



Digital ergonomics with RAMSIS

Trend-setting impetus for interior design

YOUR BUSINESS FIRST

Ergonomics and efficiency

Space is at a premium in cars nowadays. More and more assistance and communication systems are used to optimize driving and travel time for the occupants. RAMSIS will help you to ensure that your brand continues to deliver in the future what it promises today.

The renowned ergonomics tool RAMSIS is constantly being developed in cooperation with the German automotive industry. That's why the world's leading software not only provides optimal ergonomic vehicle functionality, it also gives you greater efficiency in the development process – so your vehicles will always perform efficiently with RAMSIS.

Your advantages:

- > Definition of representative test collectives
- > World's largest anthropometric database
- > Realistic automatic posture calculation
- > Many ergonomic analyses

INTERIOR DESIGN FOR PASSENGER CARS

Highly efficient development – on the digital model

RAMSIS is a 3D manikin especially developed for the ergonomic analysis of passenger cars. You can design your vehicles exactly according to norm specifications, quickly document your studies and easily repeat them within a vehicle model or transfer them to other vehicle models. Standardization with RAMSIS also makes it possible to directly compare the results of different studies.

THE MANIKIN AND ITS POSITIONING

Model structure

RAMSIS gives you a sophisticated ergonomic simulation environment – the software works with grid, shading and surface models, imaging the motions of human beings with physiological joint simulation. The starting point for positioning is the H point.

Special anthropometric database

Thanks to the detailed anthropometric data, RAMSIS enables you to generate any target group, specifying height, gender and population and age-specific characteristics. The elaborate model structure and the comprehensive ergonomic international databases are derived from documented and replicable sources, including research projects and serial measurement projects from countries all over the world including most recent Size North America. This is why RAMSIS also offers a detailed hand geometry.

Automatic posture calculation

RAMSIS simulates the most probable posture and movement behavior of vehicle occupants based on current research. Thanks to ultra-modern posture studies, the virtual test persons behave realistically, whether sitting or standing. Tasks can be interactively defined and quickly transmitted to more manikins by means of the simple fixation and orientation of body parts.

Role-based properties

A vehicle can be occupied by a collective of drivers and co-drivers. Role combinations are also possible, e.g. men and women as drivers & co-drivers and men, women and children as second or third row passengers. Each role knows its typical H point position and its typical posture and movement models for its respective tasks.

Analysis for total and partial collectives

By viewing several manikins simultaneously, RAMSIS enables complete coverage of the population to be considered for development. This means that all your analyses for the ergonomic interior design of a vehicle model can be applied consistently to the entire test collective or specifically to an individual selection of manikins.

Animation and movement

To easily simulate sequences, RAMSIS postures can be recorded and extended to animated movement sequences with automatically calculated intermediate postures. Each recording can then be saved as an AVI video for presentation and documentation purposes. Besides automatic posture calculation, the manikins can also be moved interactively by varying individual joint angles or dragging entire joint chains along the user-defined movement using inverse kinematics.



Fig. 1: Test collective

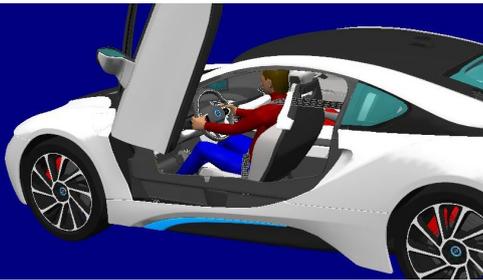


Fig. 2: Task analysis

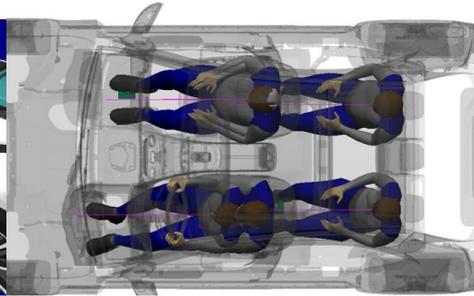


Fig. 3: Design of the complete vehicle

ERGONOMIC ANALYSES

Health and comfort

Thanks to RAMSIS, you can significantly increase the comfort of the vehicle. This measures the degree of discomfort of postures, distances and posture angles for drivers, co-drivers and passengers, enabling conclusions to be quickly drawn for vehicle optimization. Ergonomic design has demonstrable benefits – if you want to determine the probable degree of fatigue, for example, or the orthopedic load on the spinal column when your vehicles are being used.

Direct and indirect vision

A good visual field for drivers has a huge impact on safety. Even during the early concept phase, RAMSIS enables you to analyze the visual field both directly and via mirrors (planar/spherical), perform analyses in and outside the vehicle and ergonomically evaluate the existing visual fields. Eye movements, the position of the eyes including head and neck movements and visual distance are all addressed. RAMSIS Cognitive is a supplementary module with which you can also objectively evaluate the perceptibility of information.

Belt routing

The seat belt routing can already be optimally visualized on the digital model in RAMSIS Automotive. Each RAMSIS license already includes a basic analysis of the seat belt height for drivers and passengers. Seat Belt Design modules supplement detailed special functions, allowing you to calculate the belt routing over the manikin's skin surface for 3-point belts, display the belt release points and ensure compliance with the eBTD guidelines.

Reachability

To ensure the best possible operation, RAMSIS allows you to calculate reachability envelopes and reachability areas for definable body part chains.

Operating force

Operating elements can possibly be reached – but the amount of effort required to open the glove compartment from the driver's seat may be excessive. To check this, RAMSIS lets you check posture-contingent maximum force.

RAMSIS IN THE DEVELOPMENT PROCESS

Project support

RAMSIS consists of four basic modules, Framework, Ergonomics, BodyBuilder and Project Manager. These can be flexibly supplemented with additional RAMSIS modules or internal content. RAMSIS also reflects the project-oriented perspective in modern development: project, test collective/filter, examination and role can all be adopted for new concepts and studies and easily adapted. External ergonomics documentation becomes almost superfluous.

Process orientation and automation

Standardized procedures for design optimization can be automated in RAMSIS using various mechanisms, such as the investigation concept, macros and user-defined functions. This means that the individual results are not only produced efficiently and reproducibly, they can also be compared with other analyses in RAMSIS.

Availability and platforms

RAMSIS is available as a stand-alone version for Windows and as a fully integrated ergonomics tool in Catia V5, 3DEXperience and Siemens NX. RAMSIS or ergonomics data from RAMSIS can be directly integrated into other common systems in the design environment. The import and export of geometries is also possible via various formats like IGES, VDA & SAT – and additional modules can also be used to import and export JT and Catia files.

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