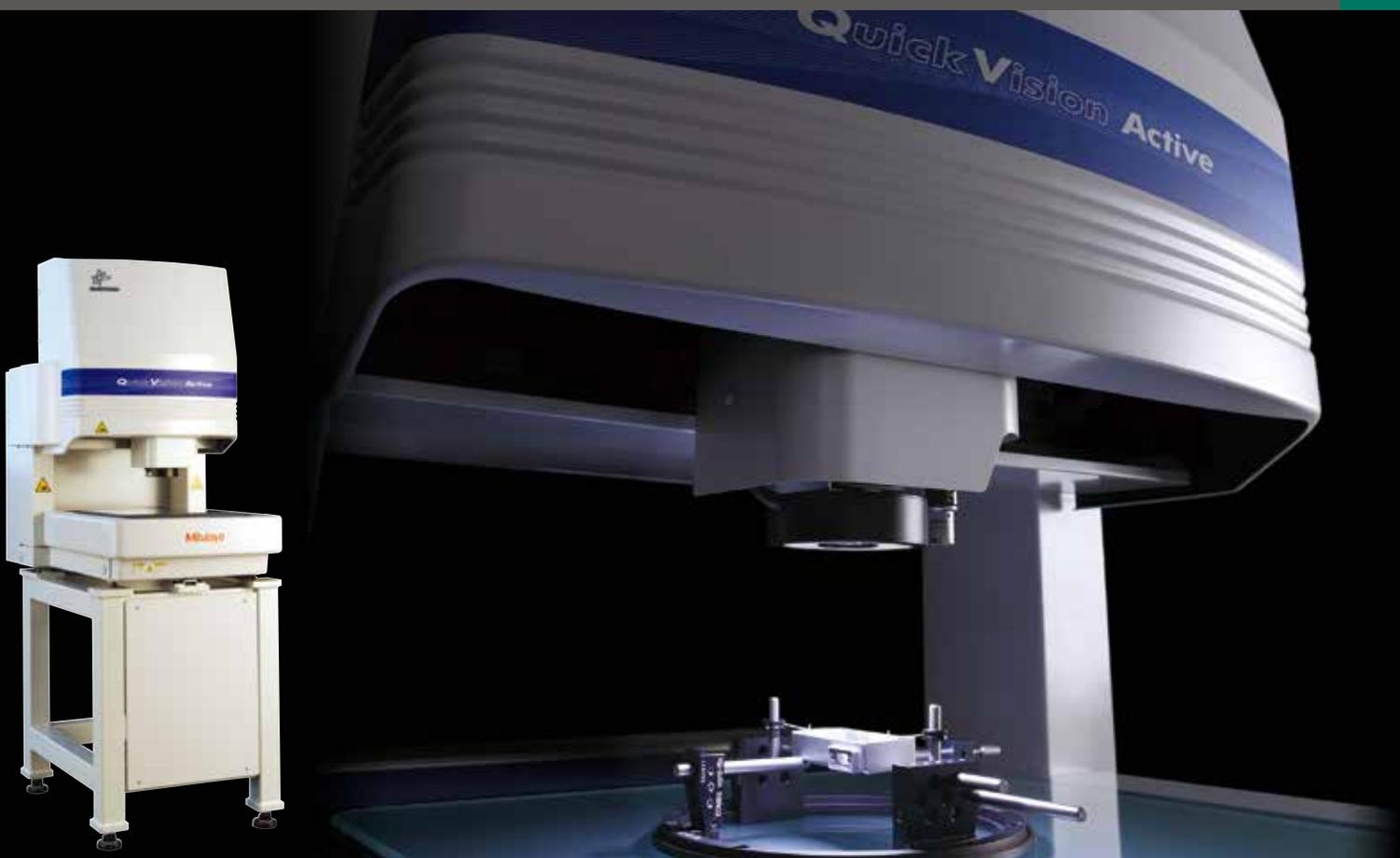


# Mitutoyo

Mitutoyo Quality

## QUICK VISION ACTIVE SERIES CNC Vision Measuring System

Vision Measuring System



A fully featured, automated vision measurement system featuring a space saving ergonomic design

