

## Vision Measuring Systems QUICK SCOPE QS-L Digital Microscope





## Vision Measuring Systems **QUICK SCOPE QS-L**



## Height measurements – Autofocus

Now you can measure height at high speed with one machine. Manual focusing or motorized autofocusing is available for height measurement without the need of additional accessories.

## Measure fine detail on small parts

High speed 7x optical zoom, with interchangeable objective lenses, provides crisp, vivid images. Unlike digital zoom, you won't miss any details.

## Highlights hard-to-see edges

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

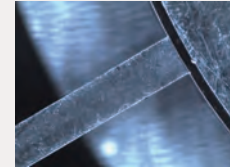
# Problems with simple dimensional measuring devices

## BEFORE

### Problems with dimensional measuring devices

#### Difficult to measure reliably using regular microscope lighting

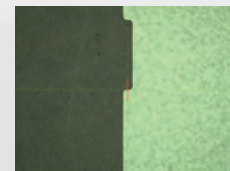
Some edges cannot be accurately detected and captured when only using the ring light as edge height and shape are so variable.



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

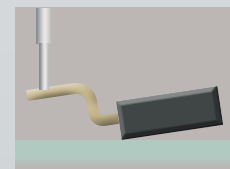
#### Edge measurement of a stepped feature cannot be performed correctly

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

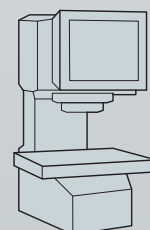


#### Height measurement results are not stable

Height measurement with a contact probe is not reliable.



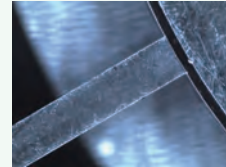
#### Could give customers unreliable measurement results



## AFTER

### Solutions with Quick Scope QS-L

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



Indistinct image using ring light

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

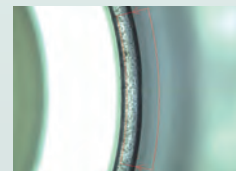


Edge capture with the ideal magnification is always available



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

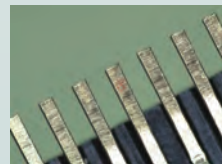
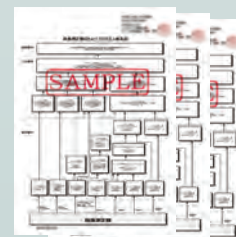


	Image auto focus
Measurement accuracy in the Z-axis	$(4.5 \pm 0.006L) \mu\text{m}$

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

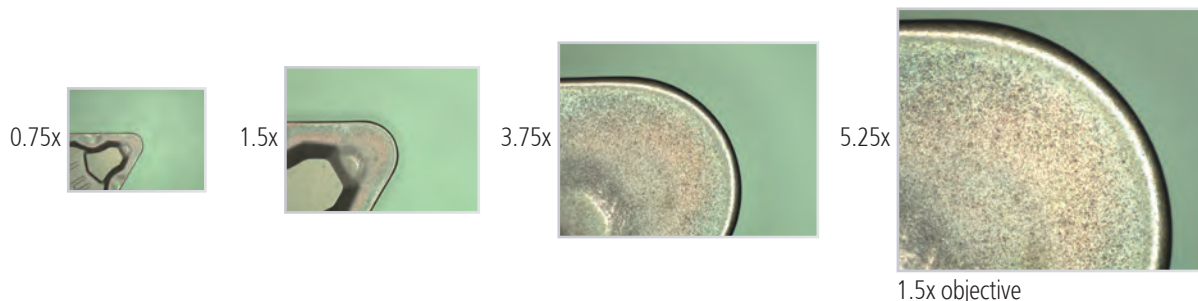


# Accurate measurement through improved technology

## 7X optical zoom with interchangeable objective lenses offers reliable small parts measurement

Newly designed 7X optical zoom with interchangeable objective lenses securely captures measurement targets from wide-field to micro form. In addition, 4X digital zoom is available using software.

