HANBACK ELECTRONICS

Since 1984

Semiconductor Application Circuit Training Equipment

SACT

Homepage

HANBACK ELECTRONICS

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SACT

Semiconductor Application Circuit Training Equipment

Improving Visual Understanding and Accessibility

- Intuitive Learning
- Managing Complexity
- Rapid Prototyping

Improving Practical Skill

- Similar to Real Industrial Site
- Acquiring Various Design Skill
- Improving Test and Verification

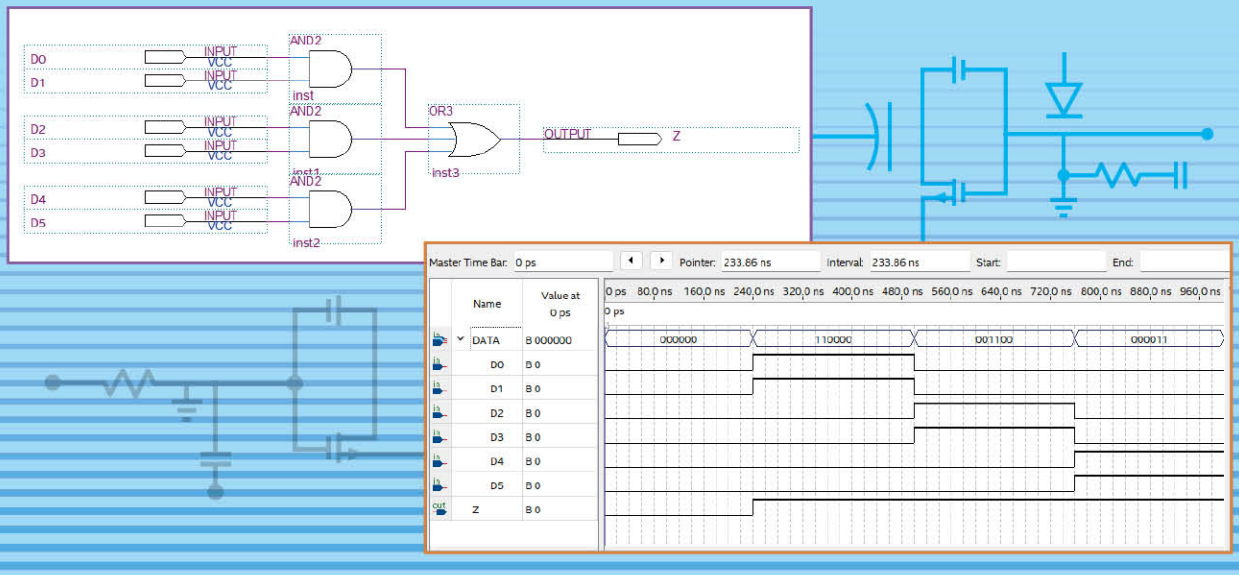
Schematic-Based System Semiconductor Design & Semiconductor Test Training

Developing Creative Problem-Solving Skill

- Flexible Design Environment
- Experiencing System-Level Design

Efficient Human Resource Development

- Reducing Training Time
- Learners from Various Backgrounds
- Industry-Customized Training



Software Specification

List	Specifications
Supported Operating System	• Windows 10 or Higher
Design	• Designing semiconductor application circuits using Schematics (and other methods)
Simulation	• Verification of functional or timing behavior On-chip
Debugging	• Monitoring and analyzing internal signals in real-time on the physical hardware
Timing Analysis Support	
Programming	• Programming a designed semiconductor application circuit

