Getting Started with the FPGA Development Board Using a USB Thumb Drive

GPIO connector P7 Banks 0 & 3

+5V/Gnd pins

LEDs D1-D4

Done LED

GPIO connector P6 Banks 1 & 2

P8 Power and USB to PC

Insert USB Thumb drive here
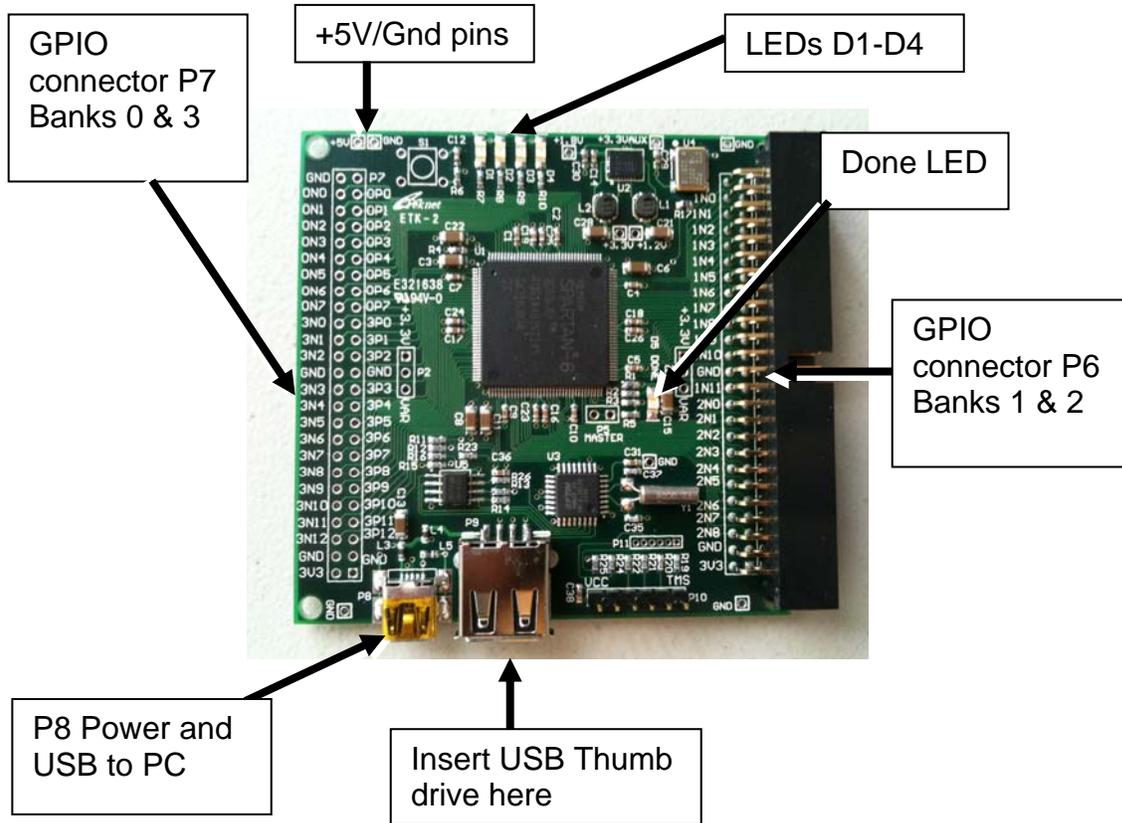
P8 provides power to the board. A powered USB port on a PC or separate USB power supply must be connected to P8. To program the configuration serial PROM using an external USB thumb drive:

1. Use ISE to create and place the desired "fpga.mcs" configuration file in the root of a FAT formatted USB flash (thumb) drive. The fpga.mcs file must be created for a 4Mbit SPI PROM, type M25P40.
2. With power to the board disconnected, plug the USB flash drive into USB connector P9, and apply power. The USB processor reads the fpga.mcs file from the thumb drive and programs the SPI configuration PROM. This will take about a minute, and when complete the activity LED on the thumb drive will stop flashing and D5, the "Done" LED will light up and the FPGA will begin running.
3. Once programming is complete, remove the USB drive, and the FPGA will be configured from the serial PROM will be used on subsequent power cycles. This process takes longer than loading the .bit file to the FPGA from JTAG.

To program the FPGA using a JTAG cable, see "Getting Started.. Using a JTAG Cable."

