



# Quick Start Guide

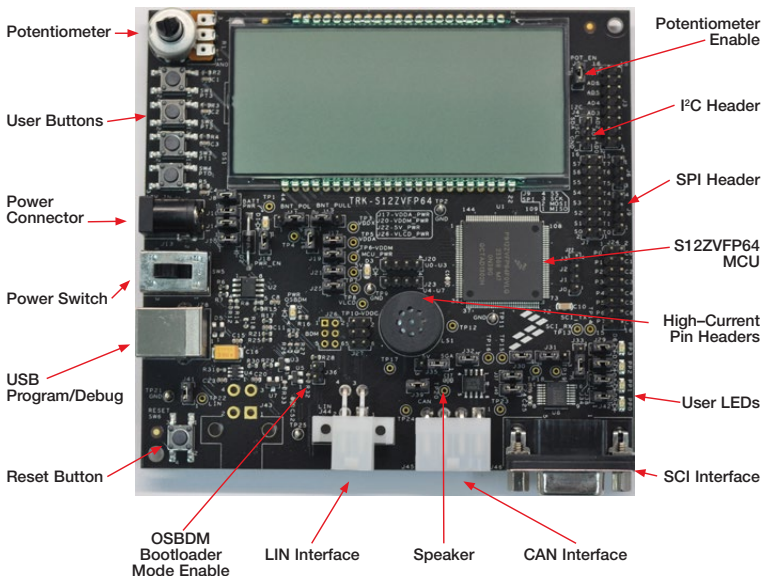
## TRK-S12ZVFP64

S12 MagniV MCU for Automotive Heating, Ventilation and Air Conditioning (HVAC) Applications





# Get to Know the TRK-S12ZVFP64

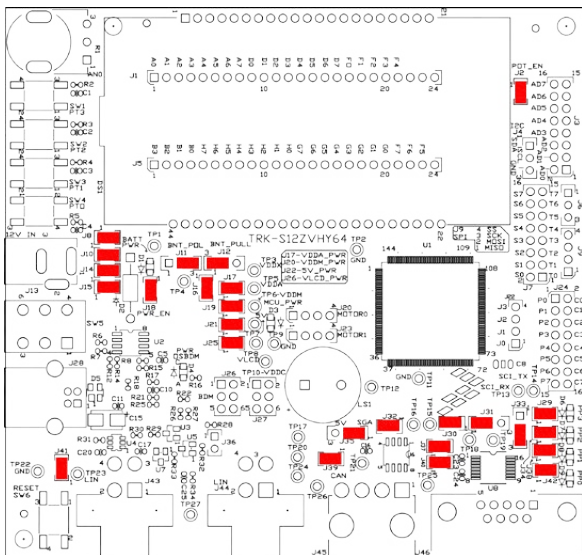


# Introduction and Default Settings

The TRK-S12ZVFP64 features the S12ZVFP64 MCU, an automotive 16-bit MCU for automotive heating, ventilation and air conditioning (HVAC) applications. The S12ZVFP64 MCU integrates an S12Z CPU, a LIN physical interface, a 5 V regulator system to supply the MCU, and an LCD controller on-chip.

The TRK-S12ZVFP64 board includes an onboard OSBDM programmer, a custom 160-segment LCD, LIN connector (attached to the internal LIN transceiver), a CAN physical transceiver and SCI physical transceiver. The board also features a speaker and dedicated headers for GPIOs, including the high-current pins.

This guide will show how to quickly connect the board to a host PC and execute a demonstration application preloaded into the flash memory. Default jumper positions of the TRK-S12ZVFP64 board are shown in the figure.



# Software Tools Installation

## 1 Install CodeWarrior Development Studio

Freescale's CodeWarrior for MCUs integrates the development tools for several architectures, including the S12Z architecture, into a single product based on the Eclipse open development platform. Eclipse offers an excellent framework for building software development environments and is a standard framework used by many embedded software vendors.

The latest version of CodeWarrior for MCUs (Eclipse IDE) can be downloaded from [freescale.com/CodeWarrior](http://freescale.com/CodeWarrior).

## 2 Launch the Demo Program

The DVD contains a CodeWarrior project to exercise the different modules of the S12ZVFP MCU family, including the ADC, TIM, LCD, key interrupts, SCI and CAN modules.

## Jumper Default Configuration

Jumper	Setting	Description
J2	1-2	Potentiometer enabled
J8	1-2	Switch 1 enabled
J10	1-2	Switch 2 enabled
J11	2-3	Switch signals high when pressed (5 V)
J12	1-2	Switch signals pulled down
J14	1-2	Switch 3 enabled
J15	1-2	Switch 4 enabled
J16	1-2	Connect VDDX to its ballast transistor output
J17	1-2	Connect VDDX to VDDA
J18	1-2	Connect VSUP to VBATT
J19	1-2	Connect VDDX to VDDM
J21	1-2	Connect VDDX to VDD5V (5 V supply for the rest of the board peripherals)
J25	1-2	Connect VDDX to VLCD
J29	1-2	LED PP3 enabled
J30	1-2	SCI physical transceiver enable
J31	1-2	MCU SCI module connected to SCI transceiver
J32	1-2	Speaker tone control enabled
J33	2-3	MCU SCI module connected to SCI transceiver
J34	1-2	LED PP2 enabled
J35	2-3	Speaker amplitude controlled by SGT pin
J37	1-2	Connect the CAN termination resistors to the CAN bus
J38	1-2	LED PP1 enabled
J39	1-2	Power the speaker amplification circuit
J40	1-2	Connect the SPLIT pin to the CAN bus
J41	1-2	LIN transceiver enabled
J42	1-2	LED PP0 enabled

