HiROX
http://www.hirox.com

3D DIGITAL MICROSCOPE
RH-2000

Exactly 30 years ago, the first video microscope was invented by Hirox.

Today, strong with our tradition of high quality optical manufacturing,
we are reinventing 3D Digital Microscopy to offer you an instrument
easier, faster and stronger than ever.

Cutting-edge Technology

Faster, easier, stronger

New mounting system

Fast and easy mounting of the camera using bayonet system with built in electrical connections for automatic lens and adapter selection, control of the rotation and more... without additional cables.

High Intensity LED Lighting

The new high intensity LED light source provides true color reproduction (5700K color temperature) and 30.000 hours lifetime (about 14 years).

Light Guide
Built-in light guide
Control through myCom

CMOS Sensor
Up to 100 frames/sec
1920 x 1200 Resolution
High Dynamic Range
High Contrast and Digital Noiseless

New Sensor

State-of-the-art CMOS sensor with improved light sensitivity and very low image noise. The resolution is higher than Full HD (1920x1200), at a very fast 50 FPS (special 100 FPS mode at half resolution).

Communication Connector
Lens / Objective / Zoom Information
Control Rotary Head

Bayonet Mount
Quick Lens Attachment

Super fast USB3 connection to any PC

Freedom to choose Fast PC, Full HD Screen, Windows 7, 8 or 10, desktop or laptop*, via an ultra fast and universal USB3 connection up to 5Gb/s.
The obsolescence is therefore limited, and offers endless future updates.
And thanks to the touch screen you can enjoy an even higher comfort of use!
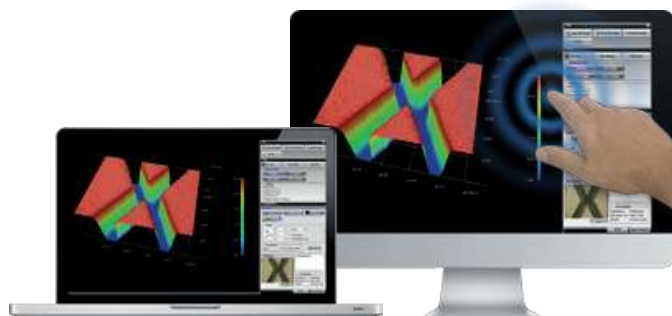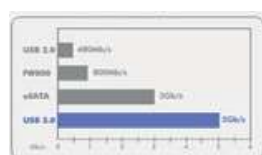
* depending on PC configuration and screen resolution

High quality observation

Perfect imaging and most accurate measuring

Auto focus - Multifocus

Ultra fast auto-focus and multi-focus! Get a fully focussed image with one click thanks to our high speed algorithm and very accurate motorized Z-axis movements (50 nanometers per step).
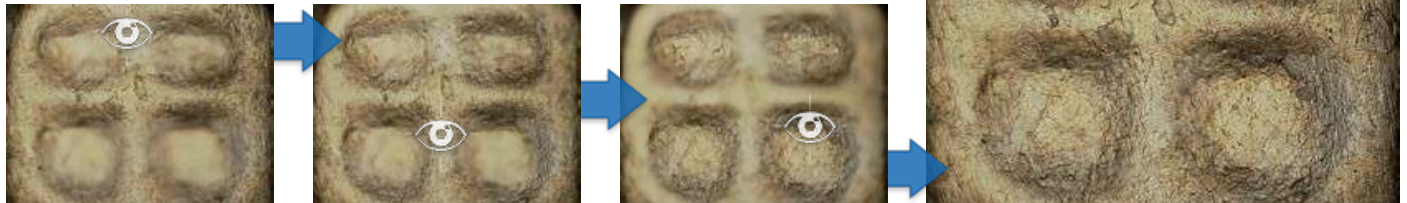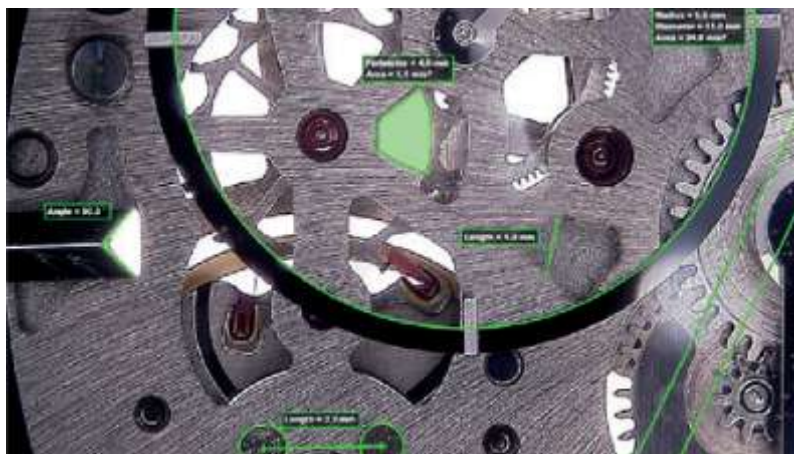

## High Dynamic Range (HDR)

Save time by quickly optimizing the image. With 1 click, the HDR function creates an image with the perfect exposition by combining many levels of light intensity: all information in the highlights and the dark areas is captured without any difficulty.

