2-D Color Vision Measuring System

QUICK IMAGE Series
The latest 2-D measuring machine created as a result of Mitutoyo quality!

**QUICK IMAGE**

Simple to operate and easy-to-perform measuring
Powerful backup for your quality control system

Outstanding improvement in operational efficiency and productivity
Accurate measurements anywhere within the field of view

- High-accuracy measurements performed on small-sized workpieces.
- Consistent measurement performance regardless of the operator.
- Accuracy of ±1.5μm within the screen, repeatability of ±0.7μm in high-resolution mode (QI-B Series), and the ability to focus through a wide range.

The highest field of view accuracy in its class

Both a wide view field and high accuracy

- Sub-pixel processing enables high-accuracy edge detection.

Stable and high-accuracy measurements of large workpieces

- Highly accurate measurements performed on long or large workpieces.
- Stable focusing no matter the height of the workpiece.

Highly accurate stages

- Stages come in various sizes with an accuracy of ± (3.5 + 0.02L) μm, letting you perform highly accurate and stable measurements, and obtain reliable data for any kind of workpiece.

Rigid construction

- Its rigid construction allows for a maximum load capacity of 20Kg, and its 100mm heightwise stroke enables large-contour workpieces to be mounted on the stage.

Ultra-long working distance of 90 mm

- The 90mm working distance ensures that you can focus, even with stepped workpieces, without worrying about collisions.
Human errors due to focusing have been eliminated

Measurements can be done on many types of parts, including:
• Stepped workpiece
• Cylindrical workpiece

Telecentric Optical System
Patent registered (Japan, the U.S.A. and Europe)

• Errors due to height are minimized within the depth of focus with steps of up to 22 mm.

Traceable to national standards

From the trusted leader in metrology, Mitutoyo’s Quick Image systems are directly traceable to National Metrology Institute of Japan.

Uses standards traceable to national standards

• Mitutoyo has a large collection of standard devices that are traceable to the national standards of Japan. Through calibration of the standard devices used in the calibration of the measuring tools and instruments, we’ve established and upheld traceability of all kinds of measuring tools and instruments.
• Our calibration laboratories have received JCSS-accreditation from JIAJapan, an internationally recognized accreditation body accorded by the ILAC Mutual Recognition Agreement (MRA), and are recognized as having measurement technological capabilities equal to that of calibration labs abroad.
Usability

Simple to operate and easy-to-perform measuring

Positioning not required

• Complete measurement tasks without the need to position and align the part each time.

One-click execution function  • Patent pending (Japan)

• After placing the workpiece within the field of view, the machine automatically recognizes the position and inclination of the registered workpiece using a pattern search function and then executes the measurements.

Simple execution of multiple measurements

• Capture repeatable measurement results from multiple measurements.

One-click video tool

• With just a single click, anyone can easily perform measurements.
• The abnormal point removal function automatically ignores abnormal points generated by dust or burrs.

Simple focusing

• Reduces the setup time of each workpiece and repeated runs.

Wide focus range

• Quick Image has a depth of focus up to 22 mm.
•Fine focusing adjustments are unnecessary.

The position and inclination of a workpiece can be measured even if it has moved.

The position and inclination of a workpiece like the one shown above is unnecessary.

One-click circle tool

One-click box tool
Easy-to-operate without the manual

- An intuitive user-friendly interface for beginners.

**EZ mode**
- Design application pending (Japan)
- This mode provides an operation guidance display to guide the operator performing measurements, thus eliminating the need for lengthy training or often referring to the instruction manual.

Graphics window - measurement efficiency

- Enables the operator to visualize the entire workpiece and quickly move the stage to a feature.

**Graphics function**
- The current position, coordinate system, measuring item and measurement result are automatically displayed in a graphics window.
- 2-D CAD model data can be imported (optional) in order to better visualize the entire workpiece.

Go/no-go judgment

- Similar to an overlay chart used on an optical comparator, an operator can quickly determine if a feature fits within the tolerance bandwidth.

**Template comparison**
- Compare workpieces against their templates to enable go/no-go judgments to be made at a glance.
- Users can also define a custom overlay template.

Quick measurements on large workpieces

- Combine multiple measurements across multiple fields of view on large workpieces.

**Quick-release mechanism on the XY stage**
- Quick-release mechanisms are built into both fine feed controls on the XY stage.
- This allows the stage to be moved rapidly to bring the next measuring point into view no matter where it is on the workpiece.
Measure multiple workpieces simultaneously

- Batch measure several workpieces in a single setup.
- Use pattern search for multiple workpieces within the screen view, and measure them all in one operation with the one-click execution function.
- Measurements can be performed very efficiently making accurate positioning unnecessary, and eliminating the need for costly holding fixtures.