# Quick Vision Active



## Aim Higher with Mitutoyo's QV Active Vision Measurement Systems

**High Speed**

**High Accuracy**

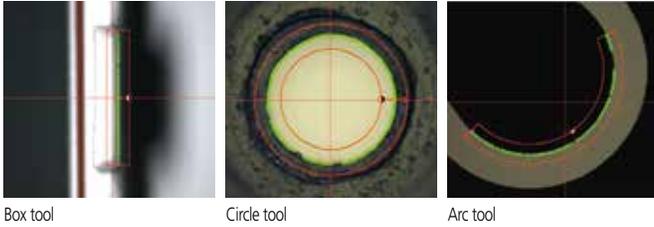
**High Throughput**

# High Efficiency

## Intelligent and Automated Feature Processing Tools allow unattended inspection

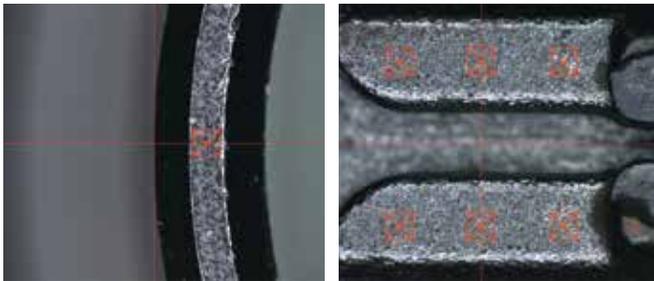
### Automatic edge detection

The "automatic edge detection" function provides superior reproducibility of measurements regardless of the skill level of the operator.



### Image auto focus

Multiple methods of "image auto focus" allows high-speed / high-accuracy height measurements of 3D features



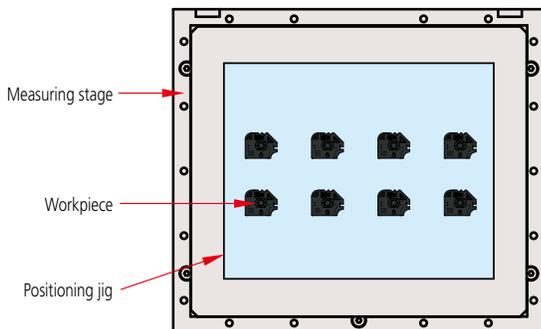
Surface focus tool

Multipoint auto focus tool

## Easy to use measurement for multiple workpieces and repetitive feature arrays

### Step & repeat

The "step & repeat" function will measure a large number of workpieces on the stage or fixture in one easy operation

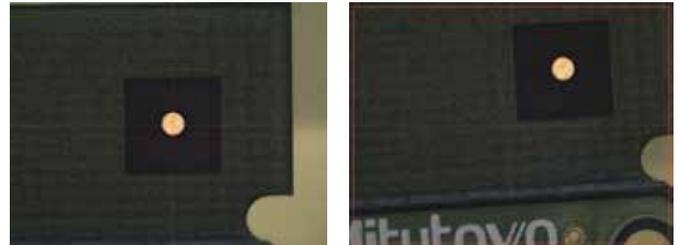


Continuous measurement of multiple workpieces

## Automatic measurement routines are available with either a click of a button or with image recognition

### Pattern search

The "pattern search" function automatically recognizes image patterns to create part alignment and feature measurement.

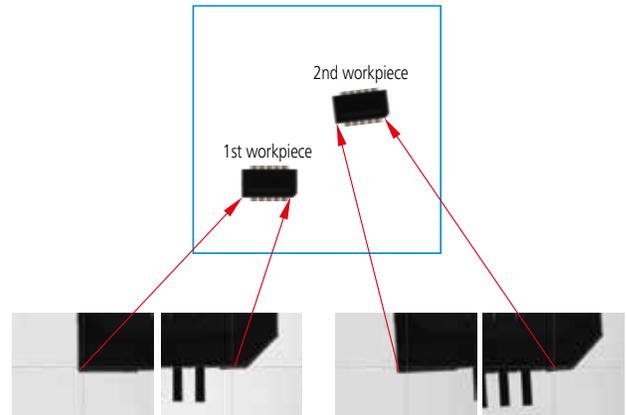


Normal position

Position is automatically compensated

### Manual tool

By applying a "manual tool" sequence to a CNC measurement routine, automatic measurement sequencing can be performed. This "One-Click" method reduces the need for fixtures as the zero point is created anywhere on the part, fixture or stage.

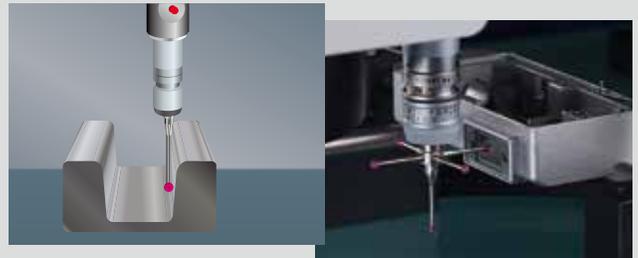


## Integrated Multi-Sensor probe models enhance measurement functionality

Touch probe equipped models

Field retrofit capable

With the Touch probe enabled system the measurement of the side faces of the workpiece are easily performed. Dimensional features such as perpendicularity, parallelism are possible. Internal side features hidden from the camera can be accessed with the star probe configuration.

