



## Quick Start Guide

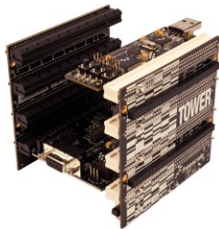
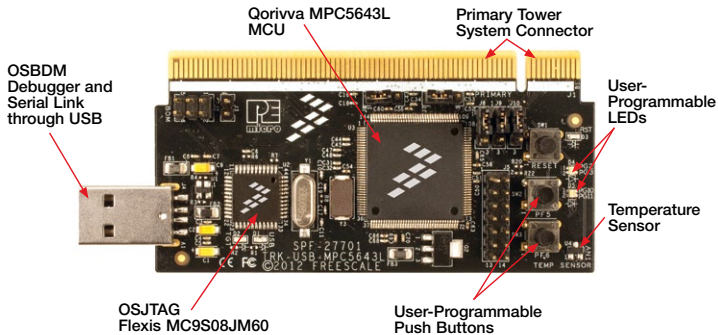
**TRK-USB-MPC5643L**

StarterTRAK USB for  
Automotive Safety Applications





## Get to know the TRK-USB-MPC5643L



### TRK-USB-MPC5643L Freescale StarterTRAK USB

The TRK-USB-MPC5643L kit is part of our StarterTRAK USB development platform. It is designed for you to easily and inexpensively give Freescale 32-bit Qorivva MCUs a test drive. This board can also be used in conjunction with the Freescale Tower System, allowing you to rapidly prototype designs with a growing portfolio of reconfigurable, modular tools.



## TRK-USB-MPC5643L Features

- Qorivva MPC5643L MCU
- Temperature sensor
- Primary Tower System connector
- Two bi-color, user-programmable LEDs
- Two user-programmable push buttons
- OSBDM debugger and serial connection through USB

# Step-by-Step Installation Instructions

This quick start guide details how to set up the TRK-USB-MPC5643L board and run some demo projects on the device.

## 1 Install Software and Tools

- Download and install the CodeWarrior Development Studio for MPC55xx/ MPC5xx V2.9 (Classic). Available at [freescale.com/TRK-USB-MPC5643L](http://freescale.com/TRK-USB-MPC5643L).

## 2 Connect Device to Computer

- Connect the USB board into an available port and allow the computer to automatically install the device drivers for the OSBDM module. CDC device drivers are required and may be obtained via the P&E Micro website (see Note 1 on next page). Once installed, you are ready to start coding and using the device.

### 3 Download Supporting Documentation

- Download the Qorivva Simple Cookbook and the MPC5643L reference manual from the downloads tab at **[freescale.com/TRK-USB-MPC5643L](https://www.freescale.com/TRK-USB-MPC5643L)**.

### 4 Explore Further

- Download the example projects and applications located under the downloads tab. These include the Qorivva Simple Cookbook examples, a TRK-USB-MPC5643L specific project and supporting Windows application. This application code utilizes the on-board temperature sensor switches and LEDs, as well as many on-chip peripherals. P&E CDC drivers will be required for this application.

Note 1: Updated drivers are required for full device functionality and are available on the P&E OSBDM website at **[pemicro.com/osbdm/index.cfm](https://www.pemicro.com/osbdm/index.cfm)**.



## On-Board Connections

The following tables show the available signals and connections of the TRK-USB-MPC5643L board.

### Jumpers

| Jumper | Option      | Setting | Description                           |
|--------|-------------|---------|---------------------------------------|
| J6     | LIN Tx      | 1-2     | LIN Tx to USB                         |
|        |             | 2-3     | LIN Tx to Tower                       |
| J7     | LIN Rx      | 1-2     | LIN Rx to USB                         |
|        |             | 2-3     | LIN Rx to Tower                       |
| J3     | OSBDM Flash | 1-2     | Allows Flashing of New OSBDM Firmware |

### Other Connections

| MCU Pin             | Signal          |
|---------------------|-----------------|
| Pin 5 (GPIO_PTF5)   | Switch SW2      |
| Pin 8 (GPIO_PTF6)   | Switch SW3      |
| Pin 47 (ADC_AN1)    | Temp Sensor     |
| Pin 102 (GPIO_PTG2) | Bi-Color LED D4 |
| Pin 104 (GPIO_PTG3) |                 |
| Pin 77 (GPIO_PTG10) | Bi-Color LED D5 |
| Pin 75 (GPIO_PTG11) |                 |

