

# IMAGING & MEASURING INSTRUMENTS



**KGC**

**EMPOWERING FUTURE**  
THROUGH RESEARCH & INNOVATION

## INTRODUCTION

Welcome to our 2020 - 2021 edition of Product Catalog. We would like to thank you for your continue support and encouragement. Throughout this challenging time, we have grown and transform our business to be more efficient and effective. This will enable us to offer better service and more competitive pricing to our customers.

Our new edition of catalog comes with a easy reference features where we categorized the products into different usage categories, i.e. Advanced Material, Renewable Energy, Bio-Process, Gauge Calibration, Membrane Technology, 3D scanner and others. This will facilitate the users to quickly access to the equipment specification required, and options available to them in term of measuring range or equipment complexity.

In our new catalog, we have also added the equipment to do research in renewable energy like solar cell, fuel cell, flow cell, lithium ion batteries, and membrane technologies. In synergy with our advanced material equipment, we have also added the equipment for material characterization especially in the area of rare earth research and magnetic properties. In line with the manufacturing industry footsteps, the equipment on 3D scanning and 3D printing also have been added in to expand the tools in the research and development for industry 4.0.

To our current customers, we believed our partnership will be strengthen for the years to come. The new catalog will also create new opportunities to build new relationship with new customers.

Lastly, I would like to thanks our staffs for their dedication and sacrifice in supporting the management for a brighter future.

Patrick Tan  
Director  
KGC (Group of Companies)

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# Digital Holography Microscope(DHM)

Model : HO-DHM-UT01



Digital holographic microscopy is an emerging modality that offers capability of quantitative phase imaging (QPI) of transparent unstained cells in their most natural state. While phase-sensitive imaging methodologies such as dark-field, phase contrast and differential interference contrast are known for several decades, they cannot provide quantitative phase information. DHM can achieve this by use of interferometric imaging concept. A schematic DHM system is shown in figure below.



<http://www.holmarc.com/dhm.php>

SF: Spatial filter  
MO1 / MO2: Microscope Objectives  
BS: Beamsplitter  
O: Object beam  
R: Reference beam

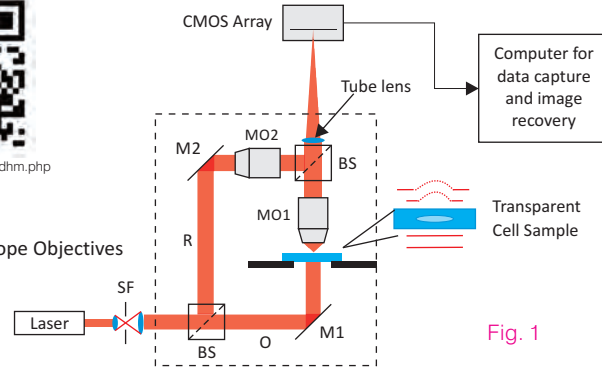


Fig. 1

Fig.1: Schematic of a balanced DHM system that works on the interferometric imaging principle. The phase image is obtained by digital processing of the interference signal recorded using an array sensor.

Fig.2: Illustration of phase delay of a collimated laser beam wavefront as it passes through a transparent cell sample. The phase delay is due to differential optical path difference through different parts of the cell sample.

When a collimated laser beam passes through a transparent cell sample, typically a very little light is absorbed. The laser wavefront however gets distorted due to the phase delay seen by the beam at each (x, y) location (see Fig. 2). The phase  $\Phi(x,y)$  of the beam after passing through the sample may be described as:

$$\Phi(x,y) = \frac{2\pi}{\lambda} \int dz n(x, y, z)$$

Here  $\lambda$  is the wavelength of laser used and  $n(x, y, z)$  stands for the relative refractive index of the cell at location (x, y, z) relative to the surrounding medium. Clearly a strong phase signal is detected if there is large index difference between the cell and the surrounding medium. If the index of the cell is uniform over a region, the phase function can be approximately associated with the height map profile of the cell, thus giving a 3D perspective of the cell. Instead of employing external contrast agents, the DHM thus uses the natural refractive index contrast of the cells for imaging purpose. Refractive index is a property related to chemical composition and therefore a sensitive phase imaging system can have several applications in basic Bio-sciences and diagnostics.

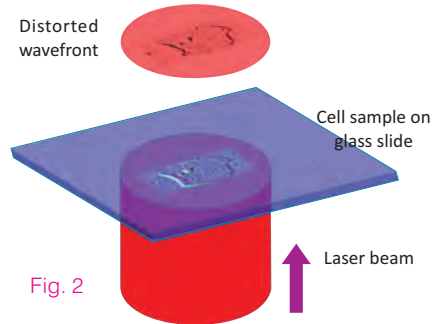


Fig. 2

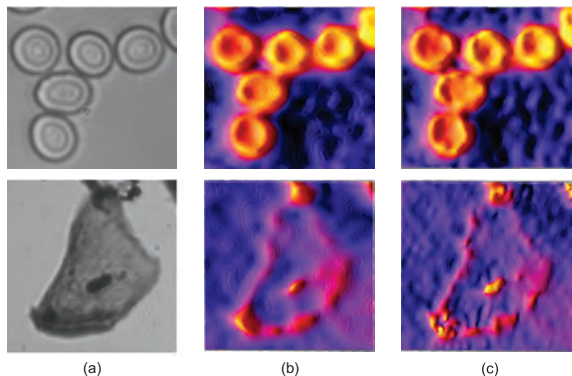


Fig. 3

The Fourier Transform Method is a popular choice for processing of single shot interferometric imaging data. However this method is known to have poor spatial resolution which is well below the diffraction-limited resolution that the microscopic system can achieve. The IIT Delhi technology used in this product uses a novel constrained optimization approach to recover of full-resolution phase images as illustrated in Fig. 3 where bright-field and phase images of a cervical cell are shown.

Fig. 3 Illustration of phase images of red blood cells and patient cervical cells using Digital Holographic Microscopy system (a) Brightfield images, (b) phase images reconstructed using the traditional Fourier transform method, (c) high resolution phase images obtained using novel single shot phase imaging technology developed at IIT Delhi. The color coding in (b) and (c) indicates the phase map (approximately height map) of the cell.

## Specifications

DHM type	Transmission, Upright
DHM configuration	Balanced, afocal
Measurement mode	Single wavelength
Source	Diode laser
Source wavelength	650nm
Source power	5mW
Object beam microscope objective	Plan Achromatic (40X, 0.65 NA)
Reference beam microscope objective	Plan Achromatic (40X, 0.65NA)
Axial depth profiling accuracy	≤ 50nm
Lateral resolution	≤ 1 μm
Camera Field of view	0.185 x 0.124 mm <sup>2</sup>
Camera	6MP CMOS Color sony make

### Features

- ▶ Unique single shot high resolution and accurate quantitative imaging capability (patented technology).
- ▶ No phase shifting required thus removing the need for piezo stages.
- ▶ Quantitative phase imaging without staining of cells.
- ▶ Full diffraction limited resolution performance.
- ▶ Digital holography as well as transmitted LED bright field observation

A complete user friendly software (Digital HM\_V01) with laptop (optional) is provided with system for the recording and reconstruction of the images. The software uses patented unique single shot high resolution method for the phase image reconstruction.

## Bright field observation

Optical system	Infinity corrected (200mm tube lens)
Observation method	Brightfield
Illumination	Transmitted
Illumination system	High bright white LED, Intensity adjustable
Nosepiece	Triple, Rotating turret
Microscope Objectives	1. Plan Achromatic 10X, NA 0.25, 2mm FOV 2. Plan Achromatic 20X, NA 0.40, 1mm FOV 3. Plan Achromatic 40X, NA 0.65, 0.5mm FOV
Viewing head	Sidentopf Binocular head, 30° inclination, 48 -75mm IP adjustment
Eyepiece	10X wide field (FN20), diopter adjustable, High eye relief
Focusing	Coaxial coarse / fine focusing, fine 0.2mm/rotation
Sample Stage	Rectangular stage, with specimen holder, XY travel - 78 x 54mm
Sample Stage drive	Manual, coaxial drop down knob
Power	230V 50Hz



## APPLICATIONS

- ★ Quantitative study of cellular dynamics
- ★ Imaging of various cell types, including SKOV-3 ovarian cancer cells, fibroblast cells, testate amoeba, diatom skeletons, and red blood cells.
- ★ 3D imaging and statistics of RBCs in multiple deformation states.
- ★ Evolution of Physiological parameters of different cells.
- ★ Non-destructive analysis of Living cells without any contrast agent: Cell number, confluence, proliferation, cell death, migration and viability.
- ★ Visualization of drug induced morphology changes.
- ★ Visualization of stained or unstained / unprocessed cells.
- ★ Toxicity studies.
- ★ Diagnosis of diabetics and to evaluate long-term glycemic controls in patients with diabetes.
- ★ Resolve neuronal network activity and identify cellular biomarkers of psychiatric disorders.
- ★ Screening and diagnostics material science.