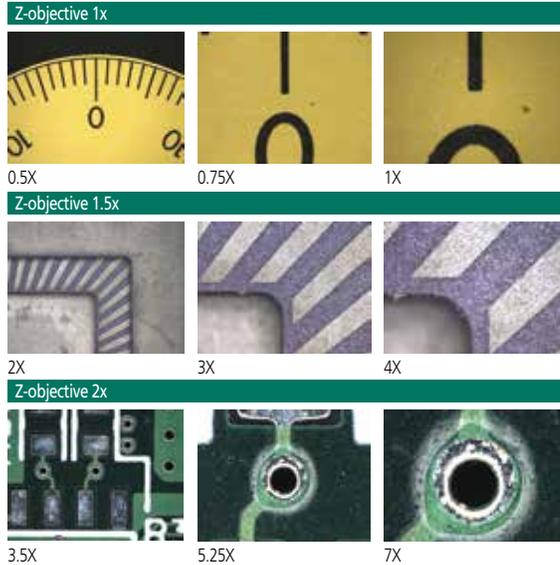


# Superior Flexibility with Color Zoom Optical System

## From wide field of view measurement to micro-measurement

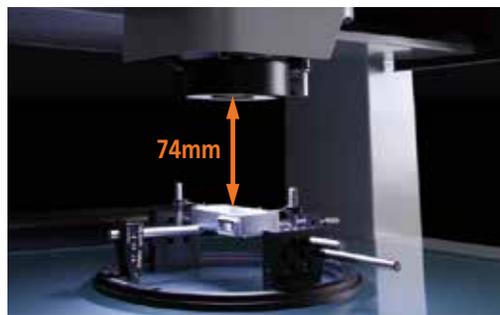
### Interchangeable objective lens zoom unit

The newly designed 7:1 ratio zoom unit and interchangeable objectives provide 13x – 183x on-screen optical magnification.



Objective 1X (option)      **Objective 1.5X (Standard accessory)**      Objective 2X (option)

Optical magnification	0.5X	0.65X	0.75X	0.85X	0.98X	1X	1.28X	1.3X	1.5X	1.7X	2X	2.25X	2.5X	3X	3.5X	3.75X	4X	5X	5.25X	7X
View field Horizontal (H) (mm)	13.60	10.46	9.07	8.00	6.94	6.80	5.31	5.23	4.53	4.00	3.40	3.02	2.72	2.27	1.94	1.81	1.70	1.36	1.30	0.97
View field Vertical (V) (mm)	10.80	8.31	7.20	6.35	5.51	5.40	4.22	4.15	3.60	3.18	2.70	2.40	2.16	1.80	1.54	1.44	1.35	1.08	1.03	0.77
Objective 1X Working distance	74mm																			
Objective 1.5X Working distance	42mm																			
Objective 2X Working distance	42mm																			



## Exceptional objective working distance handles the tallest part measurement requirements

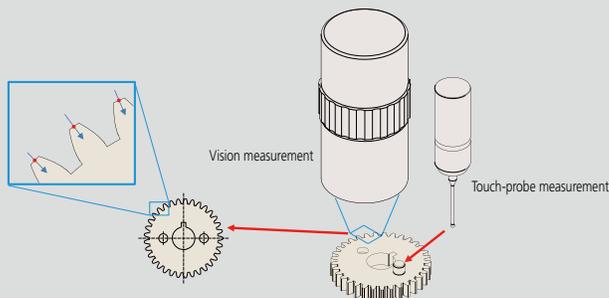
### Best in class working distance

A working distance of 74mm\* reduces the risk of damaging the objective or workpiece by accidental collision.

\* Using the 1X objective.

## 3D Vision and Touch-Probe with 3D measurement on the same workpiece

The QV Active series can perform complex measurements that are usually made using a multitude of measurement tools. The QV Active supports 3D features such as: Planes, Cylinders, Cones along with feature profile scanning.



## Module change rack, MCR20

Two and three probe rack configurations are available. Various touch-probe module configurations can be mounted in this rack to meet a variety of needs. Automatic probe changing is supported as well as both the TP-20 and TP-200 probes.



Master ball (option)

Calibration ring (option)

Used for offset calibration of the image and the touch probe.

