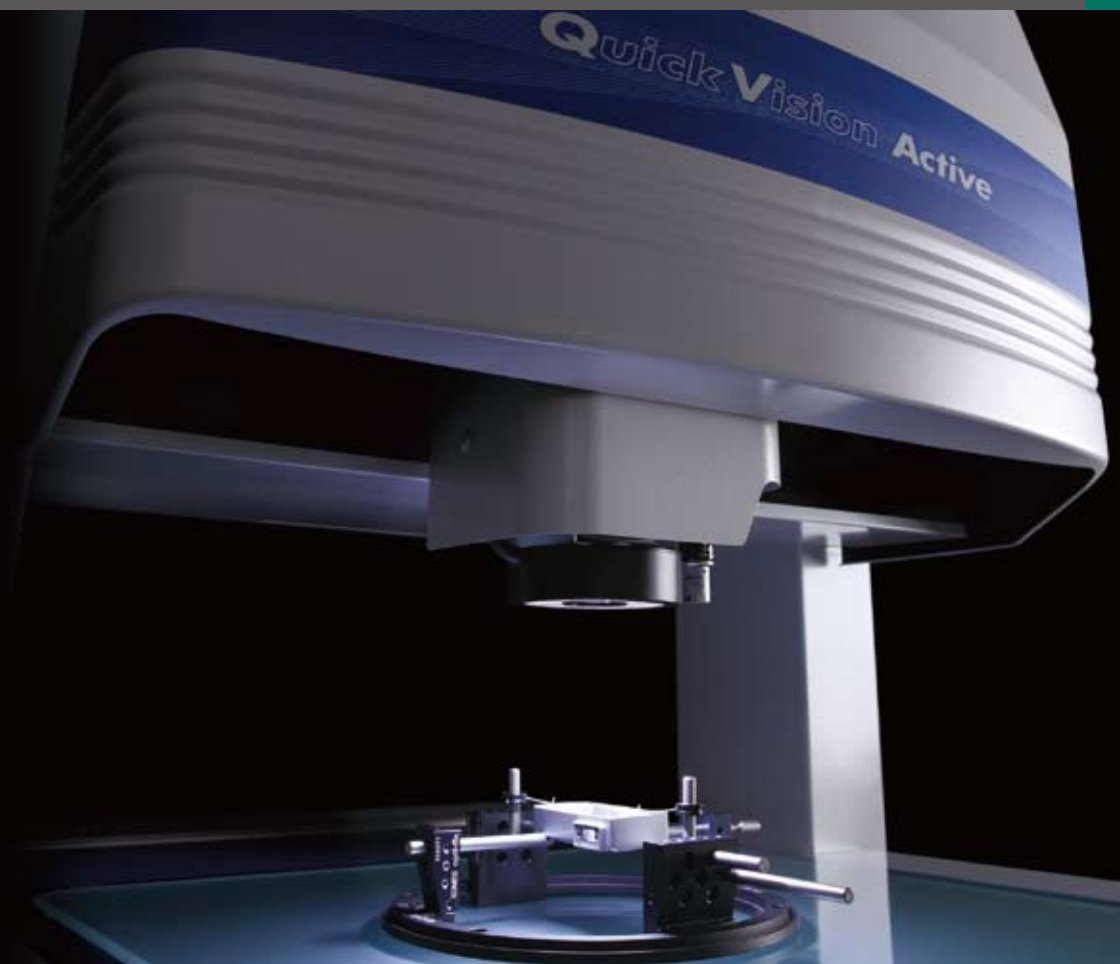


Mitutoyo

Mitutoyo  Quality

CNC Vision Measuring System Quick Vision Active Series

Vision Measuring System

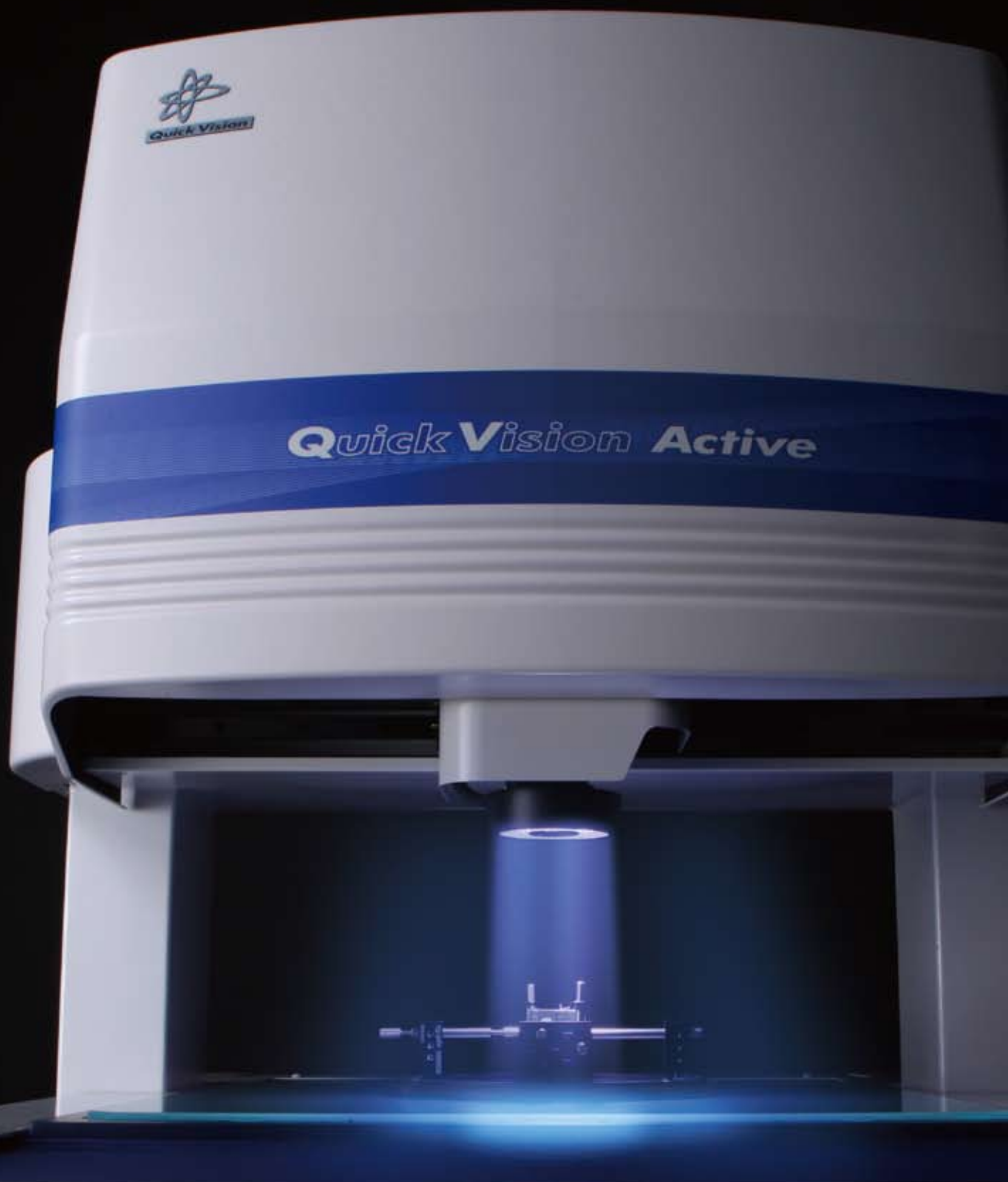


Catalog No. E14022

Mitutoyo

Easy-to-operate, space-saving model with
advanced functionality to meet various needs

Quick Vision Active





High Efficiency

Flexible Utility

**Simple but Advanced
Platform**

High Efficiency

Constant attendance is not required.
The operator can engage in other tasks.

