

## Laser Scanning



When complex or large environments need to be recorded, or small manufactured parts need to be inspected, laser scanning can provide a convenient and cost-effective solution to data collection.

The history of laser scanning dates back to the 1960s. Primitive equipment setups consisted of cameras, projectors, and lights. Traditional scanning systems were very time consuming due to heavier user input for data processing. Advancements in laser scanning capabilities later resulted in these basic scanners being replaced with LiDAR systems — high-quality scanners that use laser beams and shadowing to collect data relating to objects and surfaces.

In present day we have modern laser scanners and structured light scanners, with the ability to collect dense point cloud data. Modern software allows for the generation of mesh models to view in 3D instantly.

Laser scanning systems emit light, which then bounces off surfaces and reflects back to the sensor on the scanner. The sensor can then determine how far away the surface is by measuring the time taken for the light beam to complete its journey. This process is known as the “time of flight” measurement. The distance measured is then used to calculate a coordinate for each of the millions of points samples by the light. All of this occurs in just seconds, and during a single scan, a laser scanner will accumulate millions of 3D coordinates.

Modern laser scanning has significantly transformed the 3D scanning world. Laser scanners speed up reverse engineering exponentially, providing reference data for CAD design. Outside of design through reverse engineering, laser scanning is often used in metrology and inspection. By using 3D scan data along nominal CAD data, laser scanning provides a post-production non-contact method for inspection. 3D scan data is often used to perform CFD, CAE, FEA and other engineering analysis, often to see how modifications have affected designs. Thanks to the efficiency of laser scanning – time, money and materials are significantly reduced.

Manchester Metrology have a range of laser scanners available for hire or purchase. Find out more at [www.manchester-metrology.co.uk](http://www.manchester-metrology.co.uk)

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