8-, 16- and 32-bit Microcontrollers/Microprocessors

Freescale Tower System

Modular development platform

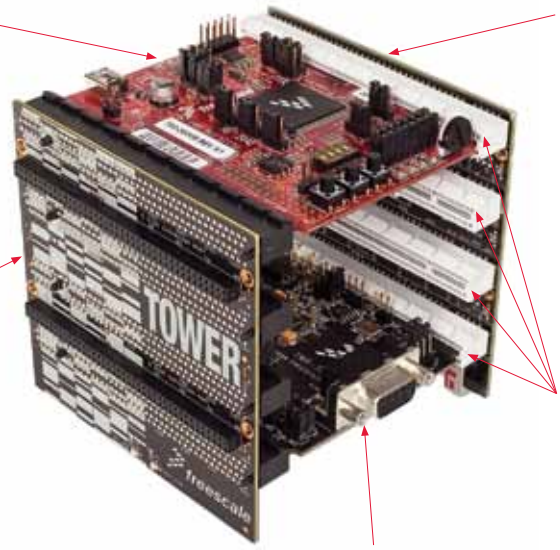
Overview

The Freescale Tower System is a modular development platform for 8-, 16- and 32-bit microcontrollers and microprocessors that enables advanced development through rapid prototyping. Featuring multiple development boards or modules, the Tower System provides designers with building blocks for entry-level to advanced microcontroller development.

Modular and Expandable

- Controller modules provide easy-to-use, reconfigurable hardware
- Interchangeable peripheral modules (including serial, memory and graphical LCD) make customization easy
- Open-source hardware and standardized specifications promote the development of additional modules for added functionality and customization

The Freescale Tower System



Controller Module

- Tower MCU/MPU board
- Works stand-alone or in Tower System
- Features integrated debugging interface for easy programming and run control via standard USB cable

Secondary Elevator

- Additional and secondary serial and expansion bus signals
- Standardized signal assignments
- Mounting holes and expansion connectors for side-mounting peripheral boards

Primary Elevator

- Common serial and expansion bus signals
- Two 2x80 connectors on backside for easy signal access and side-mounting board (LCD module)
- Power regulation circuitry
- Standardized signal assignments
- Mounting holes

Board Connectors

- Four card-edge connectors
- Uses PCI Express® connectors (x16, 90 mm/ 3.5" long, 164 pins)

Size

- Tower is approx. 3.5" H x 3.5" W x 3.5" D when fully assembled

Peripheral Module

- Examples include serial interface module, memory expansion module and Wi-Fi®

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Speeds Development Time

- Open source hardware and software allows quick development with proven designs
- Integrated debugging interface allows for easy programming and run-control via standard USB cable

Cost Effective

- Peripheral modules can be re-used with all Tower System controller modules, eliminating the need to purchase redundant hardware for future designs
- Enabling technologies like LCD, serial and memory interfacing are offered off-the-shelf at a low cost to provide a customized enablement solution

Software Enablement and Support

The increasing complexity of industrial applications and expanding functionality of semiconductors are driving embedded developers toward solutions that require the integration of proven hardware and software platforms. Freescale, along with a strong alliance network, offers comprehensive solutions, including development tools, debuggers, programmers and software.

Complimentary Software and Tools

- Freescale MQX™ RTOS, Ethernet, FileSystem, USB stacks and more*
- Freescale Linux® BSP*
- CodeWarrior Development Studio
- Processor Expert software: A rapid application development tool in the CodeWarrior tool suite
- Digital signal processing library: Provides algorithms optimized for the ColdFire architecture

* Visit freescale.com/software for a list of supported devices

Take Your Design to the Next Level

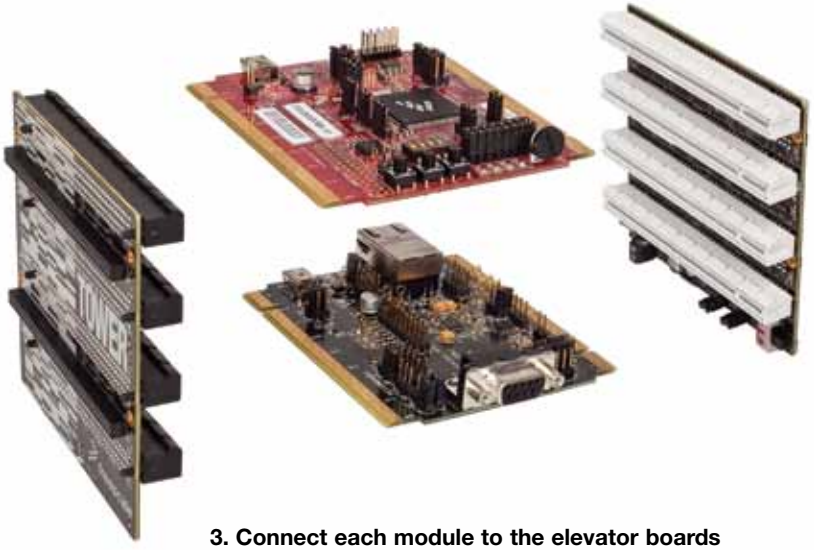
For a complete list of development kits and modules offered as part of the Freescale Tower System, please visit **freescale.com/Tower**.