2D Measurement

| Line | Circle | Circular Arc | Angle |
Trace	Area	Vertical	Circle to circle
Auto	Auto width	X Width	Y Width
XY Width	Parallel Line	Manual Count	Auto Count

The RH-2000 offers accurate and calibrated measurements in real-time, including length, area, angle, diameter or automatic surface area. The combination of encoded optics and powerful software eliminates any human errors by automatically selecting and displaying the correct lens, adapter and scale on the screen at any time. In addition, the actual dimension and measurement results can be saved on the captured image or as a CSV file.

Auto count functions
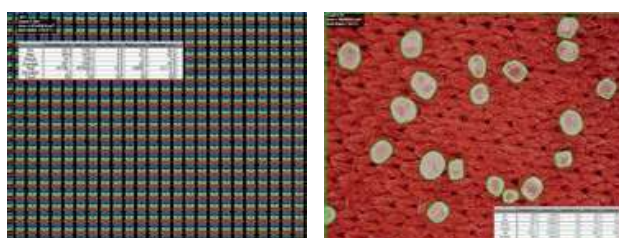
Advanced software algorithm allows automatic detection and count of particles, based on contrast or color values: with 1 click the system automatically counts parts that have similar colors, with advanced statistics.

Statistics & Excel© reports
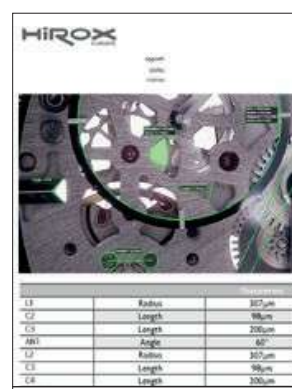
Save time by installing Microsoft© Excel© and automatically create reports including images, lens and magnification details, as well as measurement information. Several templates are available or customizable to your taste. Reports can be printed, saved, or exported to spreadsheet applications.

Fastest way to create 3D Model

Smoother, and more accurate scanning with 0.05μm/pulse precision

detail of a coin
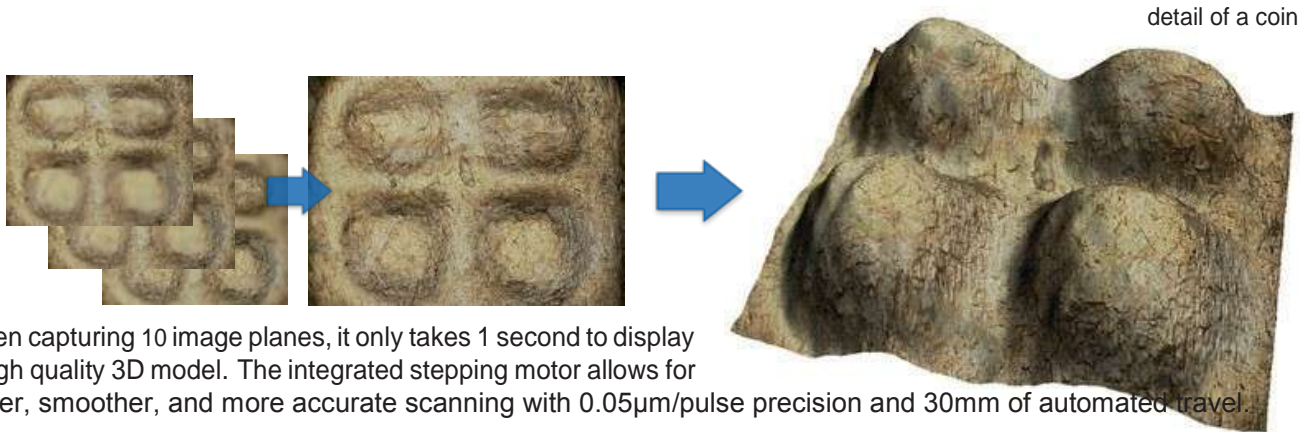
When capturing 10 image planes, it only takes 1 second to display a high quality 3D model. The integrated stepping motor allows for faster, smoother, and more accurate scanning with 0.05μm/pulse precision and 30mm of automated travel.

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.

