

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

KH-8700

HIROX
http://www.hirox.com



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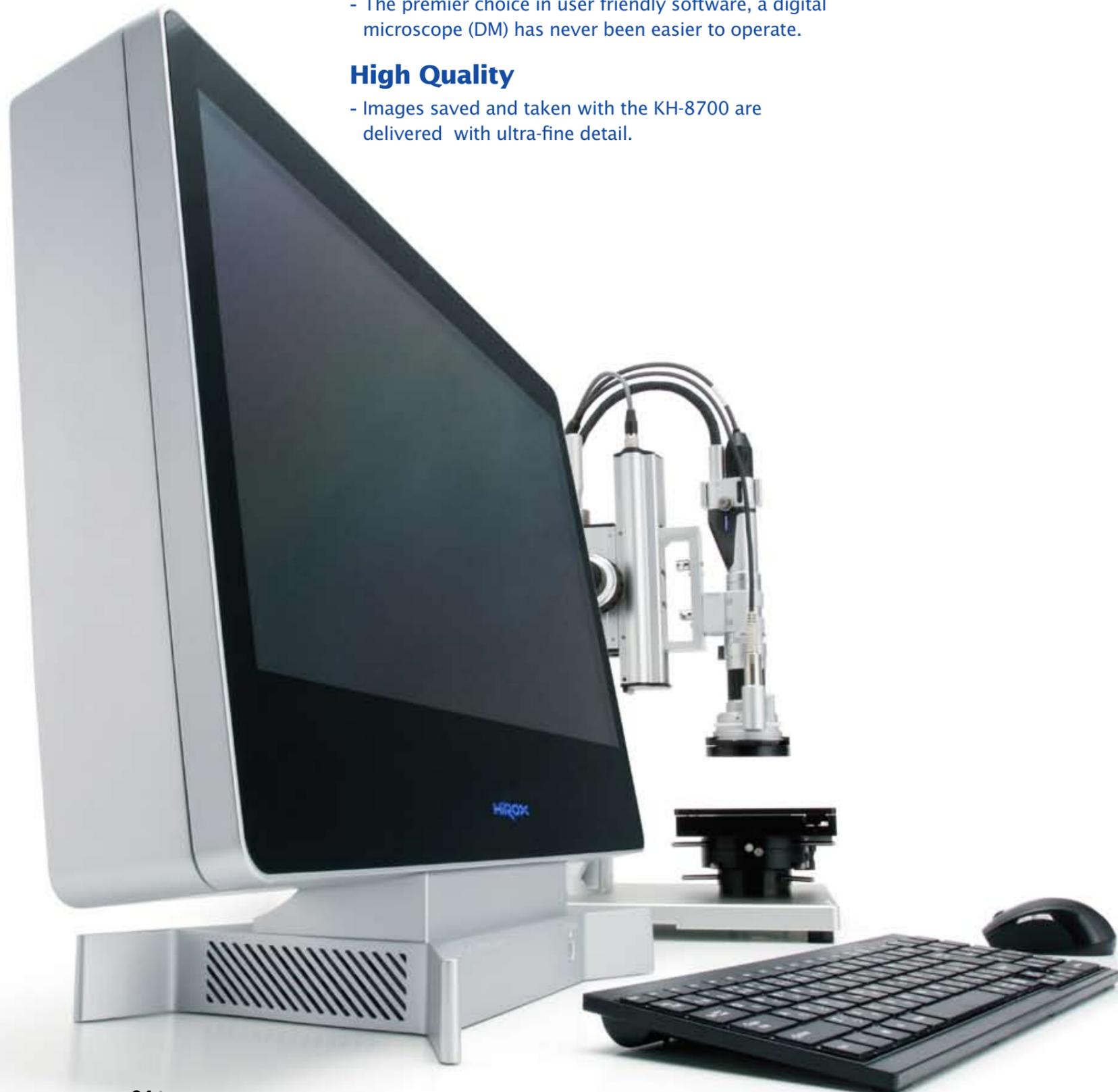
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Contact

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

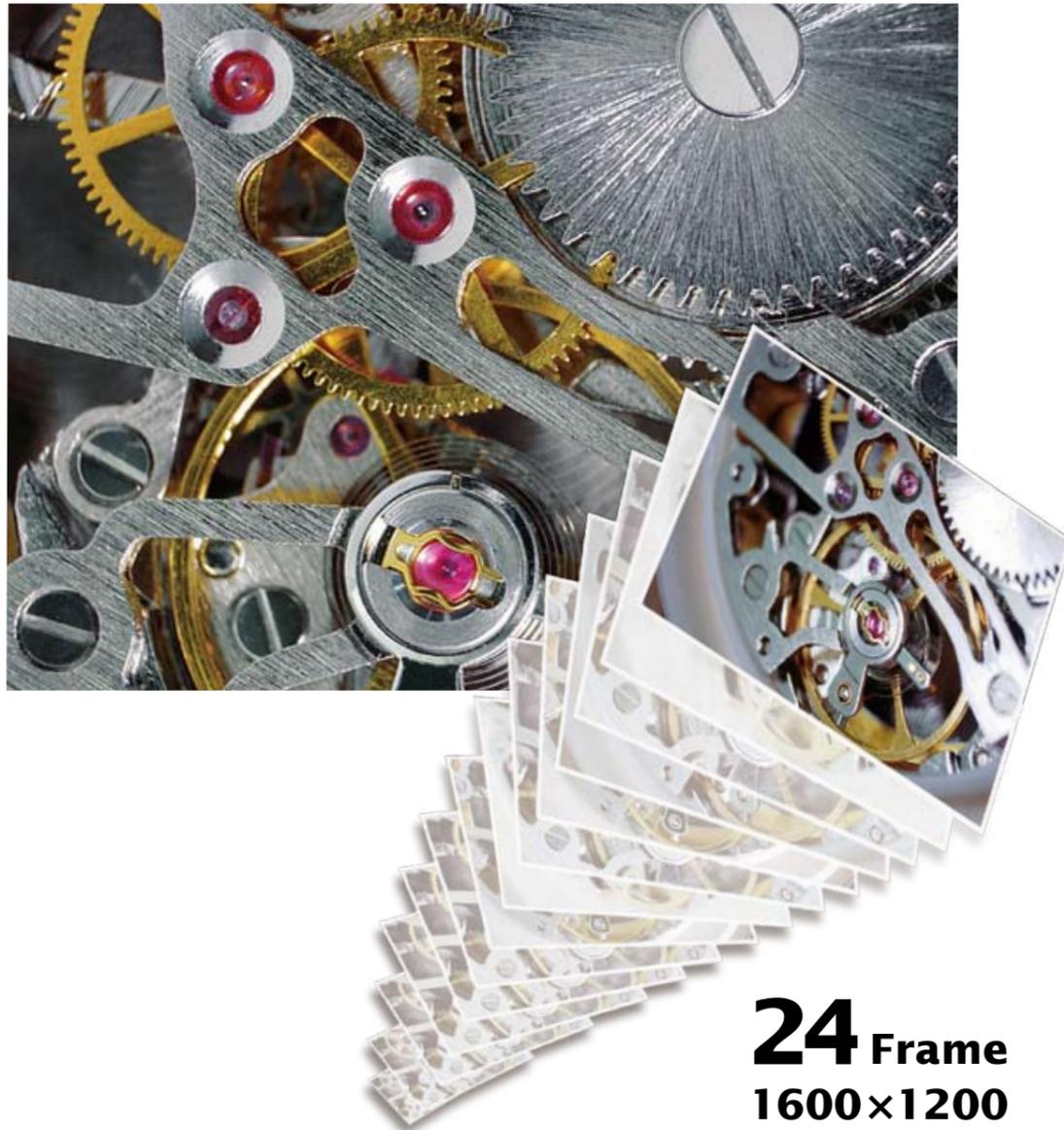
Observation

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.

