



# Release Highlights

Software Version 5.4

March 23, 2018

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# Sherlock Release Notes

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## 1 Introduction

This document provides a summary of all new features, product enhancements, and bug fixes made in the Sherlock version 5.4 release. Any known issues found prior to release will be listed in this document.

This document is located in the top-level installation directory of Sherlock and is accessible from the Help -> Release Notes menu in the Sherlock software.

## 2 New Features

### 2.1 Component Cracking

Added a strain-based component cracking indication column and result layer to ICT, Mechanical Shock, Thermal Mechanical, and Vibration Fatigue analysis. For any part which uses a material with a defined *Fracture Strength* property, the maximum part strain from the analysis is compared to the fracture strength of the material. When the strain exceeds the fracture strength, the component is at risk for cracking which is indicated with this new result column and layer.

### 2.2 Component Failure Mode Analysis

Added a new analysis module to predict component failure due to wearout not related to solder fatigue. This is initially supported for electrolytic capacitor parts. See the **Component Failure Analysis** user guide section for details about the standard and how Sherlock performs this analysis. *Support for the Component Failure Mode Analysis module requires a Sherlock license option to be enabled. If you are interested in this capability, please contact your DfR Solutions sales representative.*

### 2.3 Composite Part Materials

Sherlock now combines available part properties to generate a composite material for use during FEA analysis in place of the single part material assigned. This allows for more accurate modeling of the part. The composite materials are defined depending on the package type, taking into account the internal structure of the part.

### 2.4 Materials, Laminates, and Solders

FEA analysis now supports temperature-based material properties by specifying an analysis temperature when performing FEA analysis.

Added more than 100 epoxy molding compound definitions to the material library.

Added a **Material Temperature Value Calculator** to the **Material Manager** and **Laminate Manager** CTE and *Elastic Modulus* fields to assist with computing temperature-dependent values for those properties. This calculator is accessed with the calculator icon displayed next to each of these fields in the material editor. See the **Material Management User Guide** and **Laminate Management User Guide** sections for more information.

Updated the **Material Manager Editor** form and the **Laminate Manager Editor** form to group properties into different categories, represented by tabs in the editor. Depending on the item

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selected, certain tabs and/or properties will be disabled to indicate they are not applicable for the given item.

Updated the **Material Manager** and **Laminate Manager** to allow for advanced filtering and customized column definitions on the main window.

Added the **Solder Manager**, similar to the **Material Manager**, specifically for managing solder materials used by Sherlock for analysis. The Solder Manager allows custom-defined solder definitions without the need to manually modify a CSV file and allows definition of temperature-dependent properties for CTE and Elastic Modulus instead of defining zero and slope values. See the **Solder Management User Guide** section for more information.

Custom **FEADData.csv** files are no longer used. The critical strain, correction factor, and random correction factor parameters have been relocated in the **Solder Manager**. If you have a customized version of the **FEADData.csv** file, you will need to redefine those items in the **Solder Manager**. See the **Solder Management User Guide** and **User Data Files User Guide** sections for more information.

## 2.5 Sqlite Part Library

Added “**Sqlite Part Library**” support. The Sqlite Part Library supports SQL queries and updates. Users will experience improved query performance over large Local and Shared part libraries. It can be used as a replacement for the Local Part Library or Shared Part Library. The Sqlite Part Library can be accessed directly from third-party tools providing maximum flexibility for both users of all abilities. The Sqlite Part Library requires a Shared Part Library license. For more information, see the **Sqlite Part Library User Guide** section.

## 3 General Enhancements

### 3.1 Failure Rate Analysis

The Part Quality Factor may now be manually entered per part in place of using one of the four predefined part quality modes available. When selecting the part quality mode of “OTHER” the “Part Quality Factor” field will be enabled in the Part Editor and Failure Rate Calculator to allow for input of a specific quality factor.

### 3.2 Mechanical Shock Analysis

Improved the probability of failure calculation for mechanical shock analysis when multiple shock events are used during analysis.

### 3.3 Part Editor

The Part Editor Source Values dialog has been updated to allow for the removal of specific part property values, including simply clearing a user override without needing to clear the user overrides for all part properties. For more information, see the **Lesson #4 – Reviewing Part Properties** tutorial.

