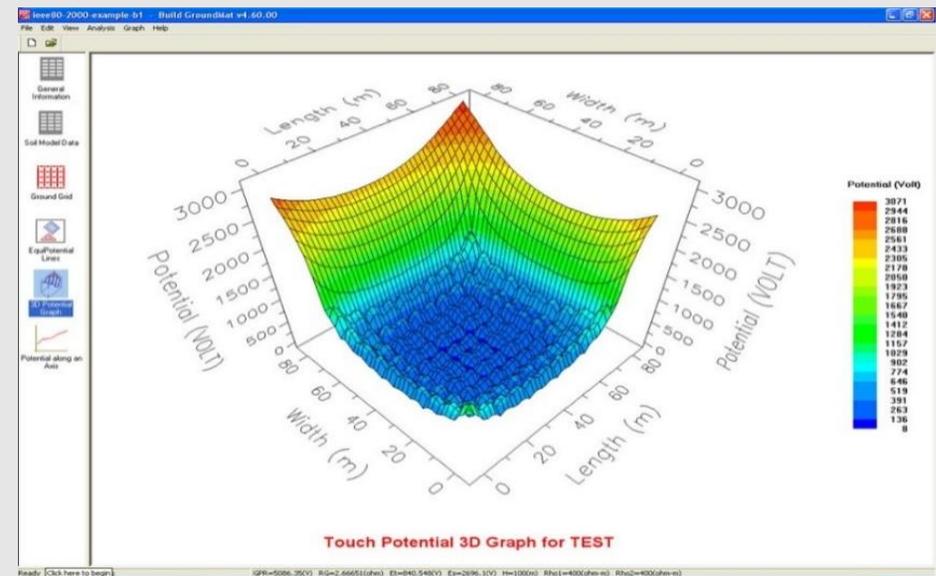
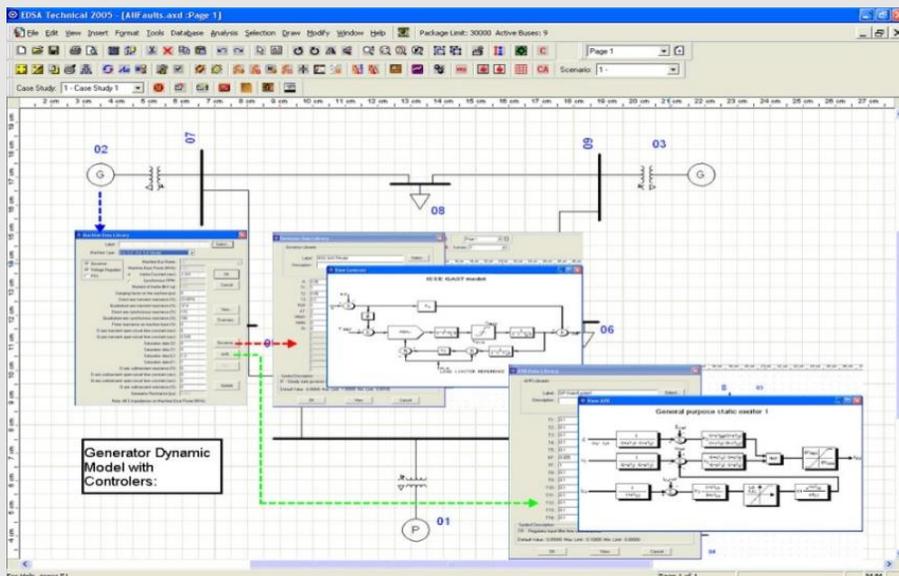


## Planning electrical power systems—modeling, simulation, analytics, and optimization

Paladin<sup>®</sup> DesignBase™ offers an extensive library of modules that enable users to perform highly accurate simulations of the electrical infrastructure design under an almost unlimited range of operating conditions, system parameters, and fault scenarios. Extending basic steady-state and transient analyses, these modules offer advanced analytic capabilities for every aspect of a mission critical power system design, allowing users to simulate and fully understand the pre- and post-operational behavior of their infrastructure.

Power Analytics' analytical techniques employ vendor-specific device information as well as advanced mathematical and applied physics to simulate, optimize, and create power system designs. They consider all aspects of power generation, transmission, and distribution of power with associated operational strategies and constraints. Powerful “what if?” capabilities extend to every aspect of the advanced design, allowing users to stress and verify nominal or steady state designs with extraordinary accuracy and real-world simulations.



## **Grid Element Library**

Power Analytics maintains libraries for over 25,000 Grid Elements for unparalleled ability to model and simulate virtually any size power system

### **What are Grid Elements?**

“Grid Element” is the term that Power Analytics (PA) uses for all the devices that comprise a power network. The description of the Grid Element is often referred to as a library. This includes power cables (e.g., busses and branches) and all the other elements of the network, especially protective devices (e.g., fuses, breakers, relays), as well as generation, loads, transformers, inverters, etc.

### **How are they developed?**

The vast majority of Grid Elements have been developed by PA over the past 30 years. Some of the elements have been developed by PA customers and submitted to PA to be verified and distributed to all customers. Any user who has a current license/support agreement receives access to all Grid Element libraries as part of the software license/support agreement. Many of the most sophisticated Grid Element libraries were developed by PA under contract from equipment suppliers (e.g., micro CHP products from Yanmar, and photovoltaic devices developed as part of research for the Department of Energy).

### **Why do they matter?**

The Grid Elements are fundamental to the power model, which is central to PA’s approach to power system analysis and design. Depending on the objectives of the analysis, the Grid Element are applied with varying degrees of detail and depth. For example, how a motor starts either for generation or load or how energy storage discharges are critical factors for planning essentially any microgrid or distributed generation power system. As the planning and understanding of the essential nature of power networks increases (part of reverse power flow networks), Grid Elements (both 50 and 60 Hz networks) increase in importance. PA has more than 25,000 different Grid Elements, which increases continuously. It is estimated that PA’s key competitors have comparatively smaller Grid Element libraries, ranging between 5,000 and 20,000. Recreating these Grid Element libraries would necessitate a substantial investment of time and money.