



8-bit USB Microcontroller

# DEMO9S08JM16

## Cost-effective USB development

- **Quick Start Guide**
- **Lab Tutorials**
- **CodeWarrior™ Manual**
- **Getting Started DVD**



## Get to Know the DEMO9S08JM16 Board

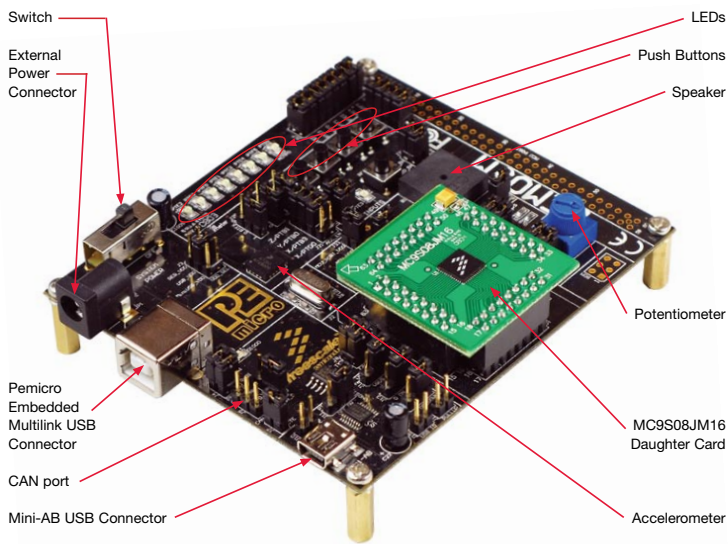


Figure 1. DEMOJM baseboard with MC9S08JM16 daughter card

## Introduction

DEMO9S08JM16 is a cost-effective kit targeting quick MC9S08JM16 evaluation. The kit includes a DEMOJM base board and a MC9S08JM16 daughter card. The included kit can be used to demonstrate the features of the MC9S08JM16 device, starting with the on-chip USB 2.0 full-speed device controller and transceiver. The USB features are supported in hardware through a dedicated USB mini-AB connector and in software through the included complimentary USB-LITE stack by CMX.

This Quick Start Guide is designed to get you ready to develop your next USB application using the MC9S08JM16 within minutes. Please take a look at the DEMO9S08JM16 Labs document (DEMO9S08JM16LAB) included in the “Training” section of the DVD to learn more about the key USB benefits that JM16 gives your application.

## Step-by-Step Installation Instructions

### Accelerometer Demo Grapher

This utility will graph data from the virtual serial port on the DEMO9S08JM16 board. The state of the on-board three-axis accelerometer can be sampled by the microcontroller's analog to digital converter channels and results can be graphed by transmitting over the virtual serial port using the microcontroller's serial communication interface.

### Virtual Serial Port

The DEMO9S08JM16 board has the capability of implementing a virtual serial port on the PC. This allows the PC to send and receive serial data via the serial communication pins of P&E's Embedded Multilink design. Using jumper J4, this virtual serial port may be configured to connect to the SCI port on the JM16 processor.



### Install CodeWarrior™ for Microcontrollers and JM16 Service Pack

CodeWarrior is a powerful tool designed to help you maximize your time to market. CodeWarrior Service Pack will install the appropriate support files for the MC9S08JM16 to the existing CodeWarrior installation. CodeWarrior installation is a one-time required step before connecting the board to your computer.

1. Insert provided DVD into computer and a menu will appear.
2. Click on appropriate board and "Install CodeWarrior."
3. Follow the on-screen instructions until installation is complete.
4. Return to DVD menu and click on "Install JM16 Service Pack."
5. Follow the on-screen instructions until installation is complete.

Once installation is complete, take advantage of several CodeWarrior tutorials that will walk you through various development tool features, such as "C Programming," "Assembly Programming," "Using Processor Expert™" and more. Simply open CodeWarrior via the "Programs>Freescale CodeWarrior>CW for Microcontroller V6.x>CodeWarrior IDE.exe" path. Click "Run Getting Started Tutorial" from the startup dialog, select a tutorial and follow the on-screen instructions.



