

Vision Measuring Systems QUICK SCOPE QS-L





Height measurement now included on a single platform

High-speed height measurement capability is now standard. Measurements previously requiring additional use of an indicator or stylus are now integrated into one machine.

Reliable small part measurement

High-speed 7X optical zoom with an interchangeable objective lens unit provides sharp and bright images. Measures details more clearly than a digital zoom.

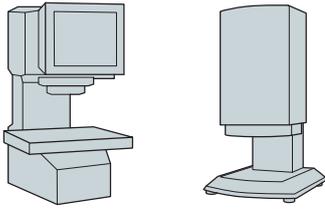
Highlights hard-to-see edges

High-intensity 4-quadrant LED ring light generates shadows to highlight edges that otherwise would be difficult to see.



Vision Measuring Systems
QUICK SCOPE QS-L

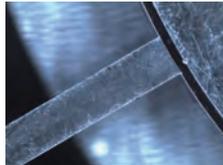
Problems with simple dimensional measuring devices



Problems

✓ Difficult to measure reliably using regular microscope lighting

Some edges cannot be accurately detected and captured when only using the ring light as edge height and shape are so variable.

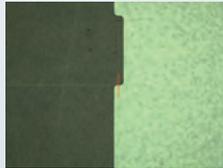


Indistinct image using ring light

✓ Cannot measure minute dimensions due to low magnification

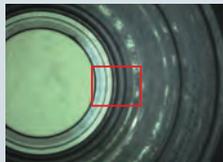
Some small forms cannot be measured only using digital zoom.

Measurement of the width of micro-recessed-forms cannot be accurately performed due to low magnification



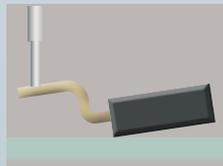
✓ Edge measurement of a stepped feature cannot be performed correctly

It's difficult to detect edges with low magnification and large depth of focus.

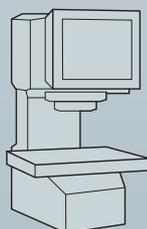


✓ Height measurement results are not stable

Height measurement with a contact probe is not reliable.



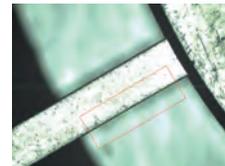
✓ Could give customers unreliable measurement results



QS-L solutions

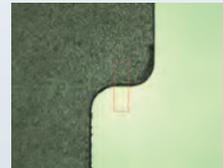


Edge measurement using a combination of co-axial light, ring light and transmitted light



Positive edge detection with co-axial light

7X optical zoom unit with interchangeable objective lenses improves small part measurements

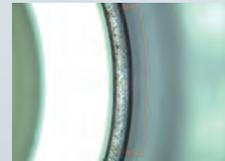


Edge capture with the ideal magnification is always available



Measurement of micro radii is easy with the correct magnification

Edges can easily be captured with the interchangeable objective lenses



Measurement with optimized optical zoom

Image auto focus function is standard equipment

Image auto focus offers highly accurate height measurement with minimal workpiece clamping

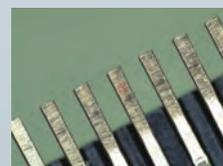
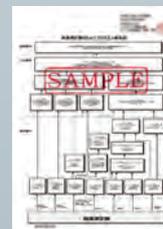


	Image auto focus
Measurement accuracy in the Z-axis	(4.5+0.006L) μm

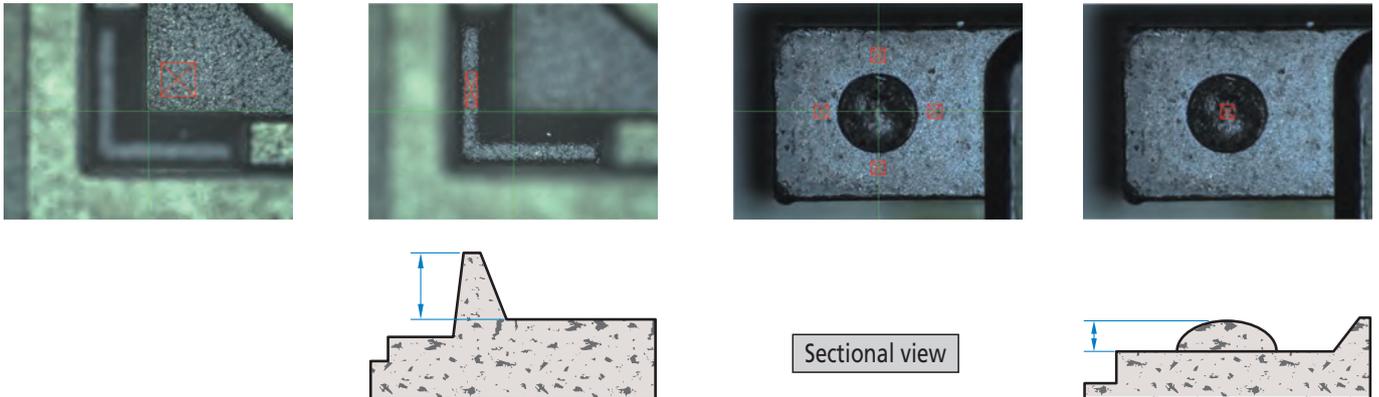
Mitutoyo provides inspection/calibration services using reference instruments that are traceable to NIST