Controlling the variation of measurement data

Automatic edge detection

The "automatic edge detection" function will provide high reproducibility in measurements regardless of the skill level of the operator.

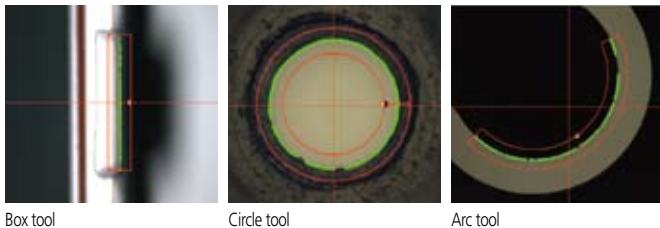
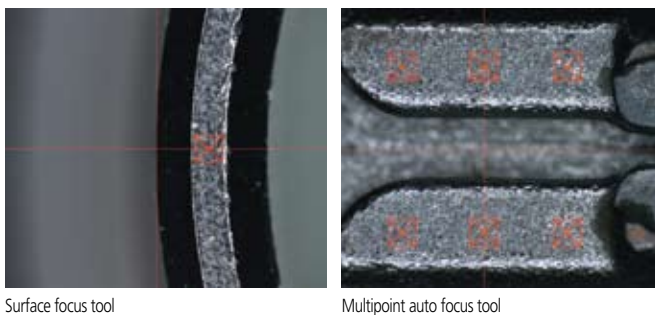


Image auto focus

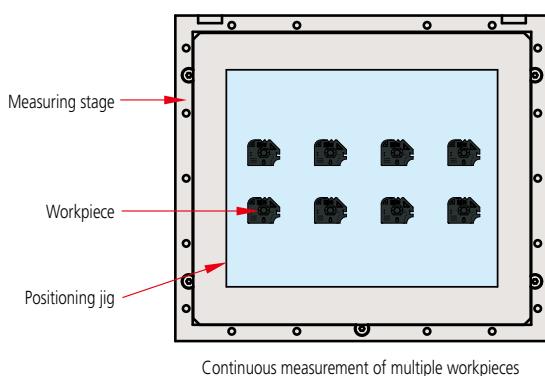
Appropriately setting up the "image auto focus" function will enable reliable and high-speed height measurements.



Continuous measurement of multiple workpieces

Step & repeat

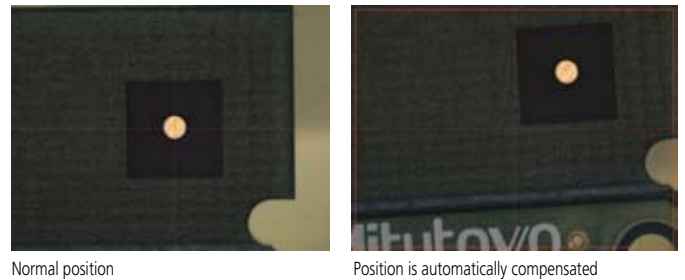
The "step&repeat" function will measure a large number of workpieces on the positioning jig in one operation.



Automatic measurement can be started just with rough positioning

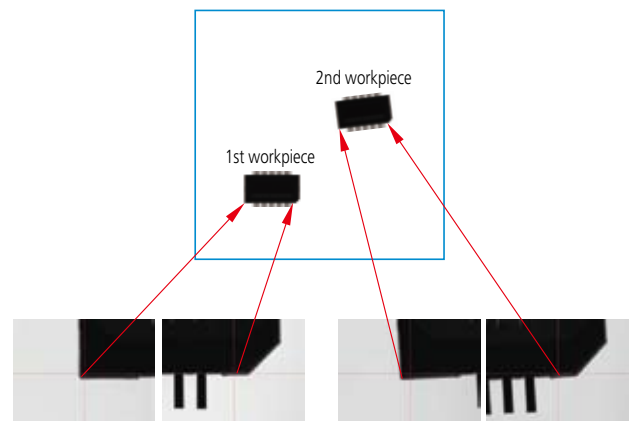
Pattern search

The "pattern search" function automatically recognizes the registered form of the workpiece.