Manufactured and marketed by

**HOLMARC**  
OPTO-MECHATRONICS PVT. LTD.

Technology by

**IIT Delhi**  
Indian Institute of Technology

In Association with

**Xinova**



# Digital Inline Holography Microscope(DIHM)

Model : HO-DIHM-T01



Holmarc's Digital In-line Holography microscope model HO-DIHM-T01 is a powerful imaging system for the digital reconstruction of complex object (amplitude and phase) from a single intensity image recorded by transmitting a coherent light through it.

Holmarc's DIHM is equipped with a transmission type in-line geometry where a coherent point light source illuminates the sample and a CMOS camera record the 2D interference pattern produced by the scattered light(object beam) with non-scattered light (reference beam). The software then numerically reconstructs the 3D structure of the sample from the recorded 2D interference pattern by computing the field backward to different planes. The software uses the patented single shot phase unwrapping algorithm developed by IIT Delhi. The large depth of field DIHM makes it possible to image large volumes with comparable resolution and simultaneous imaging of particles located at different depths without the need of mechanical scanning. Holmarc made this system particularly for particle size analysis and particle tracking.

HO-DIHM-T01 can be used as both In-situ and Ex-situ for the imaging of particles from sub microns to several millimeter in size. It uses 650nm diode laser with pinhole assembly as point light source and Sony's 2.3MP CMOS sensor IMX174 for recording the interference pattern. This USB 3.0 Sony sensor provides excellent image quality with low-noise performance at 166fps.

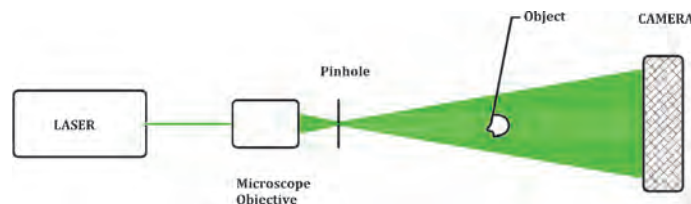


Fig. Digital In-line Holography Microscope geometry

### Applications:-

- ▶ Particle size analysis
- ▶ Particle tracking
- ▶ Cell biology, 3D dynamic analysis of cells.
- ▶ Marine biology
- ▶ Microfluidics
- ▶ Study of ice crystal habits from cloud chamber
- ▶ Deformation analysis
- ▶ Refractive index characterization
- ▶ Ferroelectric metrology
- ▶ Electro-chemistry

### Specifications -

Type	: Transmission DIHM
Laser source	: 650nm diode laser
Point source	: Microscope objective + pinhole assembly
Camera	: 3.17MP CMOS Mono USB 3.0 Global shutter
Software	: Digital IHM_V01
Phase unwrapping	: Patented single shot algorithm
Axial depth profiling accuracy	: ≤ 500nm* (depends on the geometry)

### Sensor specifications:-

Sensor type	: CMOS Mono
Shutter	: Global Shutter
Sensor characteristic	: Linear
Readout mode	: Progressive scan
Resolution	: 3.17Mpix
Resolution (h x v)	: 2056 x 1542 Pixel
Aspect ratio	: 4:3
ADC	: 12 bit
Color depth (camera)	: 12 bit
Optical sensor class	: 1/1.8"
Optical size	: 7.093mm x 5.320mm
Optical sensor diagonal	: 8.87mm (1/1.8")
Pixel size	: 3.45um
Manufacturer	: Sony
Sensor model	: IMX252LLR-C
Gain (master/RGB)	: 24x/4x
AOI horizontal	: same frame rate
AOI vertical	: increased frame rate
AOI image width/step width	: 256 / 8
AOI image height/step height	: 2 / 2
AOI position grid(horizontal/vertical)	: 4 / 2
Pixel clock range	: 70 MHz – 474 MHZ
Frame rate free run mode	: 134

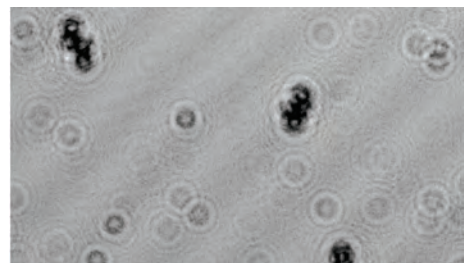


Fig. 1 . DIHM recorded image of carrom powder on glass slide

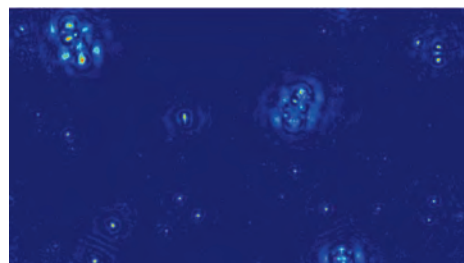


Fig. 2 . Reconstructed image of same recorded image

Frame rate trigger(continuous)	: 134
Exposure time(minimum-maximum)	: 0.018 ms – 999 ms
Long exposure (maximum)	: 30000 ms
Power consumption	: 1.5 W – 3.3 W
Image memory	: 128 MB
Special features	: IDS line scan mode, Sensor source gain, Multi-AOI
Interface connector	: USB 3.0 micro-B
I/O connector	: 8-pin Hirose connector (HR25-7TR-8PA(73))
Power supply	: USB Cable





# Confocal Fluorescence CORRELATION SPECTROMETER

Model : HO-SP-MFCS2C

DESIGNED FOR  
**RESEARCH**

(Under Technology Transfer Agreement with TIFR, Mumbai)



HOLMARC CONFOCAL FLOURESCENCE CORRELATION SPECTROMETER is a microscope with fluorescence correlation spectroscopy (FCS) attachment for capturing molecular dynamics processes in cells, solutions and nano structures. This innovative product is developed with technology from Tata Institute of Fundamental Research (TIFR), Mumbai, a laboratory world-renowned for innovation in the area of FCS. The instrument is also available without the imaging microscope option for solutions study.

The instrument is designed for maximum sensitivity through a careful design of the optical path and attentive selection of the optical components and light detectors. We have used two DPSS lasers in the instrument which are 532nm & 405nm with variable power output. Single laser configuration is also available.

The laser line clean up filters used in the instrument assures noise level in the laser output to bare minimum. The Optical paths are carefully designed so that the lasers can be used independently without changing any Opto-mechanical or Optics component in the path. Lenses, Mirrors etc are carefully chosen to minimize any kind of aberration or loss.

Dichroic filters, band pass filters, emission filters etc are sourced from best suppliers in the world for matching the laser output and sample data acquisition requirements.

High NA (1.20), water immersion Microscope Objective is used for microscopy. These super apochromat objectives, fully compensate for both spherical and chromatic aberrations from the UV to the near infrared region. Their sensitivity to fluorescence emission ensures the acquisition of sharp, clear images, without color shift, even in bright field and Nomarski DIC observations.

We have used the Single Photon Counting APD for detection of fluorescence. It detects single photons of light over 400 nm to 1060 nm wavelength range - a range and sensitivity that far outperforms a photomultiplier tube. The fiber-coupled Single Photon Counting APD used has a peak photon detection efficiency of more than 65% at 650 nm over 180  $\mu$ m diameter. The photodiode is both thermoelectrically cooled and temperature controlled, ensuring stabilized performance despite ambient temperature changes.



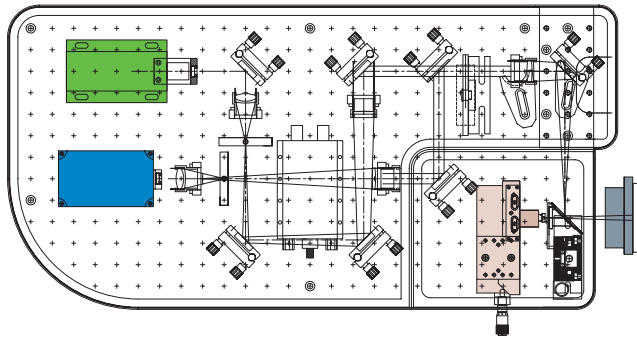
CONTACT US @ 91-484-2540075

Czerny-Turner Design  
**0.015nm**  
SPECTROSCOPIC RESOLUTION

Spectra Quasar 600  
**UV-VIS-IR**  
FULLY AUTOMATED SCIENTIFIC GRADE SCANNING SPECTROMETERS  
200-1600nm

The digital Correlator card used in the instrument requires no external power supply and can be used for both auto and cross correlation. The instrument is placed in a light proof box which ensures minimum light leakage during operation. The signal output is coupled to 25 microns Optical fiber which is fixed on a XYZ Fiber positioner. The fiber position can be finely adjusted without opening the cover. The fine tuning of the output signal can be done by observing the detector output.

The instrument has two options. The system can be integrated with a commercial fluorescence microscope for microscopic specimens .It can be used with our innovative non-imaging confocal assembly for solution studies.

