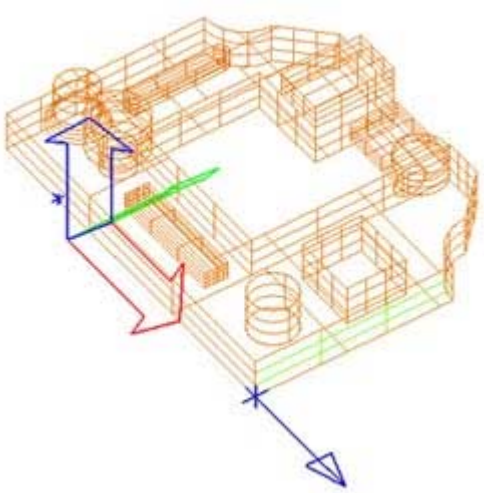
Geomet CAD Inspect

Geomet CAD Inspect is designed to provide expanded support for inspecting prismatic features and non-uniform surfaces. First by importing an IGES CAD Model, and then performing an inspection by capturing and fitting data point clouds to the model. The result is a vector color map to verify part compliance.

Geomet CAD Inspect supports the following:

- Full IGES Import of Surfaces and Curves
- Prismatic identification of features within a CAD Model
- Dynamic Data Point Vectoring
- Part-to-CAD Model Coordinate Systems
- CAD Model-to-Part Coordinate Systems
- Whisker Display of Data Point Clouds

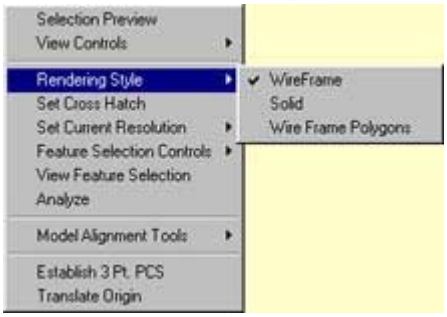


Backward Compatible

When upgrading to Geomet CAD Inspect, your existing Geomet part program files are 100% compatible with no loss of feature support.

Graphic Presentation

The Geomet graphic presentation is built on the display currently used. The example at right shows the wire frame representation of a bracket. The Part Coordinate Axes are displayed showing the current placement and working planes. The display will show your present inspection and CAD Model concurrently and allow direct selections using the mouse.



CAD Tool Menu

A new right-click sub menu can be activated providing new tools for working with the CAD Model. These tools include: View controls, feature selection, coordinate and analytical tools. Through the coordinate tools, you can orient, align and set origins on the CAD Model that will 'move' the model over the existing part on the CMM. Once this has been accomplished, you can perform direct to model inspections as well as create new coordinate systems directly from the CAD Model.

Prismatic Feature Selection

If the CAD Model has identifiable prismatic features, you can recall them as a plane, sphere or any other feature supported by Geomet. These features can then be toleranced or used in various constructions such as Part Coordinate Systems (PCS).

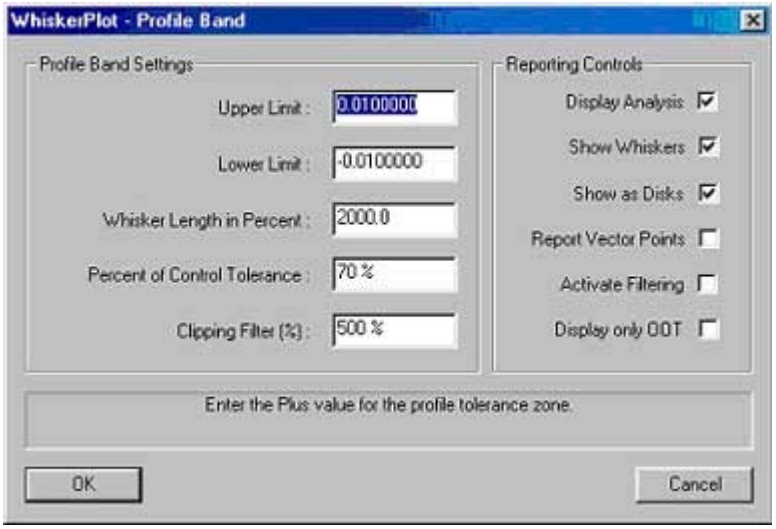
Dynamic Point Vectoring

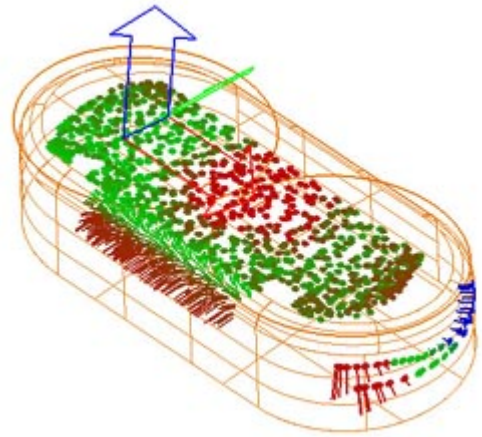
This unique feature returns nominal and measured data on points captured using either an electronic touch probe or manual hard probe. It works interactively with the model showing a vector from the model to the current position of the sensor. Moving the sensor will update the vector allowing you