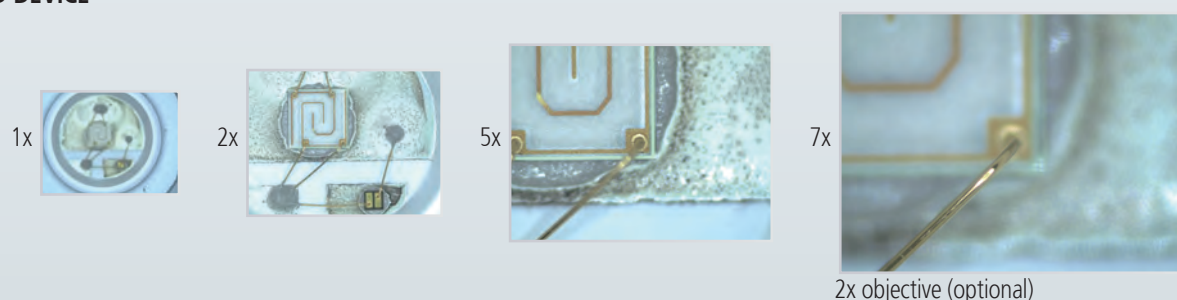
### CUTTING TOOL



### PLASTIC MOLDED ARTICLE



### LED DEVICE



1x objective (optional)      1.5x objective (standard accessory)      2x objective (optional)

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)	13.2	10.2	8.8	7.8	6.8	6.6	5.2	5.1	4.4	3.9	3.3	2.9	2.6	2.2	1.8	1.7	1.7	1.3	1.2	0.9
	Vertical (V) (mm)	9.9	7.7	6.6	5.9	5.1	5.0	3.9	3.8	3.3	2.9	2.4	2.2	2.0	1.6	1.4	1.3	1.2	1.0	1.0	0.7
Total magnification (on the monitor)		20	26	30	34	39	40	51	52	60	68	79.3	89	99.3	119	138.7	149	158.7	198.7	208	277.3
Objective lens	1x objective (optional) Working distance	74 mm																			
	1.5x objective (standard accessory) Working distance	42 mm																			
	2x objective (optional) Working distance	42 mm																			

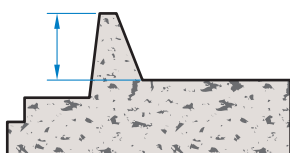
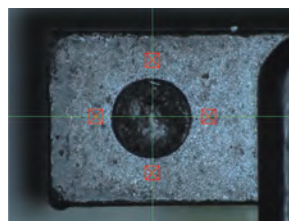
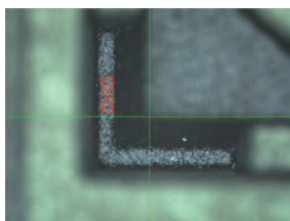
Note: The total magnification indicates the magnification on the monitor when the QSPAK video window size is the default 252.7 x 214.9 mm.



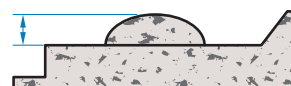
## High-speed image auto focus enables highly accurate height measurement

Because non-contact measurement requires minimal clamping of the workpiece, you can measure height faster and easier. Unlike laser devices, you don't have to worry about the workpiece surface roughness.

	Image auto focus
Measurement accuracy in Z-axis	$(4.5 \pm 0.006L) \mu\text{m}$



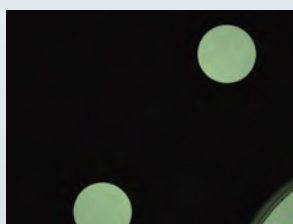
Sectional view



## 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.



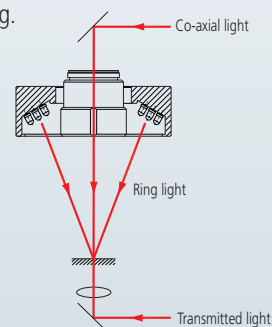
Transmitted light



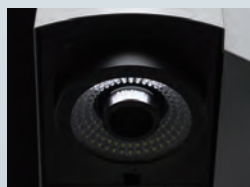
Co-axial light



Ring light



### 4-quadrant LED ring light



Back



Front



Right



Left

### Lighting tool (Contrast and brightness)

The lighting tool automatically adjusts light intensity to maintain constant brightness and helps you measure more accurately. No more errors from too much or too little light.