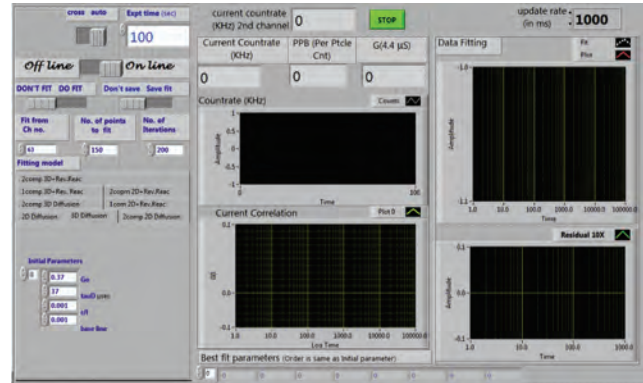


**Fig.** Optical Layout of two photon excitation confocal fluorescence correlation spectrometer

*We pay individual attention to our customers, and are ready to customize any of the parts to meet their needs.*

For more information  
contact us at [sales@holmarc.com](mailto:sales@holmarc.com)

User friendly software is supplied along with the equipment which is developed in Lab View, shows live count rate and displays the current correlation. The software has the capability to fit FCS data to multiple diffusion models, either online or offline. The software is developed by Tata Institute of Fundamental Research (TIFR), Mumbai.



The system is installed on a 6 X 4 Feet Optical Tabletop which rests on pneumatic air isolated support. This ensures ground vibration isolation during operation.

All the Opto - mechanical devices used in the setup are carefully chosen for stability and reliability. The instrument is one of the most sensitive ever developed, yet the price is affordable for acquisition by individual research laboratories. An FCS spectrometer with lifetime measurement option down to 100 ps (using time correlated single photon counting) is coming soon! The current instrument will be upgradable to the lifetime option.

Please feel free to discuss with us for all your FCS needs.

## Specifications

### Instrument Features

Precise Manual alignment of the detection Fiber  
1 or 2 colour excitation using 532nm and 405nm DPSS Laser with Power adjustable Option. Alternative wavelengths are available on request.  
Time resolution down to 12.5 ns

### Measurements

- >> Fluorescence Correlation Spectroscopy
- One channel or dual-channel data acquisition for auto or cross correlation
- >> Online correlation display
- >> Online data fitting with multiple models
- >> Conventional fluorescence imaging

### Light Source

532nm and 405nm low noise laser  
Max Power Output: 50mW With Intensity Control Knob  
Beam divergence:<1.5mrad

### Detector

Single Photon Counting Module

### Correlator Card

Real time digital Correlator

### Optics

Equipment integrated with Infinity corrected inverted research microscope: MODEL IX71

Optical Mirrors Coated with Broadband visible, MgF2. All lenses are aberration free, achromatic and coated.

A set of neutral density filters included 0.2, 0.3, 0.5, 1.0, 2.0, 3.0 OD mounted on a filter wheel for controlling the excitation power.

### Objective

Water immersion 60X/1.2, WD 0.28 mm with correction collar

**Holmarc FCS**  
Fluorescence correlation spectrometer



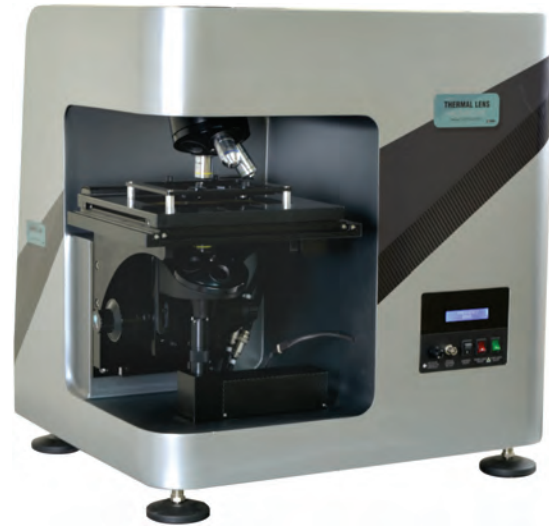
# Thermal Lens Microscope - Confocal

Model : HO-TLM-C218



HOLMARC developed a 532nm laser microscope based on the thermal lens effect induced by a coaxial beam comprised of excitation and probe beams. The scheme allows the measurement of absorption factors down to  $1.2 \times 10^{-7}$  in a  $0.35 \mu\text{m}^3$  volume by use of a heating laser power of 200 mW incident upon the sample. Results prove that a 450nm axial resolution is possible when a water immersion objective lens with a N.A. of 1.2 is used.

Thermal lensing provides high-sensitivity measurements for thermal and spectroscopic characterization or detection and imaging of low-absorption samples. Thermal-lens microscopy combines the high sensitivity of photothermal techniques with the lateral and axial resolution of conventional microscopy. The thermal lens generated by a heating beam induces a change in divergence and beam-waist position of a probe beam that are detected with the help of an aperture placed in the path of the beam in front of a photodetector. With this detection method the signal is maximum when the thermal lens is located at a distance of one heating beam's Rayleigh range from the probe beam's waist; it is null when the thermal lens lies in the plane of the probe beam's waist.

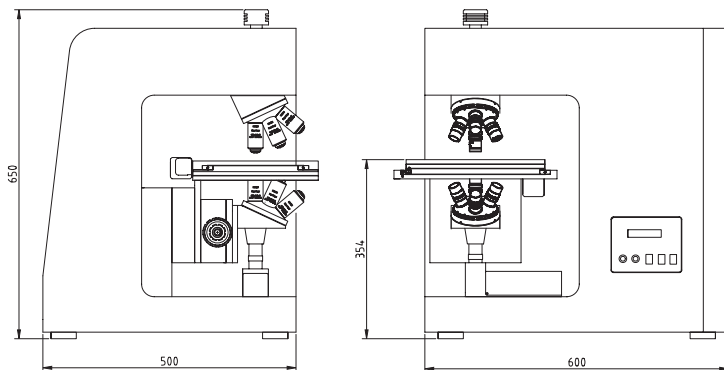
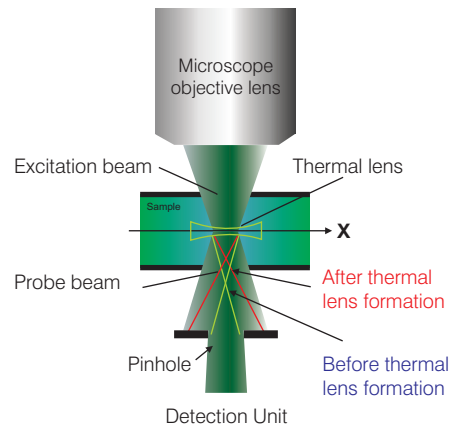


### Specifications:-

Optical system : Infinity Corrected Confocal Upright Microscope  
 Microscope Design : Double side Nosepiece Turret  
 Tube Length : 200mm  
 Nosepiece : Revolving objective nosepiece(Nosepiece have slots for filter sliders)  
 Objectives : Plan Apo Infinity-Corrected Long WD Objective  
 Focus control : Software controllable.  
 Substrate Scanning : Motorized MTS series precision X Y Scanning stage  
 Travel X Axis: 100mm  
 Travel Y Axis: 100mm  
 Sample Positioning : Equipped with Tilting & Aligning Stage  
 Z axis travel : 20mm  
 Resolution : 1Micron

Excitation laser source : 532nm DPSS  
 Laser Power : Low noise output 200mW  
 Spatial filtering unit : Objective lens based  
 Spot size : 1-5 Micron  
 Intensity control : Continuously Variable through PC  
 Optical power feedback unit : Yes  
 Focus control : Software controllable.  
 Light level control : 4096 levels  
 Probe laser source wavelength 650nm  
 with motorized Relative Focal Plane Adjustment  
 Motorized Polarizer rotator –Glan Thompson  
 Laser Beam Precision Intensity Control Accessory

Light chopper : Frequency 10-5000Hz  
 Detector :Silicon Photo Diode  
 Interface : PC based  
 Alignment camera : 5MP 1/2.5" CMOS camera  
 Active Pixels:2592H×1944V  
 Pixel Size:2.2um×2.2um  
 Field of view (mm) : 2.5 x 1.9mm  
 Optical Imaging resolution : 1 μm (horizontal/lateral imaging)  
 Software : Image analysis software IMAGE Pro Ver. 2.25  
 Image processing : Background compensation, contrast enhancement & image filtering, particle size determination etc



200mW 532nm low noise DPSS laser is used for the excitation (pump laser) and 5mW low noise 650nm diode laser used as probe laser. Before entering in to the objective both lasers passes through a spatial filter and a beam expander for maximum laser spatial and coherence correction.

Thermo-optical methods make it possible to obtain information on the parameters of a material related to heat propagation (thermal conductivity, heat capacity, refractive index, density, viscosity, etc.) directly from the development of the signal in time after the onset of irradiation.





## Probe Station Microscope - Trinocular with CCD and LCD Unit

Model : HO-PSM-T01L

Holmarc's probe station microscope is equipped with infinity corrected optical system for viewing and placement of the probe tips on the sample contacts. The highly corrected Long working distance apochromatic objective provide super quality images. The long working distance plan Apochromat objectives permit multiple layered samples to be viewed. HO-PSM series microscope incorporates quadruple revolving nosepiece (4-lens changeover turret) with objective mounting thread of M26 X 0.706 and parfocal distance of 95mm. High bright white LED with intensity adjustable option is provided for both Epi-scope and angled illuminations. A 7-inch HD LCD is fixed directly to the microscope.

