2-D Color Vision Measuring System
QUICK IMAGE Series
Repeatable Measurements, Accurate Results

Outstanding Measurement 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 type of workpiece.

Rigid construction

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

Ultra-long working distance of 90 mm

• The 90 mm 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 NIST.

Uses standards traceable to national standards
Traceability is an essential requirement for all measurements. At Mitutoyo, we consider providing traceability to our customers to be a critical part of our business. Traceability is often referred to as a “chain of comparisons,” and that chain always starts with a precise definition. For length measurements, the meter is defined by how far light moves in a vacuum in a defined amount of time. The job of reducing that definition into a practical measurement belongs to the world’s National Metrology Institutes (NMI). The NMI in the United States is the National Institute of Standards and Technology (NIST), where they realize and transfer the definition of length to physical measurements of gage blocks, line scales and other primary standards. From there, traceable measurements at other laboratories and factories are possible. Mitutoyo factories and calibration labs regularly send their standards to NIST; however, traceability can also be established through other recognized NMIs, such as the National Metrology Institute of Japan (NMIJ). The world’s leading NMIs, such as NIST and NMIJ, routinely participate in intercomparisons to ensure global traceability to the same unit of length.

Mitutoyo Calibration Lab
AZLA accredited calibration lab
(Cert. # 0750.01)

Mitutoyo Field Service Calibration
(Cert. # 1643.01)

Standard scale

Quick Image

Mitutoyo
**Usability**

**Measurement Made Simple**

**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.

- 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.

- Patent pending (Japan)

- With just a single click, anyone can easily perform measurements.

- The abnormal point removal function automatically ignores abnormal points generated by dust or burrs.

- Quick Image has a depth of focus up to 22 mm.

- Fine focusing adjustments are unnecessary.
**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.

**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.

**Graphics window - measurement efficiency**

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

**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.
Outstanding Measurement Efficiency and Productivity

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.

Confirn 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 model

- 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 400x200 mm.
- 100 mm Z-stroke allows you to measure tall workpieces.
- A maximum load capacity of 20 Kg allows you to measure heavy workpieces.

The measurement results display for go/no-go can be color-coded to meet your requirements.
Generate reports and observe, all on one machine

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

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.

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.

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.

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

- 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.
QIPAK (two modes) provides powerful assistance

**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 and labels in the list of part programs (automatic measurement procedure programs), thereby simplifying program editing.

Consistant measurements with the robust edge-detection

**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 cloud data.
Point cloud data lets you perform contour form analysis and design value comparison using FORMTRACEPAK-AP (optional).
Measurement examples

**Progressive-die pressed parts**

Measure the diameter and distances between each hole.

**O-ring**

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

**Weatherstrip**

Execute a pattern search to automatically find the position and complete measuring in one click.

**Small-stepped workpiece**

Measure and illuminate edges easily by using a single quadrant of the ring light, increasing workpiece contrast.

**Stepped workpiece**

Measure the workpiece with all features in focus with telecentric lens technology.
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 action to be taken.

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

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 data acquired via tools such as the auto trace tool.

- Contour measurement can easily be executed
- Resulting analysis can be observed quickly via color tolerancing

- Perform contour matching against the CAD data
- Define virtual circles of a given diameter enabling over-pin diameter analysis to be performed

Effective use of CAD models
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. The graphics window makes the current location easy to identify, allowing the operator to quickly move the stage to a given point in the 2D CAD model.

- Contour measurement can easily be executed
- Resulting analysis can be observed quickly via color tolerancing

- Perform contour matching against the CAD data
- Define virtual circles of a given diameter enabling over-pin diameter analysis to be performed

Example of gear contour matching and an over-pin diameter analysis

Example of form analysis
Optional accessories

**Holder with clamp**

Application: Clamping of thin workpieces such as PCBs and pressed parts.
Order No.: 176-107
Maximum clamp length: 35mm
Dimensions: 62(W)×152(D)×38(H)mm
Mass: 0.4Kg
Note: An adapter set is required to suit a particular QI model. These are available to order (see below).