Manual tool

By applying the "manual tool" measurement to automatic measurement, measurement can be performed with temporary positioning. Therefore, automatic measurement can be started from any position on the stage. Making a positioning jig is not required, which results in cost and man-hour reduction.



No changeover is required in the continuous measurement of three-dimensional objects

Touch probe equipped models

With the Vision Measuring System, the side face of a three-dimensional object, or the height of metal/resin moldings can be measured using a touch probe.

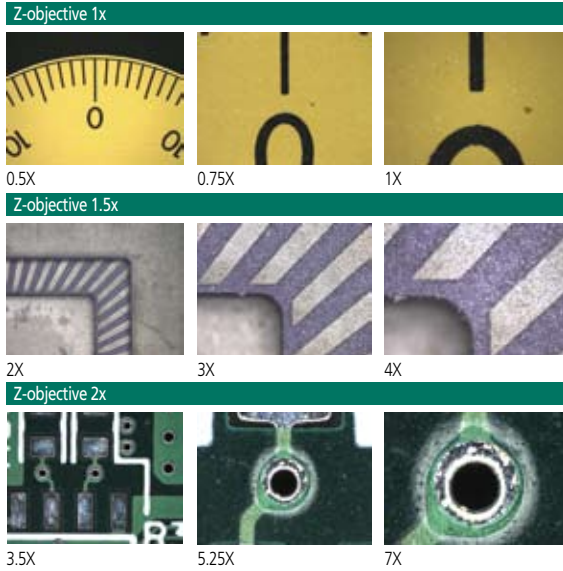


Flexible Utility

From wide view measurement to micro-measurement

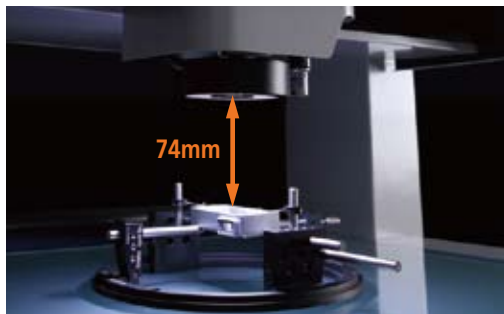
Interchangeable objective lens zoom unit

The newly designed 7:1 ratio zoom unit and interchangeable objectives provide 0.5-7X 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 (mm) | Horizontal (H) | 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 |
| | Vertical (V) | 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 | | | | | | | | | | | | | | | | | | | | |



Large stepped features can be measured safely

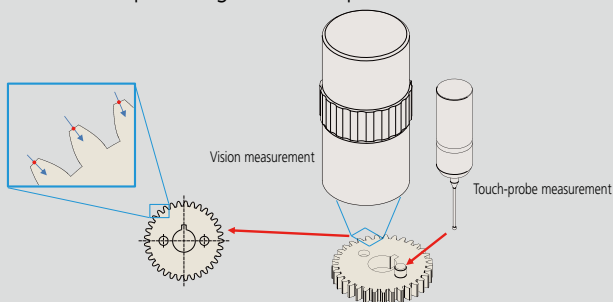
Large working distance

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

* Using the 1X objective.

Vision/touch-probe combination measurement

The QV Active series can perform complicated measurements that are usually made using tools such as calipers, dial indicators, or measuring microscopes. This will make a great contribution to reducing the number of measurement processes and optimizing the use of production resources.



Module change rack, MCR20

A maximum of three touch-probe modules can be mounted in this rack to meet a variety of needs, with the probe auto-change function complementing the QV Active imaging functionality.



Master ball (option)
Used for diameter compensation of the stylus.

Calibration ring (option)
Used for offset calibration of the image and the touch probe.

