Main Features

- Model-based and integrated toolset supporting hazard analysis, risk assessment, Hazard and Operability Studies (HAZOP), Fault Tree Analysis (FTA), Failure Mode and Effect Analysis (FMEA, FMEDA, FMECA), and reliability analysis.
- Safety analysis and design according to ISO 26262, IEC 61508, ARP4761, etc., for safety related functions.
- Quality analysis for product design and related processes according to SAE J1739, VDA quality handbook, AIAG, etc.
- Integration of architectural/functional design models with quality, reliability and functional safety analysis methods.
- Capture and management of functional and technical safety requirements.
- Support of complete end-to-end traceability.
- Customizable work product/documentation generation.
- Teamwork with detailed compare and merge.
- Fully integrated with ANSYS tools for embedded systems development, analysis and simulation – Ansys SCADE Architect and Ansys RedHawk.
- Integration with IBM Rational DOORS, PTC Integrity, Jama, MS Office, Optima, SVN, and others.
/ Hazard Analysis and Risk Management

- Hazard and Operability Analysis (HAZOP) for determination of malfunctions/system failures.
- Hazard Analysis and Risk Assessment (HARA) and Functional Hazard Assessment (FHA) connected to system models.
- Risk graph support according to ISO 26262, ARP4754 and others.
- Operational situation analysis based on catalogs for consistent derivation of hazardous events/failure conditions.
- Matrix for easy combination of malfunctions and operational situations.
- Multiple views and customization options with user attributes and validation rules.
- Comprehensive traceability and connection to safety requirements.

/ Requirement Analysis Management

- Graphical and table editors for safety requirements.
- Visualization of requirement hierarchies and traceability using diagrams.
- Allocation of requirements to system architecture, HW and SW models and function models.
- Support for safety standard specific concepts (e.g., ASIL decomposition for ISO 26262).
- Validation rules to check compliance with safety standards and corporate rules.
- Import, export and round-trip from/to requirements management systems (e.g., IBM® Rational® DOORS®, IBM® Rational® DOORS® Next Generation, PTC Integrity, Jama) including custom attribute mapping.
- Support for general requirements exchange via ReqIF/RIF.
// System, Software and Hardware Modeling

- Graphical editor for SysML system models.
- Structural modeling of system architecture and design using blocks, parts, ports and connections.
- Function and process modeling using activities and actions, allocations to design (system/HW/SW).
- Dependency Editor to visualize and edit function nets, allocations and other relations.
- Block type and element libraries for re-use with semi-automatic update in case of changes.
- Computation, validation and visualization of safety integrity levels at system design.
- Import, update and visualization of MATLAB®/Simulink® and Stateflow® models.
- Traceability of system models to requirements and safety analysis such as HARA, FTA and FME(D)A.
- Automatic creation of FTA models from MATLAB®/Simulink® models using structural path analysis.
# Reliability Engineering

- Failure rate and failure mode prediction embedded in SysML design models for system and hardware components.
- Multiple prediction models to aggregate or distribute failure rates (e.g., over components, ports, using die area, etc.).
- Application of mission profiles and custom scaling for failure rates (e.g., for confidence levels, acceleration factors).
- Support for part libraries to manage failure rates/modes for fast and consistent application across projects.
- Transient and permanent failure mode modeling.
- Import and round-trip of BOM (bill of material) from CSV/Excel and IP Design (chip models).
- Consistent usage of failure rate and mode data in quantitative analyses (FTA, FMEDA).
- Support for full-custom failure rate handbooks.
**Failure Mode and Effect Analysis (FMEA)**

- Support for function, system design, and process FMEAs according to VDA/AIAG, SAE J1739, IEC 60812 and related standards.
- Model-based FMEA tables synchronizing with the structural elements and functions from design and process models.
- Management of measures and design controls.
- Failure net editor for end-to-end cause/effect chains across abstraction levels.
- Consistent computation of risk priority numbers (RPN) and Action Priorities (AP) along failure net.
- Customizable risk parameters and risk matrices for assessment and optimization of measures.
- Customizable worksheets with user attributes including formulas and access to reliability data (e.g., failure rates for FMECA).
- Connection to requirements management and task management.
- MSR-FMEA import and update (e.g., from APIS IQ-FMEA, PLATO SCIO™).
- MSR-FMEA export.
/ Fault Tree Analysis (FTA)

- Graphical editor for quantitative and qualitative FTA.
- Automatic layout and support to handle large fault trees by multiple diagrams.
- Creation of events and subtrees by drag & drop of model elements and failure modes from system design.
- Coherent and non-coherent fault trees.
- Support for different probability models (fixed, exponential distribution, monitored/repairable, Weibull, custom).
- Evaluation of minimal cut-sets (with adjustable cut set order) and path analysis.
- Time-dependent calculation of unavailability, unreliability and conditional failure intensity of top and intermediate events (exact probabilities and Esary-Proshan upper bounds).
- Importance measures such as Birnbaum, Fussell-Vesely, criticality for primary events and cut sets.
- Support for time-at-risk models according to ARP4761.
- Automatic recalculation of probabilities after design changes.
- Integration with FMEDA for safety mechanisms and failure modes.
- Seamless navigation from cut-set events to elements of the system design.
- Import of fault trees from Isograph® FaultTree+ and CAFTA.

/ Rich Traceability

- Definition of traces between information elements of any type within medini analyze.
- Definition of traces using trace-matrix or by quick-trace functionality.
- Navigation via traces to related elements in other models.
- Visualization of traced elements at any diagram.
- Filters and hierarchies to support the usage even of large trace matrices.
- Impact analysis by graphical visualization of traces (customizable dependency viewer).
Teamwork and Integrated Task Management

- Project compare with two-way and three-way difference analysis.
- Project merge functionality for team collaboration.
- Integration with configuration management systems (TortoiseSVN, IBM® Rational® ClearCase, PTC Integrity, etc.).
- Management of model versions, support of team synchronization.
- Integration with issue tracking systems (e.g. Bugzilla, Trac, RTC, Redmine, Jira, Mantis, PTC Integrity, Microsoft® Outlook).
- Creation of tasks/comments for arbitrary model elements.
- Navigation from tasks to elements and vice versa.
- Context visualization for active tasks.
- Documentation of all decisions at the tasks.
- Scheduling, user assignment, email notification.
// Reporting and Customization

- Reporting functionality to generate PDF, Word, Excel or HTML documents for all project content.
- Default reports for HARA, safety concept, safety requirements, FME(D)A and FTA analyses.
- Customizable reporting framework to build corporate reports for safety-related work products.
- Profiling mechanism to add custom fields, references and queries to all models and analyses.
- Extensible model validation rules to check consistency across all project data.
- Scripting API with integrated JavaScript engine for adding automation features and building tool extensions.