

Next Generation 3D Digital Microscope  
Fast, Easy and High Quality  
Total Imaging Solutions

# KH-8700

**HiROX**  
<http://www.hirox.com>



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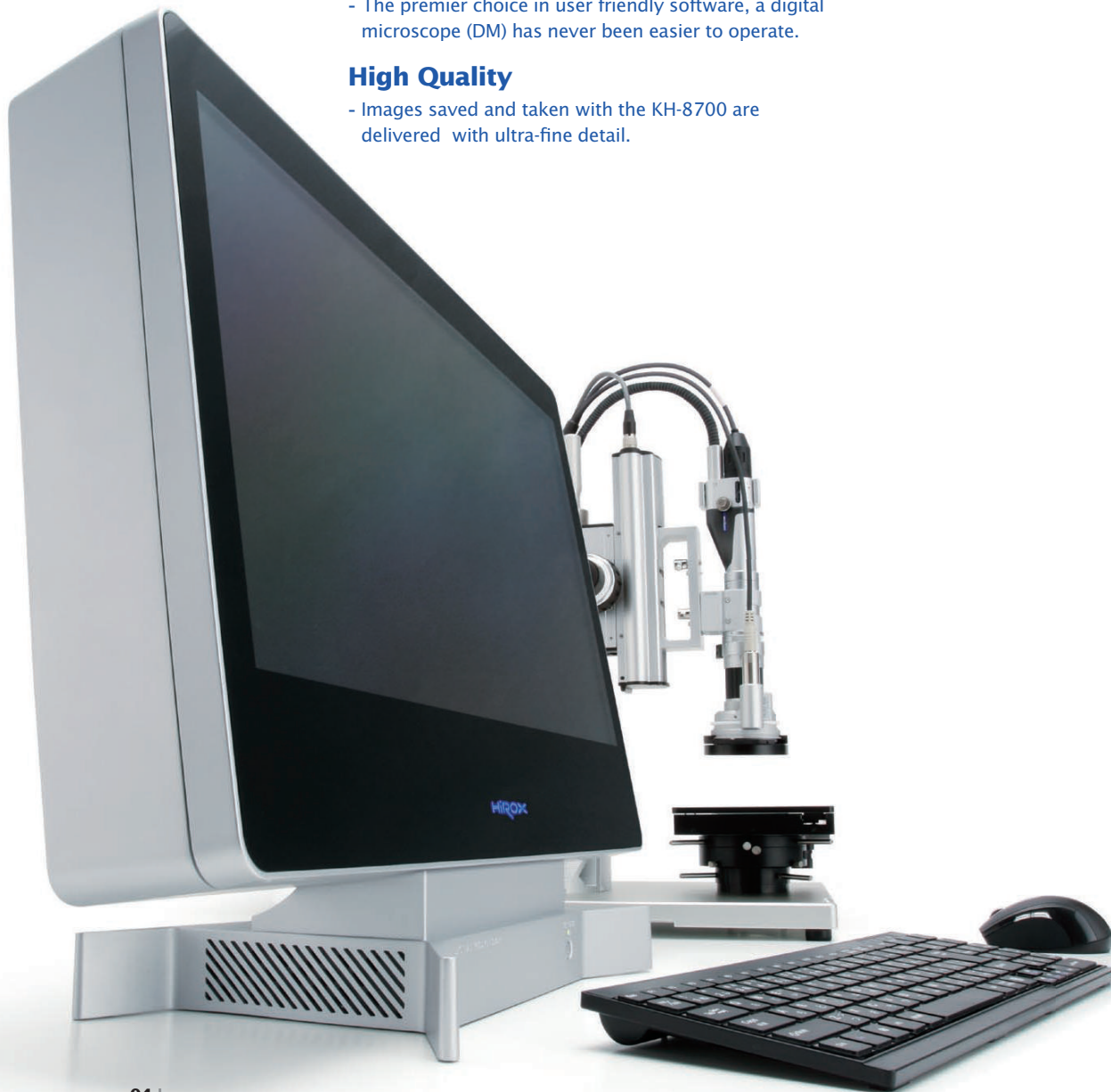
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Contact

The products in this catalog may be changed at any time, without notice.





### Fast

- The all new Hirox platform delivers fast operation and faster processing speeds.

### Easy

- The premier choice in user friendly software, a digital microscope (DM) has never been easier to operate.

### High Quality

- Images saved and taken with the KH-8700 are delivered with ultra-fine detail.

### Observation

**P.06**

Obtain high quality images and utilize multiple angles of observation.

### Measurement

**P.10**

Achieve quick and accurate 2D/3D results eliminating human error.

### Capture and Record

**P.14**

Create analytical data of the smallest details in the highest resolution.



Portable



Handheld



# Observation

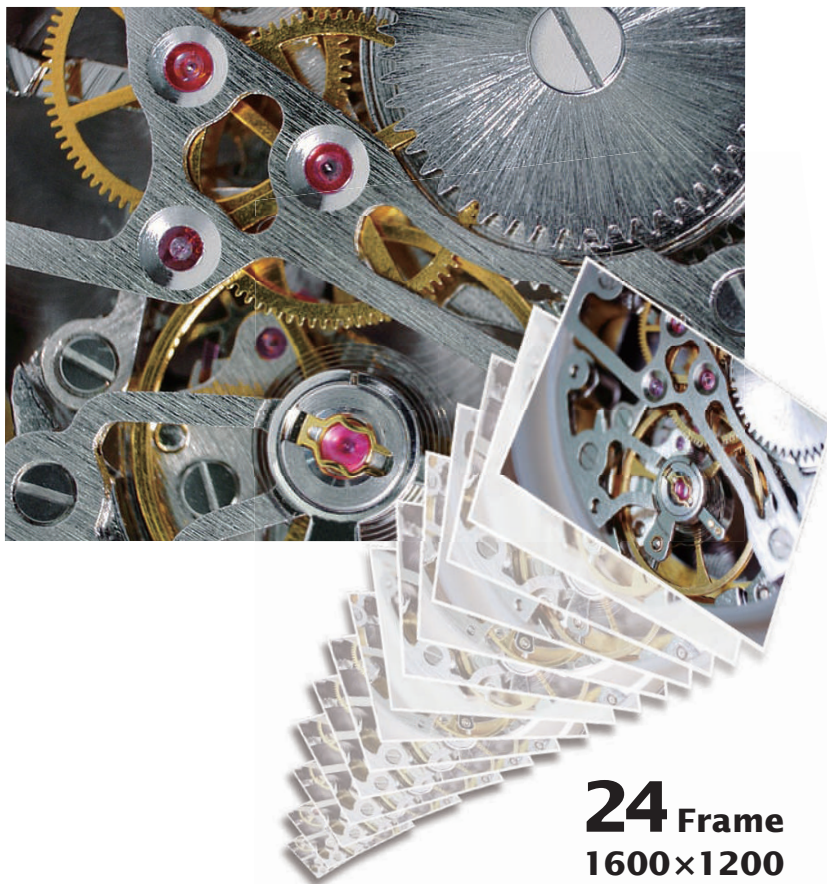
## Obtain High Quality Images and Utilize Multiple Angles of Observation.

Noticing small but significant details is now a more efficient process than ever. Smooth functionality and fast performance is attained by combining our 24 frames/second output and the all new GENEX engine. By utilizing high intensity LED optics with a full HD monitor, the KH-8700 obtains optimal picture quality.

**New**

### 24 Frame /Second (First and Fastest for a DM)

The new high-speed Genex Graphics Processor allows Hirox's CCD camera to capture 24 fps with the continuous high-quality resolution of 1200 x 1600 pixels. This provides a great on-screen performance and live image operation is as smooth as the naked eye. Here, it is not necessary to change to a lower resolution setup, all of the functions work with 1200 x 1600 pixel resolution (UXGA).



