



Quick Start Guide

DEMO9S08LG32

Up to 5V MCU with integrated
LCD display driver

- **Quick Start Guide**
- **Lab Tutorial**
- **CodeWarrior™ Manual**
- **Getting Started CD**

Get to Know the DEMO9S08LG32 Board

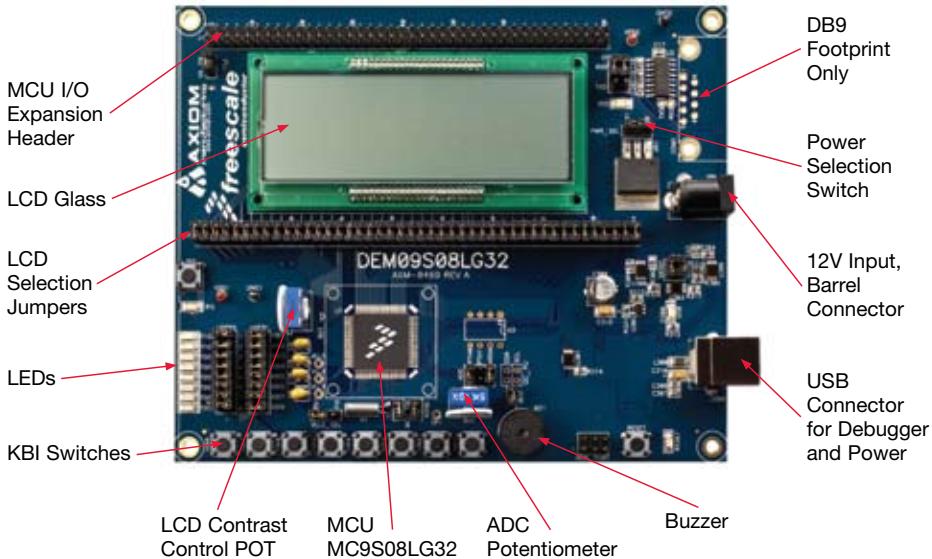


Figure 1. DEMO9S08LG32 Board

Introduction

DEMO9S08LG32 is a cost-effective board targeting quick microcontroller evaluation. The MC9S08LG32 device is a 5V Freescale microcontroller with an integrated liquid crystal display (LCD) driver for automotive and industrial applications.

DEMO9S08LG32 contains an on-board display that allows developers to explore software development using the integrated LCD driver.

MC9S08LG32 is available in three pin packages: 48-pin, 64-pin and 80-pin LQFP, and two temperature ranges: (-40°C to +85°C) for industrial applications and (-40°C to +105°C) for automotive applications. This quick start guide is designed to provide step-by-step guidelines to get you ready to develop your applications using the MC9S08LG32 within minutes.

Step-by-Step Installation Instructions

In this quick start guide, you will learn how to set up the board and run the default demo code.

Additional labs are available for the LCD lab software. Please take a look at the DEMO9S08LG32 lab document included in the Training section of the CD to learn more about the key benefits that LG32 provides to your applications.

STEP
1

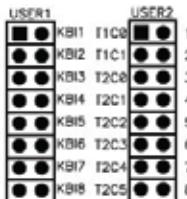
Install CodeWarrior™ 6.2 for microcontrollers and CodeWarrior v.6.2 Service Pack for MC9S08LG32

Insert the Getting Started CD from DEMO9S08LG32 kit into the CDROM drive on your computer to install CodeWarrior. This provides the driver files for built-in debug support. The CodeWarrior v.6.2 Service Pack for MC9S08LG32 will install the appropriate support files for MC9S08LG32 to the existing CodeWarrior installation. CodeWarrior installation is a one-time required step before connecting the board to your computer.

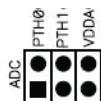
From the CD home page, click on Install CodeWarrior. This will initiate the Code Warrior install. After the install is complete, return to the CD home page and click on Install CodeWarrior Service Pack for MC9S08LG32.

**STEP
2****Verify the default jumper positions on the board**

All jumpers 2–88 shunted for LCD applications



USER 1 and 2 jumpers 1–8 connected



ADC jumper VDDA connected



Connected for buzzer application



MCU_EN and AGND jumpers connected



Connected to FIX



Connected to VB for power through USB, or connected to VR1 to power through external supply

**STEP
3**

Connect the USB cable between the PC and the USB debugger connector

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.

**STEP
4**

Install example software and program the demo board

The CD provided in the demo board kit contains example software. Insert the CD into your computer.

From the main menu select “Documentation.”

At the bottom of the screen, left click on “LG Demo Board Software.”

This will open the folder that contains the example software.

Right click on the DEMO_LG32 folder and select “Copy.” Then, paste this folder onto your computer’s desktop for easy access.

Next, Start CodeWarrior by selecting it from the Windows Start menu.

From the CodeWarrior main menu, choose “File > Open” and choose the DEMO_LG.mcp that is found in the DEMO_LG directory. This is the example software you copied from CD.

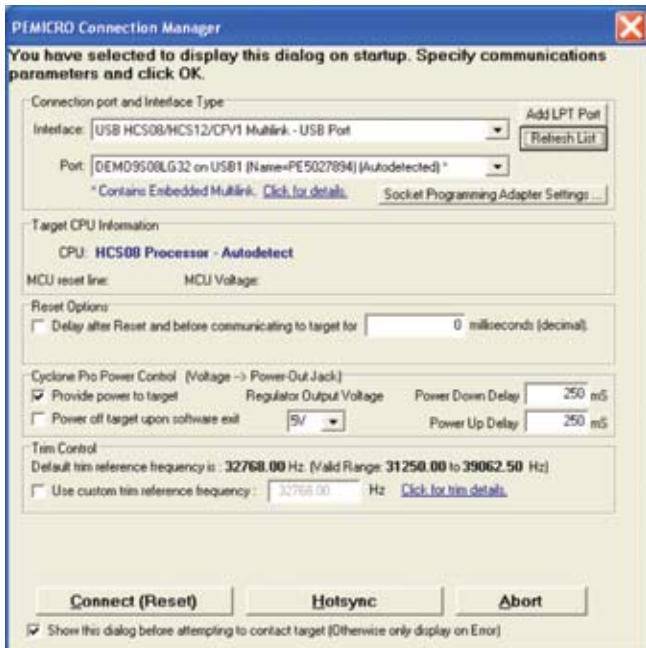
Click “Open.” The Project window will open.

In the Code Warrior window:

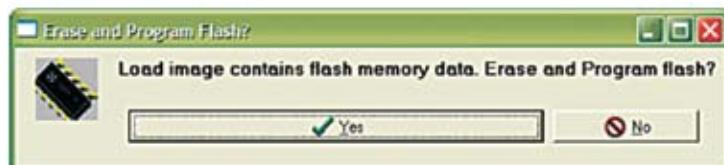


When the debugger is launched:

From the connection manager click
“Connect (Reset).”



From Erase and Program Flash menu, click
“Yes” to allow the debugger to mass erase
the microcontroller’s on-chip memory and
program it with the new application.



The flash programming status window
(shown below) will appear.

The screenshot shows a window titled "C:\Program Files\Freescale\CodeWarrior for Microcontrollers V6.2\prog\PKE\9508L032.38F" with the URL "http://www.pemicro.com". The window contains a log of programming commands:

```
USB MC508/MCS12 MULTILINE detected - Flash Version 3.79
Initializing. Target has been RESET and is active.

:CD>CH C:\Program Files\Freescale\CodeWarrior for Microcontrollers V6.2\prog\PKE\9508L032.38F
USB MC508/MCS12 MULTILINE detected - Flash Version 5.79
Initializing. (Recommended TRIM=000AB, FTRIM=0) (Bus Freq = 10429MHz) Initialized.
:version 1.00, 11/17/2008. Copyright F4E Microcomputer Systems, www.pemicro.com [9s08lg32]
:device Freescale, 9508L032, All
:begin_CS
Loading programming algorithm ... Done.(FCDIV=#84)

:CD>RI
Loading programming algorithm routine...Done.
Erasing. Module has been erased.

:CD>RH
Loading programming algorithm routine...Done.
Programming and Verifying Address 30C580

[Running programming script ...]
```

Click Run

When CodeWarrior makes the connection,
the integrated debugger circuit provides
power to the MCU if PWR_SEL is
connected as VB, thus enabling the
application to run.

STEP 5

Use combination of KEY1 to KEY8 to see the various functionalities of the LG32 demo in accordance with the table below

KEY1 Mode >	LCD Demo	SPED Demo	Speedometer Demo	Fuel Demo	LED Demo	ADC Demo	PWM Demo	Driver Info
KEY2	Special segments with blinking	N/A	X		LED on off freq.	Volt meter ¹	Demo	ADC controlled Miles Left—LCD blink warning
KEY3	0–9 and A–Z display on all 9 alpha numeric with blinking		X		Freq 2	X	ADC controlled LEDs	
KEY6	Vol display with blinking		X		Freq 4			
KEY7	Power display with blinking		X		Freq 5			
KEY8	LCD diagnostics test with blinking (All seg one-by-one)		X	Level empty to full	Freq 6			

¹ – Measures the voltage across the potentiometer RV1 fed to ADC channel.

DEMO LG32 Software Description

In the demo software, KEY1 is used to rotate between all the modes explained above and other KEYs (KEY2, KEY3, KEY6, KEY7, KEY8) are used to select various demonstrations under each mode (refer to table above).

Demo LG32 software exercises the following block functionalities:

- LCD Block: Demo software demonstrates various LCD IP block functionalities, such as displaying alphanumeric strings on digit segments, special characters, alternate string mode, blinking and contrast control.

For LCD contrast control, connect a 12V supply to the barrel connector and change the  connector to VR1 and  to RV1. The CONTRAST Pot  should be used to view the effect of contrast control.

STEP
6

- TPM Block: In the PWM demo, the software uses PWM functionality of this block to operate LEDs with different frequencies.
- ADC Block: Demo also exercises ADC functionality in the Voltmeter and Driver Info demonstration. For this the jumper  PTH0 should be connected and removed after use.
 - Voltmeter displays the digital value of measured analog voltage on the LCD.
 - Driver Information demo consists of simulation of the number of kilometers left as per the fuel quantity left. In Driver Information demo, fuel quantity left is controlled by ADC input, where if number of kilometers left is less than 50, then LCD starts blinking to show the criticality of the indication.

Use the ADC port  to see the ADC functionality.

To learn more about the MC9S08LG32, read the release notes in the Software section of the CD, which includes:

- LCD Glass Module Driver Note
- Stepper motor motion control driver
- Emulated EEPROM program and erase driver documentation and code

Read the demo board-related documents in the Documentation section of the CD, which includes:

- Demo Board Schematics
- Demo Board LCD Glass Specifications
- Demo Board User's Guide

Learn More:

For more information about Freescale products, please visit www.freescale.com.

Freescale and the Freescale logo are trademarks or registered trademarks of Freescale Semiconductor, Inc. in the U.S. and other countries. All other product or service names are the property of their respective owners. © Freescale Semiconductor, Inc. 2009.