Quick Start Guide

TWR-VF65GS10

For Vybrid Controller Solutions Based on ARM[®] Cortex[™]-A5 and Cortex[™]-M4 Processors with the ARM DS-5[™] Toolchain



TOWER SYSTEM

Get to Know the TWR-VF65GS10





TWR-VF65GS10 Freescale Tower System

The TWR-VF65GS10 module is a part of the Freescale Tower System, a modular development platform that enables rapid prototyping and tool re-use through reconfigurable hardware. Elevate your design to the next level and begin constructing your Tower System today.

Get to Know the TWR-VF65GS10

Battery Receptacle (VBAT)

Module



TWR-VF65GS10 Features

- Vybrid VF61NS151CMK50 processor (dual-core ARM Cortex-A5 at 500 MHz + ARM Cortex-M4 at 167 MHz, 1.5 MB SRAM, dual Ethernet, dual USB, advanced security)
- Kinetis K20DX128VFM5-based OpenSDA circuit
- 1 Gb x 16 (128 MB) DDR3 in 96 FBGA package (Samsung)
- 2 Gb x 16 (256 MB) NAND flash (Micron)
- Two 128 MB (16 MB) quad I/O serial flash (Spansion)
- Dual USB with on-chip PHY
- Interfaces to TWR-LCD-RGB graphical LCD module
- Four user-controlled status LEDs
- Two mechanical push buttons for user input and one for reset
- Potentiometer and MMA8451Q three-axis digital accelerometer
- Micro SD card slot
- Independent battery-operated power supply for real-time clock and tamper detection module

Step-by-Step Installation Instructions

This quick start guide details how to set up the TWR-VF65GS10 module and run some demo projects on the device.



2 Configure the Hardware

- Assemble your Tower System per the instructions found in the TWR-ELEV module package, unless the board will be used stand-alone.
- Insert the dual-headed USB-A side of the provided USB cable into the PC and insert the micro-B end into the OpenSDA USB port (J3) on the TWR-VF65GS10 module. Allow the PC to automatically configure the USB drivers if needed.

Step-by-Step Installation Instructions

3 Locate and Install CDC Device Drivers

- The module will enumerate as a composite "Mass Storage and Serial CDC Device." The drivers for the CDC functionality can be found on the enumerated drive (for example: F:\TWR-VF65GS).
- Go to that drive to find the CDC drivers and install them.

4 Set up Serial Communication

- A USB-to-serial bridge is supported through the USB CDC functionality. The serial port number is viewable in the Device Manager (right click, My Computer>Properties>Device Manager>Port Settings). This allows for serial communication between the Tower module and a terminal program running on the PC via the USB connection.
- Setup a terminal program to use this COM port with the following settings: 115200 baud, eight data bits, no parity, one stop bit. Alternatively, you may use the TWR-SER or TWR-SER2 serial module for serial communication. See the TWR-VF65GS10 lab guide for more details.

5 Tilt the Board

- After the TWR-VF65GS10 module powers up, the U boot bootloader will load the out-of-box demo from the SD card. The ARM Cortex-A5 core runs the Linux[®] operating system and uses the Open SDA USB-to-serial bridge. The ARM Cortex-M4 core runs the Freescale MQX[™] operating system and uses the TWR-SER or TWR-SER2 serial module for serial communication. Both operating systems operate independently of each other on their respective cores, but can communicate via software APIs and shared memory.
- Tilt the module to see different LEDs light up—the accelerometer data is being read by MQX on the M4 core

and transferred to Linux on the A5 core. You will also see Linux output on the OpenSDA serial connection set up in Step 3.

6 Download the Lab Guide

 Follow the TWR-VF65GS10 lab guide at freescale.com/TWR-VF65GS10 to further explore the features and capabilities of the out-of-box demo.

7 Start Debugging

 To start debugging with DS-5, the OpenSDA firmware needs to be updated with the CMSIS-DAP application. For more detail, please refer to the "Jump Start Your Design" documentation located at freescale.com/TWR-VF65GS10

TWR-VF65GS10 Jumper Options

The following is a list of all jumper options on the TWR-VF65GS10. The default installed jumper settings are shown in white text within the colored boxes.