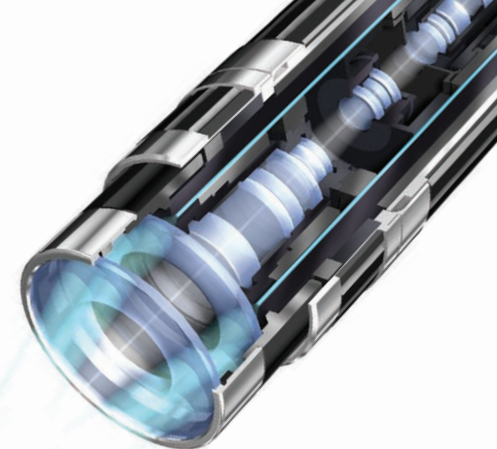
**24 Frame**  
**1600x1200**

**New**

### High Intensity LED Light Source

The new high intensity LED light source provides 5700K temperature, which closely portrays daylight color temperature (5500K) to re-produce true sample color images as well as full illumination immediately with no warm up time. The light source has an average lifetime of 30,000 hours, equivalent to over 10 years of usage (Note: 8 hours/day x 30 days x 12 months x 10 years).

In addition, the new light source is environment friendly with 1/4 electronic consumption, less heat and UV.



**New**

### Full High Definition LCD Monitor (First for a DM)

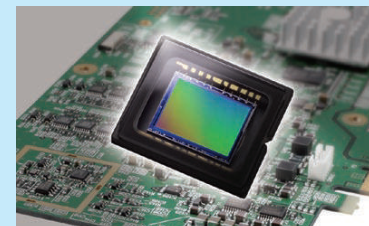
21.5" Full HD LCD monitor (1920 x 1080) is integrated into the KH-8700. It is one of the top grade high intensity pixel reproduction monitors displaying 16.77 million colors, a contrast ratio of 1000:1, and brightness of 300 cd/m2. Monitor size has increased 80%, with a new aspect ratio of 9:16 instead of 3:4. The new aspect ratio allows our new software platform main menu and other function keys not to overlap with live images.



## GENEX

### What is Genex?

The new graphics processor called, "Genex Engine," creates the fastest sample to on-screen ratio (24fps). For the first time ever in digital microscopy, the CCU (Genex) combines a high sensitivity compact CCD camera operating in a 32 bit image with high resolution at 1200 x 1600 pixels on the "Live Image."



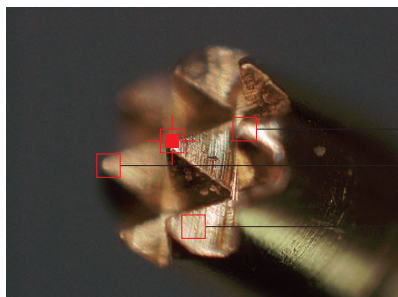




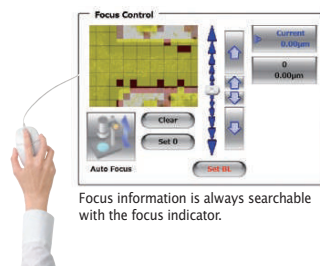
**New**

## Point Focus (Auto Focus)

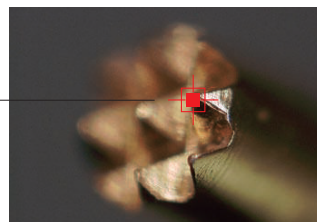
A key advantage in the line of Hirox digital microscopy is the ability to easily and quickly auto focus an image. Auto focusing an image at a rapid rate is due to our 0.05 micron pulse motorized z axis. All one has to do is double click the desired location on the monitor and the high speed software does the rest by automatically selecting the optimal focus point.



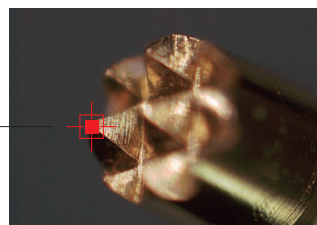
By obtaining focus information on the entire image, you can instantaneously focus on an arbitrary point simply by a mouse operation.



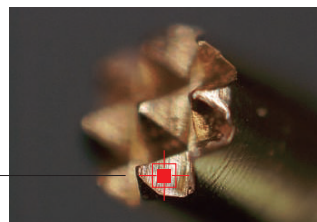
Focus information is always searchable with the focus indicator.



Contact Probe (200x)



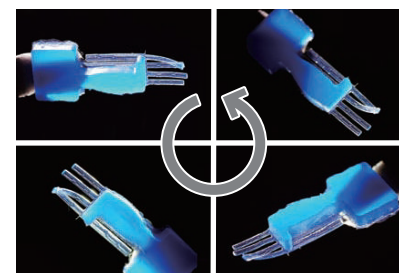
Focusing on the Clicked Point



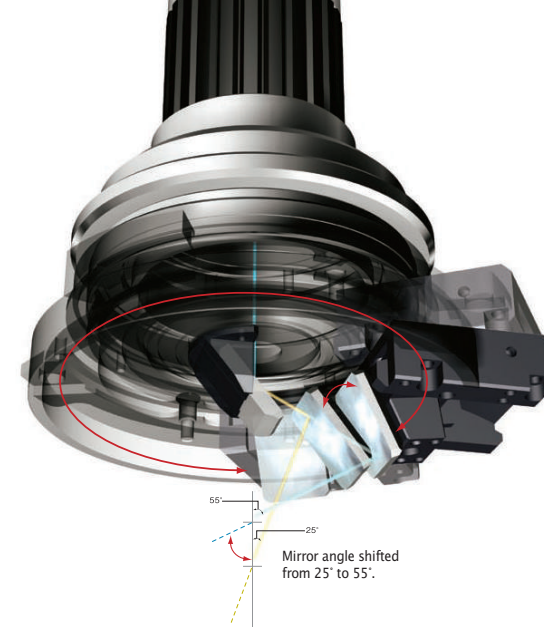
Focusing on the Clicked Point

## 360 Degree View Rotary Head

360 degree rotation of the mirror enables the side of the object to be thoroughly observed. The object shape can be freely ascertained in a limited space and in 3D without the need to tilt the lens, object or make complex focus adjustments.



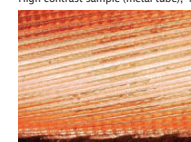
Microhand



## High Dynamic Range (HDR) - Real Time

High Dynamic Range, an essential observation technology based on a Hirox original algorithm, reproduces a dynamic shutter range as a visual image. This function provides results through blending both the low and high boundaries of an image to give a clear and balanced result.

High-contrast sample (metal tube), 40x



Before

After

Low-contrast sample (printed material), 20x



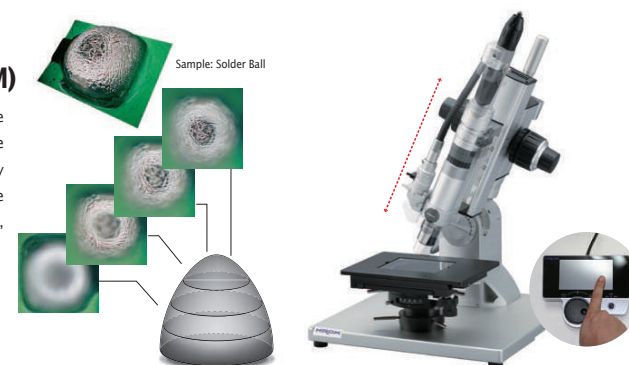
Before

After

**New**

## Quick 3D - One Push Operation (Fastest for a DM)

Just tapping on the touch screen scans from the bottom to top and creates 3D. Intuitive software provides the end user the ability to automatically detect focal planes, eliminating time in the procedure. Indicate the bottom most focal plane, and let the system do the rest.