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

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.



Full High Definition LCD Monitor (First for a DM)

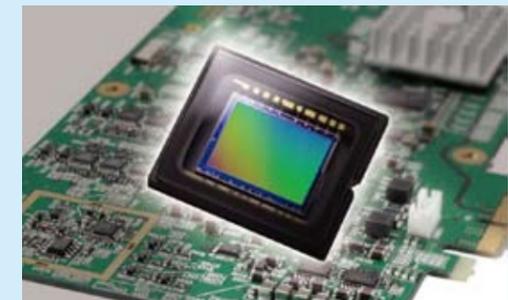
21.5" Full HD LCD monitor (1920 x 1080) is integrated into the KH-8700. It is one of the top grade high intensity pixel reproduction monitors displaying 16.77 million colors, a contrast ratio of 1000:1, and brightness of 300 cd/m2. Monitor size has increased 80%, with a new aspect ratio of 9:16 instead 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."



Live Focus Compose

NEW

Focus on the entire observed area.

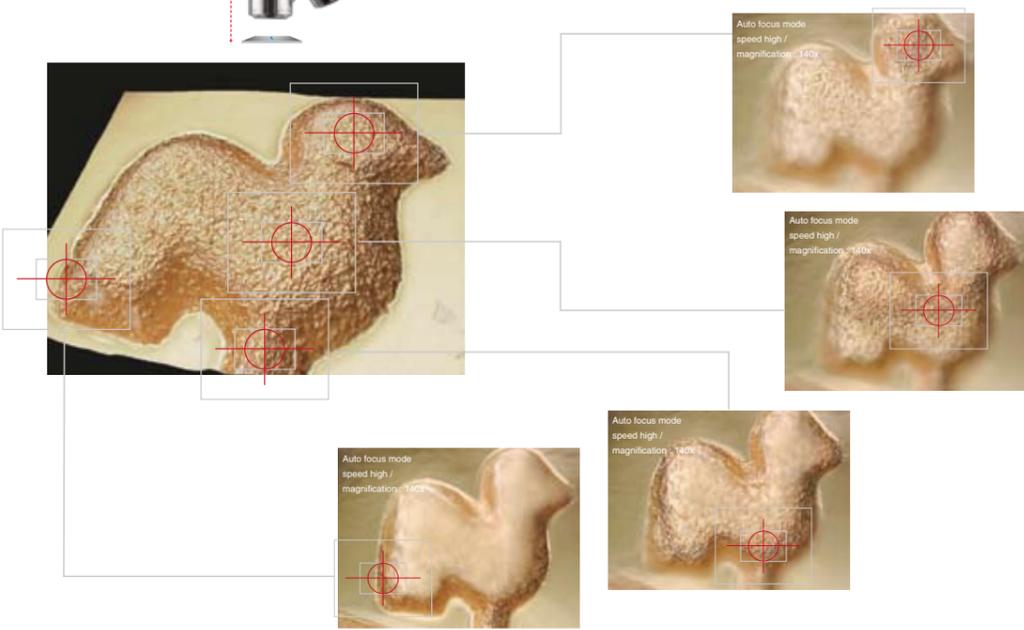
This instantly creates a fully focused image of the area the user wishes to view, even for objects with differences in elevation. Anyone can easily perform expanded observation without being affected by the depth of field.

Further, as height information is included in the fully focused image being observed, it can be switched to a 3D image just by clicking with the mouse.



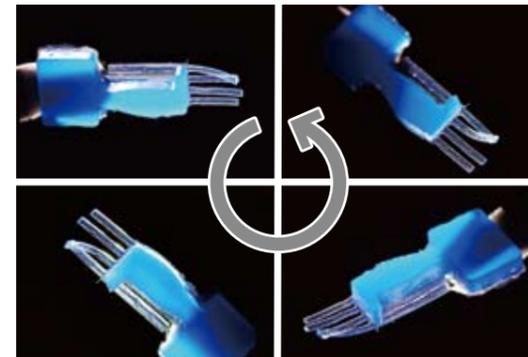
Point Focus (Auto Focus)

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.



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.



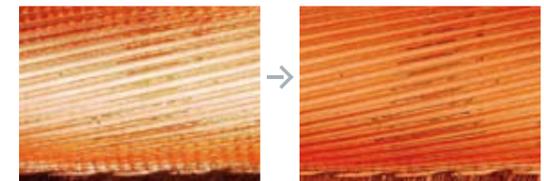
Microhand



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

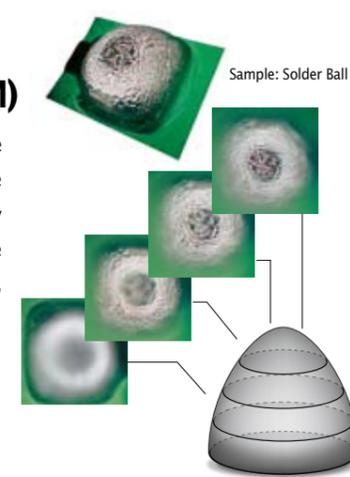


Before

After

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.



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.

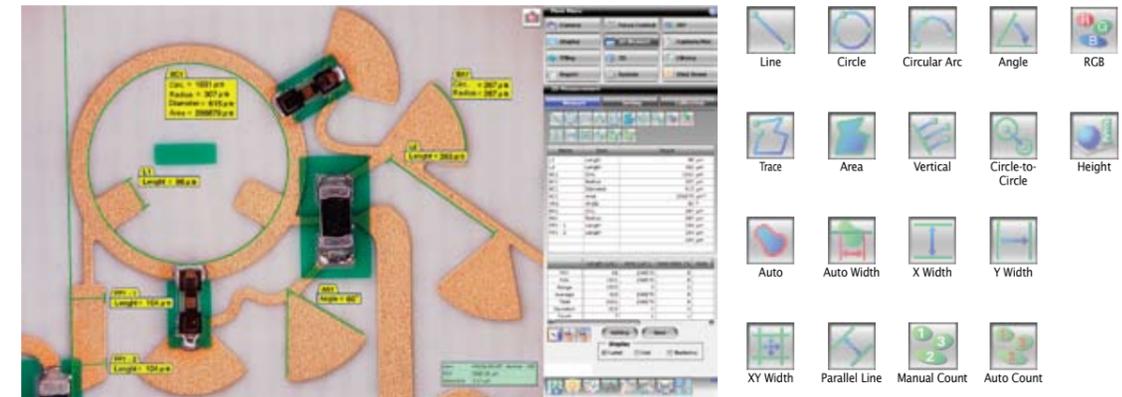
Hirox's unique ACS communication

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.



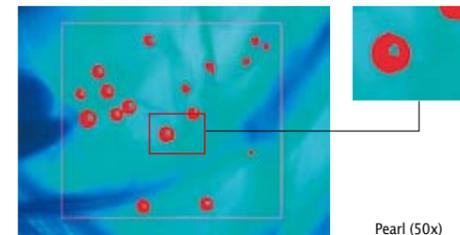
2D Measurement

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 (RGB/Binarization)

Such operations as extracting specified colors from within the same image, as well as counting quantities and measuring areas within specified conditions, can be performed simply.



Height measurement

NEW

Through pairing with an electric stand, height measurements can be performed on 2D measurements. As it is not necessary to perform depth synthesis, work efficiency is improved.