Tower System Modules	
Features	**Benefits**
Controller Modules (8-, 16-, 32-bit)	
• Works stand-alone or as part of Tower System	• Allows rapid prototyping
• Features open source debugging interface	• Provides easy programming and run-control via standard USB cable
Peripheral Modules	
• Can be re-used with all Tower System controller modules	• Eliminates the need to buy/develop redundant hardware
• Interchangeable peripheral modules—serial, memory, graphical LCD, prototyping, sensor	• Enables advanced development and broad functionality
Elevator Boards	
• Two 2x80 connectors	• Provides easy signal access and side-mounting board (i.e. LCD module)
• Power regulation circuitry	• Provides power to all boards
• Standardized signal assignments	• Allows for customized peripheral module development
• Four card-edge connectors available	• Allows easy expansion using PCI Express connectors (x16, 90 mm/3.5” long, 164 pins)

Build Your System in Three Steps or Less

1. Choose a controller module

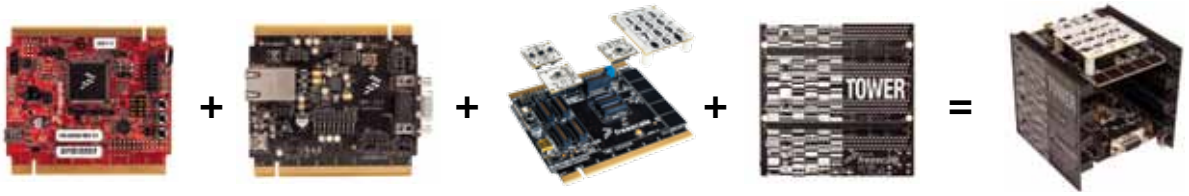
2. Choose peripheral modules
(up to three standard modules plus side-mounting module(s))



3. Connect each module to the elevator boards

TWR-MCF5225x + TWR-SER + TWR-ELEV = TWR-MCF5225X-KIT

Ultimate Connectivity Solution



TWR-MCF5225x + TWR-SER + TWR-SENSOR-PAK + TWR-ELEV = Tower Sensor Solution

Connectivity Solution with Sensors

TWR-MCF5225x + TWR-SER + TWR-LCD + TWR-ELEV = Tower LCD Solution

Connectivity Solution with Graphical LCD

Example Configurations

Partner Modules

Tap into a powerful ecosystem of Freescale technology alliances for building smarter, better connected solutions. Designed to help you shorten your design cycle and get your products to market faster, these technology alliances provide you with access to rich design tools, peripherals and world-class support and training.

A number of partners have developed modules for the Tower System. Some examples include the i.MX515 ARM® Cortex™-A8 Tower Computer Module and StackableUSB™ I/O Device Carrier module from Micro/sys, as well as the Rapid Prototyping System (RPS) AM1 and FM1 modules from iMN MicroControl.

A complete list of partner-developed modules is available at **freescale.com/Tower**.

Multiple Power Options

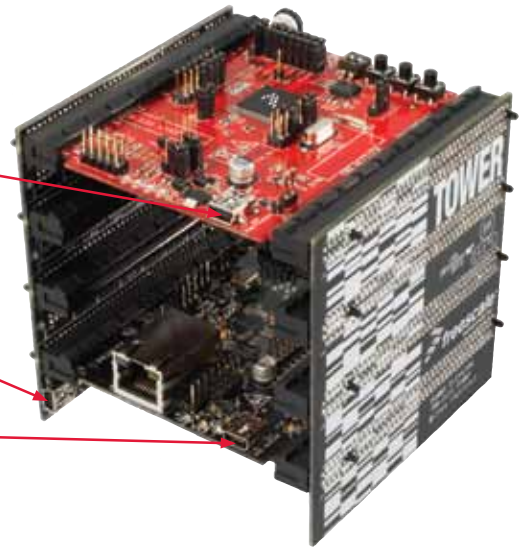
The Freescale Tower System can be powered entirely over a USB cable via a host PC or USB wall power adaptor. Alternatively, power can be supplied to the Tower via a screw terminal on the Primary Elevator.

Protection circuitry is built into all Tower System modules to avoid contention on the power rails. Although power can be supplied through any module, power supplied through the elevator modules takes precedence.

1. Processor module via debugger connection

2. Tower elevator

3. Peripheral module



All power connectors are standard USB connectors that can be powered by a USB host/hub or an AC-to-DC adapter with a USB cable.

