mode key 'SW2' that switches the BGM Adapter to user mode or serial write mode.

Figure 3 Adapter USB Interface



Keep pressing SW2, power on the adapter, and it enters serial write mode. User can download code from PC.

Note: Use “FLASH USB DIRECT Programmer” tool to download hex file to adapter. Please refer to chapter 7 for details.

SW2 is not pressed when powering on, and it enters user mode. Adapter functions normally in this mode.

3.3 BGM Adapter UART Interface

The UART interface is used to connect target MCU board. The communication between adapter and target MCU is through UART. The UART baud rate depends on MCU types. Following table lists the baud rate.

Table 3 Baud Rates

MCU Type	Baud Rate	Remarks
0.35um	62500	Normal status
	125K	Upload status
1 st 0.18um	500K	Normal status
2 nd 0.18um	500K	Selectable normal status by softune workbench
	1M	Selectable normal status by softune workbench

Connect the MCU to the adapter interface connector according to the following specifications.

Table 4 Pin Number Specifications

Connector pin number	Input / output	Target MCU connection pin name	Function	Remarks
1	BGM Adapter *1←MCU *2	UVCC	User power supply input	Connected to the MCU Vcc pin.
2	-	GND	Vss pin	Connected to the MCU Vss
3	BGM Adapter→MCU	RSTIN	Tool reset output	Reserved
4	BGM Adapter←MCU	RSTOUT	User System reset output	Connected to user System reset circuit
5	-	RSV	-	Reserved
6	BGM Adapter→MCU	VCC	BGM Adapter power output	BGM Adapter supplies power to target board Vcc (3.3V)
7	-	RSV	-	Reserved
8	BGM Adapter←MCU BGM	DBG	Communication line	1-line UART
9	-	RSV	-	Reserved
10	-	RSV	-	Reserved

4. Feature List

This chapter describes the BGM Adapter features.

Following items describe the updated features.

- Baud rate(max): 0.35um---125K, 1st 0.18um---500K, 2nd 0.18um---1M
- Baud rate selection between 500K and 1M in 2nd 0.18um
- Changeable target board clock function
- RAM monitor detect function
- 16 bytes data continuous read
- 8 bytes data continuous write
- Supply power to target board selectable
- Power key to control BGM Adapter power
- LED to show BGM Adapter operation result
- Support target MCU power range is 1.8~5.5^{*1}

Following table lists the power LED and the related operation results.

Table 5 Power LED Status

LED	Status	Information
Green & Red	OFF	Both BGM Adapter and target board power off
Green	ON	BGM Adapter Power on only
Red	ON	Target board power on only
Orange	ON	Both BGM Adapter and target board power on

Following table lists the status LED and the related operation results.

Table 6 Status LED Information

LED	Status	Information
Red	ON	BGM Adapter failed to handshake with target MCU
	OFF	BGM Adapter succeeded in handshaking with target MCU
Green	ON	BGM Adapter connected to PC with USB normally and enumerated success.
	OFF	USB disconnected or enumerates failed
	Twinkling	Data is communicating from USB cable.

Note:

**1: For 3.3V power MCU, the power range is 1.8~3.6V
 For 5V power MCU, the power range is 2.4~5.5V*

5. Performance Description

This chapter describes the BGM Adapter operation.