High-speed image auto focus enables highly accurate height measurement

Since non-contact measurement requires only the minimum clamping of the workpiece, height measurement can be performed efficiently. Also, in contrast with laser-equipped measuring devices, height measurement is less influenced by the surface roughness of the workpiece.

	Image auto focus
Measurement accuracy in Z-axis	(4.5+0.006L) μm



LED light unit offers many options for reliable edge measurement

The view may vary depending on the type of method used for lighting the workpiece. The QS-L can capture edges accurately by switching between transmitted lighting, co-axial lighting and ring lighting.



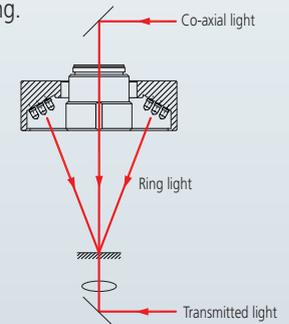
Transmitted light



Co-axial light



Ring light



4-quadrant LED ring light



Back



Front



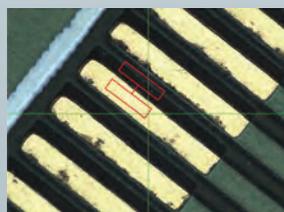
Right



Left

Lighting tool (Contrast and brightness)

The lighting tool offers automatic light intensity to maintain constant brightness and eliminates inaccurate measurements caused by lighting conditions.



Dual-area contrast tool



Brightness tool

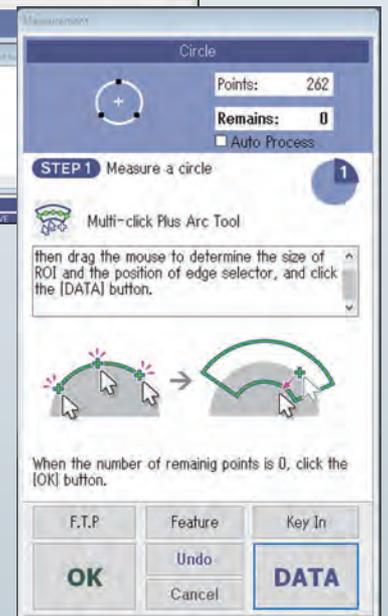
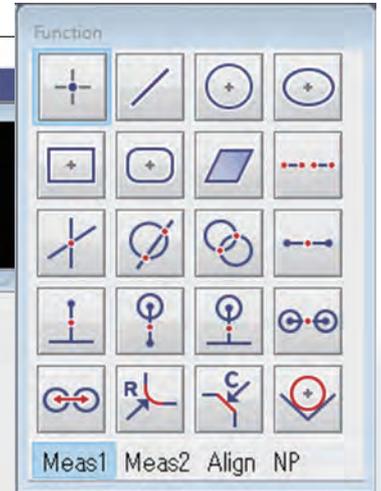
QSPak software enables easy operation and reliable measurement

Many commands enable fast measurement

A wide choice of commands including various distance and intersection point measurements enables easy and reliable measurement.

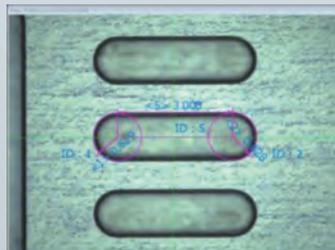
Large screen makes detailed operations easy

All the functions needed for measurement are displayed on one screen; measurement can be performed by simply moving the mouse. Large images enable users to measure details with ease.



