When actual product reliability data is not available, standards based reliability prediction may be used to evaluate design feasibility, compare design alternatives, identify potential failure areas, trade-off system design factors and track reliability improvement.

ReliaSoft's Lambda Predict facilitates failure rate and MTBF predictions based on the major reliability prediction standards. The software also offers reliability allocation, derating analysis and a full set of supporting tools.

Lambda Predict has now been completely re-engineered and integrated into the powerful Synthesis Platform®.
ReliaSoft’s Lambda Predict facilitates reliability prediction analysis based on the major published standards, including MIL-HDBK-217, Bellcore/Telcordia, FIDES and NSWC Mechanical.

**Comprehensive Platform for Reliability Prediction Analysis**

Lambda Predict facilitates every step of the standards based reliability prediction analysis process, with user-friendly capabilities designed to make it easy for you to:

- Build the system configuration (from scratch or by importing data from Bill of Materials files, predefined part libraries or other external sources).
- Define component characteristics and operating conditions, with the choice of two different views to facilitate data entry.
- Calculate results (Pi Factors, Failure Rates, MTBFs) at any level within the configuration.
- Use graphical plots/charts to visualize and present analysis results.
- Generate print-ready reports to support your decisions and disseminate knowledge.

**Derating Analysis**

Lambda Predict also makes it easy to perform derating analysis for your systems. When you select from the available published derating standards or define your own criteria, the software provides a visual indication of each item’s derating status and allows you to drill down for more detailed analysis information and plots.

**Reliability Allocation**

The Allocation utility provides a choice of five allocation models that can be used to logically apportion the product design reliability into lower level design criteria such that the cumulative reliability still meets the requirements. The available models are: Equal, AGREE, Feasibility of Objective, ARINC Apportionment Technique and Repairable Systems Allocation.

**Flexible Data Management via Import/Export or Copy/Paste**

Lambda Predict stores your analysis information in a relational database, which makes it possible for you to take advantage of many useful data management capabilities. For example, the software provides a flexible tool for finding and reusing data from existing analyses or libraries. You also have the option to easily duplicate or transfer data using import/export or copy/paste.

**Access to PartLibraries.org**

Lambda Predict provides exclusive access to the PartLibraries.org website portal, which allows you to search and import parts data from MIL-M-38510, EPRD-97 or NPRD-95 (free to all users) as well as more than 300,000 specific commercial electronic components (yearly subscription required).


- Integration into the Synthesis Platform, which allows multiple users throughout the organization to share analysis information between any of ReliaSoft’s Synthesis-enabled analysis tools.
- Support for the FIDES prediction standard (FIDES Guide 2009) and the latest version of the Telcordia standard (SR-332 Issue 3).
- An updated user interface and many usability enhancements that make it easier to import data from external files, share and reuse data from custom libraries and generate custom reports.

**Built on the Synthesis Platform**
Integration with Weibull++, ALTA, DOE++, RGA, BlockSim, RENO, Xfmea, RCM++, RBI, MPC and XFRACAS

**Multiple Languages**
English, French, German, Portuguese, Spanish, Simplified Chinese

**Support**
Extensive resources online and in print. Network of regional offices provide support via phone, e-mail or live chat.
Lambda Predict has been integrated into the ground-breaking new Synthesis Platform, which offers practitioners the best of both worlds: analysis tools that are optimized to fully meet the individual user’s needs for a particular set of analysis methods, plus integration into a centralized repository that is shared by users throughout the organization and facilitates integration between analysis tools.

**Synthesis Platform for Multi-User Access and Intelligent Integration — New in Latest Version!**

The Synthesis Platform offers a unique solution to the challenge of integrating reliability information without sacrificing the power and flexibility of each individual analysis method. Your interaction with each application will be similar to your experience with previous versions — a full-featured tool that has been expertly designed to meet your needs for all aspects of the analysis methodology. And from the overall reliability program perspective, multiple users will now have the ability to share resources between applications and analyses.