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) from a specific position on the model. Point height measurements are possible in both 2D and 3D rendered images.
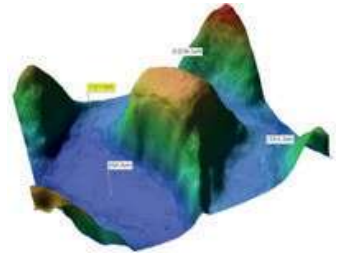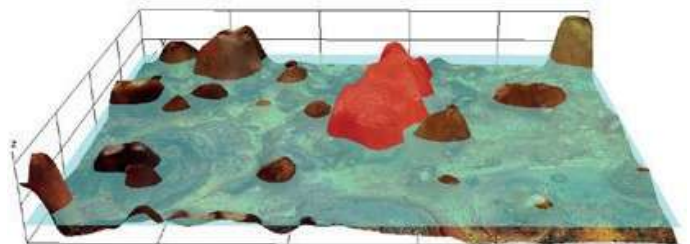
Profiling
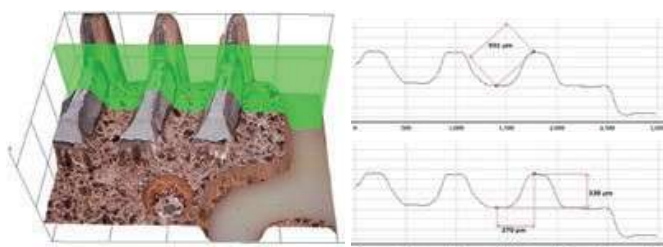
Simply adjust the slicer to visualize and measure any details on the 3D object: the profile created is like a virtual vertical cross section allowing precise measurements.

Volume and area

Volume and area can also be measured on the 3D object by adjusting the horizontal cross section and clicking on the area of interest.

Angle/radius in 3D

Using the profile measurement function, it's very simple to measure any radius on a 3D object by simply "drawing" a circle with 3 points or any angle by selecting 2 lines crossing each other.
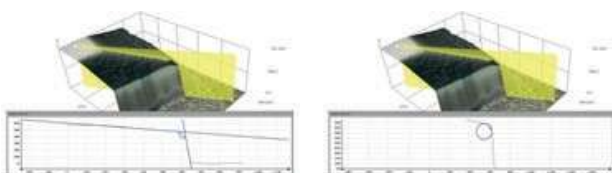
Roughness (Ra, Rz, Rzjis)

The powerful 3D software enables accurate line roughness measurement Ra and Rz (ISO4287:1997) and is compatible with optional surface roughness measurements (Sa, Sq, and many more) .

Easy 2D and 3D Tiling

Combining wide-view and high-resolution images

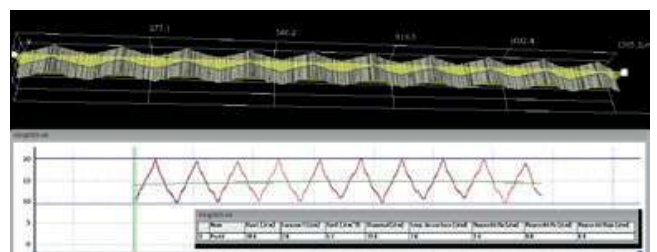Until now, it was a constant challenge for optical microscopes to capture images with a high optical resolution and a wide field of view simultaneously. Hirox's new process does not require a specified position to match tile to tile. The image will automatically begin tiling seamlessly in real-time just by moving the XY stage. This new method increases the field of view up to more than 350 times while retaining a high optical resolution.

