PolyWorks|Inspector™ basic probing and scanning applications for CNC CMMs

Objective

The objective of this 4-day training is to enable metrology operators, technicians, and engineers, who have little or no knowledge of the PolyWorks Metrology Suite, to perform 3D inspections using tools found in PolyWorks|Inspector™. More specifically, it covers the key concepts of a typical inspection workflow for CNC CMMs with probing and scanning capabilities.

Prerequisites

- Trainees are familiar with their CNC CMM and its related equipment, including performing calibrations, using components, setting operational parameters (best practices), as well as performance, maintenance, and care.
- Trainees must have basic knowledge of metrology and be able to read engineering drawings.
- Trainees must have basic computer skills (Windows operating systems).

Outline

- Manage files and navigate through the PolyWorks® interface
- Create and edit a machine configuration
- Define a measurement plan and create a measurement sequence to perform the automated measurement of a part, online and offline
- Measure surface deviations and control part dimensions by CNC probing
- Measure surface deviations and control part dimensions by CNC scanning
- Align measured part to the CAD model
- Review, report, and share inspection results
- Inspect multiple pieces

Content

Manage files and navigate through the PolyWorks® interface

- Navigate through the PolyWorks Workspace Manager interface
- Create and save a workspace
- Navigate through the PolyWorks|Inspector interface
- Create and save a PolyWorks|Inspector project

Create and edit a machine configuration

- Create and edit a machine configuration
- Create and locate reference spheres

- Create tools
- Create and locate tool changers, specify ports
- Create and calibrate tool orientations

Define a measurement plan and create a measurement sequence

- Define a typical inspection workflow
- Import a CAD model and use as a Reference object
- Create features, comparison points, and cross-sections
- Set dimensional and GD&T controls and tolerances
- Create a measurement sequence to perform the automated measurement of objects
- Accelerate measurement sequence creation using the assisted sequence creation tool
- Detect and avoid potential collisions
- Adjust the inspection project for a different device
- Prepare an inspection project using the Offline Simulation mode

Measure by CNC probing

- Measure objects using the Probe and CNC Probe methods
  - Features and comparison points

Measure by CNC scanning

- Configure a scanning device
- Scan a polygonal model using quality metrics
- Clean data while scanning using a clipping plane
- CNC Scan using define paths: area or linear
- Measure deviations to Reference object surfaces using data color maps
- Extract measurement objects from scan data
  - Features, comparison points and cross-sections

Align measured part to the CAD model

- Align using a CMM Prealignment
- Align using Surface Points
- Align using objects
  - Perpendicular Planes
  - Plane, Axis, Center Point
  - Best-Fit Measurement Objects
- Best-fit Data to Reference Objects
- Align using Datum Reference Frames

- Create coordinate systems

Review, report, and share inspection results

- Review measurement results using the Control Reviewer
- Structure measurement results using control views
- Create formatted reports using snapshots and tables
- Share and review inspection results using PolyWorks|Reviewer™

Inspect multiple pieces

- Create a piece template for multipiece inspections
- Review multipiece inspections using Object Control SPC