



Six Sigma Products Group, Inc. is an authorized reseller of Quantum XL.

Quantum XL Feature Comparison Table

Price for Single License and Features Summary

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
	\$499	\$1,395	\$995	\$995 w/o Optimization \$1,995 with Optimization	\$249	\$249	\$399
Design of Experiments	✓	✓				✓	
General Statistical Tools	✓	✓			✓		
Companion Tools	✓		✓				
Monte Carlo Simulation	✓			✓			✓

Design of Experiments

Unique Features	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Regression Advisor	✓						
Automatic S-hat Modeling	✓					✓	
Mixed Response Modeling	✓						

Regression Type

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Ordinary Least Squares	✓					✓	
Weighted Regression	✓						
Binary Logistic Regression	✓	⊘ Not as part of DOE					
Nominal Logistic Regression	✓	⊘ Not as part of DOE					
Ordinal Logistic Regression		⊘ Not as part of DOE					

Independent Variable Types

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Optimize Least Squares Models	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
Optimize Binary Logistic Models	<input checked="" type="checkbox"/>						
Optimize Nominal Logistic Models	<input checked="" type="checkbox"/>						
Optimize Mixed (Least Squares, Binary, and Nominal) Models	<input checked="" type="checkbox"/>						
Optimize with constraints	<input checked="" type="checkbox"/>						

Prediction

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Predict Least Squares Models	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
Predict Binary Logistic Models	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
Predict Nominal Logistic Models	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
Predict Mixed (Least Squares, Binary, and Nominal) Models	<input checked="" type="checkbox"/>						
Quality Measures (Cp, Cpk, dpm, etc.)	<input checked="" type="checkbox"/>						

Charts

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Pareto of Regression Coefficients	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
Interaction Plot	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
Main Effect Plot	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
Thumbnail Plot	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
Surface and Contour Plot	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
Residual Plots	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	

Design Types

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Design Wizard	✓					✓	
2-Level Full/Fractional Factorial	✓	✓				✓	
3-Level Full Factorial	✓	✓				✓	
N-Level (mixed) Factorial	✓	✓				✓	
Central Composite (CCD)	✓	✓				✓	
Box-Behnken	✓	✓				✓	
Plackett-Burman	✓	✓				✓	
Taguchi	✓	✓				✓	
Custom	✓					✓	
D-Optimal	✓	✓					
Mixture		✓					

Design Features

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Blocking	✓	✓					
Folding	✓	✓					
Automatic S-hat model	✓					✓	
Table Format	✓					✓	
Stacked Format	✓	✓					
Randomization	✓	✓				Random string only	
Add Center Points	✓	✓					

General Statistics Tools

Data template

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
One factor	✓						
Two factors	✓						
Specification limits	✓						
X-Axis column	✓						
Random data	✓						
Select multiple analysis on sheet	✓						
Analyze template	✓						

Control Charts

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
XbarR Chart	✓	✓			✓		
XbarS Chart	✓	✓			✓		
IMR Chart	✓	✓			✓		
p Chart	✓	✓			✓		
c Chart	✓	✓			✓		
np Chart	✓	✓			✓		
u Chart	✓	✓			✓		
Ability to add points to existing charts	✓	✓			✓		
Assign labels to X Axis of control chart	✓	✓			✓		
Custom out-of-control checking	✓	✓			✓		
Custom Control Limits	✓	✓			✓		
On-sheet scrolling controls	✓						
StDev estimate options	✓	✓					
Scroll control charts	✓	✓			✓		
Split limits	✓	✓			✓		
Outliers	✓	✓			✓		

Cpk

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Spec limits	✓	✓			✓		
Spec limits linked to cell	✓						
Spec limits are boundaries	✓	✓					
Plot target value	✓	✓					
Ppk curve	✓	✓			✓		
Cpk curve	✓	✓					
Both curves	✓	✓					
Multiple charts	✓	✓					
Overlaid charts	✓	✓					
StDev estimate options	✓	✓					
Cp	✓	✓					
Lower CI bound for Cp	✓	✓					
Upper CI bound for Cp	✓	✓					
Cpl	✓	✓					
Cpu	✓	✓					
Cpk	✓	✓					

Lower CI bound for Cpk	✓	✓					
Upper CI bound for Cpk	✓	✓					
Pp	✓	✓			✓		
Ppl	✓	✓					
Ppu	✓	✓					
Ppk	✓	✓			✓		
Observed Defects (< LSL)	✓	✓					
Observed Defects (> LSL)	✓	✓					
Observed Defects (Total)	✓	✓					
Short Term Defects (< LSL)	✓	✓					
Short Term Defects (> LSL)	✓	✓					
Short Term Defects (Total)	✓	✓					
Long Term Defects (< LSL)	✓	✓					
Long Term Defects (> LSL)	✓	✓					
Long Term Defects (Total)	✓	✓			✓		
Sample size	✓	✓			✓		
Mean Overall	✓	✓			✓		
Stdev Overall	✓	✓			✓		
Stdev Within	✓	✓					
Min	✓	✓					
Max	✓	✓					
Updatable	✓	✓					

