Quick Start Guide

S12VR64EVB3
S12 MagniV Mixed-Signal MCUs

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S12 MagniV

Get to Know the S12VR64EVB3

LIN Connectors

Barrel Power Connector

High-Current Banana Connector

SPI Header

Reset Switch

S12VR BDM Connector

JM60 OSBDM/Serial Bridge

JM60 BDM Connector

OSBDM/Serial USB Bridge

HVI Pot

1 m ohm shunt to measure motor current

Relay

Motor Connection Block

S12VR64 48 LQFP

HVI Wakeup Switch
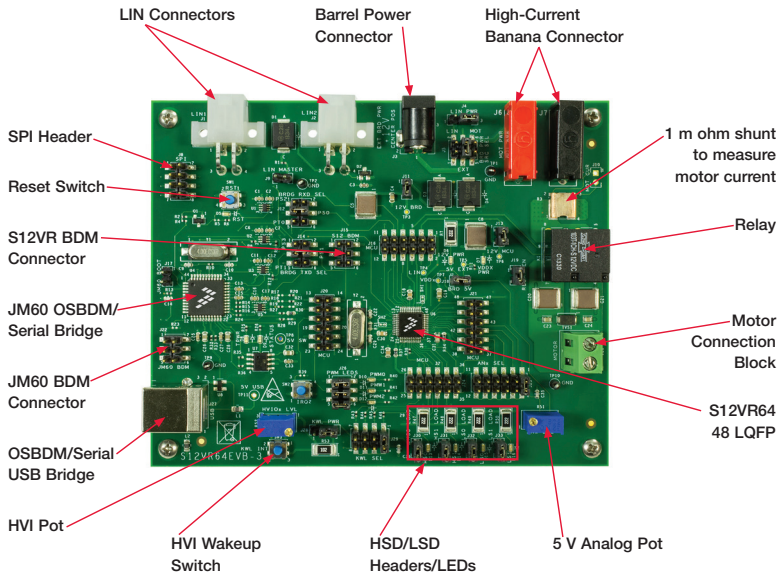
HSD/LSD Headers/LEDs

5 V Analog Pot

Figure 1: Front Side of S12VR64EVB3

Introduction and Default Settings

The S12VR64EVB3 features the S12VR64 (maskset 0N59H which is the most recent version of this MCU), an automotive 16-bit MCU. This family integrates an S12 microcontroller with a LIN physical interface, a 5 V regulator system to supply the microcontroller and analog blocks to control other elements of the system which operate at vehicle battery level. The S12VR family uses many of the same features found on the S12G family, including error correction code (ECC) on flash memory, EEPROM for diagnostic or data storage, a fast analog-to-digital converter (ADC) and a frequency modulated internal phase locked loop (IPLL) that improves the EMC performance. This guide will show how to quickly connect the board to a host PC and execute a demonstration application preloaded into flash memory. Default jumper positions are for applications loaded on the S12VR64EVB3 board and are shown on the following page.

S12VR64EVB3 Option Settings
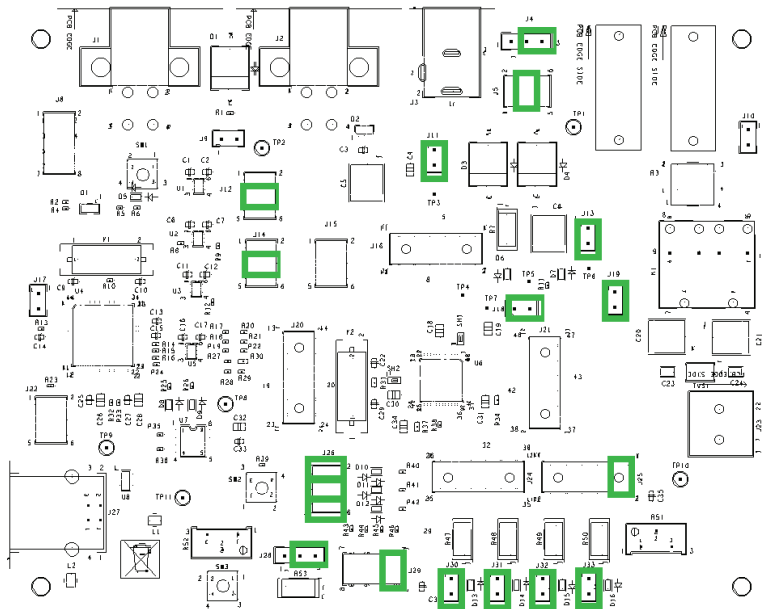
1 Install CodeWarrior Development Studio