Sample: Solder Ball

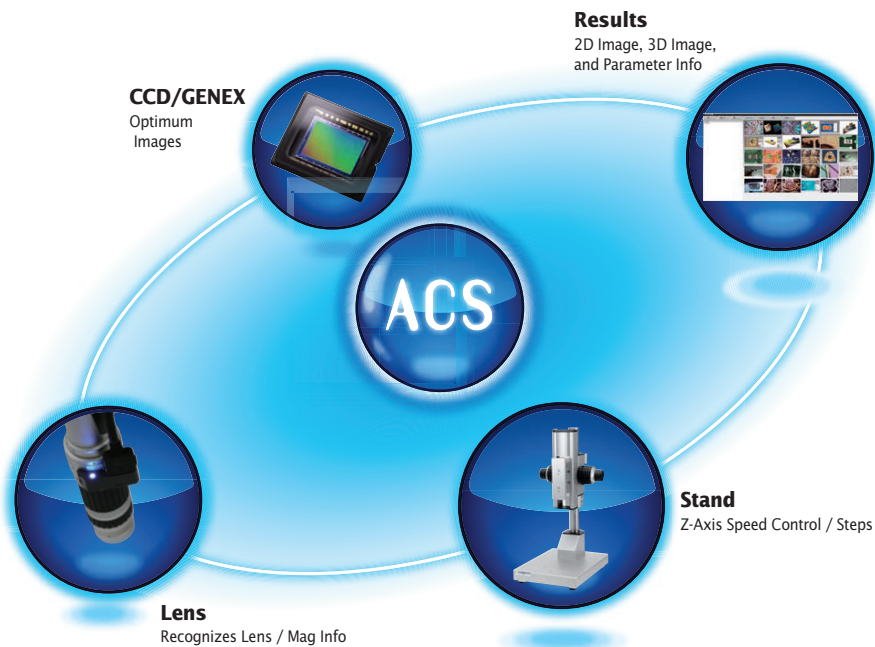
# Measurement

## Accurate Results with No Human Error

Incorporating various measurement technologies such as a highly accurate 3D measurement function, the KH-8700 outputs many values to answer your needs and objectives. In addition, the increased accuracy of measurement functionality has improved the usability for smarter and simpler operation.

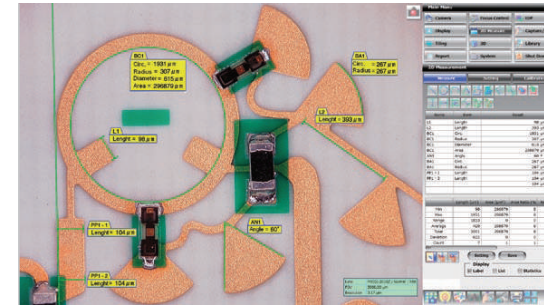
## Hirox's unique ACS communication

The Auto Calibration Select (ACS) sensor automatically applies the proper lens settings with each magnification or lens change, completely eliminating the need to choose proper calibration values. When a lens / mag is changed, the ACS feature also adjusts the z-axis speed / steps coinciding with the preferred lens' camera setup.



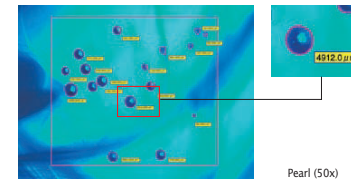
## 2D Measurement

Measurements including length, area, and surface area can be taken in various styles. Using only mouse operation, the object on the monitor can be measured in real-time. In addition, the actual dimension and measurement results can be saved on the capture image or as a CSV file.



### Auto Count

Advanced software provides the end user the ability to auto-count particles, detect particle size and ratio.



### Statistical Data

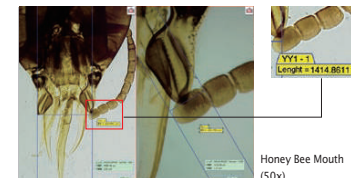
All measurement results automatically calculate to standard statistical data.

	Length (μm)	Area (μm²)	Area Ratio (%)	Radius
Item	48	296879	8	
Min	1911	296879	8	
Range	1813	0	0	
Average	429	296879	8	
Total	3001	296879	8	
Standard	632	0	0	
Count	7	1	1	

Statistic List

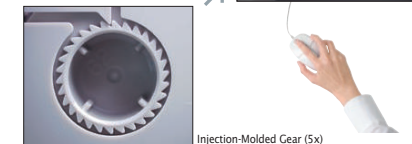
### Multi View Measurement

For the first time in the industry, Hirox is able to accurately use 2D measurement functions when splitting the monitor for multi-view display.



### Digital Zoom Measurement

By utilizing the real-time digital-zoom function, the end user can enhance pixels in order to locate the exact edge of a measurement, increasing accuracy and consistency.

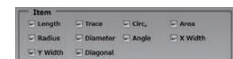


### Calibration / Lens Settings

Cleaning up the menu to improve work efficiency; it is now possible to display other lens manufacturer's information and hide Hirox lenses you do not own.

### Result Display Setting

Based on your work scenario, measurement data displayed can be selected or deselected.