### Specifications:-

#### Microscope

Optical system : Infinity corrected (200mm tube lens)  
Observation Method : bright field  
Illumination : Reflected (Co-axial and Angled)  
Illumination system : High bright white LEDs  
Nosepiece : Revolving, quadruple with positive precision click stops  
Viewing head : Siedentopf Trinocular head,  
30 degree inclination, 48-75mm IP adjustment  
Eyepiece : Wide field eyepiece  
Magnification : 10X, FN : 20mm  
Tube diameter-30mm, diopter adjustable.  
Focusing : roller guide (rack& pinion)

Objective : Plan Apo 5X  
Type : long working distance Plan apochromatic objective  
NA : 0.14, Working distance : 34mm, Focal length : 40mm,  
FOV with Eyepiece : 4mm  
FOV with camera : 1.14 x 0.856mm, 1.426 diagonal

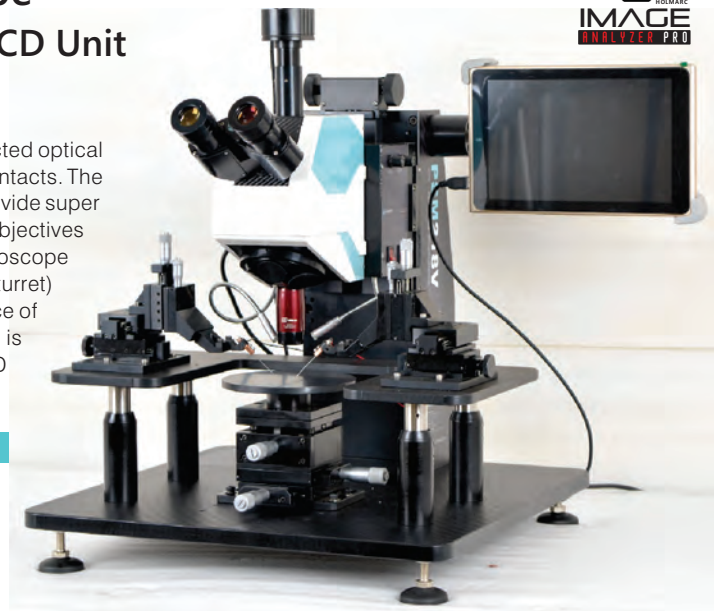
#### Camera

Optical format : 1/2.5" CMOS  
Active imager size : 5.70mm x 4.28mm, 7.13mm diagonal  
Active pixels : 2592 x 1944 (5Mp)  
Pixel size : 2.2 x 2.2 um  
Color filter array : RGB Bayer pattern  
Shutter type : Global reset release(GRR), Snapshot only,  
Electronic rolling shutter(ERS)  
Maximum data rate/master clock : 96Mp/s at 96MHz (2.8 V I/O),  
48 Mp/s at 48MHz(1.8 V I/O)

Frame rate : Full resolution – Programmable upto 15fps,  
VGA(640x480 with binning) – programmable upto 70 fps  
ADC resolution : 12-bit, on-chip  
Pixel dynamic range : 70.1 dB  
Operating temperature : -30°C to +70°C  
Power consumption : 381mW at 15 fps full resolution

#### Display

Display : 7" HD, Full Capacitive Multi touch  
Type : Windows tablet  
CPU : Intel Atom Quad core processor upto 1.83 GHz  
Memory : 1 GB DDR3 RAM  
Storage : 16GB built-in storage, Micro SD support up to 64GB  
Operating system : Microsoft windows 8.1  
Connectivity : Wi-Fi 802.11, mini-HDMI port, Micro USB port,  
Bluetooth 4.0, USB OTG function  
LCD is fixed directly to the microscope.



Applications include failure analysis, LED, MEMS, optoelectronics, device characterization, wafer level reliability etc. We offer a complete set of accessories to allow you to position, navigate, and contact the wafer or device under test.

#### Manual and Motorized Probe Positioners

We offers a wide variety of manual and motorized probe positioners for any application

#### Vibration Isolation Tables

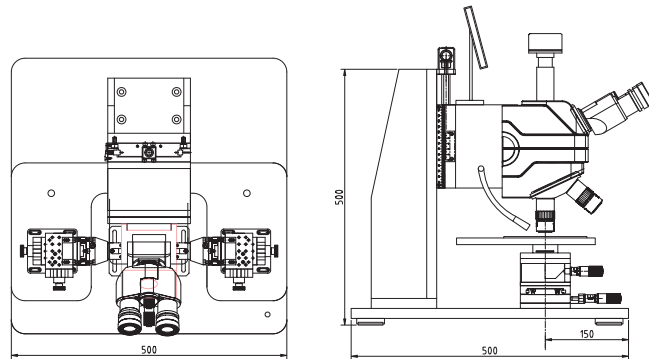
Slight vibrations will cause the probes to jump and miss their contacts and the microscope image will be blurred. Holmarc offers wide varieties of vibration isolation optical tables and works station for your needs. Please refer chapter 1 for details.

#### Digital Imaging System

Digital imaging system improves sample navigation and software automation.

#### Sample Holder - Chucks

Holmarc offers custom chucks depending on the substrate to be tested.

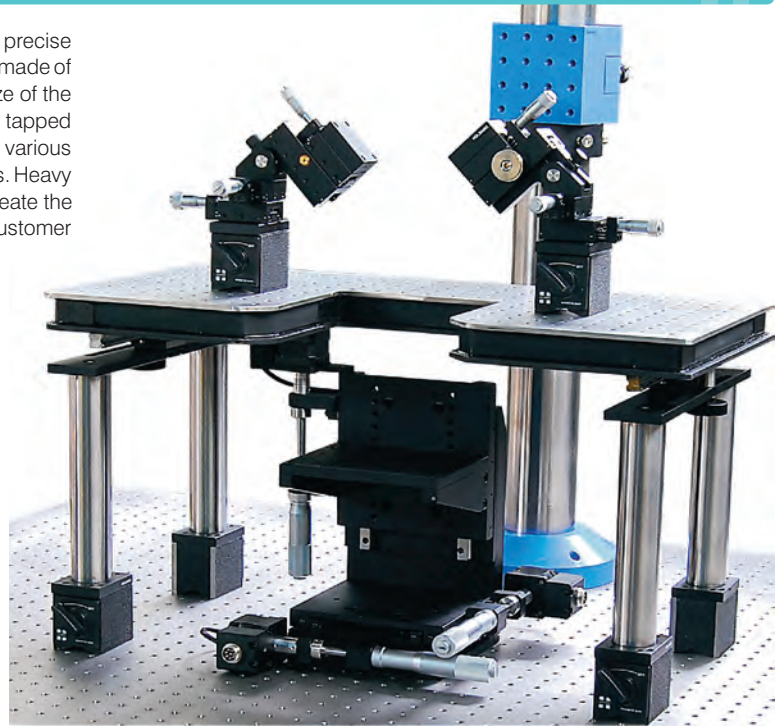


We design and manufacture instruments based upon your specifications, whether it's a modification to an existing design, proprietary instrument manufacturing, or a completely new design. We ensure the client design remains secure and confidential throughout the entire process.

## PROBE STATION PLATFORM

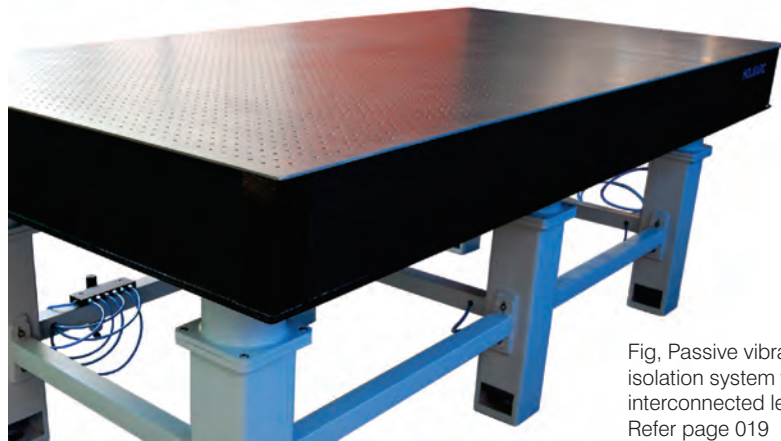
Our probe station is configured to serve as a platform for precise probe head positioning. Standard probe station platforms are made of aluminium material with black anodized finish. Shape and size of the platforms are as per customer requirements. There are M6 tapped holes on 25mm grid. These platforms are available in various materials, sizes and shapes and with different patterns of holes. Heavy duty pillar posts and magnetic / slotted bases are used to create the platform. Material other than aluminium can be used as per customer requirements.

- ▶ M6 tapped holes on 25mm Grid
- ▶ Rigid aluminum material
- ▶ Black anodized finish
- ▶ Heavy duty pillar posts mounting
- ▶ Magnetic bases / slotted post base



## Vibration Isolated Platforms

Holmarc manufactures vibration isolated supports and honeycomb table tops in various models. Please refer to chapter 1 for more detail about these products. The isolated supports find wide applications in life science laboratories for conducting vibration sensitive experiments. Pneumatic isolators are used for preventing ground vibrations to reach the work stations. The size of the platforms can be as large as 3 x 1.5 meters.



