

Freescale Semiconductor User's Guide Document Number: MC9S08JS16UG Rev. 0, 10/2008

USB Bootloader GUI User's Guide

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1 Overview

The MC9S08JS16 (JS16) supports the USB bootloader used to upgrade the firmware via the USB interface. Freescale provides a complete solution for the JS16 USB bootloader.

This document describes how to install the USB bootloader GUI to your computer and how to use the GUI to upgrade and download the firmware.

NOTE

This user's guide is based on the JS16. It can also apply to JS8 with the difference noted in the context.

Contents

1	Ove	erview
2	Inst	all the Bootloader GUI 2
3	Inst	all the Driver for the New Bootloader Device7
4	Dov	wnload the Firmware Using the Bootloader9
	4.1	JS16 Bootloader GUI
	4.2	Update JS16 Firmware with USB Bootloader 10



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Install the Bootloader GUI

2 Install the Bootloader GUI

The USB bootloader GUI is used to communicate with the boot code in ROM to implement the firmware update and download process.

NOTE

The bootloader GUI can only be installed on a PC with Windows XPTM (SP2 or later version) operating system. The .NET2.0 or later version must be ready before the installation. If the bootloader GUI installer can not detect the .NET2.0 installed it then connects to the website to download and install it. In this user guide it is assumed the .NET2.0 has been installed.

The following steps installs the bootloader GUI:

1. Double click the setup.exe to start the installation (Figure 1).



Figure 1. Start the Installation

The installation window in Figure 2 appears.

🙀 JSfamily Bootloader			
Welcome to the JSfamily	[,] Bootloadei	^r Setup Wizar	d 🎉
The installer will guide you through the ste computer.	ps required to insta	l JSfamily Bootloader o	n your
WARNING: This computer program is pro Unauthorized duplication or distribution of or criminal penalties, and will be prosecute	tected by copyright this program, or any ad to the maximum e	law and international tr portion of it, may resul wtent possible under th	eaties. t in severe civil e law.
	Cancel	< <u>B</u> ack	<u>N</u> ext >

Figure 2. JS Family Bootloader Installation Window

2. Click the Next button in this window (Figure 2). Users can set the destination folder by clicking the Browse button in the window shown in Figure 3.



🔀 JSfamily Bootloader									
Select Installation Folde	r								
The installer will install JSfamily Bootloader to the following folder.									
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".									
<u>F</u> older:									
C:\Program Files\Freescale\JSfamily Bootloader\ Browse									
]	<u>D</u> isk Cost						
Install JSfamily Bootloader for yourself, or for anyone who uses this computer:									
• Everyone									
⊂ Just <u>m</u> e									
	Cancel	< <u>B</u> ack	<u>N</u> ext >						

Figure 3. Change the Installation Path

3. Click the Next button in the same window (Figure 3) and the License Agreement page is displayed. To continue with the installation select I Agree.

🥵 JSfamily Bootloader						
License Agreement						
Please take a moment to read the licens Agree", then "Next". Otherwise click "C	e agreement now. If you accept the terms below, click "I ancel".					
LICENSE GRANT. Exclusively in conjunction with Licensee's development and sale of a product containing a programmable processing unit (e.g., a microprocessor, microcontroller, or digital signal processor) supplied directly or indirectly from Freescale ("Freescale System"), Freescale grants to you, free of charge, the non-exclusive, non-transferable right (1) to use the Software (2) to reproduce the Software I Do Not Agree						

Figure 4. License Agreement



Install the Bootloader GUI

4. Click the Next button in the License Agreement (Figure 4). The installation wizard begins to copy the files to the folder configured in step 2 (Figure 5).

🥵 JSfamily Bootloader		
Installing JSfamily Bootload	er	
JSfamily Bootloader is being installed.		
Please wait		
	Cancel < Back	Next >

Figure 5. Installing the Bootloader

5. In the rest of the installation process the bootloader's USB driver (WinUSB) will be installed in the system. The dialog in Figure 6 appears after the process is completed.

