What's New In SA

CHAPTER 1

SpatialAnalyzer develops and implements changes fast. New feature requests, bug fixes, and changes are implemented quickly, enabling you to use them right away. The following is a summary of the newest additions.

SpatialAnalyzer Version **2025.1**

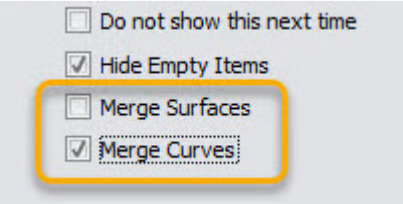
CAD Import

Updated CAD Import Format Support:

- AutoCAD 2024, Autodesk Inventor 2025, Autodesk Navisworks 2025, CATIA V5_6R2024,
- Creo 11.0, DGN 8, IFC2 up to 2.3.0.1, IFC4 up to 4.0.2.1, NX - Unigraphics NX2412, Parasolid 37.0
- Revit 2025, Rhino3D 8, Solid Edge 2025, Solidworks 2025, STEP AP242 E1/2(beta)/3(beta)

Expanded Direct CAD Import to Include Merge Objects:

Some CAD formats can include thousands of items within them. Importing these files and then sorting and condensing them within the SA tree can take pose a challenge. There are now an intelligent options to merge surfaces and curves (b-splines) as part of the selective CAD Import process. This option condenses tree items based on the CAD's inherent structure and can greatly reduce the number separate pieces built within the SA tree on import.

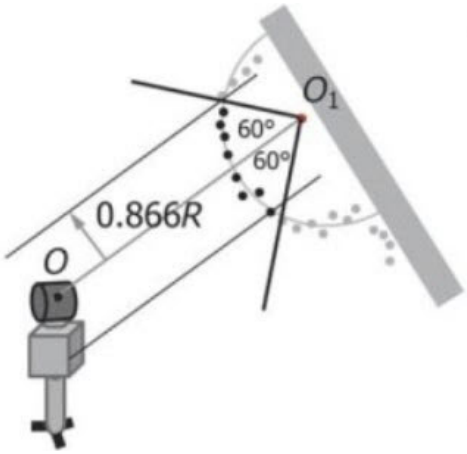


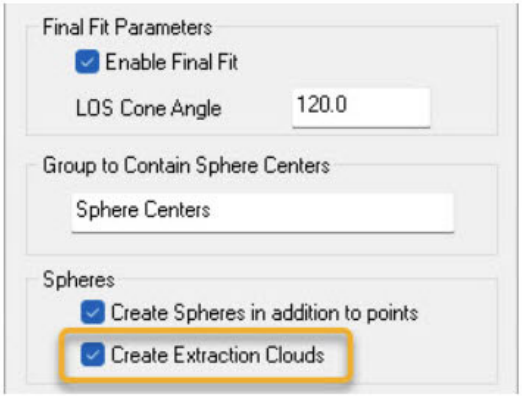
Point Cloud Operations

Auto-Detect Sphere Centers Offer Cloud Construction

An additional final fit can be performed to remove outliers and refine the

solution based on the associated instrument station. Enabling the option to perform a "Final Fit" will use the ASTM E3125-17 fitting algorithms. The point cloud data is filtered so that only a central cone opening angle of 120° is used to compute the sphere and its center point. There is now an option to save these filtered clouds as part of the sphere point detection process:

