

ADDITIVE

Soft- und Hardware für Technik und Wissenschaft GmbH

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Minitab 18.1 - detailed

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Overview of new functionality

Minitab 18 offers an updated Session window, definitive screening designs, tolerance intervals for non-normal distributions, and more. This document outlines the interface changes associated with the new features and enhancements to make it easier for you to update your materials from Minitab 17 to 18.

- * **Definitive Screening Designs** - Identify which inputs affect your outputs with this new type of DOE screening design.
- * **More Distributions for Tolerance Intervals** - Calculate statistical tolerance intervals for nonnormal data using a variety of distributions including Weibull, lognormal, exponential, and more.
- * **REML** for Random and Fixed X's - Explore relationships between variables, run multiple comparisons, and calculate predictions for mixed models.
- * **DOE Effects Plots** - Visually identify significant X's with effects plots for general factorial and response surface designs.
- * **Gage R&R** - Incorporate a user-specified process (historical) standard deviation in relevant calculations.
- * **GLM Response Optimizer** - Include both your factors and covariates when using the response optimizer to find optimal settings.
- * **Updated Session Window** - The Session window has a new look and new enhancements including the ability to specify the number of significant digits, easily access graphs via links, zoom in and out, and collapse output.
- * **Sort Worksheets** - Easily manage your data within the Project Manager using new options for sorting your worksheets by title or in chronological order.
- * **Command Line Pane** - Enter commands to expand Minitab's functionality using a docked pane that keeps commands separate from Session output..
- * **Word and Excel Improvements** - Import Session output into Word and Excel in table format to easily manipulate and customize the appearance of your results.

Note on installation of Minitab 18 and Minitab 17: Note that installing Minitab 18 will not automatically uninstall Minitab 17. They are separate products and can be run simultaneously on the same computer, thus making it easier for you to compare changes between the two versions.

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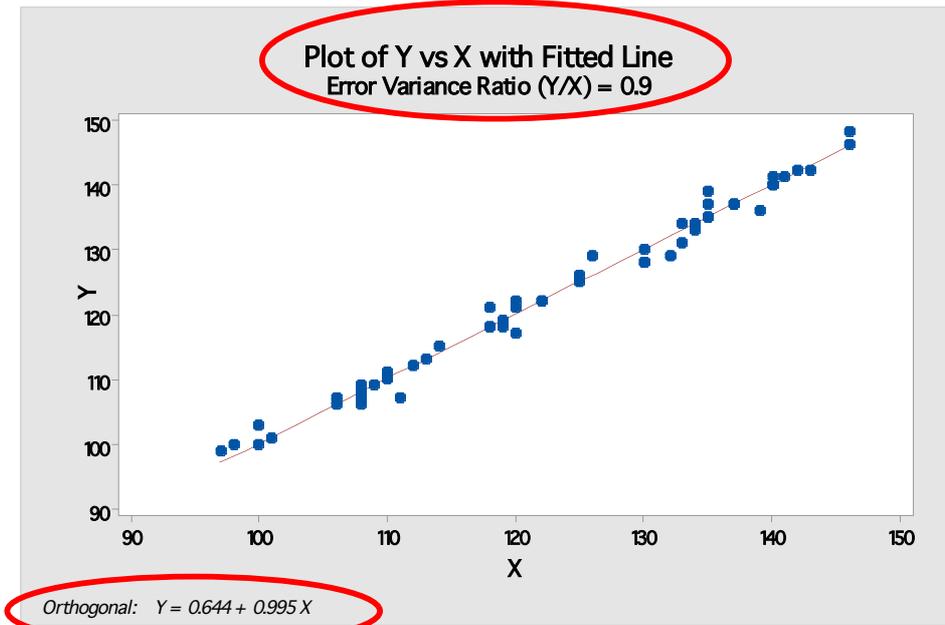
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Statistical Tools

Regression

Orthogonal Regression

The orthogonal regression equation and error variance ratio are now displayed on the fitted line plot.



Binary Logistic Regression

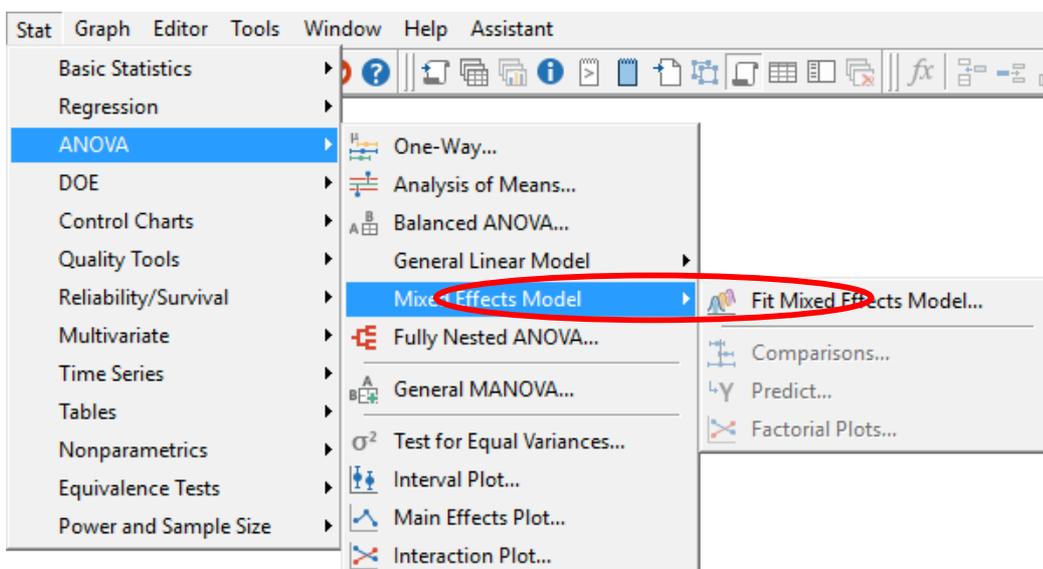
When you include a categorical predictor and use the Coding sub-dialog to change the corresponding Reference Level, the odds ratios for that categorical predictor are now computed with respect to that setting. Minitab 17 instead used the value order of the categorical predictor column to determine the order of the odds ratios. This change only impacts the Session output, not the dialog box.

