

New 8FX Family
8-bit MICROCONTROLLER
BGM ADAPTOR
MB2146-07-E
OPERATION MANUAL

PREFACE

Thank you for purchasing the New 8FX Family All Series BGM adapter (model number: MB2146-07-E).

The product is a development support tool for developing and evaluating applied products which use Fujitsu Semiconductor microcontrollers (hereafter MCU) that have a BDSU module. This manual describes how to handle the New 8FX Family All Series BGM adapter. Be sure to read it before using the product.

For information on the MCU supported by this product, contact the sales or support representative.

Note: This product doesn't correspond to the MB95200H/210H/220H series of the New 8FX family. Please use MB2146-08-E for the MB95200H/210H/220H series.

■ Using the product safely

This manual contains important information required for using the product safely. Be sure to read through the manual before using the product and follow the instructions contained therein to use it correctly.

In particular, carefully read “■ Caution of the products described in this manual” at the beginning of this manual to understand the requirements for safe use of the product before using it.

After reading the manual, keep it handy for future reference.

■ Related manuals

You should refer to the following manuals as well:

- “HARDWARE MANUAL” for each type of MCU
- “DATA SHEET” for each type of MCU
- “SOFTUNE Workbench OPERATION MANUAL”
- “SOFTUNE Workbench USER’S MANUAL”
- “SOFTUNE Workbench COMMAND REFERENCE MANUAL”

■ European RoHS compliance

Products with a -E suffix on the part number are European RoHS compliant products.


■ Notice on this document


All information included in this document is current as of the date it is issued. Such information is subject to change without any prior notice.

Please confirm the latest relevant information with the sales representatives.

■ Caution of the products described in this document

The following precautions apply to the product described in this manual.

 WARNING	<p>Indicates a potentially hazardous situation which could result in death or serious injury and/or a fault in the user's system if the product is not used correctly.</p>
Electric shock, Damage	<p>Before performing any operation described in this manual, turn off all the power supplies to the system. Performing such an operation with the power on may cause an electric shock or device fault.</p>
Electric shock, Damage	<p>Once the product has been turned on, do not touch any metal part of it. Doing so may cause an electric shock or device fault.</p>

 CAUTION	<p>Indicates the presence of a hazard that may cause a minor or moderate injury, damages to this product or devices connected to it, or may cause to lose software resources and other properties such as data, if the device is not used appropriately.</p>
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Cuts, Damage	<p>Before moving the product, be sure to turn off all the power supplies and unplug the cables. Watch your step when carrying the product. Do not use the product in an unstable location such as a place exposed to strong vibration or a sloping surface. Doing so may cause the product to fall, resulting in an injury or fault.</p>
Cuts	<p>The product contains sharp edges that are left unavoidably exposed, such as jumper plugs. Handle the product with due care not to get injured with such pointed parts.</p>
Damage	<p>Do not place anything on the product or expose the product to physical shocks. Do not carry the product after the power has been turned on. Doing so may cause a malfunction due to overloading or shock.</p>
Damage	<p>Since the product contains many electronic components, keep it away from direct sunlight, high temperature, and high humidity to prevent condensation. Do not use or store the product where it is exposed to much dust or a strong magnetic or electric field for an extended period of time. Inappropriate operating or storage environments may cause a fault.</p>
Damage	<p>Use the product within the ranges given in the specifications. Operation over the specified ranges may cause a fault.</p>
Damage	<p>To prevent electrostatic breakdown, do not let your finger or other object come into contact with the metal parts of any of the connectors. Before handling the product, touch a metal object (such as a door knob) to discharge any static electricity from your body.</p>
Damage	<p>Before turning the power on, in particular, be sure to finish making all the required connections. Furthermore, be sure to configure and use the product by following the instructions given in this document. Using the product incorrectly or inappropriately may cause a fault.</p>
Damage	<p>Always turn the power off before connecting or disconnecting any cables from the product. When unplugging a cable, unplug the cable by holding the connector part without pulling on the cable itself. Pulling the cable itself or bending it may expose or disconnect the cable core, resulting in a fault.</p>
Damage	<p>It is recommended that it be stored in the original packaging. Transporting the product may cause a damage or fault. Therefore, keep the packaging materials and use them when re-shipping the product.</p>

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1. Checking the Delivered Product

Before using the product, make sure that the package contains the following items:

- | | |
|--------------------------------|-----|
| • BGM adaptor * | : 1 |
| • USB cable (1.0m) | : 1 |
| • Interface cable | : 1 |
| • Hardcopy (China RoHS report) | : 1 |

* : Referred to as the adaptor.

2. Introduction

MB2146-07-E is a tool used for Fujitsu Semiconductor New 8FX MCU. It is updated from MB2146-08-E and similar to MB2146-08-E in appearance. MB2146-07-E has inherited all functions of MB2146-08-E. It is updated to be compatible with the new 0.18µm MCU and obtain a better performance and new functions.

This operation manual is applicable to all series of FUJITSU SEMICONDUCTOR 8-bit microcontroller except MB95200H/210H/220H.

A variety of optional parts are available for this adaptor that may be purchased separately as needed. Consult a sales or support representative for details.

Following table describes the sort of New 8FX MCU.