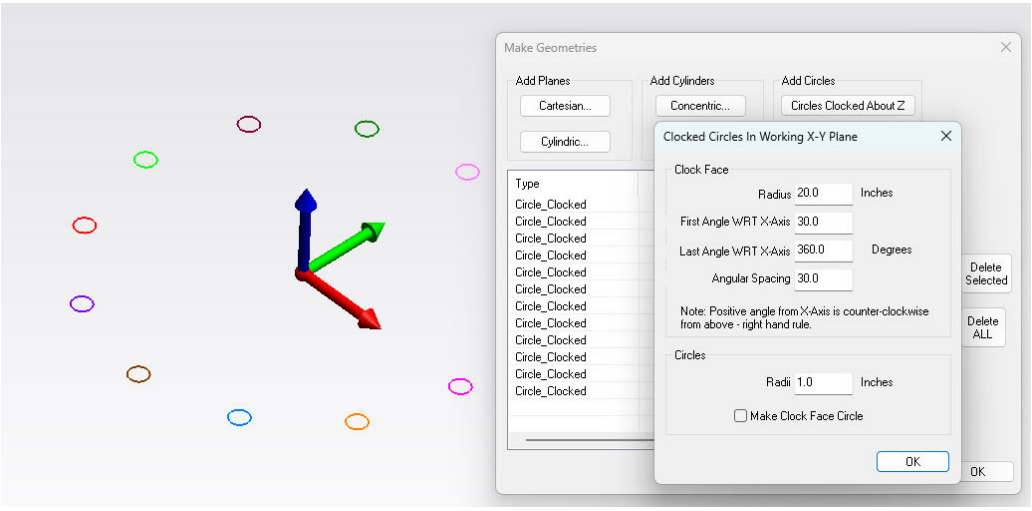




Cross Section Measurement

Added New Multi-Geometry Building Tool

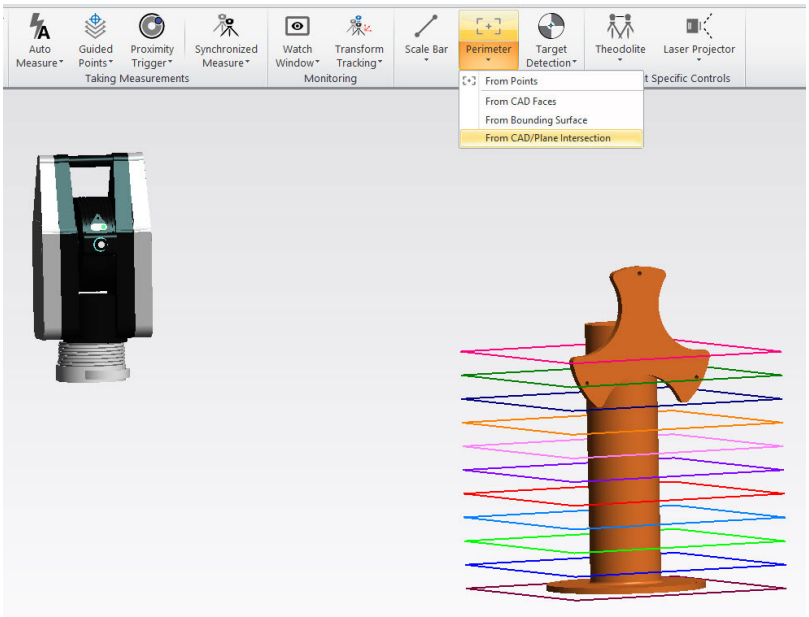
A new tool has been added to easily define and construct a series of items at tone time. This tool works great for creation of geometries for cross section cuts as an example. Several options are included:



- Planes at set distances along selected working frame axes
- Planes rotated at set intervals about working frame z-axis
- Concentric cylinders centered on working frame z-axis. This tool also offers a method to build clocked circles about working frame z-axis. This can be very helpful in spool flange measurement.

Perimeter Construction Options

Added a new construction option to create perimeters "From CAD / Plane Intersection". This uses a selected instruments perspective to build a set of open perimeters for cross section measurement.



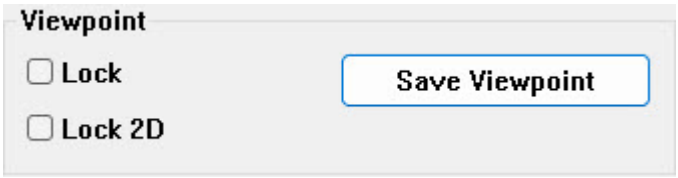
Expanded Cross Section Clouds

Cross-section clouds can now be build directly through measurement. It is now possible to scan directly into a cross section cloud with devices like the Leica ATS600.

- The default mode for the ATS600 Line Scans is now "Linear" and a new method Separate Cloud Per Line is now available to facilitate this measurement method which will produce a scan stripe cloud as the measurement result for easy analysis.
- An additional construction method has been added to allow separate clouds in the tree to be combined into a cross section cloud.

2D Callout View

Added a 2D callout view lock mode.

