



# 8FX Family

## 8-bit Microcontroller

### BGM Adaptor MB2146-07-E User Manual

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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
Hardcopy (China RoHS report)	1

\*: Referred to as the adaptor.

## 2. Introduction



MB2146-07-E is a tool used for Cypress 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 compatible with the new 0.18um MCU and obtain a better performance and new functions.

This user manual is applicable to all series of Cypress 8-bit microcontroller except MB95F200 and MB95F210 series.

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.

**Note:**

Following table describes the sort of 8FX MCU.

Sort of MCU	MCU Type
0.35um	MB95F260
	MB95F310
	MB95F330
	MB95F370
	MB95F350
	MB95F390
	MB95F410
	MB95F430
1st 0.18um	MB95F564
2nd 0.18um	MB95F630
	MB95F690
	MB95F810
	.....

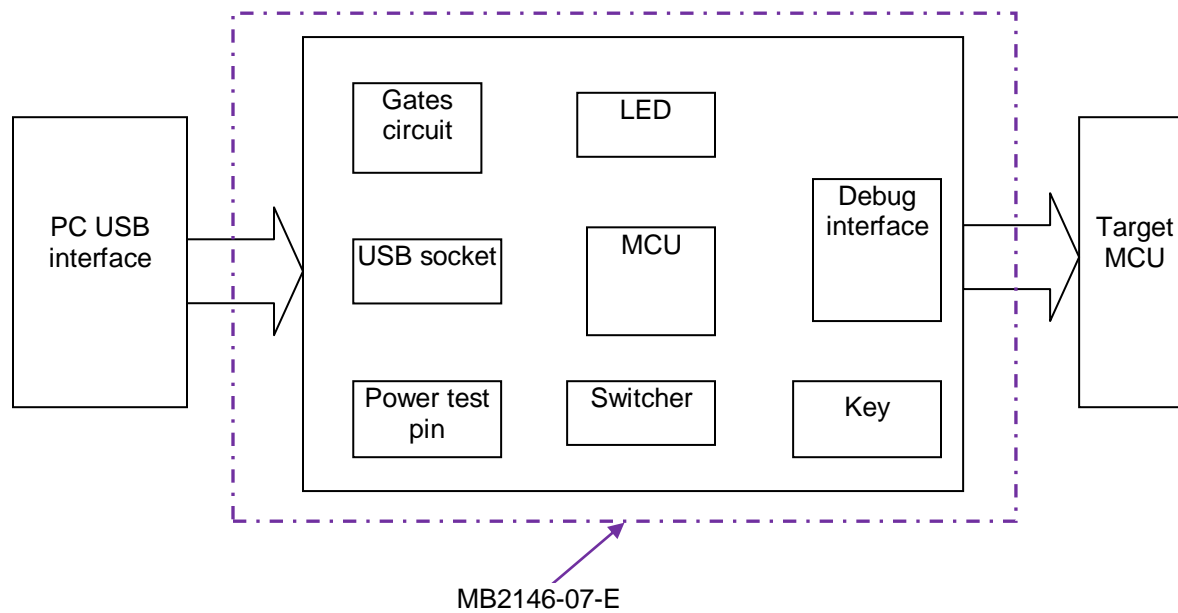
# 3. Block Diagram



This chapter describes the MB2146-07-E block diagram.