Hardware Specification

List	Specifications
Semiconductor Application Circuit Design Block	• Control of over 134 GPIO pins • Allows programming and usage of a semiconductor application circuit designed schematically using PC software
Clock Control	One 50MHz base board oscillator and external user clock • Provides clock supply in 16 levels from 0 Hz to 50 MHz : 0Hz, 1Hz, 10Hz, 50Hz, 100Hz, 500Hz, 1kHz, 5kHz, 10kHz, 50kHz, 100kHz, 500kHz, 1MHz, 5MHz, 25MHz, 50MHz • Clock settings can be confirmed through a 3-digit 7-segment display and LED indicators
Display	• 16x2 Text LCD, 8 Red Diffused LEDs, RGB LEDs, and 2 four-digit 7-Segment displays
Actuator	• Step Motor(status LED 4ea)
AD/DA Converter	• ADC: Parallel 8-Bit with a Sampling Speed of 1MHz • DAC: Parallel 8-Bit with a Voltage Output of 500kHz • Volume Resistor (0 to 5V ADC Input) • Voltage Meter (10 LED indicators G/Y/R)
Input	• 8 Slide Switches, 8 Push Button Switches, and 3x4 Keypads
Output	• 1 Buzzer and 1 Multi-Tone Buzzer
Application Block	• Traffic Light: A signal light in the form of an intersection made up of 32 LEDs, with control over 24 I/O ports • Vending machine image display : A representation of a cup being filled with water using 20 LEDs, with control over 7 I/O ports
Assistance Module	• Assistance Controller - 4 Core, 4 Threads, 3.4GHz, LPDDR5, M.2 256GB SSD, - Wifi 5, Bluetooth 5, 2.5G Gigabit Ethernet Port - USB 3.2/2.0 Ports, HDMI supporting up to 4k • 7-inch TFT LCD: 1024 x 600 resolution, TouchScreen, 2-channel Speaker • Camera: 1080p at 30 fps, 1/2.7 inch optical format, • Practical Instruction DISPLAY • AI experiments can be conducted through the camera

Features

- Programmable Semiconductor Practice Equipment that User Can Freely Define Hardware Operation
- Built-in Assistant Computing Module Consisting of Touch Display, Camera, Edge Computer to Operate Instruction Manual
- Built-in 16 Type-Clock Supply for Application Circuit Operation Clock
- Built-in Peripheral Devices (Button, Text LCD, Keypad, Step Motor, RGB-LED, Potentiometer) for Application Circuit Experiment
- Built-in ADC/DAC for Sensor Application Circuit Design and Analog Signal Control
- Built-in Professional Design Environment based on Various Design Tools such as Timing Analyzer, State Diagram Creation Tool, and Simulation Environment
- Supports Circuit Design with Schematic Editor That Beginners Can Easily Use
- Quick Feedback From Design-Implementation-Test Cycle to Verify and Improve your Design
- Provides Simplified Workflow to Simulate Designed Circuit and to Experiment on Practice Equipment
- Supports Systematically Design and Practice of Combinational Logic Circuit such as Adder, Subtractor, Comparator, Multiplexer
- Learning by Gradually Increasing Level from Latch and Flip-Flop to Register and Counter
- Precise Timing and Synchronization Practice Possible
- Implements Complex State-Based Control Logic with FSM Design such as Moore/Mealy Machine
- Memory Design and Test Practice Possible
- Supports Curriculum from Basic Logic Gate and Gradually Developing to Complex Combinational and Sequential Logic Circuit
- Indirect Experience of Actual Semiconductor Design and Test Process

Training Contents

Semiconductor Basics

Basic Logic Gates and Boolean Algebra

- AND, OR, NOT, NAND Gate Operation Principle
- Boolean Algebra
- Simplification of Logic Formula

Combinational Logic Circuit

- Adder and Subtractor
- Comparator
- Encoder and Decoder
- Multiplexer and Demultiplexer

Sequential Logic Circuit

- Latch, D Flip-Flop, JK Flip-Flop, T Flip-Flop
- Register: SISO, SIPO, PISO, PIPO
- Asynchronous Counter and Synchronous Counter

Timing and Synchronization

- Clock and Timing Diagram
- Timing Analyzer

Finite State Machine(FSM) Designing

- Moore State Machine and Mealy State Machine
- State Diagram, State Table

Memory

- RAM and ROM

Application Circuit Designing

- 4-Bit Calculator, Clock, Traffic Light, Password Input System

Components

SACT

AC Power Cable
1ea

USB Cable
1ea

User's Guide Book
1ea