**V-block with clamp**

Application: Clamping of cylindrical objects
Order No.: 172-378
Maximum supportable diameter: ø25mm
Center height from mounting face: 38-48mm
Dimensions: 117(H)×90(W)×45(D)mm
Mass: 0.8Kg
Note: An adapter set is required to suit a particular QI model. These are available to order (see below).

**Swivel center support**

Application: Clamping of the workpiece between centers for effective thread diameter and depth measurements.
Order No.: 172-197
Can be set to an inclination angle of ±10°, in minimum increments of 1°
Maximum supportable dimensions:
- When horizontally positioned: ø80×140 mm
- When tilted at 10°angle: ø65×140mm
Mass: 2.5Kg
Note: An adapter set is required to suit a particular QI model. These are available to order (see below).

**Stage adapter sets**

Application: These are used when connecting some optional peripherals to the measuring device.
Order No.: Stage adapter: 176-304
Stage adapter B: 176-310
Dimensions (1 piece): 50(W)×340(D)×15(H)mm
Mass: Stage adapter: 1.5Kg
Stage adapter B: 1.2Kg
Note: The stage adapter B is 280(D).

<table>
<thead>
<tr>
<th>Stage size</th>
<th>1010</th>
<th>2010</th>
<th>3017</th>
<th>4020</th>
</tr>
</thead>
<tbody>
<tr>
<td>176-304 Stage adapter</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>176-310 Stage adapter B</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
Note: One set consists of two adapters.

**Foot switch**

Application: Quick data entry while gripping the handle

**Standard type**
Order No.: 937179T

**Rigid type**
Order No.: 12AAJ088
## 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>
</tr>
</thead>
<tbody>
<tr>
<td><strong>View field</strong></td>
<td>1.26&quot; x 0.94&quot; (32×24mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Measurement mode</strong></td>
<td>High resolution mode/Normal mode</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Measuring range (X, Y axes)</strong></td>
<td>3.94&quot; x 3.94&quot; (100×100mm)</td>
<td>7.87&quot; x 3.94&quot; (200×100mm)</td>
<td>7.87&quot; x 6.69&quot; (200×100mm)</td>
<td>11.81&quot; x 6.69&quot; (300×170mm)</td>
<td>15.75&quot; x 7.87&quot; (400×200mm)</td>
</tr>
<tr>
<td><strong>Travel range (Z axis)</strong></td>
<td>3.94&quot; (100mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>Measurement accuracy within the screen*1</td>
<td>High resolution mode: ±2µm/Normal mode: ±4µm</td>
<td>High resolution mode: ±1µm/Normal mode: ±2µm</td>
<td>± (3.5+0.02L) µm, L: arbitrary measuring length (mm)</td>
<td></td>
</tr>
<tr>
<td><strong>Imaging device</strong></td>
<td>3 megapixel, 1/2&quot;, color</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Monitor magnification</strong></td>
<td>7.6X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optical system</strong></td>
<td>Magnification (Telecentric Optical System)</td>
<td>0.2X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Working distance</strong></td>
<td>3.54&quot; (90mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Deph of focus</strong></td>
<td>High resolution mode: ±0.6 mm/Normal mode: ±1.1mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Illumination</strong></td>
<td>Transmitted light: Green LED telecentric illumination</td>
<td>Co-axial light: White LED</td>
<td>Ring light: quadrant white LED</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Effective stage glass size</strong></td>
<td>6.69&quot; x 6.69&quot; (170×170mm)</td>
<td>9.52&quot; x 5.5&quot; (242×140mm)</td>
<td>10.24&quot; x 9.05&quot; (260×230mm)</td>
<td>14.17&quot; x 9.06&quot; (360×230mm)</td>
<td>17.32&quot; x 9.13&quot; (440×232mm)</td>
</tr>
<tr>
<td><strong>Maximum stage loading</strong></td>
<td>Approx. 22lbs. (10Kg)</td>
<td>Approx. 44lbs. (20Kg)</td>
<td>Approx. 33lbs. (15Kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>100-240VAC, 50/60HZ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Main unit mass</strong></td>
<td>Approx. 154 lbs. (70Kg)</td>
<td>Approx. 163lbs. (74Kg)</td>
<td>Approx. 309lbs. (140Kg)</td>
<td>Approx. 326lbs. (148Kg)</td>
<td>Approx. 340lbs. (154Kg)</td>
</tr>
<tr>
<td><strong>Accuracy guaranteed temperature</strong></td>
<td>20±1ºC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</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