Figure 3-1 shows the block diagram of-MB2146-07-E

Figure 3-1: Block Diagram



# 4. Interface Introduction

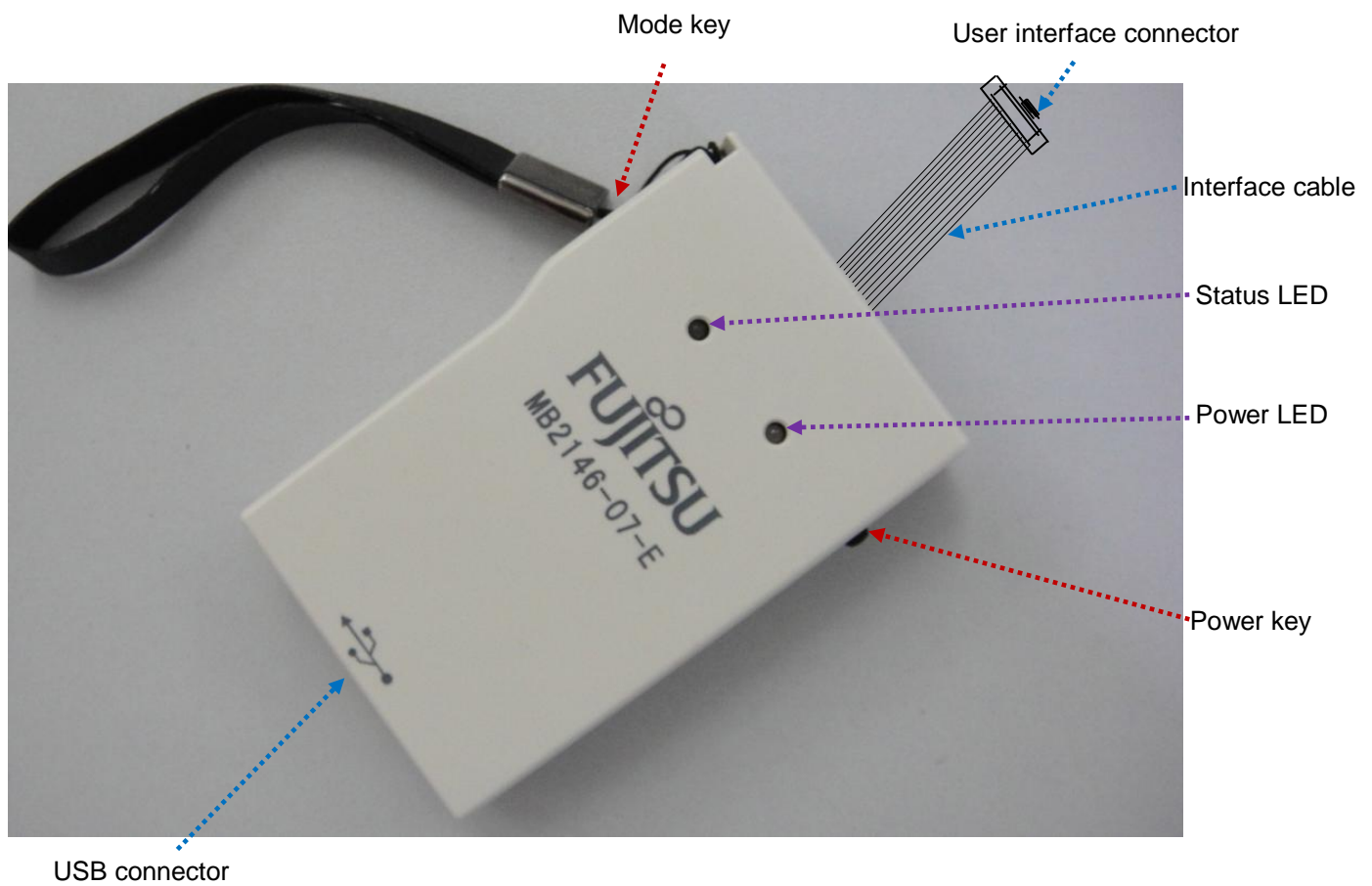


This chapter describes the BGMA interface.

## 4.1 MB2146-07-E Appearance

Figure 4-1 shows the BGMA appearance

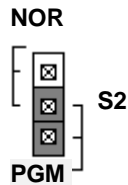
Figure 4-1. BGMA Appearance



## 4.2 BGMA USB Interface

The USB part is used to connect to PC for downloading BGMA code and PC command to BGMA.

There is a jumper 'S2' that switch the BGMA mode between program and normal.



When S2 connects with PGM, user can download code from PC.

When S2 connects with NOR, BGMA begins running internal code.

User can use 'FLASH USB DIRECT Programmer.exe' to download hex file to BGMA to update the BGMA code. In Chapter 7. , the method will be described.

User can enable/disable clock up function by new 8FX Softune debug setting item to debug new 8FX MCU.

