

# BlockSim

*ReliaSoft BlockSim provides a comprehensive platform for system reliability, availability, maintainability and related analyses that allows you to model the most complex systems and processes using RBDs, FTA or Markov diagrams.*



## Features

- Offers optionally licensed features for Process Flow to upstream maintenance optimisation for any processes and chemical industries.
- Offers optionally licensed features for Event Analysis to model and run complex analyses for any probabilistic or deterministic scenario.
- Facilitates a wide variety of analyses for both repairable and non-repairable systems.

## Benefits

- Identify critical components (or failure modes) and determine the most effective ways to improve system performance through design improvements and/or maintenance planning.
- Use simulation to obtain estimated performance metrics that can facilitate decision-making in variety of areas, such as scheduling planned maintenance, planning for spares, identifying bottlenecks in production throughput, estimating life cycle costs.
- Identify vulnerabilities in a system and determine the most effective ways to reduce risk.
- Enhance your maintenance optimisation and simulation modelling using process flow diagrams
- Make crucial decisions easier with life cycle cost analysis



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## Process Flow module

*Process Flow module upstreams maintenance optimisation for any processes and chemical industries.*


### Features

- Models the reliability and maintainability of equipment and analyses multiple flow types within the system.
- Using simulation approach you are able to choose the best scenario and make confident evidence-based decisions.
- Offers complete solution for process design changes, where you can create and simulate various flow models to improve processes, increase efficiency, and reduce costs.
- Can be used for the visual design and optimisation of any technical processes such as chemical plants, Oil & Gas facilities, power stations, complex manufacturing operations and biological processes such as water treatment.

### Benefits

- Solve problems and find the best scenario
- Improve design and optimise any technical processes
- Model the most complex systems with multiple and various flows
- Identify bottleneck to achieve maximum performance
- Make confident evidence-based decisions with highly intuitive graphical interface

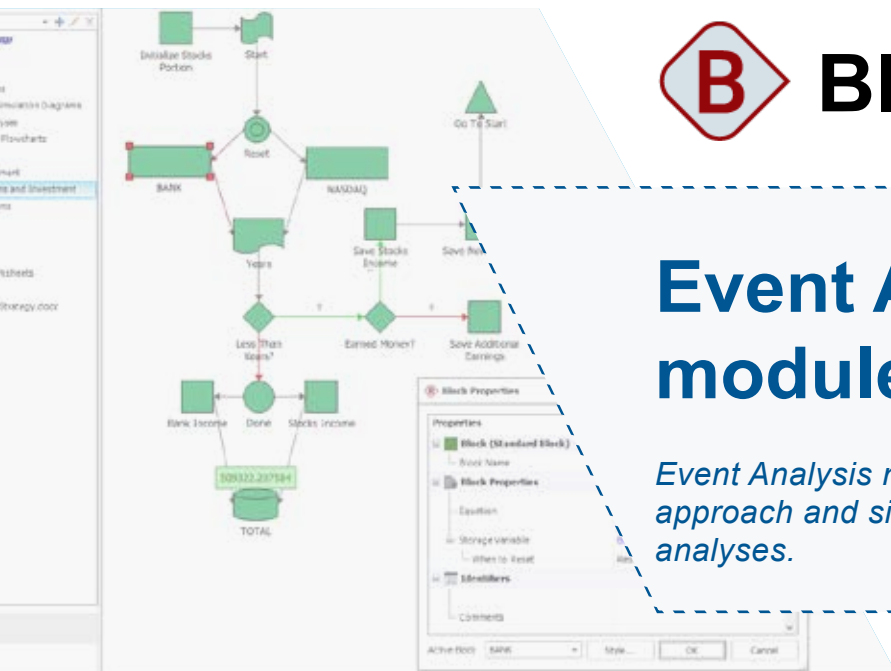




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## Event Analysis module

*Event Analysis module uses flowchart modelling approach and simulation to build and run any complex analyses.*



### Features

- Model and run complex analyses for any probabilistic or deterministic scenario and optimise the results needed for further analysis.
- Develop ideas, workflows and estimate results of interest with a familiar and intuitive flowcharting concept.
- Track real-time values and evaluate equipment's behaviour over time with reliability or availability results by using sensitivity analysis.

