



8FX Family
8-bit Microcontroller

BGM Adaptor MB2146-07-E Operation
Manual

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Thank you for purchasing the 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 Cypress 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 does not 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.

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■ 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 an -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 loose software resources and other properties such as data, if the device is not used appropriately.</p> |
| 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> |
| 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 | 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. |
| Damage | 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. |
| Damage | 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. |
| Damage | 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. |

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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 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 obtain a better performance and new functions.

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

Note:

- *The New 8FX series BGM adaptor (MB2146-07-E) has no compatibility with F²MC-8FX family B95100 series BGM adaptor (MB2146-09, MB2146-09A-E) and New 8FX family MB95200H/210H/220H types and its option parts.
If different MCUs and the BGM adaptor or the option parts are connected, there is the possibility that they will not operate correctly or damage devices.
Avoid using the combination of different types of BGM adaptors and devices.*
- *This product does not correspond to the MB95200H/210H/220H series in the New 8FX family.
Use MB2146-08-E for the MB95200H 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.

Following table describes the sort of 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. System Configuration

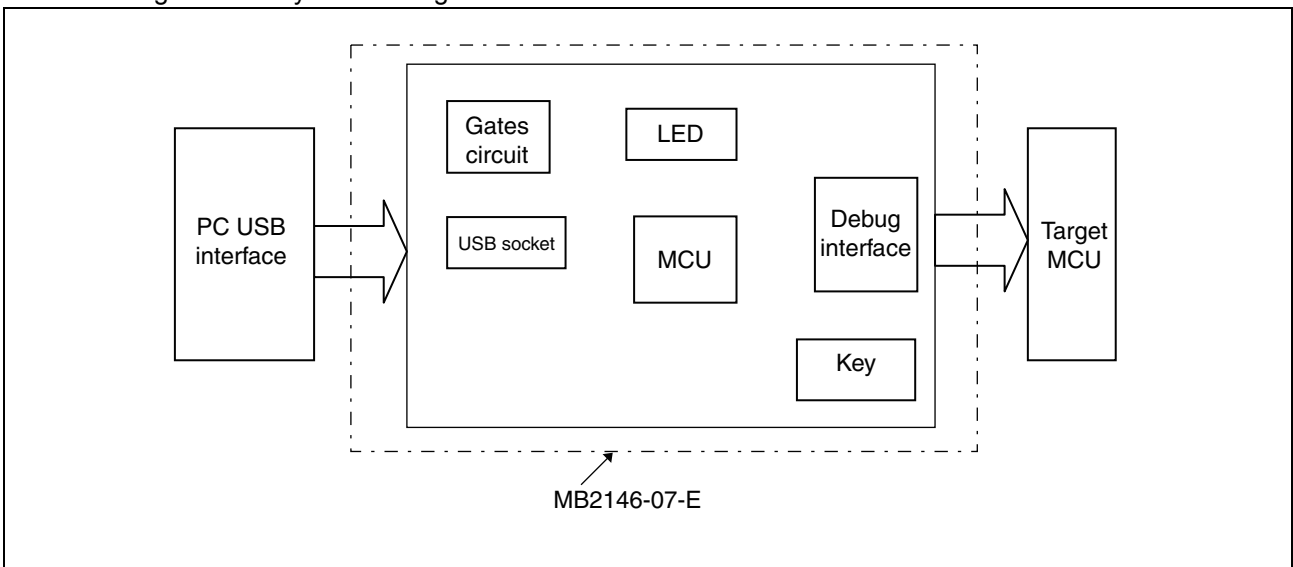


■ Use as Emulator System

The adaptor is connected to the host computer and the user system, and it can be used as the emulator by control via the host computer. See "SOFTUNE Workbench OPERATION MANUAL" for the details on the emulation debugger software operation in the host computer.

Figure 3 -1 shows the system construction when used as the emulator system

Figure 3-1. System Configuration.