Confirm measurement results quickly and easily

- Intuitively determine the measurement results and measurement position at a glance.
- Video window measurement results
  - Measurement results can be understood intuitively just by looking at a measurement image.
  - Change the display color of the go/no-go result to immediately perform tolerance determination as well as determine no-go items.
  - Paste measurement images in inspection results report.

The measurement results display for go/no-go can be color-coded to meet your requirements.

Capable of supporting a variety of workpieces

- Measure several workpieces in one setup.
- Measure larger workpieces, overcoming size restrictions.

Large-stage mode

- The large stage allows you to arrange multiple workpieces and measure them in a single setup, thereby saving valuable time that would otherwise be spent in loading and unloading the stage.

Extensive lineup of stages

- XY measurement range: Measure workpieces up to 400x200mm.
- 100mm Z-stroke allows you to measure tall workpieces.
- A maximum load capacity of 20Kg allows you to measure heavy workpieces.

XY measuring range: Maximum 400x200 mm
Z-stroke: 100 mm
Maximum load capacity: 20 Kg
Outstanding improvement in operation efficiency and productivity

Generate reports and observe, all on one machine

• Observation and measurements on a single platform.
• Capture color images.

Tolerance judgment result

• Go/no-go judgment can be seen at a glance, for faster operation.
• Go/no-go judgment can be done for each measurement item, and judgment can be passed on each workpiece.
• Prevents no-go data omissions.

Simple go/no-go judgment of multiple workpieces

• Go/no-go judgment made quickly and easily.
• Go/no-go judgment can be made for every workpiece.

High-definition color camera

• The camera not only produces high-resolution color images of measurements, but it is also effective for observing the workpiece surface.
• Brilliant color images can be easily saved as files for use in measurement reports.

High accuracy measurement with bright and clear images

• Precisely measure the edges of a stepped workpiece.
• Clear measurements of rubber and black resin surfaces.

Wide field of view / high-resolution mode

• The high-resolution mode and the normal mode can share a single measurement procedure.
• The shallow depth of focus in high-resolution mode shows the edges of stepped workpieces more clearly, making measurements highly accurate.

Enhanced illumination

• Patent registered (Japan)

• The enhanced illumination function of the high-resolution mode enables measurements of low-reflectivity workpieces like rubber and black resin moldings to be performed with a clear image.

Simple execution of measurement procedure programs

• Easily run measurement procedure programs.

Program launcher

• A measurement procedure program can be registered to a dedicated icon along with a photo and comments so that the required programs can be started easily.
• Programs can be managed for each operator or workpiece.
Standard software
QIPAK

QIPAK (two modes) provides powerful assistance to customers in diverse conditions

**EZ mode**
(Simple measurement mode)

**PRO mode**
(General purpose measurement mode)

Simple execution and editing of measurement procedure programs

**Smart editor**
This function allows XY-stage target position, illumination condition, etc., to be separately displayed as icons or labels in the list of part programs (automatic measurement procedure programs), thereby simplifying program editing.

Strong support of measurements with the full edge-detection function

**Outlier removal**
Removes outliers caused by anomalies such as debris, burrs and chips.

**Auto trace tool**
The tool automatically detects the edges of unknown contours and obtains point group data. Point group data lets you perform contour form analysis and design value comparison using FORMTRACEPAK-AP (optional).

**Dual area contrast tool**
Automatically sets the amount of illumination so that the contrast between two regions is maximized. First-time users can also set the optimum intensity.
Measurement examples

**Progressive-die pressed parts**

Measure the diameter and difference in coordinates of each hole.

**O-ring**

Enhanced illumination is very effective for low reflectivity materials such as rubber and black resin. (Use ring illumination in high-resolution mode + enhanced illumination)

**Measuring a stepped workpiece**

Measure with simple focusing.

**Measuring a tiny stepped workpiece**

You can see and measure edges easily with just one quadrant of the ring light providing illumination.

**Weatherstrip**

Execute a pattern search unrelated to position and finish measuring in one click.
Optional application software

Easily handle sophisticated dimension and contour evaluations

**Contour evaluation and analysis software: FORMTRACEPAK-AP**
Data processing software for advanced form analysis that carefully reads point group date acquired via tools such as the auto trace tool.

- A contour measurement is easy to make
- The resulting analysis displayed on the screen is easy to interpret.