😽 Freescale WinUSB Drivers 0.1 Setup: License Agre 🔳 🗖 🔀						
If you accept all the terms of the agreement, choose I Agree to continue. You must accept the agreement to install Freescale WinUSB Drivers 0.1.						
IMPORTANT. Read the following Freescale Semiconductor Software License Agreement (Hägreement? completely. By selecting the "I Accept" 📃						
button at the end of this page, you indicate that you accept						
the terms of this Agreement. You may then download the file.						
FREESCALE SEMICONDUCTOR SOFTWARE LICENSE AGREEMENT						
This is a legal agreement between you (either as an individual or as an authorized representative of your employer) and						
Freescale Semiconductor, Inc. ("Freescale"). It concerns your						
rights to use this file and any accompanying written materials 🗸						
Cancel Nullsoft Install System v2.35 I Agree						

Figure 6. Agreement for installation of USB driver

The user must select I Agree to continue with the installation (Figure 6).

😽 Freescale WinUSB Drivers 0.1 Setup: Installatio	n 🔳 🗖 🔀						
Setup will install Freescale WinUSB Drivers 0.1 in the following folder. To install in a different folder, click Browse and select another folder.							
Destination Folder							
Freescale\Bootloader JSFamily GUI\Automatic USB Driver Browse							
Socie required 6 2MP							
Space required: 6.3MB Space available: 9.1GB							
Cancel Nullsoft Install System v2,35 < Back	Install						

Figure 7. Select the USB Driver Installation Path

6. After the user sets the USB driver installation path (Figure 7), the installation wizard begins to copy the USB driver files to the destination folder (Figure 8).

😽 Freescale WinUSB Drivers 0.1 Setup: Installing 💦 🔲 🔲						
Installing the driver						
Output folder: C:\Program Files\Freescale\Bootloader JSFamily GUI\Autom Extract: WdfCoInstaller01005.dll 100% Extract: WinUSBCoInstaller.dll 100% Output folder: C:\Program Files\Freescale\Bootloader JSFamily GUI\Autom Extract: setupapi.dll 100% Extract: BOOTLOADER JSFamily.inf 100% Extract: WinUsb.sys 100% Extract: WudfUpdate_01005.dll 100% Updating the driver (this make take several minutes) The device is not plugged in, cannot update the driver. Installing the driver						
Cancel Nullsoft Install System v2,35 < Back Close						

Figure 8. Copying the USB Driver Files



Install the Bootloader GUI



Figure 9. USB Driver Installation Completed

ট JSfamily Bootloader	
Installation Complete	
JSfamily Bootloader has been successfully installed.	
Click "Close" to exit.	
Please use Windows Update to check for any critical updates to the .NET Framewo	rk.
Cancel < <u>B</u> ack	<u>C</u> lose

Figure 10. All Installations Completed

 After the USB driver files are all copied to the destination folder a dialog is displayed as in Figure 9. To close the USB driver installation click the Close button and a dialog is then displayed see Figure 10. This indicates that the installation process has been completed.



3 Install the Driver for the New Bootloader Device

Each time the USB port of a PC is connected with a new USB device the PC needs to install the driver.

The following steps installs the driver:

1. Attach the USB device to the PC

Connect the mini-USB port on the demo board to the USB port on the PC with a USB cable.

- Power on the demo board Press the PTG0 (BLMS) button and hold it down while the demo board is powered on. This forces the JS16 to enter boot mode.
- 3. Wait for detection by the PC

When the JS16 enters boot mode it is detected by the PC. The PC then prompts Found New Hardware message (Figure 11).



Figure 11. Detecting JS Family Bootloader

After this message is displayed the Found New Hardware Wizard window appears (Figure 12).



Figure 12. Install the Bootloader Driver Automatically

4. Install the USB bootloader driver

Select Install the software automatically and click the Next button (Figure 12). The installation process then begins (Figure 13).



Install the Driver for the New Bootloader Device

Found New Hardware Wizard						
Please wait while the wizard installs the software						
Freescale JS Family Bootloader						
WdfCoInstaller01005.dll To C:\WINDOWS\system32	2					
	< Back Next > Cancel					

Figure 13. Installing the JS Bootloader

5. Complete the installation

After the installation is complete click the Finish button to close the wizard (Figure 14). The message in Figure 15 is displayed if the installation is successful.



Figure 14. Complete the USB Driver Installation





If the device has been installed successfully users can find the Freescale JS Family Bootloader in the Microsoft Windows device manager(Figure 16).



