

# Relex OpSim™

## Analyze Reliability, Availability, and Cost Using Advanced System Modeling

Relex OpSim combines intuitive reliability block diagramming tools with powerful optimization and simulation calculations to analyze the performance and lifetime costs of complex, real-world systems.

By combining reliability block diagram (RBD) capabilities with optimization and simulation analyses, Relex OpSim computes reliability and availability metrics for complex systems while accounting for maintenance policies, spare parts, and repair resources. Model even the most complex system configurations and operating profiles. Augment your system diagram with a wide selection of maintenance-related parameters to accurately compute reliability, availability, and cost metrics.

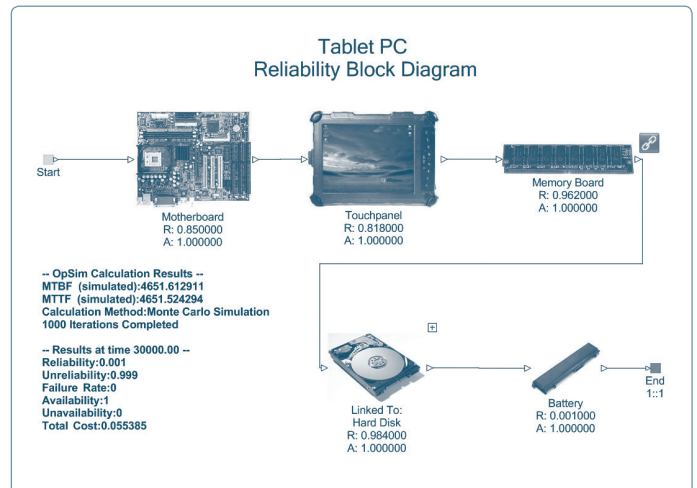
### Key Benefits

#### Powerful Analytical Capabilities

- Model your complete operational profile using phase modeling
- Supports parallel, load-sharing, and standby redundancy types
- Analyzes the diagram to determine the best approach for problem solving: purely analytical solutions, simulations, or both
- Optimizes spares quantities, preventive maintenance intervals, and inspection intervals
- Monte Carlo simulation tool supports various failure distributions
- Compare alternate system configurations, including those that use redundancy or dependency, to determine the best overall design
- Simulation log functionality visually represents failures over time as the simulation is carried out

#### Address Multiple Facets of Component Maintenance

- Account for onsite and offsite repairs and spares, discard units, and repair resources.
- Designate rules for handling spares allocations, repair team allocations and costs, and partial or perfect repairs
- Define maintenance plans that specify time interval, cost, and type of maintenance being performed



Relex OpSim supports many diagram types, including simple series, parallel operating, standby redundant, bridge network, and random network configurations

#### Flexible, User-Defined Parameters

- Specify a calculation goal: minimal costs, maximum reliability, or maximum capacity
- Define repair personnel, availability, and hourly rates for specific diagram components
- Assign overall maintenance time and availability of parts
- Specify degradation factors on all backup and repaired components to account for repairs that are not “good as new”
- Associate a fixed cost with component repair
- Assign costs to various capacity levels to determine the downtime-dependent or capacity-dependent costs of the system

#### Intuitive RBD Modeling Tools

- Supports load-sharing and block dependency diagramming
- Block library stores components and diagrams for re-use
- Address any level of system analysis, from a detailed parts analysis to an analysis of higher-level assemblies

## Features

### Supported Configuration Types

- Series
- Parallel operation
- Hot standby
- Cold standby
- Warm standby
- Redundant
- Bridge
- k-out-of-n
- Generic and random network
- Load-sharing redundancy

### Supported Calculations

- Failure Rate
- MTBF
- MTTF
- Reliability
- Availability
- Expected number of failures
- Optimize spares
- Optimize preventive maintenance intervals
- Total downtime
- Hazard rate
- Operational availability
- Steady-state availability
- Cost of initial configuration
- Cut sets
- Path sets

### Supported Distributions

- Exponential
- Normal
- Lognormal
- Weibull
- Rayleigh
- Uniform
- Time independent
- Constant time

### Modeling Features

- Switching mechanisms
- Switch delays
- Logistics delays
- Conditional repair processes
- Junctions

### Confidence Intervals

- Reliability
- Availability
- MTBF
- MTTF

### Component Repair Policies

- Upon system failure
- Immediately after component failure
- Block dependency

### Sample Analysis Outputs

- Graphical diagram
- Total cost vs. time
- Recommended spares per item
- Recommended preventive maintenance interval per item
- Capacity vs. time
- Failures vs. time
- Reliability/unreliability vs. time
- Availability/unavailability vs. time
- Hazard rate vs. time
- Expected failures vs. time
- Total downtime per item

### Input and Output Data in a Variety of Formats

- Easily import from or export to commonly used formats like Microsoft Excel, Microsoft Access, XML, and plain text files
- Create reports in Microsoft Word, Microsoft Excel, Adobe PDF, and Rich Text Format
- User-definable, wizard-driven custom graphs and reports
- Dynamically link to other Relex analyses, such as FMEA, FRACAS, Life Cycle Cost, Reliability Prediction, and Weibull

### Available Enterprise-Class Features

- Enterprise Edition supports a multi-user environment with login permissions, security features, administrator control, and audit trail functionality
- Database integration at enterprise level supports Microsoft SQL Server 2008, Oracle, Microsoft SQL Server Express, and Microsoft Jet Engine (Access compatible)
- User-specific login page displays system-wide announcements

## For More Information

For more information on Relex OpSim, please visit: [www.relex.com/products/opsim.asp](http://www.relex.com/products/opsim.asp)

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