4. Interface Overview

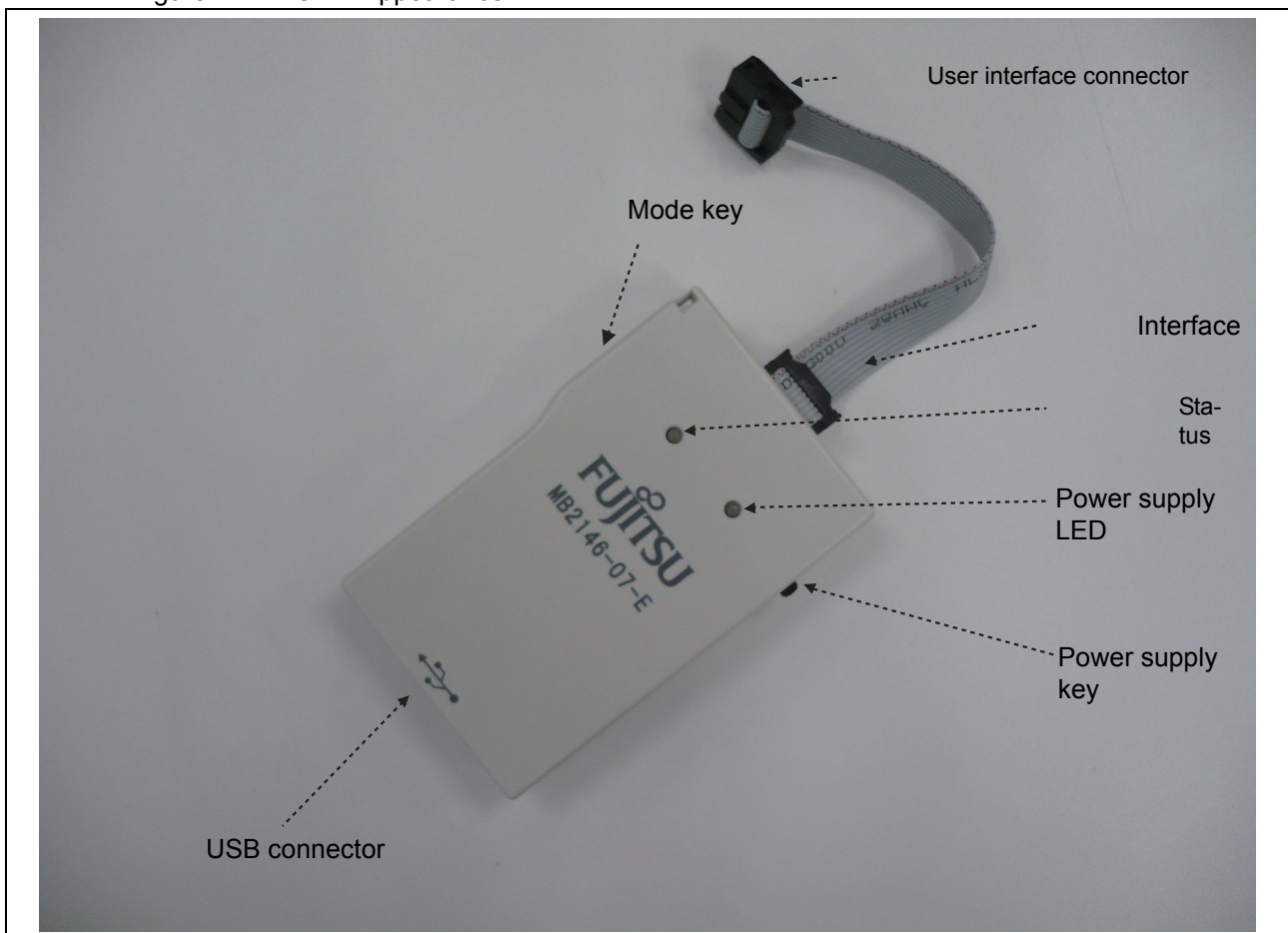


This chapter describes the BGMA interface.

4.1 MB2146-07-E Appearance

Figure 4-1 shows the BGMA appearance

Figure 4-1. BGMA Appearance



4.2 BGMA UART Interface

The UART interface is mainly used between BGMA and MCU board. BGMA sends 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 4-1. 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 | 62500 | While synchronization and start debug, 500kbps |
| MB95560 series | | |
| 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 4-2. Pin Interface

| Connector pin number | Input / output | Evaluation 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 | - | RSV | - | - |
| 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 MCU Vcc |
| 7 | - | RSV | - | - |
| 8 | BGMA ← MCU, BGMA → MCU | DBG | Communication line | 1 line UART |
| 9 | - | RSV | - | - |
| 10 | - | RSV | - | - |

*1BGMA means the BGM adaptor.
*2MCU means the evaluation MCU.

Note:

The MB2146-07-E pin assignment has no compatibility with the MB2146-09 and MB2146-09A-E pin assignments. It is impossible to use these two BGM adaptors for different MCUs. If used by mistake, there is a possibility that the debug system will not operate correctly or could be damaged. Also, some functions are added and deleted as the MB2146-08-E upper compatibility product. See the MCU hardware manual in use for the details about the connection of the user system and adaptors.

5. Feature list



■ Function Description of BGMA

The MB2146-07-E BGMA is updated from MB2146-08-E. The updated features are described below.

- BGMA power supply is DC 5V (Power supply from the USB pin)
- UART Baud rate Max speed improved:
Data in MB95260H, MB95310L, MB95370L, MB95330H, MB95390H, MB95350L, MB95410H and MB95470H series are updated at 125kbps, data in MB95560H series is updated at 500kbps and data in MB95630H and later series are updated at 1Mbps.
- Baud rate selection between 500kbps and 1Mbps (in MB95630H series and following develop MCU)
- Clock up enable function
- RAM Monitoring Function
- 16 bytes data continuous read
- 8 bytes data continuous write
- Supply power to target board seletable
- Power supply key to control BGMA power
- LED to show BGMA operation result
- Update BGMA by connection to PCs
- Flexible operation voltage range to target MCU power supply : 1.8V*¹ to 5.5V*²

*1 for 3.3V power supply MCU, the voltage range is 1.8V to 3.6V

*2 for 5V power supply MCU, the voltage range is 2.4V to 5.5V

The following shows the power supply state indicated by the BGMA LED.

