



INSTANT MEASUREMENT MACHINE

One Touch Inspection System

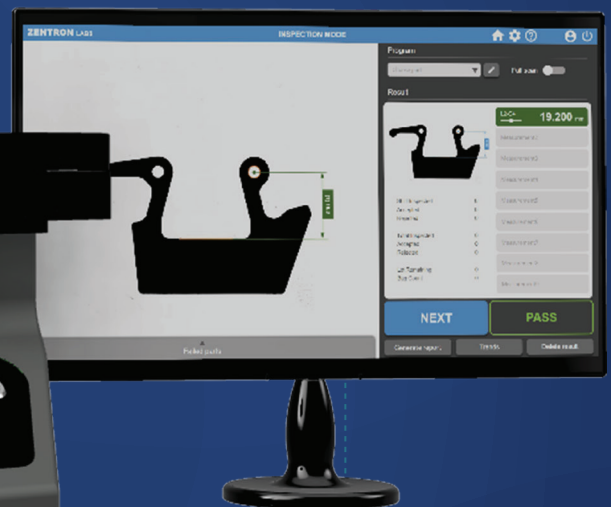
Why iMM?

- ◆ 100 % reliable inspection
- ◆ Zero defect dispatch
- ◆ Complete data of all the inspected parts
- ◆ Real-time report generation
- ◆ Ease of use
- ◆ Reduced human resource
- ◆ Payback period of less than 2 years



Auto Focus

The system uses advanced algorithms to automatically focus on the required measurement plane at the click of a button. This helps in capturing a sharp image independent of the operator's eyesight and this brings consistency and repeatability in the measurement.



Intuitive UI

Inspection result, part configuration, parts reports, batch reports and data analytics can be easily accessed and read by the user at the click of a button.

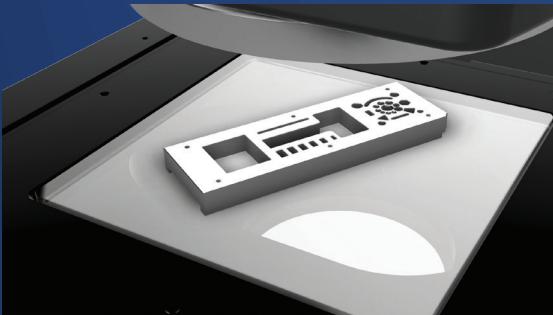
One Touch, Instant Inspection

Just place the part on the table
and press a button.

The inspection result is obtained in
less than 2 seconds.



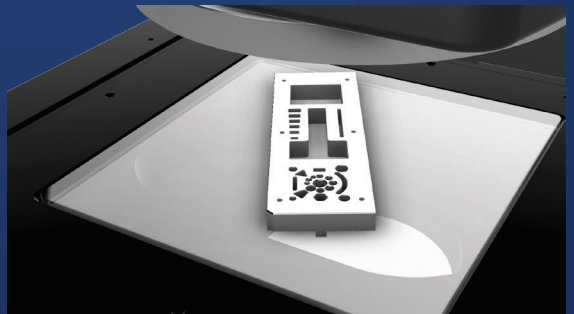
**Orientation detection in conjunction with autofocus makes
the system completely user-independent
and user-friendly.**



Orientation Detection

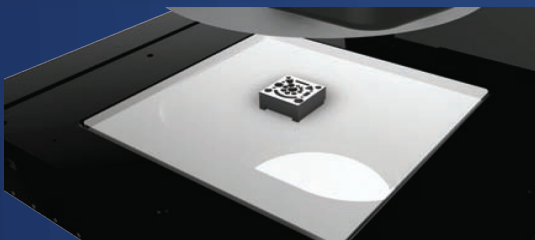
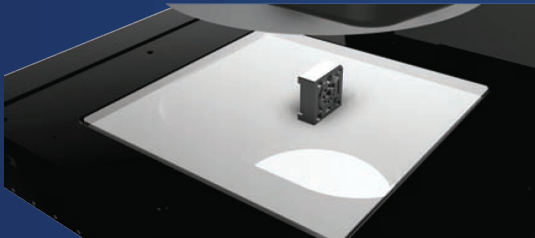
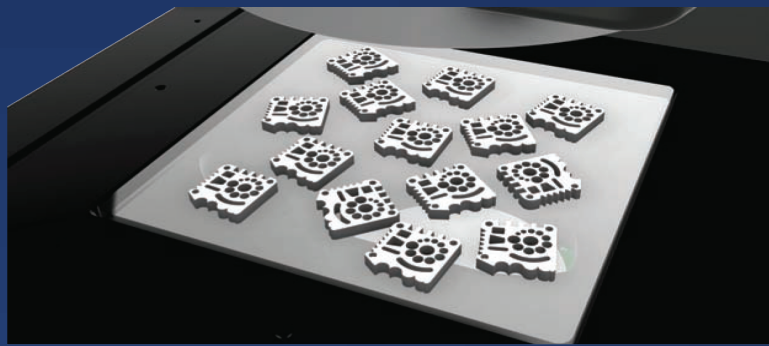
The system uses advanced pattern
matching algorithm to identify the
position and orientation of the part by
automatically creating a reference system.