Getting Started with the FPGA Development Board Using a JTAG Cable:

GPIO connector P7 Banks 0 & 3

+5V/Gnd pins

LEDs D1-D4

Done LED

GPIO connector P6 Banks 1 & 2

P8 Power and USB to PC

1 2 3 4 5 6
P10 pin out

P10 6 pin 0.1" JTAG Connnector		
Pin	Signal	Color
1	Vcc	Red
2	Gnd	Blk
3	TCK	Grn
4	TDO	Orn
5	TDI	Blu
6	TMS	Brn
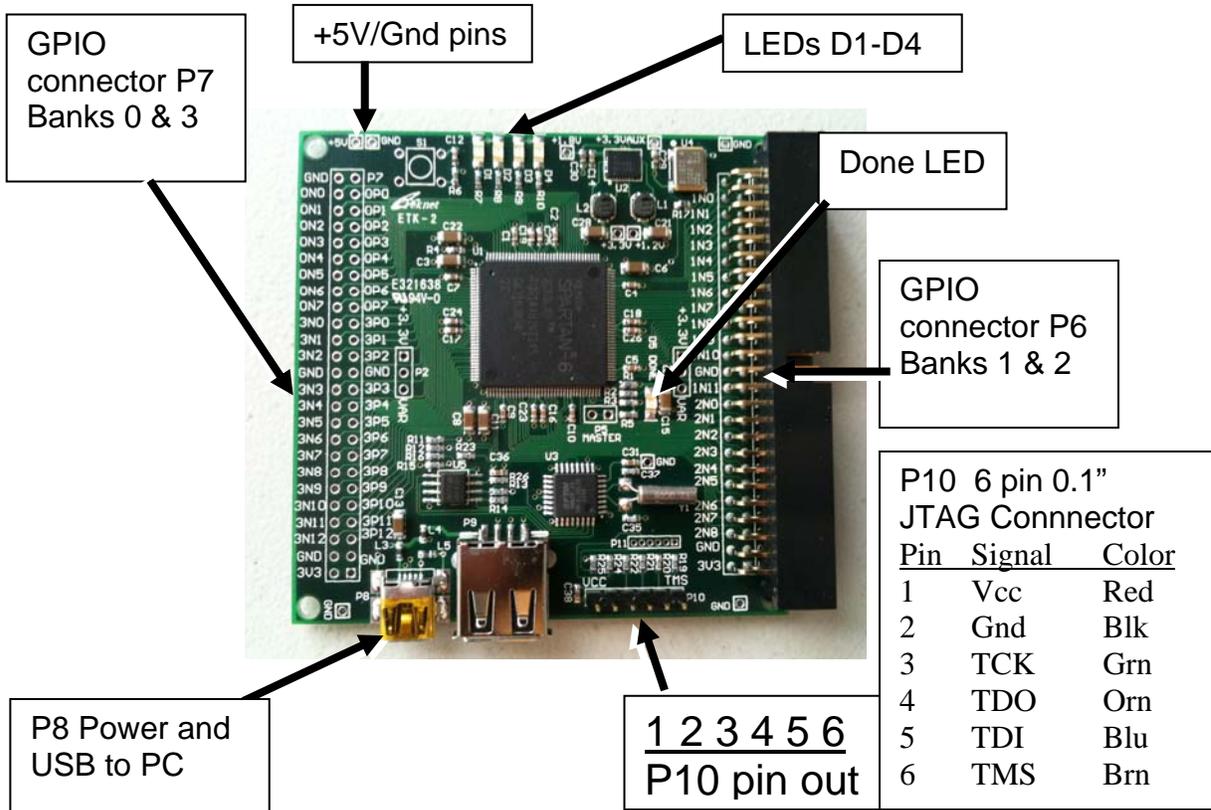
P8 provides power to the board. A powered USB port or separate USB power supply must be connected to P8, or +5V must be supplied by the +5V/Gnd pins to supply power to the board. **Once power is applied, the FPGA loads the configuration file stored in the SPI configuration PROM by default, after which the "Done" LED (D5) will light up.** To program the FPGA directly using a JTAG cable, attach the programming cable to P10 and use Impact to initialize the JTAG chain, detect, configure and program the FPGA as described in the Xilinx documentation. To program the SPI configuration PROM using the JTAG cable, see Xilinx application note 974 in the file xapp974.pdf "Indirect Programming of SPI Serial Flash PROMs with Spartan-3A FPGAs." Create a 4MBit ".mcs" file for U5, the M25P40 device. Note that programming the FPGA directly with a .bit file through JTAG will result in loss of the FPGA program when power is removed, but it is the fastest programming method for quick development iteration. Programming the SPI EEPROM configuration memory using JTAG is done indirectly through the FPGA, and takes more than a minute, but the result will be a non-volatile configuration that loads automatically after every power cycle.

When using a USB flash drive to program the configuration SPI EEPROM, the process is different. See "Getting started .. Using a Thumb Drive" for details.