Table 5-1. Power supply indication of BGMA

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

The following shows the status indicated by the BGMA LED.

Table 5-2. Status indication of BGMA

| LED | Status | Information |
|-------------|-----------|--|
| Green & Red | OFF | Idle mode |
| Green | ON | Standalone mode |
| | Blinking | Standalone programming, target CR trimming |
| Red | 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 ∞ (8kbyte-9) |

6. Performance Description



■ Operating Description of BGMA

This chapter describes the BGMA operation.

6.1 Debug Function

Open the project file in SOFTUNE Workbench which supports New 8FX and execute the setup related to the debug. The following shows the supplemental description about the special settings.

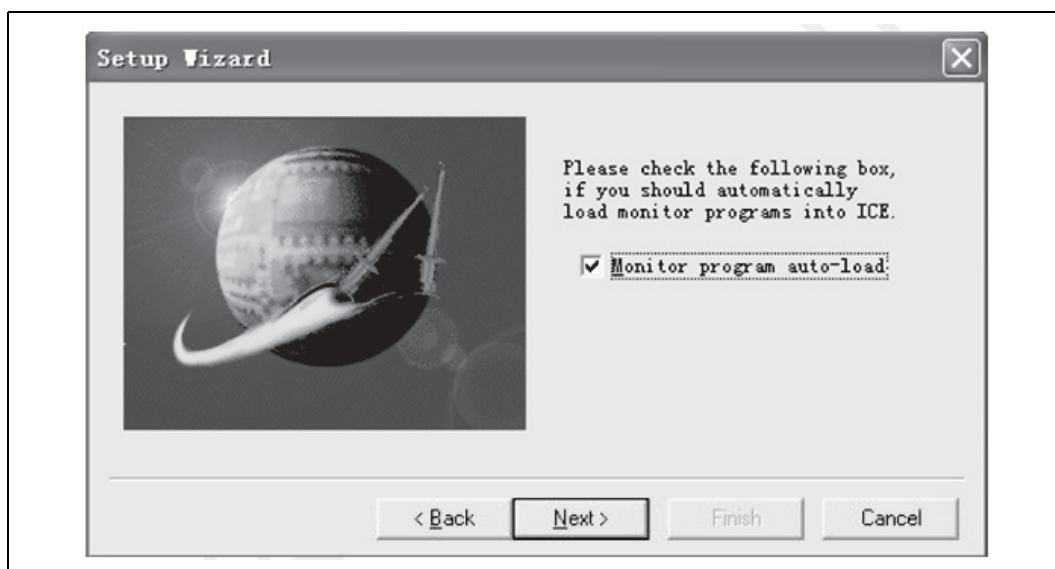
6.1.1 CE Type

Select, the ICE type MB2146-07.

6.1.2 Monitor Program Auto-load

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

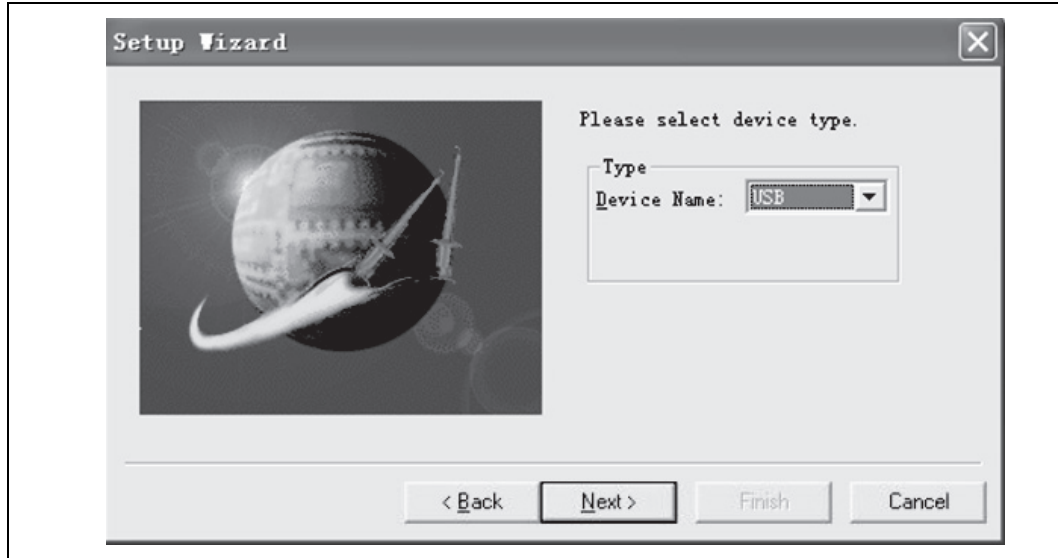
Table 6-1. Figure 3 Monitor Program Auto-load



6.1.3 Device Type

Select the device name to USB in Type Field, as shown in Figure 6-1 below.