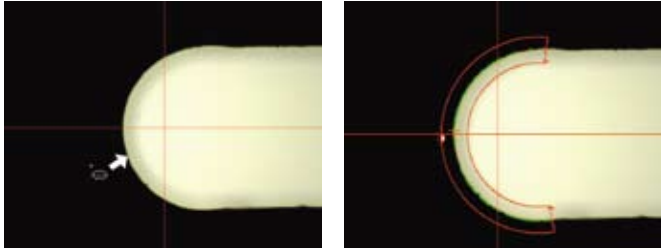
MCR20 (option)

Simple but Advanced Platform

Easy-to-operate for beginners

One-click tool

After selecting the element to be measured (circle, line, etc.), just one click on an edge enables high-accuracy measurement regardless of the proficiency level of the operator. The outlier removal function 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

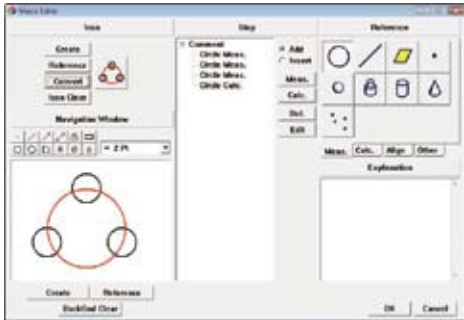
Support for handling complicated measuring items

Swift automatic measurement

QV Navigator

Anyone can easily run a repeat, identical measurement. An image or diagram of the workpiece can be registered as an icon in an automatic measurement program, enabling the target program to be called and run quickly.

User-specific macro creation function



Registration example of an automatic measurement program

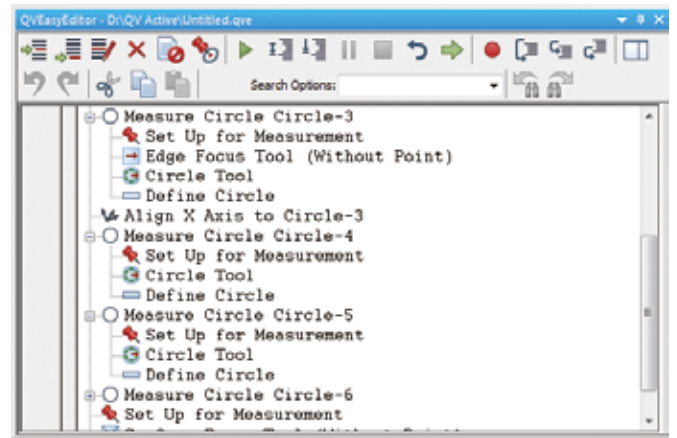


Expertise not required

Creating and editing an automatic measurement program

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 as before.

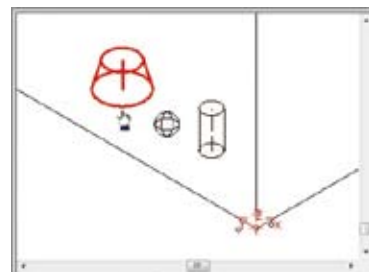


Easy-to-read tree-structure view

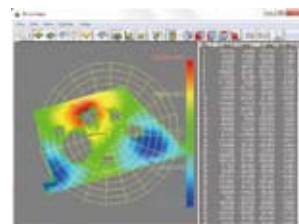
Highly sophisticated analysis can be performed simply by selecting a graphic element

QVGraphics

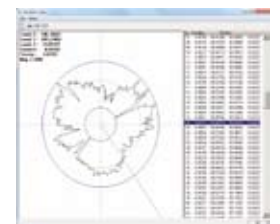
A simple operation, just clicking a measurement graphic element shown in the graphic window enables coordinate creation/change, combination arithmetic operations, and geometric deviation illustration of roundness, flatness, and more. A useful function is automatic creation of a measurement program just by dragging a pitch measurement element.