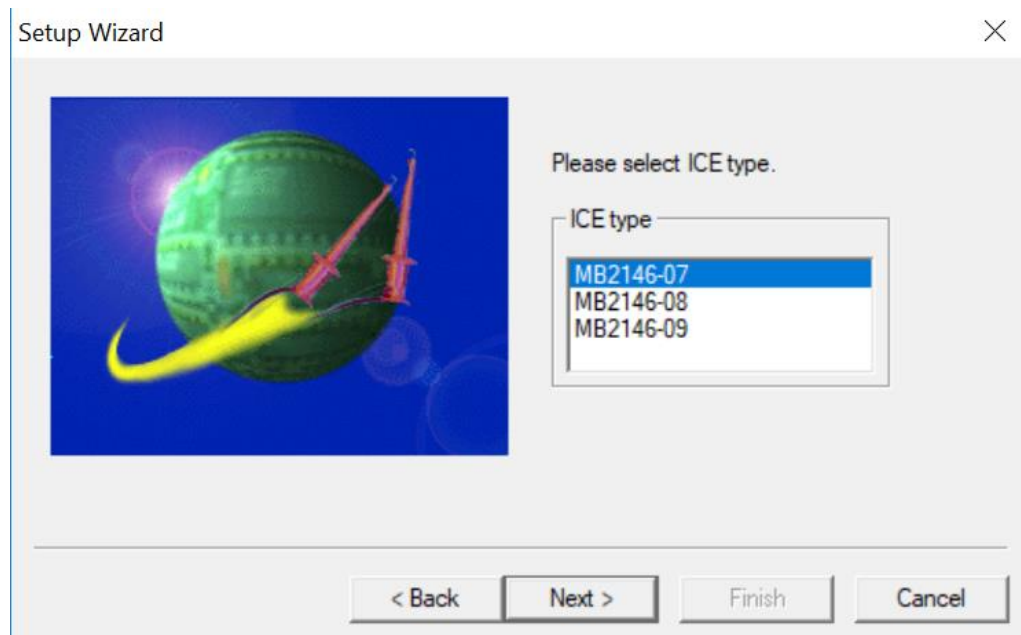
5.1 Debug Performance

Same as MB2146-07-E, before debugging, open new 8FX project, and then set the debug options. The sections below describe some special settings in detail.

5.1.1 ICE Type

For New 8Fx BGM Adapter, the ICE type should be set to MB2146-07-E.

Figure 4 ICE Type Selection

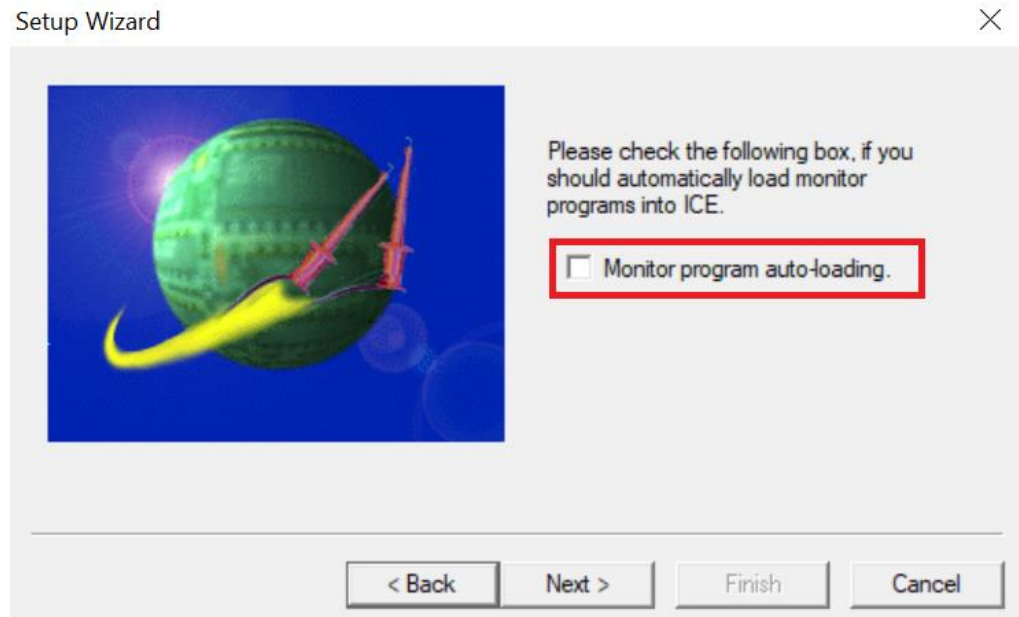


5.1.2 Monitor Program Auto-load

This function is not supported, this option is invalid.

Don't select this message box.

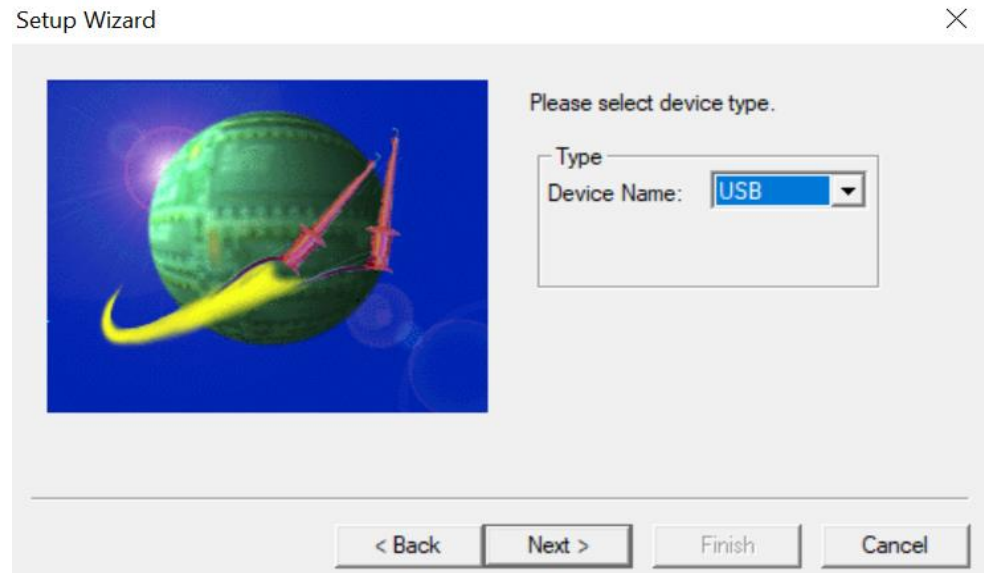
Figure 5 Monitor Program Auto-load



5.1.3 Device Type

Select **USB** for the device name in **Type** Field, as shown in the following figure.

