

Saber Electrical System Designer

**Design and verify
electrical systems,
quickly and reliably**

Overview

The complexity of the electrical system in today's cars and commercial vehicles has increased tremendously over the last few decades. The expansion of infotainment and the addition of numerous safety systems has multiplied the number of wires and so is the case with aerospace and industrial applications. The move to hybrid and electric motors introduced high voltage to a low voltage environment. To add to this, the ongoing development of vehicle platforms is shared and designed by teams across the world. These factors result in huge and complex designs that need to be designed efficiently and verified quickly and reliably. Design teams working on these platforms are under constant pressure to reduce the cost of the design and improve the design process. These challenges are universal for the development of all electrical systems.

SaberES Designer™ enables design teams to address these challenges by providing an integrated process for electrical system design from concept to manufacturing. SaberES Designer minimizes data entry, manages complex, system-wide design variants, enables concurrent engineering, maintains data integrity, and allows efficient exchange with 3D CAD systems.

SaberES Designer is the Only Completely Unified Tool for Electric System Design and Verification

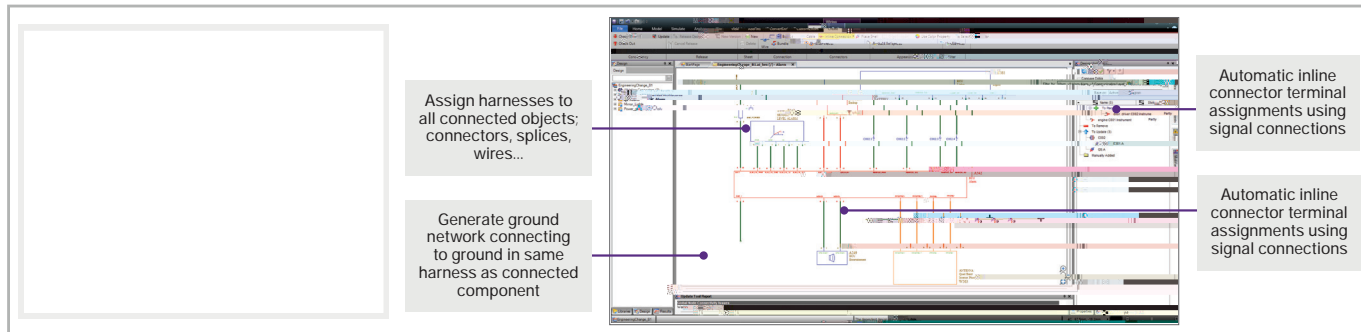
- Intuitive tool for developing functional and physical electrical system designs
- Integrated data flow for electrical system design from concept to manufacturing
- Single database ensures correct by construction and eliminates data translation errors
- Built-in and extensible design verification

Top-Down “connected” Design Flow

Parts (Symbols, Wires, Shells, Models...)



Part of the design process of the physical design is to divide the design up into geographical areas using inline connectors. This process can be done manually or by using a Harness Architecture design to automate that part of the flow.



Verification of Electrical Systems

The increasing complexity of the design and design variations increased the need for an alternative way of verifying the design. The traditional way of building and measuring a physical prototype is costly both in time and money. On top, it is impossible to validate all design variations. Simulation allows for earlier, more detailed, and complete verification of the design.

Voltage Drop and Over-current

- Implement reusable verification simulations using SaberES Designer Experiment Analyzer
- Use built-in DC simulation capabilities to verify voltage drop and overcurrent to determine fuse sizes, cross-sectional areas of all wires, existence of sneak paths, etc
- Back-annotate simulation data and probe critical nodes to quickly identify problem areas



Figure 6: Simulation experiment

Simulation for Robust Design

- Verify transient behavior of high-speed systems including vehicle networks
- Analyze parameter sensitivity, and worst-case behaviors
- Optimize the design for component variations and shifts in operating conditions
- Quickly select and configure hardware faults directly from the SaberES Designer wiring design
- Verify functional safety of electrical systems through automated fault injection
- Export functional safety simulation results From SaberES Designer Experiment Analyzer to document fault coverage and support functional safety flows

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