

SigmaXL[®] Version 7.0 Feature List Summary

Compatible with Excel 2013: 32 & 64 bit and Excel Mac 2011

Menu Layout: Classical or DMAIC

Recall Last Dialog & Worksheet Manager

Data Manipulation:

- Subset by Category, Number, Date or Random
- Stack Subgroups Across Rows
- Stack and Unstack Columns
- Standardize Data
- Random Number Generator
 - Normal
 - Uniform (Continuous & Integer)
 - Lognormal
 - Weibull
 - Triangular
- Box-Cox Transformation

Templates & Calculators:

- DMAIC & DFSS Templates
 - Team/Project Charter
 - SIPOC Diagram
 - Flowchart Toolbar
 - Data Measurement Plan
 - Cause & Effect (Fishbone) Diagram and Quick Template
 - Cause & Effect (XY) Matrix with Pareto
 - Failure Mode & Effects Analysis (FMEA) with RPN Sort
 - Quality Function Deployment (QFD)
 - Pugh Concept Selection Matrix
 - Control Plan
- Lean Templates
 - Takt Time Calculator
 - Value Analysis/Process Load Balance
 - Value Stream Mapping
- Graphical Templates
 - Pareto Chart, Histogram, Run Chart
- Statistical Templates
 - Sample Size – Discrete and Continuous
 - Minimum Sample Size for Robust t-Tests and ANOVA
 - 1 Sample t-Test & Confidence Interval for Mean
 - 2 Sample t-Test & Confidence Interval (Compare 2 Means)
 - 1 Sample Chi-Square Test and CI for Standard Deviation
 - 2 Sample F-Test and CI (Compare 2 Standard Deviations)
 - 1 Proportion Test and Confidence Interval
 - 2 Proportions Test and Confidence Interval (with Fisher Exact P-Value)
 - 1 Poisson Rate Test and Confidence Interval
 - 2 Poisson Rates Test and Confidence Interval
 - One-Way Chi-Square Goodness-of-Fit Test (with Exact and Monte Carlo P-Value)**
- Probability Distribution Calculators
 - Normal, Lognormal, Exponential, Weibull
 - Binomial, Poisson, Hypergeometric
- Measurement Systems Analysis (MSA) Templates
 - Gage R&R Study – with Multi-Vari Analysis
 - Attribute Gage R&R (Attribute Agreement Analysis)
- Process Sigma Level – Discrete and Continuous
- Process Capability & Confidence Intervals
- DOE Templates
 - 2 to 5 Factors
 - 2-Level Full and Fractional-Factorial designs
 - Main Effects & Interaction Plots
- Control Chart Templates
 - Individuals, C-Chart

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Graphical Tools:

- Basic and Advanced (Multiple) Pareto Charts
- EZ-Pivot/Pivot Charts: Easily create Pivot Tables and Charts
- Basic Histogram
- Multiple Histograms and Descriptive Statistics (includes Confidence Interval for Mean and StDev., and Anderson-Darling Normality Test)
- Multiple Histograms and Process Capability (Pp, Ppk, Cpm, ppm, %)
- Multiple Boxplots, Dotplots
- Run Charts (with Nonparametric Runs Test allowing you to test for Clustering, Mixtures, Lack of Randomness, Trends and Oscillation)
- Overlay Run Chart
- Multiple Normal Probability Plots (with 95% confidence intervals to ease interpretation of normality/non-normality)
- Multi-Vari Charts
- Scatter Plots (with linear regression and optional 95% confidence intervals and prediction intervals)
- Scatter Plot Matrix

Measurement Systems Analysis:

- Create Gage R&R (Crossed) Worksheet:
 - Generate worksheet with user specified number of parts, operators, replicates
- Analyze Gage R&R (Crossed)
 - ANOVA, %Total, %Tolerance (with upper and/or lower specifications), %Process, Variance Components, Number of Distinct Categories
 - Gage R&R Multi-Vari and X-bar R Charts
 - Confidence Intervals for %Total, %Tolerance, %Process and Standard Deviations
 - Handles unbalanced data
- Attribute MSA (Binary, Ordinal**, Nominal**)
 - Any number of samples, appraisers and replicates
 - Within Appraiser Agreement, Each Appraiser vs Standard Agreement, Each Appraiser vs Standard Disagreement, Between Appraiser Agreement, All Appraisers vs Standard Agreement; Fleiss' Kappa; Kendall's Coefficients (Ordinal Concordance and Correlation)**
 - Confidence Interval Graphs for Percent Agreement, Fleiss' Kappa and Kendall's Coefficients**
 - Kappa and Kendall color highlight to aid interpretation (Green/Yellow/Red)**
 - Effectiveness Report (treats each appraisal trial as an opportunity) and Misclassification Summary**