Jumper	Option	Setting	Description
J1	VBAT Power Source, Secure RTC, 32 kHz XOSC, Tamper and Monitors	1-2	VBAT tied to main 3.3 V (VCC_3V3_MCU)
		2-3	VBAT tied to coin cell
J4	MCU 3.3 V Supply	ON	VDD33 power to the MCU (P3V3 tied to VDD33 of device)
		OFF	VDD33 power to the MCU disconnected
J6	JTAG 5 V Selection	OFF	Pin 11 and 13 of JTAG connector floating
		ON	Pin 11 and 13 of JTAG connecter tied to 5 V
J7	Tamper Loopback	ON	EXT_WM0_TAMPER_IN tied to EXT_WM0_ TAMPER_OUT
		OFF	EXT_WM0_TAMPER_IN open; EXT_WM0_TAMPER_OUT open
J13	Accelerometer Interrupt	ON	Connect MCU PTB9 pin to INT1 of MMA8451Q accelerometer
		OFF	No accelerometer interrupt connection

(continued from previous page)

Jumper	Option	Setting	Description
J18	Main Board 3.3 V Filtered Supply	ON	Connect 3.3 V regulator output to P3V3
	Derived from 5.0 V Supply	OFF	Disconnect P3V3 from regulator output
J19	Elevator 5 V Supply	1-2	P5V_ELEV tied to elevator sense
		2-3	Disconnect P3V3 from regulator output
J20	USB0 VBUS	1-2 only	Device, bus powered
		2-3 only	Device, self powered
		1-2 and 3-4	Host
J21	USB1 VBUS	1-2 and 3-4	Host
		1-2 only	Device, self powered
		2-3 only	Device, bus powered

TWR-VF65GS10 Jumper Settings (continued from previous page)

Jumper	Option	Setting	Description
J22 Pins 1 to 10	Boot Configuration ON/INSTALLED-1 , OFF-0	<u>12_345</u>	Switch Settings Detail
		00_xxx	Boot from fuses
		10_000	Quad SPI boot
	2 4 6 8 10 1 3 5 7 9	10_110	SD card boot
		10_001	NAND boot
		01_xxx	USB boot
J22 Pins 11 and 12	USB0 Mux Selection	0	USB0 connected to Tower elevator
			USB0 connected to on-board micro-B USB connector (J8)
J23	SCI1_TX	1-2	SCI1_TX connected to ELEV_UART1_TX
		1-3	SCI1_TX connected to OpenSDA_UART_RX
	SCI2_TX select	2-4	SCI2_TX connected to ELEV_UART1_TX
		3-4	SCI2_TX connected to OpenSDA_UART_RX

(continued from previous page)

Jumper	Option	Setting	Description
J24	SCI1_RX	1-2	SCI1_RX connected to ELEV_UART1_RX
		1-3	SCI1_RX connected to OpenSDA_UART_TX
	SCI2_RX Select	2-4	SCI2_RX connected to ELEV_UART1_RX
		3-4	SCI2_RX connected to OpenSDA_UART_TX

Quick Start Guide

Visit **freescale.com/TWR-VF65GS10** for information on the TWR-VF65GS10, including:

- TWR-VF65GS10 schematics
- Vybrid family fact sheets
- Tower System fact sheet

Support

Visit **freescale.com/support** for a list of phone numbers within your region.

Warranty

One (1) year limited warranty. Please visit us at **freescale.com/warranty** for complete warranty information.

For more information, visit freescale.com/Tower or freescale.com/Vybrid

Join the online Tower community at towergeeks.org

Freescale, the Freescale logo and Kinetis are trademarks of Freescale Semiconductor, Inc., Reg. U.S. Pat. & Tm. Off. Vybrid and Tower are trademarks of Freescale Semiconductor, Inc. ARM is a registered trademark of ARM Limited. Cortex-AS, Cortex-M4 and DS-5 are trademarks of ARM Limited. All other product or service names are the property of their respective owners. © 2013 Freescale Semiconductor, Inc.



Doc Number: TWRVF65GS10QSG REV 2 Agile Number: 926-27442 Rev C