

## What's New in Verisurf 2022: *Release Highlights*

**Verisurf 2022—Measurement Software Automation to Boost Manufacturing:** Verisurf 2022 achieves big results from big datasets and reduces inspection planning time while improving repeatability and process control.

[OVERVIEW VIDEO](#) 

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### AUTOMATE



#### **Auto Path Generation for CNC CMMs**

- Efficient inspection plan creation
- Consistent measurement strategies
- Supports all CMM probing systems including tactile scanning

Makes inspection plan programming faster and more efficient through automatic inspection path generation for CNC CMM's programmed in automated mode. As geometric features are added to a plan the default path settings for each feature type are used to create the probe path automatically. Auto Path Generation works for all geometric features that are based on a CAD entity whether they're added using the toolbar or speed menu. Automatic Path Generation produces a consistent measurement strategy by ensuring that feature paths use the same settings regardless of device or programmer. Verisurf configuration files extend this functionality by allowing users to save and reuse predefined path defaults. Autopath Generation works with all of your CNC CMM's probing systems including tactile scanners so you can take advantage of increased programming efficiency regardless of which type of probing system you use.



#### **Find and Select in Graphics**

- Streamline inspection plan navigation
- Search textually and select graphically
- Supports all measuring devices

Streamlines inspection plan navigation through the use of two new search functions, Find and Select in Graphics. These tools simplify plan creation and editing by making it easy to locate specific features in a complex plan by searching either textually or graphically. The Find function enables searching by partial text strings. All features containing the string are then highlighted in the plan to enable rapid application of functions such as path generation or modification of common attributes such as tolerance. A similar function, Select in Graphics, allows the user to highlight features in the plan by selecting or unselecting them in the graphics window. Select in Graphics can be used in combination with Find to refine a text search by adding or removing features. The Find and Select in Graphics functions work with inspection plans created for any measuring device so you can take advantage of simplified plan navigation regardless of what you're inspecting or how you're measuring it.



#### **Collision Detection for CNC CMMs**

- Real-time collision detection
- Graphical, interactive collision prevention
- Supports 3-axis and 5-axis probing systems

Helps ensure the safety of your CNC CMM hardware and machine parts through the use of real-time collision detection to identify potential probe impacts within an inspection path. In simulation mode, clearance zones are established around the probe, the shaft, and the probe head and the model type projections are chosen. As the simulation runs Verisurf monitors for intrusions of the model into the clearance zones. When a collision is detected the clearance zone turns red as a warning that the path requires modification. Once detected collisions can be prevented using graphical real-time tools. Go-to points can be added at the current probe location and then adjusted to move the probe path clear of the model enabling on-the-fly path correction. Collisions are detected for all entities as well as fixturing if it's included in the model. Collision detection works for all three and five axis probing systems so you can program all of your CNC CMM's with confidence.



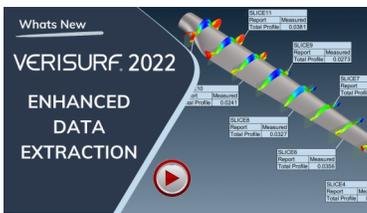
## What's New in Verisurf 2022: Release Highlights (cont'd)



- Graphical extraction zone display
- Interactive zone editing
- Improves extraction accuracy

### Feature Extraction Zone Display

Simplifies scan based inspection and analysis through a graphical display of extraction zone boundaries making it easy to visualize which points are used to define the measured geometry. Separate zones for radial and axial limits facilitate custom extraction strategies for different feature types and extraction zones can be individualized for each feature in a plan. Extraction zones are edited interactively and the results can be viewed graphically in real time. The height zone controls the distance in either direction of the feature normal to establish the zone along the axis of a cylinder or normal to a plane. The radial zone establishes the boundary perpendicular to an axis or away from a center point. Zones can be further modified by limiting the number of points used in high density scans. The intuitive extraction zone display improves feature extraction accuracy by taking the guesswork out of creating extraction zone boundaries providing more confidence in the results. Accuracy is further enhanced through sigma filtering to enable outlier rejection at various levels of statistical certainty.