ANOVA

Mixed Effects Models (REML)

The new **Stat > ANOVA > Mixed Effects Model** menu provides the restricted maximum likelihood and the maximum likelihood estimation methods to fit linear models with both fixed and random factors.

Additional functionality offered beyond that previously available in **Stat > ANOVA > General Linear Model** includes confidence intervals for variances as well as predictions and multiple comparisons for random factors.



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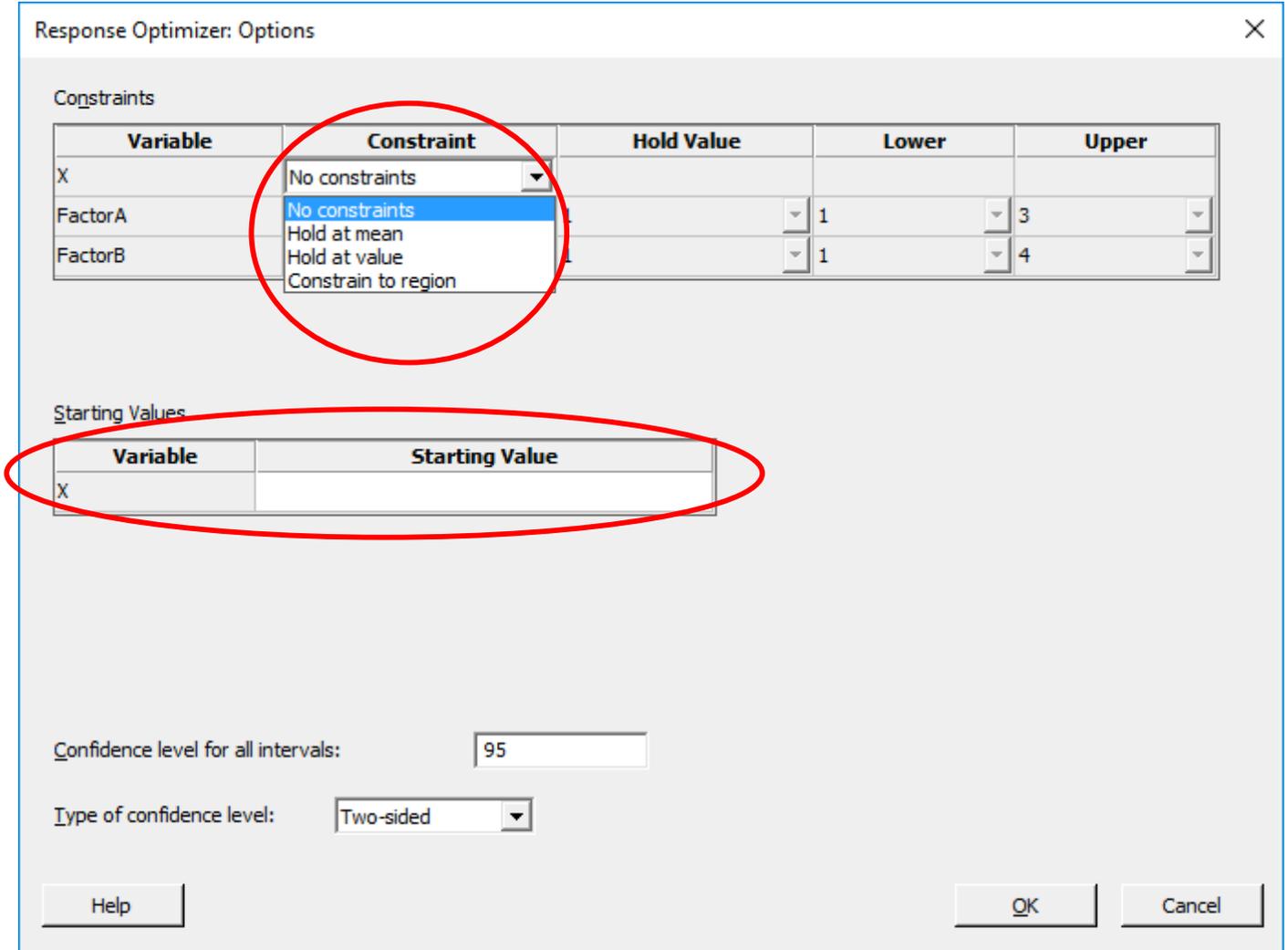
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Response Optimizer

You can now optimize covariates in **Stat > ANOVA > General Linear Model > Response Optimizer**. In Minitab 17, you could use Response Optimizer to find the best settings for categorical factors, but not covariates which were held at a fixed level (the mean by default or at some user-specified hold value).