1920px

1200px
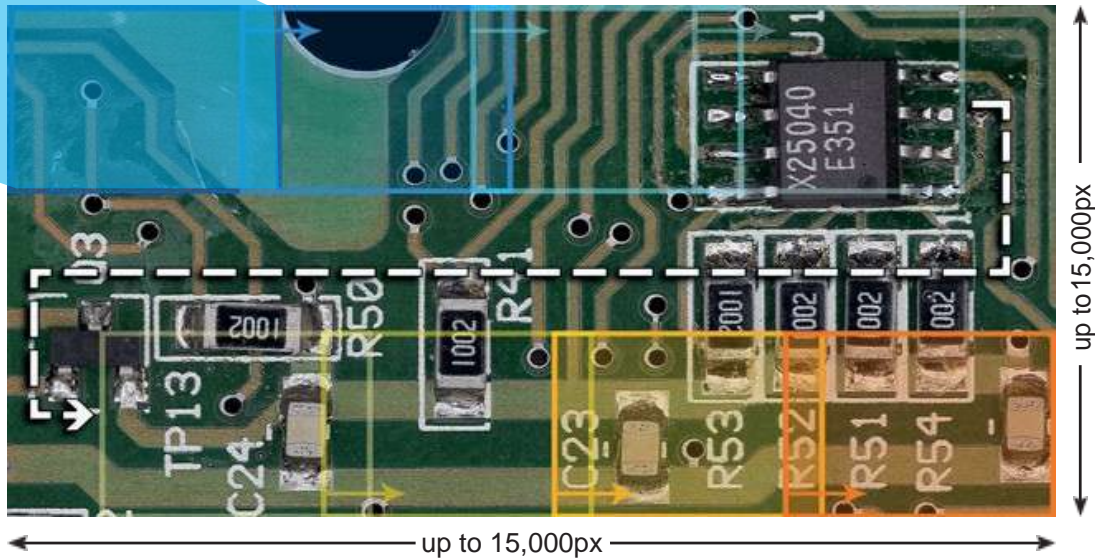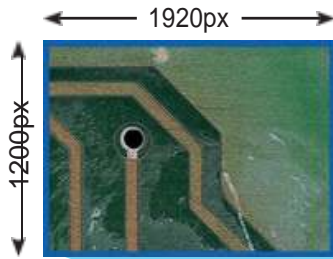
Easy panorama at micro scale: discover a new relationship between Field Of View (FOV) and magnification: the new Hirox technology easily allows detailed observation allowing fine measurement while getting the advantages of wide field of view.

up to 15,000px

up to 15,000px

Full Auto 3D Stitching with high precision motorized XYZ movement
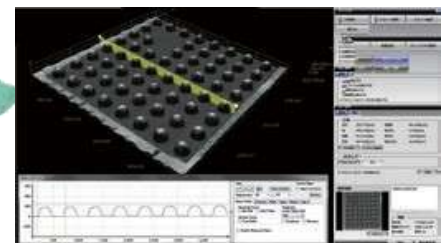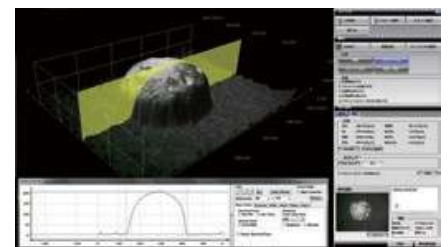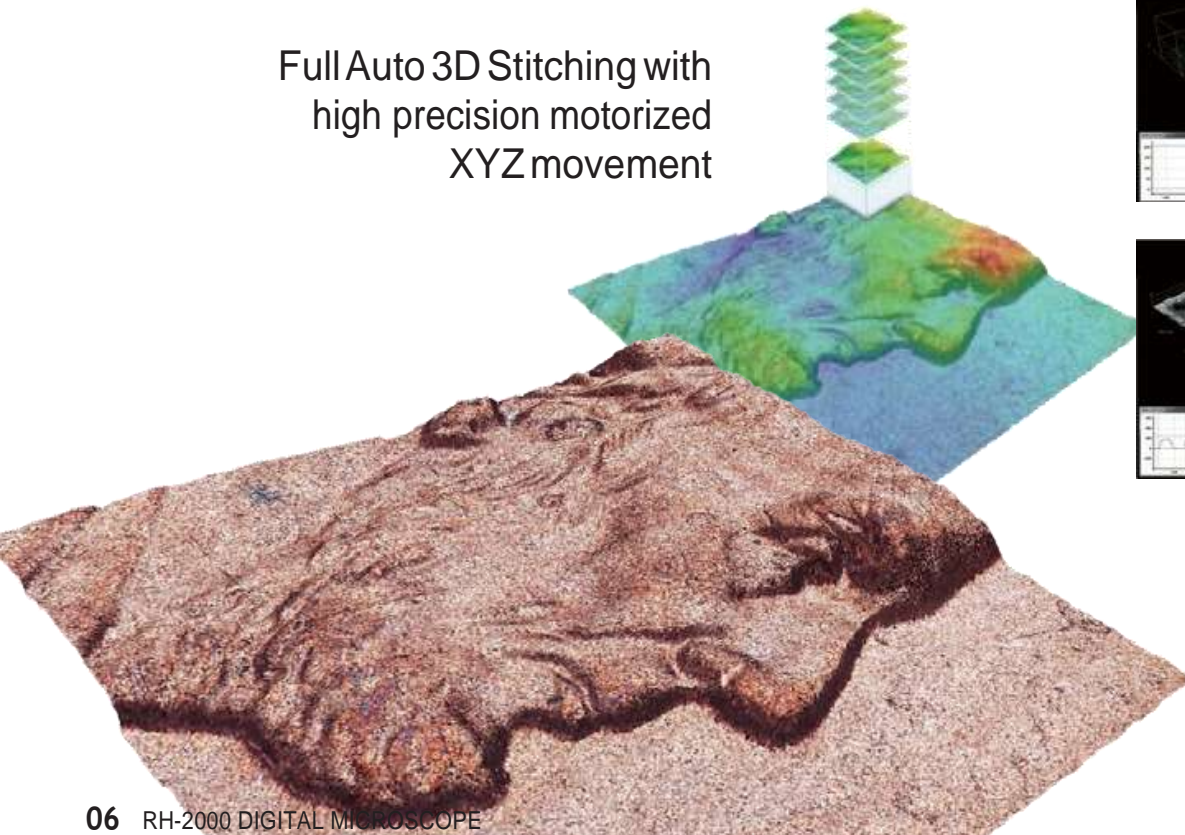
3D stitching of BGA balls