MCU Type
MB95260 series
MB95310 series
MB95330 series
MB95370 series
MB95350 series
MB95390 series
MB95410 series
MB95430 series
MB95560 series
MB95630 series
Following develop product

3. Block Diagram

This chapter describes the MB2146-07-E block diagram.
Figure 1 shows the block diagram of MB2146-07-E

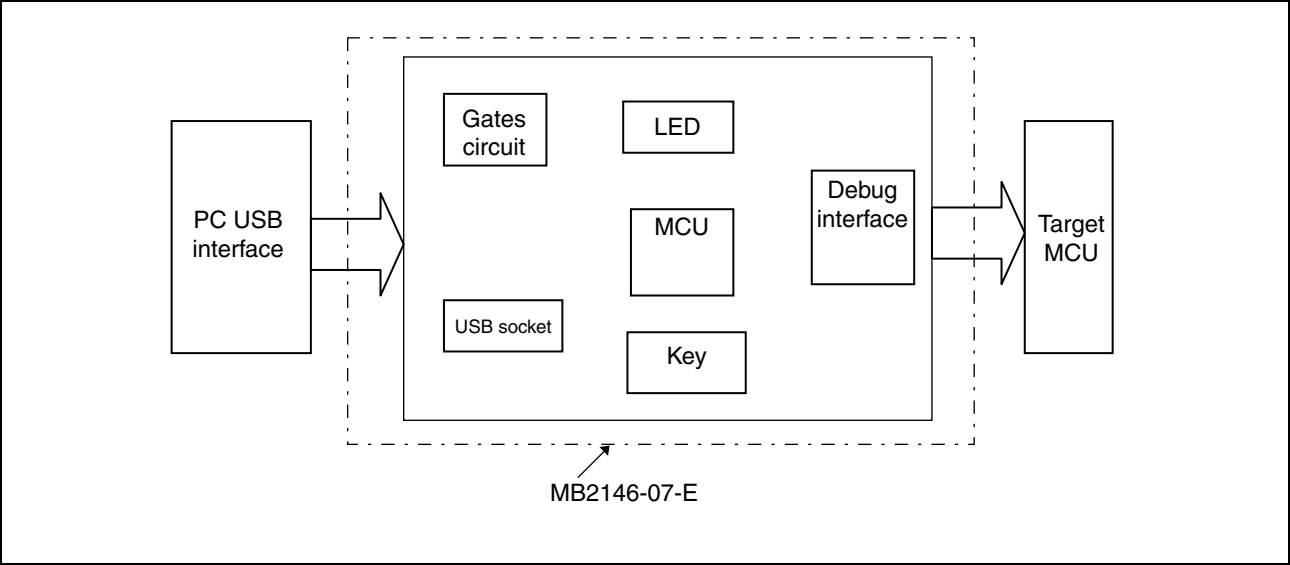


Figure 1 Block Diagram

4. Interface Introduction

This chapter describes the BGMA interface.

4.1 MB2146-07-E Appearance

Figure 2 shows the BGMA appearance

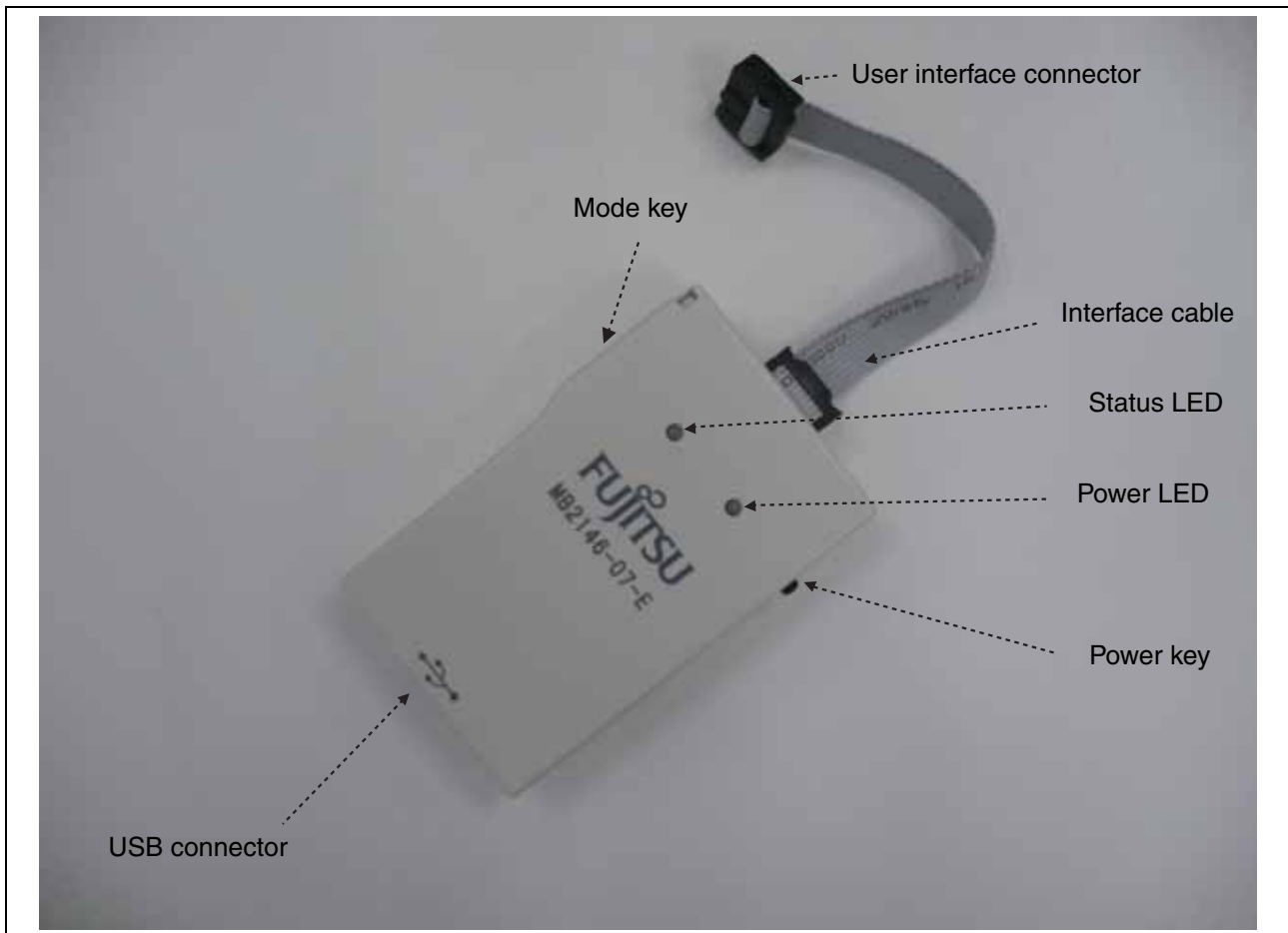


Figure 2 BGMA Appearance

4.2 BGMA UART Interface

The UART interface is mainly used between BGMA and MCU board. BGMA send command to MCU by UART, and receives the MCU feedback by UART too.