You can also specify constraints and starting values for covariates via the **Response Optimizer > Options** sub-dialog, and the **Response Optimizer > Storage** sub-dialog includes covariates.

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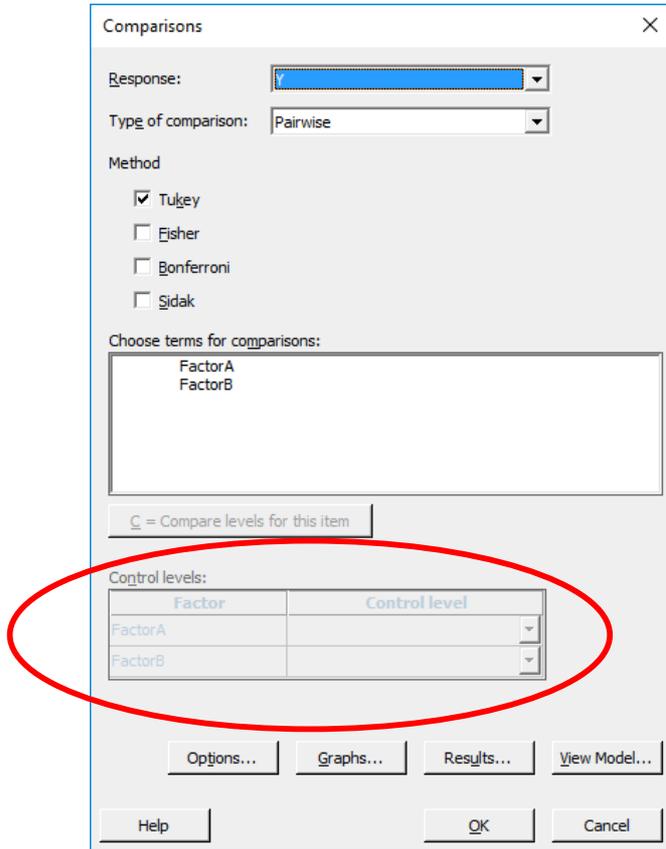
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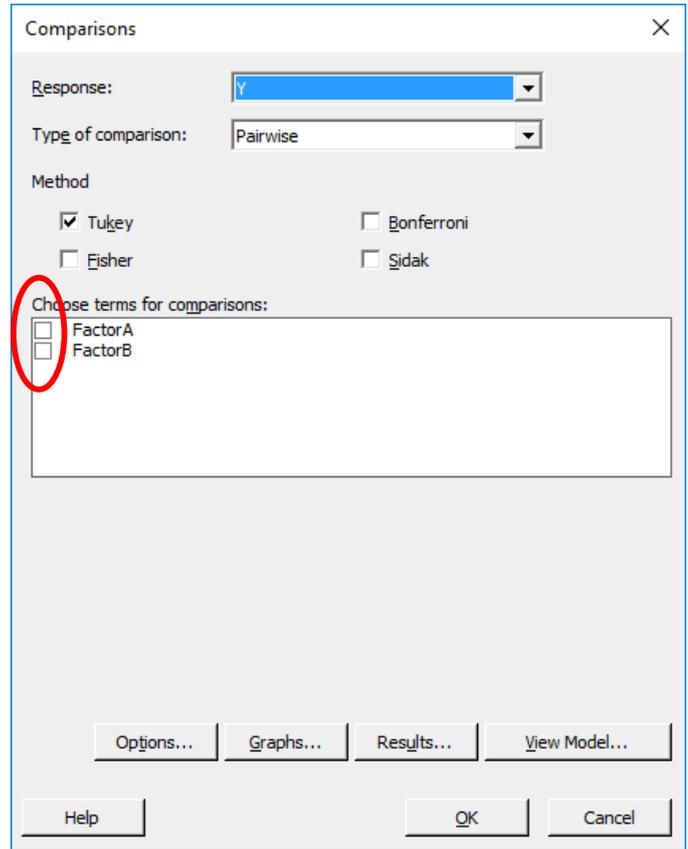
Comparisons

The **Stat > ANOVA > General Linear Model > Comparisons** dialog has been updated to improve usability. Check boxes now indicate terms to be selected, and the 'Control levels' interface only appears when you choose 'With a control' for 'Type of comparison.'

