

# Advanced planning and reviewing of CAD-based inspections using PolyWorks | Inspector™ and CNC CMMs

## Objective

The objective of this 3-day training is to allow metrology operators, technicians, and engineers, who have either successfully completed a basic training specific to CNC CMMs or who already have experience using the PolyWorks Metrology Suite with CNC CMMs, to improve the efficiency of their inspection workflows using tools found in PolyWorks | Inspector™. More specifically, it aims at expanding measurement capabilities, defining adaptive measurement sequences, creating simple macro scripts, and improving the review and analysis of measurement results. Lastly, it also targets streamlined project measurement planning across the organization.

## Prerequisites

- Trainees must have successfully completed a basic training specific to CNC CMMs or have experience operating a CNC CMM with PolyWorks | Inspector.
- Trainees must have basic knowledge of metrology and be able to read drawings with tolerances.
- Trainees must have basic computer skills on Windows operating systems.

## Outline

- Expand measurement capabilities using feature construction methods and optimize measurement parameters for feature and surface inspection.
- Create adaptive measurement sequences by inserting operations such as comments, guiding instructions, questions, and conditional statements.
- Perform purpose-specific tasks using PolyWorks | Inspector's powerful macro scripting language.
- Report meaningful measurement results by using the right alignment tool.
- Review, structure, and report measurement results by using the Control Reviewer and defining sorted and filtered control views.
- Streamline project measurement planning by creating and deploying templates as well as configurations across the organization.

## Content

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### Expand measurement capabilities

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- Create features using advanced construction methods
  - From Intersection
  - From Objects
  - From Projection

- Create dependencies
- Set measurement parameters for feature and surface inspection
  - Probing and point acquisition parameters
- Create custom measurements
  - Quantitative and qualitative

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## Create adaptative measurement sequences

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- Insert comments and guiding instructions: messages and pictures
- Insert questions and conditional statements
- Insert utility macros as part of the measurement sequence
- Organize a sequence by grouping measurement steps
- Troubleshoot and fix measurement sequences
- Adjust the inspection project for a different device
- Use piece templates to manage inspection using different devices
- Prepare an inspection project offline using the Offline Simulation mode

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## Perform purpose-specific tasks using macro scripting

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- Introduce macro scripting
  - Use the command History and Macro Script Editor panes
  - Declare, set values and use variables: integer, double, and string
  - Request operator input and output macro execution result or status
  - Use mathematical and logical expressions such as `EXPR()`, `IF`, and `WHILE`
  - Read, create, and append file
  - Check Syntax
  - Execute a macro script or sections of it
  - Execute a remote script
- Create utility macro scripts
  - Export inspection results to a file
  - Print inspection results automatically
  - Launch the calibration of a tool prior to measuring an object

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## Report meaningful measurement results

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- Align using reference targets
  - Using reference target points and reference target lines
- Best-Fit Measurement Objects
  - Using points, axes, surfaces, and edges
  - Set alignment directions and weight

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## Review, structure, and report measurement results

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- Analyze measured point deviations
- Edit and report measured points
- Review, structure, and report measurement results using the Control Reviewer
  - Create sorted and filtered control views
  - Edit the context of controls
- Monitor trends and variations using Object Control SPC
- Review and structure measurement results using PolyWorks | Reviewer™

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## Streamline project measurement planning

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- Customize the format and content of annotations and report tables
- Create custom report layouts
- Create and share templates: tolerances, controls, annotations, and report tables
- Add custom project, piece, and report properties
- Export and load user configurations