Fig, Passive vibration isolation system with interconnected legs  
Refer page 019

## Precision Probing Systems

The probing system is manually operated, yet precise and operator friendly. A wide range of probe holders, three-axis positioners and optics packages are available to customize the solution to your application. Positioners feature rolling contact bearings for precise and smooth motion. Optional vibration isolation supports reduce the effects of steady-state and transient vibrations in test area.

### Microscopes

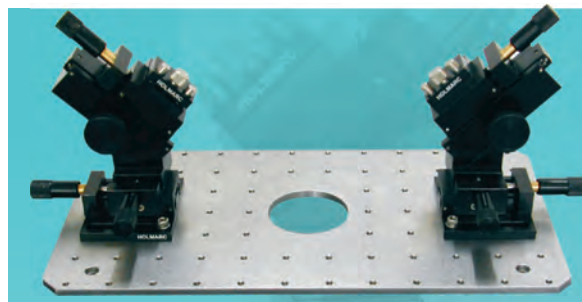
Rigid bridge positioning mechanism is available for mounting the microscope. Probe station can also be configured with a high resolution video system, including camera and LCD monitor.

### Tables

We manufacture variety of lab benches and tables, including vibration isolation systems.

## Custom Probe Stations

Prototype designs can be developed for custom applications. Upgrades are available for motorized microscopes and manipulators. Please contact us for details or to discuss your application.

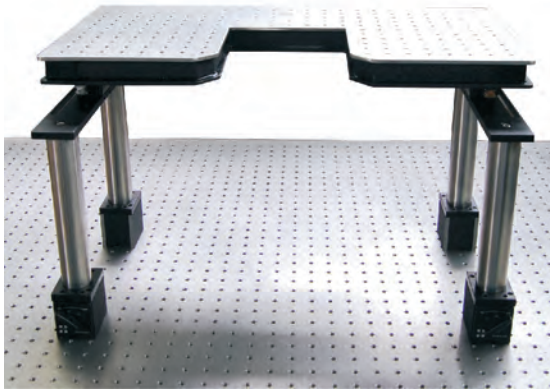


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## PROBE STATION PLATFORM ACCESSORIES

### Platform



Probe station platforms are made of aluminium material with black anodized finish. These can be constructed in honeycomb structure as well. Shape and size of the platforms are as per customer requirements. There are M6 tapped holes on 25mm grid. These platforms are available in various material, sizes and shapes and with different patterns of holes. Heavy duty pillar posts and magnetic / slotted bases are used to create the platform. Materials other than aluminium can be used as per custom specifications.

<b>Model</b>	HO-LS-PSA-P-600300
<b>Size</b>	600x300 (160X160mm inside cutting)

- ▶ M6 tapped holes on 25mm Grid
- ▶ Rigid aluminum material
- ▶ Black anodized finish
- ▶ Heavy duty pillar posts mounting
- ▶ Magnetic bases / slotted post base

### Micromanipulator

The micromanipulators are available with either motorized or manual movements in all three axes (X, Y and Z axis). The manual micromanipulators are equipped with precise and stable rolling contact bearings without play and backlash. Wear and tear is negligible for all practical purposes. Coarse and fine movements are provided for all axis. Coarse movement is by rack and pinion for quick positioning where as fine movement is by either micrometer or by fine pitched lead screw. Special clamping arrangements are provided for safe fixing of sensors. Linear graduation are given by the side of the stage for repeatable positioning.



- ▶ Hold up to 12mm diameter probe
- ▶ Fine movement - 10mm on Z axis
- ▶ 25mm coarse movements for all 3 axes
- ▶ Vernier reading for coarse movements
- ▶ Friction lock for all four movements
- ▶ Compatible with magnetic post stand or tilting base

Micro-manipulator provides safe and efficient positioning of micro tool. The manipulators are designed and manufactured for either left hand side or right hand side use. In both cases when placed correctly the adjustment knobs comes to the side of the operator. We have different models for left hand side and right hand side use as specified below. Custom probe holders are also available on special request.

### 3 Axis Micromanipulator (XYZ)

Manual	
Model	Item
MIMA-LH-12	Left Hand Micromanipulator
MIMA-RH-12	Right Hand Micromanipulator

Motorized	
Model	Item
MIMAM-LH-12	Left Hand Micromanipulator
MIMAM-RH-12	Right Hand Micromanipulator



Accessories  
for micromanipulator



#### Magnetic Stand

- ▶ Magnetic base
- ▶ 300mm height vertical pillar
- ▶ Rotatable right angle clamp
- ▶ Micro manipulator accepts 12 mm horizontal posts

**Model No.**  
MIMA-AC-MG-25300



#### Tilting Base

- ▶ Rigid mounting
- ▶ Tilting up to 80 degree
- ▶ M6 CLR slots on the base

**Model No.**  
MIMA-AC-RGD-180



## XYZ Sample Holder Manual

- ▶ 50mm Travel
- ▶ Drive Micrometer
- ▶ 100 x100mm platform size
- ▶ 10 micron straight line accuracy
- ▶ M6 Mounting Holes

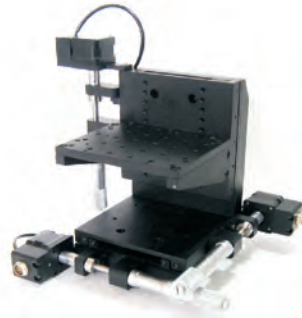
Model No. HO-LS-MISH-50



## XYZ Sample Holder Motorized

- ▶ Drive by joystick / from a computer
- ▶ 25 mm travel
- ▶ Lead screw drive
- ▶ Stepper motor actuator
- ▶ 0.3 micron resolution
- ▶ 100 x100mm platform size
- ▶ 5 micron straight line accuracy
- ▶ M6 Mounting holes

Model No. HO-LS-MISHM-25



## Guillotines

for small animal sacrifice

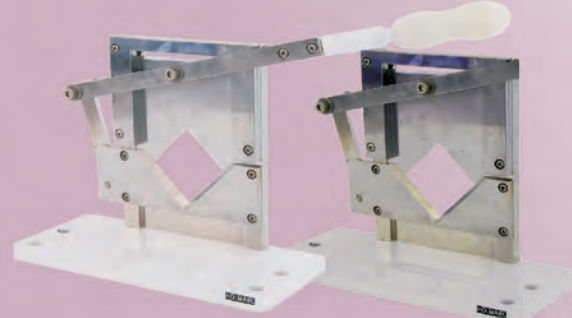
Guillotines provide instant decapitation of laboratory animals. Motorized and manual version available. Stainless steel blades are honed to retain their sharpness over extended use. It is also ideal for sectioning plastic tubing.

Manual version

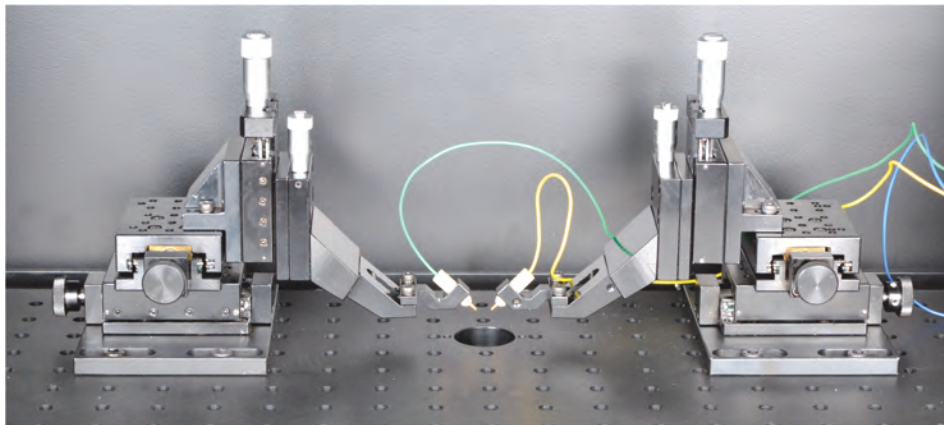
>> Model No: HLS-GL-01-MA

Motorised version

>> Model No: HLS-GL-01-MO



## 4 Axis Micromanipulator (XYZ & Tilt)



Model	Type	Travel
MIM-4A-10	4 axis Micromanipulator	XYZ 10mm & +/- 3 degree
MIM-4A-15	4 axis Micromanipulator	XYZ 15mm & +/- 3 degree
MIM-4A-20	4 axis Micromanipulator	XYZ 20mm & +/- 3 degree
MIM-4A-25	4 axis Micromanipulator	XY -25mm, Z-10mm & +/- 3 degree



Model : MIM-4A-10



Model : MIM-4A-25

## Motorized Micromanipulator with Piezoelectric Translation

Holmarc offers precision motorized micromanipulators that will provide automated movement in all 3 orthogonal axes. Motorized Micromanipulators are used to manipulate micro sized objects or specimens under a microscope. A benefit of using motorized micromanipulators is the precision movement on a variety of axis that enables absolute manipulation far superior to traditional manual manipulation. Common actions included holding, cutting or injecting and are often controlled via joystick. All the movements are integrated and control by our motion control software.