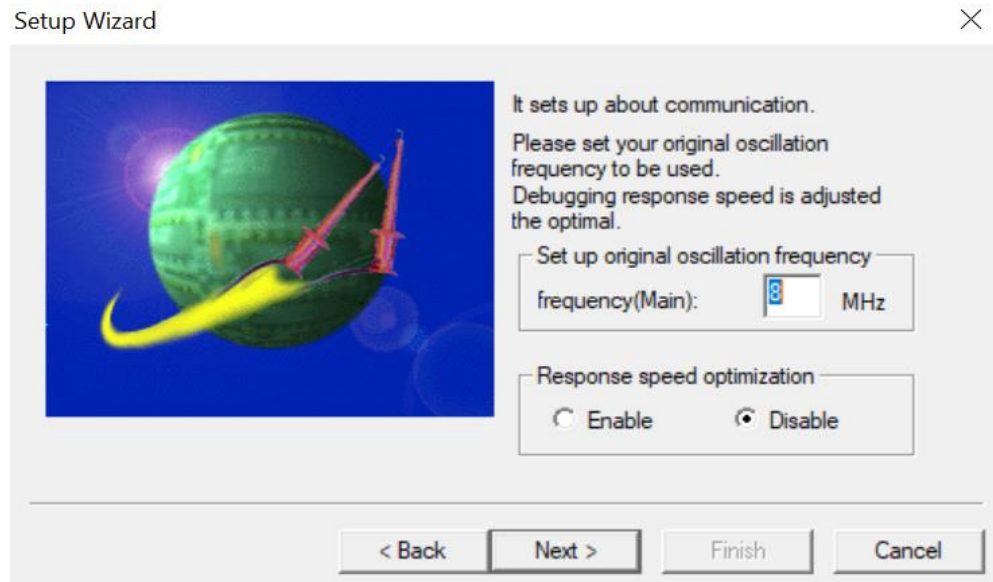
Figure 6 Device Type Selection



5.1.4 Target Oscillation and Speed

In this dialog box, user can select target MCU external clock value in **Frequency(main)** Field and enable or disable clock up in **Response Speed Optimization** Field.

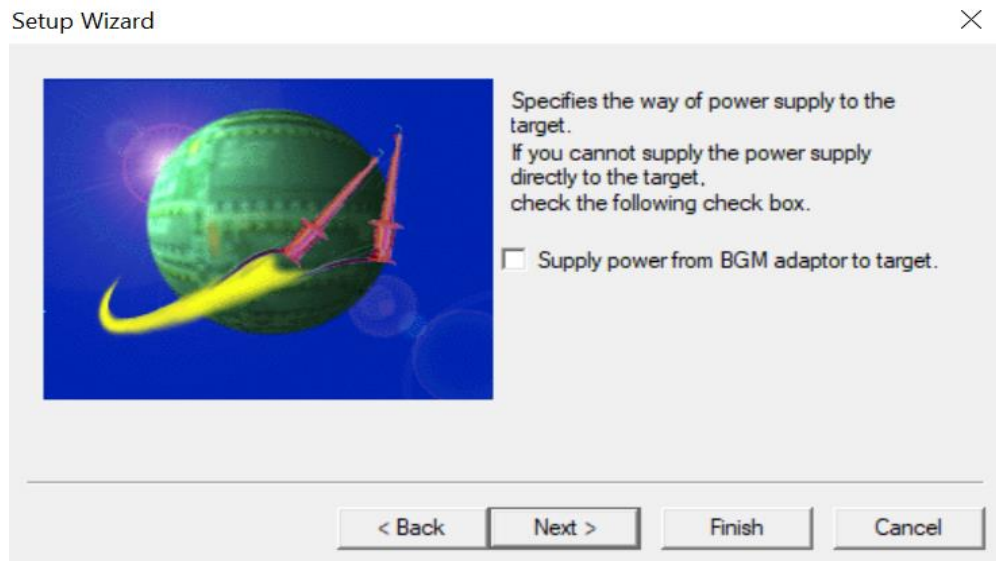
Figure 7 Setting Frequency and Response Speed Optimization



5.1.5 Target Power Supply

This item enables BGM Adapter to supply power to target MCU board.

