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MODDE®

Design of Experiments Solution

Technical features for MODDE® 13

November 16, 2021

Design of Experiments (DOE) is the most effective method to achieve product and process efficiency and optimization. MODDE® is a state-of-the-art design of experiments software package that is used by scientists, engineers, and statisticians alike to help understand complex processes and products. Highlighted rows are new in MODDE® 13.

Feature	MODDE® Go	MODDE® Pro
Design generation		
Design Wizard guides the design generation	■	■
Four design objectives: Screening, System Characterization, Optimization (RSM), Robust Verification	■	■
Split objective	-	■
Up to 48 factors	■	■
Factor ranges (scaling) can be updated retroactively	■	■
Factor types: Quantitative, quantitative multilevel (24 levels) factors, qualitative factors (24 levels),	■	■
Factor types: Formulation (mixture), Filler	-	■
Constant and uncontrolled factors	■	■
Linear constraints on factors	-	■
Combination of process and formulation factors	-	■
128 responses possible	■	■
New response objective and condition	■	■
Linear, Log, Neglog, Logit, Exp and Power transformations of factors and responses	■	■
Detailed design power estimation	■	■
Optimal selection of replicated design points	■	■
A wide variety of classical designs: Fractional factorial, Full factorial (2 levels, 3 levels and mixed), L9, L18 , L27, L36, CCF, CCC, CCO, Reduced CCF and CCC, Box Behnken, Rechtschaffner designs in 2 and 3 levels, Doehlert designs, regular and Super saturated Plackett Burman designs. Definitive screening designs.	■	■
Axial (reduced, normal, and extended), Cubic centroid (Mod, Mod w/face, Special and Full) designs	-	■
Reduced combinatorial designs (J2)	-	■
Generalized subset designs - optimal and balanced multilevel designs	-	■
Stability testing designs	-	■

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Rectangular Experimental Designs for Multi-Unit Platforms, RED-MUP. Supports designs for up to 4 plates with sizes 8x12 and 16x24, with 32x48 size plate. Includes RED-MUP specific designs	-	■
D-Optimal designs using state of the art algorithm	-	■
Blocking of classical and D-Optimal designs	-	■
Inclusions can be imported and edited	-	■
Candidate sets can be read from file	-	■
Import design data from external files	-	■
Paste design to import it	-	■
Complementing designs, using classical and D-Optimal approaches	-	■
Onion designs from scores generated in SIMCA®	-	■
Onion design in ordinary factors, both with imported candidate set and candidate set generated by MODDE®	-	■
Analysis of worksheet including Scatter Plots, Histogram, Descriptive Statistics, Correlation Matrix, Replicate Plots and condition number	■	■
Qualitative factors with missing levels supported	■	■
Export and open in SIMCA®	-	■
Analysis and modelling		
Fit with MLR or PLS	■	■
Cox and Scheffé Mixture models	-	■
Handles process and mixture models and their combinations	-	■
Cross validation of models	■	■
Indication of confounded model terms for fractional factorial designs	■	■
Analysis guidance		
Analysis wizard guides the user through the analysis step by step allowing model customization from the graphs	■	■
One-Click analysis feature, including automatic outlier detection, transformation and model tuning	■	■
Automatic Square and Interaction tests in the Analysis wizard	■	■
Advisor pane which explains analysis plots and results and advises you on what to do next	■	■
Reviewing the model		
Multiplots and lists displaying selected responses	■	■
Summary of the model fit plot and list with Q2, R2, Model validity (LOF) and Reproducibility	■	■
Customizable model overview multiplot	■	■
ANOVA plots and lists	■	■
Residual vs Run Order, Predicted, Variable plots and lists	■	■
Normal Probability of residuals, Observed vs Predicted and Distance to Model plots	■	■

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Coefficient plots and lists	■	■
Effects and Interaction plots	■	■
Variable importance (VIP) plots and lists	■	■
Score and Loading plots	■	■
Box Cox plot	■	■
Refining the model		
Interactive pruning of model terms with automatic model fitting and updating of all open plots and lists	■	■
Automated model tuning feature	■	■
Separate model for each response with all fit methods	■	■
Predictions		
Contour, Sweet Spot and Prediction plots wizards for simple generation of plots	■	■
Design Space plot wizard to find design space and robust setpoint	-	■
Visualization of desirability	■	■
2D, 3D (mixture) and 4D plots make it possible to display up to 5 factors simultaneously.	■	■
4D plots with qualitative factors on the outer axes	■	■
Contour surface with multiple responses	■	■
Option to lock contour levels in Contour plot	■	■
Prediction plot interval estimates include confidence, prediction and tolerance options	■	■
Prediction plots display raw data	■	■
Overlay prediction plots for multiple responses	■	■
Factor effects plot including confidence intervals	■	■
Prediction Scatter plot updated with changes in the Predictions spreadsheet	■	■
Transformed factors by default displayed in original units in prediction plots	■	■
Optimization guidance		
Optimization wizard guides the user through the optimization step by step	-	■
Visualization of simulated process output	-	■
Favorite setpoint defined by user	■	■
Summary of alternative setpoints and statistics	-	■
Optimizer		
Uses a multidimensional Simplex method	■	■
Customizable desirability functions	-	■
Possible to set target values and optimization criteria	■	■
Optimizer predicts possible ranges for all responses	■	■
Weighting according to the importance of the responses	■	■
Optimization of multiple responses, regular or derived	■	■

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Feature	MODDE® Go	MODDE® Pro
Risk analysis of the optimal setting	-	■
Option to set response limits as absolute in Optimizer	■	■
Robust optimization feature presenting the most robust setpoint	-	■
Response correlation effect optionally included in Design Space calculations	-	■
<mark>Optimization within design space</mark>	-	■
Design Space Explorer		
Design space explorer plot expansion with hypercube to facilitate communication of the Proven Acceptable Range (PAR)	-	■
Export of complete Design Space as a data matrix	-	■
Setpoint validation		
Statistical robustness validation of the investigated system	-	■
Interactive GUI and automatic functions for robust range establishment	-	■
<mark>Setpoint comparison histogram</mark>	-	■
Plots and lists		
<mark>Contextual properties pane for easier access to plot properties</mark>	■	■
Predefined plot sizes when copying to various presentation types	■	■
Create list from plots	■	■
Color coding in lists to highlight suspicious values	■	■
Plots can be customized, and templates saved	■	■
Reports		
Customizable report generator for fast and standardized documentation	■	■
Report integrated in the MODDE® *.mip file	■	■