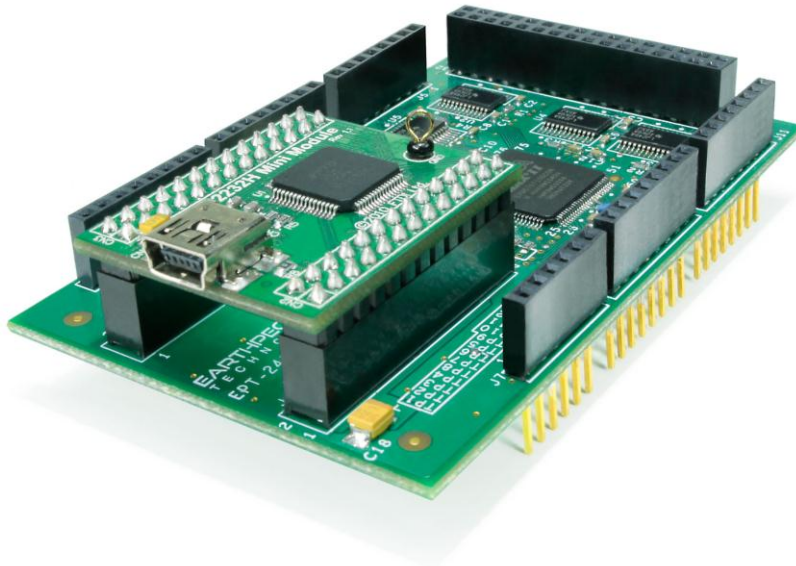# EPT 570-AP-M4

# USB PLD DEVELOPMENT SYSTEM FOR THE ARDUINO MEGA

Data Sheet

The EPT 570 AP M4 is a part of the EPT USB/PLD development system. It provides an innovative method of developing and debugging the users microcontroller code. It can also provide a high speed data transfer mechanism between microcontroller and Host PC.

The EPT-570-AP-M4 board is equipped with an Altera EPM570 PLD; which is programmed using the Altera Quartus II software. The PLD has 570 Logic Elements which is equivalent to 440 Macrocells. An on board 66 MHz oscillator is used by the EPT-Active-Transfer-Library to provide data transfer rates of 8 Mega Bytes per second. The EPT-Active-Transfer-Library provides control communication between the objective device and the PLD. Data transfer during the objective device checkout between the PC and the PLD program is available via the Hyper

Serial Port. The board also includes the following parts.

- Altera EPM570 in the TQFP 100 pin package
- 66 MHz oscillator for driving USB data transfers and users code
- Four 74LVC245 bidirectional voltage translator/bus transceiver
- 32 user Input/Outputs
- Four Green LED's accessible by the user
- Two PCB switches accessible by the user
- All connectors to stack into the Arduino Uno
- Two 13x2 connectors for accepting the FT2232H Mini Module.

Figure 2 EPT-570-AP Block Diagram
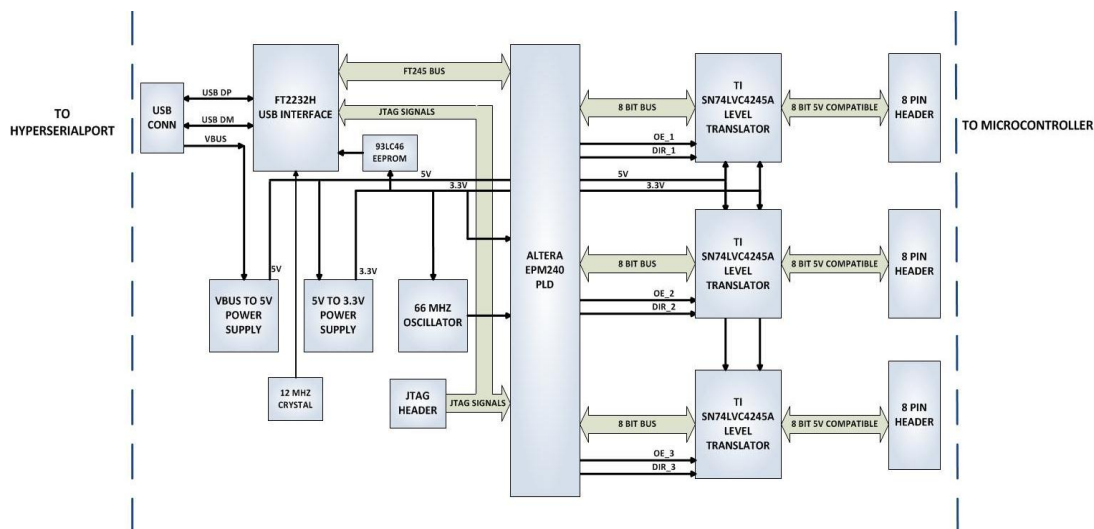
The user's microcontroller code is developed to perform particular functions required by the user. The code is downloaded to the device using the hardware/software system provided as part of the microcontroller development system. The EPT-570-AP USB/PLD Development System consists of a board base onto which is plugged the FT2232H board. These boards comprise the hardware components of the EPT USB/PLD development system. The PLD allows users to write HDL code that will implement any digital logic circuit. The users HDL code is compiled and synthesized and packaged into a programming file. The packaged file is programmed into the PLD using the side A channel of the USB to Serial chip, FT2232H. The Active_Host DLL is