Specifically for Lambda Predict, Synthesis gives you the ability to:
- Publish models that are based on analyses performed in prediction folios, which makes this information available to analyses performed in other Synthesis applications.
- Use system configuration and failure rate prediction data from Lambda Predict in BlockSim, Xfmea, RCM++ or RBI analyses.

**Centralized Data Storage and Flexible Permissions**

All Synthesis applications offer centralized data storage that allows multiple users to work cooperatively on analysis projects. You can choose which type of database will provide the back-end data storage:
- A **Standard Repository** is easy to create and maintain without any special IT infrastructure or support, but there are limitations to the amount of data it can store and the number of simultaneous users.
- An **Enterprise Repository** requires implementation of Microsoft SQL Server® or Oracle®, but it is a more robust platform that can store much more analysis information in the same database and supports access by many more simultaneous users. (Licensing, support and maintenance for SQL Server®/Oracle® are not included with Synthesis.)

When using login security, you will be able to determine which capabilities are available to each individual user. Choose basic predefined security groups or customize the access permissions to meet specific needs.

**Messages and Action Tracking**

One of the many benefits of having multiple users working from the same centralized data repository is the opportunity to use a common interface for posting messages and tracking completion of assigned actions.

The Synthesis repository can be configured to enable e-mail notifications that serve to alert members of the team when relevant messages or actions are created or updated. You also have the option to send actions to your calendar in Microsoft Outlook®.

**Enhanced, Easy-to-Use Interface with Internet Connectivity**

All Synthesis applications offer a completely updated user interface with an "Office 2010" look and feel, and many usability enhancements. Some of the most useful include the ability to check-in/check-out portions of the analysis, "restore points" that allow you to restore or roll back to a previous stage in the analysis, and more flexible tools to organize and manage analysis projects.

Whenever possible, the new interface takes advantage of an active Internet connection to deliver the most up-to-date announcements, documentation and theoretical resources.
Lambda Predict supports the major reliability prediction standards and makes it possible to mix and match components analyzed with different standards when applicable. Depending on your license, the following prediction standards may be available:

**MIL-HDBK-217F**


In addition to providing full support for the MIL-217 Part Stress calculation method, the software also includes a library database with nearly 3,000 components that can be used to quickly create a MIL-217 Parts Count prediction. This analysis approach may be applicable during bid proposals and early design phases when sufficient information is not available to use other methodologies.

Lambda Predict provides an optional tool (based on a technical report produced by the US Air Force, RADC-TR-85-91) that can be used to predict the Non-Operational Failure Rates of components.

**Bellcore/Telcordia — Enhanced in the Latest Version!**

The Bellcore/Telcordia standards (Reliability Prediction Procedure for Electronic Equipment) provide reliability prediction models for electronic components in commercial applications. Lambda Predict now supports four versions of the standard including the latest SR-332 Issue 3, issued by Telcordia Technologies in 2011.

These standards provide a choice of three methods for calculating the steady-state failure rate. Method I (also known as the Black Box method) uses only the generic failure rates and pi factors from the standard. Method II allows you to supplement the black box calculations with real data that you’ve obtained from testing, while Method III considers real data obtained from an identical or similar item operating in the field.

**FIDES — New in the Latest Version!**

The FIDES Guide 2009 (UTE-C 80811) was updated in 2009 by a consortium of leading French international aeronautical and defense companies, under the supervision of the DGA (Délégation Générale pour l’Armement - French Ministry of Defense). It offers a reliability prediction methodology based on physics of failure, and provides failure rate models for electrical, electronic and electromagnetic components, as well as for commercial-off-the-shelf (COTS) board assemblies.

Lambda Predict provides full support for defining different operating phases (life profile). The software also guides you through the pi factor assessments recommended by the standard and makes it easy to reuse supplier/process evaluations when applicable.