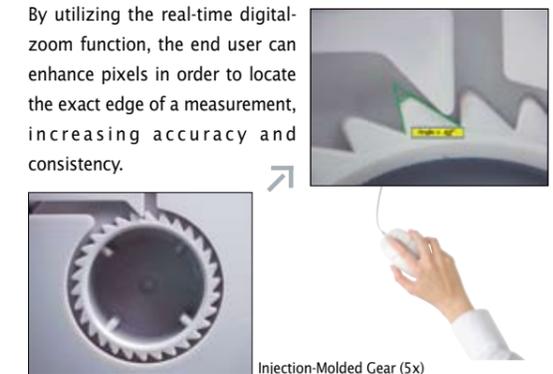
Multi View Measurement

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.



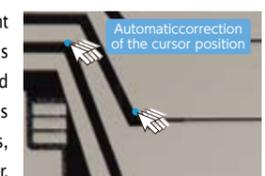
Calibration / Lens Settings

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.

Edge Adsorption

NEW

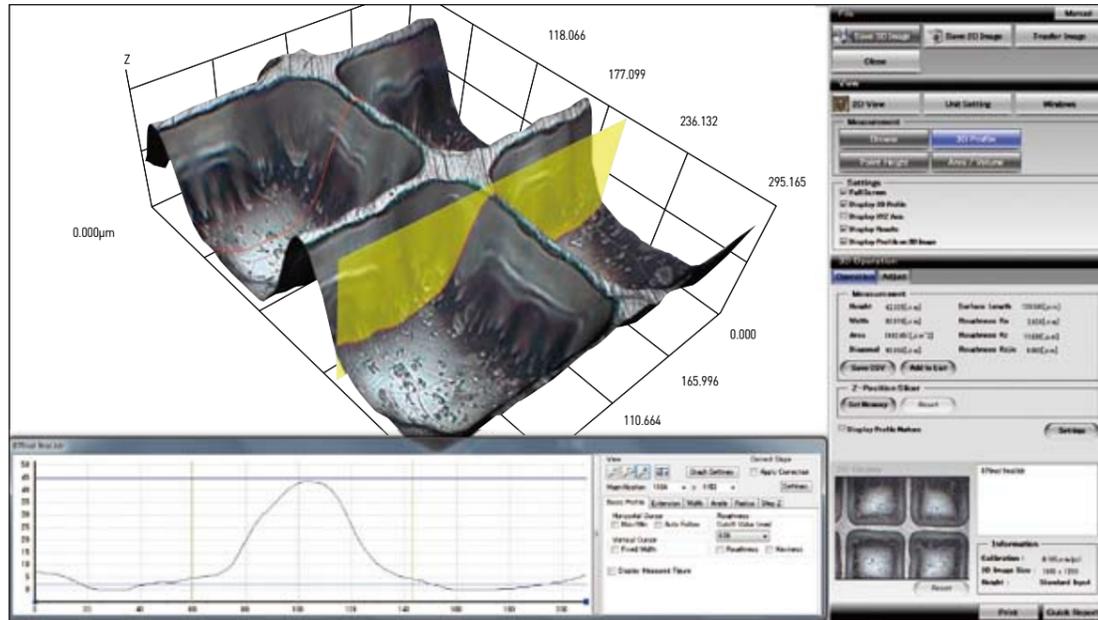
When the cursor approaches a point the user wishes to measure, its position is automatically corrected to match the edge. This reduces inconsistencies in measured points, which tend to occur for each operator.



Display in High Resolution 3D

Fastest System to Create a 3D Model

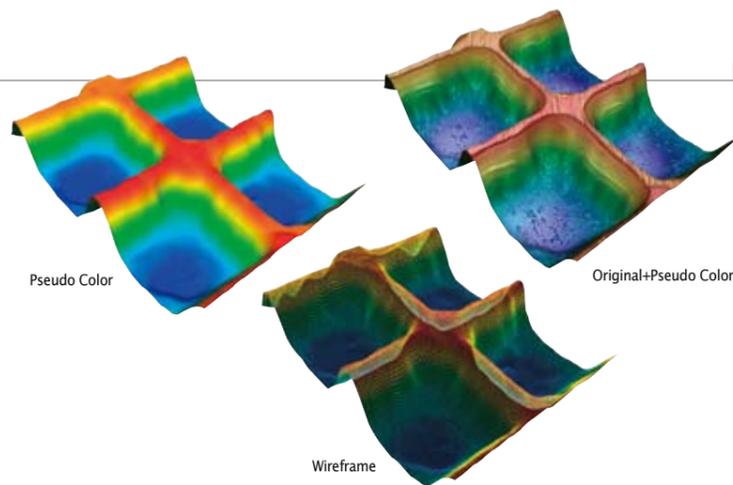
When capturing 10 image planes, it only takes 4 seconds to display a high quality 3D model. The integrated stepping motor allows for faster, smoother, and more accurate scanning with 0.05 $\mu\text{m}/\text{pulse}$ precision and 30 mm of automated travel. Paired with the CT-R01, controlling focus manually is a thing of the past.



3D Viewer

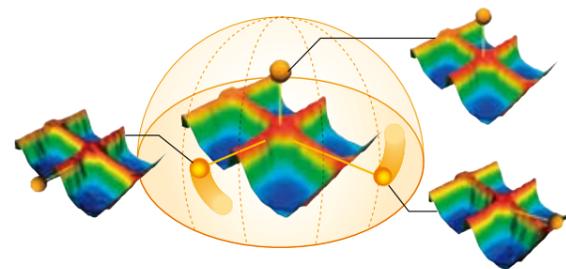
3D Display

3D model information can be displayed as original color, pseudo, or as a wireframe, maximizing the amount of information that can be taken from a 3D model. Original and pseudo color can be mixed on the 3D model.



Lighting (Flashlight)

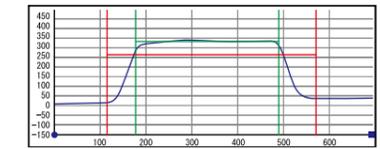
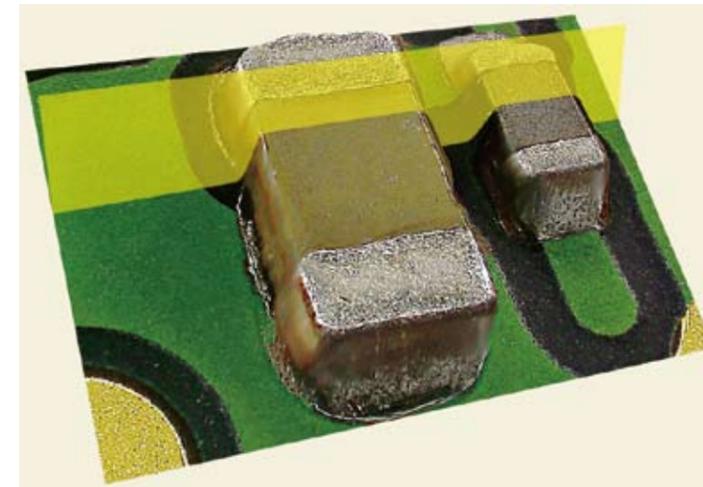
Manipulate the lighting digitally after building a 3D model in order to yield more data. Variable lighting through the software allows the end user to improve edge contrast after capturing.



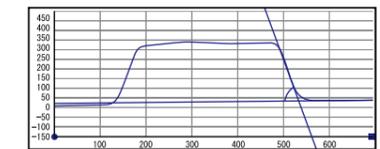
3D Profile Measurement

Numerical Data Supporting Accurate Analyses

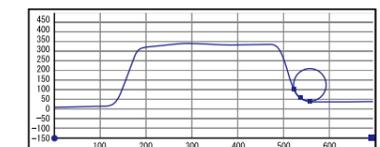
Quantify 3D data by associating the profile graph with the image display area. Intuitively measure 3D height information as well as have the capability to extract angle and radius data.



