Quick Start Guide

TWR-KL46Z48M

Development Kit for Kinetis
KL46/36/34/26/16 MCU Families

freescale™

Step-by-Step Installation Instructions

In this quick start guide, you will learn how to set up the TWR-KL46Z48M module and run the included demonstrated software. For more detailed information, review the user manual at **freescale.com/TWR-KL46Z48M**.

1 Download Software and Tools

Download installation software and documentation under **"Jump Start Your Design"** at **freescale.com/TWR-KL46Z48M**.

2 Install Software and Tools

Install the OpenSDA Tower Toolkit to install the OpenSDA and USB-to-Serial drivers.

3 Configure the Hardware

Connect one end of the USB cable to the PC and the other end to the Power/OpenSDA mini-B connector on the TWR-KL46Z48M module. Allow the PC to automatically configure the USB drivers if needed.

4 Segment LCD

All segments are turned on for three seconds, then potentiometer readings are displayed.

5 Touch Electrodes

When board is picked up, the four LEDs will toggle in the direction of the inclination. Toggling frequency will increase as the tilt angle increases.

6 Move the Potentiometer

The TWRPI-SLCD shows the ADC reading.

7 Explore Further

Explore Kinetis KL46 MCU ultra-low-power modes and USB communication by conducting the additional labs located at **freescale.com/TWR-KL46Z48M**.
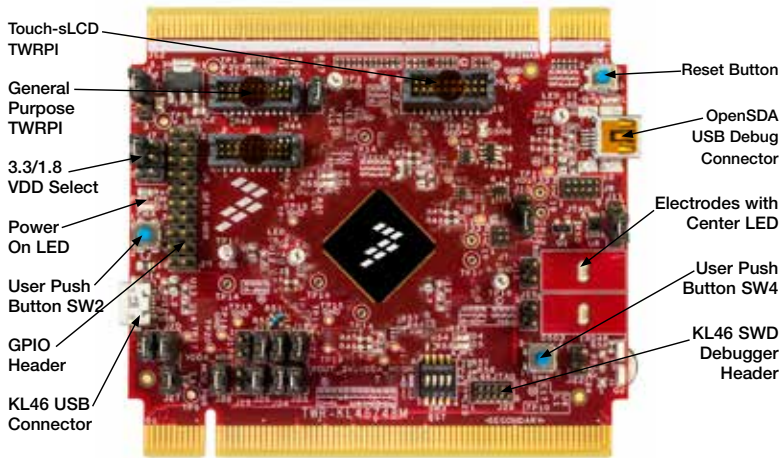
Get to Know the TWR-KL46Z48M

Touch-sLCD TWRPI

General Purpose TWRPI

3.3/1.8 VDD Select

Power On LED

User Push Button SW2

GPIO Header

KL46 USB Connector

Reset Button

OpenSDA USB Debug Connector

Electrodes with Center LED

User Push Button SW4

KL46 SWD Debugger Header

Figure 1: Front side of TWR-KL46Z48M module
(TWRPI device not attached)

Get to Know the TWR-KL46Z48M (continued)

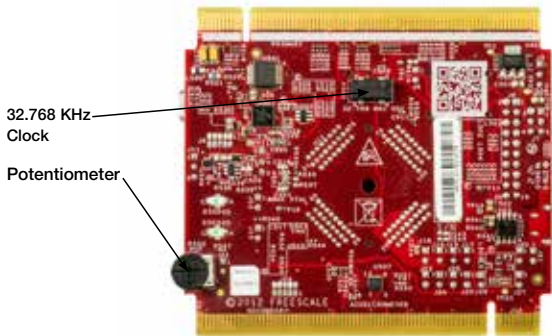**32.768 KHz Clock**

Potentiometer

Figure 2: Back side of TWR-KL46Z48M module

TWR-KL46Z48M
Freescale Tower System

The TWR-KL46Z48M MCU module is designed to work either in standalone mode or as part of the Freescale Tower System, a modular development platform that enables rapid prototyping and tool re-use through reconfigurable hardware. Take your design to the next level and begin constructing your Tower System today by visiting **freescale.com/Tower** for additional Tower System MCU modules and compatible peripherals.

TWR-KL46Z48M Features

- Tower System-compatible MCU module
- MKL46Z256VLL4 MCU (48 MHz, 256 KB flash, 32 KB RAM, low power, sLCD controller, 100 LQFP package
- Segment LCD module (TWRPI-SLCD)
- Dual role USB interface with Micro-AB USB connector
- Touch Tower plug-in socket
- General-purpose Tower plug-in (TWRPI) socket
- On-board debug circuit MK20D50 OpenSDA with virtual serial port
- Three axis accelerometer (MMA8451Q)
- Four (4) user-controllable LEDs
- Two (2) capacitive touch pads
- Two (2) user push buttons switch
- Infrared transmit and receive
- Potentiometer
- General-purpose pin header to directly access MCU signals

Tools

- Freescale CodeWarrior Development Studio for Microcontrollers V10.4 (CW-MCU10)
- IAR EWARM V6.50.6 or higher
- Processor Expert with MQX™ Lite integration available for CodeWarrior or a standalone for integrating generated code into other IDEs

TWR-KL46Z48M Jumper Options

The following is a list of all the jumper options. The default installed jumper settings are indicated by white text within the red boxes or bold text in the "Signal" column.

Jumper	Position	Signal	KL46 Pin Name
J3	1-2	BOARD POWER SELECTOR **1-2 P5V_TRG_USB** 2-3 VBUS_ELEV	
J19	1-2	MCU_POWER	
J4	1-2	**Reset** 1-2 RESET_B 2-3 RST_TGTMCU_B	
J7	1-3	V_BRD Voltage Selection **1-3 3.3V** 3-5 1.8V	
J27	1-2	V_BRD to MCU_POWER	
J28	1-2	VDDA_HDR to MCU_POWER enable	
J17	Open	VLL3 to VDD enable	VLL3
J16	Open	VOUT_3V3 to MCU_POWER	
J18	1-2	VREG_IN Selector **1-2 P5V_KL46_USB** 2-3 VBUS_ELEV	P5V_KL46_USB_L

Jumper	Position	Signal	KL46 Pin Name
J21	1-2	KL46_USB_FLGA	PTE31/FTM0_CH4
J20	1-2	KL46_USB_ENABLE	PTB11/SPI1_SCK
SW3	1-8 ON	LED Green	PTA17
SW3	7-2 ON	LED Red	PTB8
J13	1-2	LED Orange	PTE26/TPM0_CH5
J15	1-2	LED Yellow	PTA16
SW3	6-3 OFF	IR (Tx)	PTE22
SW3	5-4 OFF	IR (Rx)	PTE23
J24	1-2	Accelerometer SCL Enable	PTC10 I2C1_SCL
J26	1-2	Accelerometer SDA Enable	PTC11 I2C1_SDA
J23	Open	Accelerometer INT1 Enable	PTC5/LLWU_P9/SPI0_SCK/CMP0_OUT
J25	Open	Accelerometer INT2 Enable	PTC6/LLWU_P10/EXTRG_IN/SPI0_MISO
J10	2-3	2-3 UART2 Tx- OpenSDA 2-1 UART2 Tx Elevator	PTE16
J11	2-3	2-3 UART2 Rx– OpenSDA 2-1 UART2 Rx- Elevator	PTE17
J22	1-2	Potentiometer Enable	PTE29/ADC0_SE4B

Get Started

Download installation software and documentation under **"Jump Start Your Design"** at **freescale.com/TWR-KL46Z48M.**

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/Tower

Join the online Tower community at towergeeks.org