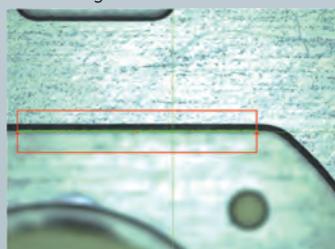
Eliminates confusion between results and points

Since results are displayed on the camera image, confusion from numeric-only results are eliminated.



One-click edge detection

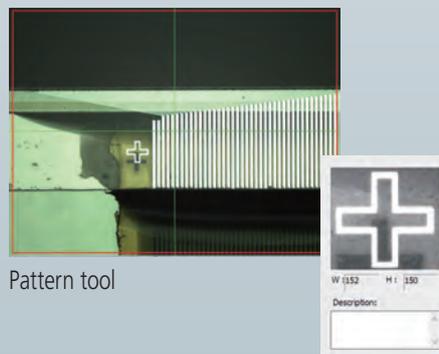
Circles, lines and locations around the measurement point can be output instantly with a single mouse click.



One-click line tool

Detection tools matched to targets

Detection tools can be selected based on feature in order to capture edges with high accuracy.



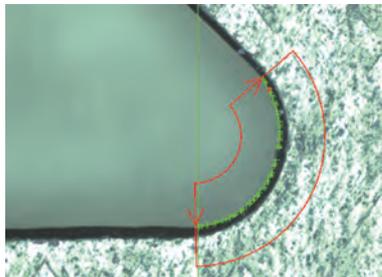
Pattern tool

User-friendly operation

When a command is selected, instructions are displayed on the screen.

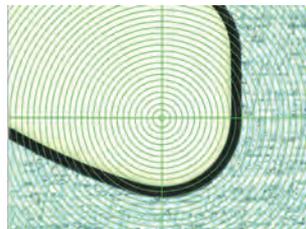
Remove influence from chips and burrs by excluding point anomalies

Erroneous measurement points caused by dust on a workpiece, including chips and burrs, are removed automatically. The removal threshold can be easily set as well.



Template function

The template function overlays a template on the camera image for manual measurements.



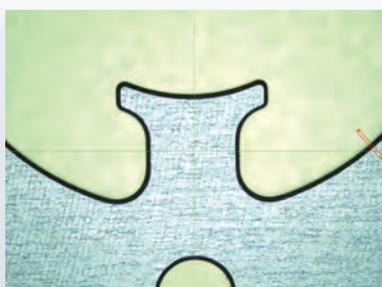
Concentric circle template



User template

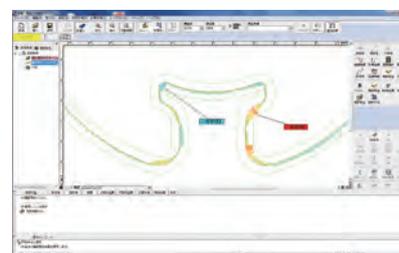
Form tolerance is also supported

The auto trace tool automatically measures complex contours.



In addition

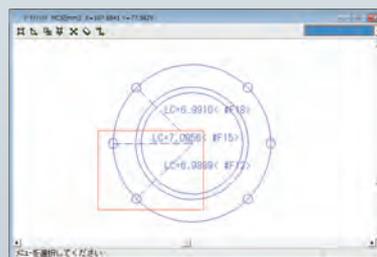
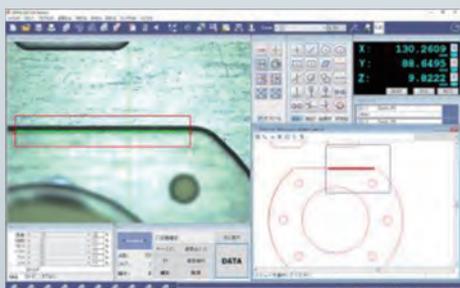
Option



The **FORMTRACEPAK-AP** optional analysis software can provide advanced dimensional analysis.

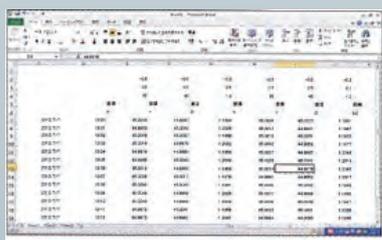
Identifies desired measuring points quickly

Measured points can quickly be found in the graphical window. Measurements can be easily performed on these elements.



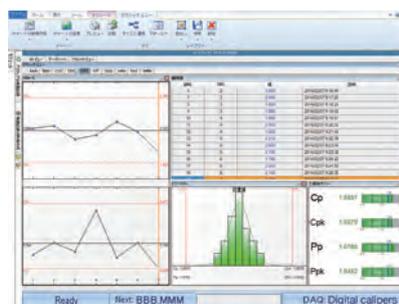
Multiple measurement runs can easily be combined

CSV output of measurement results can be used for statistical data processing with Excel.