Width and height measurement



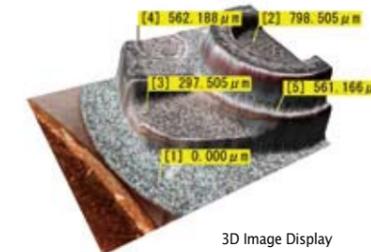
Angle measurement



Radius measurement

Point Height Measurement

Display point height by simply clicking on the 3D model. With each click, height value labels are displayed from a standard zero point or a zero point can be set (new reference point) to a specific position on the model. Point height measurements are possible in both 2D and 3D rendered images.



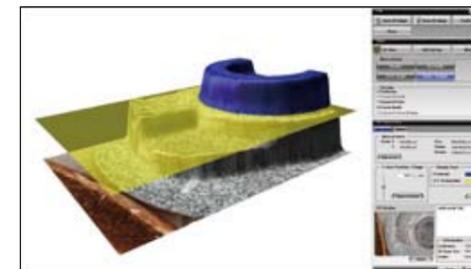
3D Image Display



2D Image Display

Volume and Area Measurement

The operator can adjust the slicer to measure volume, surface and cross-section area on the 3D model.



Roughness Measurement (Ra, Rz, Rzjis)

Engineering advances in the KH-8700's software includes profile line Roughness measurements giving the end user more quantitative data than before.

Level Correction

The level correction feature gives the end-user the ability to adjust the surface on the image without touching the sample.

Noise Filter and Reduction

The advanced Noise Filter reduces unwanted static and provides a more clear image.

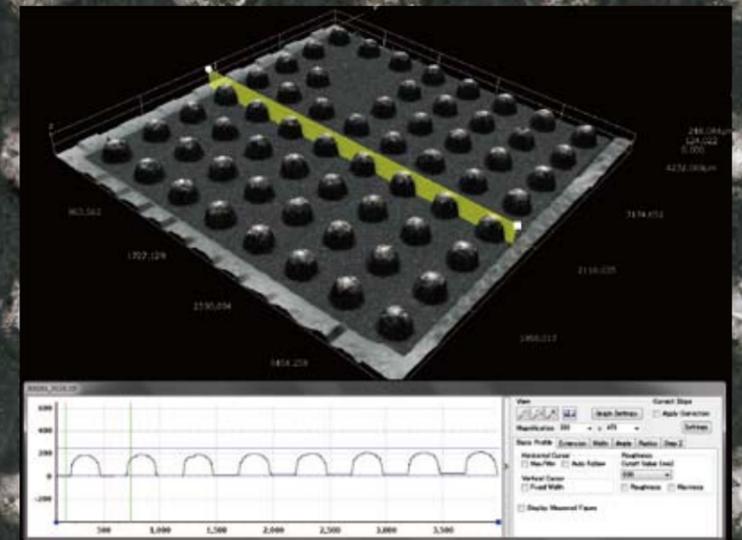
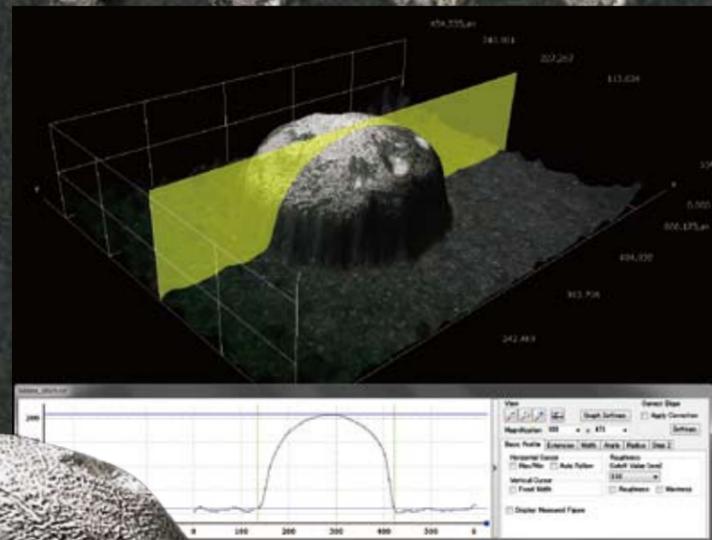
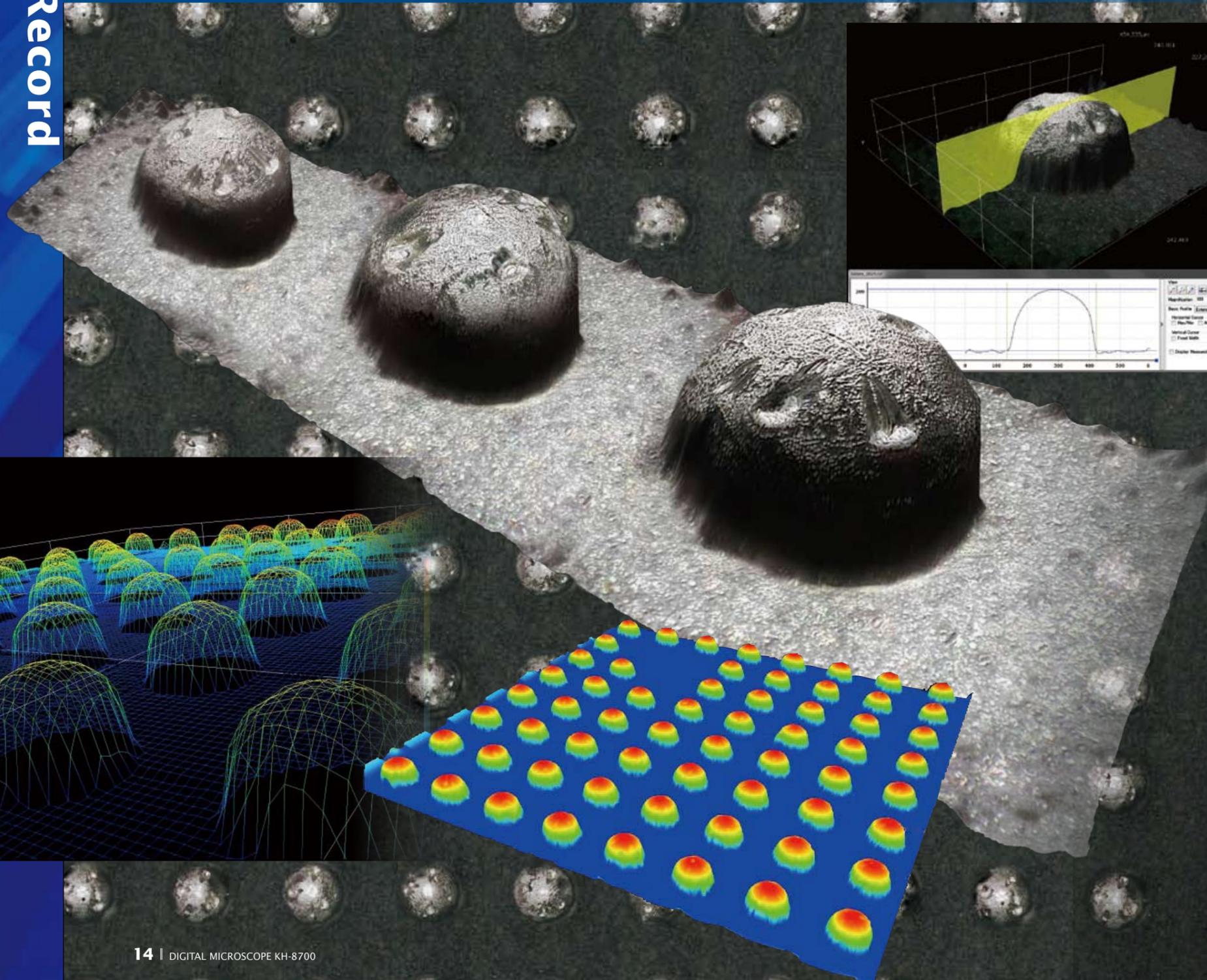
Export 3D Models Files by CSV Format

The 3D models can be exported as a CSV file format into any other 3D analysis application software.

