freescale™
Tower System

8-, 16- and 32-bit MCUs/MPUs

Freescale Tower System Development Board Platform

Overview

The Freescale Tower System is an evaluation board platform for 8-, 16- and 32-bit MCUs and MPUs that enables advanced development through rapid prototyping. Featuring more than fifty development boards or modules, the Tower System provides designers with building blocks for entry-level to advanced MCU development.

The Freescale Tower System

Tower Plug-In (TWRPI)

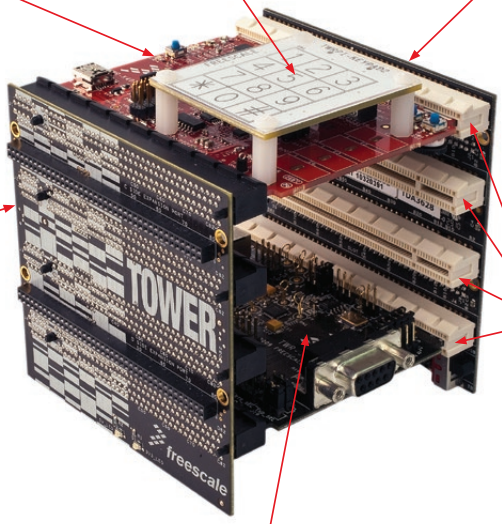
- Designed to attach to boards that have a TWRPI socket(s)
- Adds features and functionality
- Swappable with other TWRPIs
- Examples include accelerometers, key pads, touchpads, sliders and rotary touchpads

Controller/ Processor Board (MCU/MPU)

- Tower MCU/MPU board
- Works standalone 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



Primary Elevator

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

Size

- Fully assembled Tower System is approx. 3.5" H x 3.5" W x 3.5" D

Board Connectors

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

Peripheral Board

- Adds features and functionality to your designs
- Interchangeable with other peripheral boards and compatible with all controller/processor boards
- Examples include serial interface, memory, Wi-Fi®, graphical LCD, motor control, audio, Xtrinsic sensing and high-precision analog boards

Modular and Expandable

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

Speeds Development Time

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

Cost Effective

- Interchangeable peripheral boards can be re-used with all Tower System controller boards, eliminating the need to purchase redundant hardware for future designs
- Enabling technologies like LCD, Wi-Fi, motor control, 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, TCP/IP stacks, file system, USB stacks and more*
- Freescale Linux® BSP*
- CodeWarrior Development Studio
- Processor Expert software configuration tool: Create, configure, optimize, migrate and deliver software components that generate source code for Freescale silicon
- Freescale eGUI: Graphical LCD driver for MCUs and eMPUs

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

Tower System Modules

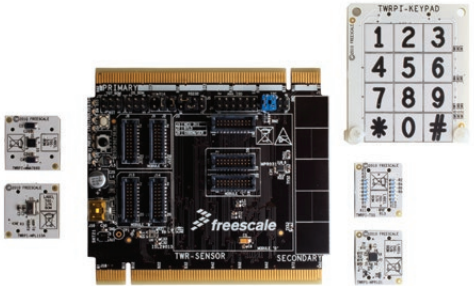
Controller/Processor Modules (8-, 16-, 32-bit) freescale.com/Towercontroller	
• Works standalone or as part of Tower System	• Allows rapid prototyping
• Features open source debugging interface	• Provides easy programming and run control via standard USB cable
Peripheral Modules freescale.com/Towerperipheral	
• Can be re-used with all Tower System controller boards	• Eliminates the need to buy/develop redundant hardware
• Interchangeable peripheral boards: serial, memory, graphical LCD, prototyping, sensor	• Enables advanced development and broad functionality
Tower Plug-Ins freescale.com/TWRPI	
• Designed to attach to any Tower System board with a TWRPI socket(s)	• Adds features and functionality with little investment
• Swappable components	• Allows for design flexibility
Elevator Modules freescale.com/Towerelev	
• Two 2x80 connectors	• Provides easy signal access and side-mounting board (i.e., LCD board)
• Power regulation circuitry	• Provides power to all boards
• Standardized signal assignments	• Allows for customized peripheral board development
• Four card-edge connectors available	• Allows easy expansion using PCI Express® connectors (x16, 90 mm/3.5" long, 164 pins)

Build Your Tower System in Three Steps or Less

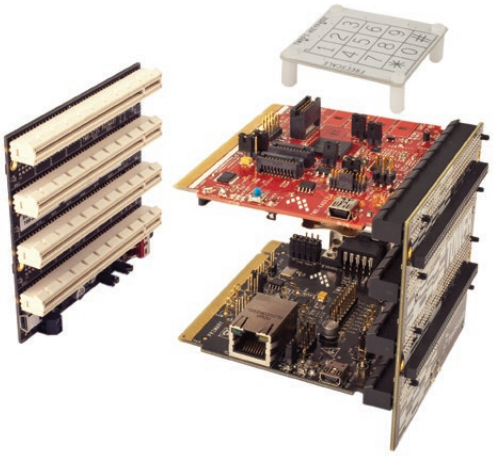
Each assembled Tower System will accommodate:

- One controller/processor board
- Up to three peripheral boards
- One or more additional side mounting peripheral boards
- Multiple Tower plug-ins (TWRPIs)
- Two elevator boards (or risers)

1. Choose a controller/ processor module



2. Choose peripheral boards and desired Tower plug-ins (TWRPIs)



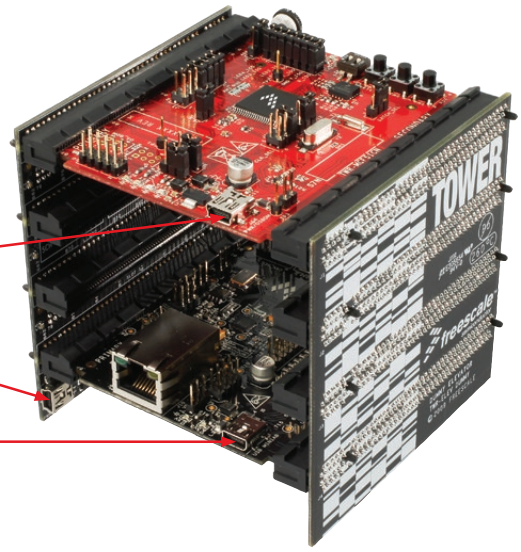
3. Connect each module to the elevator boards

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 System via a screw terminal on the primary elevator.

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

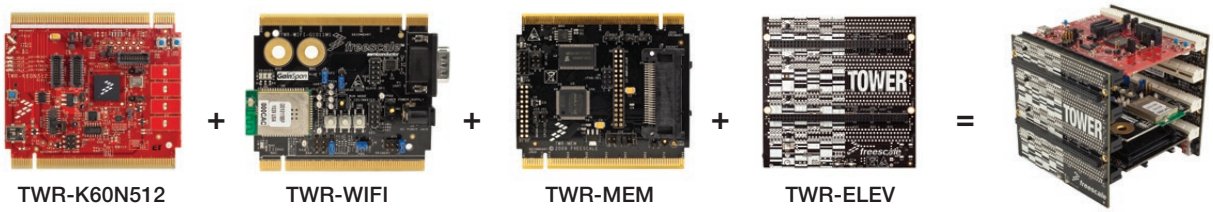
All power connectors are standard USB connectors that can be powered by a USB host/hub or an AC-to-DC adapter with a USB cable.



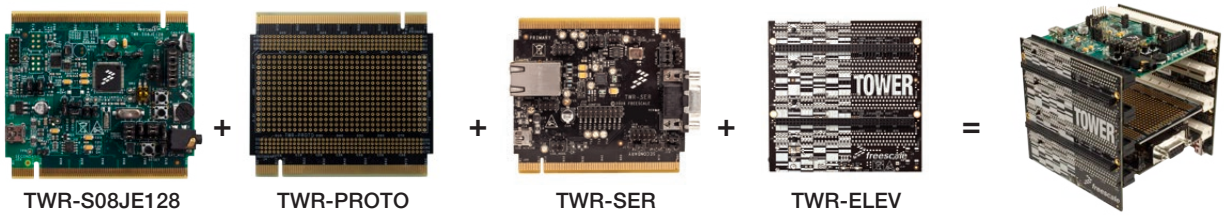
Example Configurations

Sensors Solution

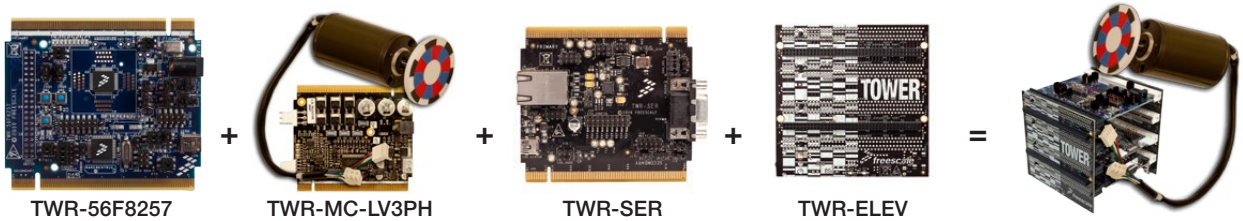
Multimedia Solution



Wi-Fi Solution



Medical Prototyping Solution



Motor Control Solution

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 development board platform. 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**.

Design Your Own

Interested in designing your own Tower System board? View application note AN4390 “Creating Your Own Tower Module” for a complete guide to starting your board design available at **freescale.com/Tower**.

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

Watch the **Tower System** video here.

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

Document Number: TWRFS REV 17