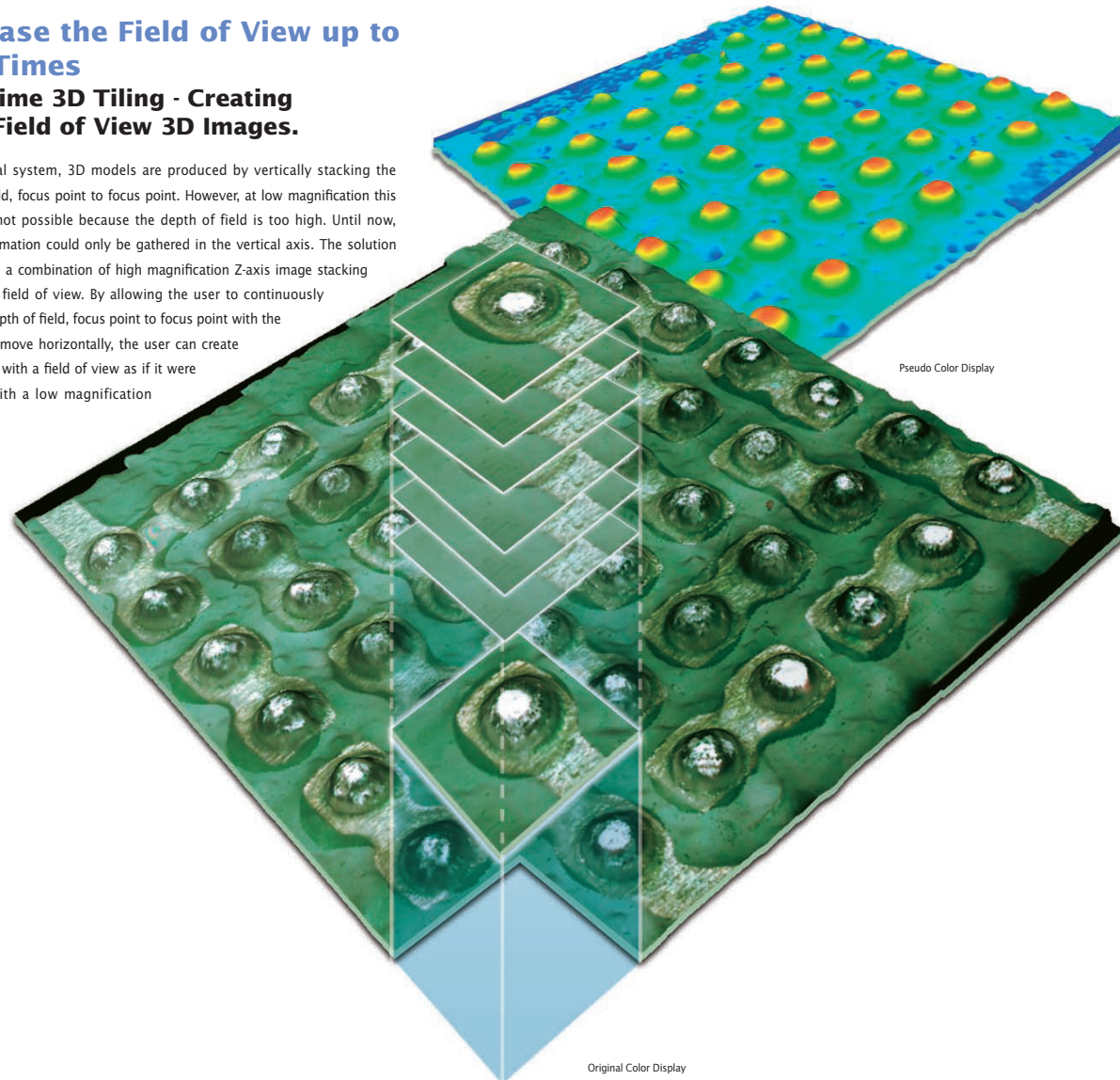
# Capture and Record

Create Analytical Data of the Smallest Details in the Highest Resolution

## Increase the Field of View up to 110 Times

### Real-Time 3D Tiling - Creating Wide Field of View 3D Images.

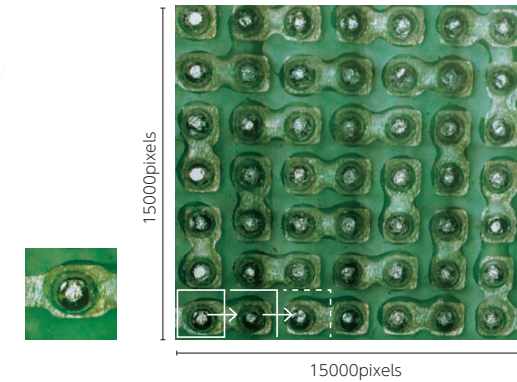
In an optical system, 3D models are produced by vertically stacking the depth of field, focus point to focus point. However, at low magnification this method is not possible because the depth of field is too high. Until now, height information could only be gathered in the vertical axis. The solution is 3D Tiling, a combination of high magnification Z-axis image stacking and a wide field of view. By allowing the user to continuously stack the depth of field, focus point to focus point with the freedom to move horizontally, the user can create a 3D model with a field of view as if it were captured with a low magnification lens.



### Real-Time 2D Tiling Feature

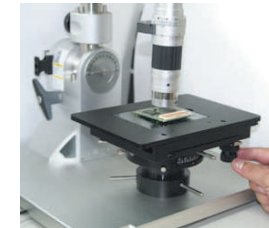
### A Hirox Original Algorithm Achieves Quick and Seamless Tiling

It is a constant challenge for optical microscopes to capture with a high optical resolution and a wide field of view simultaneously. This new process does not require a specified position to match tile to tile. The image will automatically begin tiling seamlessly in real-time just by moving the XY stage. This Hirox original method increases the field of view from 1200 x 1600 pixels up to 15,000 x 15,000 pixels while retaining a high optical resolution.



### Easy Operation and High Speed Processing

All you have to do is move the XY stage and the image will be tiled automatically by the software.



Moving the XY Stage

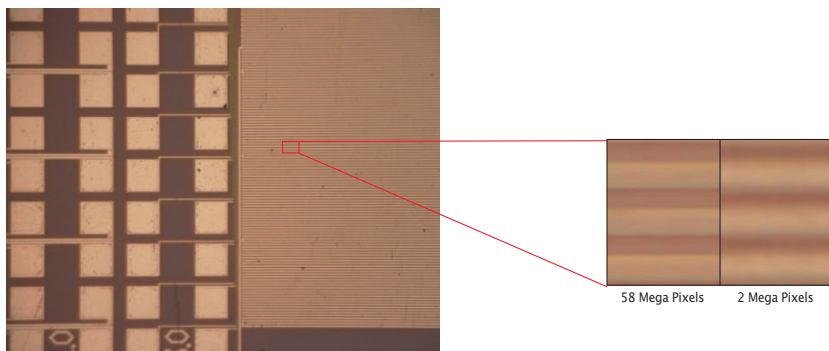
# EDP (Enhanced Digital Processing)

To perfect an on-screen image, Hiox has created an Enhanced Digital Processing feature to improve images to the desired outcome.

**New**

## 58 Mega Pixel High Resolution Image

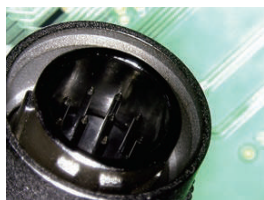
Constantly improving with technology, 58 mega pixel images are now supported to provide optimal resolution and on-screen clarity, also decreasing aliasing noise (pixilation) when controlling real-time digital zooms.



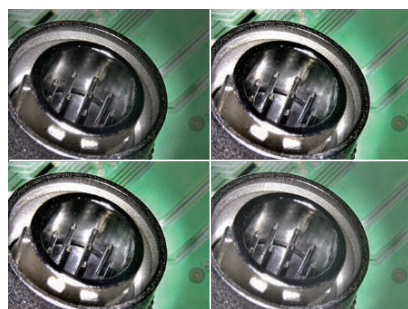
Printed Circuit Board

## Preview Function for HDR, Anti-Halation and 3D Models

Preview your adjustments before processing an image. Various options are now imbedded into the KH-8700 to further broaden the field for image selection. Not only is this possible for HDR and Anti-Halation images, but 3D models as well.



Live Image (Cable Connector)



HDR Preview Images

**New**

## Offering Seamless Observation, Measurement, and Capture/Record Remote Device (CT-R01)

The user friendly controller simplifies operation by integrating all functions with a touch-screen. The remote device provides quick and easy operation. Main functions are displayed on the remote's home-screen for easy access. In addition, the device allows adjustments of shutter speed, the ability to quickly auto-white balance, and control Z-Axis movement as well as rotary speed/direction.

### Large Touch Screen

4.3 inch monitor provides easy access to features.

### Clear and Easy Menu

The menu was designed with icon and text to prevent confusion.

### Jog Shuttle

Controlling motorized Z-Axis and rotary head.

### Lighting Level Knob

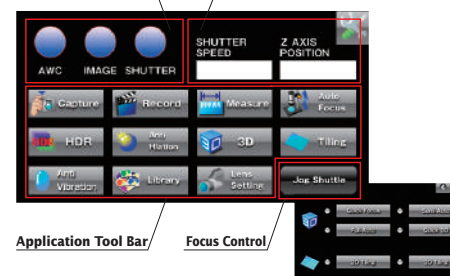
Adjusting the lighting level of the on screen image.



## Remote Device Menu Screen

### Camera Setup Control

### Position Indicator



### Camera Setup Control -

Contains features such as white balance, image adjustment, and shutter speed.

### Position Indicator -

This indicates camera shutter speed and Z Axis position.

### Application Tool Bar -

Simple operation allows one touch capture, recording, measurement, Auto Focus, HDR, and much more.

### Focus Control -

Allows control by the jog dial of functions such as Z-axis movement and rotation speed.



## Easy Operation Features

Designed for efficient interaction, an array of Hirox features help problems become solutions.

### Camera Preview

In the Camera Preview function, display a variety of images for different perspectives to choose from. Adjust edge, chroma, and contrast, and have the ability to customize each image displayed with user preferences.



### Anti-Vibration (Camera Stabilization)

Some working environments can cause constant micron level shaking on microscopy stages. A solution to this problem is Hirox's new Anti-Vibration feature improving observations in adverse conditions.



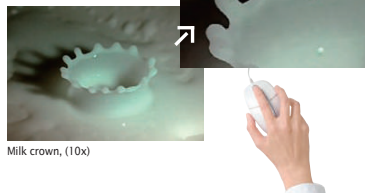
Cutting Bit (20x)  
[Before Image Stabilization]



Cutting Bit (20x)  
[After Image Stabilization]

### Real-Time Zooming

Scrolling with the mouse wheel lets the user digitally zoom in on a measurement point in real-time.

