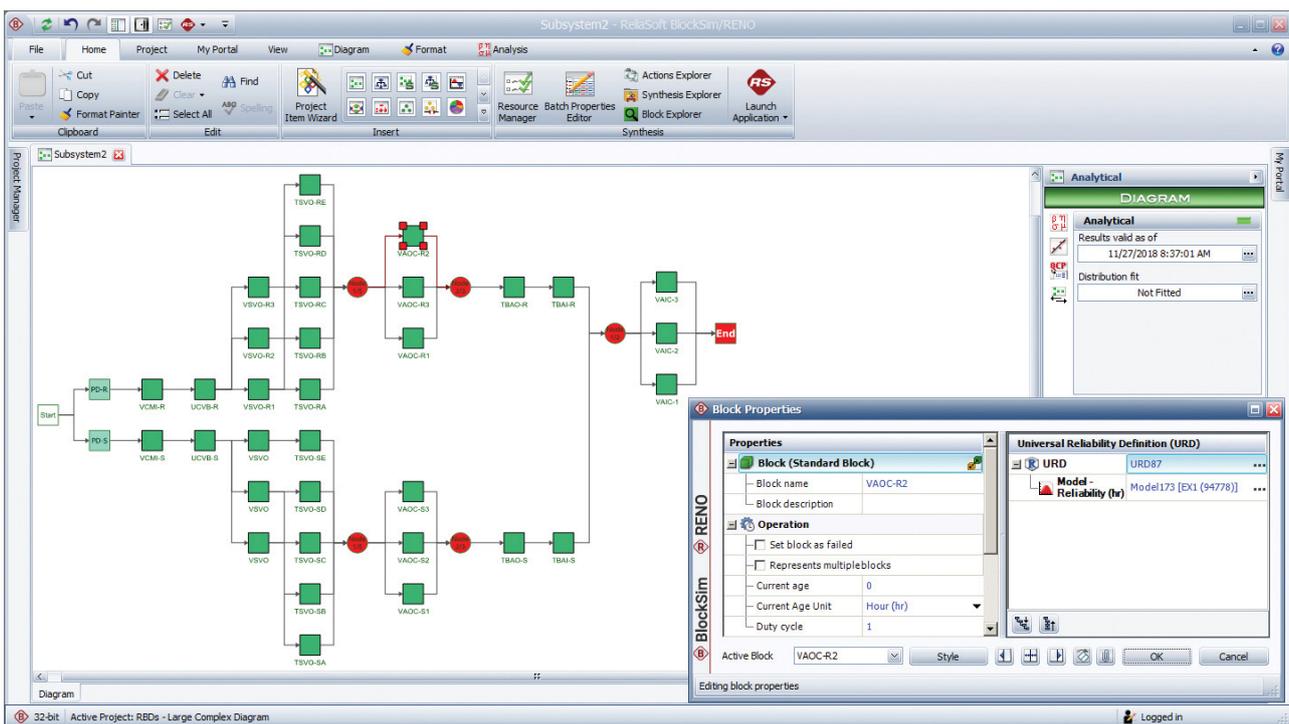


# BlockSim

## RBDs, fault trees, process flows and Markov diagrams

ReliaSoft BlockSim provides a comprehensive and flexible platform to model systems and processes using both reliability block diagram (RBD) and fault tree analysis (FTA) approaches. An extensive array of RBD configurations and FTA gates and events are supported, including advanced capabilities to model complex configurations, load sharing, standby redundancy, phases, duty cycles and more! Process flow models and Markov diagrams are also available.

Use the system models to perform reliability, maintainability, availability, reliability optimization, throughput, resource allocation, life cycle cost and other analyses.



### 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 a variety of areas, such as scheduling planned maintenance, planning for spares, identifying bottlenecks in production throughput and estimating life cycle costs
- Identify vulnerabilities in a system and determine the most effective ways to reduce risk

# 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 unavailability
  - 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

- Analysis of continuous throughput
- Multiple types of flows

## 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++/RBI or Lambda Predict
- Use BlockSim diagrams to simulate response data for Weibull++
- Use BlockSim diagram results in RENO flowcharts
- 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 consulting services

For more information visit: [www.reliasoft.com/blocksim](http://www.reliasoft.com/blocksim)

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