High quality optics

All lenses include high-performance zoom incorporated technologies, as well as high-grade built in illumination, and precision mechanism designs, crafted with pride by the lens manufacturer, Hirox.

The patented Hirox motorized rotary head creates a unique 360° «helicopter» view over an object : discover inaccessible details, without any manipulation.

MXB-2016Z *Low Range High Resolution Zoom Lens*

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.

Magnification	20～160x
Field of view	15.4～2.0mm (H)
Working distance	44mm

MXB-2500REZ / 5000REZ *Dual Illumination Revolver Zoom Lens*

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

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

	Low-Range 35～250x	Mid-Range 140～1000x	High-Range 700～5000x
Magnification			
Field of view	8.71～1.22mm (H)	2.18～0.31mm (H)	0.43～0.06mm (H)
Working distance	10.0mm	10.0mm	3.4mm

MXB-5040RZ *High Resolution Zoom Lens with Optical 3D Rotation*

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.

Magnification	50～400x
Field of view	6.1～0.78mm (H)
Working distance	54mm (RZ)/63mm (SZ)

MXB-10C *High Range / High Resolution 10x Co-Axial Zoom Lens*

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.

	OL-35 35～350x	OL-70 II 70～700x	OL-140 140～1400x	OL-140 II 140～1400x	OL-350 II 350～3500x	OL-700 II 700～7000x	OL-1000 1000～10.000x
Magnification							
Field of view	9.63～1.05mm (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)	0.3～0.03mm (H)
Working distance	34mm	21mm	30.5mm	12mm	10.6mm	3.4mm	1mm

High performancestands

A high performance lens requires a high performance stand to show its' power while being 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.

Combine this stand with the optional Electronic Focus Block (50 nanometers / pulse) for 3D observation and height measurements.
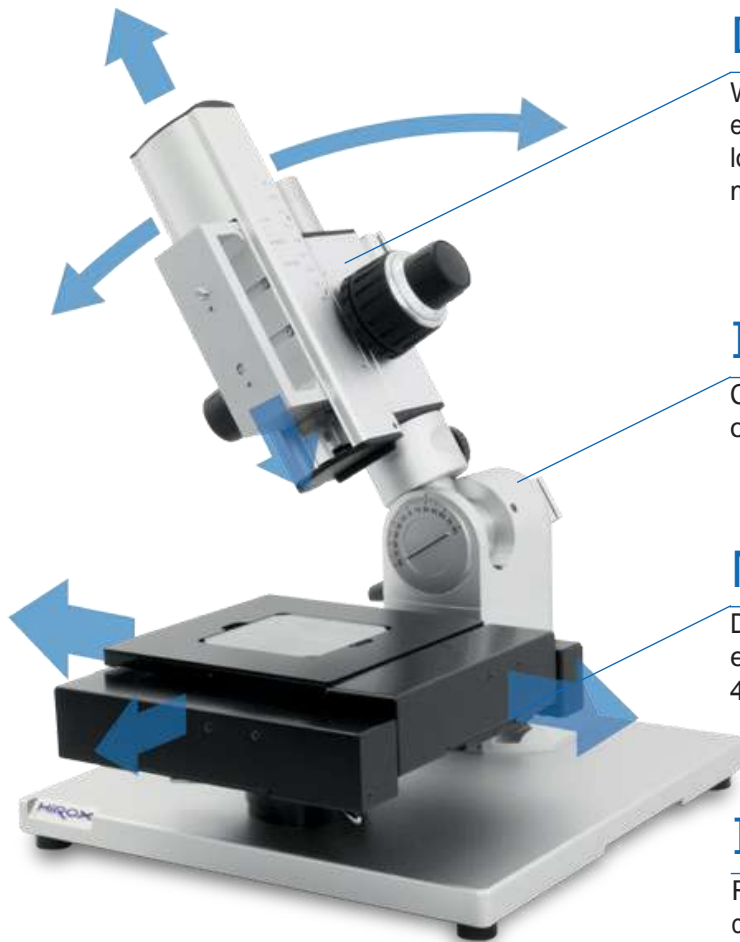
Dynamic Focus Control (Z-Axis)

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.