The speed of UART communication is related to UART baud rate. Following table lists the baud rate.

Table 1 Baud Rate List

MCU Type	Baud Rate	Remark
MB95260 series	62500	While synchronization and start debug, 125kbps
MB95310 series		
MB95330 series		
MB95370 series		
MB95350 series		
MB95390 series		
MB95410 series		
MB95430 series		
MB95560 series	62500	While synchronization and start debug, 500kbps
MB95630 series and following develop MCU	500K	While synchronization and start debug, 1Mbps

When the adaptor interface connector is mounted on the user system, connect the MCU to the adaptor interface connector according to the following specifications.

Table 2 Pin Interface

Connector pin number	Input / output	Target MCU connection pin name	Function	Remarks
1	BGMA ← MCU	UVCC	User power supply input	Connected to the MCU Vcc pin.
2	-	GND	Vss pin	Connected to the MCU Vss pin.
3	BGMA → MCU	RSTIN	User System reset output	Initialization of users logic
4	BGMA ← MCU	RSTOUT	User System reset input	Connected to user system reset circuit
5	-	RSV	-	-
6	BGMA → MCU	VCC	BGMA power output	BGMA supplies power to target board Vcc
7	-	RSV	-	-
8	BGMA ← MCU BGMA → MCU	DBG	Communication line	1 line UART
9	-	RSV	-	-
10	-	RSV	-	-

5. Feature list

The MB2146-07-E BGMA is updated from MB2146-08-E. Following items describe the updated feature.

- BGMA power supply is DC 5V (USB pedestal can be the power input)
- UART Baud rate improve (Max):
MB95260H, MB95310L, MB95370L, MB95330H, MB95390H, MB95350L, MB95410H, MB95470H series MCU can be improve to 125kbps, MB95560H series MCU can be improve to 500kbps, MB95630 and the following develop MCU can be improve to 1Mbps.
- Baud rate selection between 500kbps and 1Mbps (in MB95630H series and following develop MCU)
- Clock up enable function
- RAM monitor detect function
- 16 bytes data continuous read
- 8 bytes data continuous write
- Supply power to target board seletable
- Power key to control BGMA power
- LED to show BGMA operation result
- Update BGMA code by PC
- Support target MCU power range is 1.8 to 5.5*

*: for 3.3V power MCU, the power range is 1.8V to 3.6V
for 5V power MCU, the power range is 2.4V to 5.5V

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

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

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

LED	Status	Information
Green & Red	OFF	Idle mode
Green	ON	Standalone mode
	Twinkling	Standalone programming, target CR trimming
Red	ON	Program (standalone, Trimming) error, logging data write error
	Twinkling	Reserved
Orange	ON	Logging will full soon
	Twinkling	Logging data record time is over 255* (8k-9)

6. Performance Description

This chapter describes the BGMA roughly operation.

6.1 Debug Performance

Same as MB2146-08-E, before debugging, open New 8FX project firstly, and then set the debug item. The setions below describe some special settings in detail.

6.1.1 ICE Type

For MB2146-07-E, the ICE type should be set to MB2146-07.

6.1.2 Monitor Program Auto-load

If user wants to upgrade the BGMA code when starting debugging, check Monitor Program Auto-load in Setup Wizard Dialog Box, as shown in Figure 3.

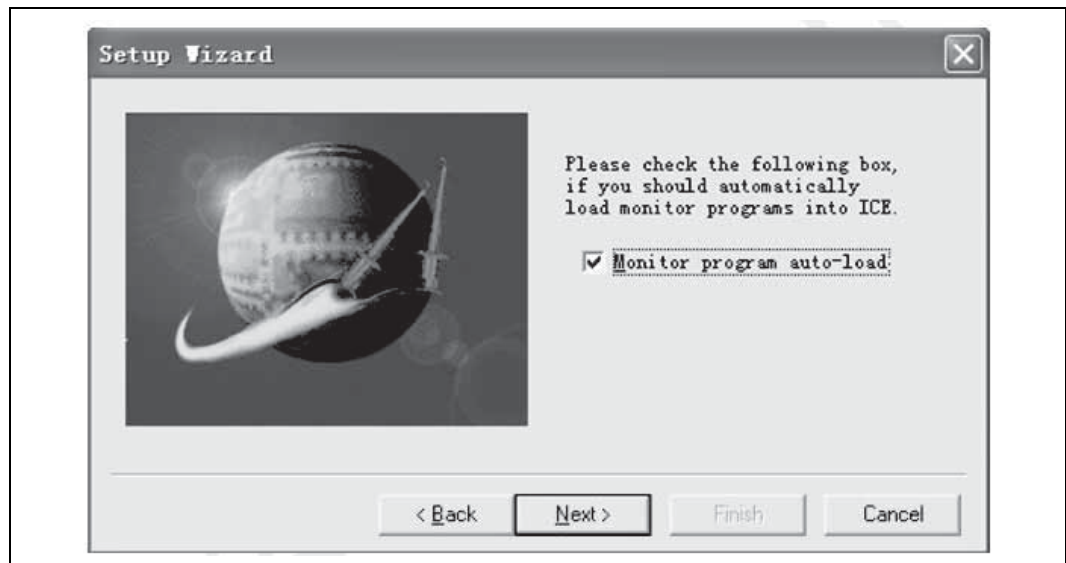


Figure 3 Monitor Program Auto-load

6.1.3 Device Type

Select the device name to USB in Type Field, as shown in Figure 4.