### Benefits

- Use flowchart simulation to model complex scenarios and forecast performance under a variety of different design and usage scenarios
- Perform sensitivity analysis to evaluate how key inputs will affect the results
- Automatically estimate optimum values by performing multiple simulation runs with different variables
- Wide range of applications for risk/safety analysis, complex reliability modelling, decision making, maintenance planning, optimisation, operational research and logistics, etc.
- Design and build your own analyses without having to write any code



## BlockSim Software Highlights

### Reliability Block Diagrams (RBDs)

- Series, Parallel and Complex
- k-out-of-n
- Standby
- Load sharing
- Subdiagrams
- Multi blocks and Mirrored blocks

### Fault Trees

- AND and OR Gates
- Voting Gates (k-out-of-n)
- Inhibit Gates
- NOT, NAND and NOR Gates
- Standby configurations using:
  - Standby Gates
  - Priority AND Gates
  - Sequence Enforcing Gates
- Load Sharing Gates
- Subdiagrams
- Utility to trace a subdiagram to the top node

### Analytical diagrams

- Exact system reliability equation
- Minimal Cut Sets
- Metrics:
  - Reliability and probability of failure
  - Conditional reliability
  - Conditional probability of failure
  - Reliable life (aka warranty time)
  - BX% life
  - Mean life
  - Failure rate
- Plots:
  - Reliability/Unreliability vs. Time pdf
  - Failure Rate vs. Time
  - Reliability importance plots

### Simulation diagrams

- Duty cycles

- Maintenance durations
- Restoration factors
- Direct & indirect maintenance costs
- Spare Parts availability
- Maintenance crew logistics
- State change triggers
- Batch simulation
- Metrics:
  - Mean and point availability
  - Mean and point anavailability
  - Reliability and probability of failure
  - Mean time to first failure
- Plots (for system and/or block):
  - Point reliability
  - Point availability
  - Mean availability
  - Costs
  - Up/Down timeline
  - Block or system downtime
  - Expected failures
  - Expected downing events
  - Criticality metrics (RS FCI)
  - Block bubble plot
  - Crew metrics
  - Spare part metrics
- Throughput analysis
  - Throughput
  - Block excess capacity
  - Block backlog and backlog processed
- Maintenance planning

### Phase diagrams

- Maintenance phases
- Node and stop blocks
- Varying throughput
- Subdiagrams

### Process Flow module

- Analysis of continuous throughput
- Multiple types of flows

### Event Analysis module

- Easy to build flowchart models
- Equation building utilities
- Simulation results (in Excel®-compatible spreadsheet and or directly in the flowchart)
- Sensitivity analysis
- Optimisation

### Markov diagrams

- Discrete
- Continuous

### System improvement tools and reports

- Allocation analysis
- Optimum replacement
- FRED reports
- Overlay plots (aka Multi-plots)
- Synthesis workbooks (spreadsheet and word processing modules combined)

### Reliability program integration

- Use models created from analyses performed in other ReliaSoft applications
- Build RBDs or Fault Trees from data in XFMEA/RCM++ or Lambda Predict
- Use BlockSim diagrams to simulate response data for Weibull++
- Publish models based on diagram analyses and create metrics to track and display KPIs

### Available services

- Detailed user documentation
- Practical example files
- Training for theory + software
- Quick tour guide
- Professional engineering services

For more information visit:



**ReliaSoft**

Holistic Asset Management is the Australia and New Zealand reseller of ReliaSoft Software from HBM Prencsia Inc. These expert analysis tools are benchmarks in the reliability industry and are widely used in various industry sectors to facilitate the practical application of reliability in maintenance, asset management, product development and after sales.



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