Process Capability:

- Multiple Histograms and Process Capability
- Capability Combination Report for Individuals/Subgroups:
 - Histogram, Normal Probability Plot and Normality Test
 - Capability Report (Cp, Cpk, Pp, Ppk, Cpm, ppm, %)
 - Control Charts
- Capability Combination Report for Nonnormal Data (Individuals)
 - Box-Cox Transformation (includes an automatic threshold option so that data with negative values can be transformed)
 - Johnson Transformation
 - Distributions supported: Half-Normal, Lognormal (2 & 3 parameter), Exponential (1 & 2), Weibull (2 & 3), Beta (2 & 4), Gamma (2 & 3), Logistic, Loglogistic (2 & 3), Largest Extreme Value, Smallest Extreme Value
 - Automatic Best Fit based on AD p-value
 - Nonnormal Process Capability Indices: Z-Score (Cp, Cpk, Pp, Ppk) and Percentile (ISO) Method (Pp, Ppk)
- Distribution Fitting Report
 - All valid distributions and transformations reported with histograms, curve fit and probability plots
 - Sorted by AD p-value

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Statistical Tools:

- P-values turn red when results are significant (p-value < alpha)
- Descriptive Statistics including Anderson-Darling Normality test, Skewness and Kurtosis with p-values
- 1 Sample t-test and confidence intervals
- Paired t-test, 2 Sample t-test
- 2 Sample comparison tests:
 - Reports AD Normality, F-test and Levene's for variance, t-test assuming equal and unequal variance, Mann-Whitney test for medians.
 - Recommended tests are highlighted based on sample size, normality, and variance
- One-Way ANOVA and Means Matrix
- Automatic Assumptions Check for One Sample, Two-Sample, Paired T-tests and One-Way ANOVA**
 - Text report with color highlight: Green (OK), Yellow (Warning) and Red (Serious Violation)**
 - Test each sample for Normality. If not, check minimum sample size for robustness of test**
 - Check each sample for Outliers: Potential (Tukey's Boxplot 1.5*IQR); Likely (2*IQR); Extreme (3*IQR)**
 - Randomness (Nonparametric Runs Test)**
 - Equal Variance (for 2 or more samples)**
- Two-Way ANOVA (Balanced and Unbalanced)
- Equal Variance Tests (Bartlett, Levene and Welch's ANOVA)
- Correlation Matrix (Pearson and Spearman's Rank Correlation)
 - Automatic normality check for correlation utilizing the powerful Doornik-Hansen bivariate normality test**
 - Yellow highlight to recommend significant Pearson or Spearman correlation - Pearson is highlighted if the data are bivariate normal, otherwise Spearman is highlighted**
- Multiple Linear Regression:
 - Accepts continuous and/or categorical (discrete) predictors
 - Interactive Predicted Response Calculator with 95% Confidence Interval and 95% Prediction Interval
 - Residual Plots: histogram, normal probability plot, residuals vs. time, residuals vs. predicted and residuals vs. X factors
 - Residual types include Regular, Standardized, Studentized (Deleted t) and Cook's Distance (Influence), Leverage and DFITS
 - Highlight of significant outliers in residuals
 - Durbin-Watson Test for Autocorrelation in Residuals with p-value
 - ANOVA report for categorical predictors
 - Pure Error and Lack-of-Fit report
 - Collinearity Variance Inflation Factor (VIF) and Tolerance report
 - Fit Intercept is optional
- Binary and Ordinal Logistic Regression
 - Powerful and user-friendly logistic regression.
 - Report includes a calculator to predict the response event probability for a given set of input X values.
 - Categorical (discrete) predictors can be included in the model in addition to continuous predictors.
 - Model summary and goodness of fit tests include Likelihood Ratio Chi-Square, Pseudo R-Square, Pearson Residuals Chi-Square, Deviance Residuals Chi-Square, Observed and Predicted Outcomes – Percent Correctly Predicted.
 - Stored data includes Event Probabilities, Predicted Outcome, Observed-Predicted, Pearson Residuals, Standardized Pearson Residuals, and Deviance Residuals.
- Chi-Square Test (Stacked Column data and Two-Way Table data)
 - With Fisher Exact (utilizing permutations and fast network algorithms) and Monte Carlo P-Values**
- Nonparametric Tests:
 - 1 Sample Sign and 1 Sample Wilcoxon
 - 2 Sample Mann-Whitney
 - Kruskal-Wallis and Mood's Median Test
 - Kruskal-Wallis and Mood's include a graph of Group Medians and 95% Median Confidence Intervals
 - Runs Test
 - With Exact and Monte Carlo P-Value**
- Power and Sample Size Calculators for:
 - 1 and 2 Sample t-Test
 - One-Way ANOVA
 - 1 Proportion Test, 2 Proportions Test
 - The Power and Sample Size Calculators allow you to solve for Power (1 – Beta), Sample Size, or Difference (specify two, solve for the third).
- Power and Sample Size Chart. Quickly create a graph showing the relationship between Power, Sample Size and Difference.

