



Quick Start Guide

TWR-KL46Z48M

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



Energy Efficient Solutions
optimized for low power



TOWER SYSTEM

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.

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.

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.

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

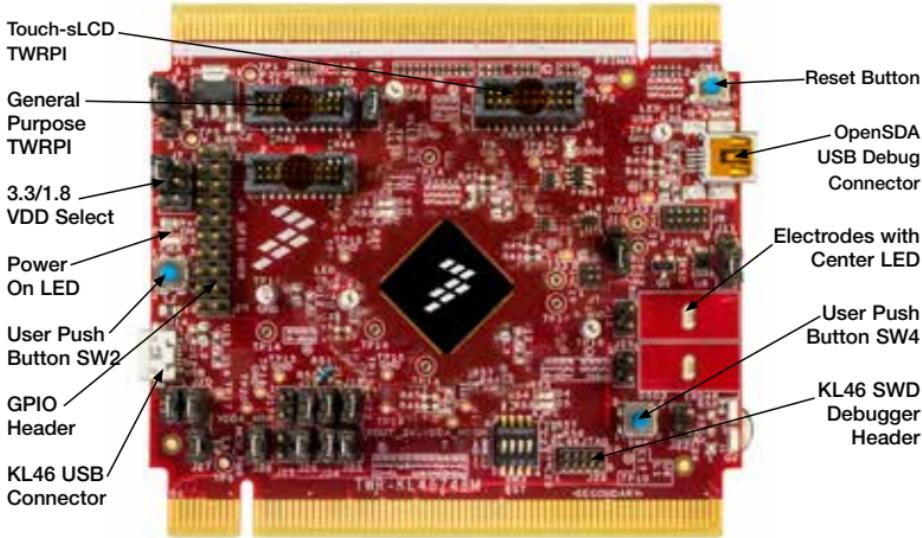


Figure 1: Front side of TWR-KL46Z48M module
(TWRPI device not attached)

Get to Know the TWR-KL46Z48M (continued)

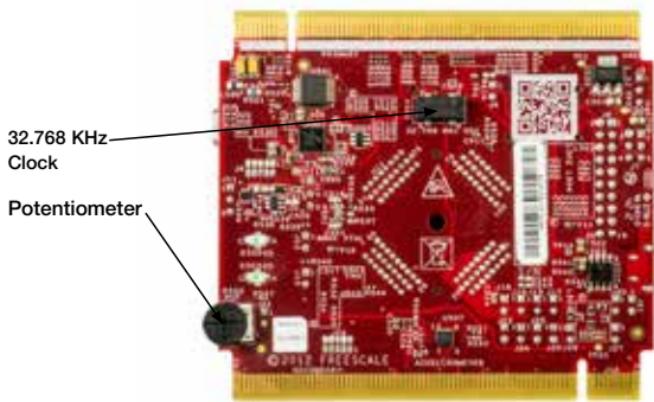


Figure 2: Back side of TWR-KL46Z48M module



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/ADCO_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

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