Capture and Record

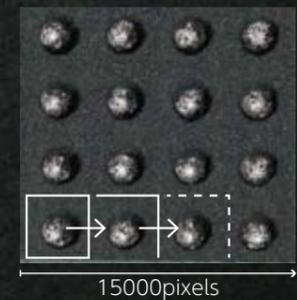
Create Analytical Data of the Smallest Details in the Highest Resolution

The tiling function realizes the ultimate ideal demanded for a digital microscope, that is, offering wide-view but high-resolution images. Ahead of the common sense with the optical microscope that a higher magnification makes the resolution higher but the field of view smaller, the KH-8700 digital microscope offers high-resolution and wide-view images. Hirox's high-level technology to combine high-resolution images realizes wide-view but high-resolution images.



Smoothly combining 2D tiling

Just moving the stage causes the fields of view of the lens to be combined on a real-time basis, extended up to 15,000 × 15,000 pixels. Giving a breakthrough over the common sense of the relation between the field of view and the magnification, the new technology easily realizes wide and detailed observation and highly fine measurement with wide fields of view.



High-speed processing technology

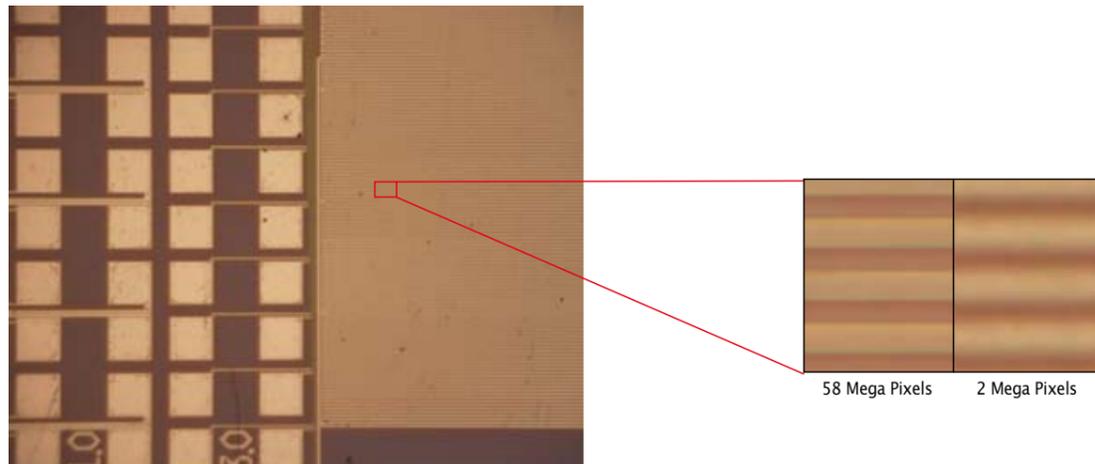
The 2D tiling function combines images on a real-time basis simply by moving the stage. The 3D tiling is available by automatically and appropriately controlling the Z axis based on the information given by the ACS. Operating two times more quickly than the conventional models, the KH-8700 greatly shortens the time before observation.

EDP (Enhanced Digital Processing)

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

58 Mega Pixel High Resolution Image

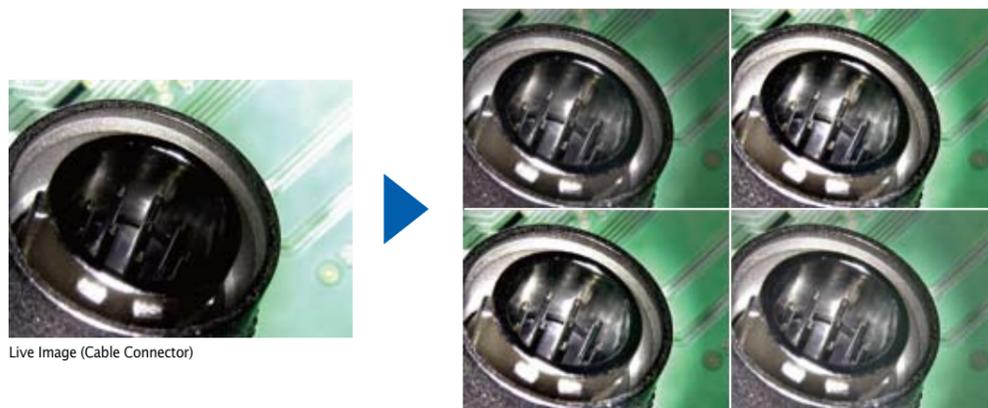
Constantly improving with technology, 58 mega pixel images are now supported to provide optimal resolution and on-screen clarity, also decreasing aliasing noise (pixilation) when controlling real-time digital zooms.



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

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.

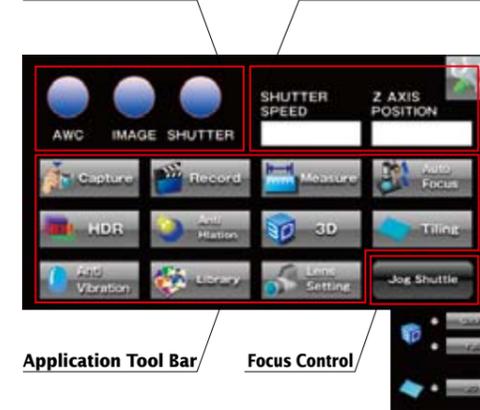
Lighting Level Knob

Adjusting the lighting level of the on screen image.



Remove Device Menu Screen

Camera Setup Control



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.



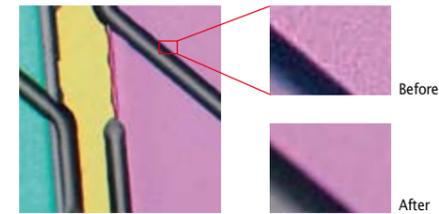
Split Window (Multi-View)

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.



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.



Library - Explorer

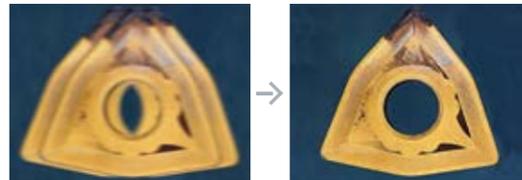
Cover all storage access through the Explorer tab. Organize files by selecting the detail setup. Be able to edit, connect to a network, burn files to a CD/DVD, and print any file directly from the Library.



Library display screen

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.

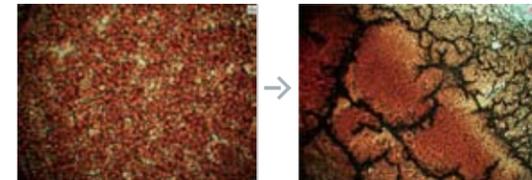


Cutting Bit (20x)
[Before Image Stabilization]

Cutting Bit (20x)
[After Image Stabilization]

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.