## 4.3 BGMA UART Interface

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

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

Table 4-1. Baud Rate List

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

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 4-2. Pin Interface

Connector pin number	Input / output	Target MCU connection pin name	Function	Remarks
1	BGMA *1←MCU *2	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	Tool reset output	BDSU, Initialization of users logic
4	BGMA←MCU	RSTOUT	User System reset output	Connected to user System reset circuit
5	-	RSV	-	-



Connector pin number	Input / output	Target MCU connection pin name	Function	Remarks
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	-	-

The BGMA can read the LPC MCU status by command. For detailed command please refer to “18um LPC MCU BGMA FW External Specification”

# 5. Feature List



This chapter describes the BGMA feature.

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

- Dedicate for 2<sup>nd</sup> 0.18um MCU
- Baud rate(max): 0.35um---125K(uploading), 1<sup>st</sup> 0.18um---500K, 2<sup>nd</sup> 0.18um---1M
- Baud rate selection between 500K and 1M in 2<sup>nd</sup> 0.18um
- Clock up enable 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 BGMA power
- LED to show BGMA operation result
- Update BGMA code by PC
- Support target MCU power range is 1.8~5.5<sup>\*1</sup>

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

\*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

# 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 sections below describe some special settings in detail.

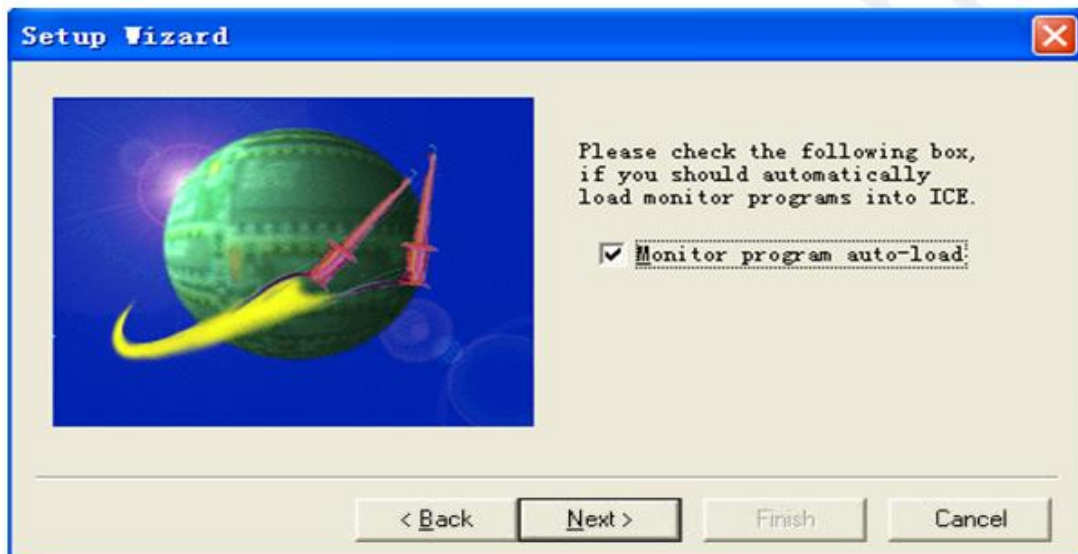
### 6.1.1 ICE Type

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 6-1](#).

Figure 6-1. Monitor Program Auto-load



### 6.1.3 Device Type

Select the device name to **USB** in **Type** Field, as shown in Figure 6-2.