The S12VR64EVB3 board ships with the latest version of CodeWarrior Development Studio for Freescale HCS12(X) microcontrollers. CodeWarrior Development Studio is a complete Integrated Development Environment (IDE) that provides a highly visual and automated framework to accelerate the development of the most complex embedded applications.

NOTE: CodeWarrior Development Studios and the provided PE OSBDM drivers, must be properly installed before attempting to connect the target board to the host PC. Otherwise, the necessary USB drivers will not be available and the host PC will not recognize the board.

CodeWarrior Development Studio for HCS12(X) V5.1 IDEV5.9 is included on the DVD provided and can be found on the main screen or on the additional resources tab.

2 Install CodeWarrior Service Pack for S12VR Family Microcontrollers

Double-click on the link for the S12VR service pack. This patch contains header files for the S12VR family microcontrollers.

NOTE: CodeWarrior Service Pack for S12VR is included on the DVD provided and can be found on the main screen or on the additional resources tab.

3 Launch the Demo Program

The DVD contains a CodeWarrior project to exercise the BATS module, ADC, high-side drivers, the relay using low-side drivers, Port T and SCI module. Please follow the instructions below to compile and load this code.

NOTE: If you want to connect a load on the relay outputs, you'll need to use a power supply with a higher current output connected to the power supply banana connectors J6 and J7.

1. Open CodeWarrior Development Studio.

2. Unzip the content of the EVB Source Code file (evb_demo_application_3_0.zip) located on the additional resources tab of the DVD.

3. Drag the unzipped file "evb demo application.mcp" into CodeWarrior's Window (the file is located below directory "evb demo application"). This action should open CodeWarriors' project explorer.

4. Press "F7" key to build the project.

5. Verify the option jumpers are set in default positions. Refer to Figure 2.

6. Connect the included A/B USB cable between an open USB port on the host PC and the USB connector on the target board.

7. Install PE V11.1.1 OSBDM drivers (included in the DVD). This allows using the OSBDM as a USB to serial bridge and connect the board to any serial terminal. Note: Virtual serial port cannot be used with this driver. However, serial terminals can connect through a COM serial port.

8. Connect the power adaptor to the barrel plug to power the device.

9. While in CodeWarrior's window press "F5"; this action will attempt to establish a connection between the evaluation board and the PC.

10. Follow the instructions presented to connect to the embedded debugger and download the code recently compiled.

11. While in the debugger screen "True-Time Simulator & Real-Time Debugger", press "F5" to start the code recently downloaded.

12. The relay will click on base time defined by the potentiometer R51.

13. Open a terminal program and configure for 19200, 8, none, 1, none. Open a serial connection to OSBDM/OSJTAG- CDC Serial Port.

14. Rotate the potentiometer and notice that the relay switching time will change according to the potentiometer.

15. Notice that the LEDs D13, D14, D15 and D16 will flash according to the relay changes.

16. Notice that the terminal program is reporting the status of the system.

17. Program is reporting the status of the VSENSE pin with an 8-bit resolution, the current relay timer configuration on milliseconds and the battery voltage status.

18. Adjust the supply voltage to be below or over the thresholds and check on the terminal program and the battery voltage status during this operation. (The example program is using the VLBI2 and VHBI1 thresholds, these thresholds are defined on the 9S12VR RM).

19. While in the Debugger window, you can halt the controller by pressing "F6" and add break points in the code by right clicking on it and selecting the option "Set Break Point".

20. Pres "F1" while in the Debugger window or in CodeWarrior Development Studio to open the included help.

S12VR64EVB3 Jumper List and Description

The following is a list of all jumper options on the S12VR64EVB3. The default installed jumper settings are indicated by **bold** text.