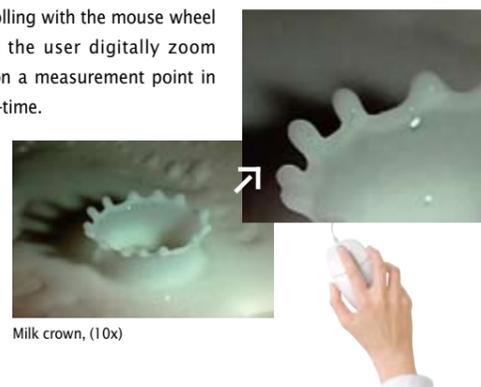


Blood Serum (1500x)
[Recording Starts]

Blood Serum (1500x)
[Recording Ends]

Real-Time Zooming

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



Milk crown, (10x)

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.



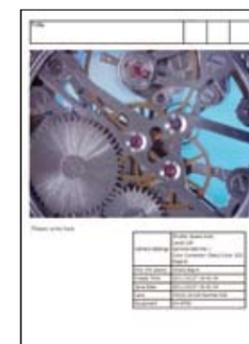
IC pot bonding, (2000x)



BGA, (200x)

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.



Personal 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.



Quick Launch

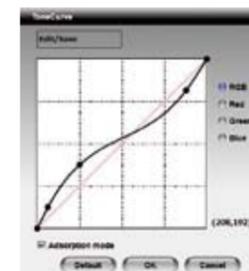
A quick launch feature is always present on screen to easily go to various controls that are most used. These controls include lighting adjustment, image capture, a print tab, and other shortcuts.



Live image correction feature

NEW

It can reflect features that automatically correct brightness inconsistencies, as well as brightness/contrast corrections, in live images. This allows for more optimal observation.

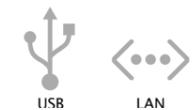


Printer

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

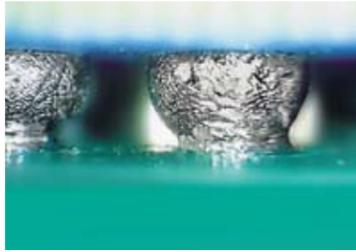
Electric/Electronics



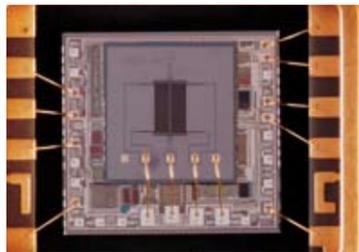
GFP (150x)



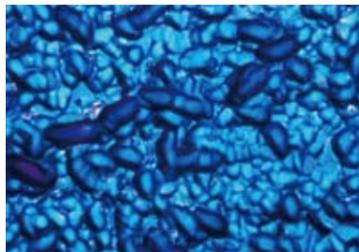
Electronic Component (100x)



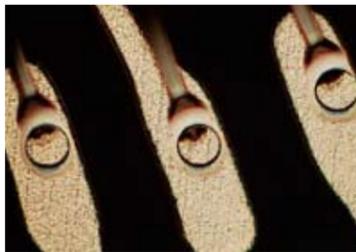
BGA Ball (150x)



IC Package (100x)



Solar cell (2500x)



Wire Bonding (2000x)

Material/Metallurgical



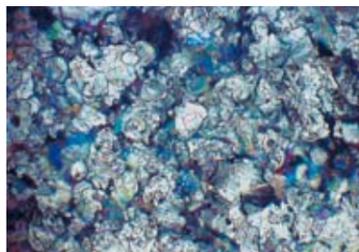
Metallographic Structure (700x)



Metal Corrosion (50x)



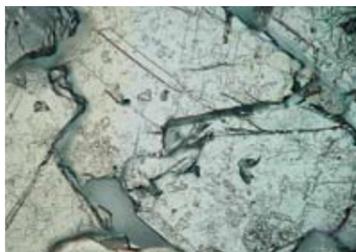
Fatigue Fracture (20x)



Silver Coating (1400x)



Section Fatigue Crack (50x)



Metallic Organization (2000x)

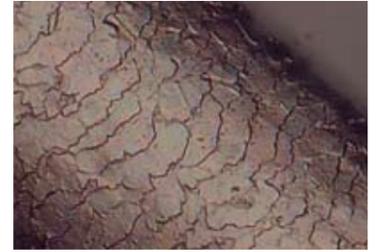
Organism/Healthcare



Mouse Fetus 10.5 Days after Conception (150x)

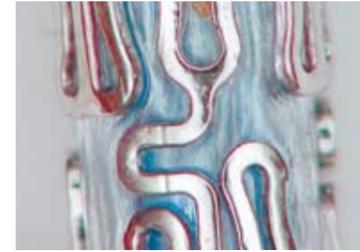


A Fruit Fly (100x) – Split Image



Hair Cuticle (3500x)

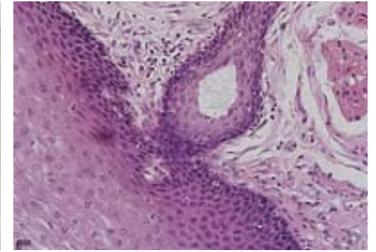
Medical/Pharmaceutical



Stent (150x)

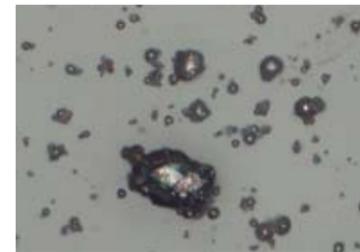


Protein Crystals (100x)



Smear Cell (2100x)

Forensic



Bullet Powder Residue (1750x)



Textile Color Comparison (1000x) – Split Image

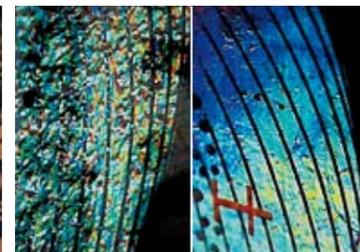


Bullet Shell Comparison (100x) – Split Image

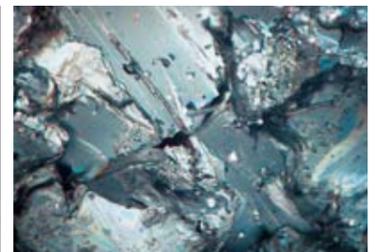
Other Applications



Carbon-Based Film (1000x)



Counterfeit Money (350x) – Split Image



Single Crystal Superconductor (1000x)



Petroleum Research (50x)



Bone 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.

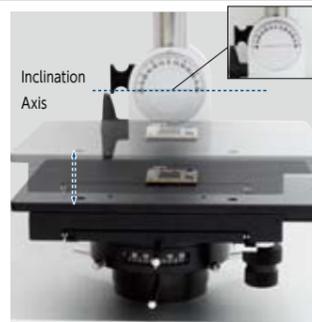
Dynamic Focus Control

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

[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.

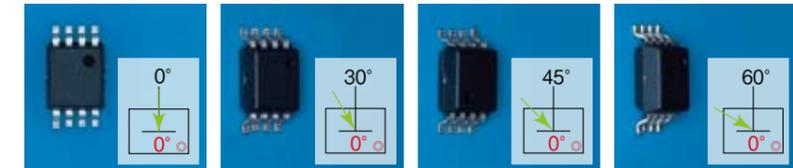


[Base] **Structured Stability and Vibration Absorber**

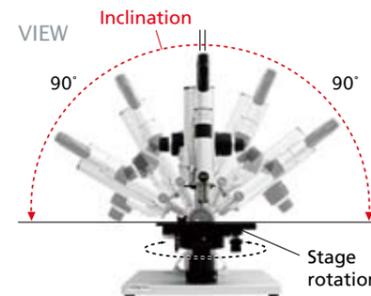
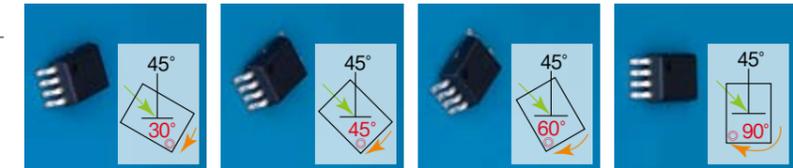
Weight distribution designed to eliminate vibrations and a specialized material reduces a wide range of vibrations.