In addition

Option



The optional **MeasurLink®** software provides statistical process control (SPC) control charts, histograms and process capability indexes.

Manual Vision Measuring Machine with Motorized Z-axis QS-L/AFC



Specifications

Model	QS-L2010Z/AFC	QS-L3017Z/AFC	QS-L4020Z/AFC
Order No.	359-713 -10	359-714 -10	359-715-10
Package No.	359-713-10PK	359-714-10PK	359-715-10PK
Drive method	X/Y axes: Manual Z axis: CNC with Auto focus		
Measuring volume	8x4x6" (200x100x150 mm)	12x6.7x6" (300x170x150 mm)	16x8x6" (400x200x150 mm)
Resolution / Scale type	0.1 μ m / Linear encoder		
Accuracy *1*2	X axis, Y axis	(2.2+0.02L) μ m	
	Z axis	(4.5+0.006L) μ m	
Accuracy guaranteed temperature range	20 \pm 1 $^{\circ}$ C		
Observation unit *3	7X zoom (8 steps) interchangeable objective lenses (1X objective 0.5X - 3.5X; 1.5X objective 0.75X - 5.25X; 2X objective 1X - 7X)		
Image sensor	3 Megapixel, CMOS color camera		
Illumination	Transmitted light	white LED	
	Co-axial light	white LED	
	Ring light	4-quadrant ring light (LED)	
Dimensions (main unit, WxDxH)	24.5x28x29" (624x711x729 mm)	27x34x33" (692x857x837 mm)	30x34x33" (757x867x837 mm)
Stage glass size	10x6" (250x150 mm)	14.5x9" (370x240 mm)	18x9" (450x240 mm)
Maximum stage loading	22 lbs (10 kg)	44 lbs (20 kg)	33 lbs (15 kg)
Mass (main unit)	154 lbs (70 kg)	353 lbs (60 kg)	368 lbs (167 kg)

*1: Inspected to Mitutoyo standard. L = measuring length (mm)

*2: 3X lens magnification or greater

*3: 1X and 2X objective lenses are optional

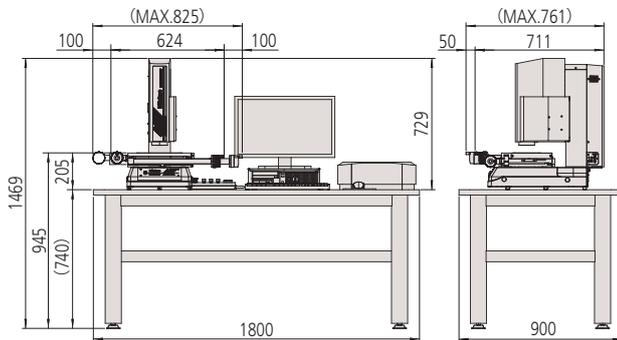
Remote box



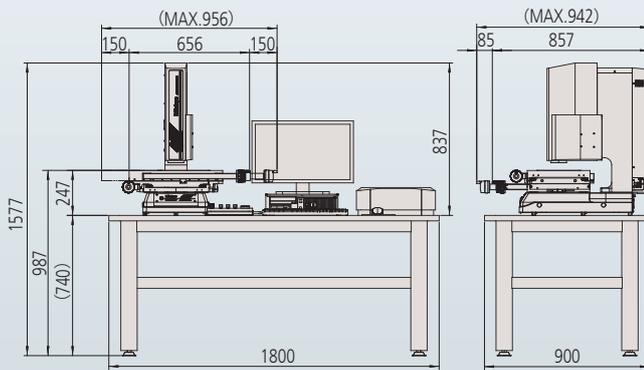
External dimensions

Unit: mm
25.4mm = 1"

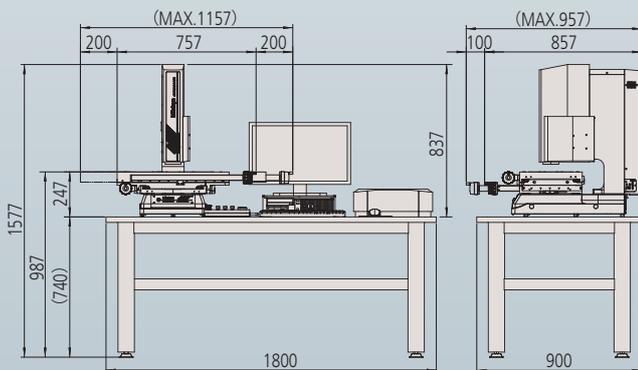
QS-L2010Z/AFC



QS-L3017Z/AFC



QS-L4020Z/AFC



Option

Calibration chart



Order No.	Q2ATN695
Application	This corrects the pixel size of the camera, the accuracy of automatic focusing at each magnification and optical axis offset.