Inclination stand

Choose up to 180 degrees of inclination with stage rotation for target observation.

Motorized XY-Axis Stage

Designed with a compact body and integrated motor drivers, it can be easily controlled by joystick or dragging mouse.
40mm x 40mm working range with high precision of 0.04 µm step

Interactive 3D Controller

Redefining ease of use: control with one hand the auto XYZ movement, capture images and much more!

VIEW Inclination
90°   90°
Stage rotation

Inclination Images
0°   30°   45°   60°
0°   0°   0°   0°

Rotation Images
45°   45°   45°   45°
30°   45°   60°   90°

08 RH-2000 DIGITAL MICROSCOPE

System configuration

PC / Network

All-In-One PC
with Touchscreen

Desk Top or Mini PC
with monitor

Camera Unit / Devices

RH-2000

Camera

FT-01
Foot Switch

3D Mouse

High Quality Lenses

MXB-2016Z
20-160x (6-320x) Zoom Lens

MXB-5040RZ
50-400x (20-800x) Zoom Lens

MXB-2500REZ
MXB-5000REZ
35-2500x (5000x) Zoom Lens

MXB-10C
10x Zoom Lens (35-10.000x)

MXB-050Z
0-50x Zoom Lens

MXB-MACRO
0-20x Lens

High Precision Stands

Free Angle Stand
Motorized XYZ Axis

Free Angle Stand
Motorized Z-Axis

Straight Stand
Motorized Z-Axis

Straight Stand
Motorized XYZ-Axis

MXB-2016Z Adapters

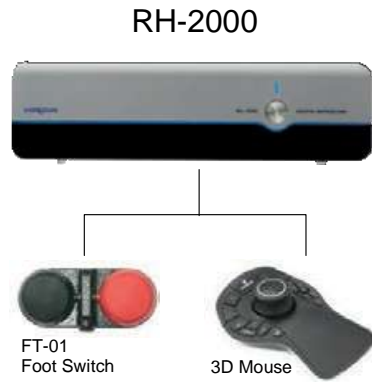| ■ AD-2016H Non-contact adapter	■ AD-2016S Variable lighting adapter	■ AD-2016SV Contact adapter	AD-2016LOW Low-magnification	AD-2016HI High-magnification	ADB-2016RLM 360° Rotary head
AD-2016 (S/L) Lateral viewing adapter	AD-2016D Diffuse lighting adapter	AD-2016HIS High-magnification, variable lighting adapter	AD-2016P Polarizing adapter	AD-2016C Coxial, vertical-lighting adapter	AD-2016RLD Diffuse lighting for rotary head

MXB-5040RZ Adapters

■ AD-5040HS Non contact adapter	AD-5040DS Diffuse lighting adapter	AD-5040SVS Contact adapter	AD-5040LOWRS Low magnification 360° rotary head	AD-5040HIRS High magnification 360° rotary head	AD-5040RVS Variable angle 360° rotary head	AD-5040RVD Diffuse lighting adapter for rotary head
AD-5040LOWS Low magnification adapter	AD-5040HIS High magnification adapter	AD-5040SS Variable lighting adapter	AD-5040SHIS High magnification, variable lighting adapter	AD-5040CS Coxial,vertical-lighting adapter	AD-5040PS Polarizing adapter	AD-5040VLS Lift-off adapter

MXB-2500REZ & MXB-10C Adapters

■ AD-25S1 Directional lighting adapter	AD-25S2 Fixed iris adapter	AD-25S3 Variable iris adapter	AD-25S4 Center iris adapter	ADB-25P1 Polarizing adapter (set of 2units)	AD-25P2 Single wavelength adapter	AD-25R1 Optical rotary adapter

MXB-10C Objectives

OL-35
Objective lens,
35-350x

OL-70
Objective lens,
70-700x

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

OL-350
Objective lens,
350-3500x

OL-700
Objective lens,
700-7000x

OL-1000
Objective lens,
1000-10.000x

NR-405-OL
Ring lighting for
MXB-10C

■ included in the microscope package.

