Quick Start Guide

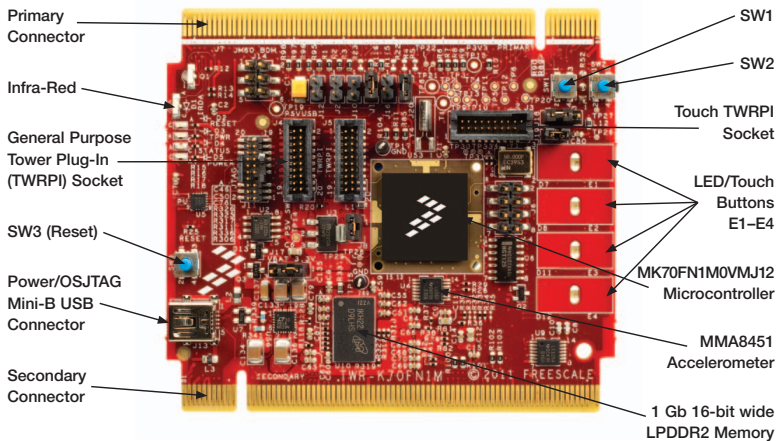## TWR-K70F120M
High-Performance MCUs with Graphics
LCD, Connectivity and Security

freescale

Get to Know the TWR-K70F120M

Primary Connector

Infra-Red

General Purpose Tower Plug-In (TWRPI) Socket

SW3 (Reset)

Power/OSJTAG Mini-B USB Connector

Secondary Connector

SW1

SW2

Touch TWRPI Socket

LED/Touch Buttons E1–E4

MK70FN1M0VMJ12 Microcontroller

MMA8451 Accelerometer

1 Gb 16-bit wide LPDDR2 Memory

Figure 1: Front side of TWR-K70F120M module (TWRPI devices not shown).
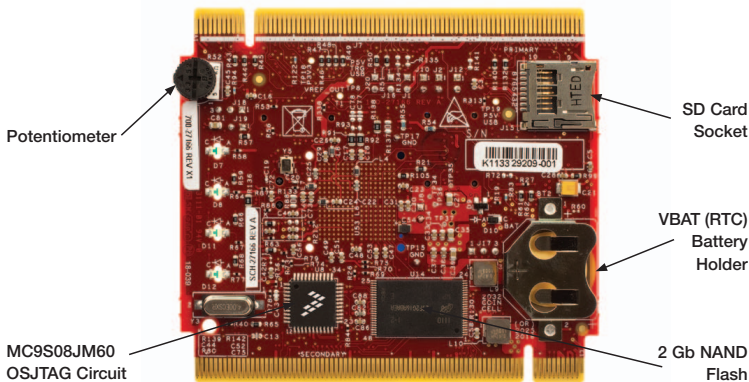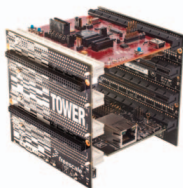
Figure 2: Back side of TWR-K70F120M module.

TWR-K70F120M
Freescale Tower System

The TWR-K70F120M module is part of the Freescale Tower System, a modular development 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 peripheral modules, including the new TWR-LCD-RGB which accepts RGB data from the K70 MCU graphics LCD controller.

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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 touch pads and two mechanical push buttons

- 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 touch pads E1–E4. A sequence will light up, then press the touch pads 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 jumper options. The default installed jumper settings are shown in white text within the red boxes.

Jumper	Option	Setting	Description
J8	MCU Power Connection	ON	Connect on-board 3.3-volt 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-volt supply
		2-3	Connect VBAT to the higher voltage between on-board 3.3-volt supply or coin-cell supply

TWR-K70F120M Jumper Options (continued)

Jumper	Option	Setting	Description
J18	Clock Input Source Selection	1-2	Connect main EXTAL to on-board 50 MHz clock
		2-3	Connect EXTAL to the CLKIN0 signal on the elevator connector
J10	OSJTAG Bootloader Selection	ON	OSJTAG bootloader mode (OSJTAG firmware reprogramming)
		OFF	Debugger mode
J19	50 MHz clock disable	ON	ON = on-board 50 MHz oscillator enabled
		OFF	OFF = on-board 50 MHz oscillator disabled
J12	JTAG Board Power Connection	ON	Connect on-board 5-volt supply to JTAG port (supports powering board from JTAG pod supporting 5-volt supply output)
		OFF	Disconnect on-board 5-volt 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

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

For more information, visit freescale.com/Tower

Join the online Tower community at towergeeks.org

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