# Quick Start Guide

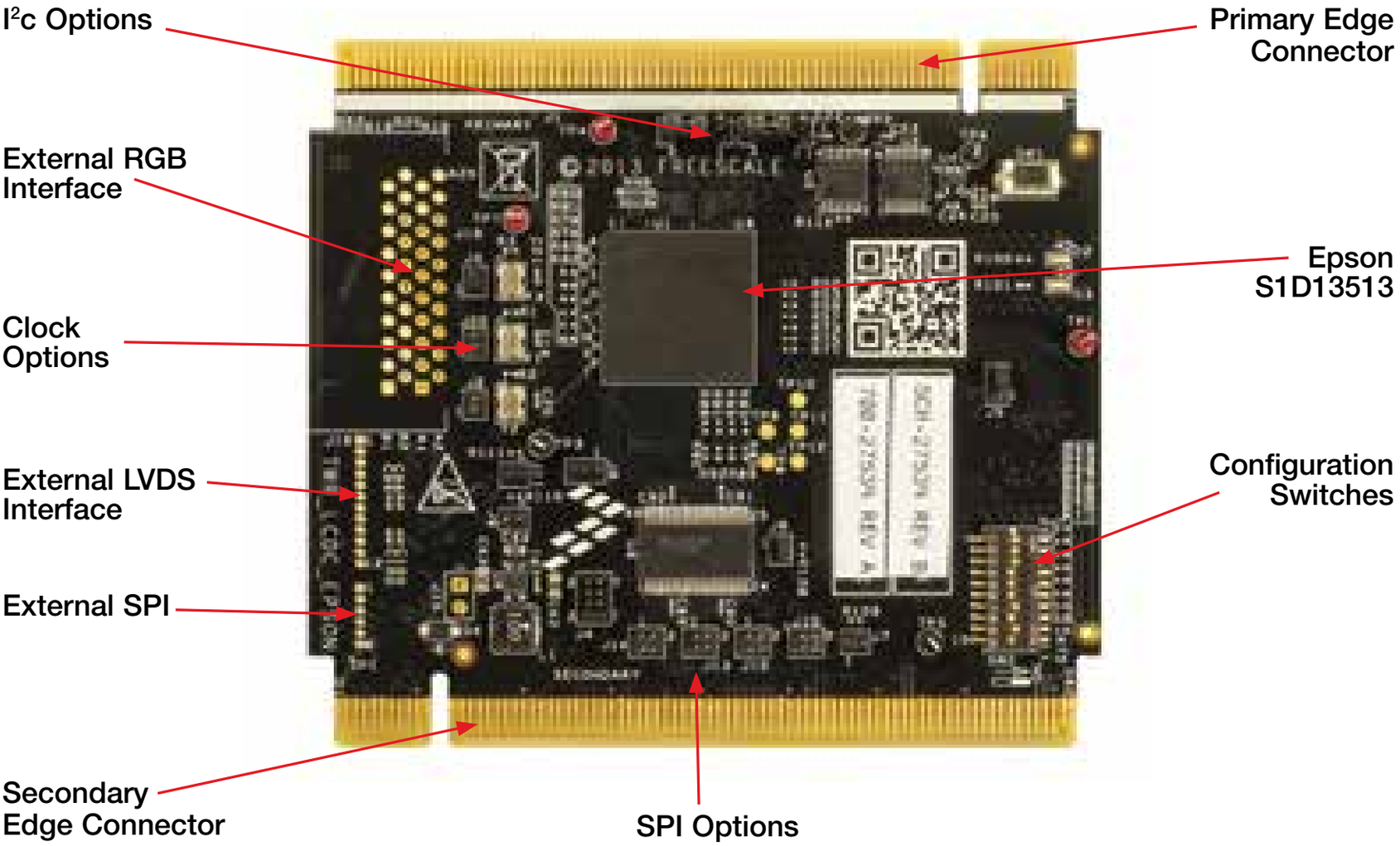
## TWR-LCDC-EPSON

Epson Display Controller Module

freescale™

TOWER SYSTEM

# Get to Know the TWR-LCDC-EPSON



## TWR-LCDC-EPSON Freescale Tower System

The TWR-LCDC-EPSON module is part of the Freescale Tower System portfolio, a modular development platform that enables rapid prototyping and tool re-use through reconfigurable hardware. Elevate your design to the next level with this industrial power house by building your Tower System today.