## Tower System Interface Connections

| PCI Connector | MCU Pin | Signal    |  | PCI Connector | MCU Pin | Signal     |
|---------------|---------|-----------|--|---------------|---------|------------|
| A1            | N/A     | 5 V       |  | B1            | N/A     | 5 V        |
| A2            | N/A     | GND       |  | B2            | N/A     | GND        |
| A3            | N/A     | 3.3 V     |  | B3            | N/A     | 3.3 V      |
| A4            | N/A     | 3.3 V     |  | B4            | N.C     |            |
| A5            | N/A     | GND       |  | B5            | N/A     | GND        |
| A6            | N/A     | GND       |  | B6            | N/A     | GND        |
| A7            | N.C     |           |  | B7            | Pin 2   | DSP11_SCK  |
| A8            | N.C     |           |  | B8            | Pin 79  | DSP11_CS1  |
| A9            | Pin 26  | GPIO_PTD9 |  | B9            | Pin 14  | DSP11_CS0  |
| A10           | Pin 32  | GPIO_PTD8 |  | B10           | Pin 10  | DSP11_SOUT |
| A11           | Pin 37  | GPIO_PTD7 |  | B11           | Pin 12  | DSP11_SIN  |
| A12           | N.C     |           |  | B12           | N.C     |            |
| A13           | N.C     |           |  | B13           | N.C     |            |
| A14           | N.C     |           |  | B14           | N.C     |            |



| PCI Connector | MCU Pin | Signal       |  | PCI Connector | MCU Pin | Signal       |
|---------------|---------|--------------|--|---------------|---------|--------------|
| A15           | N.C     |              |  | B15           | N.C     |              |
| A16           | N.C     |              |  | B16           | N.C     |              |
| A17           | N.C     |              |  | B17           | N.C     |              |
| A18           | N.C     |              |  | B18           | N.C     |              |
| A19           | N.C     |              |  | B19           | N.C     |              |
| A20           | N.C     |              |  | B20           | N.C     |              |
| A21           | N.C     |              |  | B21           | Pin 101 | GPIO_PTC13   |
| A22           | N.C     |              |  | B22           | Pin 103 | GPIO_PTC14   |
| A23           | N.C     |              |  | B23           | Pin 124 | GPIO_PTC15   |
| A24           | N.C     |              |  | B24           | N.C     |              |
| A25           | N.C     |              |  | B25           | N.C     |              |
| A26           | N/A     | GND          |  | B26           | N/A     | GND          |
| A27           | Pin 45  | ADC_AN3      |  | B27           | Pin 42  | ADC_AN7      |
| A28           | Pin 41  | ADC_AN2      |  | B28           | Pin 48  | ADC_AN6      |
| A29           | Pin 47  | ADC_AN1      |  | B29           | Pin 49  | ADC_AN5      |
| A30           | Pin 43  | ADC_AN0      |  | B30           | Pin 46  | ADC_AN4      |
| A31           | N/A     | GND          |  | B31           | N/A     | GND          |
| A32           | N.C     |              |  | B32           | N.C     |              |
| A33           | Pin 74  | ETIMER0_ETC1 |  | B33           | Pin 82  | ETIMER0_ETC5 |



