



TWR-K70F120M Quick Start Guide

High-Performance MCUs with Graphics
LCD, Connectivity and Security

Tower System
Development Board
Platform



Get to Know the TWR-K70F120M Board

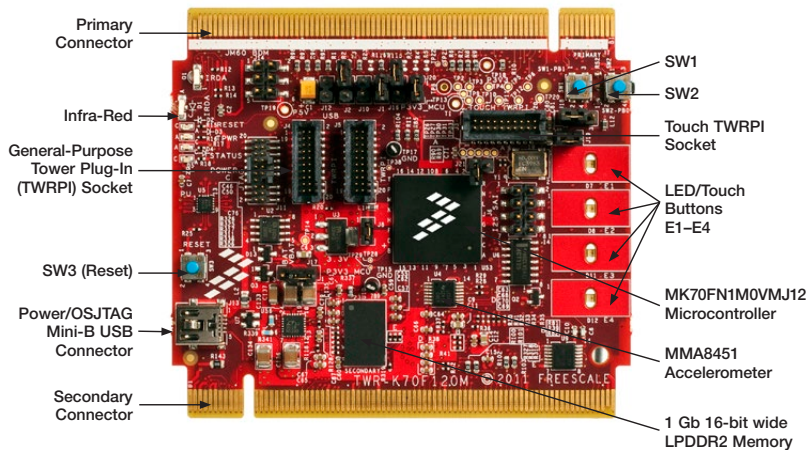


Figure 1: Front side of TWR-K70F120M board (TWRPI devices not shown)

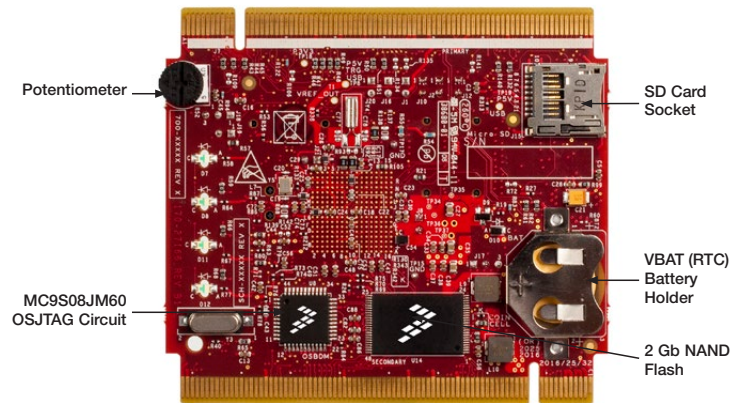


Figure 2: Back side of TWR-K70F120M board



TWR-K70F120M Freescale Tower System Development Board Platform

The TWR-K70F120M board is part of the Freescale Tower System, a modular development board platform that enables rapid prototyping and tool re-use through reconfigurable hardware. The TWR-K70F120M can be used with a broad selection of Tower System controller boards, including the new TWR-LCD-RGB which accepts RGB data from the K70 MCU graphics LCD controller.

TWR-K70F120M Features

- MK70FN1M0VMJ12 MCU (120 MHz, 1 MB flash, graphics LCD, Ethernet, USB OTG, tamper detection, encryption, NAND flash and DDR controller, 256 MBGA)
- Interfaces to the new TWR-LCD-RGB Tower peripheral module (accepts RGB data directly from the K70 MCU LCD controller)
- MC9S08JM60 open source JTAG (OSJTAG) circuit
- Micron MT47H64M16HR-25 1 Gb 16-bit wide LPDDR2 memory
- Micron MT29F2G16ABAEAWP 2 Gb NAND flash
- Four user-controlled status LEDs
- Four capacitive touchpads and two mechanical pushbuttons
- General-purpose TWRPI socket (Tower plug-in module)
- TWRPI-TOUCH-STR socket (touch-sensing Tower plug-in module)

Step-by-Step Installation Instructions

1 Install the Software and Tools

Install the P&E Micro Kinetis Tower toolkit. The toolkit includes the OSJTAG and USB to serial drivers. These can be found on the DVD under Software.