Inclination



Rotation



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 ∞-5x magnification lens to a 5x-50x par-focal magnification lens.



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

Dual Illumination Revolver Zoom Lens

MXG-2500REZ

35x-2500x

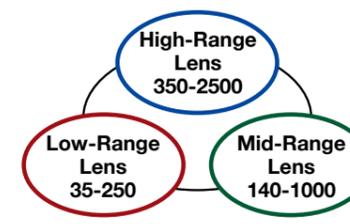
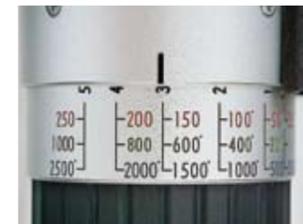


Incredibly wide zoom range with a triple objective turret. The dual illumination mechanism provides both co-axial and ring lighting. The operator is free to choose either setting or a mix of both in order to cover a multitude of applications. The lighting system is integrated into the lens and no additional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



MT-C16III

0-20x

Model	MT-C16III
Magnification	0x to 20x
Field of view	—
Operable distance	—

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.



Ring illumination device attached

MX-MACROZ IV

0-50x

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)

Straw-scope Lens

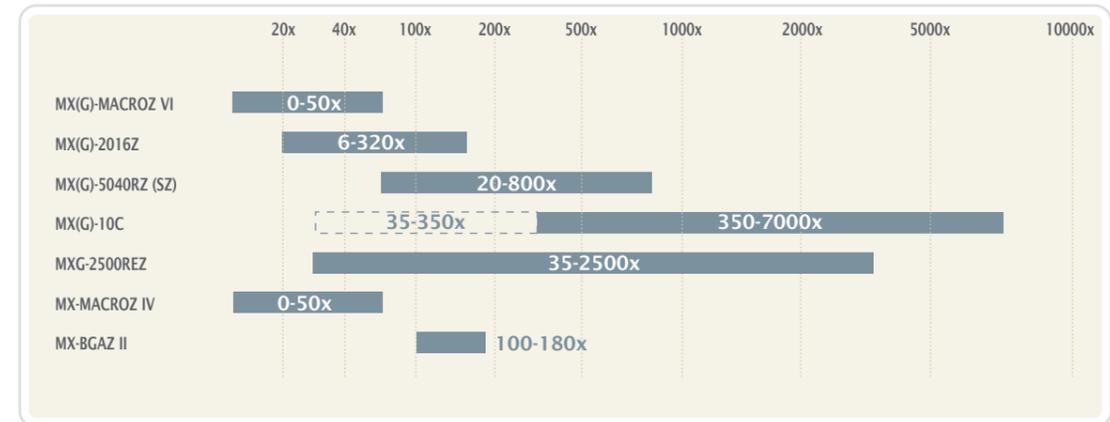
The Straw-scope Lens allows Observation in Congested Areas

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.



MX-STZ Lenses

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				
View angle	40°	40°	40°	40°	40°



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.

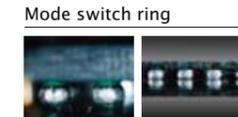
Rotating lens accepting large PCBs

Optical rotary ring



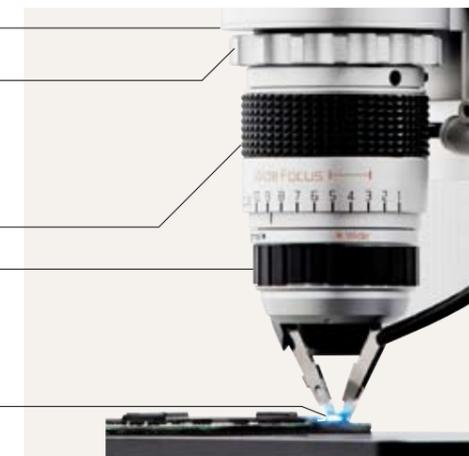
Upper contact Lower contact

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.

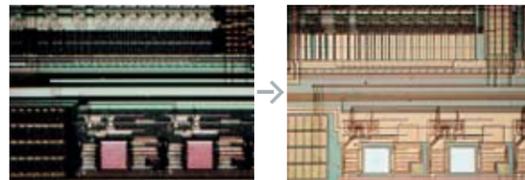


Coin (20x)
[Vertical Lighting]

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.

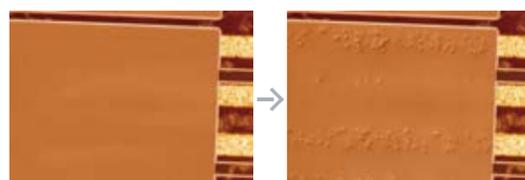


Freckle (50x)
[Lateral Lighting]

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.

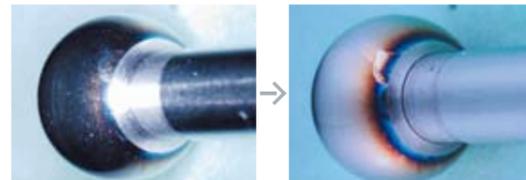


Impression of liquid crystal conductive ball, 200x [Lighting for light fields of view]

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.

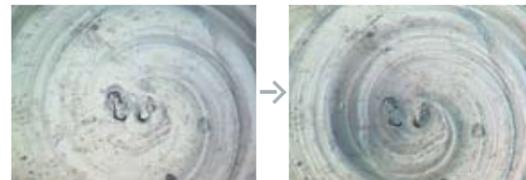


Ball Joint (40x)
[Vertical Lighting]

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.



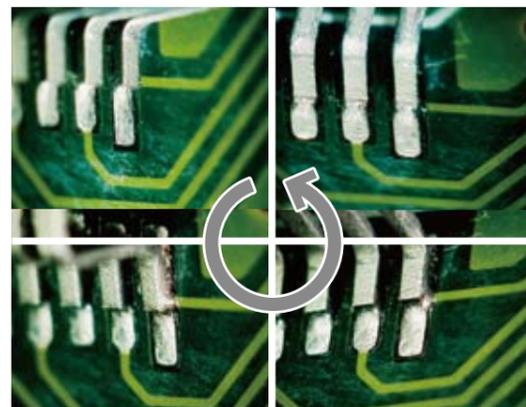
Bottom of a Can (250x)
[Vertical Lighting]

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 (30x) (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
		AUTO (0 d B to 6 d B) , MANUAL (0, 3, 6, 9, 12 d B) , 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 ²
	Contrast ratio	1000:1 (Typ)
	Visual field angle	±85 (horizontal) ±80 (vertical)
Light source	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	MXG 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)
	LAN	10BASE-T/100BASE-TX/1000BASE-T
Interface	USB2.0	6 routes (side: 2 routes, rear: 4 routes)
	RS232C	General purpose port (expansion port)
	Remote device	Dedicated terminal
	Recording media	Hard disk 500GB included (recording/ storage area: 360GB)
	External recording media	External DVD drive (USB2.0) supported/ external HDD
Recording		CD-R/RW, DVD±R/RW, etc.
	Still image formats	Non-compressed: TIFF, BMP, Compressed: JPEG
		Supported image size: 15000 (H) X 15000 (V) Pixel (for image connection)
		Normal capture
	Still image recording pixel	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)
	Rated power supply voltage	AC100 to 240V, 50/60Hz
Usage environment	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)

*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.