Minitab 17



Minitab 18

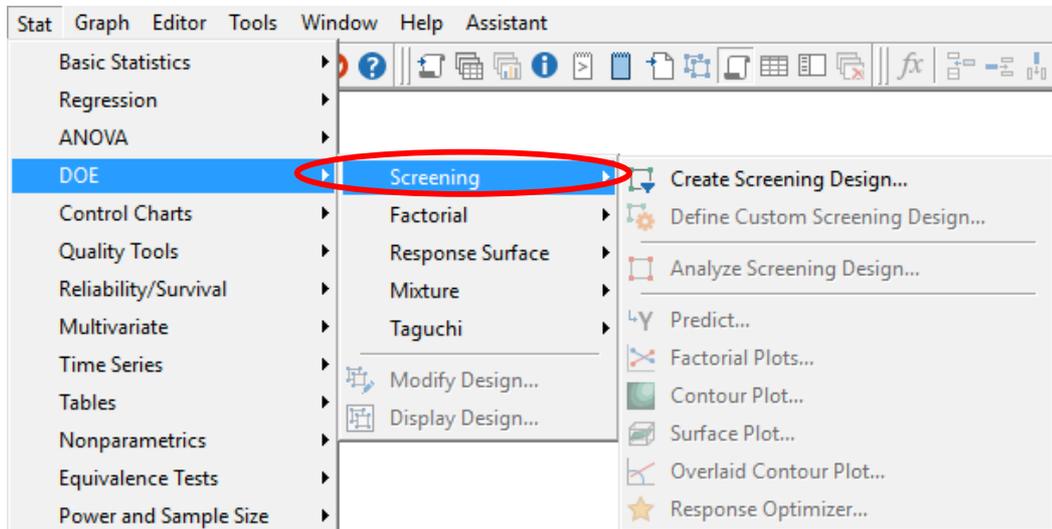


DOE

Definitive Screening Designs

There is a new **Stat > DOE > Factorial > Screening** menu that offers definitive screening designs. These resolution IV screening designs allow estimation of individual squared terms as well as main effects free of confounding with 2-factor interactions.

The new Screening menu also includes Plackett-Burman designs, which are still available via the **Stat > DOE > Factorial** menu as well.



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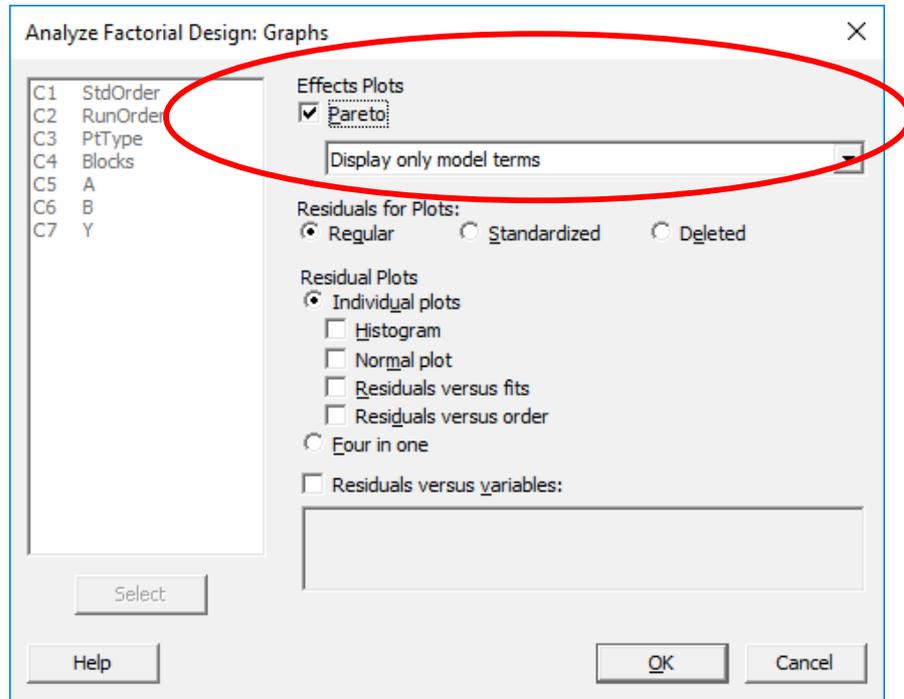
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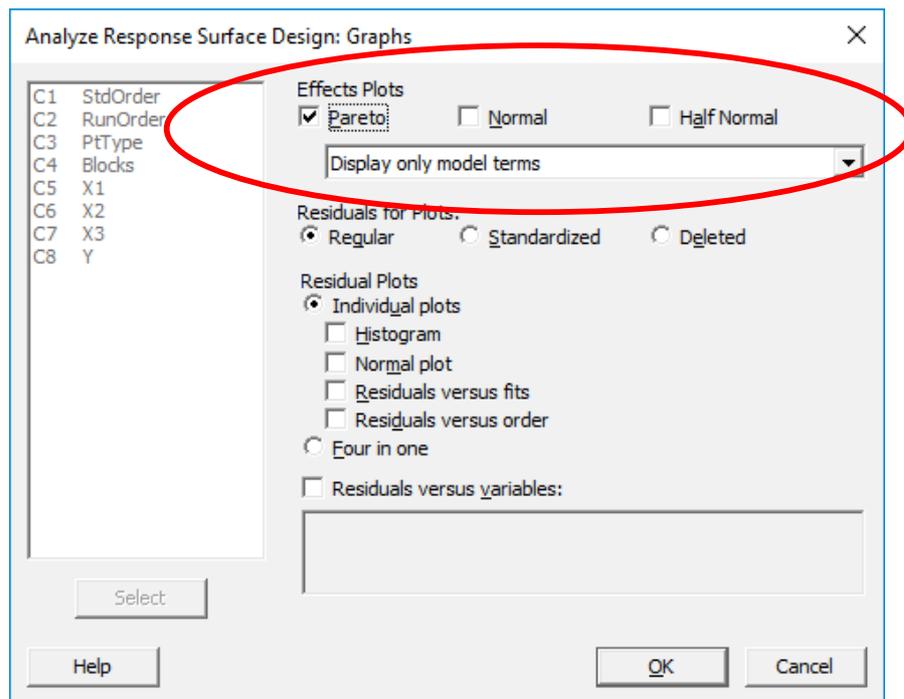
General Factorial Designs

A Pareto Chart of Effects is now available in **Stat > DOE > Factorial > Analyze Factorial Design** for general factorial designs (for designs with factors that have more than 2 levels) to visually identify significant factors.