Applications

Automotive

Automotive wire cable   *x80*

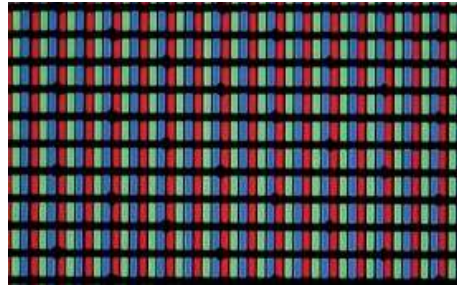## Biology

Close up of an insect head   *x120*
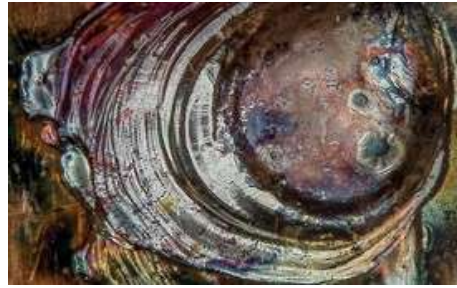
PCB & Micro Electronics

Soldering   *x20*

LCD Screen   *x160*

Watch Making

Watch anchor escapement   *x350*

Material Sciences

Broken composite   *x20*

Welding   *x100*

Metal fracture   *x200*

Forensics

Document falsification   *x350*

Art Restoration

Detail of a painting   *x160*
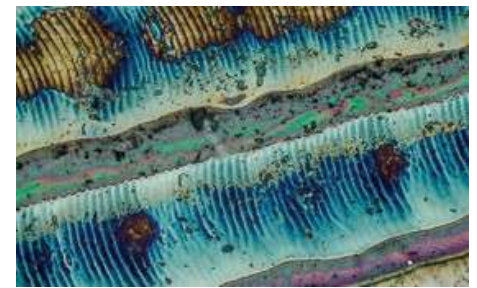
Nano Technology

Nano structure   *x3.000*

Cosmetics

Hair surface   *x1.500*

Metallography

Metal crystals   *x1.000*
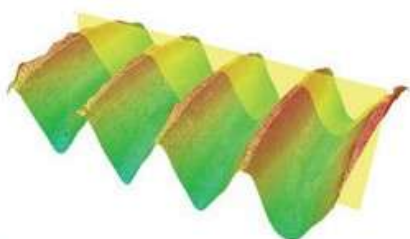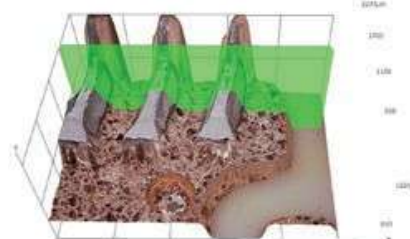
Security printing

Ink pigments   *x1.000*

3D View and measurement

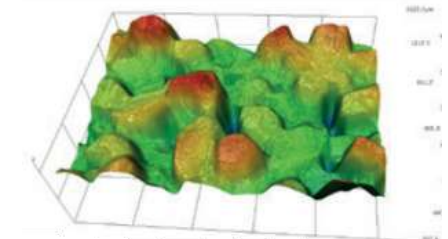
Thread of a screw   *x60*

Hybrid Component   *x100*

Copper abrasive   *x350*

Specifications

Basic Functions: Camera Control Unit

Camera	Imaging Device	1/1.9-inch 2.38 Mega-pixel CMOS Image Sensor
	Total Pixels	1952 (H) ×1241 (V)
	Euective Pixels	1945 (H) ×1225 (V)
	Visual Pixels	1920 (H) ×1200 (V)
	Scanning Method	Progressive Scan
	Frame Rate	50 Frame/Sec (Max) at 1920 x 1200 Resolution
		100 Frame/Sec (Max) at Binning
	Electronic Shutter	Auto (1/24 ~1/100000)
		Manual 1~1/50000
	Supercharge Shutter	Preference Setup (17 ~ 1/100000)
	Gain	Auto / Manual 0dB~12dB
	White Balance	AUTO (One Push), MANUAL (R, B)
	Back Focus	NOT Required
Light Source	Lamp	High Intensity LED
	Lamp Life	30,000 hours (Average)
	Color Temperature	5700K (Typical)
Output	Camera	USB 3.0 Series B
	MyCom Contoller	USB 2.0 Series B
		ACS, Rotary, External Devices, Others
Input	Motorized Z-Axis	5 Phase Step Motor Driver Integrated
	External	Foot Switch (Capture / Capture Image)
	USB Ports	USB 2.0 Series A / 2Types
Interface	Through PC	LAN, USB 3.0 / 2.0, HDMI, Others
Power	Supply Voltage	AC100V~240V 50/60Hz
	Consumption	120 VA
Environmental Resistance	Ambient Temperature	5~40 (41~104F)
	Relative Humidity	20~80% RH (No Condensation)
	Atmosphere	Corrosive Gas Prohibited
	Altitude	Below 2000 Meter
	Storage Temperature	_ 15 C~50 C (No Condensation)
	Contamination Degree	2
	Overvoltage Level	II
Weight	Main Unit	3.6 Kg (7.94lb)
	Camera Unit	1.0 Kg (2.20lb)
Dimension	Main Unit	270mm (W) × 75mm (H) × 230mm (D)
		10.63" (W) × 2.95" (H) × 9.06" (D)