MCR20 (option)

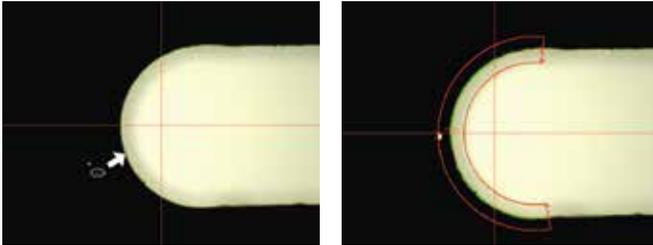
Used for diameter compensation of the stylus.

# Software that is simple to use, yet advanced when you need it

## Easy-to-operate across all skill levels

### One-click tool for feature measurements

Select the element type, and with just one click on an edge, a high-accuracy measurement is taken regardless of the proficiency level of the operator. The embedded outlier removal filter automatically excludes bad data caused by burrs and dust.



Move the mouse to the edge and click once.

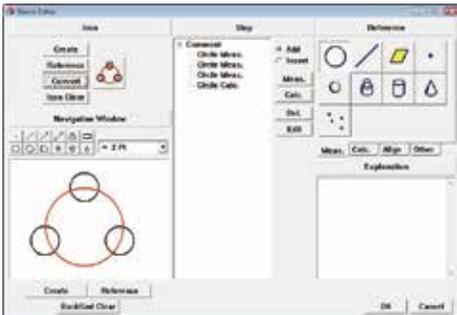
Executes high-accuracy multi-point measurement and removes the outlier

## Easily created measuring macros with walk through vitalization

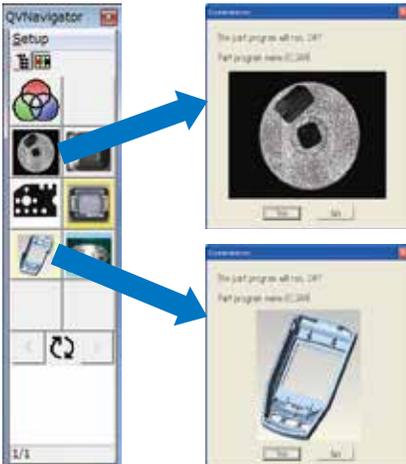
### QVNavigator

ALL skill levels can easily run and repeat identical measurement routines. An image or diagram of the workpiece can be registered as an icon in an automatic measurement program, enabling the target program to be quickly executed.

### User-specific macro creation function



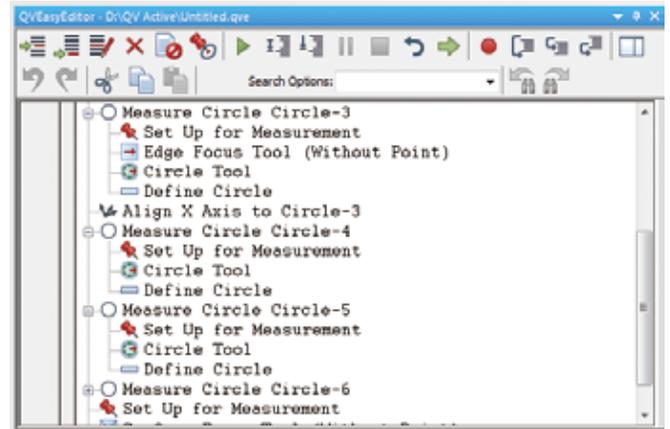
### Registration example of an automatic measurement program



## The embedded intelligence of Easy Editor makes programing and editing simpler

### QVEasyEditor

A teaching method is adopted in which programs are automatically recorded while measurement is performed. The insertion, revision, addition, and deletion of the part program can be performed easily using the tree-structure display. Also, execution of only a certain portion of the program after editing can be performed for the purpose of confirmation. Power-user-oriented QVBasicEditor is also available.



Easy-to-read tree-structure view

## Full featured 2D and 3D graphical results module allows the operator to perform visual analysis

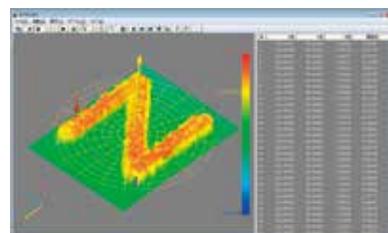
### QVGraphics

A simple operation, just clicking a measurement graphic element shown in the graphic window, enables coordinate creation/change, combination arithmetic operations, and geometric deviation illustration of roundness, flatness, and more.

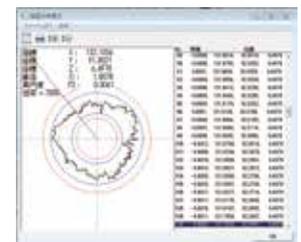
A useful function is automatic creation of a measurement program just by dragging a pitch measurement element.



