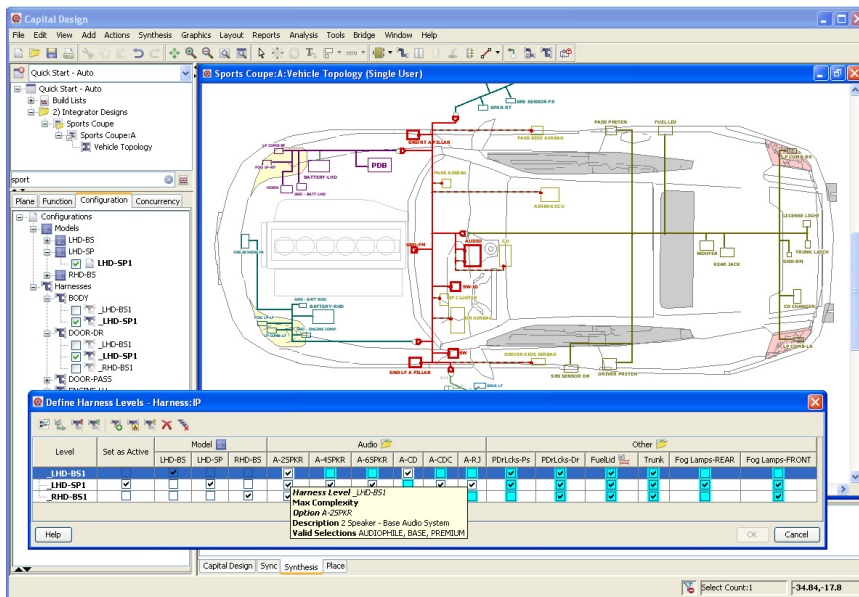# Capital Integrator

Generate wiring designs and diagrams automatically from physical layout, system designs, and option content

Generative Design:
Automated Systems and Physical Integration

Capital Integrator is the key application supporting generative design—a breakthrough in automating systems integration. Capital Integrator automatically merges generic sub-system signal connectivity with physical topology to optimize component layout and generate fully-detailed vehicle wiring designs. This removes a huge part of the system integration task, saving time, improving quality, and leaving engineers free to innovate and investigate a wide range of physical architectures to determine the optimum layout.

Using a correct-by-construction rules paradigm, Capital Integrator automatically merges signal connectivity (defined within Capital Logic) with configuration logic and physical topology to place devices and synthesize fully composite whole platform wiring designs. User-defined rules control the automated placement of devices, the automated routing of signals/wires, splice locations, and other detailed wiring design decisions.

Capital Integrator's ability to synthesize wiring directly from logical connectivity provides key competitive advantages to its users: generic connectivity can be defined once then used in other platforms, providing better standardization, improved reliability due to consistent application of best-practice designs, and shorter design cycles.

Product Features

Generative Design

- Automates integration of logical subsystem and physical designs to generate optimized component layout and physical wiring

Choice of Products

- Capital Integrator: rules-based generative design with extensive choice of powerful add-ons

- Capital Integrator Composite: adds facilities that simplify the design of platforms with complex options and variants

Extensive Add-Ons

- Automated generation of wiring diagrams

- Deep integration with MCAD and PLM systems

- Rules-based ground design

- Web-based enterprise-wide design browsing

- Service-oriented architecture with powerful customization capability

Analysis & Simulation

- Easy to use DC simulation facility helps trap problems earlier

- Optional add-ons for automated component resizing, transient analysis, FMEA, and sneak analysis

Streamlined Processes

- Data-centric backbone simplifies project & process management, design change, cross-organization communication, and integration with upstream & downstream processes

Mentor Graphics®

Physical Design

Capital Integrator provides a choice of approaches when defining physical topology. Designers can create early concept layouts using Capital Integrator's 2D layout facility and then synchronize with a 3D CAD model as the design matures. Alternatively they can start by working directly from a 3D master definition. A close-coupled interface between Capital Integrator's 2D layout facility and 3D CAD supports concurrent design activities with 3D CAD at all stages in the design process, from architectural concept through detailed physical design.

Capital Integrator Composite

Capital Integrator Composite shares the same functionality as Capital Integrator and extends the scope by providing optimization for platforms with the complex options and variants typically found on a vehicle platform. Wiring is synthesized in a fully composite way, with all option & variant configurations (of which there may be thousands) managed as a single set. This capability is especially valuable when a design change can impact multiple configurations.

Extending the Capability

Add-on products extend Capital Integrator's capabilities even further. A wide range of MCAD interfaces with ground-breaking data-exchange and change management capabilities. Capital Ground Design provides configurable, rule-based functionality to generate ground wires with correct signal separation (clean, dirty, etc) and optimised routing. Capital AVAI automatically generates wiring diagrams direct from the logical-physical synthesis, eliminating the need for manual creation of wiring. AVAI diagrams can be interactively refined, and AVAI memorizes and automatically applies interactive refinements to update the wiring diagrams when the original logical or physical specifications are changed.

Simulation & Analysis

Capital Integrator incorporates a DC simulator directly within the logical sub-system and system diagrams, allowing non-specialist designers to apply specialist electrical analysis and validation throughout the design cycle and identify problems early, when they are much cheaper to correct. The simulation facility can be extended with options such as:

- **Capital SimStress** identifies component and wire sizing problems, recommends changes, can automatically resize wires and fuses for worst-case conditions, and can select new parts from the component library.

- **Capital SimProve** identifies unintended functionality, such as sneak paths, and detects missing or unimplemented functionality.

- **Capital SimCertify** performs FMEA analysis to identify failures and quantify their risk and probability.

- **Capital SimTransient** extends the simulation capability from DC to Transient analysis.

Streamlined Processes

Capital Integrator sits within a fully supported data flow that starts with logical connectivity and manages related data right through to harness and formboard design. Capital Integrator is built on a data-centric backbone that integrates each and every part of the design process, streamlining the flow of information as the design matures, and eliminating the requirement to manipulate files.

Capital Integrator's data-centric backbone simplifies the data management task and eliminates many of the time-consuming and error-prone data entry tasks required with traditional design tools.

Project management, design management, change management and transparent integration with other enterprise applications are key capabilities of the system. These capabilities can be extended further: using Capital Integration Server, customization and SOA integration with other enterprise applications can be achieved. Using Capital Enterprise Reporter, design data can be accessed from every desktop in the organization via web-browser reporting technology.

About the CHS Application Suite

CHS is a fully integrated application suite for electrical system design, electrical analysis, system integration/wiring design and harness engineering. Architected for multi-site, multi-user environments, CHS tools automate tasks throughout the electical design process.

Visit our website at www.mentor.com/harness