Motorized XYZ Stage

XY Axis	Euective Stroke	40 x 40 mm (1.57" x 1.57")
	Maximum Speed	8 mm / Sec
	Load Capasity	3.0 kg
	Resolution / Lost Motion	0.04 um / Within 0.020 mm
	Dimension	195 mm (W) x 209 mm (D) x 53 mm (H)
	Weight	3.9 kg
Z Axis	Euective Stroke	30 mm (1.18") Motor
		85 mm (3.35") Manual
	Resolution	0.05 um / pulse - 5 Phases Motor
		0.002 Mil / pulse - 5 Phases Motor
	Repeatability	0.5 um (0.23 Mil)
	Weight	1 kg

Advanced Software

3D Measurement Functions	3D Display (Original Color / Wireframe / Pseudo Color Display)
	3D Profile Measurement (Height, Length, Angle, Radius, Others)
	3D Model Illumination Simulation
	3D Profile Roughness Measurement
	3D Volume and Area Measurement
	3D Image Height Point Measurement
	HDR / Anti-Halation 3D Model
	2D Image 3D Profile Measurement
	3D Image Map CSV Output (Import to Various 3D application Software)
	Noise Filter and Removal
	3D Model Level Correction

Standard Software

Observation Functions	Camera Setup Preview
	Mode Function (save camera settings)
	My Com Communication (ACS)
	Gamma Correction / Edge Enhancement
	Hue / Chroma Correction and Chroma ON/OFF
	Brightness Level
	Live Anti-Halation / HDR
	Camera Shake Correction
	Auto Brightness / Tone Curve Adjustment
Observation Tool	Focus Control / Focus Indicator
	Light Shift (Full, Partial, Lateral and Others)
	LED Lamp ON/OFF
	Real-Time Digital Zoom / Rotary Head Control
	Grid Settings (Various Functions are available)
	Custom Tool Bar and Quick Function Key
	Split Monitor (Horizontal, Vertical, 4 window)
	Cropping Image / Turning Over, ±90 Rotation
Various Fuctions	Full Focus / Auto-Focus
	Quick Extended Depth of Field
	Auto Multi-Focus 3D Merge Depth Composition
	Auto-Positioning Depth Composition
	3D Multi-Focus / 3D Model Preview Function
Enhanced Digital Processing	High-Resolution Image (10560×6600 ~ 2400×1800)
	High Dynamic Range (HDR) / Anti-Halation Function
	Image Adjustment: Contrast, Edge, Hue/Chroma Correction
	Image Improvement: Auto Brightness / Tone Curve, Noise Removal
Measurement Functions	Auto Calibration Select (ACS): Recognize Lens, Zoom, Objective Lens, Adapter
	Distance, Angle, Radius, Diameter, Area and Other Tools
	Automatic Measurement: Auto-Count, Auto-Area, Auto-Edge Detection
	Scale Display (Various Setup Available in Metric/Inch)
	Statistic Result Data CSV or MS Office Output
	Wide Image Measurement
Recording	Image Format: Exif-JPEG (compressed), Exif-TFF (non-compressed)
	Capture Still Image (1920×1200 ~ 768×480)
	Maximum Non-Tiled Resolution Image: 10560 (H) × 6600 (V)
	Maximum Tiled Resolution Image 15000 (H) × 15000 (V)
	Movie - 1920x1200 (25FPS), 860x600 (50FPS)
	Time Lapse at Specified Time Interval (Minimum 0.1 Sec)
	Auto Cordinate Axis / Position Capture
Utility	Image Data Parameter
	Comments / Annotation / Scale / Date / Image Information
	Easy Report Function and Export to MS Office
	Password Protection (Calibration / User setup)
	Language (ENG, JPN, FRN, GER, ITA, SPA, KOR, CHN, RUS)
	Help (Pop-up User Guide / Manual)

Tiling	2D Tiling (Up to 15000 x 15000 pixels)
	Up to
	3D Tiling (Up to 10000 x 10000 pixels)
	Up to

Additional Software for Other PCs / Non-Licensed

E-Z View	Refer to Stardard Software Features
3D Viewer	Free 3D Image File Viewing Software

Recommended PC Specification

CPU	4th Generation Intel® Core™ i5 Processor or Higher
RAM	8GB Memory or Higher
HDD	500 GB or Higher
Monitor	Must be 1920 x 1080 Resolution or Higher (8:5 Ratio)
OS	Windows 7 - 64 bit or Higher

[Compliance with the RoHS Environmental Protection Program]

more info and demo requests on *www.mikroskopteknik.com*

Contact

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