Response Surface Designs

Effects plots are now available in **Stat > DOE > Response Surface > Analyze Response Surface Design** to visually identify significant factors.



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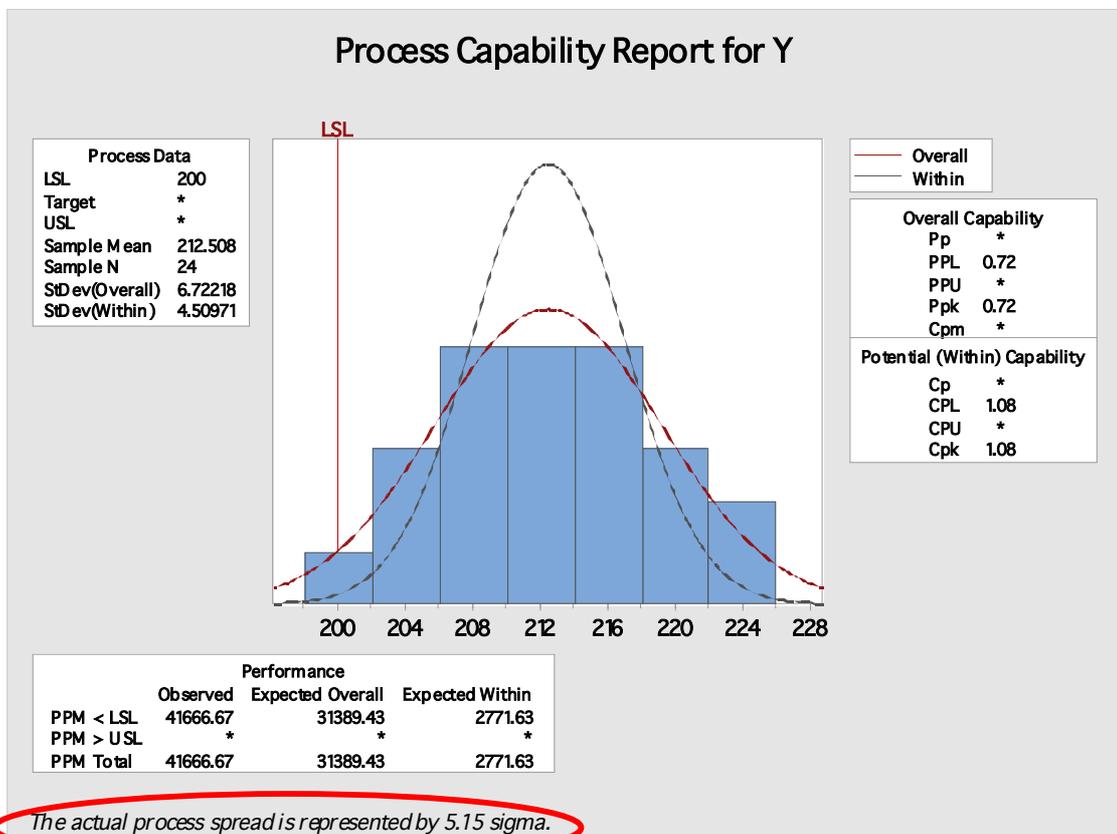
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Quality Tools

Capability Analysis

If a user changes the default tolerance value in any of the **Stat > Quality Tools > Capability Analysis** or **Sixpack** dialogs listed below (via the **Options** sub-dialog), a footnote now appears in the graphical output to note the specified value. To view or change the default value, choose **Tools > Options > Control Charts and Quality Tools > Capability Analysis**.

- Capability Analysis
 - Normal
 - Between/Within
 - Nonnormal
 - Multiple Variables (Nonnormal)
 - Multiple Variables (Normal)
- Capability Sixpack
 - Normal
 - Between/Within
 - Nonnormal