Measurement result graphic



Geometric deviation of a plane surface

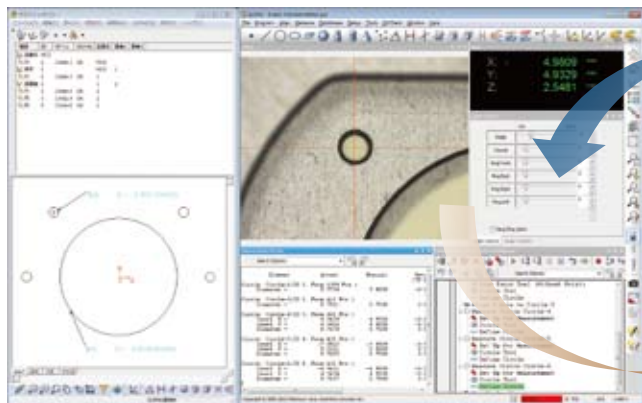


Geometric deviation of a circular feature

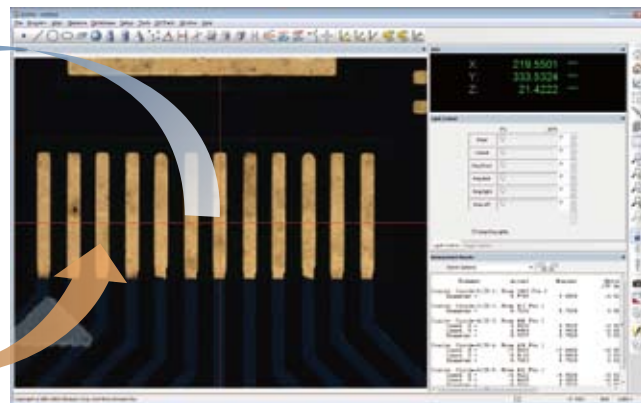
Customizing the window layout

Access control

Window layout can be customized and registered 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 with high-definition color image for less eye fatigue

High-definition color camera

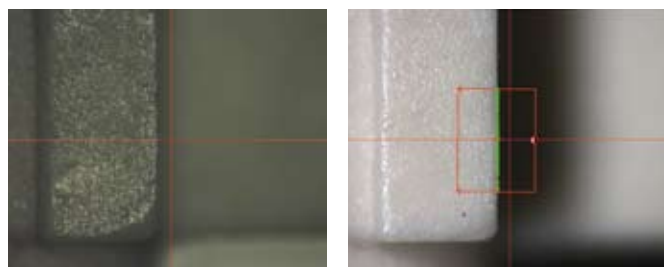
Measurement and observation is performed using high-quality and high-definition images, which prevents operator fatigue even over long periods of observation.



Edge sharpening means reliable measurement

Matching lighting to the feature

Transmitted, co-axial and 4-quadrant ring lighting is provided so that 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.



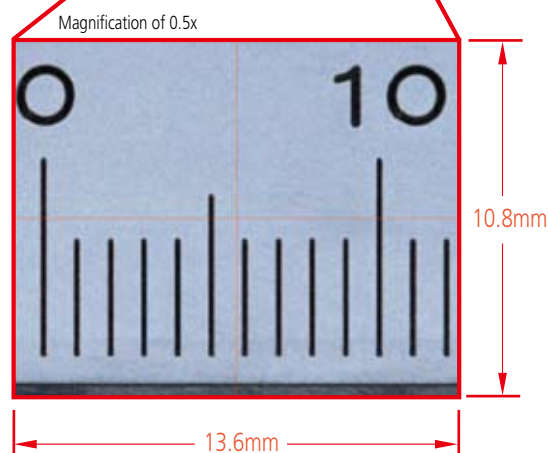
A feature viewed by reflected light only.

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

Widefield view enables the measuring point to be found easily

Zoom lens

The newly designed zoom lens enables the area of interest to be quickly found, from where the measuring point is easily and quickly identified by zooming to higher magnification.