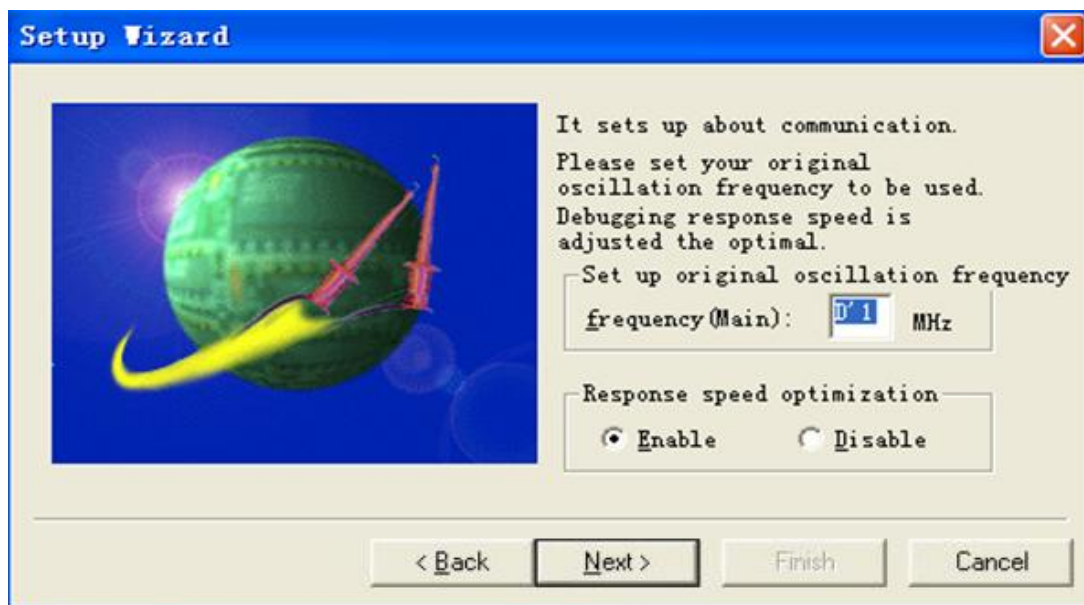
Figure 6-2. Device Type



### 6.1.4 Oscillation and Speed

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

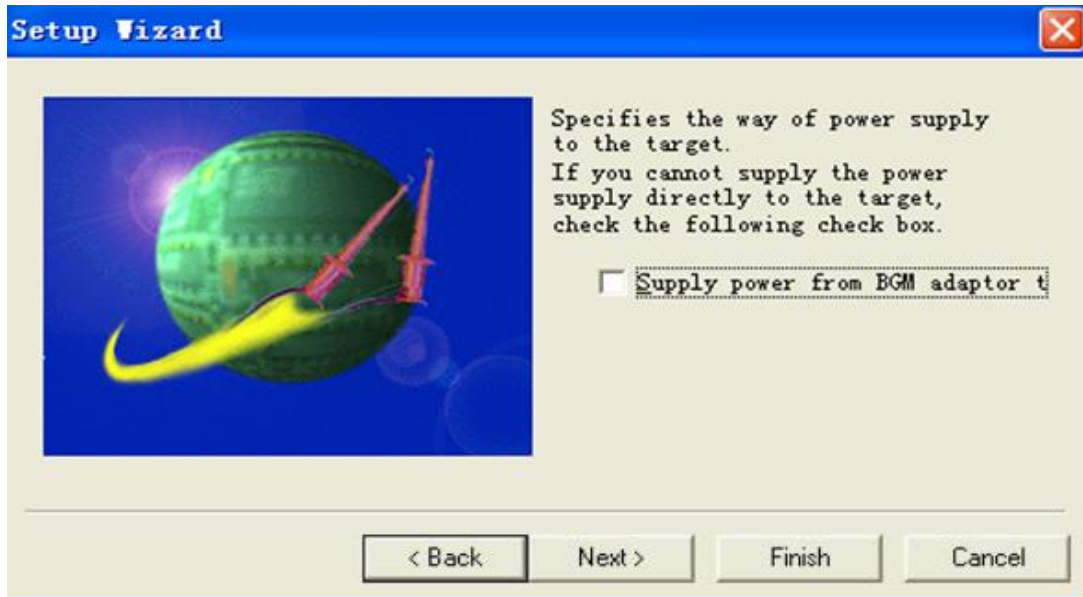
Figure 6-3. Clock Setting



### 6.1.5 Power Supply To Target

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