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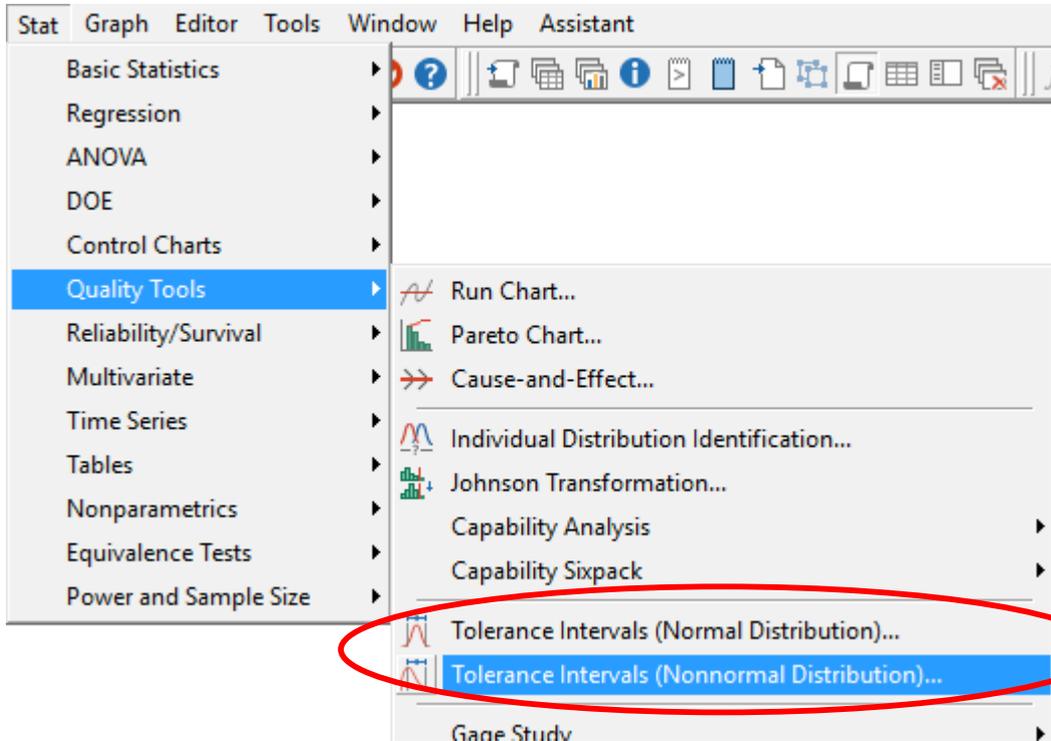
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Nonnormal Tolerance Intervals

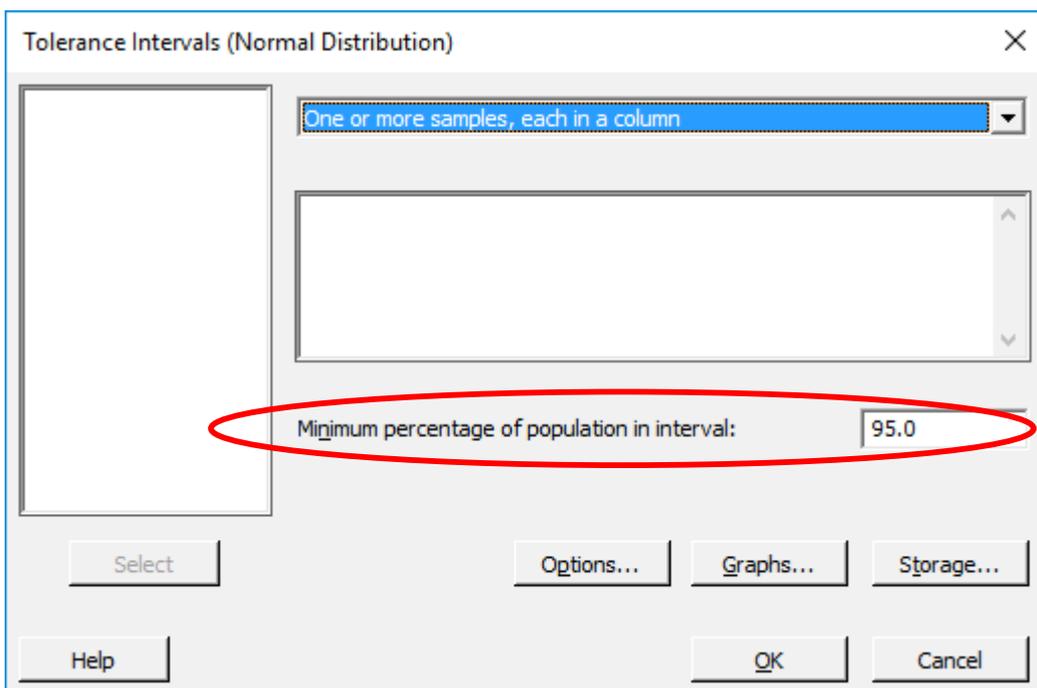
Stat > Quality Tools > Tolerance Intervals (Nonnormal Distribution) is a new feature for calculating tolerance intervals for a Weibull, lognormal, gamma, exponential, smallest or largest extreme value, logistic, or loglogistic distribution.



Normal Tolerance Intervals

Due to the addition of nonnormal tolerance intervals, the **Stat > Quality Tools > Tolerance Intervals** menu is now named **Tolerance Intervals (Normal Distribution)**.

Also, the 'Minimum percentage of population in interval' option has moved from the Options sub-dialog to the main dialog.



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Gage R&R Study

For **Stat > Quality Tools > Gage Study > Gage R&R Study Crossed, Nested, and Expanded**, you can now calculate part-to-part variation using the historical standard deviation, if a value is specified.

The new dropdown menu includes options to 'Use historical standard deviation to estimate process variation' (the new default) or 'Use parts in the study to estimate process variation' (the default, and only option, in Minitab 17).

'Display probabilities of misclassification' is now selected by default. For Crossed and Nested, this checkbox is located in the Options sub-dialog. For Expanded, it is located under Results.