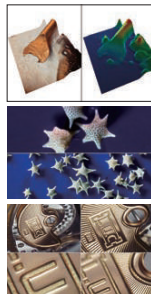


Milk crown, (10x)

**New**

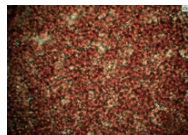
### Split Window (Multi-View)

Multiple images can be simultaneously displayed for comparison. You can split the screen horizontally / vertically, or divide the screen into 4 windows. First in the industry to be able to access all functions when splitting the screen into vertical / horizontal comparisons or multi-view comparisons.

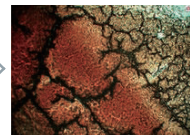


### Time Lapse

The KH-8700 can automatically take a sequence of frames at a specified interval to record changes over a set duration. To help reduce energy consumption, the LED lamp is only turned on when necessary.



Blood Serum (1500x)  
[Recording Starts]



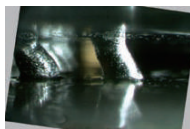
Blood Serum (1500x)  
[Recording Ends]

### Real-Time Rotation/ Image Flipping

Real time rotation and image flipping are not only available for still images, but movies as well. The observation direction can be adjusted without physically moving the sample. This allows fine positioning and angle adjustment with simple mouse operations. With image flipping, reversing a lens' picture can instantaneously be corrected to preferred display.



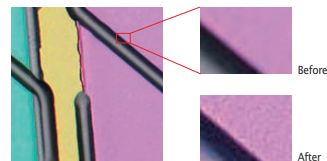
IC pot bonding, (2000x)



BGA, (200x)

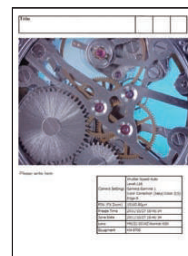
### Noise Removal Function

When eliminating particle disturbances on the image is desired, the KH-8700 digital microscope can reduce unwanted noise while keeping the objects outline. Images with extremely high contrast can also be changed into the appropriate image.



### Easy Report Writer

Save time by quickly transferring image files into the Easy Report Writer in order to make presentations. Several different templates are available or customize templates to taste. Reports can be printed, saved, or exported to spreadsheet applications.



### Quick Launch

A quick launch feature is always present on screen to easily go to various controls that are most used. These controls include lighting adjustment, image capture, a print tab, and other shortcuts.



### Library - Explorer

Cover all storage access through the Explorer tab. Organize files by selecting the detail setup. Be able to edit, connect to a network, burn files to a CD/DVD, and print any file directly from the Library.



Library display screen

### mera Set-Up / Individual User

A log-in screen helps distinguish users in a multi-user work environment. Personal preferences such as system settings and image data can be saved to a unique user profile. This is particularly helpful with numerous operators each making observations and measurements on different objects.



### Printer

With no need to install a driver, quickly sending reports and images to a printer is possible through a port connection on the KH-8700 system.

### External Ports

The KH-8700 system allows users to export/import data easily through 6 USB ports and a LAN port. Duplicating the screen is also quickly achieved through both an RGB port and a digital display port to connect via HDMI.





## Applications

Creating a Wide Array of Applications for the Demands of Numerous Industries

### Electric/Electronics



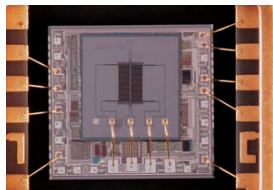
GFP (150x)



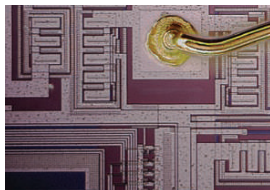
Electronic Component (100x)



BGA Ball (150x)



IC Package (100x)

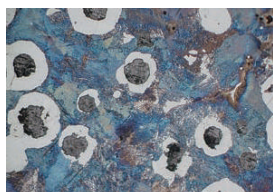


IC Package (1000x)

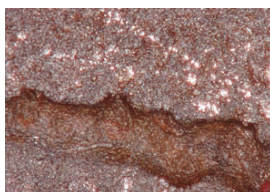


Wire Bonding (2000x)

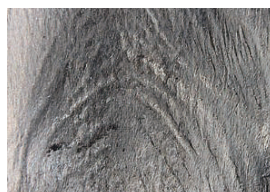
### Material/Metallurgical



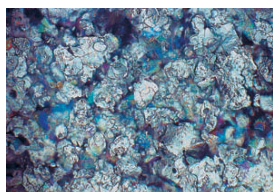
Metallographic Structure (700x)



Metal Corrosion (50x)



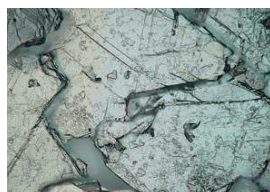
Fatigue Fracture (20x)



Silver Coating (1400x)



Section Fatigue Crack (50x)

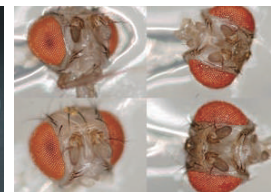


Metallic Organization (2000x)

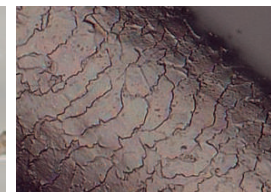
### Organism/Healthcare



Mouse Fetus 10.5 Days after Conception (150x)



A Fruit Fly (100x) - Split Image



Hair Cuticle (3500x)

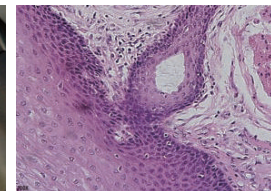
### Medical/Pharmaceutical



Stent (150x)

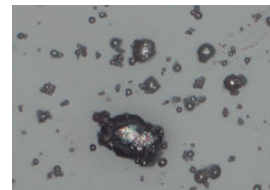


Protein Crystals (100x)



Smear Cell (2100x)

### Forensic



Bullet Powder Residue (1750x)

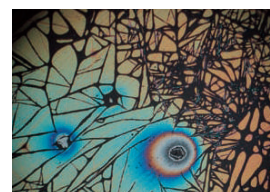


Textile Color Comparison (1000x) - Split Image

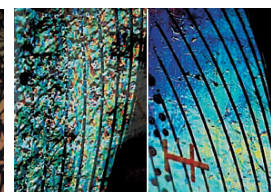


Bullet Shell Comparison (100x) - Split Image

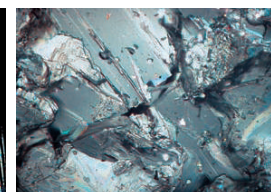
### Other Applications



Carbon-Based Film (1000x)



Counterfeit Money (350x) - Split Image



Single Crystal Superconductor (1000x)



Petroleum Research (50x)



Borne Piece - Archaeology (40x)



Mechanical Watch (100x)



## Stands

### High Precision Straight and Free Angle Stand

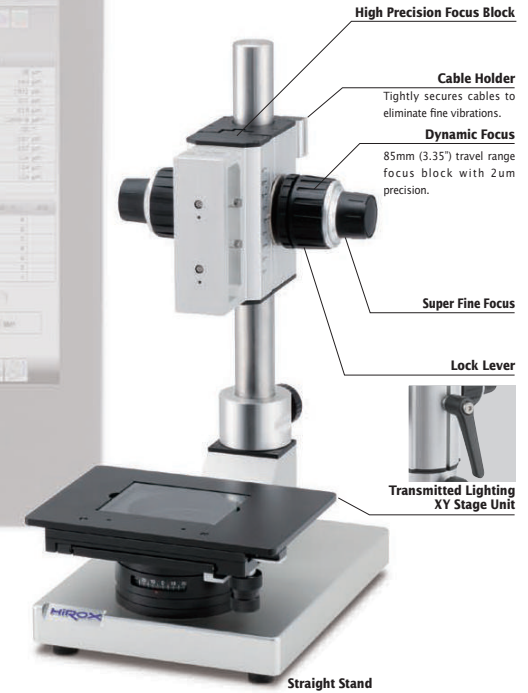
A high performance lens only shows its power when it is operated. It is the stand that connects the lens to the operator's hand, meaning that the stand must have a high level of precision and be easy to use. The operator is free to choose 180 degrees of inclination and 360 degrees of stage rotation for target observation. This is combined with the option of the Electronic Focus Block (0.05um/pulse) for 3D observation and height measurements.