Figure 6-4: Power Supply



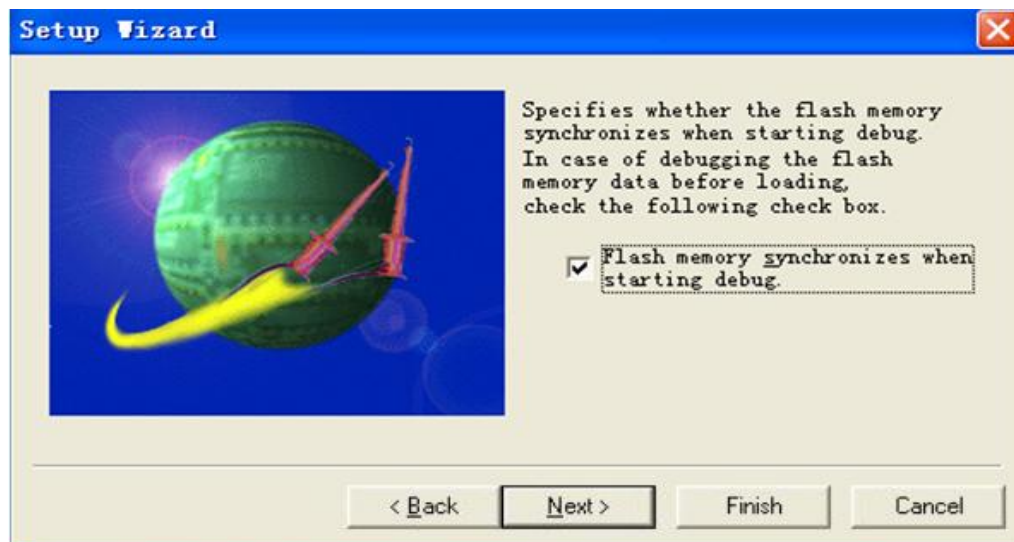
**Note:**

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 6-5. Flash Synchronization



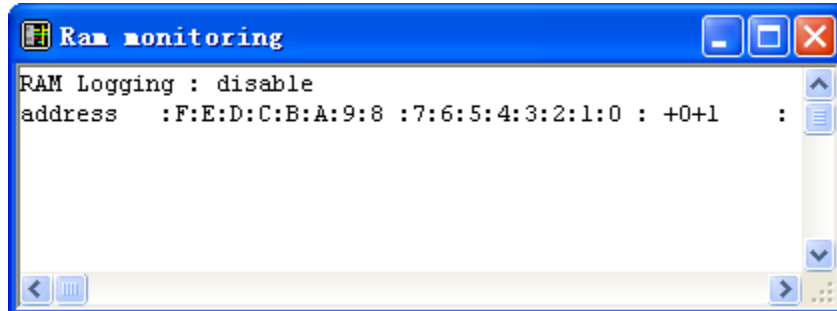
## 6.2 Ram Monitor Performance

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.