- Pre-filter data using CAD entities
- Enables multi-step alignment and extraction
- Automates cross section analysis

### Enhanced Data Extraction

Expands the functionality of group alignment and CAD based extraction through the use of a pre-selection filter for scan data. Pre-selection enables more complex extraction strategies by allowing the main selection to operate on subsets of the scan data and it improves extraction efficiency by processing only the required data. Pre-selection is used with group alignment to first filter the scan data based on proximity to the pre-selection CAD entities such as datum targets. This subset is then registered to the main selection such as CAD surfaces. Using two-stage selection in this case enables automation of non-contact 3-2-1 alignment prior to feature extraction. Pre-selection can also be used to filter the CAD extraction zone prior to fitting or analysis. For example, section planes can be used to pre-select profiles from the scan data. These profiles are then compared to the main CAD selection as an Analysis. Here two-stage selection enables automation of line or surface profile in a single operation.

## MBD



- Automate inspection plan creation
- Automatically apply associative tolerances
- Creates feature control frames

### MBD to Plan

Simplifies inspection plan creation through automatic generation of plans from MBD callouts. Datum targets, datum features, surface profile and other callouts can be added to a plan or used to create a new plan and then modified as required. Auto Align targets are created automatically from datum targets to form the basis of the plan alignment. As additional callouts are added, the features required to measure and evaluate the callouts are added as well, and the paths are created automatically. To further simplify plan creation the associative tolerance in the GD&T callouts is automatically applied to the objects in the plan. Profile tolerance is assigned to Analysis objects created from profile callouts and composite position is assigned to hole patterns. This saves time and ensures that the plan satisfies the inspection requirements. Feature control frame images are added for various callouts. These can be viewed in the Automate Manager details pane as well as the Report Manager and they're automatically added to reports to help clarify the results.



- Creates intelligent meshes
- Extends MBD analysis to meshes
- Step, gap, flush, and thickness for meshes

### MBD for Meshes

Introduces the concept of the intelligent mesh to facilitate model-based alignment, profile analysis, and real-time inspection using nominal meshes and to enable rapid interrogation of mesh dimensions. When used as a nominal data set for alignment and analysis, Auto Align targets can be placed directly on the mesh to enable model-based alignment. GD&T callouts such as surface profile can be applied and used for both offline analysis and real-time inspection using Verisurf's Build mode. If the mesh is segmented each element can be assigned a different inspection tolerance. Intelligent meshes simplify the analysis of scalar dimensions for scan data. After measuring a part dimensions can be taken directly from the mesh without first surfacing or even aligning the data. Thickness is evaluated simply by clicking the mesh and the two-point dimension tool enables rapid evaluation of step, gap and flush.



## What's New in Verisurf 2022: Release Highlights (cont'd)

### REVERSE



- Neutral file format for sharing massive dataset
- Both read and write E57 file formats
- Extends support for large volume terrestrial scanners

#### **E57 File Support**

Offers expanded analysis and reverse engineering support for massive data sets to enable modeling and inspection using the latest generation of large volume scanners. Verisurf now supports reading and writing the E57 file format, a compact vendor-neutral format specified by the American Society for Testing and Materials (ASTM) for storing point clouds produced by 3D imaging systems such as laser scanners. E57 file support extends Verisurf support for devices such as large volume terrestrial scanners capable of scanning volumes the size of a city block or larger.



- Segments data into manageable blocks
- Simplifies editing of massive datasets
- Facilitates extraction, fitting, and analysis

#### **Block Segment for Point Cloud**

Simplifies analysis and reverse engineering workflows involving large data sets by enabling segmentation of point clouds into manageable blocks that can be recombined later into a single object. Clouds can be segmented evenly along all three axes while leaving the original scan data undisturbed. Segmenting a cloud simplifies the editing process in which outliers are removed. This is particularly helpful on the inside of the cloud where scanner artifacts might be present. Segmentation makes possible data cleanup that might otherwise be impractical or time consuming. When editing is complete the segments are merged into a single point cloud for subsequent processing. Feature extraction, fitting, and analysis all rely on error-free data to return accurate results. Block segmentation makes it easy to obtain the most accurate results possible.