Tower Geeks Online Community

TowerGeeks.org is an online design engineer community that allows members to interact, develop designs and share ideas. Offering a direct path to explore and interact with other engineers designing with the Tower System, **TowerGeeks.org** is a great way to discuss your projects, post videos of your progress, ask questions through the forum and upload software. With updates through **Twitter** and **Facebook**, it's easy to get involved.

Follow Tower Geeks on Twitter
twitter.com/towergeeks

Visit Freescale on Facebook
facebook.com/freescale

Available Tower System Modules

Controller Modules	Price	Features
• TWR-MCF51CN	$39	MCF51CN ColdFire V1 Ethernet module
• TWR-MCF5225X	$49	MCF5225X ColdFire V2 connectivity module
• TWR-S08LL64	$69	MC9S08LL64 8-bit segment LCD module
• TWR-S08LH64	$69	MC9S08LH64 8-bit segment LCD module with integrated 16-bit ADC
• TWR-MPC5125	$119	MPC5125 e300c4 module built on Power Architecture® technology
• TWR-MCF51MM	$59	MCF51MM ColdFire V1 microcontroller module designed for medical applications
• TWR-S08MM128	$59	MC9S08MM128 8-bit microcontroller module designed for medical applications
• TWR-MCF51JE	$69	MCF51JE ColdFire V1 USB microcontroller module
• TWR-MCF5441X	$139	MCF5441X ColdFire V4 connectivity module with dual Ethernet
• TWR-56F8257	$79	MC56F8257 DSC module
• TWR-K40X256	$69	K40X256 Kinetis module (based on ARM® Cortex™-M4 core) with full-speed USB 2.0 On-The-Go and segment LCD controller
• TWR-K60N512	$69	K60N512 Kinetis module (based on ARM Cortex-M4 core) with IEEE® 1588 Ethernet, full- and High-Speed USB 2.0 On-the-Go, hardware encryption and tamper detection
Peripheral Modules	**Price**	**Features**
• TWR-ELEV	$29	Elevator modules: Primary and secondary
• TWR-SER	$49	Serial module with RS232/RS485, Ethernet, CAN, USB
• TWR-SER2	$99	Enhanced serial module featuring dual Ethernet and High-Speed USB
• TWR-PROTO	$14.99	Prototyping module
• TWR-LCD	$99	Graphical LCD module with 3.2" QVGA display
• TWR-MEM	$89	Memory module with serial flash, MRAM, SD card and compact flash interfaces
• TWR-SENSOR-PAK	$149	Swappable sensor module with accelerometer, barometer and touch-sensing controller
• TWR-WIFI-RS2101	$69	802.11n Wi-Fi® board featuring Redpine Signals' RS9110-N-11-21 Connect-io-n™ Wi-Fi module on board
• TWR-WIFI-G1011MI	$69	802.11b Wi-Fi board featuring GainSpan's GS1011MIP Wi-Fi module on board
• MED-EKG	$NA	Sold as part of a complete kit, electrocardiograph sensor for medical applications
• TWR-ADCDAC-LTC	$119	Linear Technology analog module featuring high-precision ADCs and DACs
Complete Kits	**Price**	**Includes**
• TWR-MCF51CN-KIT	$99	TWR-MCF51CN, TWR-SER and TWR-ELEV modules
• TWR-MCF5225X-KIT	$119	TWR-MCF5225X, TWR-SER and TWR-ELEV modules
• TWR-S08LL64-KIT	$99	TWR-S08LL64, TWR-PROTO and TWR-ELEV modules
• TWR-S08LH64-KIT	$99	TWR-S08LH64, TWR-PROTO and TWR-ELEV modules
• TWR-MPC5125-KIT	$169	TWR-MPC5125, TWR-SER and TWR-ELEV modules
• TWR-MCF51MM-KIT	$149	TWR-MCF51MM, TWR-SER, TWR-ELEV and MED-EKG modules
• TWR-S08MM128-KIT	$149	TWR-S08MM128, TWR-SER, TWR-ELEV and MED-EKG modules
• TWR-MCF51JE-KIT	$119	TWR-MCF51JE-KIT, TWR-SER and TWR-ELEV modules
• TWR-MCF5441X-KIT	$259	TWR-MCF5441X, TWR-SER2 and TWR-ELEV modules
• TWR-K40X256-KIT	$139	TWR-K40X256, TWR-SER and TWR-ELEV modules
• TWR-K60N512-KIT	$139	TWR-K60N512, TWR-SER and TWR-ELEV modules
• TWR-K60N512-IAR	$239	TWR-K60N512-KIT, TWR-PROTO, IAR J-Link (Lite) Debug Probe

Note: All prices indicated are MSRP.

Learn More: For more information about the Freescale Tower System, please visit **freescale.com/Tower**.

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