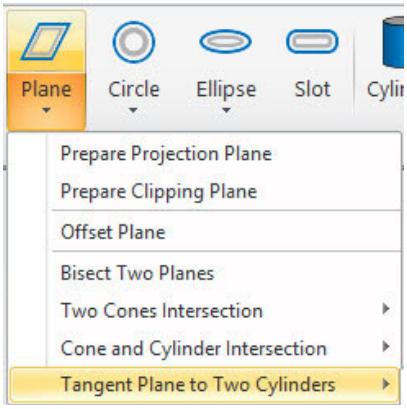


Updates for Roller Alignment

New Dynamic Tangent Plane

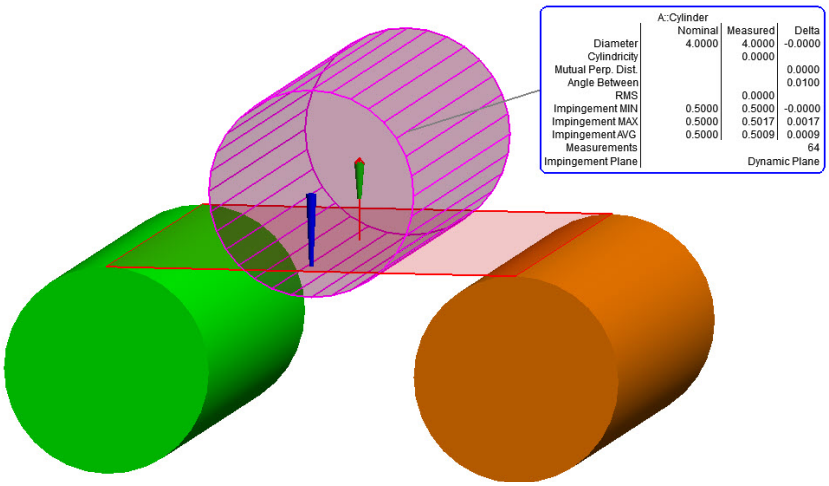
There is now an option to build a dynamic tangent planes based upon the selection of two nominally parallel reference cylinders. Selection is available

for all 4 possible tangent variations (top, bottom and both angles).



Impingement Plane for Cylinders

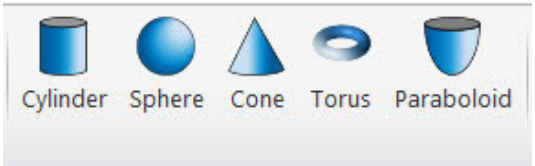
The impingement plane concept was added to aid in roller alignment applications. The idea being that the reference roller should be set at a given depth relative to a tangent plane set by the two adjacent rollers. The 3 Impingement criteria are computed dynamically to return statistics on these values.



Feature Inspection Updates

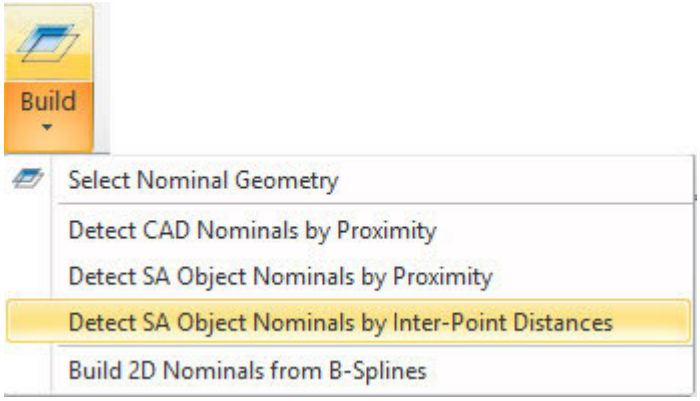
New Torus Geometry Relationship

Toroid geometry is now included in SA's list of dynamic features. When measuring bearing races and other similar shapes this feature will greatly aid in measurement and reporting.