Optional accessories

FORMTRACEPAK-AP

This is contour analysis software that can perform sophisticated analyses, such as design value verification and shape analysis on the basis of the point cloud data obtained with QVPAK auto trace tools.

Contour tolerancing function

- Creating design data
CAD data 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

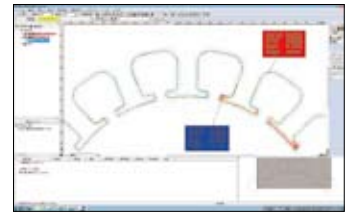
- Analysis items: Point measurement, line measurement, circle measurement, distance measurement, intersection point measurement, angle measurement, origin point setting, axis rotation
- Arithmetic operation items: Maximum value, minimum value, mean value, standard deviation, area

Report creation function

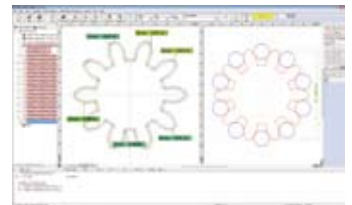
- Measurement results, error diagram, error development diagram

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

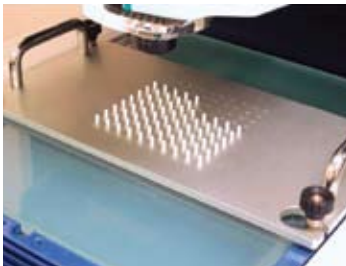


Measurement example of lines, space, and thickness of conductive portion on PCB

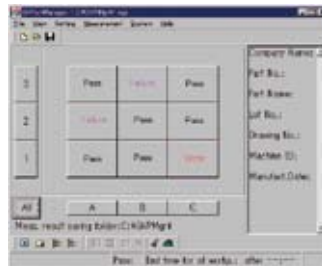
QVPartManager

QV PartManager is part program execution management software for multiple workpieces arranged on the measuring stage.

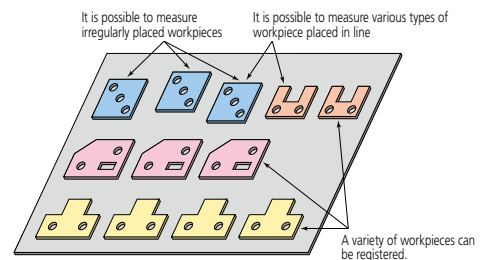
A part program can be executed and managed even for various kinds of workpieces and workpieces that are not arranged in an orderly manner.



Workpieces aligned on a jig.



QV Parts manager window



QV-CAD I/F

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 P5.)

QVEio

QV Eio is client application software for external control.

It provides three functions, QVEio-PLC, QVEio-PC, and QVEio-Signal.

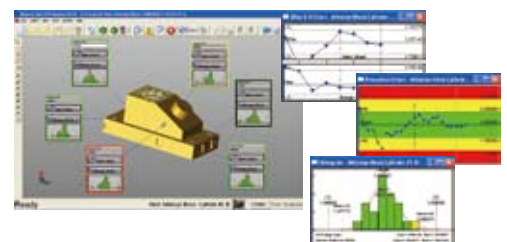
QVEio-PLC is software that can inform a user of the state of an external execution command or an execution command via the RS-232C communication with the PLC. Automation systems such as those that connect with automatic transport robots can be constructed without difficulty.

QVEio-PC can efficiently control QV Active using a GUI that is specific to an external PC via RS-232C communication. It also provides the measurement result output and error state output. QVEio-Signa informs the PLC of the operating status of QV Active. This function is best suited for displaying the operating status of QV Active on the signal tower or the like.