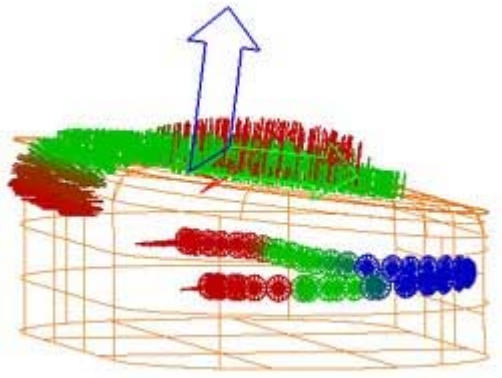
precise visual control of capturing surface points. With every point taken, a report is generated providing the actual IJK surface normal and XYZ measured point as well as the deviation from nominal.

Whisker Plot Analysis

Data clouds can be captured through the existing GeoTracer and other manual or DCC scan functions. These functions build a data cloud of a few to thousands of points. GeoTracer works with hard probes that allow you to scan over the surface capturing large counts of data points. Manual scan is used with electronic touch probes capturing one data point at a time and grouping them into a single data cloud.







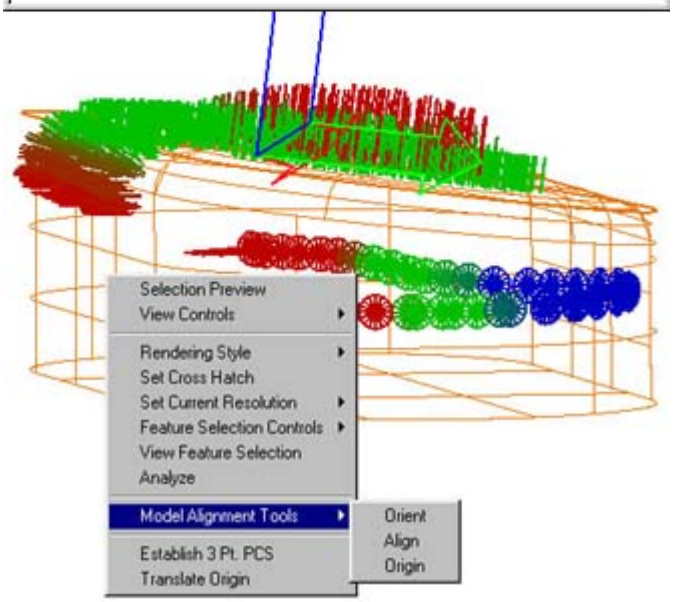
Through the 'Build Whisker Plot' function, the data point cloud will be compared point-by-point with the CAD Model returning the location and indicating on the screen in color whether they are within a specified tolerance band or not. The display can be customized to display whiskers, colored disks or both for visual reference as shown in the examples.

Each group of data points can have unique characteristics. These include the profile band, user defined control limits, display settings and filtering tools. Filtering tools can be activated to remove from calculations stray data points which can be caused by a poor scanning procedure or, in the case of lasers, introduction of noise.

The display produces a color map providing a quick reference of the quality of the data points. Green indicates acceptable values, red for values exceeding the upper profile band and blue for data points exceeding the lower profile band. A transition color is used for data points between the user define control limits and the profile band.

Analysis of the data points can be included in a Geomet inspection report by simply

highlighting the data cloud and from the sub menu and select Whisker Analysis Report. As shown here, the report provides a summary of the data by sorting into Cells, similar to that of a histogram. This report provides a quick overview of the data cloud.



Coordinate System Tools

Geomet CAD Inspect offers tools that allow you to position the CAD Model in the same coordinate system already established on the part under inspection. An example would be establishing a PCS on your part, then select the corresponding feature within the CAD Model to be used for orient, align and origin. You will see the CAD Model, 'move' over the part sharing a common coordinate system.

Once this has been accomplished, you will be able to obtain additional PCS systems directly from the CAD Model by using the tools; Establish 3PT PCS and Translate Origin. To further enhance PCS creation, you can also recall various features directly from the CAD Model and choose whether to use it to establish the orient, align or origin just as if you were capturing features on the CMM.