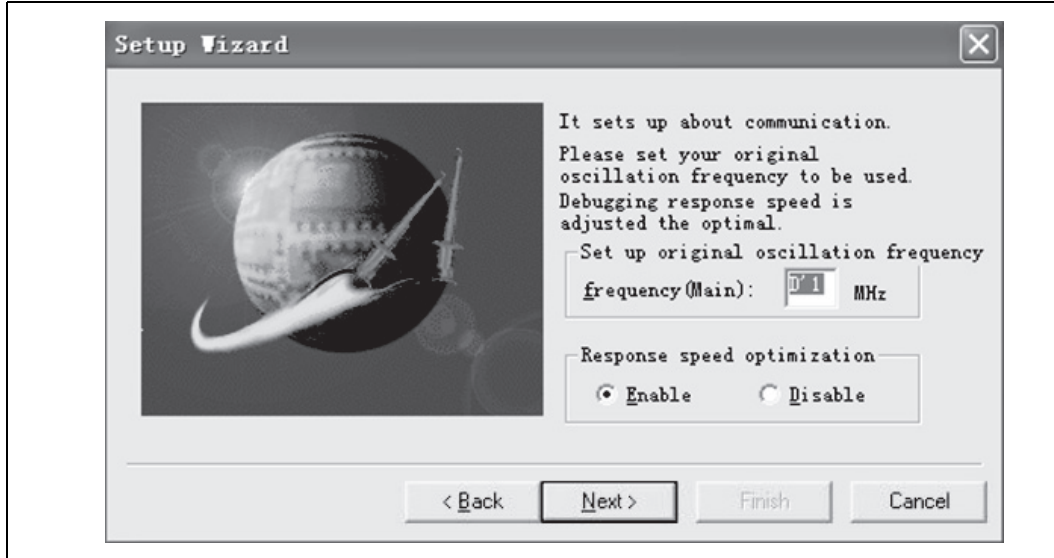
Figure 6-1. Device Type



6.1.4 Settings of Oscillation and Communication Speed

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

Figure 6-2. Clock Setting



6.1.5 Power Supply To Target

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

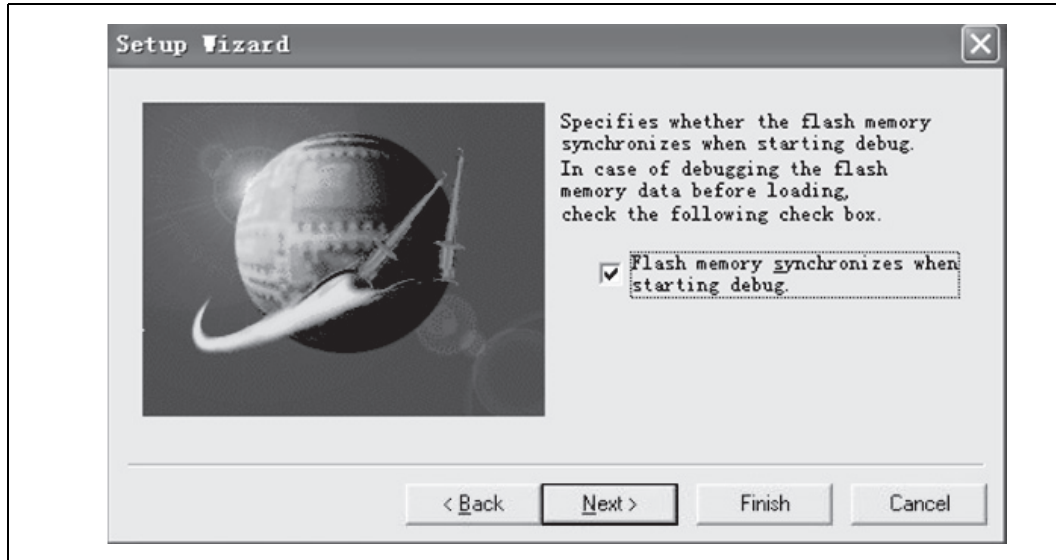
Figure 6-3. Power Supply



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

6.1.6 Flash Memory Synchronization

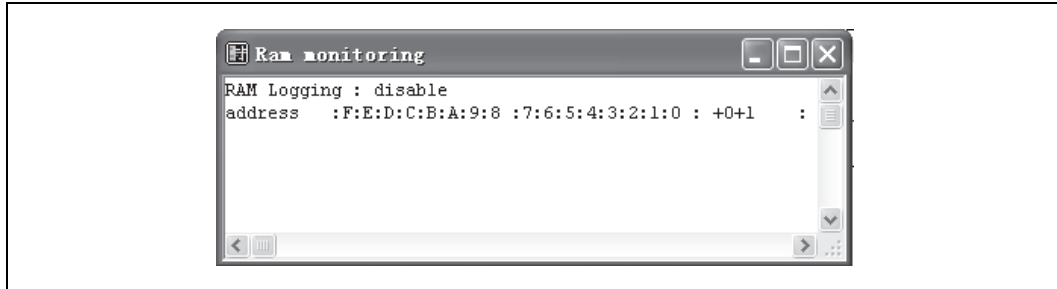
This dialog box is used to select the Flash memory synchronous function when starting debug. If the dialog box is selected, the SOFTUNE will read all MCU flash data to SOFTUNE.



