

## Reliability Block Diagram Analysis

*Relyence® RBD offers a comprehensive platform for modeling complex systems, including those incorporating redundancy. Computing a wide range of metrics with its highly capable mathematical engine, Relyence RBD offers the finest in power and performance for your reliability block diagram analysis needs.*

### KEY HIGHLIGHTS

- Complex system modeling
- Redundancy analysis
- Series & parallel configurations
- Hot & cold standby redundancies
- Monte Carlo simulation
- 16 availability & reliability metrics
- 10 failure & 9 repair distributions
- 10 Plot types
- Path sets & Cut sets
- Diagram & Block Libraries
- Analytics Calculator
- Dashboard overviews
- Device independence

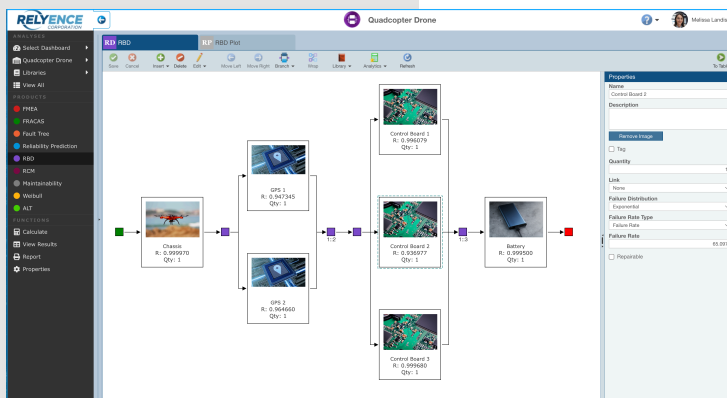
**Complete System Modeling.** Relyence RBD is a complete modeling tool for reliability block diagram (RBD) analysis. The intuitive, visual diagrammer provides an easy-to-use interface for creating impressive, organized graphical system models. The built-in *smart layout* feature expertly manages your diagram layout and connections. You can model series and parallel configurations, incorporate branches, and analyze standby redundancies with switch probabilities and delay factors. To ensure accurate modeling, Relyence RBD supports an array of failure and repair distributions, including Constant Time, Exponential, Gumbel+, Gumbel-, Lognormal, Normal, Rayleigh, Time Independent, Uniform, & Weibull.

**Capable Calculation Engine.** The heart of Relyence RBD is the highly intelligent mathematical calculation engine. First evaluating your diagram to determine the most efficient computational methods to employ, the calculation engine then computes a wide array of reliability and availability metrics. Utilizing both analytical and Monte Carlo simulation techniques, Relyence RBD can compute reliability, failure rate, availability, mean availability, hazard rate, total downtime, unreliability, equivalent failure rate, unavailability, mean unavailability, failure frequency, expected number of failures, and steady state values of MTTF, MTTR, MTBF, and availability. The calculation engine also can be used to evaluate cut sets and path sets for critical path identification. A range of Plot types aid in assessing lifetime performance. Additionally, the Analytics Calculator can be used to compute point-based metrics such as availability, bearing life (used to calculate B10 life), failure rate, mean life, reliability, warranty time, and more.

**Robust RBD Package.** Relyence RBD includes a host of additional capabilities for a best-in-class RBD package: support for sub-diagrams and images, RBD Block and Diagram Libraries for efficient diagram and data management, integration with Relyence Reliability Prediction and Relyence Weibull for failure modeling, API features, and much more!

**Dashboard for RBD.** The Relyence RBD Dashboard provides an at-a-glance overview of your reliability block diagram analyses. Combining all the data you need for quick assessment, the Dashboard offers the ability to monitor and manage your reliability and availability metrics with efficiency and effectiveness with a choice of customizable widgets. This focused overview enables you to quickly gauge system health, proactively maintain your reliability and availability objectives, and turn insight into action.

**Deployment Choice.** Relyence RBD is built on the Relyence Platform - a highly adaptable, browser-based, mobile-friendly framework constructed with today's workplace in mind. Relyence RBD can be installed on-premise at your location, hosted in the Microsoft Cloud, or hosted in your own private secure cloud. All platforms offer the same features and functions. The choice is yours!



## Reliability Block Diagram Analysis

Combining an easy-to-use diagramming front end with powerful calculations.

Array of Plot Types      Complex System Modeling      Extensive Help including Videos

Image Support for Impressive Diagrams      RBD Diagram      Extensive Failure & Repair Modeling

### Comprehensive Calculations

Calculation Options

Analytical & Simulation Methods

### Account Management

### Top Ten Blocks with Highest Unavailability

Example RBD Dashboard

NAME	RELIABILITY
Motors	0.005113
Chassis	0.004459
Flight Controller	0.003999
ESC	0.003549
Receiver	0.003423
GPS	0.132165
Motherboard	0.119989

NAME	RELIABILITY
Motors	2.49969e-004
Chassis	1.20000e-004
Flight Controller	7.50000e-005
ESC	4.75072e-007
Receiver	3.73112e-007
Battery	7.49971e-008
Ground Controller	4.99648e-008

NAME	DESCRIPTION	AVAILABILITY	BLOCKS
Motors	Provide power for propeller movement.	2.49969e-004	ESC
Chassis	Main body of drone. Housing control and electronics for flight.	1.20000e-004	Receiver
Flight Controller	Circuit board with flight controller avionics.	7.50000e-005	Ground Controller, ESC
ESC	Electronic Speed Controller. Interfaces between flight controller board and motors for speed control in flight.	4.75072e-007	Ground Controller, Motors
Receiver	Radio receiver for obtaining commands from ground controller.	3.73112e-007	Ground Controller, Chassis
Battery	Drone power unit.	7.49971e-008	Ground Controller, Flight Controller
Ground Controller	Controls and maneuvers the drone from a remote location.	4.99648e-008	Ground Controller, Flight Controller

List of Blocks with Low Reliability

Example RBD Dashboard

Path Set Listing