**NSWC Mechanical**

The Handbook of Reliability Prediction Procedures for Mechanical Equipment (NSWC-07), issued by the Naval Surface Warfare Center Carderock Division on July 31, 2007. This standard provides reliability prediction models for mechanical components, such as seals, springs, pumps, valves, brakes and more.
Flexible Tools to Build Your Reliability Predictions

Importing Parts from "Bill of Materials" (BOM) Data Files — Enhanced in the Latest Version!

Because we understand that importing system configuration data from an external "Bill of Materials" data file can provide a significant head-start for performing a reliability prediction analysis, Lambda Predict makes it easier than ever to import data from Microsoft Excel® or delimited text files.

Of course we still provide the flexibility to create and manage templates manually. In the Synthesis version, we’ve also improved the feature that automatically “maps” the information from your file to the data fields that are supported by the software. Either way, you can save time by reusing the same templates for any other data sets that are organized the same way.

The Synthesis version also introduces the ability to use your BOM file to automatically update the properties of components that already exist in the prediction folio and append new data.

Beyond the Basics

Lambda Predict offers several innovative features and analysis capabilities that provide convenience and/or go beyond the basic standards based reliability prediction methods.

- **External Components**: Use an external component to reflect the failure rate for any component that is not addressed in the reliability prediction standard you’re using.

- **Linked Blocks**: Use a linked block to represent the same system or assembly in more than one location within the system hierarchy. When the analysis for the original (source) system/assembly is updated, any linked blocks are updated automatically.

- **Redundancy**: Lambda Predict makes it easy to explore whether you can meet your MTBF/failure rate target by adding redundancy. Simply set the Redundancy property to “true,” then define the parallel configuration (e.g., 2 of 3 identical components must be operating) and the mission time at which you want to calculate the failure rate.

- **Adjustment Factor**: Regardless of which prediction standard you are using, Lambda Predict allows you to tweak an item’s calculated failure rate by a specified value. For example, if you have reason to believe that the actual failure rate of a component will be half of the rate calculated by the prediction standard, change the adjustment factor from 1 (the default) to 0.5.

- **Easy Property Updates**: The software provides two features that make it easy to update the properties of multiple components simultaneously. The **Global Edit** feature provides the flexibility to change a variety of properties for any selected components, while the **Update Modes** feature serves as a quick way to coordinate some of the application and physical properties that might be the same for an entire assembly.
**CALCULATED RESULTS, PLOTS AND REPORTS**

**Complete Array of Calculated Results — Enhanced in Latest Version!**

Failure rates, MTBFs and other calculated results are displayed directly in the system hierarchy.

You can choose which columns will be displayed at any given time, and also use the new **Highlights** feature to use red, yellow and green background colors to make it easy to see how the component’s failure rate contributes to the overall failure calculated for the system or assembly.

You can use the **Pi Factors View** to see how the component properties contribute to the pi factors (also called multiplying factors) in the failure rate model.

You can also use the **Calculation Information** window to see a report of the pi factors and failure rate calculation for any selected component.

**Graphical Plots and Charts**

Lambda Predict also provides a complete array of plots and charts to demonstrate your analysis graphically. This includes plots for Failure Rate, MTBF, Mission Time and Unreliability (plotted independently and versus Temperature, Environment, Stress, etc.).

The **Plot Setup** gives you full control over the display settings and all plot graphics can be saved and inserted into other reports and presentations.

You have the option to create plots that present data from more than one system/assembly analysis. The **Saved Plots** feature also provides the ability to save the plot with the project (including all settings and a direct link to the original data source).

**Template-Based Reports — Enhanced in Latest Version!**

For maximum flexibility, Lambda Predict offers template-based reports to present and disseminate the results of your predictions. A basic report template is provided for each reliability prediction standard that is included with your license. You can customize the appearance of these predefined report templates, and also manage and build your own custom report templates.

Reports can be generated in Microsoft Word® and/or Excel®.
EASY TO REUSE EXISTING COMPONENT DATA

The ability to quickly find and reuse component data from an existing analysis or library can be one of the most powerful benefits of performing your reliability predictions in Lambda Predict. When used correctly, the following features can provide significant time savings and also help to avoid errors by ensuring consistency among your analyses.