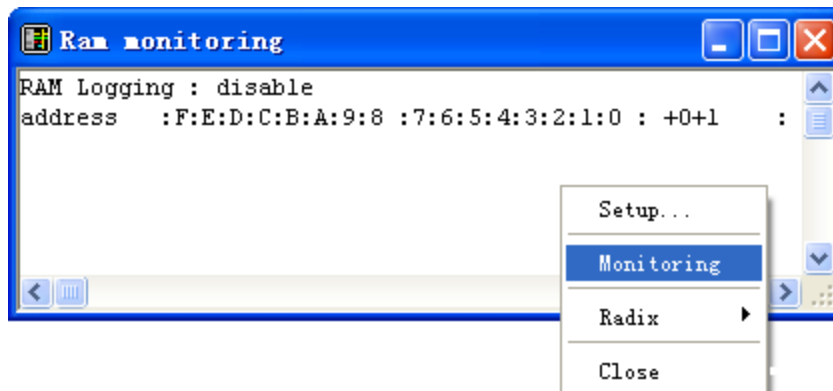
Figure 6-6. RAM Monitor Window



### 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 6-7.

Figure 6-7. RAM Monitor

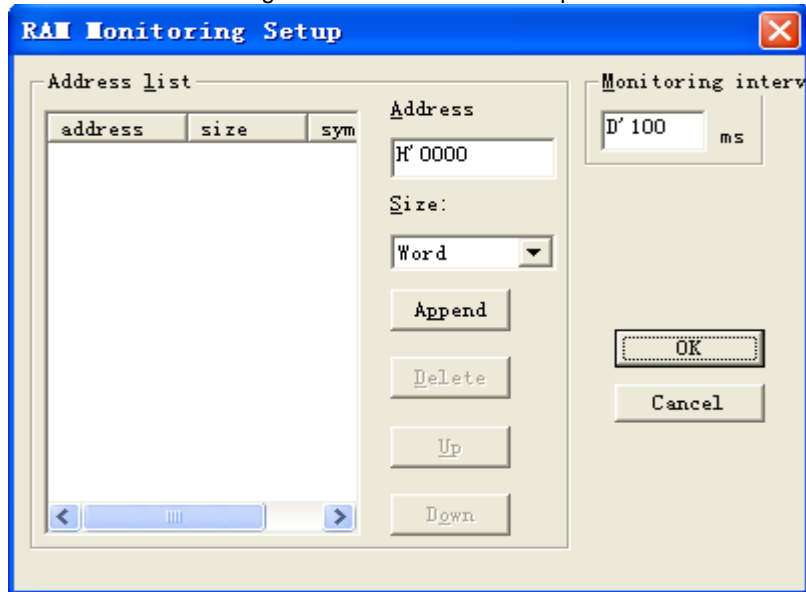


### 6.2.2 Set Register

Select **Setup** from the shortcut menu in [Figure 6-8](#).

Figure 6-8, and **RAM Monitoring Setup** window pops up, as shown in [Figure 6-8](#).

Figure 6-8. RAM Monitor Setup

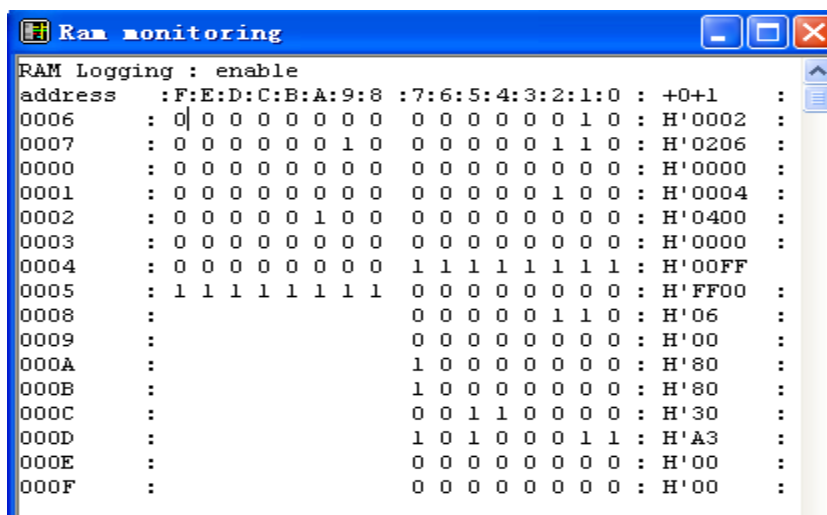


Set the RAM to be watched in **Address** field, and select **Word** from the **Size** Drop-down List Box .

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 6-9](#).

Figure 6-9. RAM Monitor Status





# 7. How to Upgrade BGMA FW



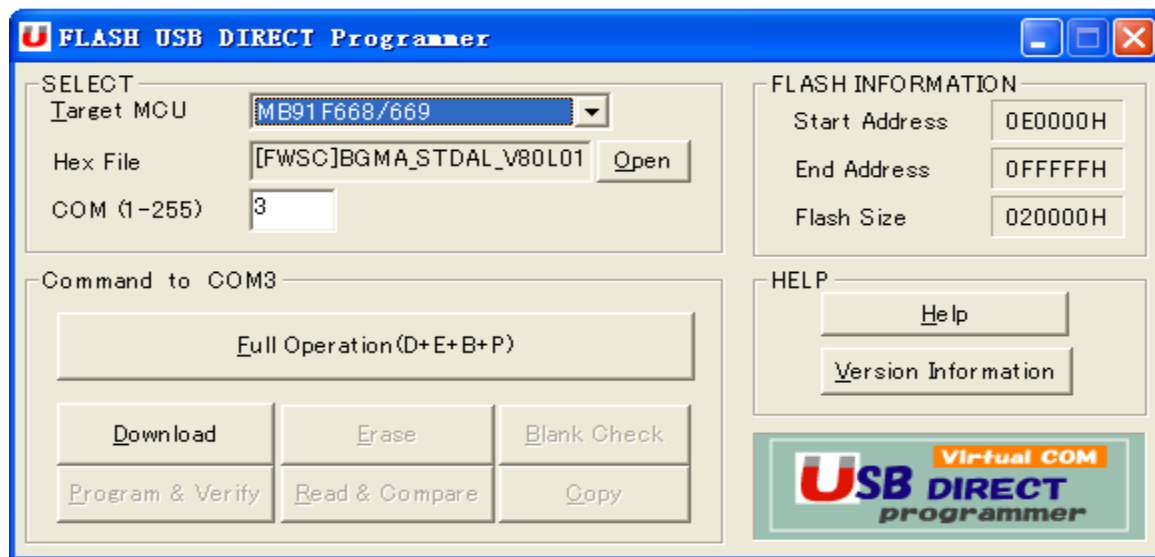
This chapter describes how to update the BGMA FW.