Dual-area contrast tool

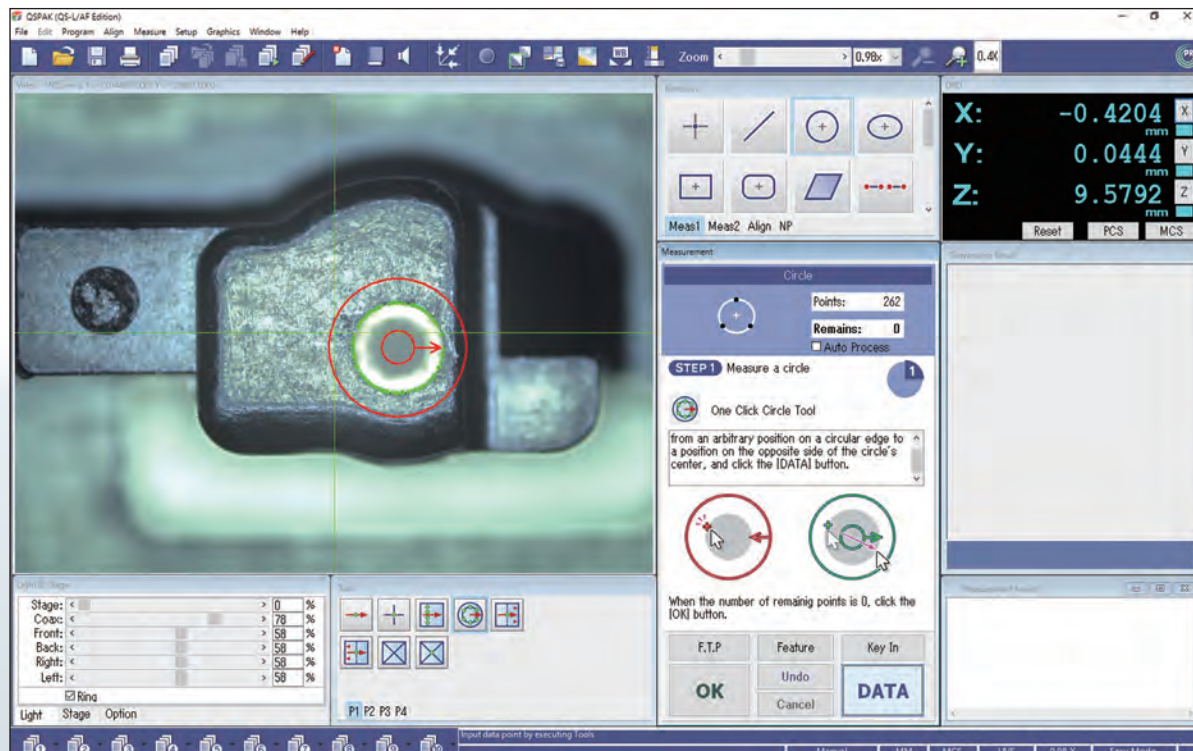


Brightness tool

# QSPak software enables easy operation and reliable measurement

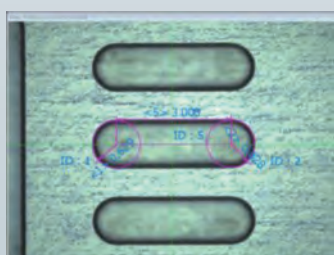
## Large screen makes detailed operations easy

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



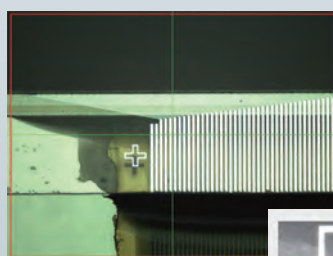
## Clear Results

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

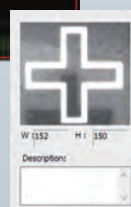


## Automatic pattern detection

Feature locations can be detected with high accuracy using pattern search.