As a result, the part can be placed
in any orientation and on any part of
the table.



Multipart Inspection

Multiple parts placed inside the Field of Vision (FOV) can be inspected simultaneously. This greatly improves productivity and facilitates 100% inspection of critical parts.



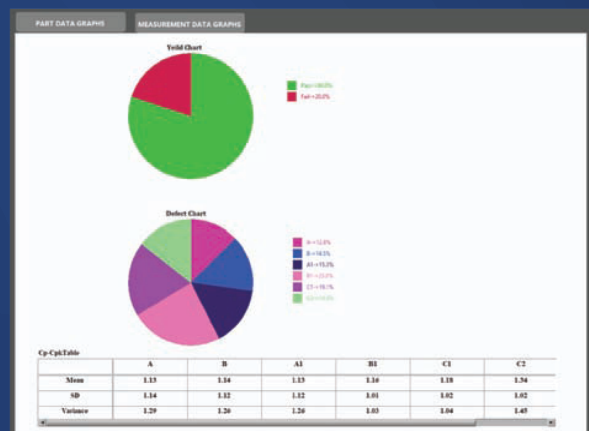
Multiview Inspection

Multiple views of a part can be inspected in a single inspection cycle. This enables 3 dimensional inspection of a part. The final inspection result is based on the measurements in all the views. Up to 5 views can be inspected in a single inspection cycle.

Data Analytics

The system compiles measurement values and part images to generate real time part & batch reports. Inspection history can be retrieved from the system for a required time period.

The system computes C_p / C_{pk} , averages & trends with graphical representation that helps in tracking the production process and detect issues, variances & defects in real time.

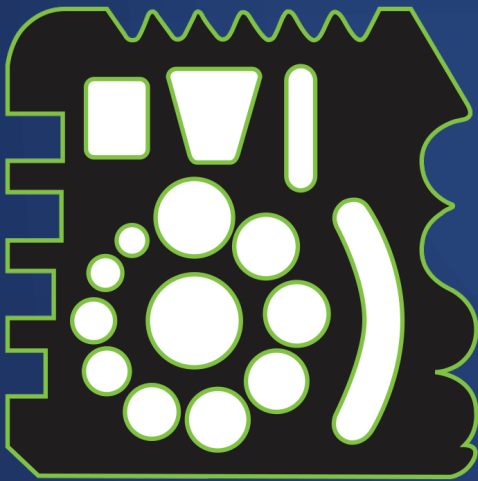
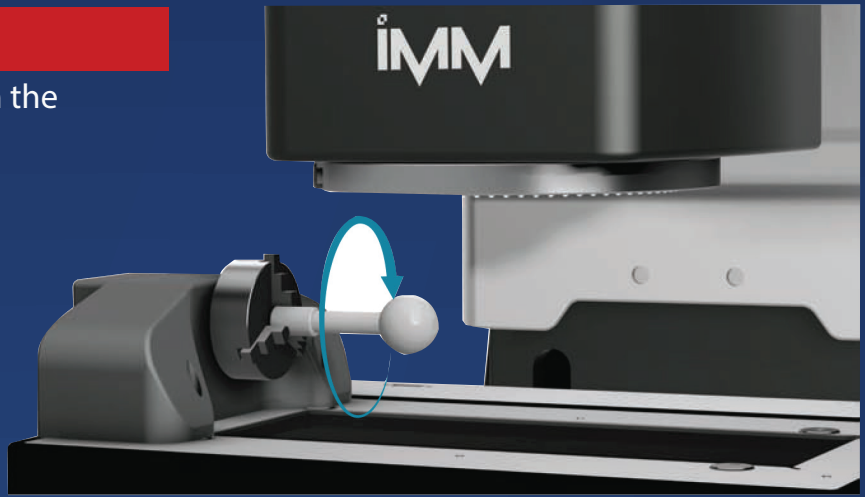


Rotary Fixture

Rotary fixture can be mounted on the table to inspect all possible measurements of a turned part.