# Jumper List and Description

Jumper	Description
J2	<b>Potentiometer enable</b> Closing this jumper connects the potentiometer signal to an ADC channel
J8	<b>Switch 1 enable</b> Closing this jumper connects the SW to the MCU
J10	<b>Switch 2 enable</b> Closing this jumper connects the SW to the MCU
J11	<b>Switch supply selector</b> Pins 1–2 closed: Switches connect to GND when pressed Pins 2–3 closed: Switches connect to 5 V when pressed
J12	<b>Switch pull direction selector</b> Pins 1–2 closed: Switches have pull-down resistors Pins 2–3 closed: Switches have pull-up resistors
J14	<b>Switch 3 enable</b> Closing this jumper connects the SW to the MCU
J15	<b>Switch 4 enable</b> Closing this jumper connects the SW to the MCU
J16	<b>VDDX ballast transistor to VDDX</b> Closing this jumper connects the VDDX ballast transistor output to the VDDX power bus
J17	<b>Connect VDDX to VDDA</b> Closing this jumper connects VDDX to VDDA
J18	<b>Connect VSUP to VBATT</b> Closing this jumper connects the 12 V input (VBATT) to the MCU (VSUP)
J19	<b>Connect VDDX to VDDM</b> Closing this jumper connects VDDX to VDDM
J21	<b>Connect VDDX to VDD5V</b> Closing this jumper connects VDDX to VDD5V (5 V power supply to other onboard peripherals)
J25	<b>Connect VDDX to VLCD</b> Closing this jumper connects VDDX to VLCD
J29	<b>LED PP3 enable</b> Closing this jumper connects the LED to the MCU



## Jumper List and Description, (cont.)

Jumper	Description
J30	<b>SCI transceiver power</b>
	Closing this jumper powers the SCI transceiver circuit
J31	<b>SCI TX Selector</b>
	Pins 1–2 closed: MCU SCI TX pin is connected to the virtual SCI module (via OSBDM)
	Pins 2–3 closed: MCU SCI TX pin is connected to SCI transceiver
J32	<b>Speaker tone control enable</b>
	Closing this jumper connects speaker amplifier to the MCU
J33	<b>SCI RX Selector</b>
	Pins 1–2 closed: MCU SCI RX pin is connected to SCI transceiver
	Pins 2–3 closed: MCU SCI RX pin is connected to the virtual SCI module (via OSBDM)
J34	<b>LED PP2 enable</b>
	Closing this jumper connects the LED to the MCU
J35	<b>Speaker amplitude control selector</b>
	Pins 1–2 closed: Speaker amplitude controlled by SGA pin
	Pins 2–3 closed: Speaker amplitude is fixed to 5 V (volume is controlled by SGT pin)
	<b>OSBDM operating mode selector</b>
J36	Pins 1–2 open: OSBDM in normal mode, programming and debugging capable
	Pins 1–2 closed: OSBDM on bootloader mode, only used for firmware update
J37	<b>CAN termination</b>
	Closing this jumper connects the CAN termination resistors to the CAN bus
J38	<b>LED PP1 enable</b>
	Closing this jumper connects the LED to the MCU
J39	<b>Speaker power</b>
	Closing this jumper powers the speaker amplification circuit
J40	<b>SPLIT</b>
	Closing this jumper connects the SPLIT pin to the CAN bus
J41	<b>LIN transceiver power</b>
	Closing this jumper powers the LIN transceiver
J42	<b>LED PP0 enable</b>
	Closing this jumper connects the LED to the MCU

# Headers and Connectors List

Header/ Connector	Description
J1	GPIO header (LCD replacement option), ports A, D and F
J3	GPIO header, port AD
J4	I <sup>2</sup> C header
J5	GPIO header (LCD replacement option), ports B, H, G and F
J6	Extended debug lines
J7	GPIO header, ports T and S
J9	SPI header
J13	Main power barrel connector (up to 18 V)
J20	High current pins header U0-U3
J23	High current pins header U4-U7
J24	GPIO header, ports P and C
J26	S12ZVH128 BDM port (external program and debug interface)—Main MCU
J27	S08JM60 BDM port (external program and debug interface)—OSBDM MCU
J28	OSBDM USB port for programming and debugging the main MCU
J43	LIN connector (not populated)
J44	LIN connector
J45	CAN connector
J46	SCI connector

## Peripheral List

Peripheral	ID	MCU Port	Description
Potentiometer	R1	AD0	Potentiometer connected to ADC channel 0
LED	D9	P0	Blue LED connected to port P0
	D8	P1	Blue LED connected to port P1
	D7	P2	Blue LED connected to port P2
	D6	P3	Blue LED connected to port P3
	D1	–	VBATT LED, ON when voltage is applied to the board
	D3	–	MCU PWR LED, ON when the MCU is regulating the input voltage to 5 V
	D4	–	OSBDM PWR LED, ON when OSBDM is successfully enumerated as USB device
Button	SW1	T3	Switch connected to port T3
	SW2	T2	Switch connected to port T2
	SW3	T1	Switch connected to port T1
	SW4	T0	Switch connected to port T0
	SW6	–	Reset switch

## Support

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

## Warranty

Visit **freescale.com/warranty** for complete warranty information.

For more information, visit  
**freescale.com/TRK-S12ZVFP64**

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