---

### QI-B Series

<table>
<thead>
<tr>
<th>Model No.</th>
<th>QI-B1010C</th>
<th>QI-B2010C</th>
<th>QI-B2017C</th>
<th>QI-B3017C</th>
<th>QI-B4020C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>View field</strong></td>
<td>0.5&quot; x 0.38&quot; (12.8x9.6mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Measurement mode</strong></td>
<td>High resolution mode/Normal mode</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Measuring range (X, Y axes)</strong></td>
<td>3.94&quot; x 3.94&quot; (100×100mm)</td>
<td>7.87&quot; x 3.94&quot; (200×100mm)</td>
<td>7.87&quot; x 6.69&quot; (200×100mm)</td>
<td>11.81&quot; x 6.69&quot; (300×170mm)</td>
<td>15.75&quot; x 7.87&quot; (400×200mm)</td>
</tr>
<tr>
<td><strong>Travel range (Z axis)</strong></td>
<td>3.94&quot; (100mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>Measurement accuracy within the screen*1</td>
<td>High resolution mode: ±1.5µm/Normal mode: ±3µm</td>
<td>High resolution mode: ±0.7µm/Normal mode: ±1µm</td>
<td>± (3.5+0.02L) µm, L: arbitrary measuring length (mm)</td>
<td></td>
</tr>
<tr>
<td><strong>Imaging device</strong></td>
<td>3 megapixel, 1/2&quot;, color</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Monitor magnification</strong></td>
<td>18.9X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optical system</strong></td>
<td>Magnification (Telecentric Optical System)</td>
<td>0.5X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Working distance</strong></td>
<td>3.54&quot; (90mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Deph of focus</strong></td>
<td>High resolution mode: ±0.6 mm/Normal mode: ±1.8mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Illumination</strong></td>
<td>Transmitted light: Green LED telecentric illumination</td>
<td>Co-axial light: White LED</td>
<td>Ring light: quadrant white LED</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Effective stage glass size</strong></td>
<td>6.69&quot; x 6.69&quot; (170×170mm)</td>
<td>9.52&quot; x 5.5&quot; (242×140mm)</td>
<td>10.24&quot; x 9.05&quot; (260×230mm)</td>
<td>14.17&quot; x 9.06&quot; (360×230mm)</td>
<td>17.32&quot; x 9.13&quot; (440×232mm)</td>
</tr>
<tr>
<td><strong>Maximum stage loading</strong></td>
<td>Approx. 22lbs. (10Kg)</td>
<td>Approx. 44lbs. (20Kg)</td>
<td>Approx. 33lbs. (15Kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>100-240VAC, 50/60HZ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Main unit mass</strong></td>
<td>Approx. 154 lbs. (70Kg)</td>
<td>Approx. 163lbs. (74Kg)</td>
<td>Approx. 309lbs. (140Kg)</td>
<td>Approx. 326lbs. (148Kg)</td>
<td>Approx. 340lbs. (154Kg)</td>
</tr>
<tr>
<td><strong>Accuracy guaranteed temperature</strong></td>
<td>20±1ºC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</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
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 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 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 catalog
www.mitutoyo.com

Note: All information regarding our products, and in particular the illustrations, drawings, dimensional and performance data contained in this printed matter as well as other technical data are to be regarded as approximate average values. We therefore reserve the right to make changes to the corresponding designs. The stated standards, similar technical regulations, descriptions and illustrations of the products were valid at the time of printing. In addition, the latest applicable version of our General Trading Conditions will apply. Only quotations submitted by ourselves may be regarded as definitive. Specifications are subject to change without notice.

Mitutoyo products are subject to US Export Administration Regulations (EAR). Re-export or relocation of our products may require prior approval by an appropriate governing authority.

Trademarks and Registrations
Designations used by companies to distinguish their products are often claimed as trademarks. In all instances where Mitutoyo America Corporation is aware of a claim, the product names appear in initial capital or all capital letters. The appropriate companies should be contacted for more complete trademark and registration information.