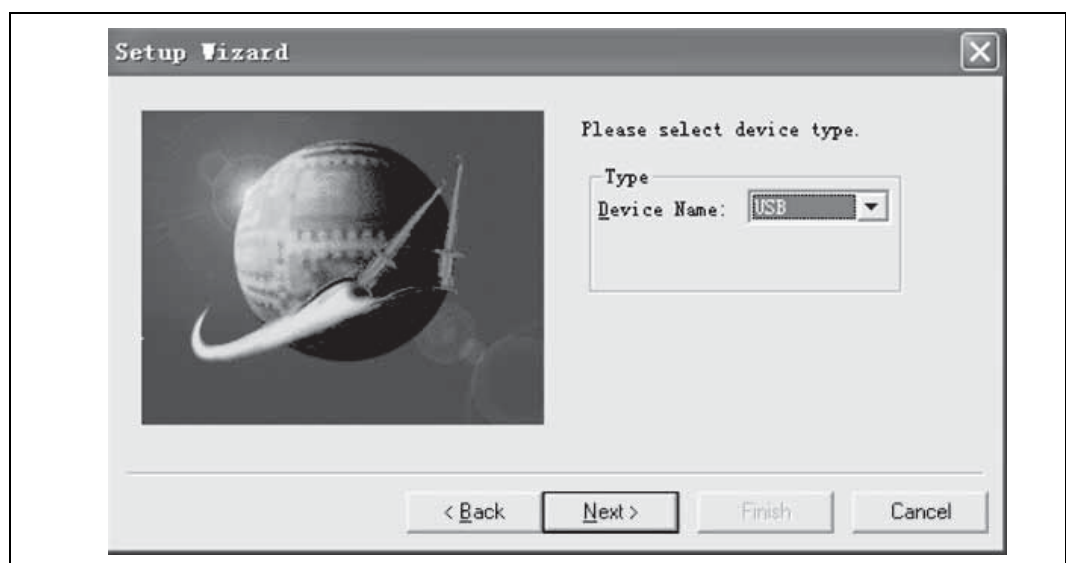


Figure 4 Device Type

6.1.4 Oscillation and Speed

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

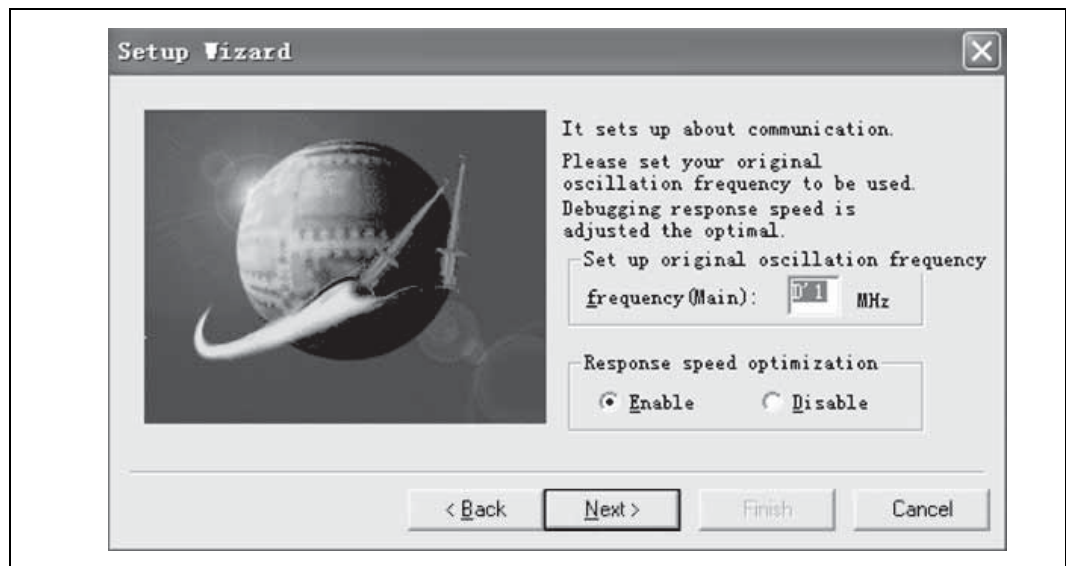


Figure 5 Clock Setting

6.1.5 Power Supply To Target

This item enables BGMA to supply power to target MCU board. Select the item the BGMA will supply power to target.