Histogram

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Distributions fit: Normal	✓	✓			✓		
Distributions fit: Exponential	✓	✓					
Distributions fit: 2-Parameter Weibull	✓	✓			✓		
Distributions fit: 2-Parameter Exponential	✓	✓			✓		
Distributions fit: 2-Parameter Gamma	✓	✓					
Distributions fit: 2-Parameter Logistic	✓	✓					
Distributions fit: 2-Parameter LogLogistic	✓	✓					
Distributions fit: 2-Parameter LogNormal	✓	✓					

Distributions fit: 3-Parameter Gamma							
Distributions fit: 3-Parameter LogNormal							
Distributions fit: 3-Parameter Weibull							
Overlaid charts							
Spec limits							
Spec limits linked to cell							
Updatable							

Scatter Plot

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Overlaid charts							
Selectable X and Y columns							
Linear regression line							
Logarithmic regression line							
Polynomial regression line							
Power regression line							
Exponential regression line							
Extrapolate Model							
Regression analysis							
On-sheet prediction							
Updatable							

Pareto

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
2D columns							
2D columns with cum. line							
3D columns							
Pareto report							
Maximum number of bars							
'Others' group							
'Custom 'Others' group caption							
Sort bars							
Sort datasets							
Multiple pareto charts							
Grid of pareto charts							
Updatable							

Dot Plot

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Multiple datasets	✓	✓			✓		
Two dimensional plot	✓	✓					
Summary stats		✓			✓		
Updatable	✓	✓					

Box Plots

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Minimum	✓	✓			✓		
Maximum	✓	✓			✓		
Mean	✓				✓		
Outliers	✓	✓					
Suspected Outliers	✓	✓					
Gap between bars	✓	✓					
Box height: Interquartile range	✓	✓			✓		
Box height: Custom	✓	✓					
Custom Whiskers type	✓	✓					
Updatable	✓	✓					

Distribution Fit

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Normal	✓	✓					
Exponential	✓	✓					
2-Parameter Weibull	✓	✓					
2-Parameter Exponential	✓	✓					
2-Parameter Gamma	✓	✓					
2-Parameter Logistic	✓	✓					
2-Parameter LogLogistic	✓	✓					
2-Parameter LogNormal	✓	✓					
3-Parameter Gamma	✓	✓					
3-Parameter LogNormal	✓	✓					
Updatable	✓	✓					

Multi-Vari Charts

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Mean	✓	✓					
Median	✓	✓					
Minimum	✓	✓					
Maximum	✓	✓					
Show range line	✓	✓					
Connect means	✓	✓					
Group mean	✓	✓					
Grand mean	✓	✓					
Standard deviation	✓	✓					
Updatable	✓	✓					

Hypothesis tests

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Advisor Wizard	✓	✓					
Auto Test	✓						
One sample t-Test	✓	✓			✓		
Two samples t-test	✓	✓			✓		
Paired t-test	✓	✓			✓		
One-way ANOVA	✓	✓			✓		
Two-way ANOVA (Crossed)	✓	✓					
Two-way ANOVA (Nested)	✓	✓					
F-test	✓	✓			✓		
Levene's test	✓	✓					
Bartlett's test	✓	✓					
1-Sample Sign	✓	✓					
1-Sample Wilcoxon	✓	✓					
Friedman	✓	✓					
Mood's Median	✓	✓					
Kruskal-Wallis	✓	✓					
Mann-Whitney	✓	✓					
One proportion test	✓	✓					
Two proportions test	✓	✓			✓		
Contingency Table	✓	✓			✓		
Multiple response regression		✓			✓		
Correlation matrix		✓			✓		
Power test for one sample t-	✓	✓					

Test							
Power test for one sample t-test	✓	✓					
Power test for two samples t-test	✓	✓					
Power test for paired t-test	✓	✓					
Power test for one-way ANOVA	✓	✓					
Power test for variance	✓	✓					
Power test for one proportion test	✓	✓					
Power test for two proportions test	✓	✓					
Confidence Intervals	✓	✓			✓		
Custom alpha level	✓	✓					
Custom confidence level	✓	✓					
Show box plot	✓	✓					
Show dot plot	✓	✓					
Updatable	✓	✓					

Measurement System Analysis

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
ANOVA	✓	✓			✓		
XbarR	✓	✓			✓		
Nested ANOVA	✓	✓			✓		
Attribute: Crosstabulation	✓	✓			✓		
Attribute: Analytic method	✓	✓					
Gage Performance Curve	✓	✓					
Gage Linearity	✓	✓					
Bias	✓	✓			✓		
Stats Advisor	✓						
Updatable	✓	✓					

Decision Trees

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
	✓						

DSM

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Create matrix	✓						
Edit matrix	✓						
DSM Navigator	✓						
Sequence	✓						
ALAP and AEAP	✓						