- Perform contour matching against the design value data
- You can define virtual circles of a given diameter enabling over-pin diameter analysis to be performed.
Early detection of process irregularities

Centralized process management software: MeasurLink

Statistical data can be displayed in real-time, making early detection of process irregularities possible. Early identification of an out-of-control situation enables rapid remedial action to be taken when necessary.

Examples of remedial action
- Mold repair or cycle-timing change
- Cutting tool adjustment or replacement.

Effective use of CAD model

Measurement support software: QS-CAD I/F

2-D CAD model data (DXF-, or IGES-formatted) can be imported into QIPAK. Conversely, QIPAK measurement results can be converted into 2-D CAD model data. The design value for each measurement item is automatically entered. Since the graphics window makes the present location easy to identify, the operator can quickly move the stage a given point in the 2D CAD model.
### SPECIFICATIONS

**QI-A Series**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>QI-A1010C</th>
<th>QI-A2010C</th>
<th>QI-A2017C</th>
<th>QI-A3017C</th>
<th>QI-A4020C</th>
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<tr>
<td>Code No.</td>
<td>361-840A</td>
<td>361-841A</td>
<td>361-842A</td>
<td>361-843A</td>
<td>361-844A</td>
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<tr>
<td>View field</td>
<td>22x24mm</td>
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<td></td>
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<td></td>
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<tr>
<td>Measurement mode</td>
<td>High resolution mode/Normal mode</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Measuring range (X, Y axes)</td>
<td>100x100mm</td>
<td>200x100mm</td>
<td>200x170mm</td>
<td>300x170mm</td>
<td>400x200mm</td>
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<tr>
<td>Travel range (Z axis)</td>
<td>100mm</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Accuracy</td>
<td>Measurement accuracy within the screen*1</td>
<td>High resolution mode: ±2μm/Normal mode: ±4μm</td>
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<td></td>
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<td>Repeatability</td>
<td>Repeatability within the screen (±2σ)*2</td>
<td>High resolution mode: ±1μm/Normal mode: ±2μm</td>
<td></td>
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<tr>
<td>Measurement accuracy (U1xy)*1</td>
<td>± (3.5+0.02L) μm, L: arbitrary measuring length (mm)</td>
<td></td>
<td></td>
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<tr>
<td>Imaging device</td>
<td>3 megapixel, 1/2&quot;, color-compatible</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Monitor magnification*3</td>
<td>7.6X</td>
<td></td>
<td></td>
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<tr>
<td>Optical system</td>
<td>Magnification (Telecentric Optical System)</td>
<td>0.2X</td>
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<tr>
<td>Working distance</td>
<td>90mm</td>
<td></td>
<td></td>
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<td>Depth of focus</td>
<td>High resolution mode: ±0.6 mm/Normal mode: ±11mm</td>
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<tr>
<td>Illumination</td>
<td>Transmitted light: Green LED telecentric illumination</td>
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<tr>
<td></td>
<td>Co-axial light: White LED</td>
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<tr>
<td></td>
<td>Ring light: quadrant white LED</td>
<td></td>
<td></td>
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<tr>
<td>Effective stage glass size</td>
<td>170x170mm</td>
<td>242x140mm</td>
<td>260x230mm</td>
<td>360x230mm</td>
<td>440x232mm</td>
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<tr>
<td>Maximum stage loading**</td>
<td>Approx. 10Kg</td>
<td>Approx. 20Kg</td>
<td>Approx. 140Kg</td>
<td>Approx. 148Kg</td>
<td>Approx. 154Kg</td>
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<tr>
<td>Power supply</td>
<td>100-240VAC, 50/60HZ</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Main unit mass</td>
<td>Approx. 70Kg</td>
<td>Approx. 74Kg</td>
<td>Approx. 140Kg</td>
<td>Approx. 148Kg</td>
<td>Approx. 154Kg</td>
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<tr>
<td>Accuracy guaranteed temperature</td>
<td>20±1°C</td>
<td></td>
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</table>

*1 Inspected to Mitutoyo standards by focus point position.  
*2 The measuring accuracy is guaranteed to be accurate within the depth of focus.  
*3 For 1X digital zoom (when using the 22-inch wide monitor)  
*4 Does not include extremely offset loads and concentrated loads

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### Optional Accessories

**Opti-Fix Fixtures**

**Kit opti-set Basic**
- Code No.: K551057

**Kit opti-set Rotation**
- Code No.: K551058
Dimensions chart

QI-A1010C

QI-A2010C

Units: mm

QI-A2017C

QI-A3017C

QI-A4020C
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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