



**POWER ANALYTICS**  
*Foresight as accurate as hindsight.*

# Paladin® DesignBase™ Programs

Simulation Solutions for Every Electrical Engineering Challenge

Power Analytics offers the industry's most extensive and comprehensive family of solutions modules. These software modules enable users to easily perform highly-accurate simulations of their infrastructure design under an almost unlimited range of operating conditions, system parameters, and fault scenarios.

Extending our basic power flow analysis, these solutions modules offer advanced analytical modules for every aspect of a mission critical power system design; thus, users can fully simulate and understand the pre- and post-operational behavior of their infrastructure.

Our analytical techniques employ vendor-specific device information, as well as advanced mathematical and applied physics to simulate, optimize, modify and create power systems designs. They consider all aspects of power generation, filtering and transmission and distribution of power and associated power protection strategies.

Powerful "what if?" capabilities extend to every aspect of the advanced design, allowing user to stress and verify nominal or steady state designs with extraordinary accuracy and real-world simulations. Categories of Solutions Modules include:

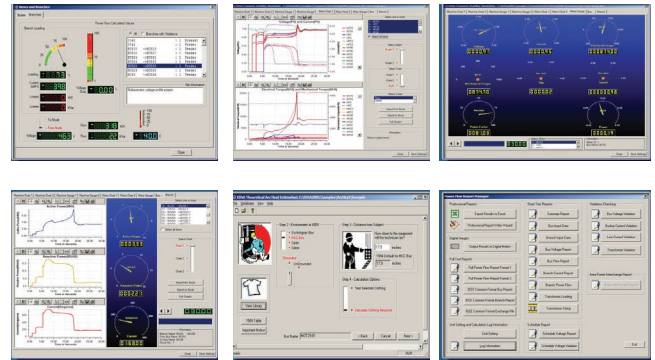
## Reliability and Capacity

Allows engineers to accurately and efficiently evaluate the reliability of electrical distribution systems.

- Load Forecasting
- Block Based Reliability Analysis
- Distribution and Substation Reliability Analysis

## Arc Flash Simulation

Based on test results given in IEEE-1584 and recommendations of NFPA-70E, this powerful tool helps safety engineers estimate the energy falling on a surface removed from a fault.



Quickly identify the grade of clothing required by operators and easily provide protective signs for electrical equipment stating the type of protective clothing required when working around energized equipment.

- AC and DC Arc Heat per NFPA-70E and /IEEE-1584

## Fault Analysis

Quickly and accurately calculate the effects of flowing faults in three-phase, single-phase and DC power distribution systems.

- AC Short Circuit – 3phase and 1phase ANSI/IEEE
- AC Short Circuit – IEC 60909
- AC Short Circuit – IEC 61363

## Protection Coordination

Designed for coordination of protective devices in DC power systems, including transmission networks requiring Distance Relay Coordination. It provides engineers with a very strong, efficient, and fast tool for selecting, comparing, and coordinating protective devices.

- Device Coordination AC
- Device Coordination DC
- Impedance Relay Coordination
- Validated Protective Device Curve Library



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## Power Flow Analysis

Enable users to conduct balanced three-phase and single phase load flow studies on almost any network configuration imaginable. This load flow program uses sparsity techniques for the load flow solution; it applies bus admittance matrix plus two iterative methods (fast decoupled, or Newton-Raphson, Gauss-Seidel, etc) to obtain the desired results at all buses in the network.

- AC Multi Motor Starting Power Flow
- AC Advanced Power Flow – 3phase, 1phase
- AC/DC Power Flow
- DC Power Flow
- AC Voltage Profile

## Power Systems Optimization

The PSO platform is a security-constrained optimal power flow software that also serves as a tool for optimal sizing and placement of reactive power resources (reactors, capacitors, and SVC). It is capable of handling power systems comprising thousands of buses, and has been used to optimize the planning and operation of some of the world's largest and most complex power systems.

## Dynamic Behavior Simulation

Allows power systems specialists to simulate all known phenomena and disturbances. Based on Power Analytics exclusive advanced trapezoidal simulation engine, considered to be the most powerful and accurate means of simulating transient events, this robust, flexible, and fast tool offers a productive and effective platform for creating user-defined AVR and Governor models.

- Universal Control Logic Simulator
- Advanced Transient
- Advanced Motor Torque and Performance
- Electromagnetic Transient Analysis (EMTAP)

## Power Quality Analysis and Mitigation

Harmonic analysis is required when devices that generate harmonics, such as rectifiers, arc furnaces, AC/DC drives etc, are present or anticipated to be added to the power system. Digital computer simulation is the most convenient, and perhaps more economical, way of tackling the problem of harmonic analysis.

- Harmonics Analysis with Automatic Filter Sizing

## Sizing Optimization

A library of proven, powerful solutions for a wide range of frequently-used sizing tasks.

- Battery Sizing
- Cable Ampacity N-M and IEC
- Generator Set Sizing
- Wire and Conduit Sizing
- Bare Wire Sizing
- Short Line Parameters
- Transmission Line Constants with EM field calculation
- Transmission Line Sag and Tension
- Reactor Sizing
- Capacitor Sizing & Optimization
- Electrical Schedules
- Motor Parameter Estimations
- Cable Pulling
- Ground Grid Design