The Mixed Signal Applications – DDP Digital training course provides a broad base of mixed signal testing knowledge, and forms a strong foundation for future applications courses. As such, the course covers a range of instruments including DC, digital, DSP and RF. It enables attendees to work comfortably in the LTX-Credence enVision user interface and program the typical instrument set using Cadence instructions.

This course applies to X-Series CX and PAX test systems utilizing the DDP digital subsystem. Please reference the overview flyer on this course for information on who should attend; prerequisites, and course structure and benefits.

X-Series Test System Overview
This unit introduces the X-Series tester functions and capabilities, including:
- Architectural features
- Power distribution
- System configuration and resources

enVision Operating System Overview
This unit introduces the concepts and philosophy of the enVision operating system, including the core elements of enVision and how enVision objects are related to each other within an enVision test program.

Getting Started with enVision
This unit introduces essential enVision skills and general concepts.
- Location of enVision files
- Starting enVision
- Connecting to enVision
- Indications that enVision is running
- Types of enVision test program files
- Loading a test program
- Running a test program at the OperatorTool and Pass/Fail indicators
- Text based datalogging
- Using the enVision on-line help
- Changing user preferences at the enVision tools
- Working with the ErrorTool
- Using enVision tools to view Objects
- Performing common tool actions such as: changing Xdefaults; finding, creating, cloning, renaming and deleting objects; and exiting an enVision tool
- Exiting an enVision session

Adapterboard Objects
This unit introduces the PackageTool and Adapterboard Objects which relate tester resources to the DUT and loadboard.
- Introduction to Adapterboard Objects
- Adapterboard selection at the OperatorTool
- Displaying pin information at the PackageTool
- Controlling the PackageTool display
- Using the Pin Spreadsheet
- Understanding PinTypes and using the PinType editor
- Creating an Adapterboard object
- Constructing a graphic image of the DUT
- Defining new PinTypes with the PinType editor
- Using the Pin Information Mode to assign pin names, PPIDs and pin types
- Using the Pin Spreadsheet to assign the tester resources
- Creating and viewing pin groups

Test Program Flow
This unit introduces the FlowTool and Flow Objects, which are used to control the test program sequence.
- Introduction to Flow Objects
- Resequencing the Flow and Moving Objects
• Structure of a Flow Object
• Understanding test IDs
• Understanding the sequence of execution
• Working with Bins
• Attaching a Bin Object to an icon in the flow
• Creating a Flow Object

Test Objects
This unit introduces the core of the enVision system, the TestTool.
• Introduction to Test Methods
• Test Method categories
• Test Method help
• TestTool orientation
• Method specific arguments
• Test context
• Sequence of test execution
• Port expressions

Spec and Mask Objects
This unit introduces the basic features and applications of the enVision Spec Object.
• Introduction to Spec and Mask Objects
• SpecTool orientation
• Categories
• Attaching categories to a flow node
• Using categories to reuse Test Objects
• Mask Objects
• Attaching a Mask to a test
• Using Spec and Mask Objects to program tester resources
• Using expressions to define parameter values
• Referring to specific parameter values
• Creating Spec and Mask Objects

Cadence in enVision
This unit presents a brief overview of the Cadence program module structure and demonstrates the methods of integrating Cadence routines into the enVision environment.
• Overview of the Cadence routines structure
• Cadence in enVision

• Parameter passing
• In/Out Cadence parameters
• Passing enVision values to Cadence
• Sharing the PPID between Cadence and enVision
• Reporting test results

Cadence Tools
This unit introduces the Cadence Tools.
• Cadence editor/debugger
• Cadence status display
• Cadence on-line help

Cadence Language
This unit introduces the Cadence language necessary to develop Cadence routines.
• Introduction to Cadence programming
• Declaration of variables
• Storage classes
• Data types
• Operators and precedence
• Type casting functions
• Built-in functions
• Flow control
• Cadence input/output
• Cadence print syntax

Octal VI / VI16
This unit introduces the Octal Voltage/Current (OVI) and VI16 module.
• Octal VI / VI16 functional description
• General syntax statements
• Connect/disconnect instructions
• Force instructions
• Measure instructions
• Programming examples
• Alarms
• DUT site connections
DSP Instruments

*Arbitrary Waveform Generator (AWG)*

This unit introduces the basic operations of the Arbitrary Waveform Generator. This DSP based instrument used to create waveforms to provide direct stimulus to the DUT or to modulate the RF generators.

- Functional overview
- Programming instructions
- Connect/disconnect instructions
- Loading waveforms into memory
- Setting up sampling rate
- Gain and impedance settings
- Software trigger
- Waveform sourcing
- Creating a clock waveform to DUT
- Programming markers
- DUT site connections

*Digitizer (DIG)*

This lesson presents the use of the Digitizer (DIG) and various methods of data collection. It covers the concept of synchronization and its importance to meaningful and accurate data processing, as well as the use of various built-in math functions for data analysis.

- Initialization
- Connect/disconnect instructions
- Setting up sampling rates
- Software trigger
- Sourcing a clock to the DUT site
- Measure instructions
- Data readback
- Data capture
- Data analysis
- DUT site connections

*DDP Digital Subsystem*

This unit introduces the hardware elements of the DDP Digital subsystem. It covers the difference between the pattern and run time code, and which parts of the program contain instructions for setting up digital functions.

- Functional overview of Digital subsystem
- Introduction to programming structure
- Pattern structure
- Run-time code
- Keep alive mode
- Digital send and acquire
- Asynchronous acquire
- Parametric Measurement Unit (PMU)
- Time Measurement Unit (TMU)
- Sync bus
- High voltage digital pin

*RF Subsystem*

This unit presents the basic operation of the Radio Frequency (RF) Source and Measure Instrument.

- RF subsystem functional block diagram
- Hardware description and interconnections
- RF subsystem programming
- Connect instructions
- Source set up instructions
- Scalar set measurement instructions
- Oneport vector set measurement
- Twoport vector set measurement
- Measure instructions
- DUT site connections

Information and Registration

Please visit www.ltx-credence.com and click on the Training Center located in the Support section to get comprehensive course information, schedules and registration information. If you have any questions, please contact your local LTX-Credence sales representative or training coordinator.