Quick Start Guide

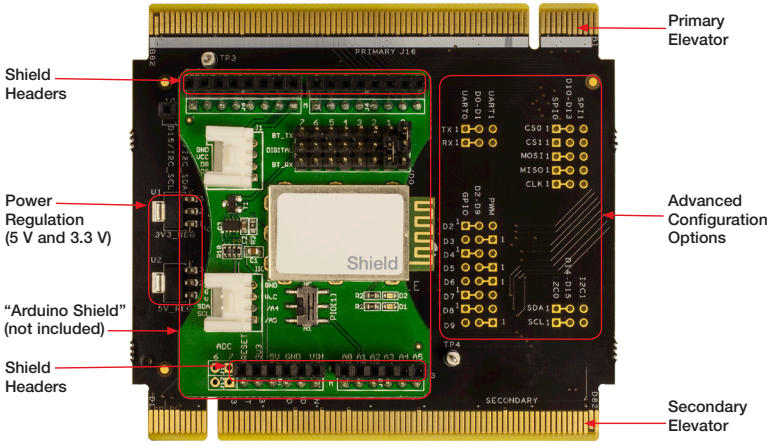
TWR-SHIELD

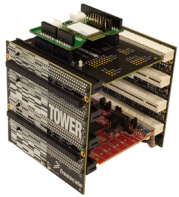
Shield Adapter Module for the Tower System

freescale™

TOWER SYSTEM

Get to Know the TWR-SHIELD





TWR-SHIELD
Freescale Tower System

The TWR-SHIELD module is part of the Freescale Tower System, a modular development platform that enables rapid prototyping and tool re-use through reconfigurable hardware. This module allows commercially available Arduino Shields to be incorporated into the Tower System. Take your design to the next level and begin prototyping with your Tower System today.

TWR-SHIELD Features

- Arduino Shield (R3 Compatible) headers
- On-board power regulation (3.3 V and 5 V)
  - Recommended input voltage: 7–12 V
  - Input Voltage Range Limits: 6–20 V
- Default signal configuration for ease of integration with the Freescale Tower System
- Flexible advanced signal configuration options and signal access

Step-by-Step Instructions

1 Configure Jumpers

The TWR-SHIELD comes preconfigured to accommodate basic interfacing with a Freescale Tower System controller module. If modifications are required, the small trace between the default connections can be cut and wire can be soldered in place to make the modified signal routing. Additionally a 3-pin header can be soldered in place to allow for increased flexibility. Refer to the TWR-SHIELD User Manual for details.

2 Attach Shield

With the correct signals routing identified, connect your R3 Compatible Shield to the TWR-SHIELD. Shields headers have a unique spacing that will aid in determining the correct orientation.

3 Assemble and Power Your Tower System

Assemble your Tower System, including a Tower System controller module, the TWR-SHIELD peripheral module and the shield(s) of your choice. Refer to the assembly instructions provided with the TWR-ELEV module for correct orientation and assembly of the boards. The Tower System can be powered using one of the standard powering methods or using the Vin pin of the shield header. The Vin pin will accept a 6–20 V input voltage and provide the necessary 5 V and 3.3 V to the entire Tower System assembly.

4 Refer to Additional Materials

Many existing MQX™ software example projects can be adapted to utilize the basic I/O interfaces featured on most peripheral shield modules (e.g., UART, I^2C, GPIO, ADC, etc.). Reference the TWR-SHIELD user manual and the latest MQX release notes for details.

TWR-SHIELD Jumper Options

The following is a list of configuration options. The preconfigured settings are shown in white text within the black boxes.

Option Name	Header Signal	Left Connection	Right Connection
TX	UART_TX / D0	UART0 RX (A41)	UART1 RX (A43)
RX	UART_RX / D1	UART0 TX (A42)	UART1 TX (A44)
D2	D2	GPIO (B21)	PWM (B40)
D3	D3	GPIO (B22)	PWM (A40)
D4	D4	GPIO (A9)	PWM (B39)
D5	D5	GPIO (B23)	PWM (A39)
D6	D6	GPIO (B35)	PWM (A38)
D7	D7	GPIO (A10)	PWM (B38)
D8	D8	GPIO (A11)	PWM (B37)
D9	D9	GPIO (B52)	PWM (A37)
CS0	D10/SPI_CS	SPI0_CS0 (B47)	SPI1_CS0 (B9)
CS1	D10/SPI_CS	SPI0_CS1 (B46)	SPI1_CS1 (B8)
MOSI	D11/SPI_MOSI	SPI0_MOSI (B45)	SPI1_MOSI (B10)
MISO	D12/SPI_MISO	SPI0_MISO (B44)	SPI1_MISO (B11)
CLK	D13/SPI_CLK	SPI0_SCK (B48)	SPI1_SCK (B7)
SDA	D14/I2C_SDA	I^2C0_SDA (A8)	I^2C1_SDA (B51)
SCL	D15/I2C_SCL	I^2C0_SCL (A7)	I^2C1_SCK (B50)

TWR-SHIELD Header Descriptions

The following is a list of all available headers and their descriptions

Header	Pin Number	Pin Name	Description
J1	1	UART_TX / D0	Serial UART Peripheral Transmit Signal
	2	UART_RX / D1	Serial UART Peripheral Receive Signal
	3	D2	GPIO or PWM
	4	D3	GPIO or PWM
	5	D4	GPIO or PWM
	6	D5	GPIO or PWM
	7	D6	GPIO or PWM
	8	D7	GPIO or PWM
J2	1	D8	GPIO or PWM
	2	D9	GPIO or PWM
	3	D10 / SPI_CS	SPI Chip Select/Slave Select
	4	D11 / SPI_MOSI	SPI Master Data Output Signal
	5	D12 / SPI_MISO	SPI Master Data Input Signal
	6	D13 / SPI_CLK	SPI Data Clock Signal
	7	GND	Ground
	8	VREF	Voltage Reference Signal
	9	D14/I²C_SDA	I²C Data Signal
	10	D15/I²C_SCL	I²C Clock Signal

TWR-SHIELD Header Descriptions continued

The following is a list of all available headers and their descriptions

Header	Pin Number	Pin Name	Description
J3	1	A5	ADC Signal
	2	A4	ADC Signal
	3	A3	ADC Signal
	4	A2	ADC Signal
	5	A1	ADC Signal
	6	A0	ADC Signal
J4	1		Not used
	2	3V3	3.3 Voltage Signal
	3	RST	Reset Signal (GPIO controlled)
	4	3V3	3.3 Voltage Signal
	5	5V	5 Voltage Signal
	6	GND	Ground
	7	GND	Ground
	8	VIN	Voltage Input (6–20 V)
J20	1	VIN Source from Header	Cut-trace located on bottom of board. The trace can be cut to isolate power regulators from VIN.
	2	VIN Sink to Regulators	

Visit **freescale.com/Tower or freescale.com/TWR-SHIELD** for information on the TWR-SHIELD module, including:

- TWR-SHIELD user guide
- TWR-SHIELD 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, please visit freescale.com/Tower

Join the online Tower community at towergeeks.org

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