



DEMO9RS08LA8—Lab Tutorial

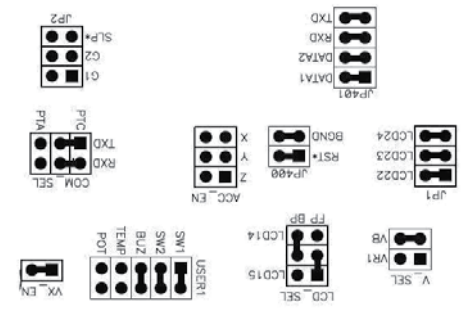
DEMO9RS08LA8—Lab Tutorial

Figure 1.
DEMO9RS08LA8



Learn More: For more information about Freescale products, please visit www.freescale.com/icc

Symbol	Number	Number	Symbol
VX	1	2	NC
VSS	3	4	PTB2/RESET*/VPP
PTC1/TxD	5	6	PTC6/ACMPO/BKGD/MS
PTC0/RxD	7	8	NC
PTA5/KBIP5/ADP5/LCD22	9	10	NC
PTA4/KBIP4/ADP4/LCD23	11	12	NC
PTC2/TPMCH0	13	14	NC
PTC3/TPMCH1	15	16	NC
PTA3/MOSI/KBIP3/ADP3/TxD/LCD24	17	18	NC
PTA2/MISO/KBIP2/ADP2/RxD/LCD25	19	20	PTA6/KBIP6/ADP6/ACMP+
PTA1/SPSCK/KBIP1/ADP1/LCD26	21	22	PTA7/KBIP7/ADP7/ACMP-
PTA0/SS/KBIP0/ADP0/LCD27	23	24	VSS
VLL1	25	26	VSS
VLL2	27	28	VLL3
NC	29	30	NC
NC	31	32	NC



The following is a list of default jumper settings for DEMO9RS08LA8 board. The settings listed indicate the "on" (or installed) position.

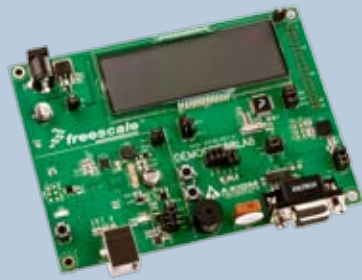
Default Jumper Settings

DEMO9RS08LA8—Lab Tutorial

MCU Port Connector Pin Out

The following is the pin out for the MCU port connector on the DEMO9RS08LA8 board.

Symbol	Number	Number	Symbol
VX	1	2	NC
VSS	3	4	PTB2/RESET*/VPP
PTC1/TxD	5	6	PTC6/ACMPO/BKGD/MS
PTC0/RxD	7	8	NC
PTA5/KBIP5/ADP5/LCD22	9	10	NC
PTA4/KBIP4/ADP4/LCD23	11	12	NC
PTC2/TPMCH0	13	14	NC
PTC3/TPMCH1	15	16	NC
PTA3/MOSI/KBIP3/ADP3/TxD/LCD24	17	18	NC
PTA2/MISO/KBIP2/ADP2/RxD/LCD25	19	20	PTA6/KBIP6/ADP6/ACMP+
PTA1/SPSCK/KBIP1/ADP1/LCD26	21	22	PTA7/KBIP7/ADP7/ACMP-
PTA0/SS/KBIP0/ADP0/LCD27	23	24	VSS
VLL1	25	26	VSS
VLL2	27	28	VLL3
NC	29	30	NC
NC	31	32	NC



DEMO9RS08LA8 Lab

This lab document applies to DEMO9RS08LA8.

Start each lab with the board powered ON. Make sure to use only one utility at a time, as they share the same USB source. Familiarize yourself with these buttons:



Start/Continue (F5) button



MCU Change Wizard button



Debug button

DEMO9RS08LA8

LAB 1

Learn How to Use the DEMO9RS08LA8 Toolkit Utilities

This lab will show you how to use one of several graphical utilities in the DEMO9RS08LA8 Toolkit included with your board. Instructions to download these utilities to your computer are provided in Step 2 of the Quick Start Guide (DEMORS08LA8QSG.pdf). In this lab we will use the Logic Analyzer utility that was installed with the P&E embedded multilink toolkit. To perform this lab the Quick start application must be downloaded to the demo board as described in the Quick start guide. This PC-based utility graphs the DATA1 and DATA2 signals on the board. For convenience, if both DATAx jumpers are installed, DATA1 graphs PTC2 activity and DATA2 graphs PTC3 activity. To graph other microcontroller signals, use wire jumpers from DATA1 and DATA2 to the respective signals on the board's MCU PORT.

1. Press RESET and Make sure that the Quick Start Application is running. Refer To the quick start guide for information on running the quick start application.
2. Launch Logic Analyzer utility from the start menu (Programs > P&E Embedded Multilink Toolkit > Utilities > Logic Analyzer Utility).
3. In utility, click on the "Connect to embedded Multilink analyzer and Graph Pins" button to begin graphing IN0 and IN1. These signals will be continually graphed at a sampling rate of 10 kHz.
4. Rotate the potentiometer RV1. This will change the duty cycle of the variable pulse width modulation signal output on the PTC2 and PTC3 pins.
5. Click on "Close Port" button when finished

LAB 2

Features of the LCD Driver



This lab will demonstrate main features of the embedded LCD driver for the MC9RS08LA8.

1. Make sure that the Quick Start Application is running. Refer to the quick start guide for information on running the quick start application.
2. Press RESET to initialize the demonstration
3. After the Message has completed scrolling and the "LOGICANLY" is shown press SW2 to enter the Time display demo. (You should see time being updated on the LCD screen)
4. The time display demo updates every second when the RTI second interrupt occurs.

LAB 3

FP/BP Configurability



This lab will demonstrate FP/BP configurability on the DEMO9RS08LA8.

1. Open CodeWarrior for Microcontrollers. From Windows start menu, you can locate it using the "Programs > Freescale CodeWarrior > CW for Microcontroller V6.x > CodeWarrior IDE.exe" path.
2. Click on File->Open and open the LA8_DEMO.mcp file from the MC9RS08LA8 Toolkit directory.
3. In the MC9RS08LA8_Demo project window select the Targets tab and then double click to select the FP_BP target.
4. Change the setting of the LCD_SEL jumpers so that LCD15 is connected to BP and LCD14 is connected to FP.
5.  Compile and program the MC9RS08LA8 microcontroller with demo application by clicking on "Debug" button, launching Debugger.
6.  Click on the "Start/Continue (F5)" button in debugger to run application.
7. The demo application is now running with a different configuration for the FP and BP pins. Note the commented changes for the FP/BP software

LAB 4

MC9RS08LA8 Accelerometer Demo

This lab will highlight the performance capability of the MC9RS08LA8 microcontroller and show how this microcontroller can easily interface with a sensor. This lab will also detail how to use another one of several software utilities included with your board to help you in your development. Instructions to download these utilities to your computer were provided in Step 2 of the Quick Start Guide. The accelerometer application reads the X, Y and Z axes of the 3-axis accelerometer on the DEMO9RS08LA8 board using the microcontroller's A/D converter. After any reset, it outputs the raw values of the accelerometer data on the microcontroller's serial communication interface. Pressing the SW1 switch outputs a rolling average of the raw accelerometer data, and pressing the SW2 switch outputs a filtered version of the raw accelerometer data.

1. Open CodeWarrior for Microcontrollers. From Windows start menu, you can locate it using the "Programs > Freescale CodeWarrior > CW for Microcontroller V6.x > CodeWarrior IDE.exe" path.
2. Click on File->Open and open the DEMO9RS08LA8_Accelerometer.mcp file from the DEMO9RS08LA8 Toolkit directory.
3.  Compile and program the MC9RS08LA8 microcontroller with demo application by clicking on "Debug" button, launching Debugger.
4. From Connection Manager menu, select "DEMO9RS08LA8 on USB1" port and click on "Connect (Reset)."
5. From Erase and Program Flash menu, click on "Yes" to allow the debugger to mass erase the microcontroller's on-chip flash memory and program it with the new application.
6.  Click on the "Start/Continue (F5)" button in debugger to run application.
7. Launch Accelerometer Demo utility from the start menu (Programs > P&E Embedded Multilink Toolkit > Utilities > Accelerometer Demo).
8. Set port to USB COM.
9. Set baud rate to 19200.

10. Board jumpers should all be set to the default settings shown in Quick Start Guide.
11. Bring Accelerometer Demo utility to front and click the "Open Serial Port and Start Demo" button.
12. Move board around to demonstrate 3-axis accelerometer.
13. Observe output of raw data in Accelerometer Demo utility. The data is displayed in hexadecimal format in the Terminal Window and in graphical form in the bar graph and Scope windows. The fourth value is the number of bus cycles for the CPU to process the data.
14. Click button labeled "SW1" on board to enable data averaging. Move board.
15. Click button labeled "SW2" on board to enable data filtering. Move board.
16. Click on "Close Port" button and close Terminal Utility when finished.