# TWR-LCDC-EPSON Features

- Features the Epson S1D13513 display controller
- Onboard SDRAM
- Interfaces with a Tower System controller module via the parallel external memory interface (EBI)
- Interfaces directly with the TWR-LCD-RGB
- Optional interfaces for externally connected RGB or LVDS display panels
- Selectable SPI and $I^2C$ pass-through interfaces for LCD/touch configurations

# Step-by-Step Installation Instructions

## 1 Assemble the Tower System

The default example application assumes the following Tower assembly: TWR-ELEV + TWR-K60D100M + TWR-LCD-RGB + TWR-LCDC-EPSON

Ensure that the Tower System modules are properly aligned to the primary and secondary edges, with the TWR-LCD-RGB attached to the secondary side.

## 2 Program the Tower System Controller

Using an IDE compatible with the TWR-K60D100M, such as CodeWarrior, follow the respective flashing instruction included with the default example application.

## 3 Interact with the Graphical User Interface

The default example application features a simple GUI developed using PEG and featuring the CRTouch to provide touch inputs.

## 4 Learn More

Refer to **freescale.com/TWR-LCDC-EPSON** for additional information, including a request link for a PEG evaluation based on the TWR-LCDC-EPSON pre-compiled PEG library.

# TWR-LCDC-EPSON Jumper Settings

| Jumper | Option | Setting | Description |
|---|---|---|---|
| J2 | 27 MHz OSC Disable | 1-2 | Disables the onboard 27 MHz oscillator connected to S1D13513 OSCI2 |
| J3 | 10 MHz OSC Disable | 1-2 | Disables the onboard 10 MHz oscillator connected to S1D13513 CLKI3 |
| J4 | External LED Back Light Configuration | **1-2** | Disables external LED Backlight (signals routed to J15 for off-board use) |
| | | 3-4 | 3-4 short, 5-6 open, 7-8 open: 20 mA load |
| | | 5-6 | 3-4 short, 5-6 short, 7-8 open: 40 mA load |
| | | 7-8 | 3-4 short, 5-6 short, 7-8 short: 60 mA load |
| J5 | SDRAM Width Select | 1-2 | x32 SDRAM (32 MB) |
| | | **2-3** | X64 SDRAM (64 MB) |
| J6 | Enable RGB Interface | **1-2** | Enables the RGB interface to the Tower System elevator, additionally signals are routed to J19 for off-board use |
| J7 | LCD Enable Signal (TWR-LCD-RGB) | 1-2 | LCD enable signal for the TWR-LCD-RGB. J7 is actively pulled high, shunting connects the LCD enable to GND |

# TWR-LCDC-EPSON Jumper Settings

Continued

| Jumper | Option | Setting | Description |
|---|---|---|---|
| J8 | SPI CS Inverter Enable | 1-2 | Inverts the S1D13513 GPIO0 signal (refer to the S1D1513 for usage details) |
| | | **2-3** | Direct connection of the S1D13513 GPIO0 signal |
| J9 | External LVDS Data Strobe Polarity | 1-2 | Unshunted: Rising edge data strobe<br><br>Shunted: Falling edge data strobe |
| J10 | SPI CS Routing Configuration | **1-2** | Routes the S1D13513 GPIO0 signal to JP1 (pin 1) for off-board use |
| | | **3-4** | Routes the primary elevator SPI1 to the secondary elevator SPI2 |
| | | 1-3 | Routes the S1D13513 GPIO0 signal to secondary elevator SPI2 CS |
| | | 2-4 | Routes the primary elevator SPI1 CS to JP1 (pin 1) for off-board use |
| J11 | External LVDS Disable | **1-2** | Disables the LVDS transmitter (signals routed to J16 for off-board use) |