Figure 8 Target Power Supply



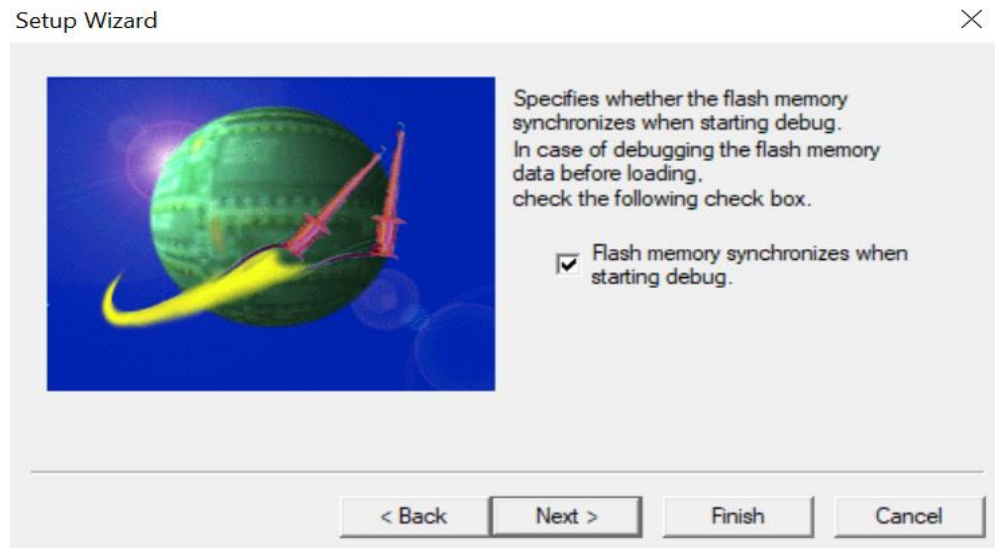
Note:

If the user current is greater than max current(200mA), the system will show power error and stop the power supply.

5.1.6 Flash Memory Synchronization

This dialog box is used to select the debug uploading function. If the dialog box is selected, the Softune will read all MCU flash data to Softune.

Figure 9 Flash Memory Synchronization



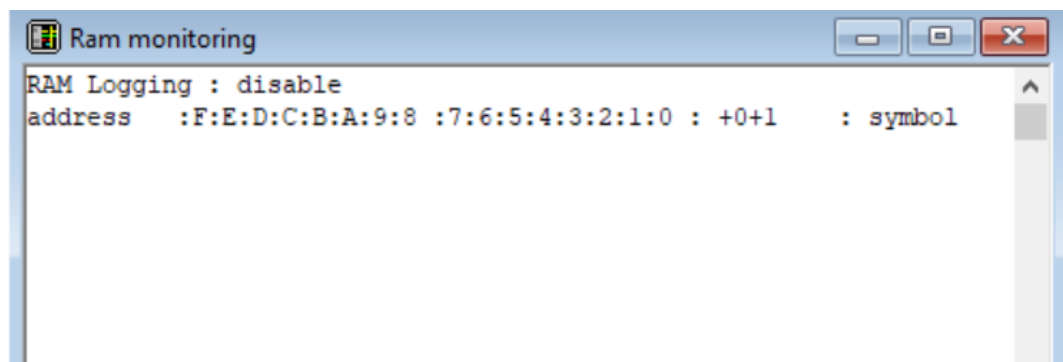
5.2 RAM Monitor Performance

When debugging, user can open RAM monitor window to watch the MCU RAM status.

The RAM monitor can watch 32 bytes RAMs at the same time. When user set all RAM size to **word**.

Following is the RAM monitor window.

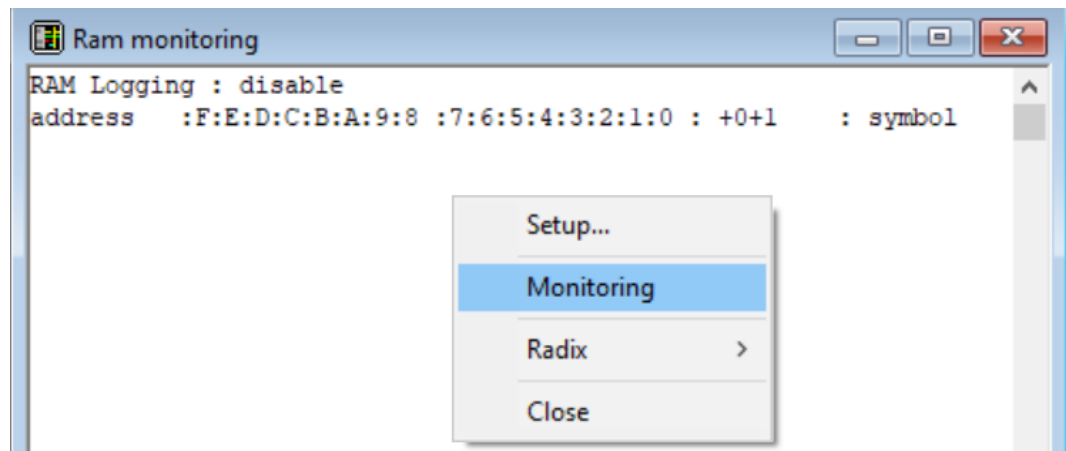
Figure 10 RAM Monitor Window



5.2.1 Enable RAM Monitor

Right-click the blank area in **Ram Monitoring** window, select Monitoring from shortcut menu will enable RAM monitor.