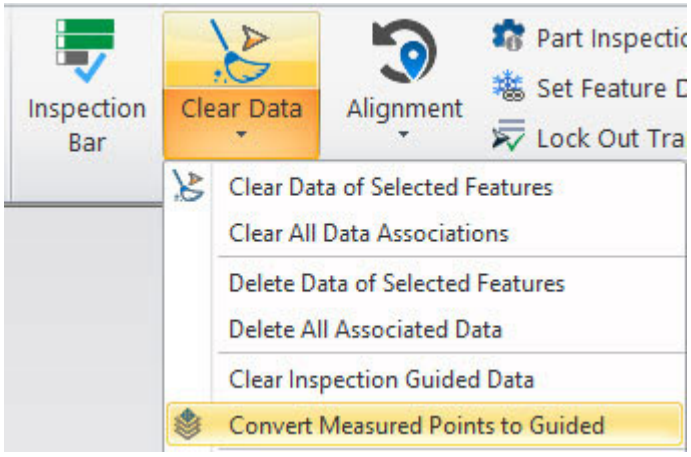
Detect SA Object Nominals by Inter-Point Distances

A more advanced option has been added to detect and add nominal items to measured GR-Features. This option allows point reducible features like circles, slots and spheres to find their nominal based on the spacial distribution in the job file, prior to alignment. This new function works great for applications such as initial part alignment after scanning. For example you can now import CAD and build nominal features from it, scan the part and directly extract desired alignment features from the cloud. This new tool can then be used to directly match up nominal and measured features in one go. This works great when performing a Nominal Geometry Relationship alignment for example.



Convert Measured Points to Guided

Guide points can be very helpful for inspection and they can also be used for auto measure operations. The Convert Measured Points to Guided option offers the ability to directly convert a measured set of features into a template that is pre-configured with guide points. The same operation is available on R-click Relationships branch menu. Added new menu option "Clear Inspection Guided Data" to remove guided points from the assigned relationships.

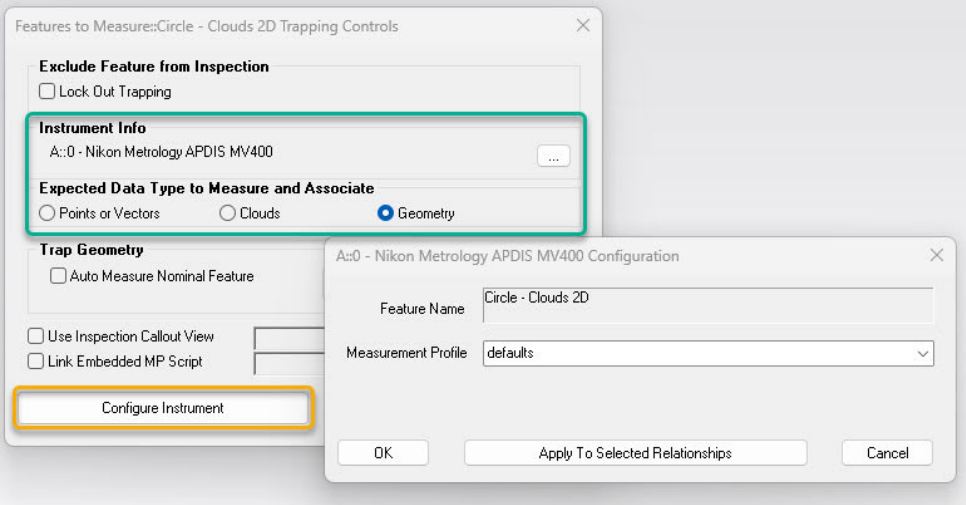


Expanded Trapping Controls for GR-Features

A selection of helpful updates have been made to the Trapping Controls dialog and the options it offers.

- The Trapping Controls dialog now dynamically adjusts to display only

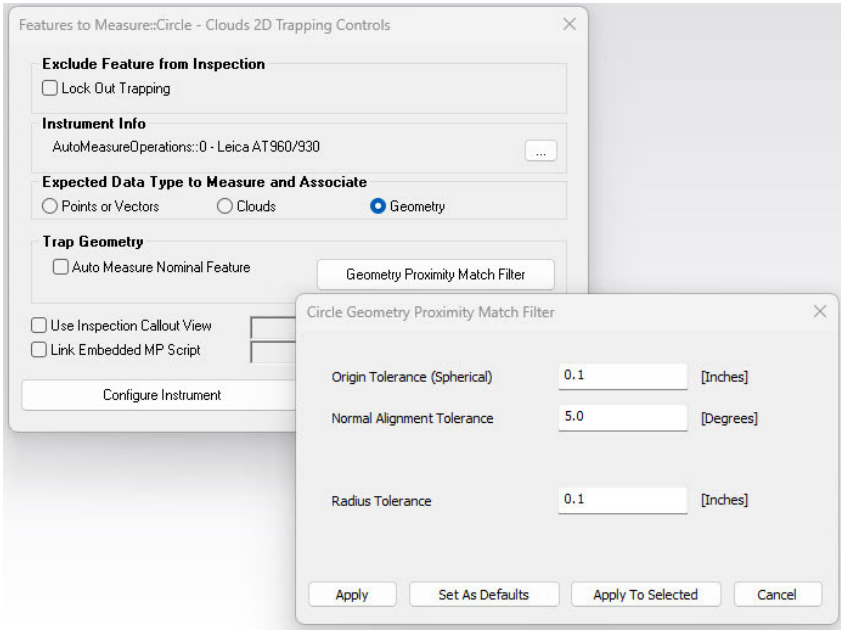
the relevant controls for the selection measurement operation. This includes adjustment for the Configure Instrument display:



- When Clouds are selected a directly link to the proximity filter options is provided.
- Added ability to apply Trapping Controls to the selected relationship of the same type. The new functionality is applicable to all relationships that have Trapping Controls option.
- The application opens a Target Watch Window for sequential trapping instead of the Closest Point watch window.
- Modified Inspection Callout View assignment in the Trapping Controls dialog on checking “Use Inspection Callout View” option. User can create new callout view or select existing one.
- Added Trapping Controls option to the following dialogs: Average Point Relationship Properties, Geometry Relationship Properties, Points to Objects Relationship Properties, Cloud to Objects Relationship Properties.

Expanded Multi-Feature Trapping

There is now an option to trap geometry using multi-feature trapping. The geometry acceptance tolerance settings have also been added to the trapping controls:



Expanded Measure Batch of Features

The Measure Batch of Features command now includes Sphere's and Cylinder geometry. The Trapping Controls dialog within each GR-Feature includes a Geometry selection control to aid in building a template for these measurements.

Updated Alignments

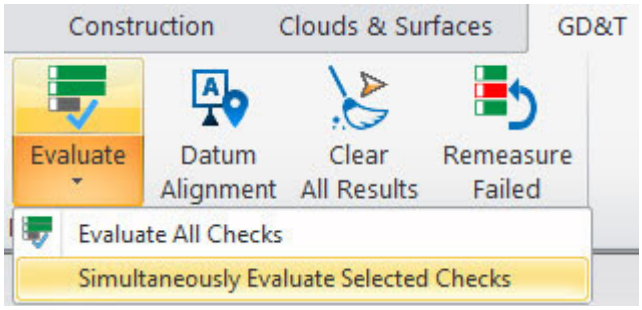
Improved RPS Alignment

Point to Point relationship are now compensated using the surface normal directions saved with the target points. This can help to ensure the desired fit even when measurements do not directly match the nominal location on angled surfaces. This also works great with the Detect SA Object Nominals by Inter-Point Distances option.

GD&T Inspection

Expanded Simultaneous Evaluations

This version completes comprehensive support for simultaneous evaluations as a template default for support of the ASME standard. Annotations marked with specific text such as "SEPT REQT" in the text below field will be automatically excluded from the simultaneous default requirement set in the user Options. A selective simultaneous evaluation option is now also available which allows the default to remain off and only the selected checks be evaluated together. Doing so also creates a dynamic event in the tree that offers the ability to re-compute the prior selection of checks. The GD&T Ribbon Menu has been updated to offer direct access to the GD&T User Options, Simultaneously Evaluated Selected Checks, and an option to Clear All Results, which is helpful when using locked results.



Improved Multi-Feature Point Associations

GR-Feature points associations are now used directly within a GD&T Feature Check that references multiple inspection features. Feature checks that include references to a bunch of different items, such as a position check on a hole patter, have always used proximity to determine which points are associated with which features. This can cause problems if the alignment is significantly off. Building checks from GR-Features eliminates this problem.

Improved User Interface Controls

Added Reference Frame Selection for Transforms

Rotate objects in 3D space with greater ease and precision through a selective reference frame. This version implemented a user selectable reference to either the current working frame or the objects own starting orientation, or its Local frame. This allows position changes to be applied with respect to either the Working frame or the starting position. Note that this option is only available where there is a single moveable object in the object move list.