Foot switch (Solid type)



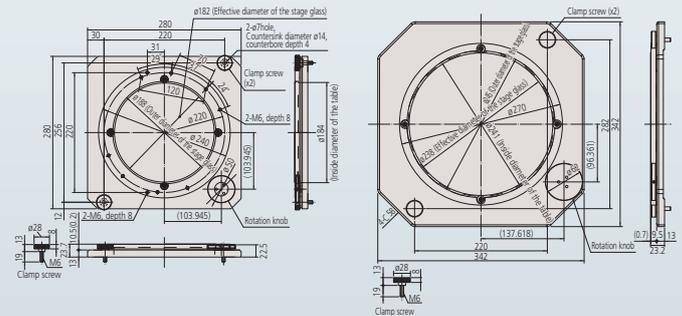
Order No.	12AAJ088
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Turntable with fine adjustment (A), (B)



	(A)	(B)
Order No.	176-305	176-306
External dimensions	280(W)×280(D)×24(H) mm	342(W)×342(D)×23(H) mm
Effective glass size (mm)	ø182	ø238

Note: V-block stage, swivel center support and holder with clamp can be fixed on the table.



Holder with clamp

Order No.	176-107
Maximum length of the clamp	35 mm

V-block with clamp

Order No.	172-378
Maximum supported diameter:	25 mm
Center height from the mounting surface:	38 - 48 mm

Swivel center support



Order No.	172-197
Application	±10° swivel is available, minimum readable angle 1° Suitable for measurement of screw

* Adapter B (176-310) is separately required for size 2010.

* Adapter B (176-304) is separately required for size 3017 and 4020.

Stage adapter Stage adapter B

Order No.	Stage adapter: 176-304 Stage adapter B: 176-310
Application	Some optional products require this be mounted on the measuring machine.

Note) A set consists of 2 sheets.



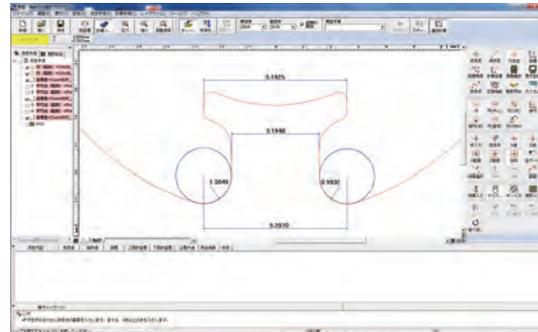
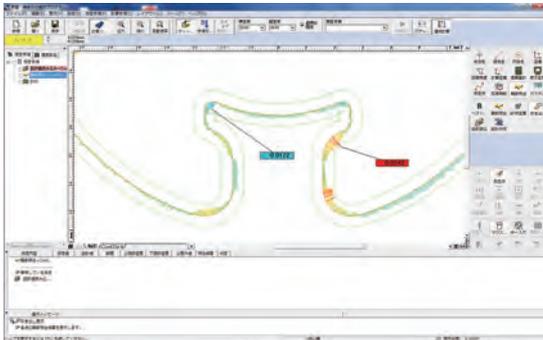
Opti-fix

The modular clamping system opti-fix has been developed especially for optical coordinate measuring systems

Optional software

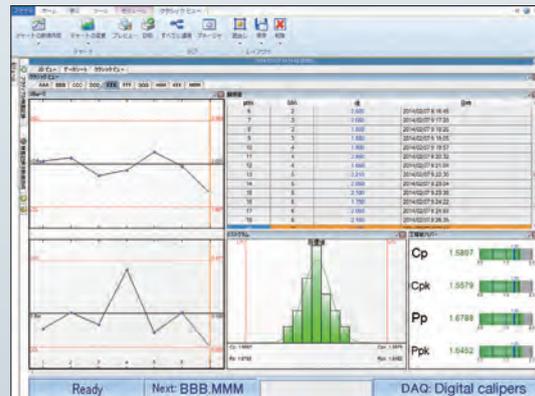
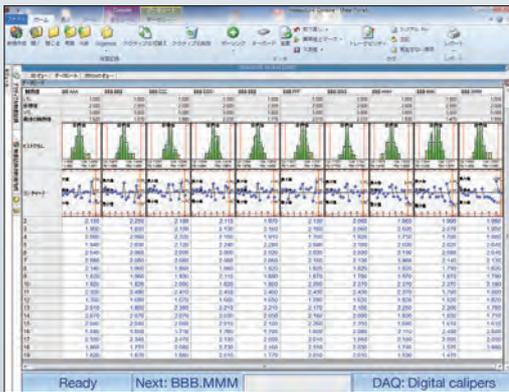
FORMTRACEPAK-AP