Gage R&R Study (Crossed): ANOVA Options

Study variation: 6 (number of standard deviations)

Process tolerance

Enter at least one specification limit

Lower spec:

Upper spec:

Upper spec - Lower spec:

Historical standard deviation: 1

Use historical standard deviation to estimate process variation

Use historical standard deviation to estimate process variation

Use parts in the study to estimate process variation

Display probabilities of misclassification

Do not display percent contribution

Do not display percent study variation

Draw graphs on separate graphs, one graph per page

Title:

Help OK Cancel

Power and Sample Size

Sample Size for Tolerance Intervals

The terminology in **Stat > Power and Sample Size > Tolerance Intervals** has changed from 'Margins of error for percentage of population in intervals' to 'Maximum acceptable percentage of population in interval' in Minitab 18 for better usability.

Also, the 'Minimum percentage of population in interval' option has moved from the Options sub-dialog to the main dialog.

Sample Size for Tolerance Intervals

Calculate sample sizes

Minimum percentage of population in interval: 95.0

Maximum acceptable percentages of population in interval (p*):

Options... Results...

Help OK Cancel

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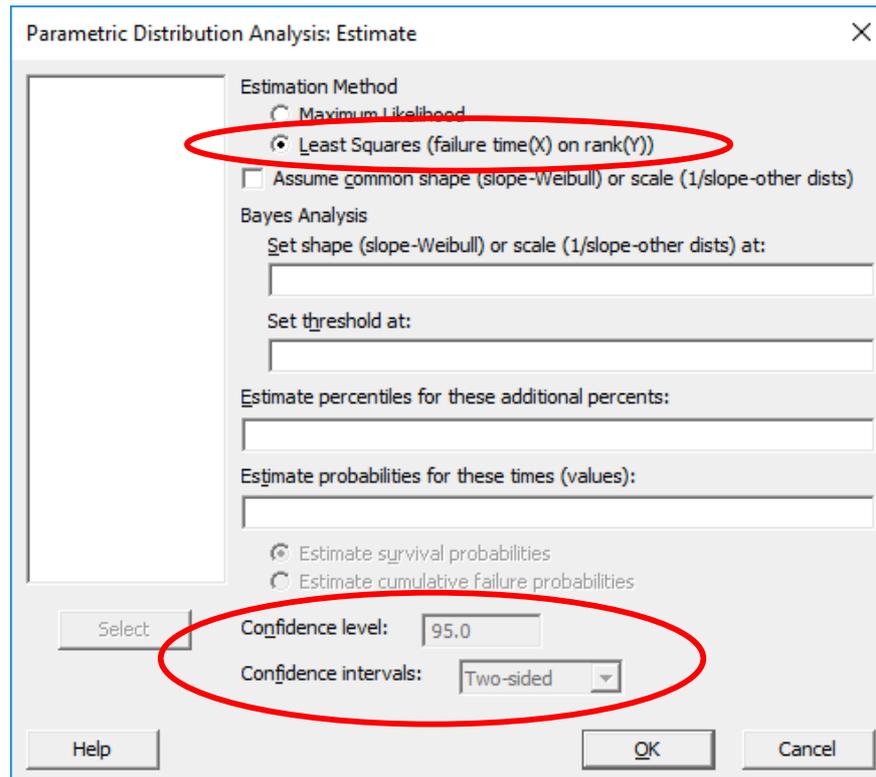
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Reliability/Survival

Distribution ID Plot (Right and Arbitrary Censoring) and Parametric Distribution Analysis (Right and Arbitrary Censoring)
When using the Least Squares estimation method (note: Maximum Likelihood is still the default), confidence intervals for model parameters, percentiles, reliability or survival probabilities, in addition to hypothesis tests, variance-covariance matrices, and standard errors are no longer computed.

And the Estimate sub-dialog now disables the CI controls if the Least Squares method is selected.



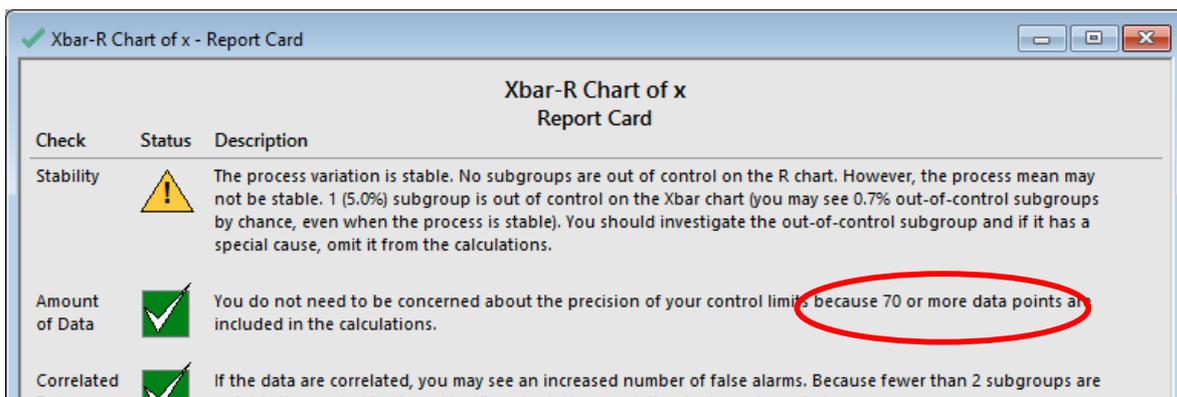
Assistant Menu

Xbar-R and Xbar-S Charts

The recommended value for sample size on the Report Card is now based on the subgroup size. In Minitab 17, this value was held at 100. If subgroup size is not constant, the average subgroup size is used.