6.1.7 RAM Monitoring Function

When debugging, a user can open RAM Monitoring Window to watch the MCU RAM status. User can watch 32 bytes RAMs on the RAM Monitoring at the same time.

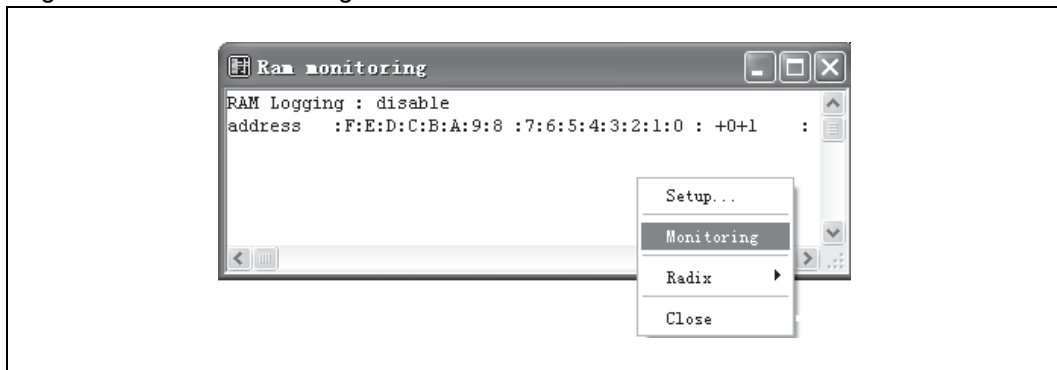
Figure 6-4. RAM Monitoring Window



6.1.8 Enable RAM Monitoring Function

Right-click the blank area in the RAM Monitoring Window and select monitoring from the shortcut menu to enable the RAM Monitoring function, as shown in Figure 6-5.

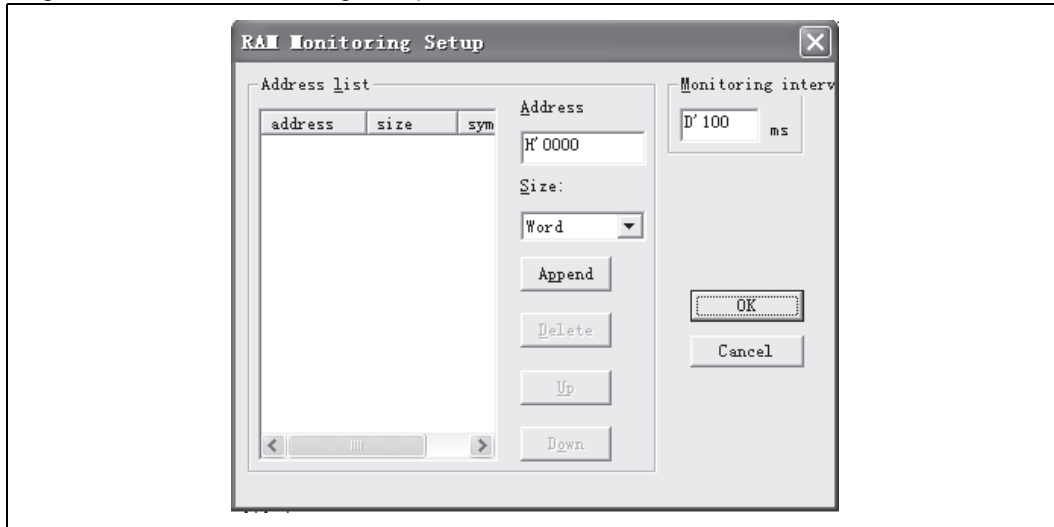
Figure 6-5. RAM Monitoring Function



6.1.9 Set Register

Select Setup from the shortcut menu in Figure 9, and RAM Monitoring Setup window pops up, as shown in Figure 6-6.

