

Key Features

A Multifaceted SPC Analysis Tool

- Import UncertaintyAnalyzer results into a process control timeline.
- Develop statistical process control limits.
- View process histories in control charts.
- Model and project drift by linear regression.
- Evaluate outliers.
- Evaluate quality control using process metrics.
- Detect out of control events.
- Test control points and diagnose problems.
- Project bias drift and uncertainty growth.
- Compute calibration intervals for equipment parameters.
- Issue reports complete with control charts and trend analysis.
- Copy charts and data to spreadsheet, word processing and other applications.

Process Control Histories

- Choose from four process control options:
 - Measurement Process Control.
 - Parameter Value Tracking.
 - Parameter Interval Analysis.
 - Sampled Process Control.
- Enter, paste or import data into the process control history table for analysis.
- Save the contents of the history table, as well as other key information, in an SPCView analysis file (*.spc).

Control Charts

- Display a plot of each control point in the process history along with upper and lower control limits.
- Show optional one-sigma upper and lower error bars.

Process Control Limits

- Develop two-sided asymmetric, two-sided symmetric, single-sided upper, or single-sided lower control limits or control bands.
- Enter control limits or bands directly or compute them using a fixed uncertainty or using process statistics.

Process Metrics

- Control process quality using process metrics:
 - Process mean value or deviation
 - Pure error and process variation uncertainties
 - Total process standard deviation
 - Process capability Cp
 - Capability indices Cpu and Cpl
 - Process capability index Cpk

SPCView Proc	ess Control Date	a - C:\Uncertainty	Analyzer 2\SPCV	'iew\Measuremen	t Process 💶 🗖		
File Edit Option	ns Process Metri	cs Run Help					
1 🗋 🎯 📮	I 📭 🐰 🖻	🖻 🗙 🏣 🖶	🎬 🧞 🕨	🧱 📼 🔽			
CONTROL DATA							
Process Identifier Parameter Name							
Length Reference	Calibration		5 cm Reference				
Parameter Qualifier 1 Par		Parameter Qualifier	ameter Qualifier 2		Control Limit Options		
Thermal Correction Applied		Special Purpose		Two-Sided	Symmetric		
Measurement Area	a Units	Conf.	Level (%)	Single-Sided U	Jpper		
_ength	cm	90.00)	Single-Sided L	.ower		
Nominal Value	Weighted U	ncertainty Sam	ple Size	Show Limits	Show Bands		
5 cm	0.00371 cm	4,698	6	Process Co	ntrol Options		
Linner Conf. Level (%) Linner Cov		Easter Upper Centrel Band		Measurement Process Control			
97.50	1.9605	0.007	728 cm	Parameter Value Tracking			
Lawar Caref Lawal (9/)		Fastan Cantral Band		Parameter Interval Analysis			
Edwer Com. Lever (92.50	(76) Lower Cov. 1 1 4398	-0.00	534 cm	Sampled Process Control			
Update <u>R</u> ecord	🛃 🛄 Unc	lo Update 🛛 🍖 🖱	<u>S</u> et Control Dat	a 🚯 🛛 🛛 🗠 🕹	ew Chart 🛛 🔁		
Date	Measured value	Reference Standard ∀alue	Measurement Process Uncertainty	Process Sample Size	Reference Standard Uncertainty		
29-Mar-1993	5.001726	4.99971	0.002700	1,022	0.000700		
11-Jul-1993	5.000977	4.99882	0.002825	421	0.000825		
31-Dec-1993 15-May-1994	4.999327	5.00101	0.002771	669 1.022	0.000771		
29-Oct-1994	5.000857	5.00110	0.002825	421	0.000825		
23-Jan-1995	5.001133	4.99992	0.002771	669	0.000771		
03-Apr-1995	5.004684	4.99810	0.002759	818	0.000671		
					P		



•	Process Metrics						
	Process Metric	Value					
	Mean Process Deviation	-0.00046895					
	Pure Error Standard Deviation	0.00391					
	Process Variation Standard Deviation	0.00062					
	Total Process Standard Deviation	0.00396					
	Process Capability (Cp)	0.567					
	Upper Capability Index (Cpu)	0.480					
	Lower Capability Index (Cpl)	0.653					
	Process Capability Index (Cpk)	0.480					
	ОК Сору	Help					



Trend Analysis

- Develop a weighted or unweighted linear regression fit of control point values vs. time, along with bounding upper and lower standard uncertainty curves.
- Display the regression fit on a control chart with projected times for intercept with the control limits or bands

Interval Analysis

- Compute a recommended test or calibration interval commensurate with either a desired confidence level or measurement uncertainty.
- Show the drift rate for the process, projected . intercept of the curve fit, and the intercepts of the upper and lower projection limits with the control limits or bands.
- Set the Initial Value and Initial Uncertainty to zero or some other value appropriate for the parameter's interval.
- Select interval time units from a drop-down list.

Outlier Identification

- Compute the confidence for rejecting a process as being out-of -control at a selected point.
- Compute false reject risk (beta risk) for each data point.
- Exclude suspect control points to assess impact on the linear regression fit shown on the process control chart. Excluded points become inactive in the process control history, but are not deleted, and are displayed in gray on the process control chart. Resubmission Time A

Resubmission

Time

104

173

167

86

70

- Use the drill-down Resubmission Time Analysis Worksheet to exclude suspect as-found and/or as-left data from Interval Analysis results.
- Sort the Resubmission Time table by Service Date. Resubmission Time. or Deviation from Prior Value.

Analysis Reports

- Generate hardcopy reports of the SPCView analysis results and of the control chart.
- Generate process evaluation reports showing in- or out-of-tolerance status of control points, along with rejection confidences and computed beta risks.
- Report interval analysis results, complete with a trend analysis plot.



Process Evaluation Worksheet X Close Print Copy Selection Undo Excluded Run Help 🔶 🖾 🔎 🗾 🕒 🧏 🎽 🛄 📟 . ? Measured Value **Display Options** Control Points Deviation from Standard 5.00468 cm 1 Control Point Exclude Measurement Uncertainty 0.002759 cm 29-Mar-1993 11-Jul-1993 Sample Size 818 31-Dec-1993 Ref Standard Uncertainty 0.000671.cm /-1994 × 994 V OK Cancel Sort Help 1995 1995 Prior Service Date As-Found Deviation from Prior Reject Reject Service Date As-Left _ Value Value Beta Risk 11-Jul-1993 5.000977 29-Mar-1993 5.000726 0.000251 100.00 % 11-Jul-1993 -0.001150 31-Dec-1993 4.999327 5.000477 100.00 % 15-May-1994 5.000226 1 31-Dec-1993 4 999927 0.000299 100.00 % 29-Oct-1994 5.000857 15-May-1994 5.001260 -0.000403 23-Jan-1995 4.999133 29-Oct-1994 5.000237 -0.001104 100.00 % 03-Apr-1995 5.001084 23-Jan-1995 5.002084 -0.001000 100.00 % 23-Jan-1995 0.00121 25.63 100.00 % 0.002878



Key Features