Figure 16. USB Bootloader in Device Manager

4 Download the Firmware Using the Bootloader

4.1 JS16 Bootloader GUI

After the JS16 USB driver has been installed the user can open the bootloader GUI from Start > Programs > Freescale > JS family bootloader > JS family bootloader 1.0. The GUI is then displayed on screen. See Figure 17.

If the JS16 is connected to the PC and is in boot mode the USB symbol in the notification area of the task bar appears green. See Figure 15. This means the JS16 bootloader is working properly otherwise this symbol appears red.



Download the Firmware Using the Bootloader

The GUI has the following items:

• s19 file loader

Click the button on the left side of the screen to select the s19 file to be downloaded later to the JS16 MCU. See Figure 17.



Figure 17. JS16 Bootloader GUI

- Bootloader command list
 - Mass erase JS16 flash module executes mass erase command. All the content in the flash space is erased.
 - Partial erase JS16 flash module executes partial erase command. All the content in the flash except that from 0xC000 to 0xC3FF (0xE000 to 0xE3FF for JS8) is erased.
 - Program Write the s19 file selected to the JS16 flash.
 - Reset Reset the JS16 MCU.
 - Auto Execute the Partial Erase, Program, and Reset commands automatically.
- Status window

Displays the operating status

4.2 Update JS16 Firmware with USB Bootloader

The user can update the firmware step by step, or by using the auto command.



4.2.1 Update the JS16 Firmware Step by Step

Take the following actions to update the JS16 firmware step by step. This process has been verified on the JS16 demo board.

- 1. Connect the demo board to the PC. Power on the demo board with the button labeled PTG0 pressed at the same time. The JS16 then enters the bootloader mode.
- 2. Open the bootloader GUI (Start > Programs > Freescale > JS Family Bootloader > JSFamily Bootloader V1.0). The USB icon on the bottom right of the bootloader GUI is green.
- 3. Select the s19 file

Click the solution of the s19 file loader to open the file select dialog. Then select the s19 file. See Figure 18.

Open							?×
Look in:	🚞 bin		*	G	ت ا	•	
My Recent Documents	out.s19 Project.abs.s19						
Desktop							
My Documents							
My Computer b07724 on B0							
	File name:	Project.abs.s19			*		Open 🛛
My Network	Files of type:	S19 files (*.s19)			*		ancel

Figure 18. Select s19 file

4. Mass erase the flash

Click the Mass Erase button to erase all flash memory.

5. Program the flash

Click Program button to burn the code in the s19 file to the JS16 flash.

6. Reset the MCU

After the program process is finished click the Reset button to reset the MCU.



Download the Firmware Using the Bootloader

4.2.2 Update Automatically

1. Obey the same procedure in steps 1, 2, and 3 in Section 4.2.1, "Update the JS16 Firmware Step by StepClick the Auto button to execute the partial erase, program, and reset commands. The update process is executed automatically (Figure 19).

Freescale S08JS family Bootloader V1.0				
freescale semiconductor		Product ID JS16		
		Commands		Status Window
		Mass Erase		File Selected: ID:\JS16_test\bin
		Partial erase	ок	\Project.abs.s19] Erasing0x0 Done
D:VJS16_test\bin\Projec -		Program	ок	Partial Erasing Partial Erase Error Done
	H	Auto	ок	Programming 0xFFFE Done Doing CRC Done Doing CRC Done
				Reseting Done
S08JS family USB Bootload	ler	1/10		2 50135

Figure 19. Execute Auto Command

NOTE

The partial erase is enabled only when the value of the flash partial erase semaphore (located at 0xFFBE) is 0x00. When the MC9S08JS16 chip is shipped from Freescale the default value of the flash partial erase semaphore is 0xFF. The user cannot use update automatically for the first update.

The user can clear the value of the flash partial erase semaphore by adding the following line in the code:

```
const Partial_Earse_Semphore @0xFFBE = 0x00;
```

After the flash partial erase semaphore is cleared the user can use the auto command in the GUI bootloader.

NOTE

The partial erase of the USB bootloader can erase only the content from 0xC400–0xFFFF (0xE400-0xFFFF for JS8). If the firmware code is in the area of 0xC000 to 0xC3FF (0xE000 to 0xE3FF for JS8), error occurs in the partial erase process.



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