1. Introduction

This document illustrates how to setup the Arduino Sield 1.8" LCD demo on the DE10-Nano and the Arduino Shield 1.8" LCD as shown in **Figure 1**. The basic design content is also included. For details about how to use DE10-Nano board resources, please refer to the DE10-Nano user manual. For details about the Arduino Shield 1.8" LCD, please refer to the web side Adafruit 1.8" TFT LCD shiled.

Figure 1 Arduino Shield 1.8" color LCD Demo

2. System Requirements

The following items are required to perform this demonstration:

- DE10-Nano and power supply
- Adafruit 1.8" Color LCD shield

3. Execute Demonstration

Please follow the procedures below to setup the demonstration:

1. Make sure both Quartus II and USB-Blaster II driver are installed on the host PC.
2. Power off the DE10-Nano board.
3. Connect a mini-USB cable to an UB2 port of the DE10-Nano and the host PC.
4. Mount the Adafruit 1.8" Color LCD shield onto the Arduino expansion header of the DE10-Nano.
5. Power on the DE10-Nano Board.
6. Launch the "test.bat" from the folder demo_batch of the DE10_Nano_Arduino_LCD Project.
7. Now, you should see the Terasic Logo on the LCD of Adafruit 1.8" Color shield.

4. Project Description

Figure 2 shows the system block diagram of this demonstration design.

From the figure, we can understand that Qsys contains the following components, NIOS microprocessor, SPI controller, ADC controller, and memory memory. NIOS through the SPI interface to control the LCD display, and the use of the ADC controller to read the analog signal back, this is mainly the joystick operation.

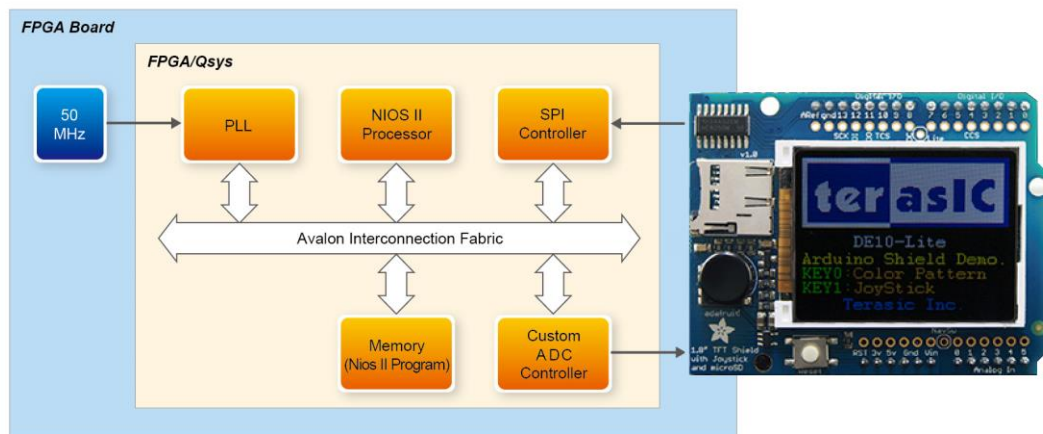The project is built by Quartus Prime 16.1.1 Standard Edition. If developers want to recompile the project, the same Quartus build is recommend for best compatibility.

Figure 2 System Block Diagram