

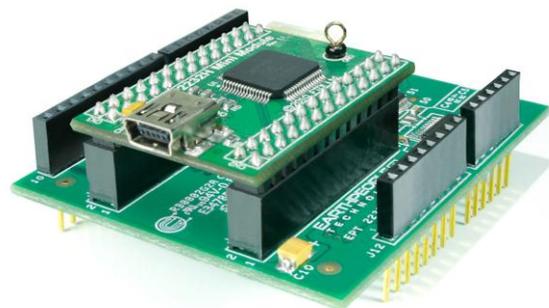


## USB-CPLD DEVELOPMENT SYSTEM FOR THE ARDUINO

- Adds CPLD Development for Your Arduino
- High Speed Data Transfer for Your Arduino
- High Speed Clock Available
- Native Programming of CPLD from Quartus II
- No USB Driver Programming
- Simplified Communications Using EndTerms

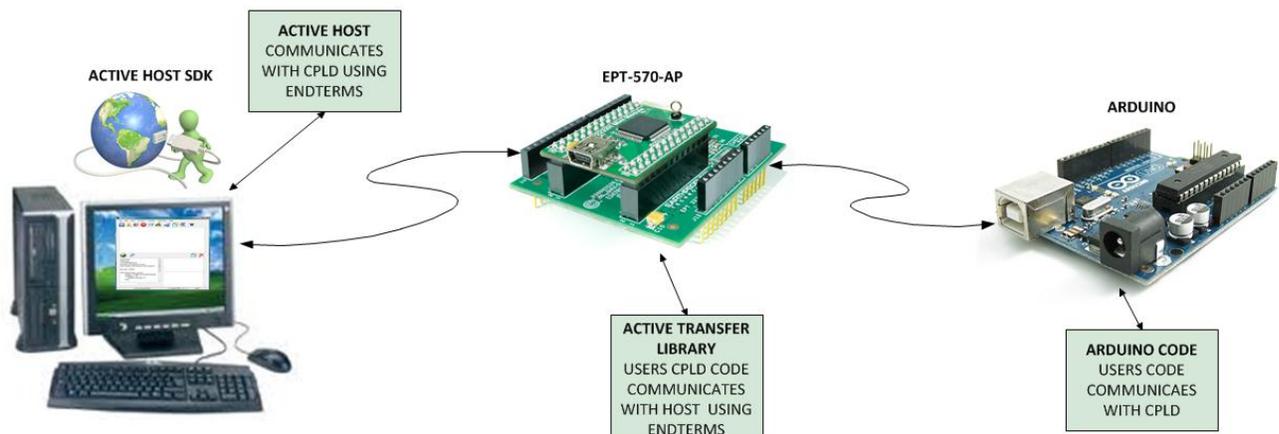
The EPT USB-CPLD development system extends the capability of the Arduino Open Source Platform by combining a powerful Complex Programmable Logic Device with a High Speed Clock. It is designed to provide an innovative method of developing and debugging programmable logic code. It also provides a high speed data transfer mechanism between an Arduino board and a host PC. The EPT USB-CPLD development system provides a convenient, user-friendly work flow by connecting seamlessly with Altera's Quartus II software. The user will develop the code in the Quartus environment on a Windows Personal Computer. The programmable logic code is loaded into the CPLD using only the Quartus

Programmer tool and a standard USB cable. The Active Host SDK provides a highly configurable communications interface between Arduino and host. It connects transparently with the Active Transfer Library in the CPLD code. This



Active Host/Active Transfer combination eliminates the complexity of designing a USB communication system. No scheduling USB

### THE EARTH PEOPLE TECHNOLOGY USB-CPLD DEVELOPMENT SYSTEM





## USB-CPLD DEVELOPMENT SYSTEM FOR THE ARDUINO

transfers, USB driver interface or inf file changes are needed.

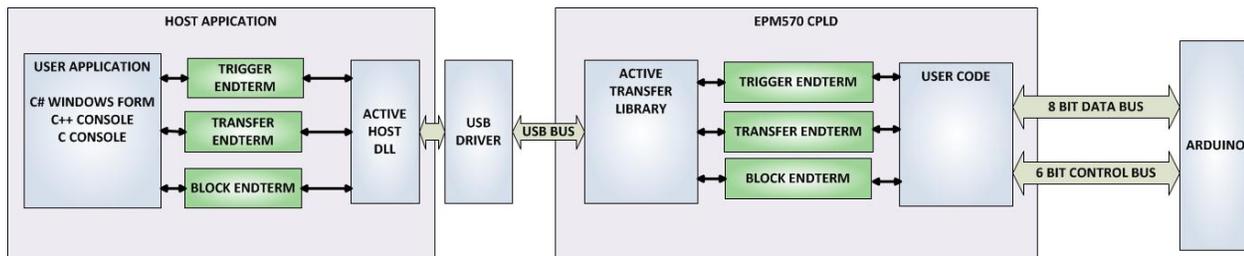
### The Hardware

The EPT USB-CPLD Development System consists of a CPLD base board onto which is connected the FT2232H USB to Serial board. These boards and a standard USB Type A to Mini B comprise the hardware components of the EPT USB-CPLD development system. The CPLD is an Altera EPM570 CPLD; which is programmed using the Altera Quartus II software. The CPLD has 570 Logic Elements which is equivalent to 440 Macrocells. A 66 MHz clock is available to the user HDL code. 24

code through the USB driver to the user CPLD code. The user code connects to “Endterms” in the Active Host dll. These Host “Endterms” have complementary HDL “Endterms” in the Active Transfer Library which reside in the CPLD code. Users have seamless bi-directional communications at their disposal in the form of:

- Trigger Endterm
- Transfer Endterm
- Block Endterm

User code writes to the Endterms as function calls. Just include the address of the individual module (there are eight individually addressable modules of each Endterm).



Inputs/Outputs that are 5 Volt compatible connect the Arduino IOL, IOH, and ADC connectors to the CPLD. Four Green LED's and two PCB switches are accessible by the user HDL code.

### The Software

The Active Host SDK is provided as a dll which easily interfaces to application software written in C#, C++ or C. It runs on the PC and provides transparent connection from PC application

Immediately after writing to the selected Endterm, the value is received at the HDL Endterm in the CPLD. The Trigger Endterms send single bits to the CPLD. The Transfer Endterm sends a single byte. And, the Block Endterm sends a block of bytes. By using one of the Active Host Endterms, the user can create a dynamic, bi-directional, and configurable data transfer design.

The Active Host SDK is designed to seamlessly transfer data from the CPLD when it becomes



**EARTHPEOPLE**  
TECHNOLOGY

## USB-CPLD DEVELOPMENT SYSTEM FOR THE ARDUINO

available. It is a transparent receive transfer path made possible by using a callback mechanism. The data seamlessly appears in Host PC memory from the Arduino.

### Programming the CPLD

The CPLD on the EPT-570-AP can be programmed with the HDL project created by the user. Programming is quick and easy. All that is required is a standard USB cable with a Mini Type B connector, and the EPT Blaster Driver DLL installed on the PC. There are no extra parts to buy - just plug in the USB cable and connect the EPT-570-AP to the PC.

### Writing the CPLD Code

Writing the CPLD code and building a CPLD project is made easy with step by step instructions in a detailed user manual. The manual walks the beginner through downloading the Quartus II environment, setting up the project variables, adding the user HDL code, inserting pins, compiling, synthesizing and programming. The EPT USB-CPLD Development System makes it quick and easy to build a powerful robust CPLD for communications with Arduino and PC.

