

# End-to-End Measurement Solutions for the Aerospace Industry

Join MSL And Explore Our Design | Manufacture | Inspection Solutions

**Date:** 27th February 2024

**Time:** 10.00 am – 4.00 pm

**Location:** Leonardo, Yeovil, Somerset

Stakeholders in the Aerospace industry are facing increasing challenges due to manufacturers' accelerated innovation, stricter regulatory standards, heightened concerns for passenger safety, mounting costs of grounded aircraft, and profitability targets.

MSL offer a range of 3D scanning and metrology solutions to the Aerospace Industry for inspections, quality control and reverse engineering.

Our solutions allow for highly accurate scans of small- to large-size parts to generate inspection reports, enabling manufacturers to quickly check the validity of their parts.

Providing unmatched speed, ease of use, reliability and repeatability, our scanning solutions make inspection and reverse engineering workflows highly efficient, significantly reduce operators' impact on measurement results, and shorten the time to generate final reports or CAD designs.

**3D Scanning and Metrology can save the Aerospace industry time and money—all without compromising diagnosis results and safety.**

Throughout the day MSL will provide a range of Product Demonstrations addressing a range of application areas, utilising Creaform Handheld scanners, the Virtek Laser Positioning System and the Renishaw Equator for shop-floor gauging.

Find out more about  
our 3D Scanners



## End-to-End Measurement in Action

### We'll explore a range of 3D Scanning Applications

**First Article Inspection:** 3D scanning for first article inspection (FAI) is a valuable tool in manufacturing and quality control processes. It involves thoroughly examining and verifying the first manufactured part of a new design to ensure that it meets all specified requirements. 3D scanning can play a crucial role in this process by providing detailed and accurate geometric information about the physical part.

- o Geometry Verification - Comparison to CAD Models
- o Dimensional Analysis - Accuracy Assessment
- o Surface Inspection - Defect Detection
- o Assemblies and Fit Checks - Interference Analysis
- o Documentation - Record Keeping
- o Efficiency and Speed
- o Adaptability to Complex Geometries
- o Non-Destructive Testing

**Inline Measurement:** Using 3D scanning for inline measurement involves integrating 3D scanning technology into a manufacturing or production line to measure and inspect parts as they are being produced. This real-time measurement process can help ensure the quality and accuracy of manufactured components.

- o Continuous Inspection
- o Dimensional Accuracy
- o Automated Feedback and Adjustment
- o High-Speed Scanning
- o Surface Inspection
- o Alignment and Positioning
- o Real-Time Data Analysis
- o Integration with Robotics
- o Traceability
- o Adaptability to Variations

**Reverse Engineering:** 3D scanning is a powerful and commonly used technology in the field of reverse engineering, it involves the process of creating a digital representation of a physical object, typically for the purpose of replicating, modifying, or understanding its design.

- o Data Acquisition - Capture Physical Geometry
- o Point Cloud Processing - Conversion to Digital Model
- o High Precision and Accuracy - Detailed Measurements
- o Surface Reconstruction - Mesh Generation
- o CAD Modelling - Parametric Modelling
- o Design Analysis - Understanding Functionality
- o Legacy Part Reproduction - Recreating Unavailable Parts
- o Quality Inspection - Comparison to Original Design
- o Prototyping and Manufacturing - Rapid Prototyping
- o Customisation and Modification - Adapting Designs

## We'll explore Laser Projection for assembly and alignment:

Assembly: Laser projection in the assembly process is a technology that uses lasers to project visual information, such as outlines, symbols, or work instructions, directly onto the work surface or object being assembled. This technology enhances the assembly process by providing real-time guidance, improving accuracy, and increasing efficiency.

- o Work Instructions - Visual Guidance
- o Part Identification - Highlighting Components
- o Alignment and Positioning - Precise Alignment
- o Quality Control - Verification Markings
- o Augmented Reality (AR) Integration - Interactive Displays
- o Dynamic Updates - Real-Time Changes
- o Time Efficiency - Reduced Training Time
- o Error Reduction - Visual Confirmation
- o Scalability - Applicability to Various Scales
- o Customisation - Tailored Instructions
- o Documentation - Recording Assembly Data

Jigs and Fixtures: Laser projection is also a valuable tool for the creation, alignment, and use of jigs and fixtures in manufacturing and it enhances the efficiency and accuracy of working with them.

- o Jig and Fixture Design - Guided Design Process
- o Assembly and Alignment - Precise Component Placement
- o Adaptive Work holding - Dynamic Adjustments
- o Verification and Inspection - Visual Quality Checks
- o Toolpath Guidance - Path Projection
- o Fixture Maintenance - Guided Maintenance Procedures issues.
- o Integration with Multiple Tools
- o Real-Time Adjustments - Immediate Corrections
- o Customisation for Different Products - Product-Specific Guides



Find out more



## We'll explore the benefits of adopting the Renishaw Equator for shop-floor gauging

The Equator gauging system enables process control by delivering highly repeatable, thermally insensitive, versatile and reprogrammable gauging to the shop floor.

### Shop floor gauging

To control manufacturing processes on the shop floor, gauges have been used for decades, for example, sets of callipers, go / no-go gauges or bore gauges. With advances in manufacturing, the need for new process control methods is increasing.

The Equator system is a flexible gauge, designed to provide speed, repeatability and ease of use for manual or automated applications, which is why hundreds of manufacturers worldwide are replacing their current gauging method with Equator systems.

### As part of an automated cell

- Delivers all the benefits of a standalone Equator gauging system
- Connection to robots and controllers eliminates human error and boosts throughput
- Offset feedback can be sent directly to the machine tool controllers
- Parts can be automatically sorted based on whether they pass or fail inspection

### As a standalone gauging system

- Measurement of all critical features is achievable on a single device
- Allows in-process corrections to be made manually or automatically after key manufacturing operations
- Allows increased frequency of inspection and rapid reaction to process variation



Find out more