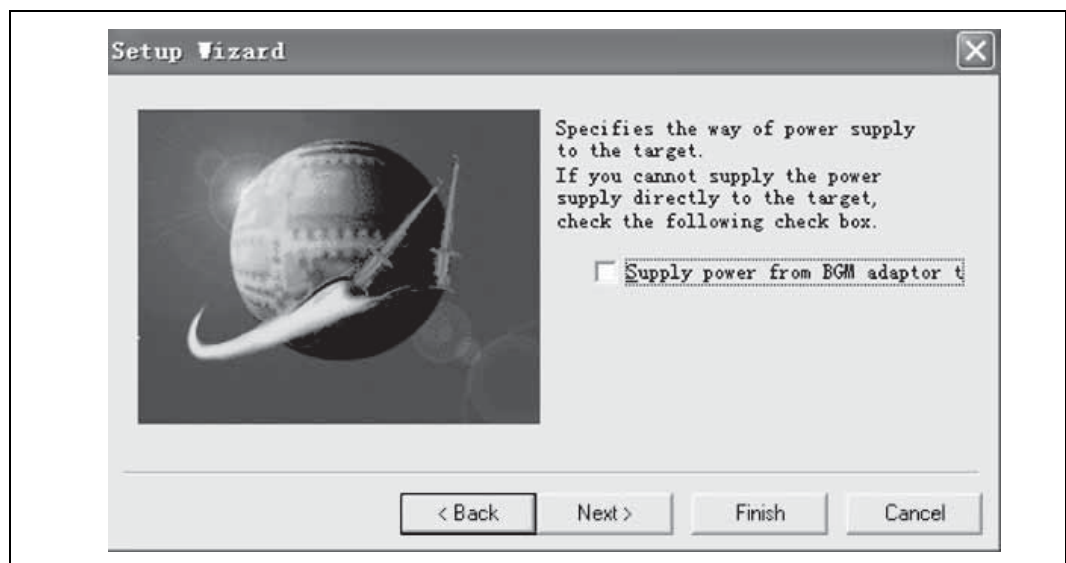


Figure 6 Power Supply

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

6.1.6 Flash Memory Synchronization

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

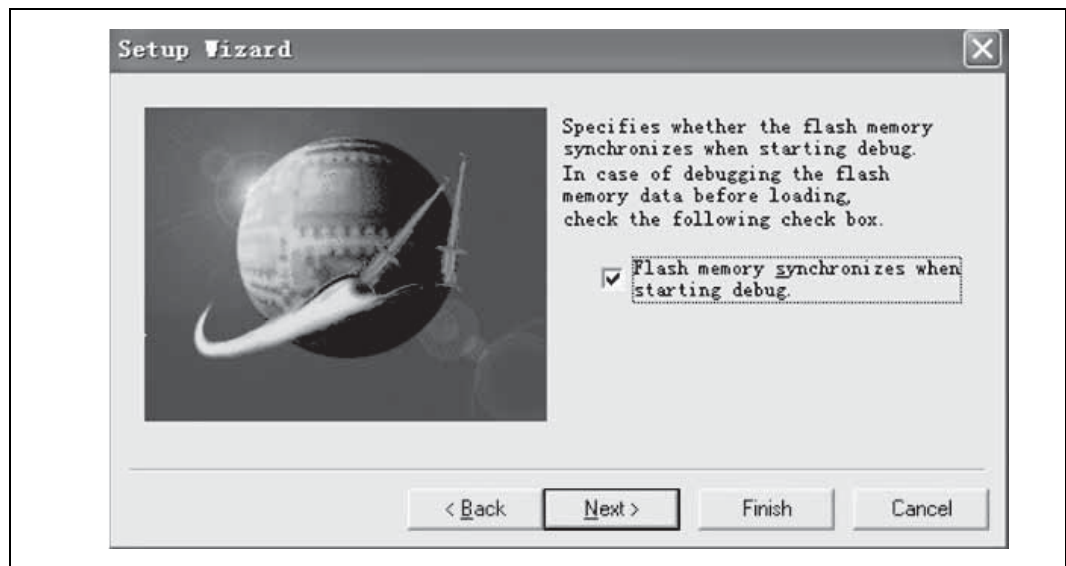


Figure 7 Flash Synchronization

6.2 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 selected all RAM size to word. Following is the RAM monitor window.

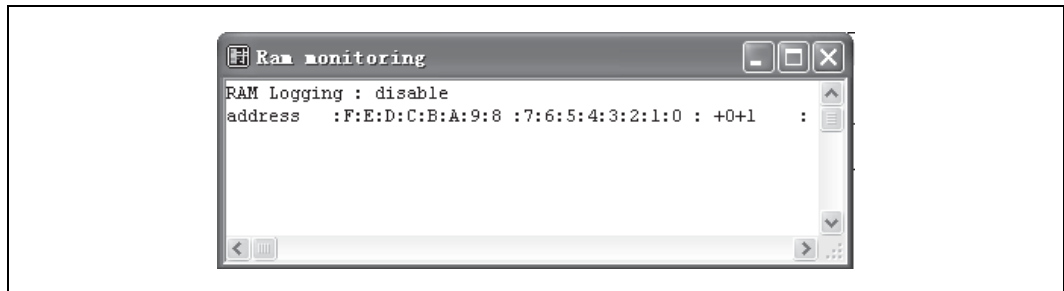


Figure 8 RAM Monitor Window

6.2.1 Enable RAM Monitor

Right click the blank area in Ram Monitor window. Selecting Monitoring from shortcut menu will enable RAM monitor, as shown in Figure 9.

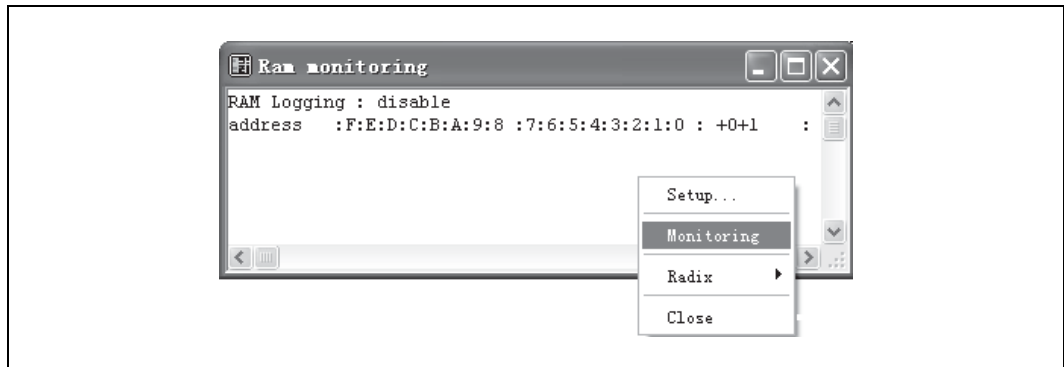


Figure 9 RAM Monitor

6.2.2 Set Register

Select Setup from the shortcut menu in Figure 9, and RAM Monitoring Setup window pops up, as shown in Figure 10.