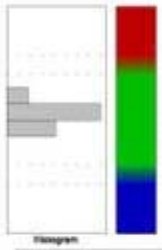
Reporting

The data associated of the fitted data clouds can be printed or exported based on your needs. To print, select the concise report for an abbreviated report or full report which provides a Histogram chart on each data cloud. Exporting is available by choosing the option to export data clouds from the File drop-down menu. All data will be exported in a column formatted ASCII file for use in programs such an Excel spreadsheet or various SPC programs.

Company Name
Drawing # n
Date 01/16/2002, 11:39:40
Operator Tom
Fixture Usage [\ \ ]

Part Name
File Name test
Serial # test sn
Note

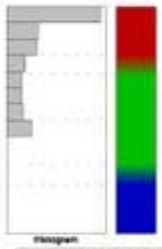
No.	Feature	Actual	Dev. Tol.	Dev. Nom.	Nominal	Tol. Plus	Tol. Minus
1	Current stylus is 1: [Ball - 0.37310"]						
2	-Z Plane [4 pts]						
3	Z Axis Oriented						
4	Z Origin Set						
5	OD XY Circle [4 pts]						
6	OD XY Circle [4 pts]						
7	X / Y Axes Aligned						
8	X Y Origin Set						
9	PCS 1 Established						
10	Imported CAD Model <File Name: 6320>						
15	Vector Point Data Cloud (0.075/-0.075)						



Cell #	13	0	0.00%	0.113 (all Data Pts. greater than)	
Cell #	12	0	0.00%	0.094	0.113
Cell #	11	0	0.00%	0.075	0.094
Cell #	10	0	0.00%	0.056	0.075
Cell #	9	0	0.00%	0.038	0.056
Cell #	8	65	12.87%	0.019	0.038
Cell #	7	290	57.43%	0.000	0.019
Cell #	6	150	29.70%	-0.019	0.000
Cell #	5	0	0.00%	-0.037	-0.019
Cell #	4	0	0.00%	-0.056	-0.037
Cell #	3	0	0.00%	-0.075	-0.056
Cell #	2	0	0.00%	-0.094	-0.075
Cell #	1	0	0.00%	-0.112	-0.094
Cell #	0	0	0.00%	-0.112 (all Data Pts. less than)	

Total Data Points 505	LPr: 0 (0.00%)	70% LCL: 0 (0.00%)	70% UCL: 0 (0.00%)	UPr: 0 (0.00%)	Bad Data Pts: 0

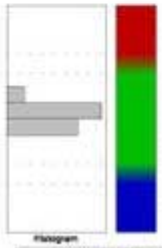
16	Vector Point Data Cloud (0.075/-0.075)			



Cell #	13	193	37.84%	0.113 (all Data Pts. greater than)	
Cell #	12	64	12.55%	0.094	0.113
Cell #	11	61	11.96%	0.075	0.094
Cell #	10	40	7.84%	0.056	0.075
Cell #	9	33	6.47%	0.038	0.056
Cell #	8	33	6.47%	0.019	0.038
Cell #	7	34	6.67%	0.000	0.019
Cell #	6	52	10.20%	-0.019	0.000
Cell #	5	0	0.00%	-0.037	-0.019
Cell #	4	0	0.00%	-0.056	-0.037
Cell #	3	0	0.00%	-0.075	-0.056
Cell #	2	0	0.00%	-0.094	-0.075
Cell #	1	0	0.00%	-0.112	-0.094
Cell #	0	0	0.00%	-0.112 (all Data Pts. less than)	

Total Data Points 510	LPr: 0 (0.00%)	70% LCL: 0 (0.00%)	70% UCL: 365 (71.57%)	UPr: 318 (62.35%)	Bad Data Pts: 0

17	Vector Point Data Cloud (0.075/-0.075)			



Cell #	13	0	0.00%	0.113 (all Data Pts. greater than)	
Cell #	12	0	0.00%	0.094	0.113
Cell #	11	0	0.00%	0.075	0.094
Cell #	10	0	0.00%	0.056	0.075
Cell #	9	0	0.00%	0.038	0.056
Cell #	8	44	9.67%	0.019	0.038
Cell #	7	234	51.43%	0.000	0.019
Cell #	6	177	38.90%	-0.019	0.000
Cell #	5	0	0.00%	-0.037	-0.019
Cell #	4	0	0.00%	-0.056	-0.037
Cell #	3	0	0.00%	-0.075	-0.056
Cell #	2	0	0.00%	-0.094	-0.075
Cell #	1	0	0.00%	-0.112	-0.094
Cell #	0	0	0.00%	-0.112 (all Data Pts. less than)	

Total Data Points 410	LPr: 0 (0.00%)	70% LCL: 0 (0.00%)	70% UCL: 0 (0.00%)	UPr: 0 (0.00%)	Bad Data Pts: 0

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