Find and Use Existing Components

The Import Local Components utility (formerly called "Add Existing Components") makes it easy to search for existing components and automatically import selected data into your analysis. You can choose to search for data within an existing prediction folio (in the current database or any other Synthesis database) or from a custom library database.

You also have the option to query by up to three properties using the Boolean operators AND and OR. For example, it’s easy to search for components where the Name contains “abc” AND the Supplier contains “xyz.” Alternatively, you can search for components where the Part Number contains “123” OR “789” — and so on.

Manage Your Own Custom Libraries — Enhanced in Latest Version!

The Manage Library feature allows you to build and share custom library databases that contain component properties that you may frequently use in your standards based reliability prediction analyses.

Enhanced in the Synthesis version, this utility now provides built-in security features that make it easier for multiple users to access shared libraries in a properly controlled manner.

We’ve also added the ability to automatically update the general and physical properties for components that already exist in a prediction folio by matching the name, type and part number against the components that have been predefined in a selected library.

Access to Prepared Component Libraries and PartLibraries.org

All Lambda Predict users receive free access to the integrated circuit (IC) component definitions published in MIL-M-38510, the electronic component failure rates published in EPRD-97 (Electronic Parts Reliability Data) and the mechanical, electrical and electromechanical component failure rates published in NPRD-95 (Nonelectronic Parts Reliability Data).

In addition, if you want access to more than 300,000 commercial components with reliability prediction parameters predefined based on the published manufacturer spec sheets, you can purchase a yearly subscription to PartLibraries.org that offers unlimited access to the full parts data repository.

The flexible Search PartLibraries.org utility makes it easy to search by category, part number, supplier, part name and/or part description.

The results provide the reliability prediction parameters required by the standard or the component failure rate. When applicable, the portal also provides additional details obtained from the manufacturer’s spec sheet, which can provide a useful additional tool when selecting components for a new design.

Note: Currently, all of the available commercial components are electronic in nature. The paid subscription is recommended only for users of MIL-217, Bellcore/Telcordia and/or Lambda Predict.
Derating Analysis and Reliability Allocation

Derating Analysis

Most equipment failures are precipitated by stress. When the applied stress exceeds the inherent strength of the part, either a serious degradation or a failure will occur. Derating analysis helps with the selection of parts and materials so that the applied stress is less than rated for a specific application.

When you are working with a MIL-217, Bellcore/Telcordia or FIDES prediction, you can select from the available published derating standards or define your own. The software provides visual indicators within the system configuration to show each component’s derating status and also makes it easy to view the derating curves.

The available derating standards are:

- NAVSEA-TE000-AB-GTP-010 issued by the Naval Sea Systems Command in March 1991.
- ECSS-Q-30-11-A issued by the European Cooperation for Space Standardization in April 2006.

Reliability Allocation

Lambda Predict’s Allocation utility provides a choice of five allocation models that can be used to logically apportion the product design reliability into lower level design criteria such that the cumulative reliability still meets the requirements.

The available allocation models are:

- Equal Allocation
- AGREE Allocation
- Feasibility of Objective Allocation
- ARINC Apportionment Technique
- Repairable Systems Allocation
FREQUENTLY ASKED QUESTIONS

How can I determine if Lambda Predict is the right tool for me?
We invite you to try this product and compare it with any comparable package on the market. Download a free demo from our website at http://Download.ReliaSoft.com.

What are the minimum system requirements?
Both 32-bit and 64-bit versions are available. The supported operating systems are Windows XP (32-bit, SP 3 or higher), Vista (SP 1 or higher), Windows 7 and Windows 8. If you choose to use an enterprise data repository, Microsoft SQL Server® and Oracle® are supported (including the “Express” editions of both). For complete details, see http://Synthesis.ReliaSoft.com/requirements.htm.

What languages are supported?
The interface is currently available in English, German, French and Portuguese (with Spanish and Simplified Chinese planned to be added soon). For details and to see if support for additional languages has been added in our most recent release, see http://www.ReliaSoft.com/languages/.