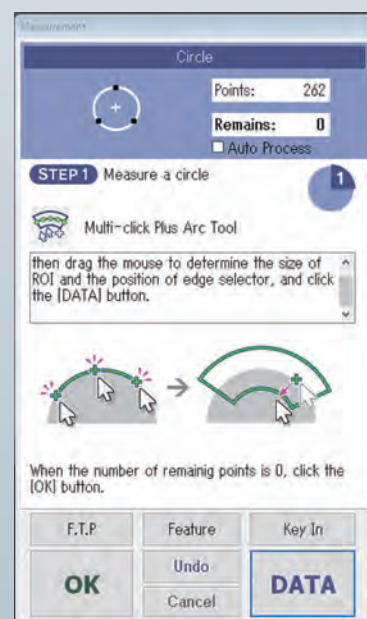


Pattern tool



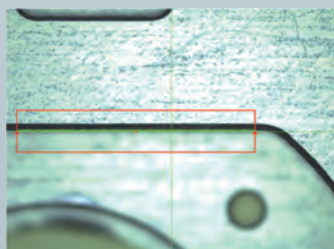
## User-friendly operation

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



## One-click edge detection

Features can be measured instantly with a single mouse click.



One-click line tool



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



## Specifications

Model		QS-L2010Z/AFC	QS-L3017Z/AFC	QS-L4020Z/AFC
Model 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" (200×100×150 mm)	12x6.7x6" (300×170×150 mm)	16x8x6" (400×200×150 mm)
Resolution / Scale type		0.1 μm / Linear encoder		
Accuracy *1*2	X axis, Y axis	(2.2+0.02L) μm		
	Z axis	(4.5+0.006L) μm		
Accuracy guaranteed temperature range		20±1 °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" (624×711×729 mm)	27x34x33" (692×857×837 mm)	30x34x33" (757×867×837 mm)
Stage glass size		10x6" (250×150 mm)	14.5x9" (370×240 mm)	18x9" (450×240 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

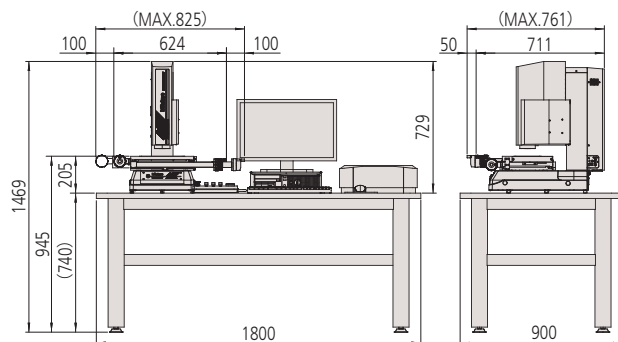
## Remote box



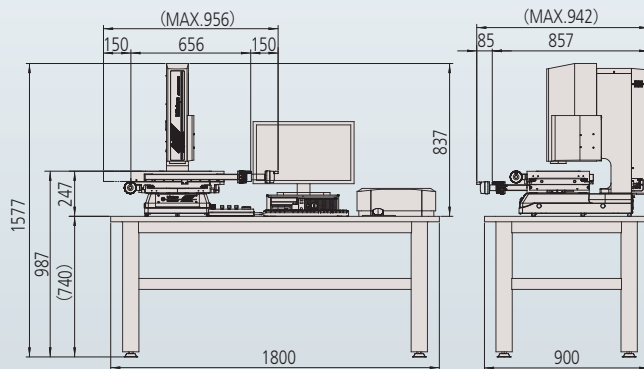
## External dimensions

Unit: mm  
25.4mm = 1"

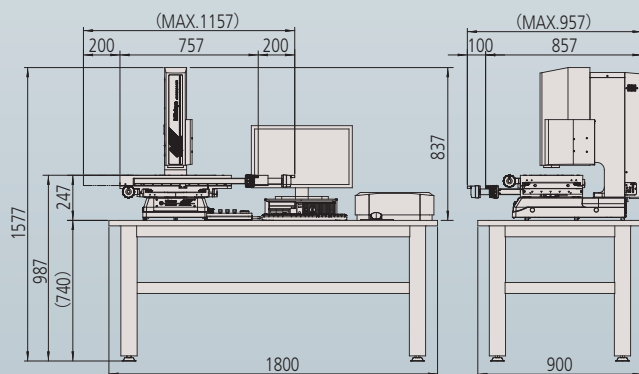
### QS-L2010Z/AFC



### QS-L3017Z/AFC

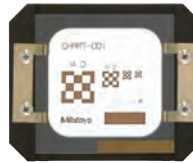


### QS-L4020Z/AFC



## Option

### Calibration chart



Code No.	02ATN695
Application	This corrects the pixel size of the camera, the accuracy of automatic focusing at each magnification and optical axis offset.