### MEASURE



- Support scan rates in excess of 2 million points per second
- Enables use of the latest scanning technology
- Inspect and model using high resolution data

#### **High Data Scan Rate**

Provides enhanced functionality for inspection and reverse engineering measurement through support for scan rates in excess of 2 million points per second. This virtually unlimited scan speed lets you take full advantage of the latest scanning technology including handheld, laser, and terrestrial scanners. High data rate scanning means you can retain 100% of the measurements to enable modeling and inspection using high resolution data.



- Simplifies or eliminates data cleanup
- Works as pre or post measurement filter
- Supports offsetting and inversion

#### **Clipping Plane**

Streamlines scan data workflows through the use of a clipping plane that simplifies or eliminates data cleanup by preventing the capture of extraneous points. Designed for scanning parts on a flat surface the surface plane is first measured and then offset to establish a lower threshold. When the part is scanned the over-spray points falling below the plane are ignored reducing or eliminating the need to edit the scan. Any plane can be designated the clipping plane and it can be flipped or offset as necessary to establish an appropriate clipping boundary. The clipping plane does not require that the data be aligned, so it provides benefit from the very start of any point cloud workflow. The clipping plane is intended for scanning applications, but works equally well with probing devices. It can also be used as a post-measurement filter during point cloud editing. It's a simple, fast way to obtain clean data.



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- Enables rapid filtering using CAD surfaces
- Interactive control of projection distance
- Facilitates removal of outliers and over scan

### Projection Filter

Streamlines workflows involving point clouds and meshes through the introduction of a data filter that removes points beyond a threshold distance from the CAD model. Filtering can be limited to specific surfaces or applied to multiple regions on the model simultaneously using level visibility or pre-selection. The filter's maximum distance setting controls which points are selected based on their distance from the CAD surfaces. Interactive settings allow the user to see in real time which points are selected for greater control over filtering. The red highlight shows which points will be retained and the inversion option simplifies filtering in cases where it's easier to choose which points to delete. The projection filter simplifies removal of outliers and over-scan in workflows where the data is aligned to a model. It's available for use on point clouds and meshes in the Reverse, Measure and Analysis managers.

## BUILD



- Simplifies monitoring and reporting of drift
- Ensures accuracy of drift assessment
- Creates graphical analysis for ease interpretation

### Quick Drift Analysis

Helps ensure the accuracy of laser tracker measurements by making it easy to monitor, record and report drift by enabling real-time analysis to measured points. After recording the drift nests, drift is easily checked by highlighting the measured points and choosing Inspect/Build. Real-time feedback reveals any change in position which can be recorded and then reported as an Analysis object. Drift monitoring is a critical part of laser tracker measurements as it ensures the stability of the setup. Verisurf's new verification tool makes it easy to monitor drift and compensate as necessary to guarantee measurement accuracy. Recording and reporting drift as an Analysis object gives a clear graphical representation of device stability which provides tracker operators and their customers with confidence in the measurement results.

## ANALYSIS



- Graphical display of upper and lower tolerance limits
- Simplifies interpretation of tolerance condition
- Supports tactile scanning devices

### 2D Cross Section Analysis

Introduces a new graphical analysis format for reporting 2D cross-section analysis that helps visualize tolerance condition by overlaying the tolerance band on the deviation plot. When a 2D object or scan cross section is compared to a model the analysis object line display can be configured to show the deviation outline and tolerance band defined by the callout for surface profile. Visualization of the tolerance band simplifies interpretation of tolerance condition and helps clarify the inspection results. The analysis can be rendered with or without deviations and tolerance band and the outline display supports all tolerance zones including equal and unequal bilateral as well as unilateral tolerance. The 2D cross-section outline and tolerance band can be displayed for profiles extracted from non-contact scan data as well as profile scans measured with tactile scanning devices such as CMMs, arms and trackers. The graphical display of 2D cross section analysis provides powerful clear reporting of tolerance condition.

*Verisurf 2022 includes additional improvements beyond those listed above.*

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