

About the Course

Power Analytics' Paladin® Combined DesignBase™ Training Program is a 5-day course for industrial plant, utility, and consulting engineers with emphasis and effective solutions based on the latest version of Paladin DesignBase. This course combines Paladin DesignBase Power Modeling Essentials (DB-103), our 'core' 3-day course, with DesignBase Advanced Power Systems Modeling (DB-313), our advanced three-day course, into a one week intensive study. Students will learn the basics of DesignBase structure, features and managing tools and projects before moving on to a study of advanced methodologies for power systems design. By attending this 5-day program, attendees will learn about:

- Power Flow studies: scope, methods, input data, output report, organizing a power flow report and connecting the report to the Paladin DesignBase project, voltage control, load analysis, simultaneous multiple motor starting, motor starting impact to the study network; dynamic individual motor starting;
- Short Circuit studies: scope, methods IEEE and IEC, input data, output report, organizing a short circuit report and connecting the report to the Paladin DesignBase project, protective device evaluation (PDE), sliding faults;
- PDC studies: scope, protection principles, PDC database, protection coordination, input data, output report, organizing a PDC Report and connecting the Report and PDC curves to the Paladin DesignBase project;
- Arc Flash investigation; generic approach and trends;
- Power Quality Investigation by using Paladin DesignBase programs – Power Factor Correction, Impact of Shunt Capacitors to System Performances, Harmonics, Harmonics Investigation, Harmonics Filter Design, Harmonics Mitigation, Dynamics in Power Systems;
- And Dynamics Modeling, Generator Controls: AVR and Governor Models.

Numerical examples are provided and step by step solutions are given by the instructor.

Total Course Length: 40 hours

Benefits:

As a result of this course, you will be able to:

1. Understand Paladin DesignBase structure and new features
2. Understand how to manage Paladin DesignBase tools
3. Understand how to organize a project and the project files: model layout management

Prerequisites:

- Basic knowledge of electrical circuits
- Power Systems experience is a plus
- Individual laptops/computers for class are preferred

Major Topics Covered

The Paladin DesignBase Modeling Interface

- The Paladin DesignBase File Structure
- Defining Drawing Files vs. Project Files
- The Paladin DesignBase Job File Manager
- Catalog Management
- Single Line Diagram Creation & Setup
- Copying & Pasting
- Defining Scenarios
- Multiple Page & Multiple File Projects
- Import and Export using Microsoft Excel
- Hyper-Linking Drawings
- Back Annotation (Color & Text)
- Pack & Ship Files
- Creation of Structural Databases (Cables, Transformers, etc.).
- Assigning newly created databases as project defaults.

ANSI --- AC Short Circuit Analysis

- Three-Phase, Line-Ground, Line-Line, Line-Line-Ground Faults
- Equipment Definition Guidelines and Parameters
- Global and Single Bus Fault Simulation
- The Options and ANSI Settings Interface
- Short Circuit Back Annotation Options and Output Reports



ANSI -- AC Protective Device Evaluation & Reactor Sizing

- Data requirements for Low Voltage Equipment
- Data requirements for Medium & High Voltage Equipment
- Data entry into the model
- Running the Protective Device Evaluation Analysis
- Creating Output Reports and Network Color/Text Annotation
- The Reactor Sizing Application

AC Protective Device Coordination

- The PDC User Interface.
- Network Based Protective Device Coordination Studies
- Adding PDC Curves
- Isolating PDC Paths
- Single Page and Multiple Page Spanning PDC Paths
- Editing, Copying & Pasting PDC Data
- Protective Device Sequence of Operation Reports
- Adding Phase and Ground Protective Curves to the study
- Injection of Fault Currents and Tripping Time Evaluation
- Creating Output Reports (Graphical and Text Based)

AC Arc Flash Hazard Assessment

- The AC Arc Flash Hazard Program Interface
- Single and Multiple Bus Analysis
- Analyzing Suppressed Nodes
- Maximum Tripping Time Settings
- Worst Case Scenario Analysis
- Standards used in Paladin DesignBase (NFPA-70E, CSA-Z462 and IEEE 1584)
- Single vs. Multiple Path Analysis (Definition of Controlling Branch)
- Graphical Outputs and Network Back Annotation
- Creation of Arc Flash Warning Labels
- Report Generation

AC Advanced Power & Motor Starting Analysis

- System setup and preparation
- Generator and Load Parameters
- Analytical Methods (Newton-Raphson, Gauss-Seidel, Decoupled, Hybrid)
- Voltage Control Options (TRX Taps, Reactive Power)
- Load Flow Results Output Interface
- The Professional Report Writer
- Dynamic Motor Starting Considerations
- Motor Equivalent Parameters
- Dynamic Starting Methods
- Motor Torque & Load Torque
- Induction Motor Parameter Estimation
- Running the Motor Starting Analysis
- The Motor Starting Output Interface

Transient Stability Analysis

- Modeling Capabilities
- Preparing the model for a Transient Stability Analysis
- The Transient Program Interface
- Entering Generator/Source Dynamic Data
- Entering Motor Dynamic Data
- Defining Case Studies
- Adding Events to a Case Study
- Adding Relays, SVC's, ULTC's and MOV's to the model
- Running the Transient Stability Analysis
- Case Study 1: Bus Transfer Analysis
- Case Study 2: Motor Sequencing Analysis
- Case Study 3: AVR Failure Simulation
- Case Study 4: Application of Under Load Tap Changers (ULTC)
- Case Study 5: Fault Clearing Simulation using O/C Relays from an Existing PDC Study

Harmonics Analysis

- Harmonics & Waveform Distortion
- Linear Loads vs. Nonlinear Loads
- Typical Harmonic Spectra of Single Phase and Three Phase Rectified Loads
- Harmonic Distortions Indices as Applied to Voltage & Current (THDF, THDR and TDD)
- Harmonics & Symmetrical Components
- Voltage Distortion Caused by Nonlinear Loads
- Transformers & K Factors
- Capacitors & Resonance
- The Harmonics Analysis Program Interface
- Harmonics Components Catalog
- Harmonic Current Sources vs. Harmonic Voltage Sources
- Frequency Scans & Frequency Response Profiles
- Adding Harmonic Loads to the Network
- Text and Graphical Output Reports
- Adding Harmonic Filters to the Network
- Using Phase Shifting Transformers
- Case Studies

Course Fees and Registration:

Please contact Training@PowerAnalytics.com to reserve your spot!
(Accommodation information will be provided at time of registration)
9208 Falls of Neuse Road, Suite 215
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919-848-6625

Paladin® Combined DesignBase™ Training Program Costs (Course #DB-395)
Training rates: \$3,400 per student (valid through December 2015)