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Design of Experiments:

- Generate 2-Level Factorial and Plackett-Burman Screening Designs
 - User-friendly dialog box
 - 2 to 19 Factors; 4,8,12,16,20 Runs
 - Unique “view power analysis as you design”
 - Randomization, Replication, Blocking and Center Points
- Basic DOE Templates
 - 2 to 5 Factors, 2-Level Full and Fractional-Factorial designs
 - Automatic update to Pareto of Coefficients
 - Easy to use, ideal for training
- Main Effects & Interaction Plots
- Analyze 2-Level Factorial and Plackett-Burman Screening Designs
 - Used in conjunction with Recall Last Dialog, it is very easy to iteratively remove terms from the model
 - Interactive Predicted Response Calculator with 95% Confidence Interval and 95% Prediction Interval.
 - ANOVA report for Blocks, Pure Error, Lack-of-Fit and Curvature
 - Collinearity Variance Inflation Factor (VIF) and Tolerance report
 - Residual plots: histogram, normal probability plot, residuals vs. time, residuals vs. predicted and residuals vs. X factors
 - Highlight of significant outliers in residuals
 - Durbin-Watson Test for Autocorrelation
- Contour & 3D Surface Plots
- Response Surface Designs
 - 2 to 5 Factors
 - Central Composite and Box-Behnken Designs
 - Easy to use design selection sorted by number of runs

Control Charts:

- Control Chart Selection Tool
- Individuals, Individuals & Moving Range
- X-Bar & R, X-Bar & S
- I-MR-R, I-MR-S (Between/Within)
- P, NP, C, U
- P' and U' (Laney) to handle overdispersion
- Control charts include a report on tests for special causes. Special causes are also labeled on the control chart data point. Set defaults to apply any or all of Tests 1-8.
- Process Capability report (Pp, Ppk, Cp, Cpk) is available for I, I-MR, X-Bar & R, X-bar & S charts.
- Add data to existing charts for operator ease of use!
- Scroll through charts with user defined window size
- Advanced Control Limit options: Subgroup Start and End; Historical Groups (e.g. split control limits to demonstrate before and after improvement)
- Exclude data points for control limit calculation
- Add comment to data point for assignable cause
- $\pm 1, 2$ Sigma Zone Lines
- Control charts for Nonnormal data (Individuals)
 - Box-Cox and Johnson Transformations
 - 16 Nonnormal distributions supported (see Process Capability)
 - Individuals chart of original data with percentile based control limits
 - Individuals/Moving Range chart for normalized data with optional tests for special causes

Reliability/Weibull Analysis:

- Weibull Analysis
 - Complete and Right Censored data
 - Least Squares and Maximum Likelihood
 - Output includes percentiles with confidence intervals, survival probabilities, and Weibull probability plot.