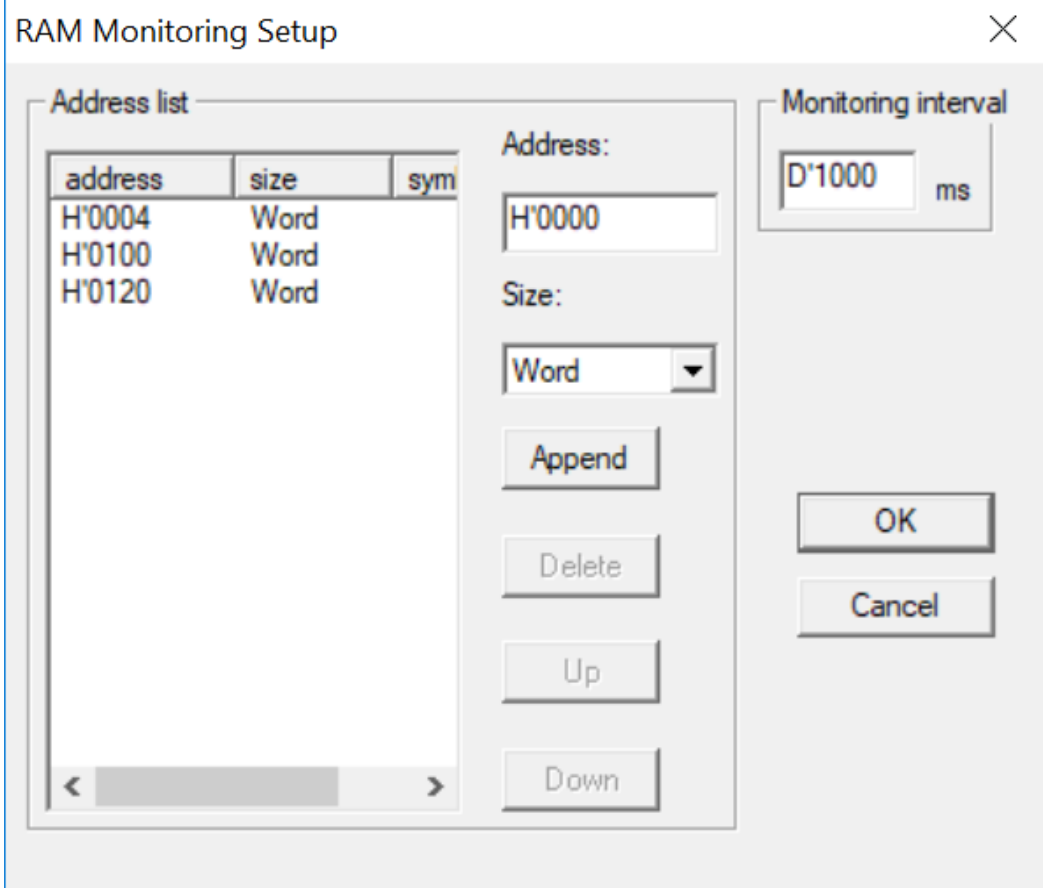
Figure 11 RAM Monitoring



5.2.2 Set Register

Select **Setup** from the shortcut menu, and **RAM Monitoring Setup** window pops up.

Figure 12 RAM Monitoring Setup



The dialog box is titled "RAM Monitoring Setup" and has a close button (X) in the top right corner. It is divided into two main sections: "Address list" and "Monitoring interval".

Address list: This section contains a table with three columns: "address", "size", and "sym". The table lists three entries: H'0004, H'0100, and H'0120, all with a size of "Word". Below the table is a horizontal scrollbar.

Monitoring interval: This section contains a text box for the interval, currently set to "D'1000", and a unit selector set to "ms".

Address and Size fields: To the right of the table, there are two input fields: "Address:" (set to H'0000) and "Size:" (set to Word). Below these are four buttons: "Append", "Delete", "Up", and "Down".

Buttons: At the bottom right of the dialog are "OK" and "Cancel" buttons.