### Install USB-LITE Stack by CMX for MC9S08JM16

USB-LITE stack by CMX for MC9S08JM16 is a complimentary stack with the appropriate JM16 USB Device mode low-level drivers and top-level HID class and CDC class examples. To exercise the various USB examples packaged with the stack follow the step-by-step DEMO9S08JM16 Labs document (DEMO9S08JM16LAB) included in the "Training" section of the DVD. Stack installation is a one-time required step before developing with this software.

1. Insert provided DVD into computer and a menu will appear.
2. Click on "Install USB-LITE by CMX." This will launch the stack installer.
3. Follow on-screen instructions until installation is complete.

### Freescale USB-LITE Stack by CMX

Freescale is providing a comprehensive USB software solution through a complimentary USB stack. The Freescale USB-LITE stack by CMX enables USB device modes of operation. The USB stack supports several HID and CDC to UART projects. The complimentary stack also interfaces with CodeWarrior Development Studio, providing a productive, comprehensive development environment for designing embedded applications.



### Install Pemicro Embedded Multilink Toolkit

PEMICRO Embedded Multilink Toolkit includes graphical utilities that run on your computer and help speed up your development. These utilities take development beyond the hardware and interact with the target microcontroller over the same USB multilink reference design on the board that allows you to debug using CodeWarrior. Best of all, you can debug your microcontroller in CodeWarrior while simultaneously using one of the following utilities: Logic Analyzer, Serial Grapher, Terminal Window and Accelerometer Demo Grapher. Pemicro Embedded Multilink Toolkit install is a one-time required step.

1. Insert provided DVD into computer and a menu will appear.
2. Click on "Install Pemicro Toolkit." This will launch the toolkit installer.
3. Follow the on-screen instructions to complete installation.

For more information on Pemicro Embedded Multilink Toolkit read the DEMO9S08JM16 User Manual (DEMO9S08JM16 UM.pdf) included in the "Documentation" section of DVD. For new and upgraded utilities to pemicro Embedded Multilink Toolkit, visit [www.pemicro.com](http://www.pemicro.com).

**STEP  
4****Connect Board to Computer**

USB driver installation is a one-time required step, to be completed after CodeWarrior installation.

1. Remove DEMOJM base board and MC9S08JM16 daughter card from anti-static bags.
2. Plug in the MC9S08JM16 daughter card to DEMOJM base board aligning pin 1 arrows.
3. Connect provided A to B gray USB cable from a free USB port on your computer to the USB connector on the board.
4. Operating system will recognize your board as new hardware and will prompt you to install the USB drivers. Choose recommended option to install the software automatically. USB drivers for your board were pre-loaded in CodeWarrior installation.
5. Follow on-screen instructions until all USB driver installations are complete. The green USB LED on-board should illuminate.

**STEP  
5****Test Board by Running Quick Start Application**

Now that you have successfully completed the software and hardware setup, test your board by running the Quick Start Application pre-loaded in the microcontroller's on-chip flash memory. The programmed application is the HID class software included in the complimentary USB-LITE stack by CMX for MC9S08JM16. The HID class software includes several examples (mouse, keyboard, etc.) with the default example turning your board and making it a simple HID mouse by exercising the JM16 on-chip USB 2.0 full speed device controller and transceiver. The example takes control of your computer's mouse cursor and moves it continuously in a back and forth motion following USB enumeration.

1. Turn the SYSTEM POWER switch to the "on" position. The red POWER LED will illuminate and application will start.
2. Connect provided A to mini-B black USB cable from a free USB port on your computer to the mini-AB USB connector on the board.



3. Your computer will recognize the MC9S08JM16 as an HID mouse device and begin installation (no user interaction needed). When hardware installation is complete, the MC9S08JM16 will control your mouse cursor by moving it back and forth.
4. Now that your board is functional, try out the labs discussed in the DEMO9S08JM16 Labs document (DEMO9S08JM16LAB) included in the "Training" section of the DVD. These labs will guide you step by step through the all the HID and CDC class examples included in the complimentary USB-LITE stack by CMX for MC9S08JM16.





**Learn More:** For more information about the JM Family, please visit [www.freescale.com/8bit](http://www.freescale.com/8bit).



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