Geometric tolerance, contour evaluation, and dimensional analysis can be performed on the data obtained using the Quick Scope.



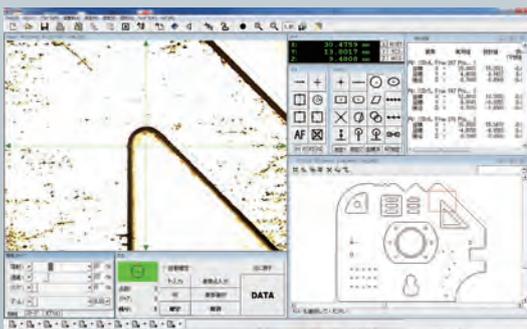
MeasurLink® Real-Time Professional

MeasurLink® Real-Time is Statistical Process Control (SPC) software that displays statistical results. This includes control charts, histograms, and process capability indices in real time based on data collected using the Quick Scope. The software helps prevent scrap by tracking feature variations, so actions can be taken early in a process to prevent products being made outside of their tolerance limits.



QS-CAD I/F

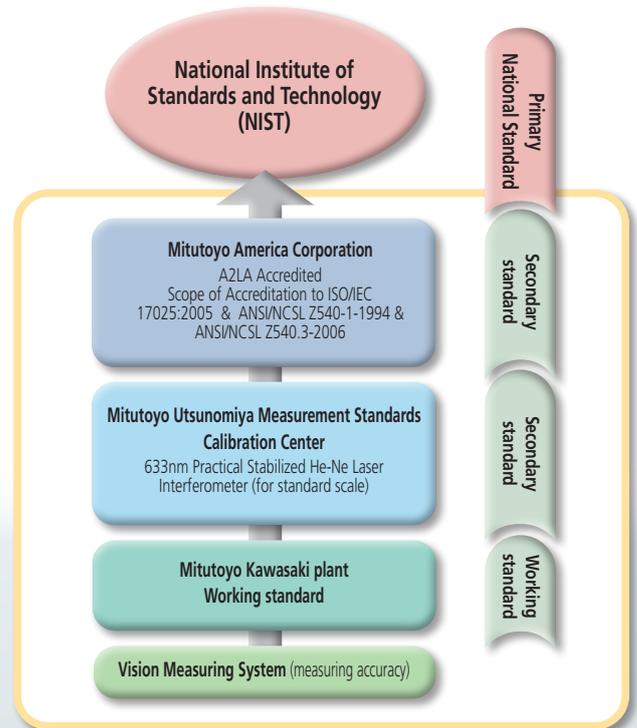
- Shows the current observation point corresponding to stage position
- Can extract design information from graphic elements and skip manual input during verification
- Outputting measurement results as CAD data is available



Traceability

Traceability to the national standard of length

- Mitutoyo owns standard scales that are traceable to the national standard of length and are used to calibrate the reference gages used for calibration of measuring instruments, thus establishing and maintaining traceability for each instrument.



Reliable support system

The world's top-level global network

Following the establishment of MTI Corporation (U.S.) in 1963, Mitutoyo has been expanding its market presence throughout the world. Currently, the company has R&D, manufacturing, sales, and engineering service bases in 29 countries, as well as a network of distributors in some 80 countries. Mitutoyo maintains its rock-solid status as a leading global manufacturer providing services tailored to each regional society.



Headquarters





Whatever your challenges are, Mitutoyo supports you from start to finish.

Mitutoyo is not only a manufacturer of top quality measuring products but one that also offers qualified support for the lifetime of the equipment, backed up by comprehensive services that ensure your staff can make the very best use of the investment.

Apart from the basics of calibration and repair, Mitutoyo offers product and metrology training, as well as IT support for the sophisticated software used in modern measuring technology. We can also design, build, test and deliver bespoke measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.



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www.mitutoyo.com

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