These micromanipulators use a combination of stepper motors and piezoelectric control of translation stages to provide precise movement. The micromanipulator can move along three different axes. Coarse translation is controlled using a stepper motor that produces a displacement up to 25 mm with a step size of 0.5  $\mu\text{m}$ . Fine control on the micromanipulators is achieved with piezoelectric unit that provide a displacement of either 10  $\mu\text{m}$  along each axis.



Fig : Manipulator, Z-axis motorized, 3-axis (XY&Z) manual, Right hand  
Model : MIM-1M3M-25R (Right Hand)  
MIM-1M3M-25L (Left Hand)

## Probe Station Microscope - Motorized Micro Manipulator

Micromanipulator is a tool that allows the user to move an input device that correlates to much more precise movements on the object being manipulated. A micropipette, electrode or probe can be mounted on a micromanipulator and move as little as a micron at a time. This tool can be used for in vitro fertilization, patch clamp experimentation, extracellular recording, microinjection and any application requiring fine mechanical displacement.



### Applications

- Microinjection
- Electrophysiology recording
- Controlled environment Measurements

Model	Description	Microscope Head Specifications
HO-PSM-M3M1L (Left Drive) HO-PSM-M3M1R (Right Drive) HO-PSM-M3M1LR (Left & Right both)	Manual XYZ 25mm Travel Stage, +/- 3 degree Tilting Stage, Additional Z Axis 25mm Travel Motorized Movement	Type : Trinocular Microscope Vision : Stereo Head: Inclined at 45 Degree Nosepiece: Turret Revolving Objectives: 2x & 4x Camera : 5MP 1/2.5" CMOS
HO-PSM-M3M3L (Left Drive) HO-PSM-M3M3R (Right Drive) HO-PSM-M3M3LR (Left & Right both)	Fully Automated, Motorized XYZ 25mm Travel Stage, +/- 3 degree Motorized Tilting Stage	

## Micromanipulator Accessories

### Probe Holder

A probe holder is either straight or bent, designed to hold the probe tip on one end and is held by the manipulator collet shaft on the other.

Probe holders secure the probe tip with either a pin jack or set screw probe mount. Custom probe holders are available on request.



Probe holder –for 90 degree Vertical inducing

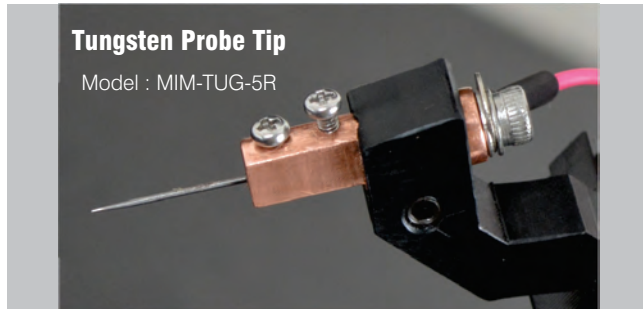
Model : MIM-PRH-90A



Probe holder –for 45degree angular inducing

Model : MIM-PRH-45A

**Probe Tip** | The Probe Tip (or needle) is the part of the micromanipulator unit that actually touches the device under test (DUT).



**Tungsten Probe Tip**

Model : MIM-TUG-5R

### Specifications:

- Sizes : 5 Micron Tip Diameter
- Material : Solid tungsten
- Shank diameter : 20 mil (0.5mm)
- Needle length : 1.26 in (30mm)
- Shape : Straight

5 micron tungsten probe tip are useful for standard, general purpose probing needs. Tungsten is a good conductor and works well for the majority of probing requirements, including probing on aluminum. Probes with a tungsten shank are pliable enough so that they can be bent to a particular shape by the end user if necessary.



**Probe Tip - Gold coated Pogo Tip**

Model : MIM-PG-1

### Specifications:

- Current Rating : 1 Amp
- Voltage Rating : Based on placement distance
- Operating Temperature : -40°C to +125°C
- Contact Material : Brass
- Contact Plating: Gold over Nickel

Pogo Pins are designed to mate with gold plated PCB pads or flat contacts in docking/cradle applications to function as the charging, data transfer or programming interface to a portable device. Gold plated contacts provide high reliability and signal integrity over 10,000 cycles.



## Microscope Translation Stage

### Manual Microscope Translation Stage



This microscope translation stage precisely move upright and inverted microscopes with 25 mm travel in X and Y direction. The translation stage accepts all types of instruments thanks to its large load carrying capacity. The microscope stage can be used with almost any Zeiss, Leica, Nikon or Olympus inverted or upright microscopes in addition to Holmarc's.

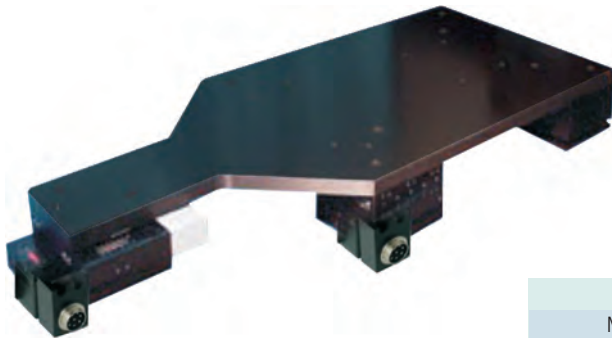
- ▶ 25mm travel range
- ▶ Micrometer drive
- ▶ 30 Kg load capacity
- ▶ Precise smooth movement
- ▶ 0.01 mm readout
- ▶ M6 mounting holes



[https://www.holmarc.com/microscope\\_translation\\_stage.php](https://www.holmarc.com/microscope_translation_stage.php)

MANUAL TRANSLATION STAGE		
Model	Item	Travel Range
HO-LS-MIC-XY-25	Manual Microscope translation Stage	25mm

### Motorized Microscope Translation Stage



With complete hand free remote control, Holmarc's universal motorised stage allows translation of any upright or inverted microscopes. Motorized control allows programmed movements in X and Y directions using suitable control electronics. Microscope stage can be used with almost any Zeiss, Leica, Nikon or Olympus inverted or upright microscopes in addition to Holmarc's.

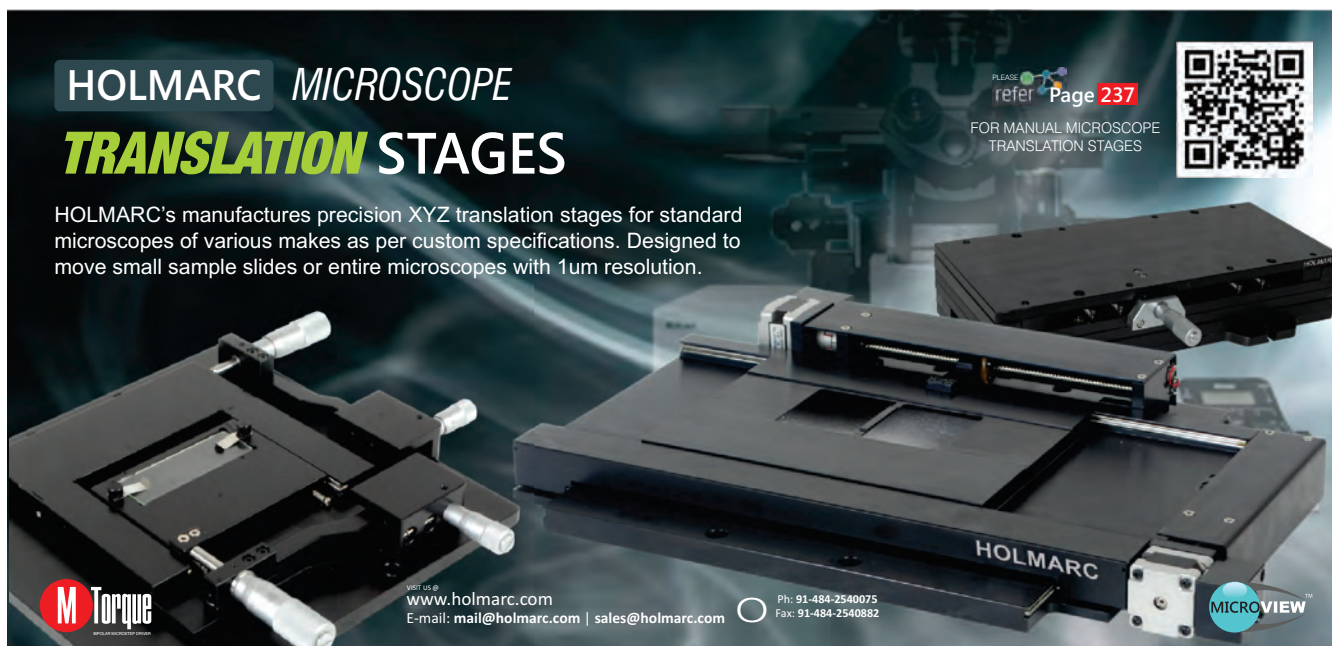
- ▶ Operates standalone or using a computer
- ▶ 25mm travel Leadscrew drive
- ▶ 30 Kg load capacity
- ▶ M6 mounting holes

MOTORIZED TRANSLATION STAGE		
Model	Item	Travel Range
HO-LS-MIC-XY-25M	Motorized Microscope translation Stage	25mm

## HOLMARC MICROSCOPE TRANSLATION STAGES

HOLMARC's manufactures precision XYZ translation stages for standard microscopes of various makes as per custom specifications. Designed to move small sample slides or entire microscopes with 1um resolution.