designed to transfer data from the PLD when it becomes available. The data will be stored into local memory of the PC, and an event will be triggered to inform the user code that data is available from the addressed module of the PLD. This method, from the user code on the PC, makes the data transfer transparent.

Figure 3 EPT USB/PLD System Communicating with the ARDUINO MEGA
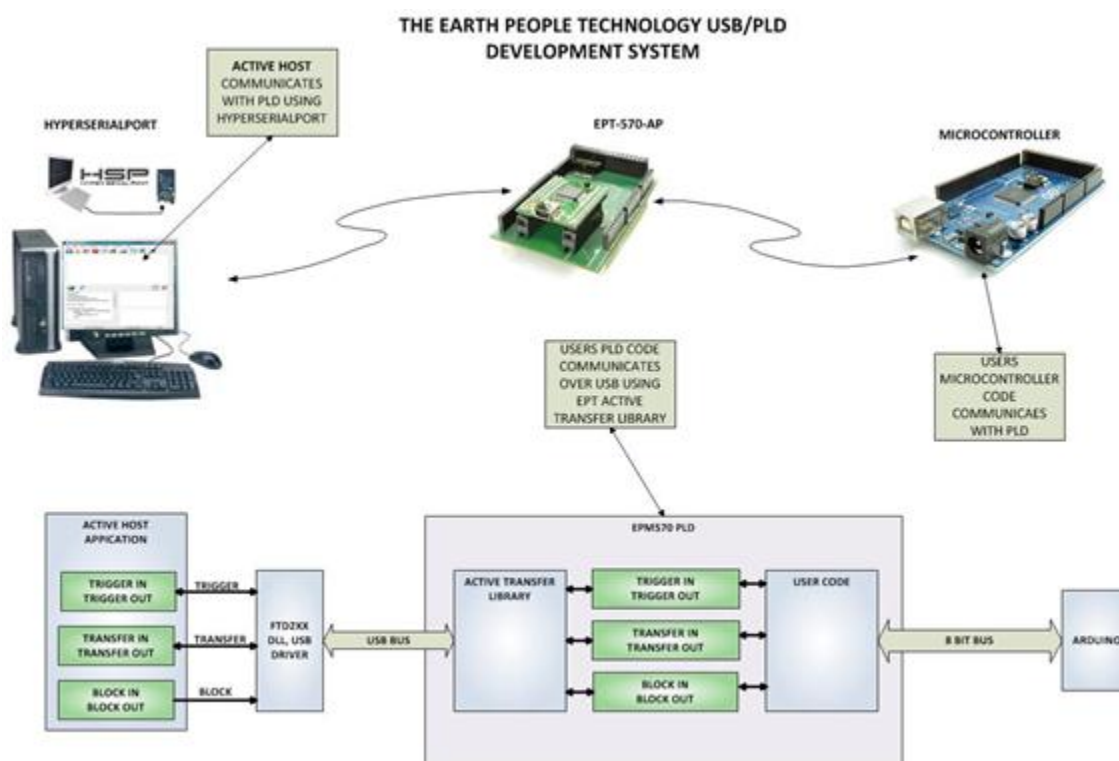
Programming the PLD is quick and easy. All that is required is a standard USB cable with a Mini Type B connector on one end and the EPT JTAG Driver DLL. Connect the EPT-570-AP to the PC, open up Quartus II, open the programmer tool, and click the Start button. To program the PLD, follow the steps to install the USB Driver and the JTAG Driver Insert for Quartus II.