Measurement result graphic



Geometric deviation of a plane surface

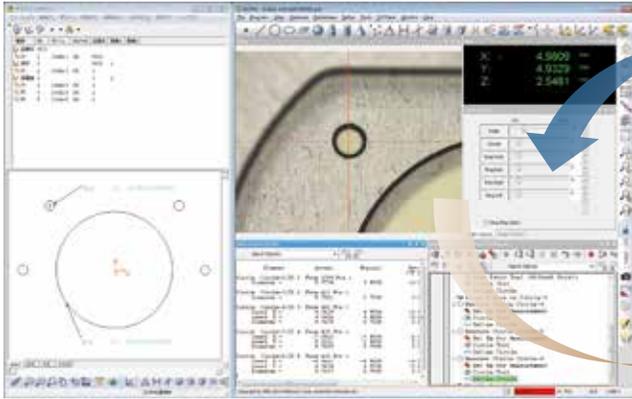


Geometric deviation of a circular feature

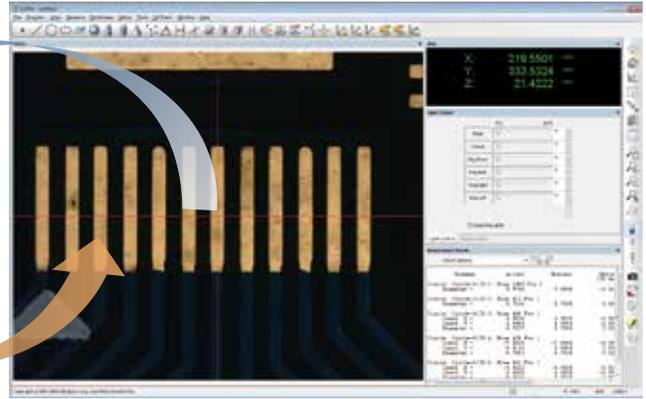
## Operator Customizable Window Layouts

### Access control

Measuring window layouts can be customized and assigned according to applications. For example, an administrator can display all the functions; an operator can display only the operation-related items.



Standard layout

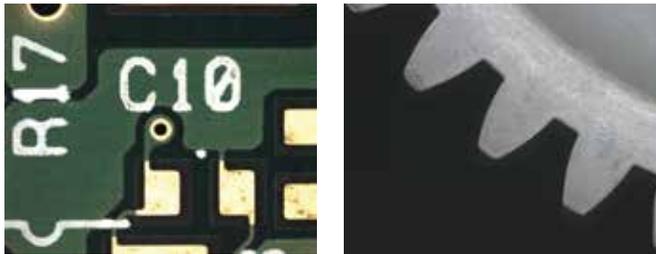


Manual-measurement-preferential layout

### Large screen format with high-definition color images reduces eye fatigue

#### High-definition color camera

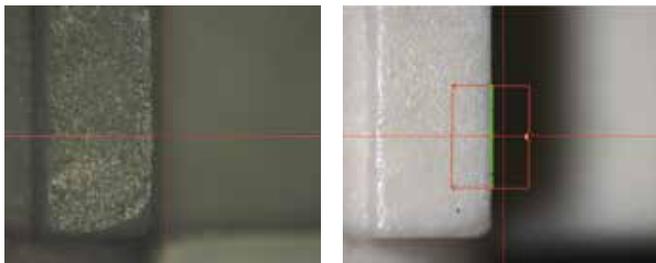
Measurement and observation is performed using high-quality and high-definition images which prevents operator fatigue even over long periods of observation.



### Clear edges ensure reliable measurement

#### Superior Lighting with automated feature illumination

Transmitted, co-axial and 4-quadrant ring lighting is provided so workpiece illumination can be set independently from the front, rear, right and left directions. This enables more reliable measurement by enhancing the sharpness of the edge of the feature to be measured.



