PAx with ThorRF Applications

For High Volume RF PA/FEM, 5G and Mobility Devices

Automotive

Mobility

IoT/IoV & Optoelectronics

Computing & Network

Industrial & Medical

Consumer

Course Description

The PAx with ThorRF Applications training course introduces the use of the PAx test system for testing high power RF devices such as switches and tuners. As such, this course covers a range of instruments including the DragonRF combined with the ThorRF sub-system, baseband waveform generators, digitizers, DC instruments and digital instruments. It enables attendees to work comfortably in the Cohu Unison user interface and program the typical instrument set using Unison Test Language instructions.

Course Outline

- PAx Test System Overview
- RF Sub-System Overview
- DragonRF Programming
- ThorRF Programming
- RF Unison Program Generator (rfupg)
- Voltage and Current Instruments
- Baseband DSP Instruments Sequenced Waveform Generator (SWG)
- Digitizers (Hummingbird [DIG-HB])
- FX2 Digital Subsystem
- Register Send Memory

Course Structure

- Five days, including classroom and practical exercises

Prerequisites

- 3 months of test experience
- C++ programming experience
- English – written and spoken

Recommended Skills

- Familiarity with Unix and Linux operating systems

Applicable Test Systems and License

- PAx system using FX2 digital hardware
- U1909 as the minimum OS release
- Unison developer's license must be available on the test system used for this training

Who Should Attend

- Test program development engineers

- Only ATE targeted specifically designed for RF FEM market
- Full range of WLAN, IoT, Cellular, Satellite Applications
- Small form factor
- Air cooled architecture and instruments
- Compact low power technology

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Online Pre-course Content

The following tutorials must be completed prior to attending classroom session:

- System hardware overview
- Software architecture
- Introduction to the Unison graphical user interface
- Components of a test
  - Adapter board
  - Bins and bin spreadsheet overview
  - Flow object
  - Test object
  - Spec object overview
  - Levels object overview
- Unison test language introduction
- Unison applications programming instructions
- Help system

Course Modules

1 - PAx Test System Overview

This unit introduces PAx test system functions and capabilities, including:

- Architectural features
- Power distribution
- System configuration and resources

2 - RF Sub-System Overview

This unit provides the student with a thorough description of the components of the RF sub-system which includes the DragonRF and ThorRF. The unit provides detailed information about programming instructions used to control the DragonRF and ThorRF.

- DragonRF Hardware components
- ThorRF Hardware components
- Graphical Debugging Tools
- Supported configurations

3 - DragonRF Programming

This unit introduces the programming instructions for the DragonRF and ThorRF.

- Unison RF Source and Measure programming

Common measurements such as 1dB compression, IP_3, Noise Figure, DUT Gain, EVM and S-Parameters.

4 - ThorRF Programming

This unit introduces the programming instructions for RF testing using the ThorRF hardware.

- ThorRF hardware components
- ThorRF functional diagrams

5 - RF Unison Program Generator (rfupg)

This unit introduces the student to the rfupg script that is used to generate a Unison test program.

- Understanding the Test Spreadsheet
- Basic Functionality
- rfupg Dependencies
- Test Limits

6 - Voltage and Current Instruments

This unit introduces the Octal Voltage/Current (OVI) and High Current VI (HCOVI) modules.

- OVI and Voltage/Current functional description
- Generic syntax statements for:
  - Connect/disconnect instructions
  - Force instructions
  - Measure instructions
  - Programming examples
- DUT site connections

Practical exercises include performing simple DC tests on an RF PA device.

7 - Based DSP Instruments Sequenced Waveform Generator (SWG)

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

- Functional overview
- Connections to DragonRF

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Course Modules (cont.)

8 - Digitizers (Hummingbird [DIG-HB])

This unit introduces the use of the Digitizers 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.

- Functional overview
- Connections to DragonRF

9 - FX2 Digital Subsystem

This unit features the FX2 Digital sub-system.

- Functional overview of Digital subsystem
- Introduction to program structure
- Pattern structure and the PatternTool
- PatternSetupTool
- Debugging Tools
- Pattern Micro-instructions
- Pattern and Unison Test Language Synchronization
- Sync bus and synchronization

10 - Register Send Memory

This unit covers the hardware and programming instructions used when loading binary data into memory and capturing data from a DUT.

- Functional Overview of Send and Capture memory
- Programing instructions to load, send and capture data
- Practical examples from a Reg Send and Capture program

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