

# Unison Mixed Signal (VLSI) Testing

Flexible, Cost Optimized Test Solutions



## Course Description

This course introduces students to the Unison software development and system operating environment. This is achieved through a combination of lectures, lab exercises, and online learning materials. After completing this class, students will be able to develop and debug digital test programs for IC's using the Diamond and Diamond<sub>x</sub> test systems and Unison software (VLSI use model). Students must complete the online pre-course before attending this class. Login information for the online materials will be sent via e-mail after student registration is completed.

## Course Outline

- Overview
- Hardware Overview
- DSP Send
- DSP Capture
- Waveform Generators
- Waveform Measurement
- Appendices

## Course Structure

- Three days, including classroom and practical exercises

## Prerequisites

- Six months test program experience
- Successful completion of pre-course
- Unison Digital Applications course

## Recommended

- C or C++ programming experience
- Familiarity with Unix and Linux operating systems
- English - written and spoken

## Who Should Attend

- Test program development engineers
- Test program support engineers



Automotive



Mobility



IoT/IoV & Optoelectronics



Computing & Network



Industrial & Medical



Consumer

- Next-gen test system for a wide range of applications
- Scalable high-throughput architecture
- Flexible configurations and solutions
- Small form factor
- Air cooled architecture and instruments
- Compact low power technology

# Unison Mixed Signal (VLSI) Testing

## Course Modules

### 1 - Overview

The first sections of the course familiarize the student with the common safety procedures and symbols used to identify hazards.

- Introduction
- Personal Safety and Equipment Protection

### 2 - Hardware Overview

The student will learn the general specifications of the various instruments installed in the test system. These instruments can and will be used to generate the stimulus used in mixed signals testing.

- MultiWave
- SWG
- DIG-HSB
- HDVI
- VIS16
- DPINg6
- PMVI<sub>x</sub>

### 3 - DSP Send

The student will be able to use the digital subsystem to source a digital representation of a sinusoidal signal. The student will learn various ways of generating sinusoidal signals and converting them to binary format to be executed in a test.

- DSP Send memory hardware implementation
- Waveform Generation including:
  - Using Built-In Functions
  - Using Unison Expressions
- Reading data from external files to be used in tests
- Executing DSP Send runtime code and patterns

### 4 - DSP Capture

Setting up the digital subsystem to receive data from the DUT (e.g. ADC) and performing signal analysis.

- DSP Capture hardware implementation
- Capture memory management
- Executing Capture runtime code and patterns
- Using Built-In Functions for data conversion
- Use of Expressions

- Writing data to external files to be used in test

### 5 - Waveform Generators

The Unison operating system uses multiple waveform generation instruments on different products to conduct mixed signal testing. The student will learn which instruments are available on the Diamond Series test systems and their capabilities. Featured instrumentation includes:

- HDVI, VIS16, and Multiwave AWG
- Generating waveform data
- Loading data into instrument memory
- Sourcing data from instrument's memory

### 6 - Waveform Measurement

The student will be able to identify the measurement instruments supported by Unison on the Diamond Series test systems. The student will modify and create programs to execute measurements on the available instruments. Featured instrumentation includes:

- HDVI, VIS16, PMVI<sub>x</sub>, and Multiwave DIG
- Capturing waveforms
- Storing measured data into instrument memory
- Using the Data Plotter, Analog Waveform Tool, and work spaces
- Analyzing captured data

## Appendices

### Appendix A - DSP Basics

This provides the student with foundation knowledge of Digital Signal Processing principles used in mixed signal testing.

- DSP Relationships
- Static Tests
- Dynamic Tests
- DAC Testing with Digitizers
- Commonly used formulas
- Sampling theorem
- Spectral leakage and aliasing

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## Course Modules (cont.)

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### Appendix B – DIG-HSB Digitizer

- Specifications
- Hardware overview

### Appendix C – SWG Sequenced Waveform Generator

- SWG Specifications
- Hardware overview

### Appendix D – API Block Diagrams

- MultiWave specific API statements
- VIS16 waveform generator specific APIs
- HDVI specific API statements

## Related Courses

- Unison Digital Applications course
- Diamond Series Basic Maintenance course
- Diamondx Maintenance course

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