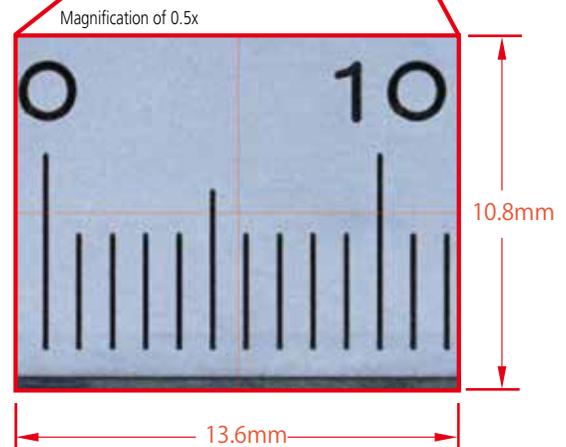
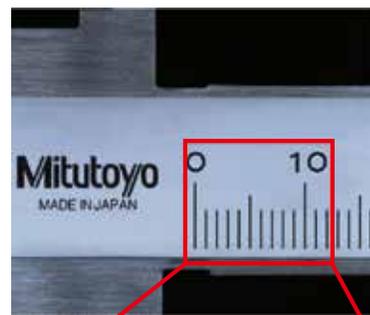
A feature viewed by reflected light only.

The same feature viewed with the measured edge sharpened by ring lighting from the left.

### Wide Field of view allows more image view, ensuring easier feature locating

#### Zoom lens

Using Mitutoyo's proprietary high-quality zoom system and objective lenses the feature field of view is expanded. Multiple objectives allow increased operator image viewing flexibility.



## Optional Software Tools

### 2D Profile Analysis Software FORMTRACEPAK-AP

This is contour analysis software that can perform sophisticated analyses such as design value verification (Toleranced Data Sets from Feature Creation) and shape analysis (2-D Profile) with data obtained via QVPAK measurement tools.

#### Contour tolerancing function

- Creating design data  
CAD conversion, master work conversion, function assignment, text file conversion, creating spherical surface design data
- Verification of design data  
Verification of normal line direction, axial direction, and best fit
- Result display  
Result list, error diagram, error development diagram, error coordinate values, analysis results

#### Shape analysis

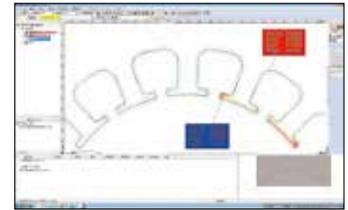
- Analysis items: Point measurement, line measurement, circle measurement, distance measurement, intersection point measurement, angle measurement, origin point setting, axis rotation
- Arithmetic operation items: Maximum value, minimum value, mean value, standard deviation, area

#### Report creation function

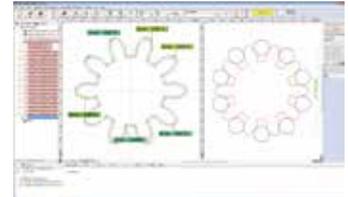
- Measurement results, error diagram, error development diagram

#### Other functions

- Record/execution of analysis procedure
- CSV format output, text output, DXF/IGES format output
- Fairing
- Quadratic curve approximating function
- Pseudo roughness analysis function



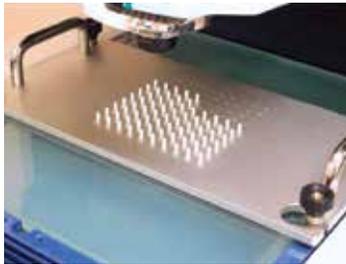
Example of design value verification



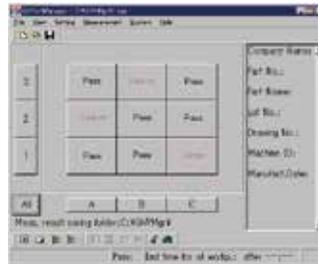
Measurement example of lines, space, and thickness of conductive portion on PCB

### Part Program Management Software QVPartManager

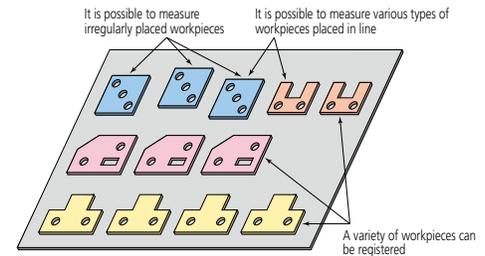
QV PartManager is part program execution management software for multiple workpieces arranged on the measuring stage. A part program can be executed and managed for various kinds of workpieces and workpieces not arranged in an orderly manner.



Workpieces aligned on a jig.



QV Parts manager window



### CAD Program Software Modules QV-CAD I/F, EASYPAG, QV 3DCAD online

Two-dimensional CAD drawings (DXF or IGES format) can be imported to QV Graphics.

The measurement results can also be converted to CAD drawings. The design value of each measurement item will be automatically entered. Because the current position can be easily found using graphics, the stage can be quickly moved to an arbitrary position on a CAD drawing which results in improving operability during the measurement. (Refer to QV Graphics on P6.)