Figure 6-6. RAM Monitoring Setup

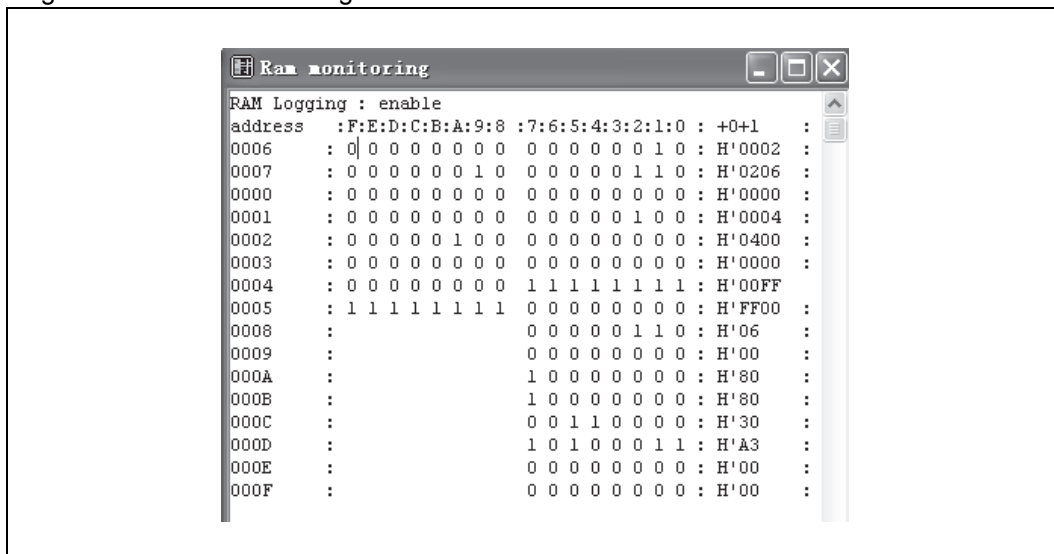


Set the RAM to be watched in Address field, and select Word from the Size Drop-down List Box.

When the address and size are selected, a user can click “Append” to confirm this operation and can select another RAM address. When all RAMs are selected, a user can click “OK” key to ensure those settings and close the window.

After that, a user can monitor all selected RAMs in RAM Monitoring window, as shown in Figure 6-7.

Figure 6-7. RAM Monitoring Status



7. How to Upgrade BGMA FW (firmware)



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.

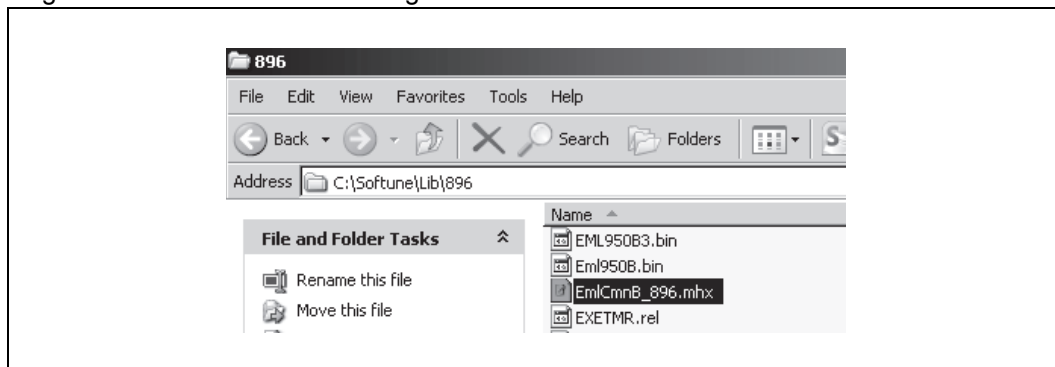
7.1 Use Softune Upgrade FW

When using SOFTUNE, a user can upgrade the BGMA FW.

The following is the method:

1. Copy EmICmnB_896.mhx file in the directory of "..\Softune\896" where Softune is installed.

Figure 7-1. The example of adding HEX file



1. Connect BGMA to PC.
2. Turn on the BGMA power.

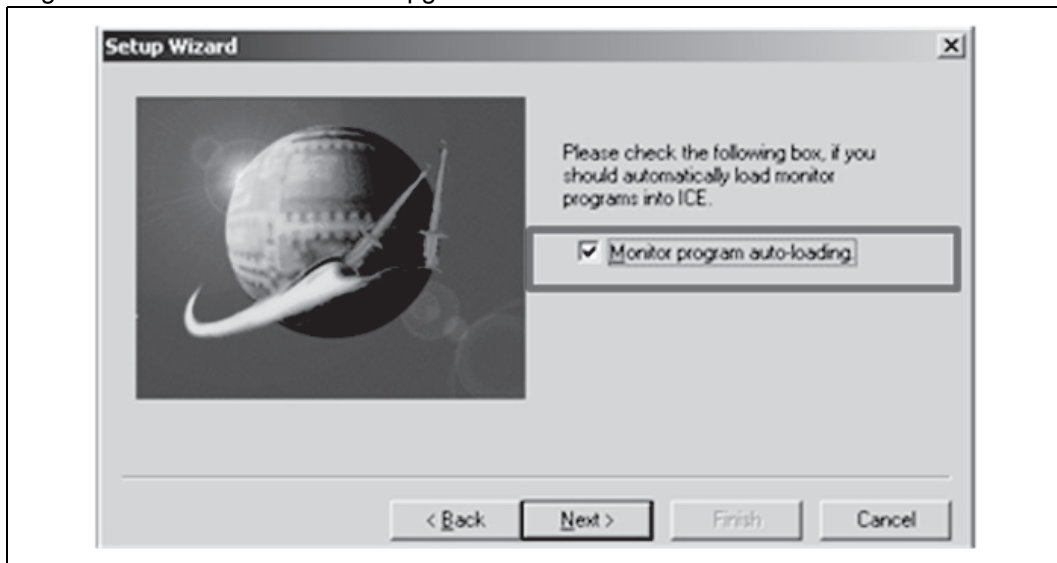
Figure 7-2. Power-on BGMA



3. Enable SOFTUNE Upgrade function.

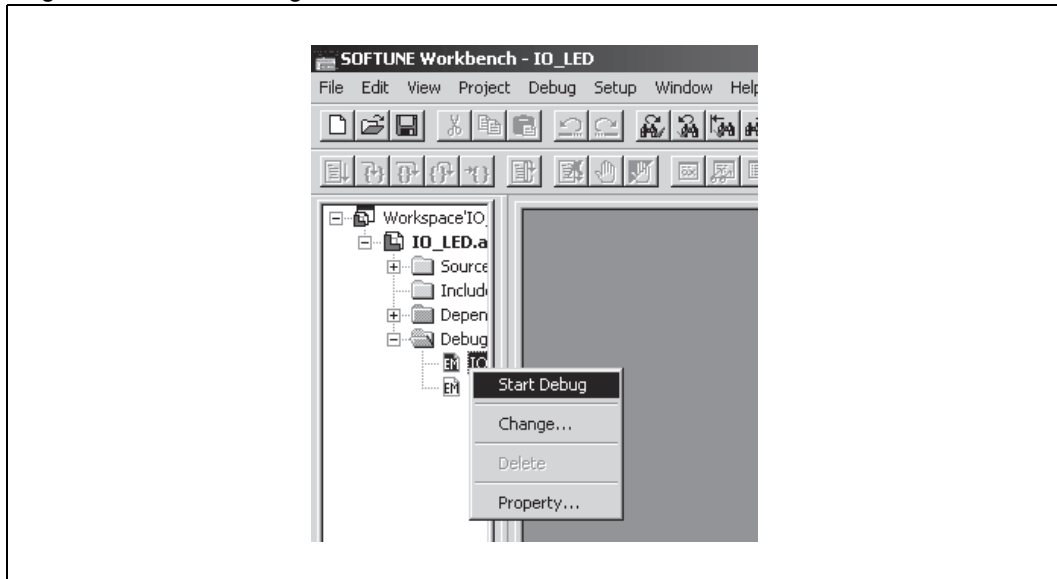
Select "Monitor program auto-loading" in SOFTUNE. For the detailed operation, see sector 6.1.2.

Figure 7-3. Enable SOFTUNE Upgrade function



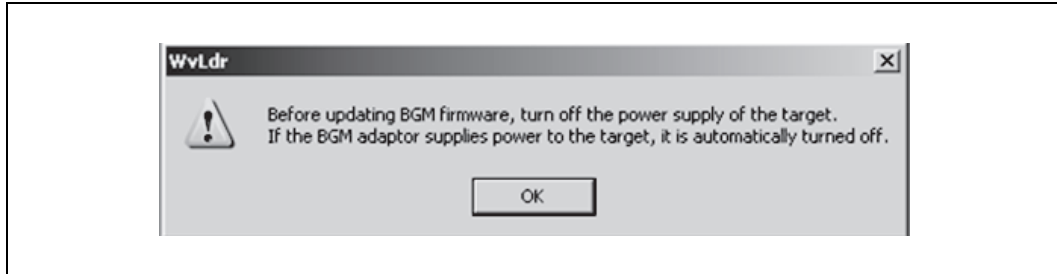
1. Right-click SOFTUNE "Debug" and select "start debug".

Figure 7-4. Start Debug Icon



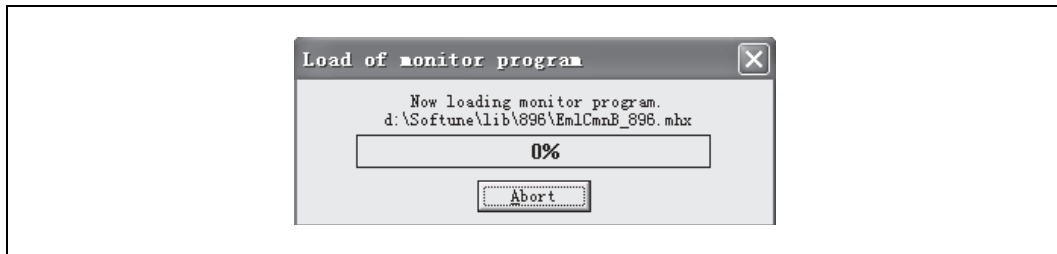
1. When the following window pops up, turn off the power supply of target board.