### Dynamic Focus Control

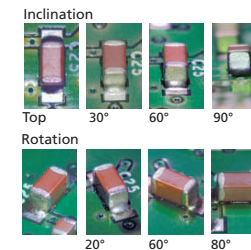
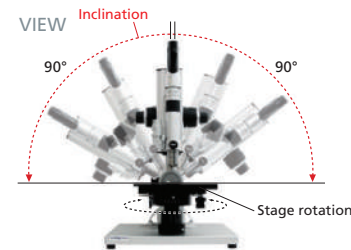
With the motor controller built into the main unit, the stand is able to easily achieve extremely high precision. The stand also has an incredibly long travel range with 30mm of motor controlled travel and 85mm of manually controlled travel.



Free Angle Stand

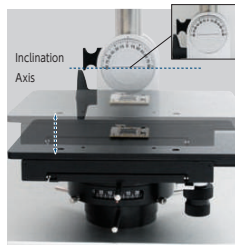


Straight Stand



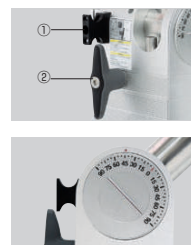
### [Stage] Stage Z-Movement

Easy Z-axis movement allows stress free inclination.



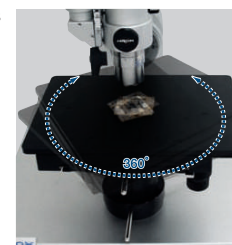
### [Control Part] Angle Adjustment

Inclinations safely stop at 45°, 60°, 90° and any angle within 180 degrees can be secured with the lock lever.



### [Stage] Flexible Operation

Reach unattainable angles with 360° rotation.



### [Base] Structured Stability and Vibration Absorber

Weight distribution designed to eliminate vibrations and a specialized material reduces a wide range of vibrations.



# Lenses

High-resolution, high-precision, and high depth of field optical lenses made for everyday measurements. The MX(G) lenses can be used for highly complex 2D and 3D measurements down to the micron level.

## High Resolution Macro Zoom Lens

MXG-MACROZ VI / MX-MACRO VI

0x-50x



The multi-functional macro zoom lens can achieve a view of the entire object and a magnification of up to 50x. A light source guide is integrated into the lens for diverse environments. This lens can be switched from a  $\infty$ -5x magnification lens to a 5x-50x par-focal magnification lens.



Model	MXG-MACROZ VI / MX-MACROZ VI
Magnification	$\infty$ ~5x 5~50x
Field of view	$\infty$ ~6.1~61mm(H)
Operable distance	$\infty$ ~90mm

## Low Range High Resolution Zoom Lens

MXG-2016Z / MX-2016Z

20x-160x (6x-320x)



The high-performance zoom lens has a compact body, provides a high resolution image, and offers a large optical depth-of-field with the ability to utilize an even larger digital depth-of-field. The lens can be handheld and accommodates numerous applications through the attachment of 13 various adapters covering a magnification range of 6x-320x.



Model	MXG-2016Z / MX-2016Z
Magnification	20~160x
Field of view	15.4~2.0mm(H)
Operable distance	44mm

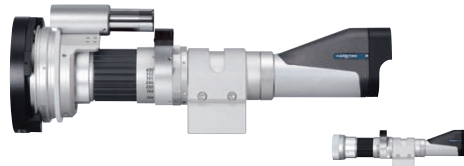
## Middle Range High Resolution Zoom Lens with Optical 3D Rotation

MXG-5040RZ (SZ) / MX-5040RZ (SZ)

50x-400x (20x-800x)



This universal lens can be equipped with a wide selection of optical adapters. Attaching the rotary head adapter allows 360 Degree revolution with the ability to inspect at multiple angles. The various exclusive adapters snap-on, allowing one-touch replacement and a magnification range that expands observation from 20x-800x.



Model	MXG-5040RZ (SZ) / MX-5040RZ (SZ)
Magnification	50~400x
Field of view	6.1~0.78mm(H)
Operable distance	54mm(RZ) / 63mm(SZ)

## High Range / High Resolution 10x Co-Axial Zoom Lens

MXG-10C / MX-10C

35x-7000x



The high range optical zoom lens incorporates high expandability and the highest resolution in the MX(G) series. With six interchangeable objective lenses, the lens covers a magnification range of 35x-7000x. A directional lighting adapter is provided for co-axial vertical lighting to achieve intricate optical observation.



Model	MXG-10C / MX-10C					
	OL-35	OL-70 II	OL-140	OL-140 II	OL-350 II	OL-700 II
Magnification	35~350x	70~700x	140~1400x	140~1400x	350~3500x	700~7000x
Field of view	9.83~1.05mm(H)	4.42~0.47mm(H)	2.46~0.26mm(H)	2.21~0.23mm(H)	0.88~0.09mm(H)	0.44~0.04mm(H)
Operable distance	34mm	21mm	30.5mm	12mm	10.6mm	3.4mm

New

## Dual Illumination Revolver Zoom Lens

MXG-2500REZ

35x-2500x

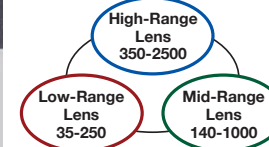


Incredibly wide zoom range with a triple objective turret. The dual illumination mechanism provides both co-axial and ring lighting. The operator is free to choose either setting or a mix of both in order to cover a multitude of applications. The lighting system is integrated into the lens and no additional cables are required



### Field of View from 8 mm ~ 0.12 mm

Turning the turret allows the operator to access each objective lens with an optical zoom range over 70 times the minimum magnification. Lens parfocality allows for sustained focus across the entire magnification spectrum from 35x-2500x. The ACS is integrated and recognizes the objective lens positioning as well as the zoom level.



Model	MXG-2500REZ		
	Low-Range	Mid-Range	High-Range
Magnification	35~250x	140~1000x	350~2500x
Field of view	8.71~1.22mm(H)	2.18~0.31mm(H)	0.87~0.12mm(H)
Operable distance	10.0mm	10.0mm	10.0mm





# Lenses

## Macro Lens

A magnification range of 0x to 20x can be covered by altering the working distance. It offers high-level images while showing an excellent cost performance.



Model	MT-C16
Magnification	0x to 20x
Field of view	—
Operable distance	—

## MT-C16

0-20x

## Macro Lens

A magnification range of 0x to 50x can be covered by altering the working distance. The dedicated ring illumination supports the excellent lens performance.



