DL-030 Microprocessor Design Trainer

With the DL-030 Embedded Systems Design Trainer you will:

Learn general FPGA design, prototyping and testing

Have a fully functioning microprocessor or microcontroller in minutes

Features:

- 137-page professionally written lab manual by university professor, Enoch Hwang, PhD with 11 hands-on labs correlated to any textbook for microprocessor design training.
- iPad version of manual available on iTunes
- Works with any Windows XP or higher system (32-bit only)
- Sturdy blow molded carrying case makes the entire lab lightweight and portable.
- 16 LED's
- 3, 7-segment displays
- 16 slide switches and 3 push-button switches
- Expandable breadboard allows the system to grow as students' knowledge increases.
- 4 each, regulated 5V power (Vcc) and ground (GND) points
- 8 input/output connection sockets
- 2-year warranty on all parts and workmanship

Third in its series of embedded systems design trainers, Global Specialties' DL-030 teaches students the advanced concepts of embedded systems control via designing and implementing microprocessors/microcontrollers on an FPGA.

The Embedded Systems Design Trainer is specifically engineered with classroom/lab learning in mind. Written by an instructor, the Student Trainer Lab Manual serves as a supplementary textbook covering essential microprocessor design topics such as data path and control unit design. With 11 hands-on labs, students will gain a solid understanding of advanced embedded systems design in an FPGA environment.

Global Specialties has created the perfect classroom tool by putting together everything you need to implement custom designed microprocessor circuits in one complete and easy-to-use trainer. Using system-on-a-programmable-chip (SOPC) framework, every aspect of the DL-030 is designed for students to get right to the business of learning embedded systems control designs.

Utilizing the DL-030 and Altera Quartus® II software, one can carry out general FPGA design, prototyping and testing, or you can continue with the Nios® II embedded design suite to successfully implement a fully functioning microprocessor or microcontroller in minutes.

Microprocessor DesignTrainer

Specifications

Model DL-030	
FPGA	Altera Cyclone®III EP3C16F256C8N 16k LE
Microprocessor	Altera Nios® II embedded processor
Logic Indicators	16 independent LED's
Seven-Segment Displays	Three sets of independent 7-segment displays
Slide Switch	16, debounced
Push Button Switch	3, debounced
Clock	16 MHz
I/0	8-pin general purpose
Bread Board	27 tie point
Tie Points	4-input 5Vcc 4-input GND
Machined Pin Connecting Wires	100 pcs
USB Interface	USB extension cable
Physical Dimensions (H x W x D)	3.5 x 13.5 x 8.5" (8.9 x 34.3 x 21.6 mm)
Weight	3.4 lbs (1.54 kg)
Training Manual with Hands-On Exercises	137 page manual 11 hands-on labs
System Requirements	Windows XP or higher (32-bit only) 256 MB Ram 800 MHz CPU Approximately 5 GB free hard-disk space Internet Access
Software CD	Quartus® II Design Software ModelSim®-Altera VHDL and Verilog HDL Simulation Tool SOPC Builder® MegaCore® IP Library Nios® II Embedded Design Suite DSP Builder

Training Manual

Chapter 1: Microprocesor Design Trainer
Microprocessor Design Trainer
Hardware
System Requirements
Quartus II Development Software
Installation
Driver Installation
Testing the Microprocessor Design
Trainer Board

Chapter 2: Microprocessor Circuits
Datapath
Control Unit

Chapter 3: Datapath Design
Register Transfer Level
Problem Specification
Selecting Registers
Selecting Functional Units
Data Transfer Methods
Generating Status Signals
Control Words
Examples of Datapath Design

Chapter 4: Control Unit Design
The State Diagram
Examples of Control Unit Design

Chapter 5: Microprocessor Design
Examples of Microprocessor Design

Chapter 6: Labs
Quartus II Development Software
Implementing a Circuit in Hardware
Counting from 1 to 10
Coutdown from Input n
Count and Sum
Greatest Common Divisor
Summing Input Numbers
Finding the Largest Number
Hi-Lo Number Guessing Game
The EC-1 General Purpose
Microprocessor
The EC-2 General Purpose
Microprocessor

Appendix A: FPGA Pin Mapping