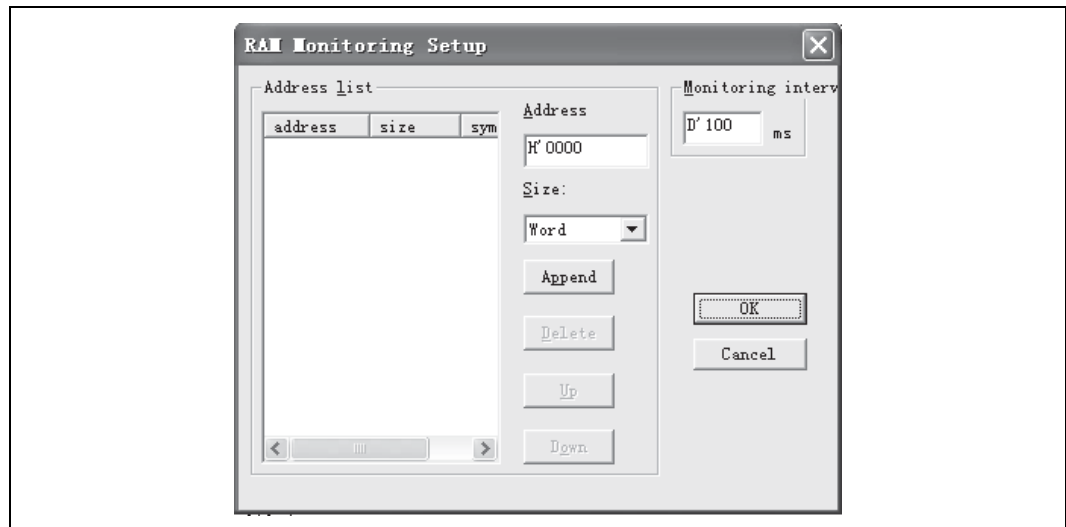


Figure 10 RAM Monitor Setup

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” key to ensure those settings and close the window.

After that, user can monitor all selected RAMs in RAM monitor window, as shown in Figure 11.

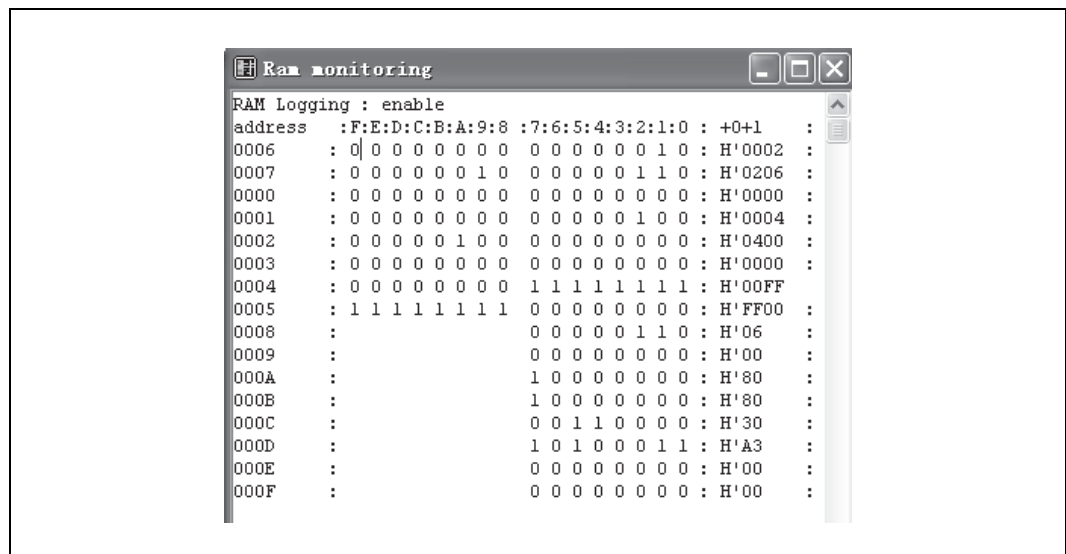


Figure 11 RAM Monitor Status

7. How to Upgrade BGMA FW

This chapter describes how to update the BGMA FW.

The BGMA FW can be updated by PC. The tool “PC Helper.exe” can be used to update the FW. The following section describes the upgrading of BGMA FW in detail.

7.1 Use SOFTUNE Upgrade FW

When using SOFTUNE, user can upgrade the BGMA FW.

Following is the method:

(1) Copy BGMA hex file to file “..\SOFTUNE\Lib\896”, following picture is a sample.

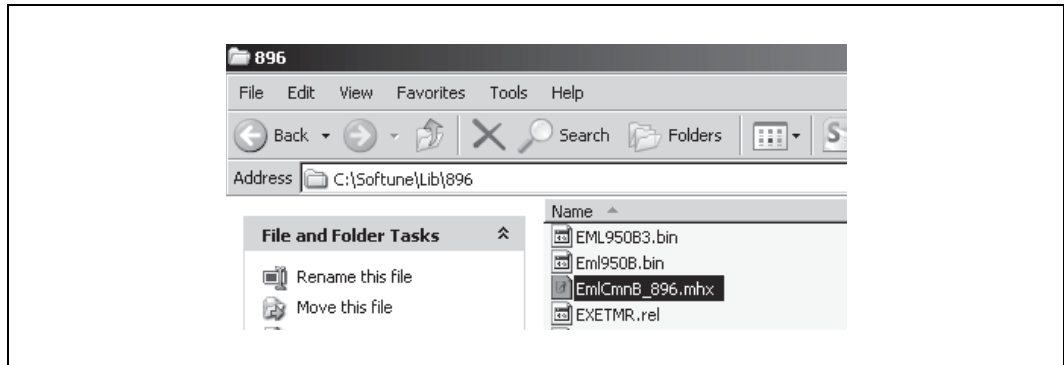


Figure 12 Add Hex file Sample

(2) Connect BGMA to PC.

(3) Power on BGMA.



Figure 13 Power on BGMA

(4) Enable SOFTUNE Upgrade function.

Select “Monitor program auto-loading” in SOFTUNE, for detailed operation please refer to sector 6.1.2.