Model	MX-MACROZ IV
Magnification	0x to 50x
Field of view	∞ ~ 6.1 mm (H)
Operable distance	~21.4mm(0~50x) / 202.8mm(5x) / 97.5mm(10x) / 49.2mm(20x) / 35.9mm(30x) / 26.8mm(40x) / 21.0mm(50x)

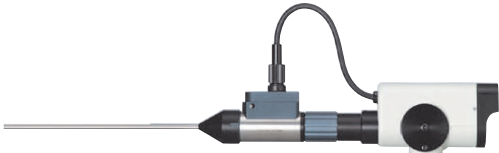
## MX-MACROZ IV

0-50x

## Straw-scope Lens

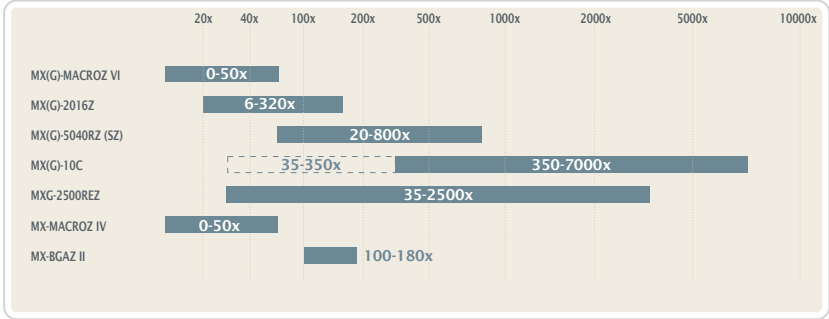
### The Straw-scope Lens allows Observation in Congested Areas

The sleeve is designed with independent optical and lighting systems to achieve an outstanding resolution impossible for existing optical straw-scopes. Additional optical magnification allows the image to be rectangular instead of circular.



Model	MX-STZ Lenses				
Model	AD-STZ28-125	AD-STZ40-120	AD-STZ40-245	AD-STZ58-135	AD-STZ58-275
Outer diameter	2.8mm	4.0mm	4.0mm	5.8mm	5.8mm
Effective length	125mm	120mm	245mm	135mm	275mm
View direction	Straight view	Straight view	Straight view	Straight view	Straight view
View angle	40°	40°	40°	40°	40°

## MX-STZ Lens



New

## BGA lens

This BGA lens incorporates Hirox's unique expertise and technologies to allow precise observation of BGAs from various angles. Using this lens, anyone can perform appropriate "outer appearance observation" like an expert engineer.



## MX-BGAZ II

100-180x

Model	MX-BGAZ II
Magnification	100x to 180x *1
Field of view	—
Operable distance	0.9~8.0mm *2

\*1 With the mode switch ring set to Normal.

\*2 Distance from BGA to tip of prism chip.

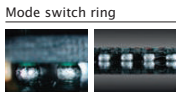
### Rotating lens accepting large PCBs

#### Optical rotary ring



Upper contact Lower contact

#### Focus ring



Mode switch ring

#### Prism chip



## Optical Adapters

Acquire Various Views of the Object Using Hirox Original Optical Adapters

### Variable Angle Lighting Adapter

This adapter varies the lighting angle from vertical to lateral. This is effective for detecting scratches, burns and blotches.



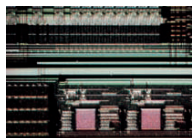
Coin (20x)  
[Vertical Lighting]



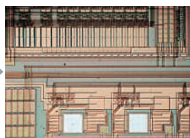
Coin (20x)  
[Lateral Lighting]

### Co-Axial Lighting Adapter

Observation through lighting that is parallel with the lens axis can be difficult to ascertain and inspect intensely reflective surfaces. With this adapter, the light is reflected perpendicular to the lens axis.



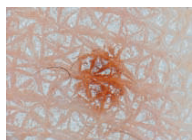
IC Pattern (1400x)  
[Dark Field Lighting]



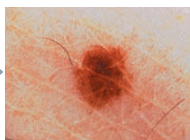
IC Pattern (1400x)  
[Bright Field Lighting Using Co-Axial Lighting]

### Polarizing Adapter

Polarizing filter is specialized to change the multi-directionality of natural light wave patterns and hones them to eliminate surface reflection and aid in the analysis of surface colors.



Freckle (50x)  
[Lateral Lighting]



Freckle (50x)  
[Polarized Lighting]

### Differential Interface Contrast

The prism adapter can be used to separate linear polarized light into two rays of polarized light that can more easily penetrate on object requiring this type of observation. The differing optical paths of the polarized light rays, in response to the phase contrast, can detect shading interference. Depending on the difference in wavelengths of the optical paths, a single shading streak on the brightest and darkest parts of the object's height difference can be observed over one hundred nanometers.



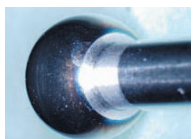
Impression of liquid crystal conductive ball, 200x  
[Lighting for light fields of view]



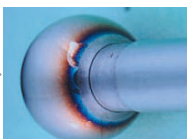
Impression of liquid crystal conductive ball, 200x  
[With the differential interference contrast adapter]

### Diffuse Lighting Adapter

Producing diffused and soft illumination in every direction, this adapter reduces strong reflections, allowing clear observations of metallic surfaces without halation.



Ball Joint (40x)  
[Vertical Lighting]



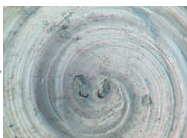
Ball Joint (40x)  
[Diffuse Lighting]

### Co-Axial Directional Lighting Adapter

In comparison with standard high-resolution bright field images, this adapter can help clearly identify shapes on extremely microscopic surfaces.



Bottom of a Can (250x)  
[Vertical Lighting]

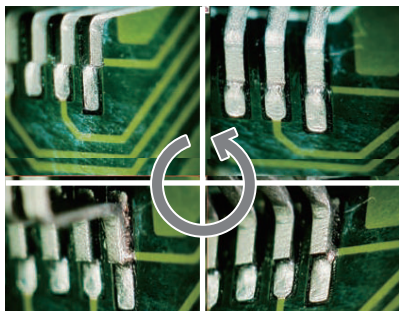


Bottom of a Can (250x)  
[Co-Axial Directional Lighting]

### 3D Rotary Head Adapter

These adapters rotate the mirrors to allow 360° observation of a subject's sides. The rotation makes it possible to easily obtain an understanding of the subjects shape. Subject size is of no concern. These adapters are HIROX original designs.

**Easy Control of the Angle, Rotational Direction, and Speed**  
With the variable angle rotary-head, subjects can be captured as desired by operating a 360° degree rotating mirror vertically within 25 to 55 degrees. Rotation, direction, and speed can be controlled from software or remote device.



QFP Contacts (45° Observation Angle) [Solder Application]

## Specifications

### Basic Functions

Camera	Image sensor	1/1.8 type, 2,11 million pixel CCD image sensor
	Total number of pixels	1688 (H) X 1248 (V)
	Number of valid pixels	1628 (H) X 1236 (V)
	Number of feasible pixels	1600 (H) X 1200 (V)
	Scan method	Progressive scan
	Frame rate	24 frames/ second
	Electronic shutter	AUTO (1/24 to 1/100000)
		MANUAL (8, 4, 2, 1, 1/2, 1/4, 1/8, 1/24, 1/60, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/15000) Settable within the range of 17 to 1/100000sec
	Gain	AUTO (0 dB to 6 dB) , MANUAL (0, 3, 6, 9, 12 dB) , OFF
	White balance	AUTO (one-push), MANUAL (R, B)
Liquid crystal monitor	Liquid crystal monitor	Full HD liquid crystal (TFT type), 21.5 type *1
	Image size	476.24mm (H) X 268.11mm (V)
	Image pitch	0.248mm X 0.248mm
	Number of screens	1920 (H) X 1080 (V)
	Display colors	16,77 million colors
	Brightness	300cd/m <sup>2</sup>
	Contrast ratio	1000:1 (Typ)
Light source	Visual field angle	±85 (horizontal) ±80 (vertical)
	Light source	LED lighting
	Lamp life span	30000 hours (reference)
	Color temperature	5700K (Typ)
Image output	Output method	Analog RGB/ DISPLAY PORT (1920 X 1080Pixel or more)
Input	Mouse/ keyboard	USB2.0 (A type) supported
	ACS input	MXC lens supported
	External remote input	Input signal; e.g. from foot switch
Output	Z axis motor output	Z axis communication control: 5-phase stepping motor driver included
	Rotary output	Rotary head drive control (round 6 pins)
Interface	LAN	10BASE-T/100BASE-TX/1000BASE-T
	USB2.0	6 routes (side: 2 routes, rear: 4 routes)
	RS232C	General purpose port (expansion port)
	Remote device	Dedicated terminal
Recording	Recording media	Hard disk 500GB included (recording/ storage area: 300GB)
	External recording media	External DVD drive (USB2.0) supported/ external HDD
		CD-R/RW, DVD±R/RW, etc.
	Still image formats	Non-compressed: TIFF, BMP, Compressed: JPEG
	Still image recording pixel	Supported image size: 15000 (H) X 15000 (V) Pixel (for image connection)
		Normal capture
		1600 X 1200, 1440 X 1080, 1280 X 960, 1024 X 768, 800 X 600, 640 X 480
		High-resolution capture
		8800 X 6600, 6400 X 4800, 4800 X 3600, 3200 X 2400, 2400 X 1800
	Animation recording formats	AVI (non-compressed), WMV (compressed)
	Animation recording pixel	1600 X 1200 (15FPS) , 800 X 600 (24FPS)
Usage environment	Rated power supply voltage	AC100 to 240V, 50/60Hz
	Power consumption	195W
	Ambient operating temperature	5 to 40°C
	Ambient operating humidity	20 to 80%RH (without dew condensation)
	Operating atmosphere	Without corrosive gas
	Storage temperature	-15 to 50°C (without dew condensation)
Weight	Main unit	Approx. 14Kg
	Camera	Approx. 1Kg
	Remote device	Approx. 0.5Kg
Outside adimensions	Main unit	525mm (W) X 445mm (H) X 210mm (D)