Is the Synthesis Platform a separate product to buy and install?
No. The platform is integrated directly into each product (Synthesis Application). It is automatically installed and configured during the installation process.

Do I have to buy a different version for single-user vs. enterprise deployments?
No. All Synthesis Applications are designed to adapt automatically to single-user, multi-user and/or enterprise configurations based on what type of repository you are connected to. Each application can be used as an enterprise version when connected to a Microsoft SQL Server® or Oracle® database, or act as a single-user or simple multi-user version when connected to a standard repository.

What type of technical support is available?
Having the best and most advanced solution on the market is only part of the package; our unparalleled after-sale support completes it. We provide good old-fashioned “pick up the phone and talk to a real engineer at ReliaSoft” support. No seemingly endless phone menus and incessant elevator music on hold. Our growing network of regional offices is waiting to answer your questions personally via phone, e-mail or live chat. Software-related technical support is completely FREE for registered end users with Single User Licenses. For other license types, support is available with an active maintenance agreement. For details, visit http://Support.ReliaSoft.com.

What resources are available to help me master the software?
Lambda Predict offers complete and detailed online help files, a quick start guide with step-by-step examples and a multitude of example files designed to get you up and running the minute the application is installed. In addition, ReliaSoft’s training seminars provide instruction in reliability engineering principles and theory as well as the ReliaSoft software tools designed to put that theory into practice. For details, see http://Seminars.ReliaSoft.com.

How do I order the software and when will it arrive?
We provide a variety of license options to meet your particular needs, and we also offer competitively priced multi-product suites. For Single User Licenses, use our secure web store, print-ready order form or contact the ReliaSoft office nearest you. For any other licensing option, including Network or Unlimited User licensing, please contact ReliaSoft to receive a quotation.

Generally, orders received by your local office before 2 p.m. are processed on the same business day. Otherwise, orders are processed the next business day. Both eDelivery and Box Delivery are available — you have the option to download the product from the website or to have a disk and printed materials shipped to you via an express courier (2nd Day or International service). If requested, and depending on your location, domestic orders can be shipped with Overnight service for delivery by the next business day. For details, see http://www.ReliaSoft.com/order/.
ReliaSoft Corporation is the global leader in reliability engineering software, training and services that combine the latest theoretical advances with essential tools for the practitioner in the field. We are dedicated to meeting the reliability, quality and maintenance planning needs of product manufacturers and equipment operators worldwide.

**SOFTWARE**

Acclaimed for their ease of use, analytical power and unparalleled technical support, ReliaSoft’s software facilitates a comprehensive set of reliability-related analysis techniques. The Synthesis Platform® facilitates intelligent integration between analysis tools.

**Weibull++**
Life data analysis

**ALTA**
Accelerated life testing data analysis

**DOE++**
Experiment design and analysis

**RGA**
Reliability growth analysis

**BlockSim**
System analysis using block diagrams or fault trees

**RENO**
Visual stochastic event simulation and risk analysis

**Predict**
Standards based reliability prediction

**XFMEA**
FMEA/FMECA and related analyses

**RCM++**
Reliability centered maintenance analysis

**RBI**
Risk based inspection analysis

**MPC**
MSG-3 aircraft systems and powerplant analysis

**XFRACAS**
Web-based FRACAS and related activities

**Orion eAPI**
Web-based asset performance management

**Enterprise Portal**
Web-based Synthesis Portal

**Synthesis API**
Application Programming Interfaces (APIs)

**Education**

ReliaSoft offers an extensive curriculum of reliability training courses that provide thorough coverage of the underlying principles and theory as well as the applicable software. The complete course list and calendar of upcoming public seminars are published on the web.

**Consulting**

ReliaSoft’s expert reliability consulting services team offers a uniquely powerful combination of industry insight, unparalleled subject mastery and, most important of all, direct access to all of ReliaSoft’s global resources, expertise and contacts.

www.ReliaSoft.com