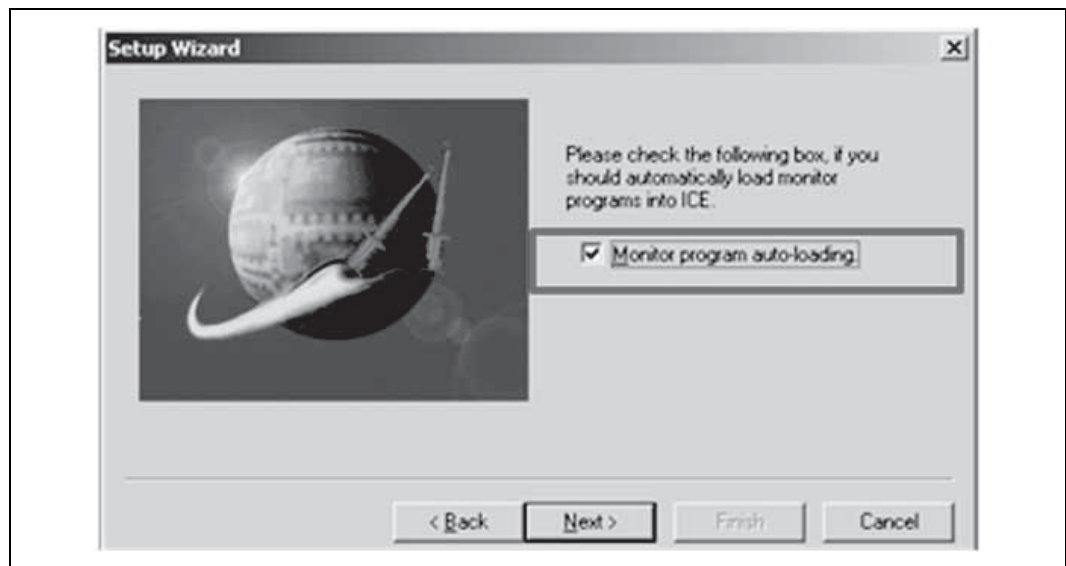


Figure 14 Enable Softune Upgrade function

(5) Right click SOFTUNE “Debug” and select “start debug”.

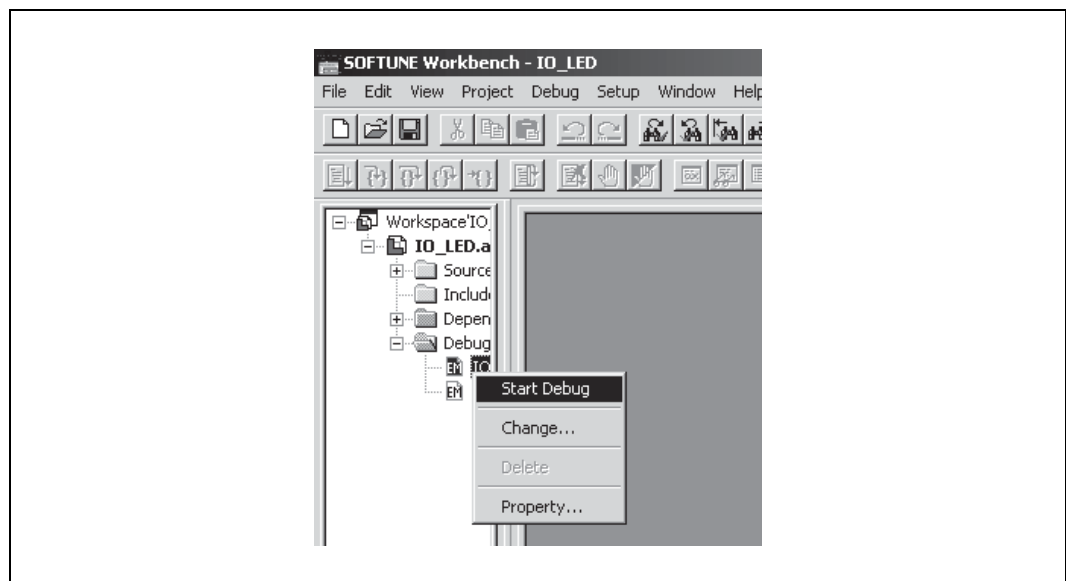


Figure 15 Start Debug Icon

(6) When following window pop-up, please turn off power of target board.

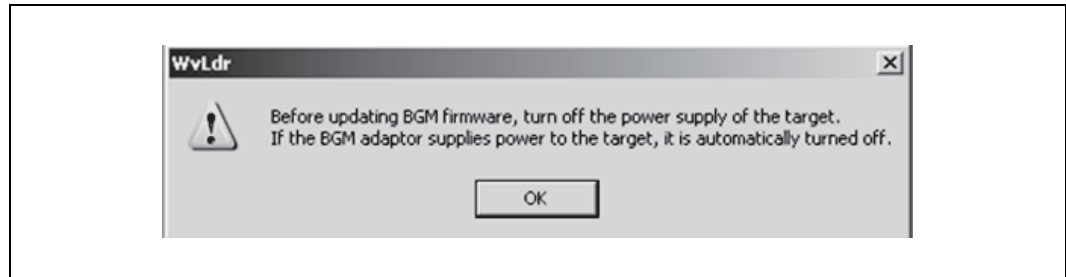


Figure 16 Power-off

(7) Press “OK” button, the following sub-window will be pop-up.

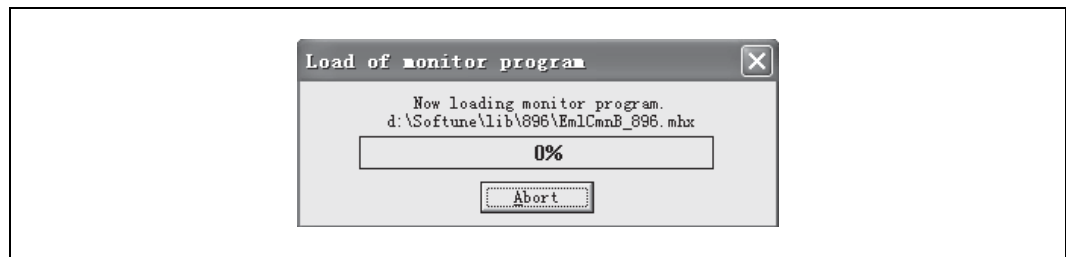


Figure 17 Upgrading Abort Icon

(8) If user want to stop the upgrading, please press “Abort” button.

(9) If “Abort” button is not pressed, the Softune will begin to upgrading.