### Various functions

Observation settings	Camera preview function
	Camera image setting
	Camera setting storage
	Camera setting optimization function
	Z axis focus control function
	Rotary head control function
	Auto focus function
	Focus indicator function
	Digital zoom function
	HDR processing function
Division/display	Anti-halation processing function
	High-resolution capture function
	Preview function (HDR, anti-halation, 3D configuration)
	Image adjustment function (noise removal, edge processing, etc.) (animation supported)
	Vertical division, horizontal division, 4-division; * When divided: 2D measurement enabled
	Inversion, rotation, horizontal 90-degree rotation
	Grid, scale, date, comment, image information
2D measurement	ACS function
	Auto calibration function
	2-point measurement (distance, angle, circle, radius, area, parallel, perpendicularity, etc.)
	Auto count, Auto area measurement, Auto distance measurement functions
	Measurement result/ statistics display function
	Scale display
	High-resolution measurement
	Lens registration function
	CSV storage
3D observation/measurement	Handy synthesis function
	Multi-focus function (semi-auto synthesis)
	Multi-focus function (full-auto synthesis)
	Multi-focus function (quick synthesis)
	Multi-focus function (manual synthesis)
	3D profile measurement function
	* Distance, angle, width, average height measurement, etc.
	3D area/ volume measurement function
	3D pseudo color display
	3D lighting display
Tiling	3D roughness measurement function
	3D height measurement/ 3D point height measurement function
	Noise removal/ cut function
	3D tilt correction function
	2D tiling (15000 X 15000Pixel)
	3D tiling (10000 X 10000Pixel)
Recording	Still image recording
	Animation recording
	Timer recording
	Cut-out still image storage
Library	Library management
	Easy preview function
Others	Image stabilization (animation supported)
	Comment/ figure input function
	User management function
	Easy report
	Language switching function (between Japanese/ English)
	Network setting
	Password setting (calibration value/ user management)
	Print
	Help function: manual

\*1: Note that since the liquid crystal is made by very high density technology, very small part on the screen may include dots not lit up or dots always lit up; i.e. They are not a failure.

**AD-2016H**  
Non-contact adapter

**AD-2016S**  
Variable lighting adapter

**AD-2016SV**  
Contact adapter

**AD-2016LOW**  
Low-magnification adapter

**AD-2016HI**  
High-magnification adapter

**AD-2016RLD**  
Diffuse lighting adapter for rotary head

**AD-2016LOWR**  
Low-magnification rotary head

**AD-2016LS/L**  
Lateral viewing adapter

**AD-2016D**  
Diffuse lighting adapter

**AD-2016HS**  
High-magnification, variable-lighting adapter

**AD-2016P**  
Polarizing adapter

**AD-2016C**  
Coaxial, vertical-lighting adapter

**AD-2016RLM**  
Rotary head

**HS-CHN(7)**  
Lens holder

**AD-5040HS**  
Non-contact adapter

**AD-5040DS**  
Diffuse-lighting adapter

**AD-5040SVS**  
Contact adapter

**AD-5040LOWRS**  
Low-magnification rotary head adapter

**AD-5040HRS**  
High-magnification rotary head adapter

**AD-5040RVS**  
Variable-angle rotary head adapter

**AD-5040RVD**  
Diffuse-lighting adapter for rotary head

**AD-5040LWS**  
Low-magnification adapter

**AD-5040HS**  
High-magnification adapter

**AD-5040SS**  
Variable-lighting adapter

**AD-5040SHS**  
High-magnification, variable-lighting adapter

**AD-5040CS**  
Coaxial vertical-lighting adapter

**AD-5040PS**  
Polarizing adapter

**AD-5040VLS**  
Lift-off adapter

**AD-5040SD**  
Snap-type adapter

**AD-5040H**  
Non-contact adapter

**AD-5040LW**  
Low-magnification adapter

**AD-5040HI**  
High-magnification adapter

**AD-5040SH**  
High-magnification, variable-lighting adapter

**AD-10S**  
Directional lighting adapter

**AD-10P**  
Polarizing adapter

**AD-10R**  
Optical Rotary Adapter

**AD-10DIL**  
DIL Adapter

**R-OL-D**  
Diffuse Adapter for NR-405-OL

**OL-35**  
Objective lens, 35-350x

**OL-70 II**  
Objective lens, 70-700x

**OL-140/OL-140 II**  
Objective lens, 140-1400x

**OL-350 II**  
Objective lens, 350-3500x

**OL-700 II**  
Objective lens, 700-7000x

**NR-405-OL**  
Ring lighting for MXiG-10C

**AD-25S1**  
Directional lighting adapter

**AD-25S2**  
Fixed-iris adapter

**AD-25S3**  
Variable-iris adapter

**AD-25S4**  
Center-iris adapter

**AD-25P1**  
Polarizing adapter (Set of 2 units)

**AD-25P2**  
Single-wavelength adapter

**AD-25R1**  
Optical rotary adapter

**NR-405-M4**  
Ring lighting for MX-MACROZ IV

**AD-BCABL**  
Backlight

**AD-STL28-125**  
Lateral viewing adapter

**Others**  
φ3.3~6.3mm L120~275mm

**ST-G Series Stands / Stages**

**STAND**

**High-precision stand**  
- Base plate and pole section (ST-G)  
- High-precision block (FB-M)

**Powered stand**  
- Base plate and pole section (ST-G)  
- Motor block (FB-E)

**STAGE-UNIT**

**XY stage unit**  
- XY stage block (XY-G)  
- Stage block (XY-C)

**XY stage unit for transmitted lighting**  
- XY stage for transmitted lighting (XY-CB)  
- Stage block for transmitted lighting (XY-CB)  
- Fiber for transmitting unit (R578)

**High-precision angle stand**  
- Base plate and angle pole section (ST-GA)  
- High-precision block (FB-M) and XY stage (XY-G)

**Powered angle stand**  
- Base plate and angle pole section (ST-GA)  
- Motor block (FB-E) and XY stage (XY-G)

**Standard Stands / Stages**

**STAND**

**STHE**  
Standard stand

**STHL**  
Large stand

**STAGE-UNIT**

**AS-XY**  
XY stage

**AS-XYL**  
Large slide stage

**AS-BH**  
BCA PCB holder

**Included in the microscope package**