### Integrated solutions modules QVEio

QVEio is a client application software for external control. It provides three functions: QVEio-PLC, QVEio-PC, and QVEio-Signal. QVEio-PLC is a software package that can inform a user of the state of an external execution command via a PLC. As an example, this can be used to control robots. QVEio-PC allows control of the Quick Vision machine through an external PC connected via RS-232C, and it also exports results and error states. QVEio-Signal outputs the operating status of the Quick Vision machine. This is best suited for displaying the operating status to a signal tower, for example.

### Data collection/statistics MeasurLink®

This is a process management program that can perform statistical processing control (SPC) based on measurement results.

Display of the control chart in real time enables early detection of machining abnormality which is effective in preventing the generation of defective products.



## Specifications

Model	QV-L202Z1L-D	QVT1-L202Z1L-D	QV-L404Z1L-D	QVT1-L404Z1L-D	
Measuring range (X×Y×Z)	250×200×150mm (9.8 x 9.8 x 5.9") (250×200×118: when a 1X objective lens is used)		400×400×200mm (15.7 x 15.7 x 7.8") (400×400×168: when a 1X objective lens is used)		
Resolution	0.1μm (.00000394)				
Scale type	Linear encoder				
Observation unit type	Zoom (8 positions)				
Image sensor	Color CMOS camera				
Illumination Unit	Co-axial Light	White LED			
	Transmitted Light	White LED			
	PRL	4-quadrant fixed white LED			
Accuracy*1	E1x, E1y	(2+3L/1000) μm			
	E1z	(3+5L/1000) μm			
	E2	(2.5+4L/1000) μm			
	Accuracy guaranteed with optics specified	Objective lens 1.5X and 3.5X Zoom ratio			
Touch-probe measuring accuracy*1	E1x, E1y, E1z	—	(2.4+3L/1000) μm	—	(2.4+3L/1000) μm
Accuracy guaranteed temperature range	20±1°C	18 - 23°C	20±1°C	18 - 23°C	
Size of stage glass	311×269mm (12.24 x 10.59")		466×480mm (18.34 x 18.89")		
Maximum stage loading*2	10kg (22lbs)		20kg (44lbs)		
Dimensions (WxDxH)	570×767×845mm (22.4 x 30.2 x 33.24")		776×1303×1004mm (30.55 x 51.29 x 39.52")		
Mass (including machine stand)	155kg (341lbs)		324kg (714lbs)		
Temperature compensation function	—	Manual	—	Manual	

\*1 Inspected to a Mitutoyo standard. L = measured length (mm)

\*2 Does not apply for unbalanced or concentrated loads.

## Options

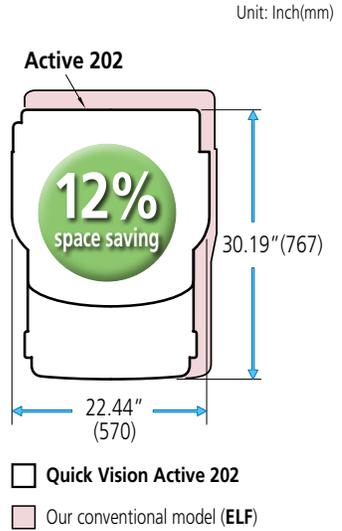
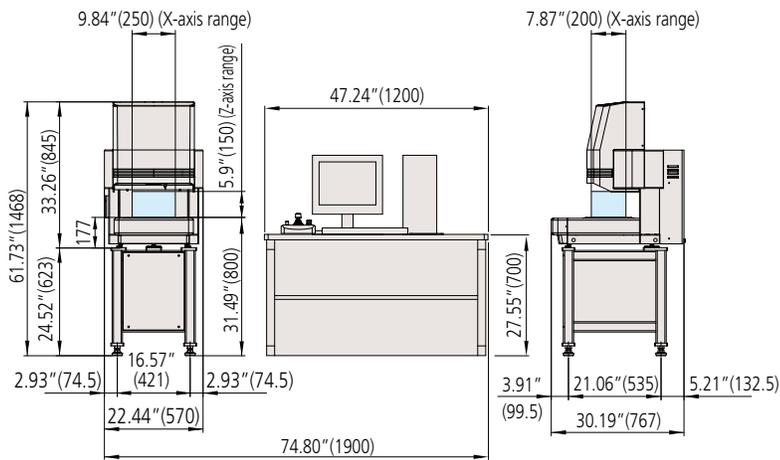
### Calibration chart

This chart is used to correct the pixel size of image elements, correct the accuracy of automatic focusing at each magnification, and correct optical axis offset.

