

## TWR-VF65GS10 OpenSDA Readme

OpenSDA is a low-cost debug/programming interface embedded in certain Freescale evaluation boards. It handles debug communications between the PC and target via USB. It uses the Kinetis K20 50Mhz chip on the Vybrid tower board to run firmware developed by P&E that acts as a bootloader, and can run and load "apps" that add functionality to the OpenSDA circuit. For example, an app could allow debugging with DS-5, or IAR. Or an app could turn OpenSDA into a virtual serial port so you can get serial data via a USB cable instead of using a RS232 cable. Or an app could allow drag-and-drop programming of flash devices like QuadSPI. The possibilities are very open ended. This is the same OpenSDA circuit found on Kinetis L boards.

The app will run every time power is applied to the OpenSDA circuit via J3. If the reset button (SW3) is held down while power is applied via J3, then the firmware will enter a bootloader mode, and enumerate as a mass storage device. You then drag and drop the "apps" into that MSD to load them. Power cycle the device, and then the new app will run.

Currently there are two apps available for Vybrid:

- CMSIS-DAP - For debugging with DS-5
- Virtual Serial Port - For creating a serial-to-usb bridge

In the future there will be a Mass Storage Device (MSD) app that will include virtual serial port capability, plus enumerate as a mass storage device on your computer to drag-and-drop binaries to be programmed into QuadSPI, NAND Flash, and more.

Other things to note:

- Only RevG boards will have OpenSDA firmware
- All other revisions (except RevA) only have a basic CMSIS-DAP firmware loaded onto the K20, and does **\*not\*** have the OpenSDA firmware/bootloader. Older boards cannot be upgraded since this firmware can only be loaded at the board manufacturer. RevA boards do not have either firmware.
- The OpenSDA circuit is only on the Vybrid tower board (TWR-VF65GS10) and not other Vybrid boards.
- There may be issues when using with the TWR-SER with a virtual serial port app. Due to potential conflict with the RS232 chip on the TWR-SER/TWR-SER2, terminal input is not recieved by Vybrid. This will not typically affect RevG boards however, since by default the serial ports used by OpenSDA and TWR-SER will be different.

However there are a very limited number of RevF boards with the OpenSDA firmware that this could affect, since on those boards the same UART is used by both OpenSDA and TWR-SER. The work-around in this case is to remove the jumper on J17 on the TWR-SER board.

More information on OpenSDA can be found at:

<http://www.pemicro.com/opensda>

[http://cache.freescale.com/files/32bit/doc/user\\_guide/OPENSDAUG.pdf](http://cache.freescale.com/files/32bit/doc/user_guide/OPENSDAUG.pdf)