Measurements included are:

1. Total run-out
2. Circular run-out
3. Circularity
4. Cylindricity
5. Average diameter



Profile Inspection

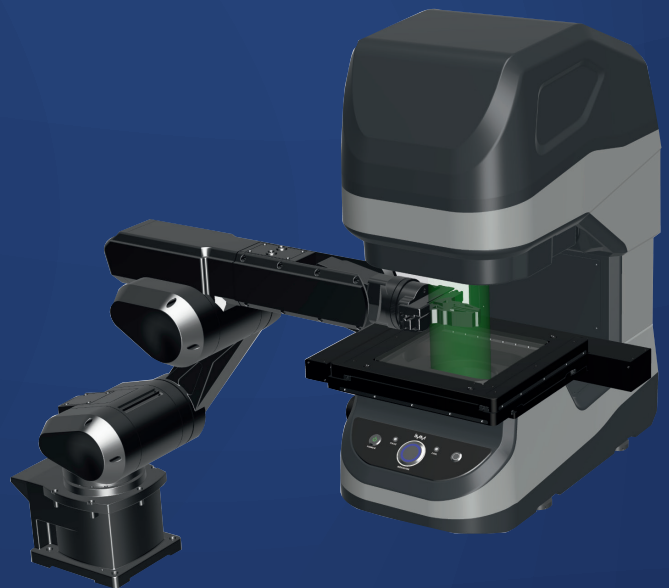
The system inspects the deviation of part's profile from true profile.

The inspection can be done w.r.t:

1. DXF
2. Golden image sample
3. Ideal feature

Lights-Out Operation

The IMM system can be integrated with automation modules to automate the inspection process. It can communicate with pick-and-place arms to sort defective parts. A robust communication protocol ensures a seamless inspection process in a lights-out environment.



Al Cast Alloy body

The body is made of special aluminium alloy which makes the structure thermally stable and free of internal stress.

This ensures long term stability and operability under shop floor conditions.

20 MP Camera

Captures a high resolution image for detecting edges with sub-pixel level accuracy.

Bi-telecentric lens

Enhances the depth of focus and maintains a constant magnification across multiple measurement planes. It also maintains uniform illuminations across the field of view (FOV) including the boundary. This helps in achieving the required accuracy across the FOV and the measurement planes.



3 Rows, 8 Segments moving top light

Moving top light helps in detecting features across multiple measurement heights and segmented light enhances the contrast by selectively illuminating the edges.

In-built electronics

Reduces the footprint of the system. The CPU is designed to work under shop floor conditions.

Collimated back light

Maintains uniform illumination across the FOV and enhances contrast along curved edges of the part.

MEASUREMENT ALGORITHMS

GD&T: True position, Symmetry, Straightness, Parallelism, Circularity, Concentricity & Perpendicularity.

Gear Measurements: PCD, Root circle, Outer circle, Circle fit over pin, Circle fit under pin, Span over teeth, Crest point of teeth, Root point of teeth & Mid point of teeth.

Thread Measurements: Pitch, Angle, Inner diameter & Outer diameter.

Linear Measurements: Line - line, Point - point, Point - line, Vertical/Horizontal point/Line to point/Line, Circle to circle, Circle to point, Circle to line, Average clamp, Max clamp, Min clamp & Circular clamp.

Standard Measurements: Angle between 3 points, Angle between 2 lines, Radius & Diameter.

Detection: O-Ring, Groove & Spoke.

CUSTOMER SUPPORT

- Development of measurement algorithms based on the requirements
- Design and manufacture of fixtures based on the part
- Intergration of automation modules
- Online technical support

TECHNICAL SPECIFICATION

Measurement Area

Model Name	Wide Inspection	Precision Inspection
9010	100 mm dia	56 mm dia
9020	300 x 80 mm	270 x 54 mm
9030	200 x 200 mm	175 x 175 mm
9040	300 x 200 mm	-

Data Sheet

	Image	Wide Inspection*	Precision Inspection**
Accuracy	One shot	$\pm 3 \mu\text{m}$	$\pm 1.5 \mu\text{m}$
	Stitched	$\pm (6+0.02L) \mu\text{m}$	$\pm (4+0.02L) \mu\text{m}$
Repeatability	One shot	$\pm 1.5 \mu\text{m}$	$\pm 1 \mu\text{m}$

Controller

System type	Intergrated
Available ports	1 USB 2 Ethernet 1 HDMI
Power	230V AC input

Machine	315 x 600 x 733 mm
Max part weight	Approx 12 kg
Working temperature	10°C to 50° C

Note: Quoted accuracy and repeatability values are from measurements made on NABL certified slip gauge using backlight, under ambient operating temperature of 21° ($\pm 1^\circ \text{C}$)

* Specified within $\varnothing 80$ mm about centre of FOV

** Specified within $\varnothing 35$ mm about centre of FOV