



# ZeroTouch®

## Precise, high-speed, non-contact, in-line metrology and inspection solutions for processing of complex geometries



**ZTM: Multipurpose Inspection System**



**ZTG: Gear Inspection System**



**ZTR: Rotational Metrology System**



**ZTR: Linear Metrology System**

**3-10X** faster than traditional methods. Flexible, measuring any part that will fit in the 300mm<sup>3</sup> envelope.

Rapid and accurate inspection of all gear geometries within **30 seconds** with **2 micron** accuracy

Ideal for high-speed inspection of transmission parts in just **30 seconds**

Perfect for measuring linear-shaped parts faster than traditional methods.

- Easy creation of part inspection plans saves measurement times for different parts
- Ease of part placement reduces setup time per part
- Single-digit, micron-level precision with high repeatability
- Identification of geometric, defect and surface characteristics, enabling adjustment of upstream processes to reduce waste
- Highly configurable and optimized for each manufacturer's specific application
- Flexible enough to provide plain and internal threaded bore measurements down to 3.5 mm ID (M4 thread)

- Rapid inspection times including internal splines and external gear tooth features compared to traditional gear measurement technologies
- 100% 3D inspection of complex gear and teeth geometries using multiple sensors
- Rapid profile, helix, pitch, and runout evaluations
- Installed in-line or near line
- Faulty gears stopped before going to final assembly
- Can support integrated part loading or unloading using robot or gantry methods

- 100% inspection of transmission parts:
  - Brake disks
  - Hubs
  - Complete stator with hairpins
  - Complete rotor with hollow shaft
  - Laminate stack with stamped profiles
  - Splines
- No developer coating/spray for shiny surfaces
- In-line or near-line use
- Capable of 3D defect detection
- Manual or fully automatic mode
- Supports a wide range of dimensions and weights

- No developer coating/spray for shiny surfaces
- 100% inspection of parts leading to process and quality improvements
- In-line or near-line use
- Smaller footprint allows for optimal use of production space
- Micron-level precision and accurate with dense point cloud
- System functions in manual or fully automatic mode

## DWFRITZ® M E T R O L O G Y

DWFritz Metrology, a wholly owned subsidiary of DWFritz Automation, is a global provider of high-speed, non-contact metrology and inspection platforms for advanced manufacturing. DWFritz Automation designs, builds, and supports engineer-to-order automation systems, as well as provides world-class build-to-print manufacturing capabilities.

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# ZeroTouch®

## Case Studies



### Automotive Electric Vehicles

#### Challenge

An EV client sought a solution that would accurately measure all critical dimensions on a **150 hairpin stator**, and also inspect weld bead defects in under the current **45 minutes**.

#### Solution

Using multiple non-contact sensors, ZTR measured the entire part surface, generating a high-density, micron-level point cloud.

This enabled the 100% inspection of all part features, including all critical dimensions and tolerances associated with hairpins, such as air gaps, pin-to-pin separation, relative positioning, and weld geometries.

The 3D measurements allowed ZTR to also verify the integrity of welds, the laminate stack, and pin deformations.

The inspection time was less than **12 seconds**, with analysis times under **30 seconds, a 90x decrease in inspection times**.



### Aviation and Aerospace Contract Manufacturing

#### Challenge

A helicopter manufacturer needed to rapidly measure **over 250 Critical to Quality (CTQ) features** on an essential component. Current inspection times exceeded 3.5 hours per part. Numerous machines, such as CMMs, comparators, micrometers, gaging stations, and manual measurements, were being used to comply with inspection requirements. These multiple stations were impacting the overall measurement precision and variance. They needed a solution that would decrease measurement risk, while improving production throughput.

#### Solution

Using ZTM, we achieved 100% part inspection, including all of the 250+ CTQ measurements. ZTM replaced all of the traditional metrology tools previously used by the client and performed all inspections in only **42 minutes compared to the current 3.5 hours**.

While decreasing inspection time by **>4X**, we also helped our client decrease costs associated with fixturing, multiple tool calibration, maintenance, and manual labor.



### Orthopedic Manufacturing

#### Challenge

Our client sought a solution that would accurately measure features for femoral knee joints featuring **organic and specular surfaces at higher speeds**. Client wanted critical feature measurements on both bone facing and articulating surfaces.

#### Solution

The ZeroTouch Linear (ZTL) system measured the entire part surface, generating a high-density, single-digit, micron-level point cloud and identified previously undetected issues. ZTL acquired **15 million points of data in only 21 seconds** compared to **800 points in 12 minutes** using traditional metrology methods.

ZTL performed all measurements that previously required multiple systems while using low-cost fixturing.

All measurements on ZTL were accomplished without using any developer coating or sprays for the shiny surfaces.

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# ZeroTouch®

# Metrology in Motion®

ZeroTouch® is a family of non-contact, high-speed inspection products manufactured for in-line or near-line measurement processes for multiple industries.



## PART TYPE

### MEDICAL ORTHOPEDIC IMLANTS

- Knee Systems
- Condyle
- Tibial Platforms
- Patella Inserts
- EPDM Liners
- Bone Plates
- Hip Stems
- Hip Cups
- Hip Ball
- Hip Bearing Surfaces
- Spinal Implants
- Non-Hollow Bone Screws



## PART TYPE

### CONTRACT MANUFACTURING

- Tooling Dies
- Injection Molding Components
- Custom Fasteners
- Mounting Brackets - Complex
- 3D Additive Metal Nests
- Textile Shoe Components
- Oil & Gas Down Hole Drilling Parts
- Valves and Valve Components
- Custom Gears - Non-Powertrain
- Worm Gears
- Medical Lens Housings
- Consumer Electronic Components
- Complex Bushings
- Machining Tooling



## PART TYPE

### AUTOMOTIVE / EV

- EV Rotors
- EV Stators
- Bearings
- Powertrain Components
- Torque Converters
- Clutch Assemblies
- Differential Housings
- Engine Components



## PART TYPE

### AEROSPACE / AVIATION

- Engine Components
- Nozzles
- Actuators
- Landing Gear Components

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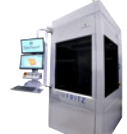
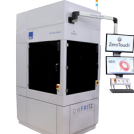
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# ZeroTouch<sup>®</sup>

## In-line Inspection Solutions

All systems are non-contact, 3D inspection solutions capable of metrology & defect detections



	ZeroTouch <sup>®</sup> Flexible Metrology [ZTM]	ZeroTouch <sup>®</sup> Gear [ZTG]	ZeroTouch <sup>®</sup> Rotational (Rotor/Stator) [ZTR R/S]	ZeroTouch <sup>®</sup> Rotational (Disc Brake) [ZTR DB]	ZeroTouch <sup>®</sup> Linear [ZTL]
Linear Inspection					X
Gear Inspection		X			
Housing Inspection	X				
Brake Rotor Inspection				X	
Clutch and Flywheel			X	X	
Motor Stator & Rotor Inspection	X		X	X	
Bore Inspection	X				



Aerospace



Automotive



E-Mobility



Medical Devices



Precision  
Manufacturing

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