| PCI Connector | MCU Pin | Signal            |  | PCI Connector | MCU Pin | Signal       |
|---------------|---------|-------------------|--|---------------|---------|--------------|
| A34           | Pin 73  | ETIMER0_ETC0      |  | B34           | Pin 80  | ETIMER0_ETC4 |
| A35           | Pin 34  | GPIO_PTD6         |  | B35           | Pin 129 | GPIO_PTD4    |
| A36           | N/A     | 3.3 V             |  | B36           | N/A     | 3.3 V        |
| A37           | Pin 122 | FLEXPWM0_B2_A2    |  | B37           | Pin 83  | FLEXPWM0_B3  |
| A38           | Pin 120 | FLEXPWM0_A2_A0    |  | B38           | Pin 98  | FLEXPWM0_A3  |
| A39           | Pin 118 | FLEMPWM0_B0_X2    |  | B39           | Pin 85  | FLEXPWM0_X3  |
| A40           | Pin 134 | FLEXPWM0_B3_FAULT |  | B40           | Pin 100 | FLEXPWM0_B2  |
| A41           | N.C     |                   |  | B41           | Pin 110 | CAN0_RXD     |
| A42           | N.C     |                   |  | B42           | Pin 109 | CAN0_TXD     |
| A43           | Pin 116 | LIN0_RXD          |  | B43           | N.C     |              |
| A44           | Pin 114 | LIN1_TXD          |  | B44           | Pin 15  | DSPIO_SIN    |
| A45           | VSSA    |                   |  | B45           | Pin 142 | DSPIO_SOUT   |
| A46           | VDDA    |                   |  | B46           | Pin 11  | DSPIO_CS0    |
| A47           | VDDA    |                   |  | B47           | Pin 81  | DSPIO_CS1    |
| A48           | VDDA    |                   |  | B48           | Pin 13  | DSPIO_SCK    |
| A49           | N/A     | GND               |  | B49           | N/A     | GND          |
| A50           | Pin 76  | GPIO_PTD10        |  | B50           | N.C     |              |
| A51           | Pin 78  | GPIO_PTD11        |  | B51           | N.C     |              |
| A52           | Pin 99  | GPIO_PTD12        |  | B52           | Pin 33  | GPIO_PTD5    |



| PCI Connector | MCU Pin | Signal       |  | PCI Connector | MCU Pin | Signal       |
|---------------|---------|--------------|--|---------------|---------|--------------|
| A53           | Pin 105 | GPIO_PTD14   |  | B53           | N.C     |              |
| A54           | N.C     |              |  | B54           | N.C     |              |
| A55           | N.C     |              |  | B55           | Pin 112 | EIRQ31_PTF13 |
| A56           | N.C     |              |  | B56           | Pin 106 | EIRQ30_PTF12 |
| A57           | N.C     |              |  | B57           | Pin 119 | EIRQ26_PTE14 |
| A58           | Pin 128 | ETIMER1_ETC4 |  | B58           | Pin 117 | EIRQ25_PTE13 |
| A59           | Pin 140 | ETIMER1_ETC3 |  | B59           | Pin 62  | EIRQ20_PTB15 |
| A60           | Pin 3   | ETIMER1_ETC2 |  | B60           | Pin 64  | EIRQ19_PTB14 |
| A61           | Pin 125 | ETIMER1_ETC1 |  | B61           | Pin 143 | EIRQ13_PTA14 |
| A62           | Pin 31  | MCU_RESET    |  | B62           | Pin 136 | EIRQ12_PTA13 |
| A63           | Pin 31  | MCU_RESET    |  | B63           | N.C     |              |
| A64           | N.C     |              |  | B64           | N.C     |              |
| A65           | N/A     | GND          |  | B65           | N/A     | GND          |
| A66           | N.C     |              |  | B66           | N.C     |              |
| A67           | N.C     |              |  | B67           | N.C     |              |
| A68           | N.C     |              |  | B68           | N.C     |              |
| A69           | N.C     |              |  | B69           | N.C     |              |
| A70           | N.C     |              |  | B70           | N.C     |              |
| A71           | N.C     |              |  | B71           | N.C     |              |

| PCI Connector | MCU Pin | Signal |  | PCI Connector | MCU Pin | Signal |
|---------------|---------|--------|--|---------------|---------|--------|
| A72           | N.C     |        |  | B72           | N.C     |        |
| A73           | N.C     |        |  | B73           | N.C     |        |
| A74           | N.C     |        |  | B74           | N.C     |        |
| A75           | N.C     |        |  | B75           | N.C     |        |
| A76           | N.C     |        |  | B76           | N.C     |        |
| A77           | N.C     |        |  | B77           | N.C     |        |
| A78           | N.C     |        |  | B78           | N.C     |        |
| A79           | N.C     |        |  | B79           | N.C     |        |
| A80           | N.C     |        |  | B80           | N.C     |        |
| A81           | N/A     | GND    |  | B81           | N/A     | GND    |
| A82           | N/A     | 3.3 V  |  | B82           | N/A     | 3.3 V  |



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