The new values are:

- If subgroup size < 3, the recommended sample size is 100.
- If 3 <= subgroup size < 4, the recommended sample size is 80.
- If 4 <= subgroup size < 6, the recommended sample size is 70.
- If subgroup size >= 6, the recommended sample size is 60.



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Gage R&R Study (Crossed)

Assistant > Measurement Systems Analysis > Gage R&R Study (Crossed) now calculates part-to-part variation using the historical standard deviation, if a value is specified. The dialog itself did not change.

Session Window

The Session window has been updated with a more modern appearance and new features, including the ability to:

1. Change the number of decimal places (e.g. regression coefficients, means, etc.)

Statistics

Variable	Class	N	Mean	StDev	Minimum	Median	Maximum
Age	1	320	39.068	13.651	0.917	39.000	71.000
	2	285	29.541	13.339	0.667	29.000	71.000
	3	706	24.946	11.487	0.167	24.000	74.000

Expand and Collapse ▼

Graph Links ▶

Variable	Class	N	Mean	StDev	Minimum	Median	Maximum
Age	1	320	39.068	13.651	0.917	39.000	71.000
	2	285	29.541	13.339	0.667	29.000	71.000
	3	706	24.946	11.487	0.167	24.000	74.000

2. Zoom in and out (use the Menu or the Alt key + your mouse wheel)
3. Easily access graphs via links
4. Expand and collapse any analysis
5. Enter commands in a separate pane, independent from the Session results. To open the command line pane, click anywhere in the Session window > Editor > Show Command Line.

Note that when you import older projects into Minitab 18, your older Session results will be visible in Minitab 18. However, if you use **File > Save Project As** to save a Minitab 18 project in an older format (e.g. Minitab 17), your Minitab 18 Session window output will not be visible in Minitab 17.

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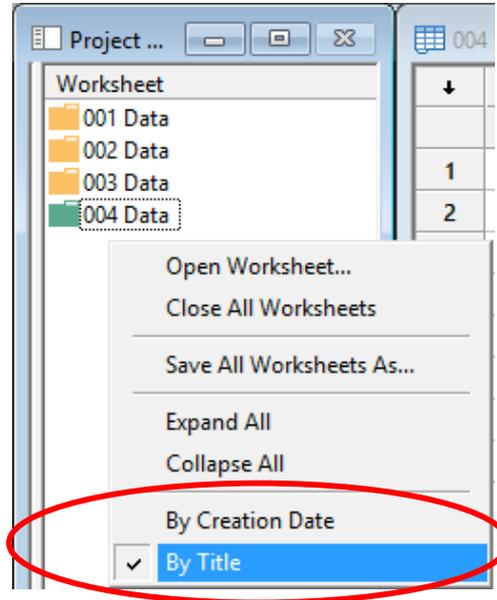
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Project Manager – Show Worksheets Folder

If you navigate to Show Worksheet Folder (Ctrl+Alt+D) and then right-click, you now have the option to sort the order in which your worksheets are listed, either By Creation Date (the default) or By Title.



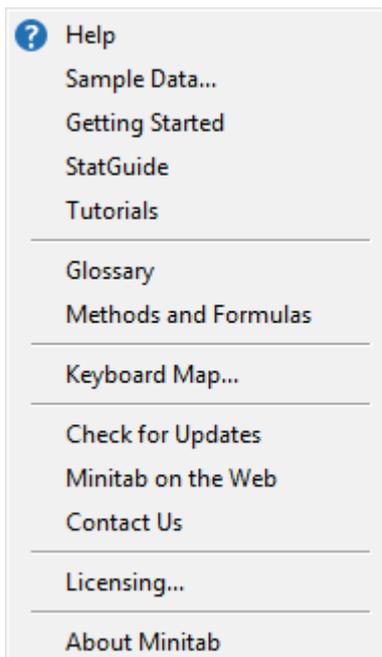
Accessibility – High Contrast for Menus

If your machine is set to high contrast mode, the menus in Minitab 18 now adhere to those settings.

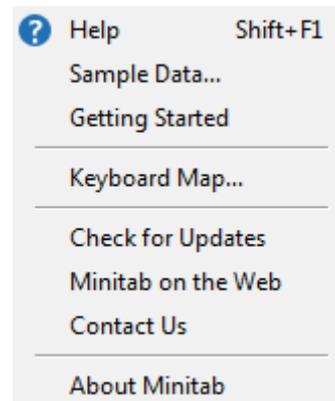
Online Help

Minitab Help is now available online. Anywhere within the software that users access Help, they will automatically be directed to the appropriate content on the Minitab website. Alternatively, you can install Help locally if you do not typically have Internet access. In order to install local Help, there must be an Internet connection for the initial download. The Help menu looks different as well.

Minitab 17



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Obsolete Features

Exploratory Data Analysis (EDA)

Although the EDA menu was available in Minitab 17 via Tools > Customize, the menu and corresponding commands are now retired.

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