2 Configure the Hardware

Install the included battery into the VBAT (RTC) battery holder. Then, connect one end of the USB cable to the PC and the other end to the Power/OSJTAG mini-B connector on the TWR-K70F120M module. Allow the PC to automatically configure the USB drivers if needed.

3 Tilt the Board

Tilt the board side to side to see the LEDs on E1–E4 light up as it is tilted. While the board is held flat, touch the pads on E1–E4 to toggle the LEDs.

4 Play the Memory Game

Press **SW2** to play a memory recall game using the touchpads E1–E4. A sequence will light up, then press the touchpads in the order flashed. If an incorrect sequence is touched or too much time has elapsed, all the lights will blink rapidly and the game will reset.

Press **SW1** to return to the accelerometer demo.

5 Download the TWR-K70F120M User Manual and Demonstration Labs

Download the TWR-K70120M user manual and demonstration labs at freescale.com/TWR-K70F120M.

6 Download the Freescale CodeWarrior IDE and MQX™ RTOS

Download the Freescale CodeWarrior IDE and MQX RTOS by clicking on the relevant links on the Software tab of the Tower Kit DVD.

TWR-K70F120M Jumper Options

The following is a list of all the jumper options. The default installed jumper settings are indicated in the shaded boxes.

| Jumper | Option | Setting | Description |
|--------|------------------------------|---------|---|
| J8 | MCU Power Connection | ON | Connect on-board 3.3 V supply to MCU |
| | | OFF | Isolate MCU from power (connect an ammeter to measure current) |
| J20 | MCU VDD_INT Power Connection | ON | Connect VDD and VDD_INT rails together |
| | | OFF | Isolate MCU VDD_INT from power (connect an ammeter to measure current) |
| J17 | VBAT Power Selection | 1-2 | Connect VBAT to on-board 3.3 V supply |
| | | 2-3 | Connect VBAT to the higher voltage between onboard 3.3 V supply or coin-cell supply |
| J18 | Oscillator output enable | OFF | 50 MHz oscillator output enabled |
| | | ON | 50 MHz oscillator output disabled |
| J10 | OSJTAG Bootloader Selection | ON | OSJTAG bootloader mode (OSJTAG firmware reprogramming) |
| | | OFF | Debugger mode |

| Jumper | Option | Setting | Description |
|--------|-----------------------------|---------|--|
| J19 | 50 MHz Oscillator Power | ON | ON = onboard 50 MHz oscillator powered |
| | | OFF | OFF = onboard 50 MHz oscillator not powered* |
| J12 | JTAG Board Power Connection | ON | Connect onboard 5 V supply to JTAG port (supports powering board from JTAG pod supporting 5 V supply output) |
| | | OFF | Disconnect onboard 5 V supply to JTAG port |
| J2 | IR Transmitter Connection | ON | Connect PTD7/CMT_IRO to IR transmitter (D1) |
| | | OFF | Disconnect PTD7/CMT_IRO from IR transmitter (D1) |
| J16 | IR Receiver Connection | ON | Connect DAC1_OUT/CMP2_IN3 to IR receiver |
| | | OFF | Disconnect DAC1_OUT/CMP2_IN3 from IR receiver |
| J1 | VREGIN Power Connection | ON | Connect USB0_VBUS from elevator to VREGIN |
| | | OFF | Disconnect USB0_VBUS from elevator to VREGIN |

*NOTE: This option must be selected whenever a Tower System module card that provides a clock on primary elevator pin B24 is connected to the CPU module.

Visit freescale.com/TWR-K70F120M, freescale.com/K70 or freescale.com/Kinetis for information on the TWR-K70F120M module, including:

- TWR-K70F120M user guide
- TWR-K70F120M schematics
- Tower System fact sheet

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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