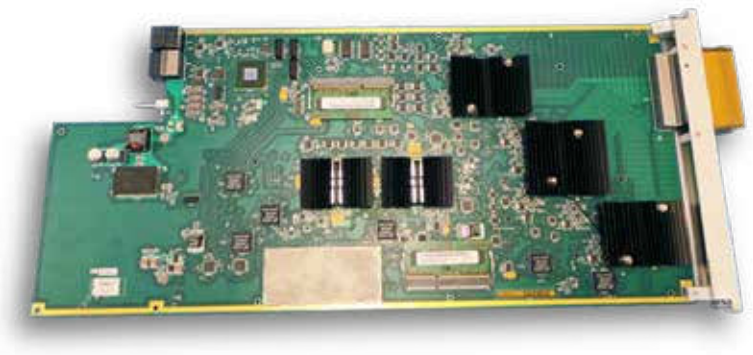
Diamond$_X$ MP1$_X$ eLearning

Optimized Solution for LVDS Port and DDR Memory Port Test
Course # 2300e



Course Description

This eLearning material introduces the student to Memory Port Tester (MP1$_X$) instrument. The training will provide the student with an overview of the instrument, the theory of operation, Loadboard design considerations, how to access online help, and some simple test examples. On completion of the course, the student will be able to describe the components of the MP1$_X$, understand the theory of operation, identify important Loadboard design criteria, be able to access the help documentation, add the instrument resources to a program, and be able to describe programming statements used in simple test examples. This is accomplished by a combination of multimedia presentations and interactive software demonstrations.

Course Outline

- Product Overview
- Functionality
- Theory of Operation
- API Instructions
- Test Examples
- Interface Design Considerations
- Calibration
- Using the Unison System Help

Course Length

- Self-paced – 2-3 hours typical depending on skill level

Prerequisites

- Six months test program experience
- Successful completion of the Unison Applications Programming Course

Recommended

- C or C++ programming
- Familiarity with Linux Operating System
- English - written and spoken

Automotive

Consumer

Flat Panel Display

IoT/IoV & Optoelectronics

Industrial & Medical

MCU

Mobility

- **LVDS/MIPI**
- **80 Channels (40 Differential)**
- **1.066 Gb Data Rate, MUX to 2.1 Gbps**
- **350M Vector Memory**

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Course Modules

1 - MP1$_X$ Product Overview

This module is a foundation for the later modules, providing the student with an overview of the MP1$_X$. On completion of this module the student will be able to:

- State on which system the MP1$_X$ can be installed
- Identify target markets the MP1$_X$ is intended to meet
- Summarize the Operating Specifications of the MP1$_X$
- Recognize the instrument's major feature set

2 - MP1$_X$ Functionality

This module uses various block diagrams to provide a high-level description of the MP1$_X$ instrument functionality. On completion of this module the student will be able to:

- List the major functional areas of the MP1$_X$ instrument
- Describe how the instrument's memory is partitioned
- Describe timing and formatting functions of the MP1$_X$
- Identify the Pin Electronics (PE) channel / port functions
- Recognize the PE drive / measure functions

3 - MP1$_X$ Theory of Operation

This module builds on the functionality module and provides a more in-depth description of the MP1$_X$ instrument functionality. On completion of this module the student will be able to:

- Recognize the intended DDR and LVDS use models
- Describe the Drive / Compare details of the PEIC and the DC reference levels available per channel
- Describe the Pin Electronics Force / Measure features
- Describe the instrument's pattern subsystem including:
  - Micro-instruction Data Ratio (8)
  - Alias character set and data structure
  - Bus directives and simple rules
  - Clock "IO Sets"
- Describe the Clock Port Timing Alignment Feature
- Identify the Single Pass Match Alignment Feature

4 - MP1$_X$ API Instructions

This module introduces the student to some of the Unison Digital APIs and the Graphical Debug Tool (GDT) used to program the MP1x. On completion of this module the student will be able to:

- Determine which APIs apply to the MP1x
- Summarize the digital API groups
- Identify the 3 major sections of the instrument GDT
- Describe the digital drive, compare and load APIs

5 - Programming - Test Examples

Building on the student's existing knowledge of creating a Test Program in Unison, this module will introduce the student to a 4- bit LVDS data interface test example. This example will be completed by the student in multiple stages using interactive software demonstrations to reinforce the programming concepts introduced. On completion of this module the student will be able to:

- Add MP1$_X$ resources to an Adapter Board Object using the Unison Package Tool.
- Recognize and use various Unison Digital APIs
- Recognize and use the Unison DC Test function in the completion of an MP1$_X$ / DPIN Contact Test
- Complete Multi-Time Domain (MTD) patterns using the ALIGN and SPMATCH extended micro-instructions
- Complete a 4-bit LVDS data interface demo application including a DSP Capture and a Functional Digital test

6 - MP1$_X$ Interface Design Considerations

This module introduces the student to the hardware connections from the MP1$_X$ board to their DUT interface hardware and general design considerations. On completion of this module the student will be able to:

- State some general interface hardware design considerations
- Recognize the importance of proper trace separations and layering to avoid crosstalk and reflections
- Identify recommended Loadboard fabrication materials
- Describe methods for controlling impendence including power planes and decoupling / coupling techniques

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Course Modules (cont.)

7 - MP1$_X$ Calibration

On completion of this module the student will be able to:

- Identify the difference between system calibration and checker
- Identify checker, verification and calibration programs
- Demonstrate the use of the Unison SMC+ tool
- Describe the use of the Focus Calibration Test
- Method for Fixture calibration (Loadboard timing offsets)
- Modify an MP1$_X$ Adapter board Object by including trace length information

8 - Using the Unison System Help

Unison provides an extensive help system. In this module the student will become familiar with the structure of the help system, and how to navigate to those areas where MP1$_X$ information can be found. On completion of this module the student will be able to:

- Launch the help system from the Operator Tool
- Navigate to the MP1$_X$ instrument manuals
- Create a PDF of the Unison help documents
- Navigate to the application programming instructions (API) documentation
- Be able to determine which APIs apply to the MP1$_X$

At the end of each module the student will be required to pass a test, achieving a score of 75% or more. The student is encouraged to take notes throughout the course, and repeat, or pause the presentation as needed.

Who Should Attend

- Test program development engineers

Related Courses

- Unison 5.x, or later, Application Programming
- Introduction to Unison

Course Viewing Requirements

To view the course, you must have:

- Browser supporting HTML5
- Audio-listening capabilities (such as a headset or speakers)
- Connection speed of at least 600 kbps

Course Cost

- Free of charge for all Cohu Semiconductor Tester Customers

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