MeasurLink STATMeasure PLUS

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

| Order No. | 363-109 | 364-109 | 363-110 | 364-110 | |
|---------------------------------------|--|---|--|----------------|------------------|
| Model | QV-L202Z1L-D | QVT1-L202Z1L-D | QV-L404Z1L-D | QVT1-L404Z1L-D | |
| Measuring range (X×Y×Z) | 250×200×150 (250×200×118: when a 1X objective lens is used) | | 400×400×200 (400×400×168: when a 1X objective lens is used) | | |
| Resolution | 0.1µm | | | | |
| 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 | E _{1X} , E _{1Y} | (2+3L/1000) µm | | | |
| | E _{1Z} | (3+5L/1000) µm | | | |
| | E ₂ | (2.5+4L/1000) µm | | | |
| | Accuracy guaranteed with optics specified | Objective lens 1.5X and 3.5X Zoom ratio | | | |
| Touch-probe measuring accuracy*1 | E _{1X} , E _{1Y} , E _{1Z} | — | (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 | | 466×480mm | | |
| Maximum stage loading*2 | 10kg | | 20kg | | |
| Dimensions (W×D×H) | 570×767×845mm | | 776×1303×1004mm | | |
| Mass (including machine stand) | 155kg | | 324kg | | |
| Temperature compensation function | — | Manual | — | Manual | |

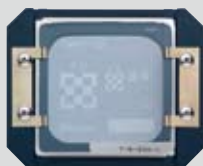
*1 Inspected to a Mitutoyo standard. L = measured length (mm)

*2 Does not apply for unbalanced or concentrated loads.

Options

Calibration chart

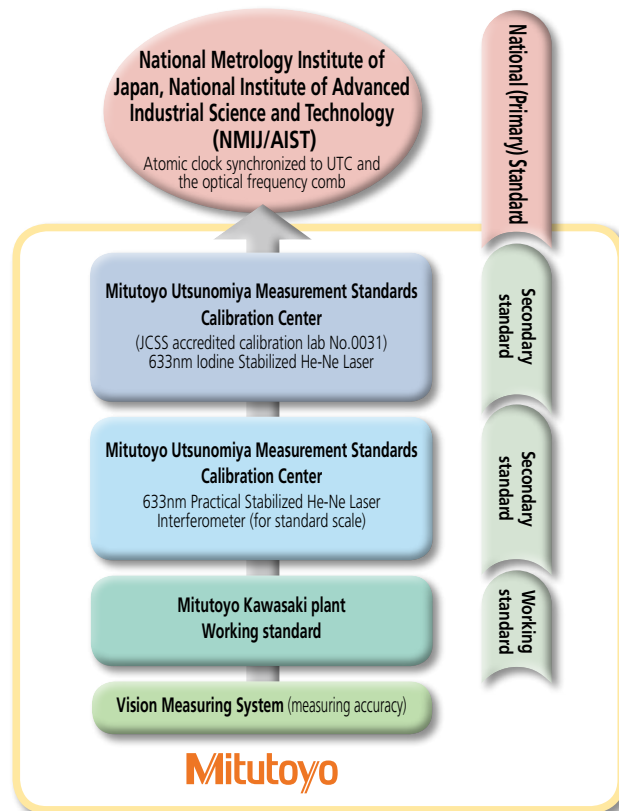
This chart is used to correct the pixel size of image elements, correct the accuracy of automatic focusing at each magnification, and correct optical axis offset.



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.



Reliable support system

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 (current 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.



Company Headquarters in Kawasaki, Japan



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 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.



Find additional product literature
and our product catalogue

<http://www.mitutoyo.co.jp/global.html>

Note: Product illustrations are without obligation. Product descriptions, in particular any and all technical specifications, are only binding when explicitly agreed upon.
MITUTOYO and MICAT are either registered trademarks or trademarks of Mitutoyo Corp. in Japan and/or other countries/regions.
Other product, company and brand names mentioned herein are for identification purposes only and may be the trademarks of their respective holders.

Mitutoyo

Mitutoyo Corporation

20-1, Sakado 1-Chome,
Takatsu-ku, Kawasaki-shi,
Kanagawa 213-8533, Japan
T +81 (0) 44 813-8230
F +81 (0) 44 813-8231
<http://www.mitutoyo.co.jp>