In conjunction with the release of the Component Failure Mode analysis module, Sherlock no longer provides part property guesses for Electrical tab properties other than electrical derating.

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## 3.4 Part Wizard Patterns

Updated **EXP** and **EXP3** Part Wizard fields to optionally allow the character delimiter to expect in the field. This allows for multiple optional fields of the same type and in the same position to perform different actions based on the delimiter. By default, the delimiter is not required. See the **Part Wizard User Guide** section for more information.

## 3.5 Semiconductor Wearout

Updated several acceleration factor parameters used in Semiconductor Wearout analysis as the result of changes based on foundry data and research to help improve wearout prediction.

## 3.6 User Interface Changes

Updated the Sherlock client so that tabs with the same name can be active at the same time. Currently if an item is opened that shares the same name as an existing open tab, the existing tab is simply displayed which may not be associated with the current circuit card or project. The associated project is displayed when hovering the mouse over any open tabs.

When closing a Sherlock project which has running analysis tasks, Sherlock will present a warning dialog alerting to the running tasks. If the project is closed with the tasks still running, they will be immediately terminated.

A new setting found in Settings > Report Settings which allows for the life cycle goals displayed in the Life Prediction chart to be located in the sub-title of the chart instead of an annotation on the chart itself.

## 4 Bug Fixes

Fixed a bug when defining surfaces on exported Abaqus models which included both sides in each of the top and bottom surface definitions for very thin models.

Updated the ODB++ component parser to make use of the ODB++ attribute “.pad\_usage” so that when attempting to determine component pad dimensions from the copper layers a better determination of the pad geometry can be made.

Fixed a bug which could result in generated FEA models from associating mount point nodes to the node set definition where the vertical mesh size was non-zero and the calculation of the coordinates resulted in double-precision values which could not be accurately represented, resulting in a rounded value which did not match the node definition. The exact error varies by analysis engine. For Calculix, an error similar to “ERROR reading \*TRANSFORM: node set MP\_001 has not yet been defined.” would be produced.

Corrected the DFMEA export so that images contained in the referenced template spreadsheet files were included in the exported files.

Updated Pick & Place file processing so that trailing spaces from part properties are removed to prevent issues with items such as the reference designator containing those spaces.

The first five persons to let Natalie Hernandez (nhernandez@dfrsolutions.com) know you have read these release notes by April 30, 2018, will receive a twenty-dollar Amazon gift card.

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## 5 Supported Platforms

Sherlock requires the following minimum hardware and software requirements.

### 5.1 Hardware Requirements

Processor – Multi-core x64 Intel or AMD processor

Memory – 4 GB minimum, 8 GB preferred

Hard Disk Space – 200 MB for installation and 4 GB project space.

### 5.2 Software Requirements

64-bit versions of Windows 7, Windows 8, or Windows 10

Java 8 Runtime Environment (see note below for Java 9 support)

Windows .NET Framework 3.5 SP1

Adobe Reader 8.x or higher or compatible PDF viewer

Microsoft Visual C++ 2008 Redistributable Package (for use with FlexNet licensing only)

### 5.3 Optional Software Requirements

The following may also be used with additional Sherlock license features enabled:

Abaqus

Ansys Mechanical Classic

Ansys Workbench

NX Nastran

### 5.4 Supported FlexNet License Servers

64-bit versions of Windows Server 2008, Windows Vista, Windows 7, and Windows 10.

64-bit versions of Linux on the x86 platform that are Linux LSB certified, such as Red Hat Enterprise Linux and CentOS (not including SUSE Linux).

### 5.5 Global Part Library and Software Update

saas.dfrsolutions.com, TCP port 443 or 80

update.dfrsolutions.com, TCP port 80

### 5.6 Java Version 9 Support

Java 9 is minimally supported by Sherlock version 5.4 and later. Because of changes to the Java architecture, versions of Sherlock prior to 5.4 will fail to start when Java 9 is used. The current builds of Java 9 will display warning messages in the Sherlock console related to "Illegal

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reflective access". These are currently only warning messages from Java and do not affect the operation of Sherlock.