Component swapping

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
	✓						

Stack Columns

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
	✓	✓			✓		

Unstack columns

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
	✓	✓			✓		

Random Numbers

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Normal	✓	✓			✓		
Exponential	✓				✓		
Uniform	✓	✓			✓		
Triangular	✓	✓					
Log-Normal	✓	✓					
Weibull	✓	✓			✓		
Gamma	✓	✓					
Logistic	✓	✓					
Log-Logistic	✓	✓					
Uniform Discrete	✓	✓			✓		
Poisson	✓	✓					
Binomial	✓	✓					
Binary	✓	✓					
Table format	✓	✓					

Group By format							
Generator per column							
Chi-Square							
F							
t							
Geometric							
Hypergeometric							
Integer							
Beta							
Cauchy							
Laplace							
Largest Extreme Value							
Smallest Extreme Value							

Other features

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Excel data source							
'Group by' data source							
SQL data source							
SmartSelect							
CNX Template and diagram							
Discrete distribution calculator							
Continuous distribution calculator							
Main Effects Plot							
Run Chart							
Cumulative Sum Chart (CUSUM)							
Product Capability Report							
Xbar +/- 3s Chart							

Non Statistical Tools

QFD

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
QFD Wizard							
Create PCM matrix							
Edit PCM matrix							

Sort PCM	✓						
Pareto PCM	✓						
Create House of Quality	✓		✓				
Edit HOQ	✓		✓				
Sort HOQ	✓		✓				
Sort HOQ	✓		✓				
Pareto HOQ	✓		✓				

Pugh matrix

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Create	✓		✓				
Edit	✓		✓				
Sort	✓		✓				
Create chart	✓		✓				

FMEA

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Create matrix	✓		✓		✓		
Current process controls	✓		✓		✓		
Recommended actions	✓		✓				
Action results	✓		✓		✓		
Add/Remove group	✓		✓				
Add/Remove failure mode	✓		✓				
Add/Remove failure cause	✓		✓				
Top 20 pareto	✓		✓				
Custom pareto	✓		✓				
Show/Hide columns	✓		✓				

Monte Carlo

Model Building

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
IPO Sheets	✓						
Import from DOE Pro	✓						✓
Any cell can be input/output	✓			✓			
Merge and Visual Merge	✓						

Speed

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Monte Carlo Simulations ¹	Rocket Mode			Extreme Speed			
Benchmark ²	1.09 Seconds (Quantum XL is up to 9X faster than Crystal Ball)			9.73 Seconds			

¹ Both Quantum XL and Crystal Ball use external calculation engines to speed up simulations in Excel. Quantum XL's is called "Rocket Mode" while Crystal Ball's is called "Extreme Speed".

² Test platform: Vista, Excel 2007 SP2, 1GB RAM, CPU Intel 3.00GHz

Tested Model: Crystal Ball Examples Guide > 'Cell Phone'

Number of simulations run: 1,000,000

Monte Carlo Statistics

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Normal Distribution Stats							
Count out of spec							
Percentile Stats							
Export EVA Raw Data							

Monte Carlo Features

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
N=10K to 1 Million Simulations							
Tolerance Allocation Table							
Sensitivity Analysis							
Latitude Plot							
Option for Embedded Histograms							
Percent Contribution							
Descriptive Sampling Support							
Native Mode Monte Carlo							
Input/Output Manager							

Optimization

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Optimize single output				Additional \$1,000			
Reduce dpm across multiple outputs				Additional \$1,000			
Optimize on Cp, Cpk Median, ...				Additional \$1,000			
Optimize with constraints				Additional \$1,000			
Advanced Optimization Technology				Additional \$1,000			

Supported Distributions

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Normal							
Exponential							
Uniform Continuous							
Triangular							
Log-Normal							
Logistic							
Log-Logistic							
Weibull (3 Parameter)							
Uniform Discrete							
Poisson							
Binary							
Binomial							
Empirical Distribution							
Custom Continuous Distribution							
Custom Discrete Distribution							

Sampling Matrices

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Latin Hypercube Sampling (LHS)							
Descriptive Sampling							

Compatibility

	Quantum XL	Minitab	Quality Companion	Crystal Ball	SPC XL	DOE Pro	DFSS Master
Windows 32 bit (Vista, 7, 8)							
Windows 64 bit (Vista, 7,8)							
Excel 2013 32 bit		NA					
Excel 2013 64 bit		NA					
Excel 2010 32 bit		NA					
Excel 2010 64 bit		NA					
Excel 2007 32 bit		NA					
Excel 2007 64 bit		NA					
Excel 2003 Compatibility		NA					
Excel XP (2002) Compatibility		NA					
Excel 2000 Compatibility		NA					
Digitally Signed Macros		NA					

Note:

- * Minitab version v16 used for comparison
- * Quality Companion v3 used for comparison
- * Quantum XL 2013 used for comparison