Figure 7-5. Power-off



1. Press the "OK" button, the following sub-window will pop up.

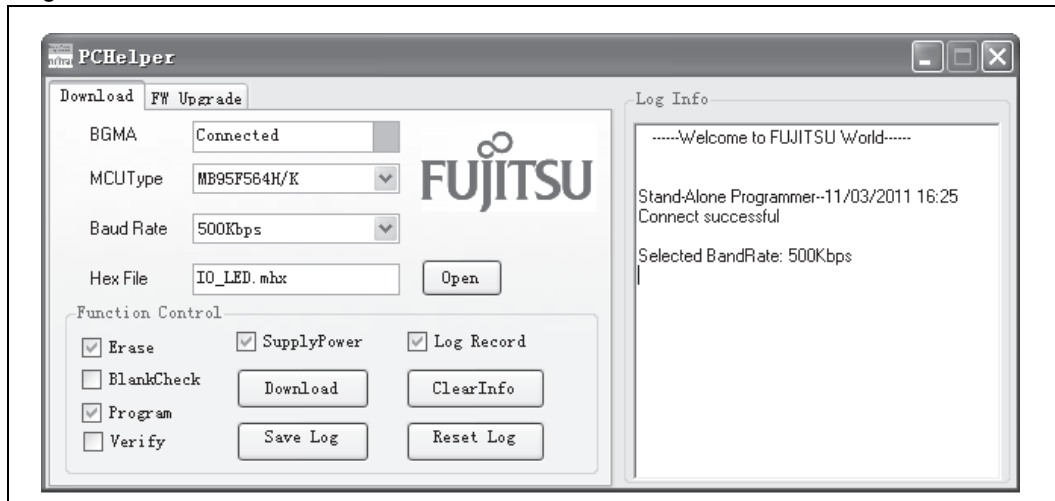
Figure 7-6. SOFTUNE Upgrade



1. If a user wants to stop the upgrading, press the "Abort" button.
 2. If the "Abort" button is not pressed, the SOFTUNE continues upgrading.
 3. When 100% upgrade is finished, the BGMA FW upgrading is completed.
- When the version of the monitor program is the same, updating is not done.

7.2 FW Upgrade Using PC Helper Programmer

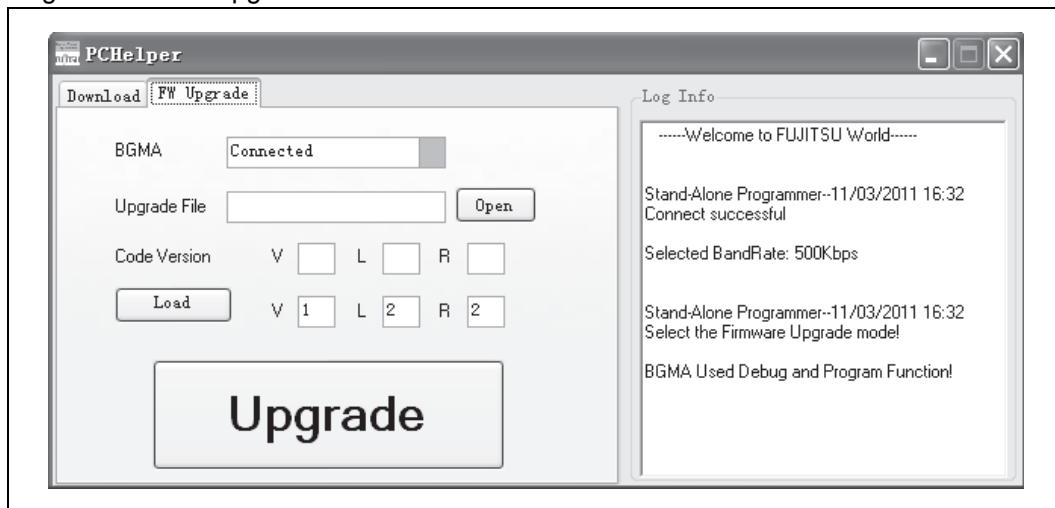
Figure 7-7. Tool Interface



Step:

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

Figure 7-8. FW Upgrade Interface



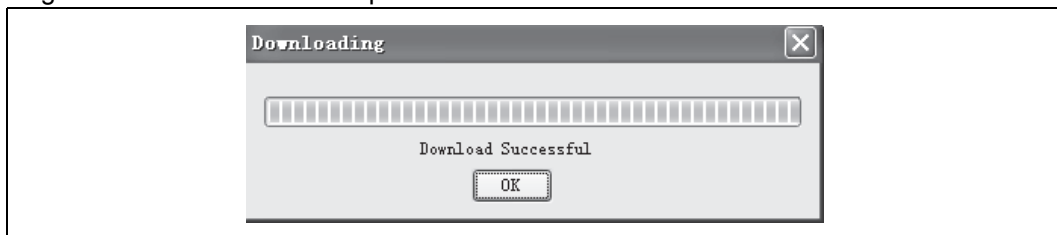
1. If the BGMA item shows “Connected” and the color is green like the picture above, the BGMA and PC connect normally.
2. Press “Open” item to choose the BGMA HEX file, the following picture is a sample.

Figure 7-9. Figure 20 Hex File Sample



1. When the HEX file is chosen, press "Upgrade" item to upgrade BGMA FW.
2. When the sub-window pops up, select recommend item and "OK".
3. When downloading is successfully completed, "Download Successful" is shown as follows.

Figure 7-10. Successful Sample



8. Additional Informations



For more informations please visit our websites:

<http://www.cypress.com/documentation/development-kitsboards/mb2146-08-e>

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

Please contact your local support team for any technical question.

Revision History



Document Revision History

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