PLEASE refer **Page 237**  
FOR MANUAL MICROSCOPE  
TRANSLATION STAGES



www.holmarc.com  
E-mail: mail@holmarc.com | sales@holmarc.com

Ph: 91-484-2540075  
Fax: 91-484-2540882





## Motorized Microscope Translation Stage

Model : HO-MMTS-XY50

These stages are meant for positioning the entire microscope in an XY plane. Manual and motorized versions are available. It features an M6-tapped hole matrix.

Features:

- xy axis integrated design, compact structure.
- High precision lead screw, better repeatability.
- Stepper motor drive
- Hand wheel for manual drive.
- Standard holes pitch for easy installation.

Specifications:

- Travel Range: 50mm x 50mm
- XY Positioning Accuracy :  $\pm 3$  microns
- Step Size Resolution : 0.625 $\mu$ m
- Load Capacity: Up to 50kg



[https://www.holmarc.com/microscope\\_translation\\_stage.php](https://www.holmarc.com/microscope_translation_stage.php)



Fig. Motorized Microscope Moving Stage



[https://www.holmarc.com/microscope\\_ts.php](https://www.holmarc.com/microscope_ts.php)

## Microscope XY Sample stages



### Precision XY Manual Sample stage

Model : HO-XY-S25

These stages are designed, specific models of microscope to make sure of the compatibility. There are micrometer and rack and pinion driven stages. Both the axes are fitted with ball bearing guides for smooth and friction free movements. There are manual as well as motorized models to fit various microscopes.

- X Axis Travel : 25mm
- Y Axis Travel : 25mm
- Resolution : 10 Micrometer
- Suitable for inverted microscope



### High Resolution XY Manual Sample stage

Model : XY-MF-25

These stages are fitted with two micrometer drives for each axis, coarse and fine. Fine drive which is based on a spring loaded lever drive mechanism can achieve sub-micron resolution and sensitivity.

- Sample Size : 25mm x 75mm
- Travel Range : 10mm Continuous
- Coarse travel resolution : 10 Micrometer
- Fine travel resolution : 0.1 Micrometer
- Suitable for inverted microscope



### XY Motorised sample stage for small microscopes

Model : HO-XY-MS50

This motorized XY translation stage is an integrated motorized stage with compact structure. It's usually used to automatically move the small object under the microscope. The aperture size is 50mm x 50mm, microscope slides can be mounted and clamped on it. Hand wheels are provided for manual positioning. This stage is connected with Holmarc's motion controller interface and it can be controlled by our computer software via RS232 interface on controller.

Specifications

- |                      |                 |              |                       |
|----------------------|-----------------|--------------|-----------------------|
| X Travel             | : 50mm          | Controller   | : Holmarc M Torque    |
| Y Travel             | : 50mm          | Interface    | : PC Based via RS 232 |
| Actuator             | : Stepper Motor | Construction | : Aluminium           |
| Resolution           | : 0.625 micron  | Finish       | : Black Anodized      |
| Positioning Accuracy | : 5 Micron      |              |                       |



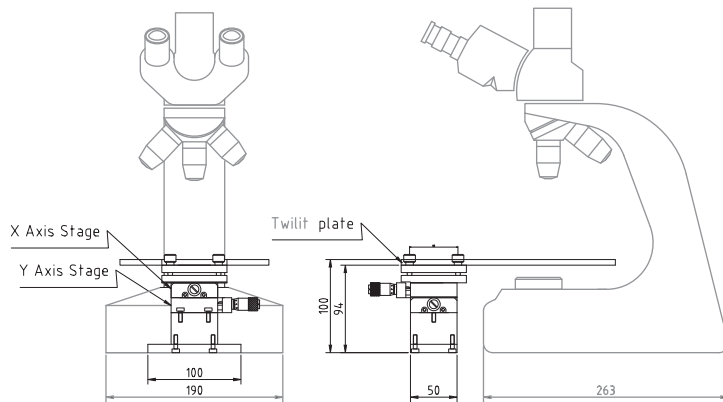
## Microscopy External Positioning Systems

### External XYZ Tilt sample Holder with Rigid Stand

MODEL : HO-MEPS-105P



Microscopy External Positioning System (MEPS) are designed to be used with standard microscopes for custom microscopic works. It support slide holders, petri dishes, chambers and other samples. MEPS can be easily inserted in to other microscope's optical path. The stage mounts to the bottom of the compact rigid stand and can be mounted directly on to a optical breadboard. These positioner can translate a sample load up to 5kg.



MODEL : HO-MEPS-105P

#### Specifications

X axis Travel	: 10mm
Y axis Travel	: 10mm
Resolution	: 5microns
Tilt Range	: +/-2 Degree

## Microscopy External Positioning Systems

### External Motorized XYZ sample holder with Rigid Stand

MODEL : HO-MEPS-5020M

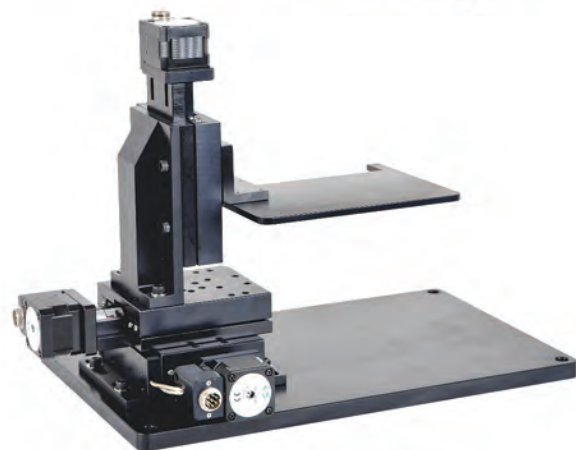


This Microscopy External Positioning System (MEPS) is based on stepper motor translation stages and are designed to be used with standard microscopes. It can support slide holders, petri dishes, chambers and other samples. MEPS can be easily inserted in to other microscope's optical path for custom microscopic works.

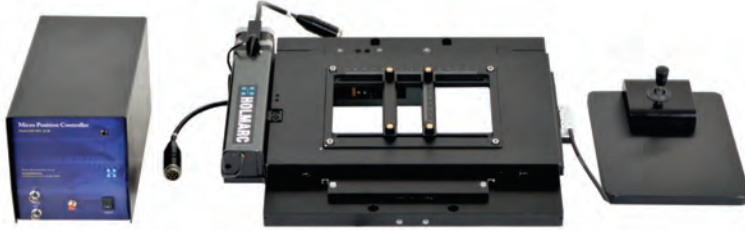
It can translate a load up to 20kg.

#### Specifications

X axis Travel	: 50mm
Y axis Travel	: 50mm
Z axis Travel	: 50mm
Resolution	: 0.625microns
Positioning Accuracy	: Better than 5 Micron



## Motorized Microscope XY Scanning Stage



Holmarc's motorized XY scanning stages are designed for the replacements of manual stages found on certain microscopes and provide programmable XY positioning of microscopy samples. Trapezoidal lead screw and resin nuts are used for high resolution and positioning accuracy. We can design XY scanning stages for inverted and upright microscopes from Nikon and Olympus. Adapter brackets will be provided for the XY stage that enable the stage to be fitted to a particular microscope.

Tabletop mounting brackets are also available that enable the stage to be bolted to an optical table or breadboard as part of a custom built microscope setup or for use in typical photonics applications.

Specimen Holders and Accessories : We offer a range of adapters to allow the positioning of standard microscope slides, multiwell plates petri dishes, and mounted metallurgical specimens.

### Specifications :

- X & Y axis Travel (XY-MR-100) : 100mm
- X & Y axis Travel(XY-MR-50-150) : 150 & 50mm
- Lead screw pitch : 1mm
- Resolution : 0.3125 microns
- Positioning accuracy : <3 micron
- Speed : 4mm / sec

### Specimen Holders and Accessories

- Multiwell Plate Adapter
  - Petri Dish Holder
  - Slide / Multi Slide Holder
- M4/M6 Tapped Breadboard Plate
- 2-Axis Joystick Controller
- Optical Encoder

### Features

- Can be integrates with Nikon, Olympus & Zeiss Upright - Inverted Microscopes
- Optical limit switch for home sensing
- Hand wheel for manual movement
- Optional handheld unit & joystick
- Optical Encoder integration on request
- High Position Accuracy (<3 μm)
- Range of Standard and Custom Sample Holders



Fig. Motorized Microscope XY Scanning Stage for Nikon TI-U Series



Fig. Motorized Microscope XY Scanning Stage for Olympus IX71 Series

Model No	Travel	Resolution	Accuracy	Speed	Item	Suitable microscope
XY-MR-100	X: 100mm Y: 100mm	0.325 microns	<3 μm	8 mm/sec	Motorized XY Sample stage	Nikon Ti-u
XY-MR-50-150	X: 150mm Y: 50mm	0.325 microns	<3 μm	8 mm/sec	Motorized XY Sample stage	Olympus I x 71