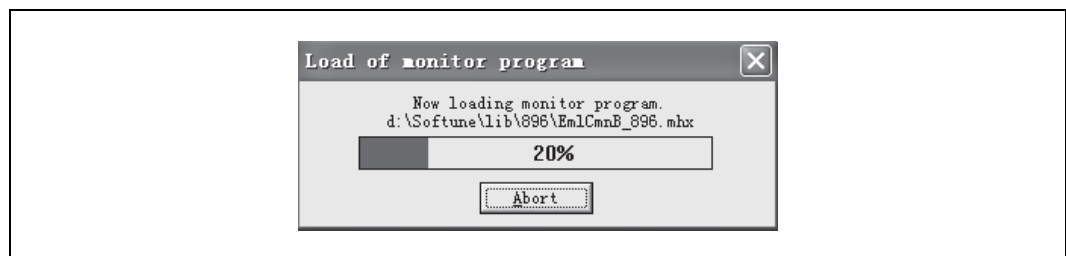


Figure 18 Softune Upgrading Icon

(10) When 100% upgrade is finished, the BGMA FW upgrading is completed.

7.2 Use PC Helper Programmer Upgrade FW

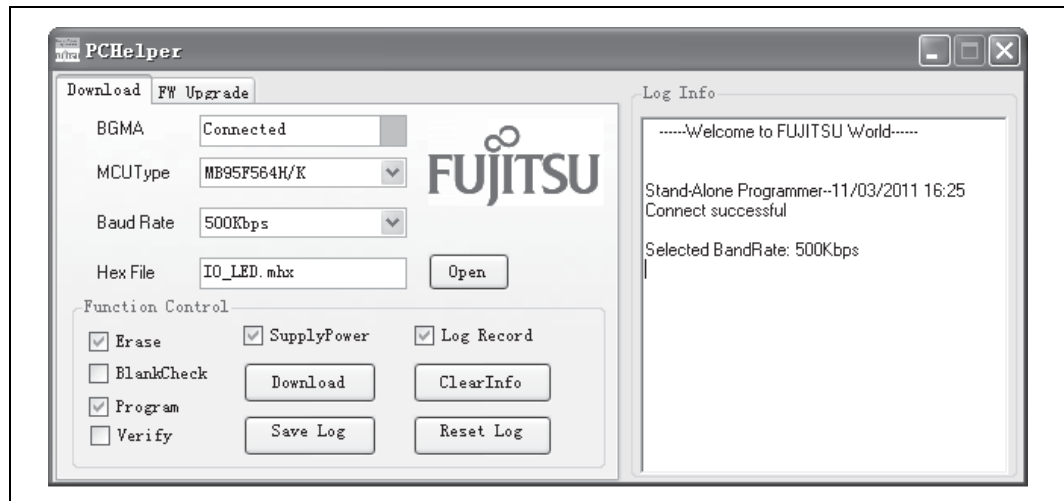


Figure 19 Tool Interface

Step:

- (1) Connect BGMA to PC.
- (2) Open PC Helper programmer.
- (3) Open “FW Upgrade”, like following picture.

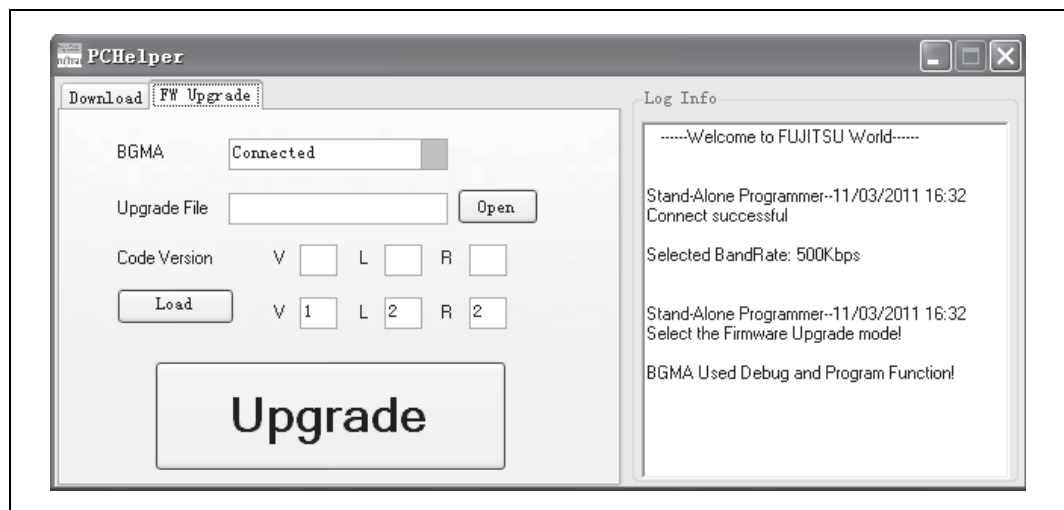


Figure 20 FW Upgrade Interface

- (4) If the BGMA item shows “connected” and the color is green like above picture, the BGMA and PC connect normally.
- (5) Press “Open” item to choose the BGMA hex file, following picture is a sample.



Figure 21 Hex File Sample

- (6) When hex file is choosen, press “Upgrade” item to upgrate BGMA FW.
- (7) When sub-window pop-up, please select recommend item “OK”.
- (8) If download successful item pop-up(like following picture), the upgrade is successful.

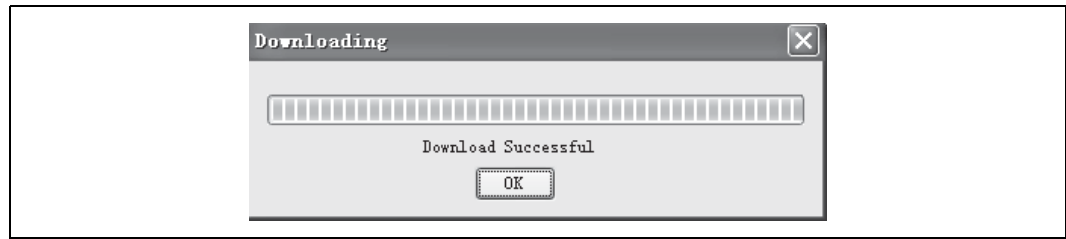


Figure 22 Successful Sample

SS702-00001-1v0-E


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