Various functions

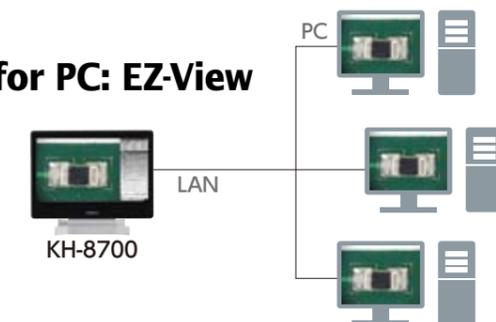
Observation settings	Camera preview function
	Camera image setting
	Camera setting storage
	Camera setting optimization function
	Z axis focus control function
	Rotary head control function
	Auto focus function
	Focus indicator function
	Digital zoom function
	HDR processing function
Anti-halation processing function	
High-resolution capture function	
Preview function (HDR, anti-halation, 3D configuration)	
Image adjustment function (noise removal, edge processing, etc.) (animation supported)	
Division/display	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
3D roughness measurement function	
3D height measurement/ 3D point height measurement function	
Noise removal/ cut function	
3D tilt correction function	
Tiling	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

NEW

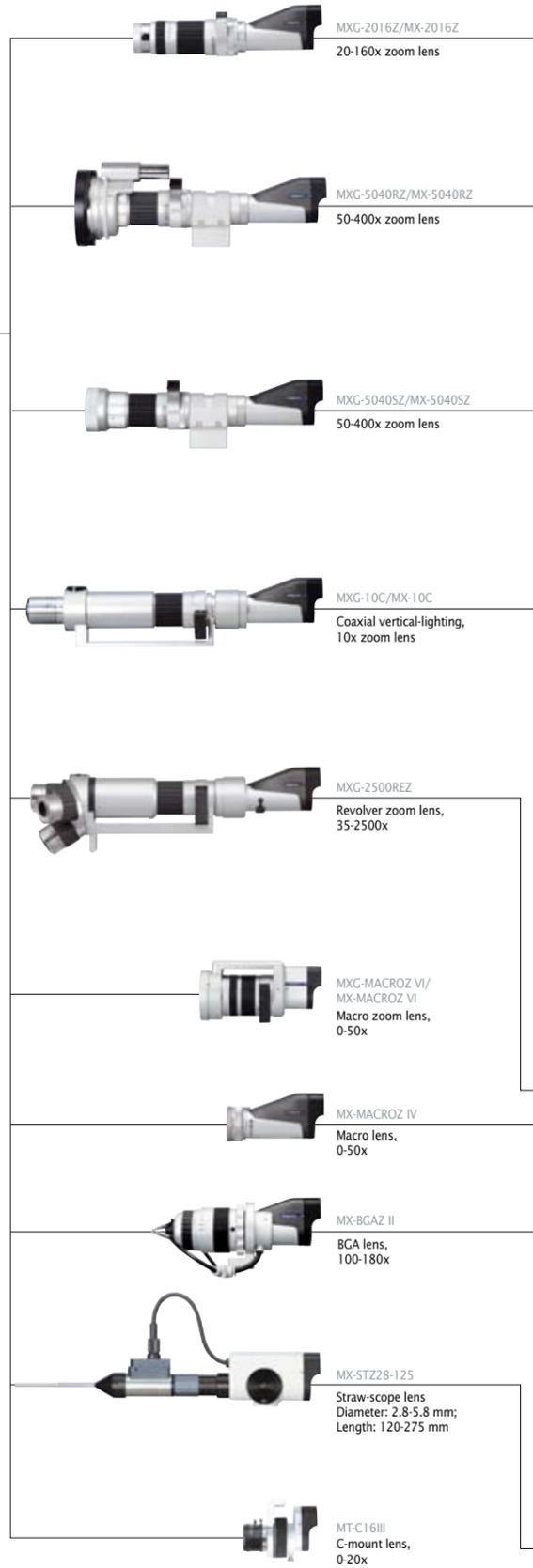
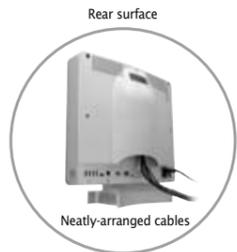
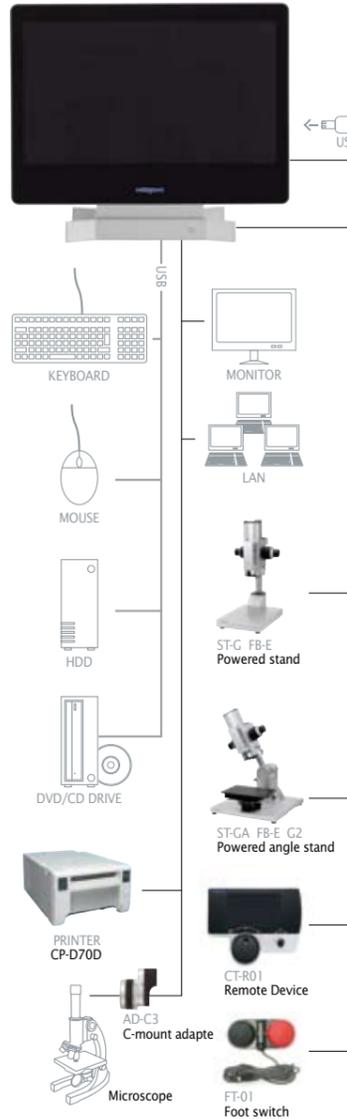
Measurement/Network Software for PC: EZ-View

As calibration information is included in images captured with the KH-8700, measurements can be performed on a PC in the same fashion as the KH-8700.

If the KH-8700 is connected via network, the images stored in it can be directly browsed from a PC, and images and measurement results can also be forwarded to Excel.



System configuration sample



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 adapter
AD-2016LS/L Lateral viewing adapter	AD-2016D Diffuse lighting adapter	AD-2016HIS High-magnification, variable-lighting adapter	AD-2016P Polarizing adapter	AD-2016C Coaxial, vertical-lighting adapter	AD-2016RLM Rotary head adapter	HS-CH(V7) Lens holder

AD-5040HS Non-contact adapter	AD-5040DS Diffuse-lighting adapter	AD-5040SVS Contact adapter	AD-5040LOWRS Low-magnification rotary head adapter	AD-5040HIRS 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-5040HIS High-magnification adapter	AD-5040SS Variable-lighting adapter	AD-5040SHIS 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-5040LOW Low-magnification adapter	AD-5040HI High-magnification adapter	AD-5040SHI High-magnification, variable-lighting adapter
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AD-10DIC DIC 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 MX(G)-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
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NR-405-M4 Ring lighting for MX-MACROZ IV
AD-BGABL Backlight
AD-STL Lateral viewing adapter Others φ3.05~6.3mm 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 (XY-G2), Stage block (XY-C)
- XY stage unit for transmitted lighting: XY stage for transmitted lighting (XY-GB2), Stage block for transmitted lighting (XY-CB), Fiber for transmitting unit (R-578)
- Powered angle stand: Base plate and angle pole section (ST-GA), Motor block (FB-E) and XY stage (XY-G2)

Standard Stands / Stages

STAND

- ST-HE Standard stand
- ST-HL Large stand

STAGE-UNIT

- AS-XY XY stage
- AS-XYL Large slide stage
- AS-BH BGA PCB holder

■ included in the microscope package.