# TWR-LCDC-EPSON Jumper Settings

Continued

| Jumper | Option | Setting | Description |
|---|---|---|---|
| J12 | SPI CLK Routing Configuration | 1-2 | Routes the S1D13513 GPIO1 signal to JP1 (pin 2) for off-board use |
| | | 3-4 | Routes the primary elevator SPI1 to the secondary elevator SPI2 |
| | | 1-3 | Routes the S1D13513 GPIO1 signal to secondary elevator SPI2 CLK |
| | | 2-4 | Routes the primary elevator SPI1 CLK to JP1 (pin 2) for off-board use |
| J13 | SPI MOSI Routing Configuration | 1-2 | Routes the S1D13513 GPIO2 signal to JP1 (pin 2) for off-board use |
| | | 3-4 | Routes the primary elevator SPI1 to the secondary elevator SPI2 |
| | | 1-3 | Routes the S1D13513 GPIO2 signal to secondary elevator SPI2 MOSI |
| | | 2-4 | Routes the primary elevator SPI1 MOSI to JP1 (pin 2) for off-board use |

# TWR-LCDC-EPSON Jumper Settings

Continued

| Jumper | Option | Setting | Description |
|---|---|---|---|
| J14 | SPI MISO Routing Configuration | 1-2 | Routes the S1D13513 GPIO3 signal to JP1 (pin 2) for off-board use |
| | | 3-4 | Routes the primary elevator SPI1 to the secondary elevator SPI2 |
| | | 1-3 | Routes the S1D13513 GPIO3 signal to secondary elevator SPI2 MISO |
| | | 2-4 | Routes the primary elevator SPI1 MISO to JP1 (Pin 2) for off-board use |
| J17 | $I^2C$ (SDA) Pass-Thru Selection | 1-2 | Routes the primary elevator I2C0 to secondary elevator $I^2C2$ |
| | | 2-3 | Routes the primary elevator I2C1 to secondary elevator $I^2C2$ |
| J18 | $I^2C$ (SCL) Pass-Through Selection | 1-2 | Routes the primary elevator I2C0 to secondary elevator $I^2C2$ |
| | | 2-3 | Routes the primary elevator $I^2C1$ to secondary elevator $I^2C2$ |
| J20 | 10 MHz OSC Disable | 1-2 | Disables the onboard 10 MHz oscillator connected to S1D13513 OSCI1 |

# TWR-LCDC-EPSON Switch Settings

| Switch | Option | Setting | Description |
|---|---|---|---|
| SW1 | Reset | Push | Resets the S1D13513 |
| SW2 [1:5] | S1D13513 Host Bus Interface Settings | 1<br>2<br>3 | Maps to S1D13513 CNF[0:4] (ON = 1 / OFF = 0) Default setting for Tower System is [On,On,On,Off,Off] Corresponding to Parallel Direct 68 bus interface |
| | | 4 | |
| | | 5 | |
| SW2 [6] | S1D13513 Endianness Setting | 6 | Maps to S1D13513 CNF[5] (ON = 1 / OFF = 0) Default setting for Tower System is [Off] Corresponding to Little Endian mode |
| SW2 [7] | S1D13513 Configuration Mode | 7 | Maps to S1D13513 CNF[6] (ON = 1 / OFF = 0) Default setting for Tower System is [On] |

# TWR-LCDC-EPSON Jumper Settings

Continued

| Jumper | Option | Setting | Description |
|---|---|---|---|
| SW2 [8:9] | S1D13513 PLL Clock Source | 8 | Maps to S1D13513 CNF[7:8]<br>(ON = 1 / OFF = 0)<br>Default setting for Tower System is [Off,On]<br>[Off,Off] = Use CLKI3 clock source<br>(refer to J3)<br>[On,Off] = Use BUSCLK<br>(not applicable for direct interfaces)<br>[Off,On] = Use OCSI1 clock source<br>(refer to J20)<br>[On,On] = Use OSCI2 clock source<br>(refer to J2) |
| | | 9 | |
| SW2 [10] | Not Used | 10 | |

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Visit **freescale.com/TWR-LCDC-EPSON** for the latest information on the TWR-LCDC-EPSON Epson display controller module, including:

- Quick start guide
- Schematics

## 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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