Jumper	Setting	Description
J5	pins 2–4 open	Power from LIN connectors J1 and J2 (J4 needs to be in 1, 2)
	pins 4–6 open	Power from motor banana connectors (J6, J7)
	pins 3–4 closed	**Power from J3 barrel connector**
J11	**pins 1–2 closed**	**Auxiliary 12 V supply circuit enabled**
J13	**pins 1–2 closed**	**S12VR powered thru D4**
J18	**pins 1–2 closed**	**Internal S12VR LDO providing 5 V power to the board enabled**
J25	**pins 1–2 closed**	**AN0 connected to 5 V analog potentiometer**
	pins 3–4 open	AN1 connected to 5 V analog potentiometer
	pins 5–6 open	AN2 connected to 5 V analog potentiometer
	pins 7–8 open	AN3 connected to 5 V analog potentiometer
	pins 9–10 open	AN4 connected to 5 V analog potentiometer
	pins 11–12 open	AN5 connected to 5 V analog potentiometer

Table 1 - Default Jumper Positions

S12VR64LEVB3 Jumper List and Description (*continued*...)

Jumper	Setting	Description
J29	**pins 1–2 closed**	**HVI0 connected to high-voltage potentiometer and wakeup push button SW3**
	pins 3–4 open	HVI1 connected to high-voltage potentiomenter and wakeup push button SW3
	pins 5–6 open	HVI2 connected to high-voltage potentiomenter and wakeup push button SW3
	pins 7–8 open	HVI3 connected to high-voltage potentiomenter and wakeup push button SW3
J28	**pins 2–3 closed**	**High-voltage potentiometer connected to auxiliary 12 V supply**
	pins 1–2 open	High-voltage potentiometer connected to high-side driver 0
J9	pins 1–2 open	1 K ohm LIN master pull up resistor disabled
J4	**pins 2–3 closed**	**LIN connector powered thru the auxiliary 12 V supply**
	pins 1–2 open	LIN connector powering the board. Use in conjunction with J5.
J22	NA	OSBDM BDC connector. To reflash the JM60 connect a BDM controller here (e.g., multilink).
J17	pins 1–2 open	OSBDM IRQ. Close this link when reflashing thru USB.
J15	NA	S12VR BDC connector. To reflash the S12VR connect a BDM controller here (e.g., multilink).

S12VR64EVB3 Jumper List and Description (*continued*...)

Jumper	Setting	Description
J12	pins 3–1 open	OSBDM used as USB to serial bridge selecting SCI1 RXD (requires configuration of MODRR2)
	pins 3–5 open	OSBDM used as USB to serial bridge selecting SCI0 RXD (requires configuration of MODRR2)
	pins 3–4 closed	**OSBDM used as USB to serial bridge selecting SCI1 or SCI0 RXD default after reset**
J14	pins 3–1 open	OSBDM used as USB to serial bridge selecting SCI1 TXD (requires configuration of MODRR2)
	pins 3–5 open	OSBDM used as USB to serial bridge selecting SCI0 TXD (requires configuration of MODRR2)
	pins 3–4 closed	**OSBDM used as USB to serial bridge selecting SCI1 or SCI0 TXD default after reset**
J32	**pins 1–2 closed**	**LSD0 LED enabled**
J33	**pins 1–2 closed**	**LSD1 LED enabled**
J30	**pins 1–2 closed**	**HSD0 LED enabled**
J31	**pins 1–2 closed**	**HSD1 LED enabled**
J19	**pins 1–2 closed**	**Relay's coils powered thru the auxiliary 12 V supply**

S12VR64LVB3 Jumper List and Description (*continued*...)

Jumper	Setting	Description
J10	NA	Measure point for motor's current. Connect a voltimeter here to compute current passing thru the motor.
J8	NA	SPI Header. Connect a 100 mils (separation between pins) header here to connect SPI devices.
J26	**pins 1–2 closed**	**PP0 powering D10**
	pins 3–4 closed	**PP1 powering D11**
	pins 5–6 closed	**PP2 (20 mA EVDD) powering to D12**