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electrical engineering streamlined

# Cutting edge electromechanical integration

ELSYS's innovative electrical engineering solutions fully integrate the electrical design and manufacturing processes into product lifecycle management. They thereby cover industry needs, facilitate collaborative work between electrical and mechanical engineers, and satisfy the engineering requirements of both onboard electrical systems (automotive, aeronautics, etc.) and other systems (machines, equipment, etc.).

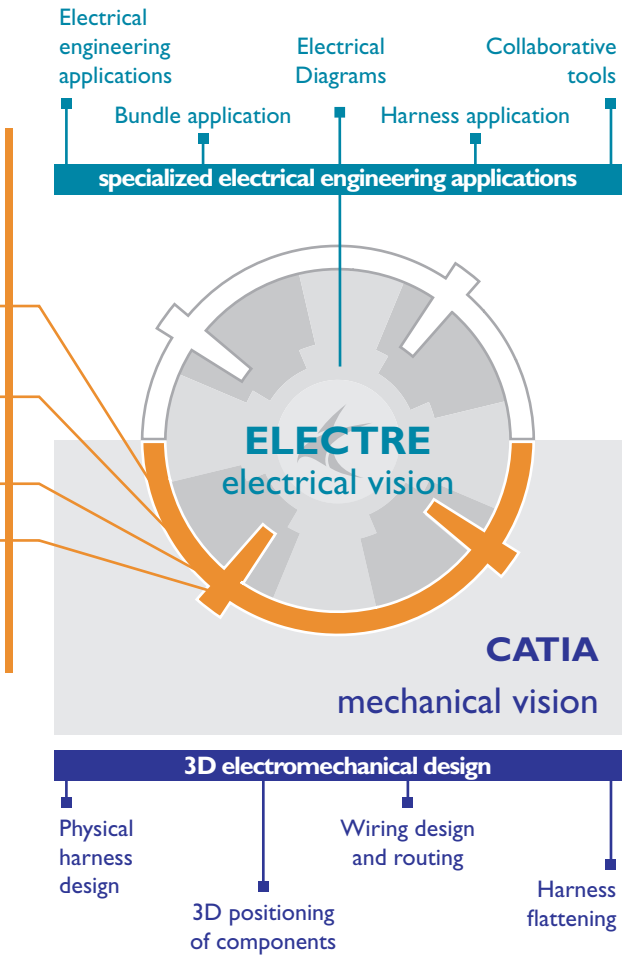
ELECTRE is the core of the electrical engineering system. It can be used on a stand-alone basis or together with CATIA, through the powerful two-way integrated platform CATELECTRE. In this cutting-edge seamless environment, CATELECTRE provides unique features for the design and interactive engineering of electrical harnesses in the CATIA V5 3D electromechanical environment.

CATELECTRE integrates ELECTRE and CATIA's 3D electrical solutions in a single digital mock-up that combines the electrical and mechanical models. This comprehensive, two-way integration makes it possible to synchronize electrical schematics with the 3D mechanical environment supporting them and to update harness data using information from the 3D models. It also enriches the CATIA representation with functional information from ELECTRE, such as electrical engineering routing constraints (segregation, etc.).

## CATELECTRE

**two-way electromechanical integration**

- **Two-way synchronization of mechanical and electrical design**
- **Electromechanical integration of 3D physical and electrical models**
- **Optimal 3D computer-aided routing**
- **Management of shared ELECTRE-CATIA environment**




**from an application-oriented vision to electromechanical integration**

## Impact

- Increased reliability of electromechanical products through early synchronization of electrical and mechanical design.
- Quality, flexibility and increased competitiveness through tighter coordination of electrical and mechanical engineering.
- More dynamic design process, direct increase in productivity and reduction of industrialization costs linked to the implementation of a 2D/3D integrated digital solution.

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## Highlights

Intelligent solution, combining and fully synchronizing electrical design with its 3D mechanical environment.

Ideal integration offering the full benefits of the excellent complementarity of ELECTRE and CATIA.

Expert system for optimized design of 3D paths.

Synchronous or asynchronous integration for CATIA V4 or V5.

Open, interactive solution, readily adapted to different industrial environments and types of project.

# High-performance integration

CATELECTRE, the intelligent integration gateway between an electrical vision (ELECTRE) and a mechanical vision (CATIA), is the ideal tool for building a complete electromechanical model combining the 2D functional model (pilot) with the 3D mechanical environment (constraints). CATELECTRE's design methodology follows and naturally enriches a company's processes for designing harnesses and integrating them in their mechanical environment.

### TWO-WAY SYNCHRONIZATION OF MECHANICAL AND ELECTRICAL DESIGN

Each CAD software programme quite naturally creates its own specific data. CATELECTRE takes advantage of existing electromechanical model data. As a result, it can be adapted to any company's design process, allowing complete two-way 2D/3D synchronization in both synchronous and asynchronous modes.

- Electric diagram data extraction and processing for 3D electromechanical design: automated export of ELECTRE connectors; automatic creation of electrical tree structure in CATIA; Electrical reconciliation; Identification of CATIA entities using ELECTRE information,
- Use of 3D data extraction and processing to make it easier to manufacture wiring (sizing, lengths, weights, etc.), flatten harnesses and produce manufacturing drawings (formboard).

### ELECTROMECHANICAL INTEGRATION OF 3D PHYSICAL AND ELECTRICAL MODELS

CATELECTRE merges the information from the electrical and physical models into a unified, consistent electro-mechanical view of the product being designed.

- Integration of the ELECTRE electrical approach into the CATIA 3D digital mock-up and generation of the electromechanical model including electrical components and wiring,
- Specification of the electromechanical model according to electrical constraints (segregation) and mechanical constraints (wire lengths, strand diameter, cable curve radii, inertias, weights, centres of gravity, etc.) to create a final model.

### OPTIMAL 3D COMPUTER-AIDED ROUTING

Given the sometimes very large number of connection points and design constraints, the generation of the 3D wire routing may become a very complex task. CATELECTRE solves this problem with extremely powerful tools that automatically find optimal 3D paths.

- Point-by-point search for possible paths between connectors and/or equipment in the 3D model,
- Identification of optimal path based on various operations research criteria (shortest, without breaks, etc.),
- Allowance for electrical constraints (segregation, interference, etc.) and mechanical environment (temperatures, prohibited areas, etc.).

### MANAGEMENT OF SHARED ELECTRE-CATIA ENVIRONMENT

Thanks to its powerful features and flexible implementation, CATELECTRE simplifies users' work, improves product quality, and offers the full benefits of the complementarity provided by the electromechanical solutions already in use in the company.

- Permanent management of associativity between ELECTRE and CATIA V5,
- Tools for multi-user interoperability between ELECTRE and CATIA applications,
- Support of synchronous (integration) and asynchronous (interface) modes, concurrent engineering,
- Parameterized integration of CATELECTRE into the PLM environment in accordance with any company's database model.

CAA V5 BASED

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