### Adapter for 96 well plate and various size glass slides For XY Scanning Stage



### Adapter for Petridish/ Petri dish Holder For XY Scanning Stage

Model	Suitable Diameter
MA-PD35	35mm
MA-PD40	40mm
MA-PD60	60mm
MA-PD80	80mm
MA-PD94	94mm
MA-PD100	100mm
MA-PD145	145mm
MA-PD150	150mm

Note : Custom Adaptor/Holder can be provided on request





# Auto-Microscope

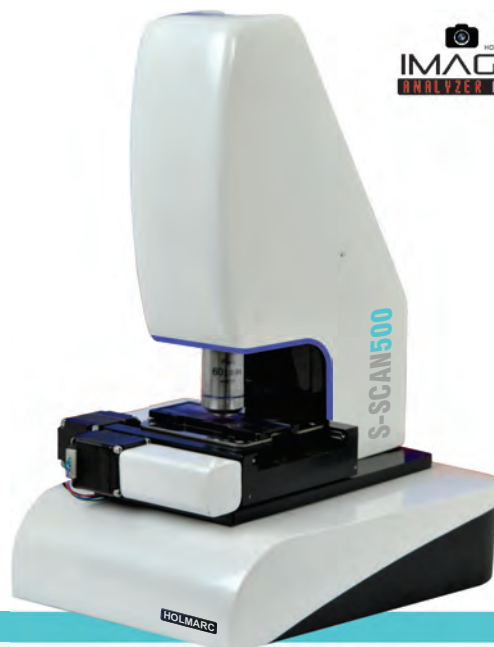
Model : HO-BM-AM01



Holmarc's auto-microscope model : HO-BM-AM01 is an automated digital microscopy system developed for the acquisition of high resolution images in brightfield observation. The motorized XY sample stage helps the user to scan a particular sample area automatically and the autofocus system will find the best focused image in each frame before saving it to the pc for further analysis.

Transmitted warm white LED illumination along with high quality Plan achromatic microscope objective provides uniform illumination of the entire field of view. The system is equipped with 5MP USB3.0 CMOS camera for the fast acquisition of the images and a 60X Plan objective with 0.85NA for high resolution images. System with user specified microscope objective is also available.

A complete user friendly image acquisition software is provided along with the system. The user can easily control the scanning operation and the camera properties through this software.



### Specifications:-

Optical system : Infinity corrected  
 Observation method : Brightfield  
 Illumination : Transmitted,  
 Illumination source : High Bright warm White LED,  
 Intensity Adjustable  
 Microscope objective : Plan Achromatic 60X, 0.85 NA  
 Focusing : Motorized with Autofocusing  
 Image acquisition : 100 images / 8 Minutes  
 Software : AM\_V01

### XY sample stage - Motorized

Travel : 18mm x 18mm  
 Drive : Stepper Motor  
 Resolution : 5 micron  
 Accuracy : 5 micron

### Camera Details

Sensor : CMOS, Color, 5Mp  
 Optical format : 1/2.5"  
 Active imaging size : 5.70mm x 4.28mm (7.13mm diagonal)  
 Active pixels : 2592 H x 1944 V  
 Pixel size : 2.2um x 2.2um  
 Frame rate : 14 fps @ full resolution, 45 fps @ 1024x768  
 Sensitivity : 1.76V/Lux-sec  
 Exposure time : 109us ~ 3000ms  
 Spectral range : 380-650nm  
 SNR : 38.5dB  
 Dynamic range : 67.7dB  
 Shutter : Electronic rolling shutter  
 Data interface : USB3.0  
 Software interface : TWAIN\DirectShow  
 Operating mode : Continuous output  
 Data format : 8 Bit/12 Bit RAW  
 Picture format : JPEG/BMP/PNG/RAW



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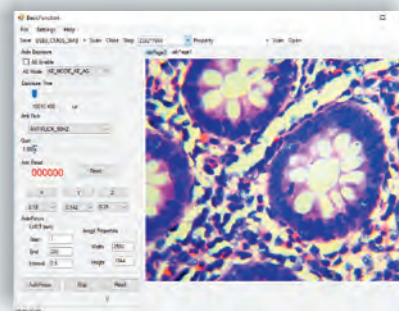
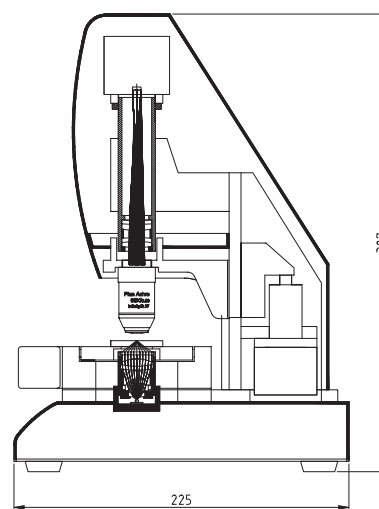
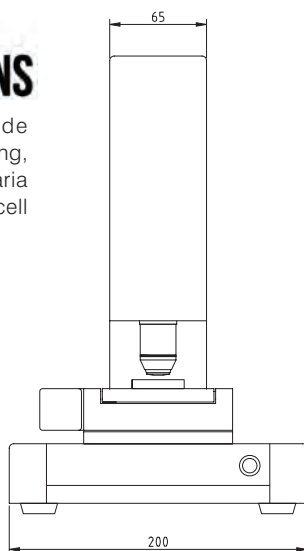


Fig. Auto-Microscope Analyte Software Window



### PRODUCT APPLICATIONS

Applications include biological cell imaging, cell counting, malaria diagnosis, cancer cell imaging etc.





## Basic Laboratory Microscope

**MV215 Series**

MV215 series microscopes from Holmarc are cost effective yet state of the art products for general purpose laboratory applications including bio-medical and pathology. This microscope is available in two models with binocular and trinocular heads. Portability and ease of use have been taken care of in the design along with stability and robustness. All materials used in the microscope are corrosion resistant to make sure of maintenance free operation. The body is esthetically finished to suit the ambience of any modern laboratory. Extreme fine focusing movements are assured by the use of precision machined and lapped mechanics.

MV215 series microscopes are fitted with precision mechanics including fine focusing mechanism integrated with coarse focusing. Model HO-MV215-BLRM2 has binocular head. Each head has standard eyetubes inclined at 30 degrees with the left eyetube having graduated diopter settings. The smooth-operating, ball bearing mounted, quadruple nosepiece provides effortless objective changes. Powerful Koehler illumination provides enhanced image quality and brightness for the observation of specimens. Advanced research microscopes with custom specifications are also manufactured at Holmarc. Please contact our sales team with your requirements.

### Model HO-MV215-BLRM2 Specifications

Head : Binocular Head, 30°Inclined.  
Eyepiece : WF10X/20mm  
Objective : Infinity Achromatic 5x, 10x, 20x, 40x and 100x(s, oil)  
Nosepiece : Quadruple Revolving Nosepiece

Focusing: Coaxial coarse and fine focusing mechanism

Stage : Double Layer Mechanical Stage  
Travel Range : 75x50mm

Illumination:  
Light source : HB LED variable light intensity control using a knob  
LED power : 3W, comparable to an halogen bulb 30-35W.  
Color temperature: 6300K  
Condenser : Abbe N.A. = 1.25 with Iris Diaphragm & Filter



[http://www.holmarc.com/basic\\_laboratory\\_microscope.php](http://www.holmarc.com/basic_laboratory_microscope.php)

Fig. Model : HO-MV215-BLRM2 Basic Laboratory Microscope

Our microscopes have carefully designed and constructed body for rigidity, robustness and portability. Sub-micron sensitivity is achieved by precision linear motion stages with minimum possible friction and stick-slip. Our optics have been widely acknowledged for visual clarity and precision of results.

Optics are made in house from the highest quality raw materials. All components included are inspected for quality at every manufacturing point before putting in to assembly. We customize and supply scientific microscopes to research laboratories.



## Microscopes

For Scientific measurement & Inspection Applications

Holmarc manufactures microscopes of varying sophistications for a variety of applications. Entire optics and mechanics for these microscopes are manufactured in house by our experienced technicians for assuring quality of the end product. Our objective is to provide our customers with superior products comparable to the best in the world at the most competitive prices. Each and every optics that becomes part of these microscopes are hand polished to the highest quality and inspected to find manufacturing defects before putting in to assembly.

The microscope body is designed ergonomically and esthetically. Each and every mechanical part is manufactured with care for lifelong operation without maintenance. Smooth focusing movements are achieved by rolling contact bearings wherever spatially possible or by fine lapped mating surfaces. There are four different models of standard microscopes available from Holmarc meant for differing scientific disciplines and applications. We manufacture custom designed microscopes as well, whether the customization is in optics or in mechanics.

## MICROSCOPY Automated Options



- Focusing
- Objective lens selection
- XY Sample Stage
- Rotation Sample Holder
- Illumination
- Shutter
- Chopper
- filter wheels

### HOLMARC Microscope Interactive System Controller

Holmarc Microscope Interactive System Controller brings a new level of user control for automated microscopes. The familiar joystick style control is enhanced for fine and coarse stage positioning. System include most functional keys and are arranged intelligently for intuitive application.





# