



Quick Start Guide

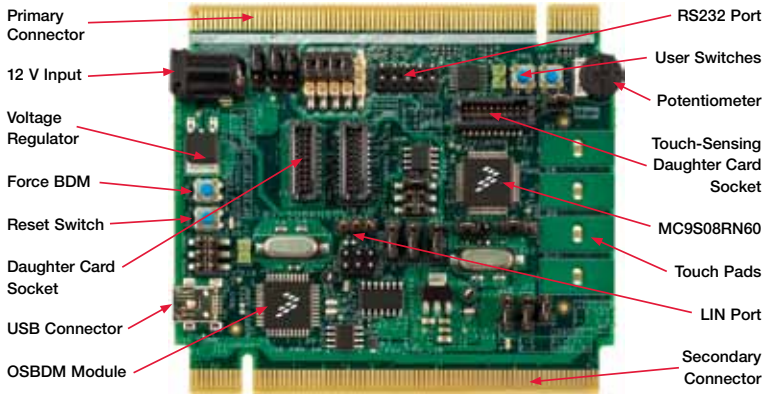
TWR-S08RN60

S08RN Family of 8-bit MCUs for
Automotive Body Electronics Applications



TOWER SYSTEM

Get to know the TWR-S08RN60



TWR-S08RN60 Freescale Tower System

The TWR-S08RN60 module is a part of the Freescale Tower System, a modular development platform that enables rapid prototyping and tool re-use through reconfigurable hardware. Elevate your design to the next level and begin constructing your Tower System today.

TWR-S08RN60 Features

The TWR-S08RN60 Tower System module demonstrates the capability of the MC9S08RN60 8-bit MCU targeted for automotive body electronics applications. It can function as a stand-alone, low-cost platform for the evaluation of MC9S08RN60 devices. There is an OSBDM module on the TWR-S08RN60 which can be used to debug MC9S08RN60 devices on the TWR-S08RN60 module.

The MC9S08RN60 is part of the S08RN family of MCUs, offering exceptional EFT/ESD performance, more durability and reliability for harsh automotive user interface environments. The S08RN family is pin compatible and integrates a touch-sensing interface (TSI), EEPROM and a motor control flex timer to simplify designs and help reduce system costs.

MC9S08RN60 Features

- 8-bit S08L core
- Up to 20 MHz CPU at 2.7–5.5 V
- 60 KB flash, 4 KB RAM, 256 byte EE
- 12-bit ADC, 16-ch.
- Analog comparator
- 16-ch. touch-sensing input
- Multiple timers, motor control, PWM capable
- Rich connectivity, including SCI, SPI and I²C
- 55 GPIOs, including eight 20 mA drive pins and 2-pin true open drain



Step-by-Step Installation Instructions

In this quick start guide, you will learn how to set up the TWR-S08RN60 module and run the lab code.

1 Install Software and Tools

Please insert the provided DVD into your computer. After the initial screen appears, install CodeWarrior development tools in the order detailed below. Follow the prompts through the installation of each component, answering each prompt with the default input.

1. Install CodeWarrior Development Studio for Microcontrollers V10.2. Also install CodeWarrior MCU V10.2 Update 1.0.0 (CW_MCU_V10.2_Update_1.0.0.zip) or newer by following the instructions in **CodeWarrior_Service_Pack_Update_Procedure.pdf** found on the DVD.
2. Install CodeWarrior Service Pack for MC9S08RN60 (found on the Software_Installers folder on the DVD) by following these steps:
 - Open the CodeWarrior application from the Windows Start menu
 - Select the required workspace and click **“OK”**
 - Go to the **Help** menu in the current window
 - Select **“Install New Software”** from the drop down menu
 - In the **“Install”** dialog, click the **“Add”** button in the upper right corner
 - In the **“Add Site”** dialog, fill your favorite site name as the update location in the **“Name”** text box and click the **“Archive”** button
 - In the **“Repository archive”** browse dialog, select the zip archive containing the Service Pack Updater Archive and click **“Open”**
 - Open the **“Work with:”** drop down list and select the update location you have just added

- Select (check) the MCU Service Pack **“MCU V10.2 Service Pack for MC9S08RN60”** and uncheck **“Contact all updates sites during install to find required software”** item, then click **“Next”**
 - Wait for the Updater to open the archive and the **“Install/Install Details”** dialog will appear. Select the Service Pack and click **“Finish.”** This will automatically install all the Service Pack dependencies
 - Select the **“I accept the terms of the license agreement”** button and click **“Finish”**
 - You will be asked to restart CodeWarrior again. Select **“Yes”**
3. Install PEMICRO Embedded Multilink Toolkit (Terminal Window version 2.03 or newer is required for labs).
 4. Create a local workspace (folder) on your computer, for example, RN60Lab.
 5. Install five CodeWarrior project files (found on the Training folder on the DVD) and unzip these files to the local workspace that was just created on your computer.

2 Set up the TWR-S08RN60 Module


Remove the TWR-S08RN60 module from anti-static pouch. Ensure the jumpers are in the default positions as shown in the Default Jumper Options table on the following pages of this quick start guide.




After ensuring the jumpers are in the default positions, connect the provided USB cable from a free USB port on your computer to the mini-B USB connector on the TWR-S08RN60 module. Allow the PC to automatically configure the USB drivers as needed. USB drivers for your TWR-S08RN60 module were pre-loaded in the CodeWarrior installation.



Step-by-Step Installation Instructions (cont.)






3 Start CodeWarrior and Debug Environment

1. Start CodeWarrior by selecting it from the Windows Start menu.
2. From the CodeWarrior main menu, choose **"File > Switch Workspace"** and select **"Other..."** The Workspace Launcher dialog appears where the current (default) workspace name is displayed on **"Workspace:"** edit text box. If this workspace is not the one on your computer that contains lab projects, click **"Browse..."** to launch the **"Select Workspace Directory"** dialog. In this dialog, browse to the project folder (workspace) containing the lab projects and select it by clicking **"OK."** The project folder appears on the **"Workspace"** text box. Click **"OK"** to allow CodeWarrior to configure and switch to the desired workspace.
3. Click **"File > Import..."** menu item to open **Import** dialog. In the **Import** dialog, double click **"General"** and select the **"Existing Projects into Workspace"** item followed by selecting **"Next."** The Import Projects dialog appears.
4. In the **"Select root directory"** dialog, click **"Browse..."** Browse to and select the project folder **"TWR-S08RN60_Lab1_6"** followed by clicking **"OK."** The project name will appear in the Projects list and will be checked. Ensure **"Copy projects into workspace"** is unchecked, and click **"Finish."**
5. When the Remote System Missing dialog appears, click **"Yes"** until the Welcome window appears. Close this window.
6.  Click the fast view icon at the bottom left of the window which will pop up on the fast view menu. Select **"CodeWarrior Projects"** from this menu to view the opened projects.

- Click the lab project name to highlight it. Click the **“Project > Clean...”** menu item to bring up the Clean dialog. In this dialog, check **“Clean projects selected below.”** Select and check the project name. Check **“Start a build immediately”** and **“Build only the selected projects”** followed by pressing **“OK.”** This will start the project building process. When you see the **“Finished building: ...”** message in Console view, the project building process is complete.
 - Click the **“Run > Debug Configurations...”** menu item and the Debug Configurations dialog will pop up. In the Debug Configurations dialog, expand **“CodeWarrior Download”** and select **“S08RN60_PnE MultiLink or OSBDM Connection.”**
 - Click **“Debug”** to download code to the RN60. This starts the launching progress until the debugger perspective appears and stops at the line of main() in the source view.
- 4 Run and Debug Lab Code on TWR-S08RN60 Module**
 -  From the main menu, choose **“Run > Resume”** or click the **Resume** icon in the Debug view toolbar. The program will be executed in real time.
 -  From the main menu, choose **“Run > Suspend”** or click the **Suspend** icon. The program execution will stop. The next instruction to be executed is highlighted in the source window.
 -  From the main menu, choose **“Run > Step Into”** or click the **Step Into** icon. The instruction highlighted in the C source window will be executed and the program execution will be stopped immediately.



Step-by-Step Installation Instructions (cont.)

-  From the main menu, choose “**Run > Step Over**” or click the **Step Over** icon. The debugger will execute the current statement and advance to the next statement in the source code. If the current statement is a routine call, program execution continues until it reaches:
end of the called routine, breakpoint, watchpoint, or an eventpoint that stops execution
-  From the main menu, choose “**Run > Step Return**” or click the **Step Return** icon. The debugger will execute the rest of the current routine and stop program execution after the routine returns to its caller. This command causes execution to return up the call chain.
-  From the main menu, choose “**Run > Restart**” or click the **Restart** icon. The debugger goes back to the beginning of the program and begins execution again. This behavior is equivalent to killing execution and starting a new debugging session.
-  From the main menu, choose “**Run > Reset**” or click the **Reset** icon. The debugger will reset the target.
-  Click the **Instruction Stepping Mode** icon to debug the program in disassembly view instead of source view.
- Now that you have successfully completed the software and hardware setup, you may continue to explore TWR-S08RN60 labs by following the TWR-S08RN60 Labs Tutorial.

5 Learn More

After completing the steps in this quick start guide, take a look at the TWR-S08RN60 Labs Tutorial document (TWR-S08RN60_LAB) included in the Training section of the Getting Started DVD to learn more about how the MC9S08RN60 benefits your application.

iVVK-5U8RN60 Default Jumper Options

The following is a list of all default jumper options.

Jumper	Setting	Description
J1	1-2	USB to SCI2 (Rx)
J2	1-2	USB to SCI2 (Tx)
J3	1-2	Touch pad to RN60
J5	2-3	UART (SCI1 Tx)
	5-6	UART (SCI1 Rx)
	8-9	LIN (SCI0 Rx)
	11-12	LIN (SCI0 Tx)
J7	1-2	Potentiometer
J13	Open	OSBDM bootloader mode
J17	2-3	External clock (EXTAL)
J18	2-3	External clock (XTAL)

(continued from previous page)

Jumper	Setting	Description
J20	2-3	TWRPI to RN60
J21	2-3	TWRPI to RN60
J22	2-3	TWRPI to RN60
J26	2-3	Power supply 3.3-volt selection
J27	2-3	Power supply level selection
J29	1-2	Power supply for RN60 IDD measurement
J31	1-2	Power supply 5-volt selection



Visit freescale.com/TWRS08RN60 for information on the TWR-S08RN60, including:

- TWR-S08RN60 quick start guide
- TWR-S08RN60 labs tutorial
- TWR-S08RN60 user guide

Support

Visit freescale.com/support for a list of phone numbers within your region.

Warranty

One (1) year limited warranty. Please visit us at freescale.com/warranty for complete warranty information.

For more information, visit freescale.com/Tower

Join the online Tower community at towergeeks.org

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