

Functional Description

Altera UP2 Expansion Board (AEB)

by

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Introduction

The Altera University Program UP2 Kit is designed to help universities teach digital logic design. The package provides an Altera MAX7128S Programmable Logic Device (MAX) and an Altera FLEX 10K70 PLD (FLEX) interfaced with a pair of dual 7-segment displays, 16 LED's, three DIP switches, and 4 push-buttons. While the board has proven useful in lab its potential has been very limited by the amount of lab time spent on interfacing support circuitry used in many of the applications. The Altera UP2 Expansion Board will increase the students' ability to focus solely on the VHDL software design by including several commonly used components on the expansion board.

Proposal

The goal of this project is to build an expansion board for the UP2 that will make it a more useful test bench for complex designs. The AEB will be designed and packaged for use in university laboratories. Certain features added on the AEB will use a toggle switch or jumper to enable or disable it from the original UP2 development kit. The toggle switches will allow the use of I/O pins on the FLEX and MAX PLD's with specific features only when needed. The final AEB product will be thoroughly tested and a data sheet will be compiled and made available with the finished product.

UP2 Board Description

- Altera EPF10k70 (FLEX)
- Altera EPM7128S (MAX)
- 2 dual 7-segment displays
- 4 push-buttons
- 16 LED's
- 3 8-bit DIP switches
- PS2 and VGA ports

Desired AEB features

- 4 line Liquid Crystal Display (LCD)
- Quad 7-segment display
- Keypad
- Additional push-button and DIP switches
- On-board A/D and D/A for each chip
- EPROM/RAM for each chip
- LED array

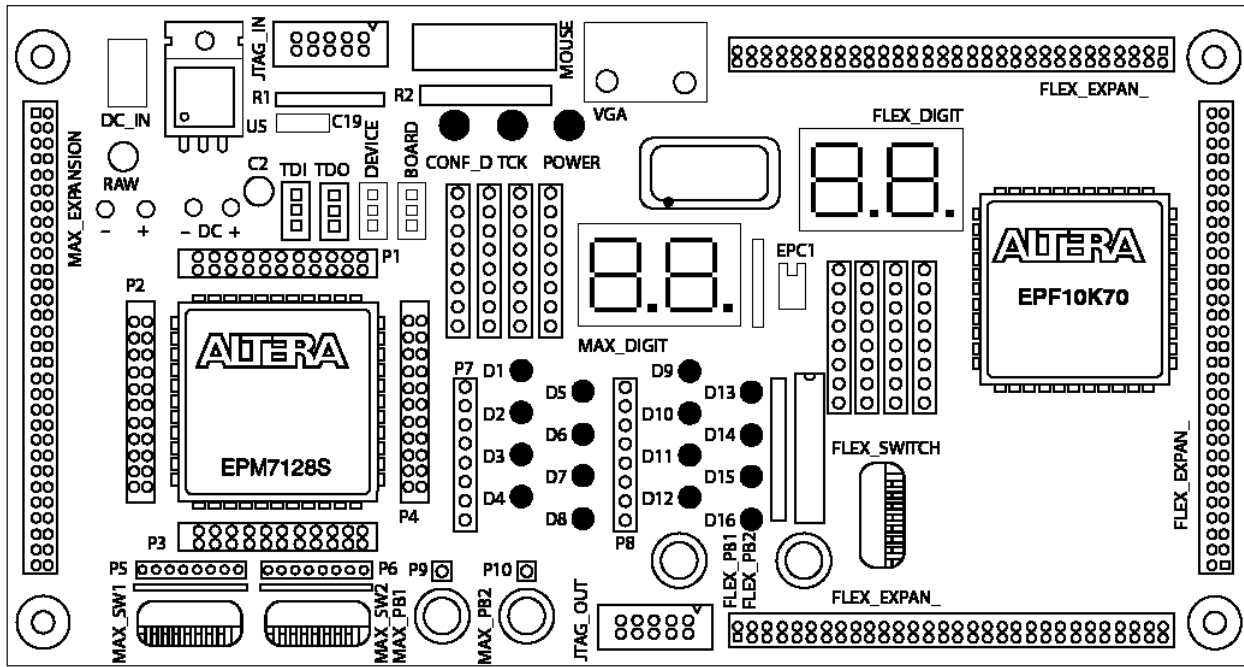


Figure 1 – UP2 Board Diagram

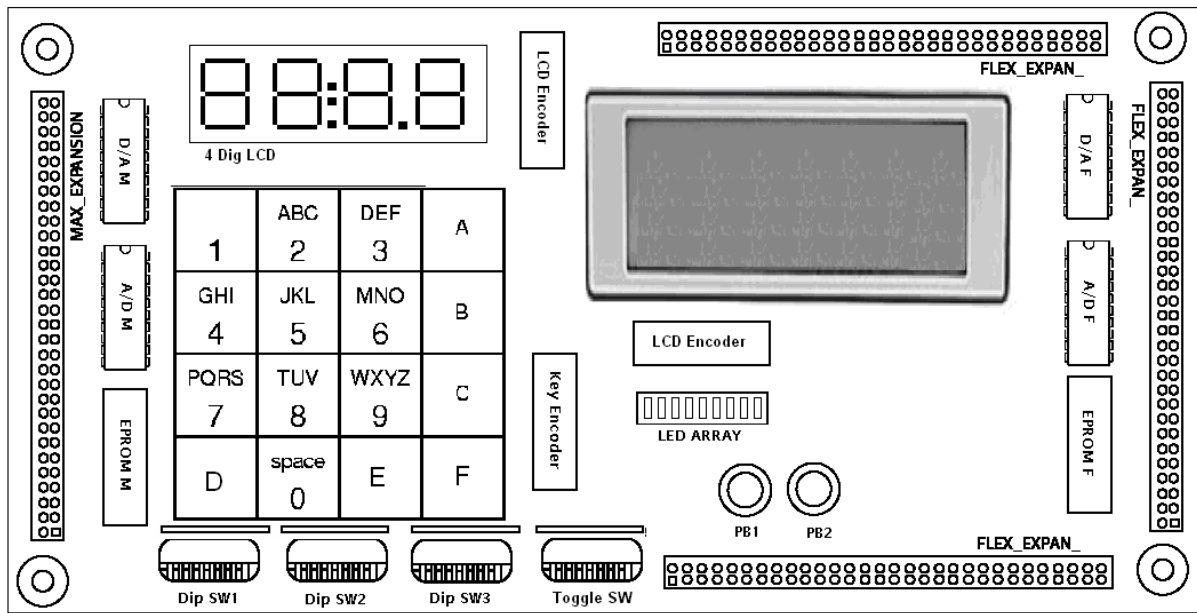


Figure 2 – AEB Diagram

The current Altera UP2 board layout is shown in figure 1. Figure 2 shows one possible preliminary layout of the expansion board. This is a tentative layout subject to significant change.