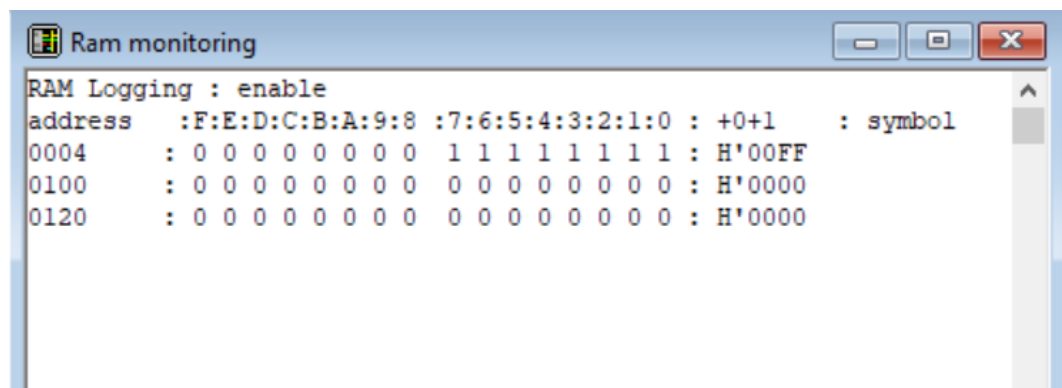
address	size	sym
H'0004	Word	
H'0100	Word	
H'0120	Word	

Set the RAM to be watched in **Address** field and select **Word** from the **Size** Drop-down List Box.

When the address and size are selected, user can click **Append** to confirm this operation and can select another RAM address. When all RAMs are selected, user can click **OK** to save those settings and close the window.

After that, user can monitor all selected RAMs in RAM monitor window.

Figure 13 RAM Monitoring



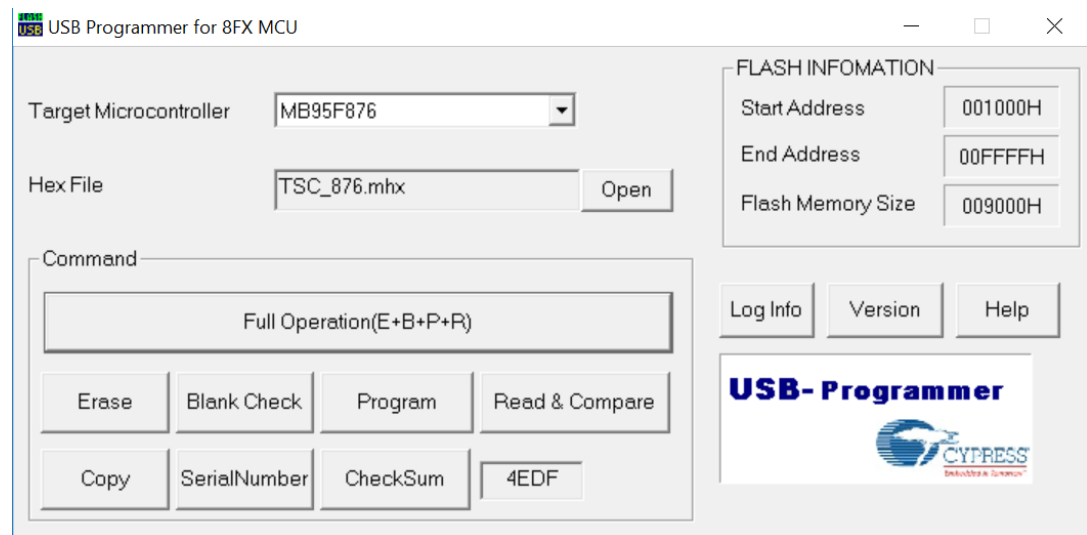
6. How to Download Code to Target MCU

This chapter describes how to download code to target MCU.

The tool 'USB Programmer for 8FX' can be used to download code. The following section describes the downloading of code in detail.