The BGMA FW can be updated by PC. The tool 'FLASH USB DIRECT Programmer.exe' can be used to update the FW. The following section describes the upgrading of BGMA FW in detail.

## 7.1 Flash USB Direct Programmer

Figure 7-1 is the tool interface.

Figure 7-1. Tool Interface



Step:

1. Connect BGMA to PC
2. Switch BGMA jumper 'S2' to 'PGM'
3. Open programmer
4. Select Target MCU---MB91F668/669
5. Click **Download** key
6. Power on BGMA, and then press **OK**, refer to [Figure 6-2](#)
7. When **OK** key appears, press **OK** key, refer to [Figure 6-3](#)
8. Press **Erase** key, When **OK** key appears, press **OK** key
9. Press **Open** key to select Hex File

10. At first, the epcs.hex would be open
11. Press **Program & Verify** key to download the epcs code
12. Press **Open** key to select EmIcMnB\_896\_V01L02R02.mhx, repeat step 11
13. Click **OK** to close the tool.
14. Power off BGMA, switch 'S2' to 'NOR'

Figure 7-2 shows the **OK** key

Figure 7-2. Selectable OK Key

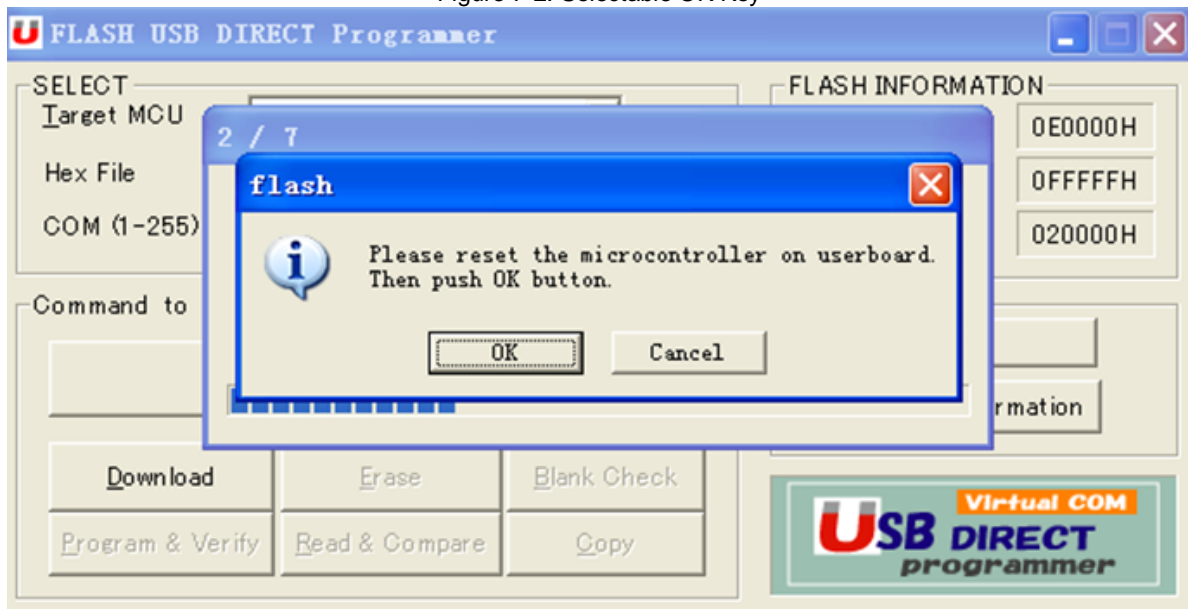
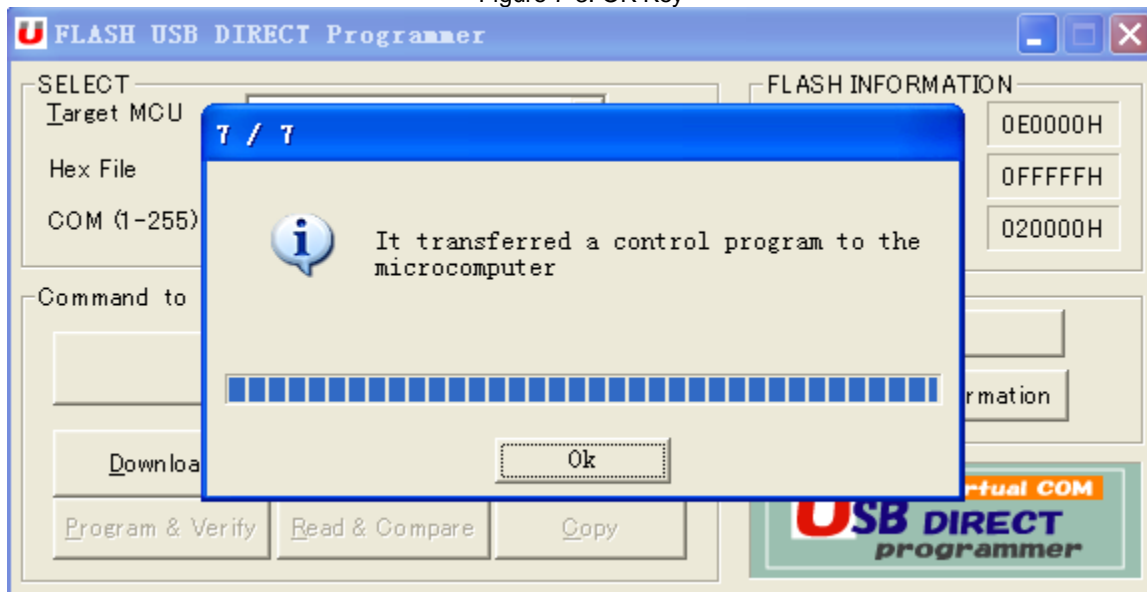


Figure 7-3 shows the complete **OK** key

Figure 7-3. OK Key