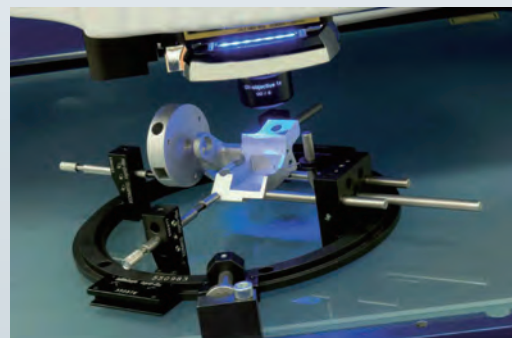
### Foot switch (Solid type)



Code No.	12AAJ088
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### Opti-fix

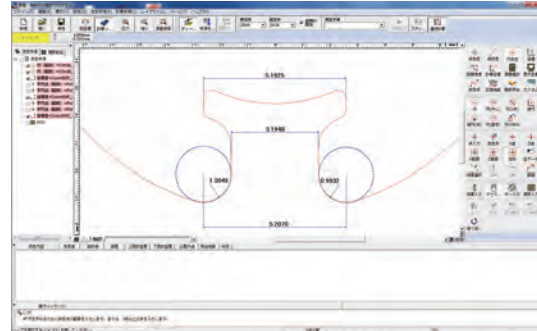
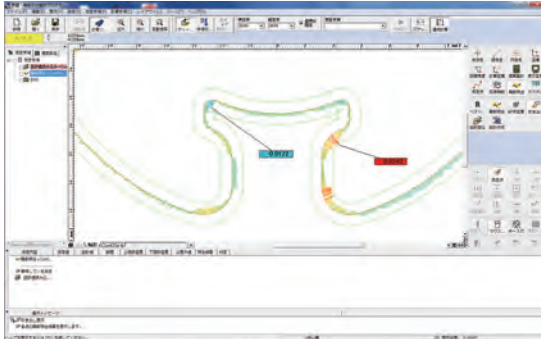
The modular clamping system opti-fix has been developed especially for optical coordinate measuring systems



## Optional software

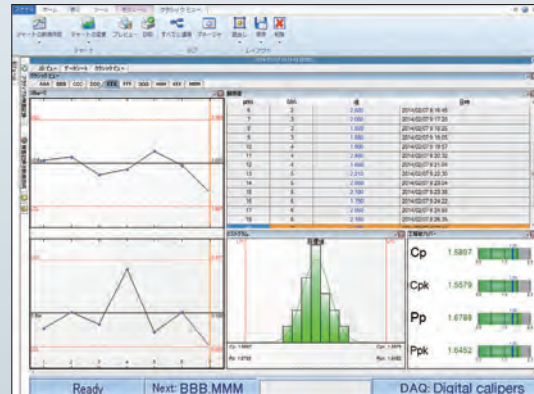
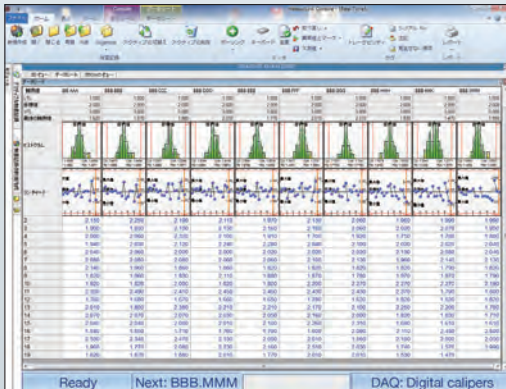
### FORMTRACEPAK-AP

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





**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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