6.1 USB Programmer for 8FX MCU

Figure 14 USB Programmer for 8FX MCU

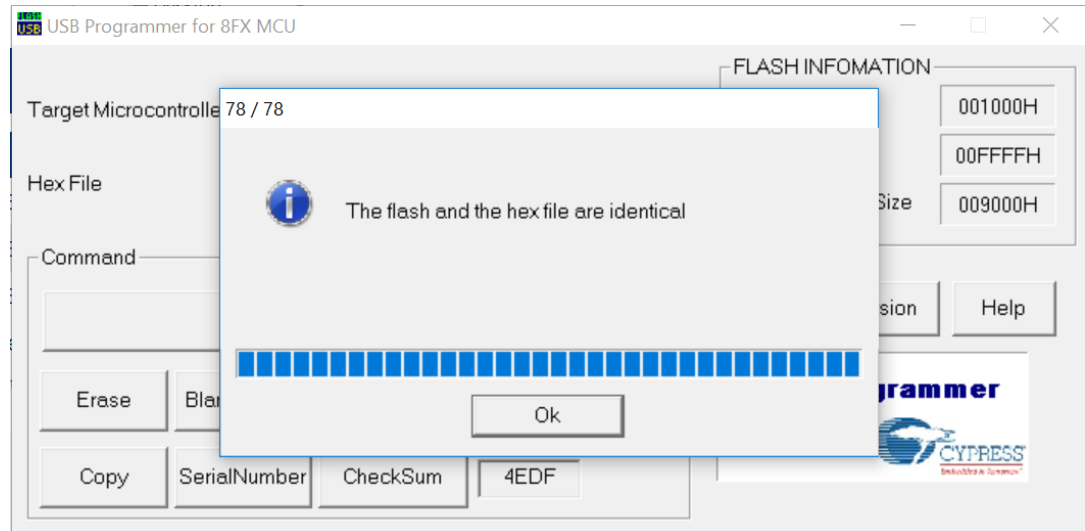


The steps are as follows:

1. Connect BGM Adapter to PC and target MCU
2. Select the MCU in **Target Microcontroller** field
3. Click **Open** to select code file
4. Click **Full Operation(E+B+B+R)**
5. Click **OK** to close the tool.

The following figure shows the completion of the downloading:

Figure 15 Completion Window of Downloading



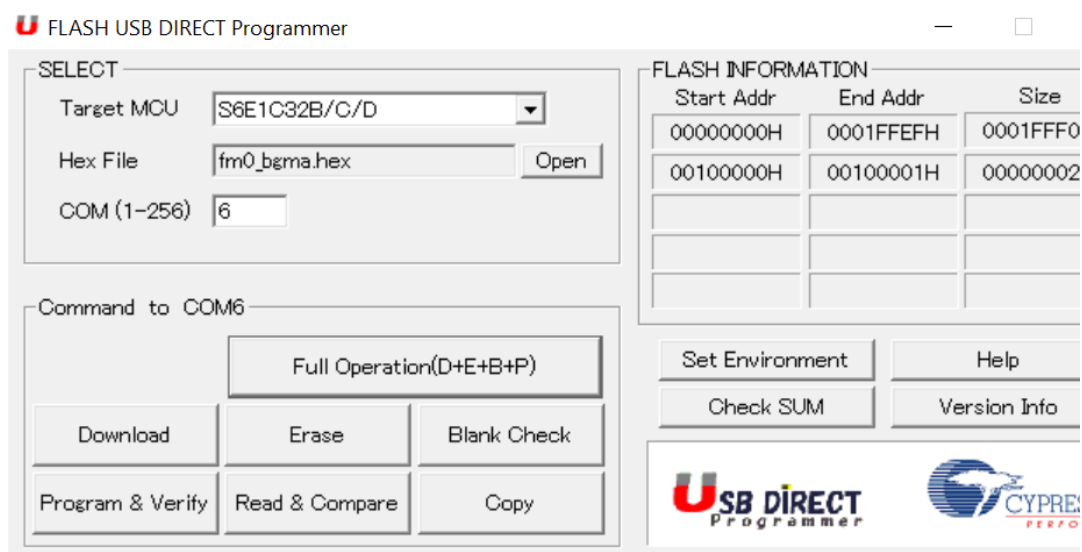
7. How to Upgrade BGM Adapter FW

This chapter describes how to update the BGM Adapter firmware.

The BGM Adapter FW can be updated using “FLASH USB DIRECT Programmer” tool. The following section describes the details.

7.1 Flash USB Direct Programmer

Figure 16 Flash USB Direct Programmer

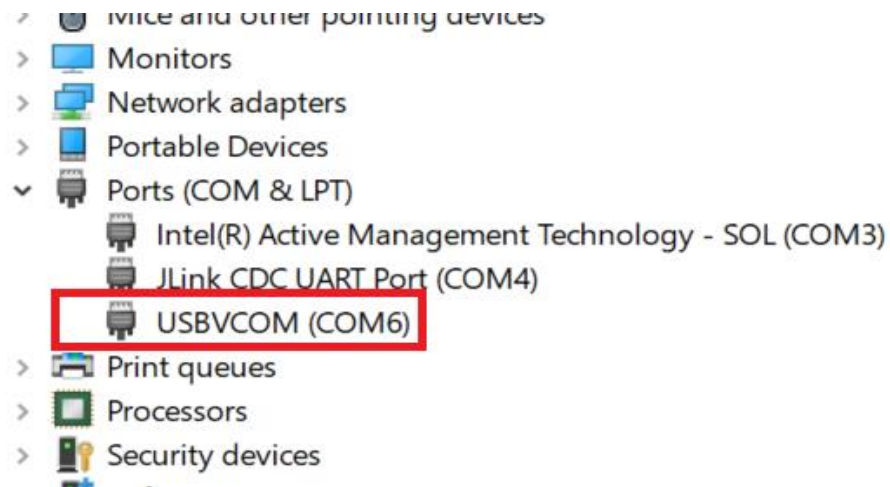


The steps are as follows:

1. Keep pressing SW2, power on the adapter, and it enters serial write mode
2. Open the “Flash USB DIRECT Programmer” tool
3. Open device manager to check COM Number
4. Set COM number
5. Select target MCU --- S6E1C32B/C/D
6. Click **Open** to select fm0_BGMAadapter.hex
7. Click **Full Operation(D+E+B+P)**
8. Restart adapter after system prompts reset information
9. Click **OK**

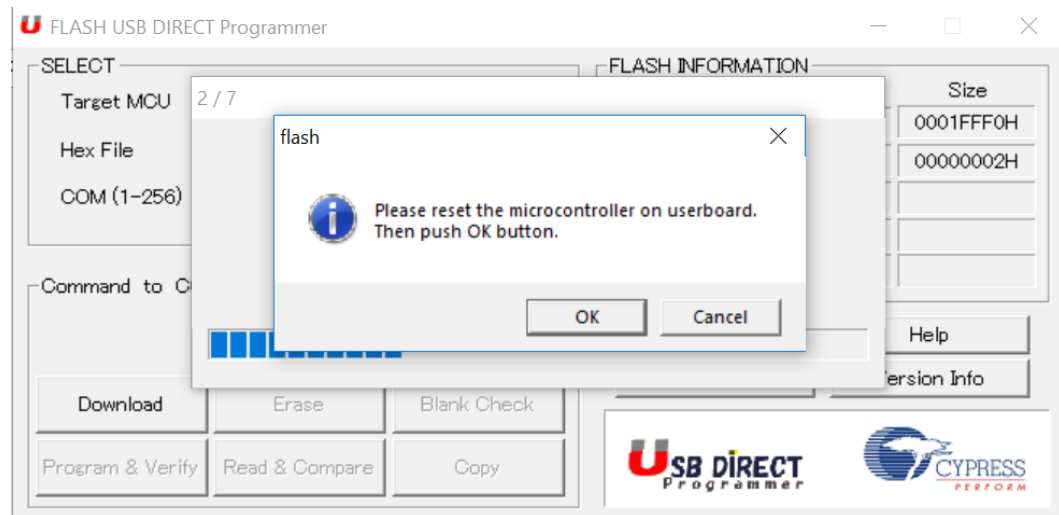
Check COM Number

Figure 17 Check COM Number



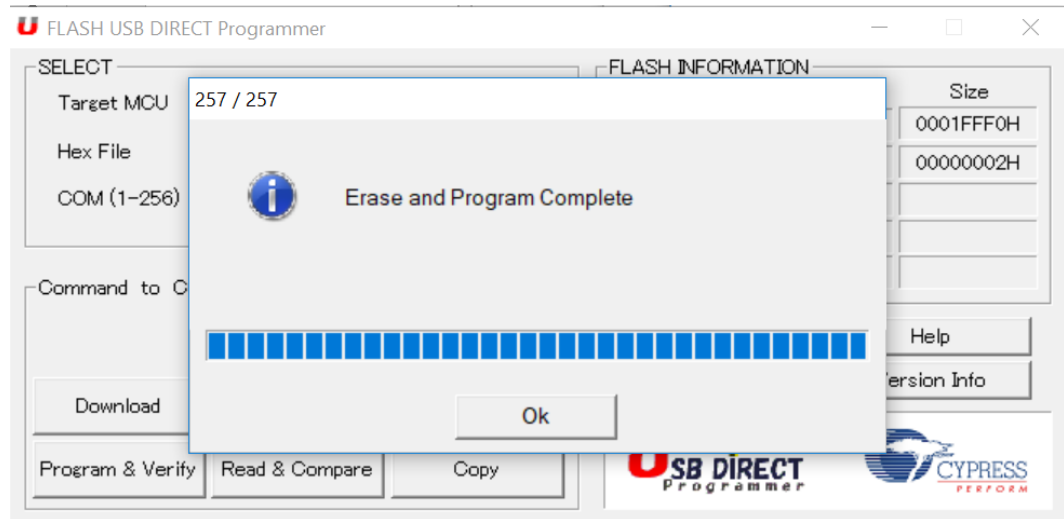
Reset dialog box.

Figure 18 Reset Dialog Box of Flash USB Direct Programmer



The following figure shows the completion:

Figure 19 Completion Window of Erase and Program Operation



Document History

Document Title: New 8Fx BGM Adapter User Manual

Document Number:

Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	-	HAXI	5/28/2020	New release