## 8. Additional Information



For more Information on MB2146-07-E (BGM adapter)and monitor program, Please visit our website:

<http://www.cypress.com/documentation/development-kitsboards/mb2146-07-e>

<http://www.cypress.com/documentation/software-and-drivers/monitor-program>

Please contact your local support team for any technical question.

# Revision History



## Revision History

Spansion Publication Number: MCU-UM-500024-E

Version	Date	Updated by	Modifications
0.1.0	5/26/2011	Jane Li	First draft
0.1.1	6/20/2011	Jane Li	Add picture for Chapter 6
0.1.2	6/22/2011	Jane Li	Modify Chapter 1
0.1.3	6/27/2011	Jane Li	Change the document title
0.1.4	7/11/2011	Jane Li	Change the title for chapter 2
0.1.5	9/16/2011	Jane Li	Add note for 1st 0.18um and 2nd 0.18um
1.0.0	10/18/2011	Jane Li	Modify board picture to suit for the prototype
1.1.0	10/26/2011	Jane Li	Add target MCU power range description

## Document Revision History

Document Title: New 8FX Family 8-bit Microcontroller BGM Adaptor MB2146-07-E User Manual				
Document Number: 002-04814				
Revision	Issue Date	ECN#	Origin of Change	Description of Change
**	04/01/2015	—	HUAL	Migrated to Cypress and assigned Document number 002-04814
*A	06/14/2016	5264449	HUAL	Migrated to Cypress format