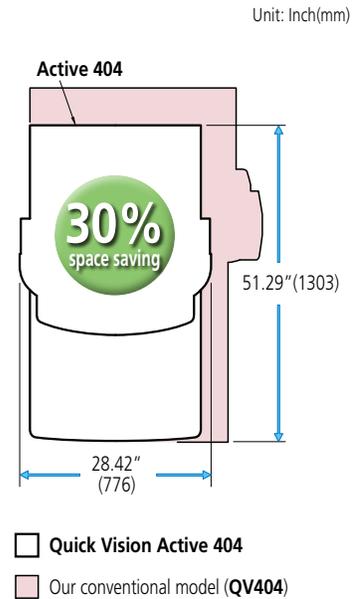
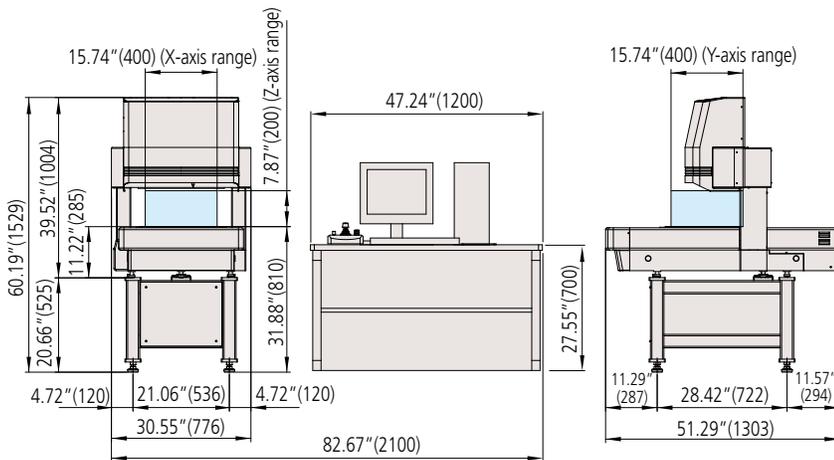


External dimensions

Quick Vision Active 202



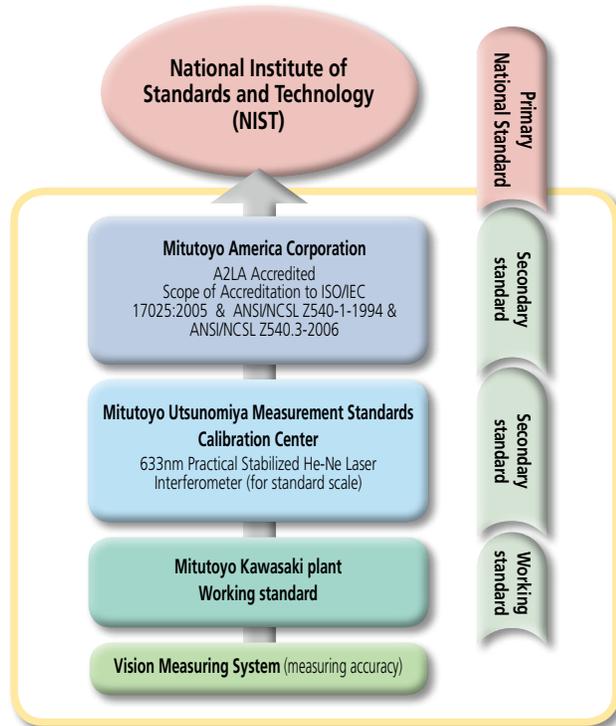
Quick Vision Active 404



## Excellent reliability

### Traceability to national standards

Mitutoyo's calibration artifacts and instruments that are used to establish machine accuracy specifications are maintained in a continuous chain of traceability to national dimensional standards. This is our customers' assurance of reliable measurement.



## A Global Market Leader

### World's top level of global network

Mitutoyo has expanded its market all over the world since the establishment of the first overseas sales company, MTI Corporation (currently Mitutoyo America Corporation) in the USA in 1963. At present, we have R&D, manufacturing, sales, and technical service bases in 29 countries with an agency network connecting over 80 countries.



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Mitutoyo Europe GmbH



Mitutoyo (UK) Ltd.



Mitutoyo France S.A.R.L.



Mitutoyo America Corporation Head Office



Mitutoyo Italiana S.R.L.



Mitutoyo Asia Pacific Pte. Ltd. Regional Headquarters



Mitutoyo Measuring Instruments (Suzhou) Co., Ltd.



MITUTOYO SUL AMERICANA Ltda. Factory (Suzano)



**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 by comprehensive services that ensure your staff can make the very best use of your 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 measuring solutions, and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.



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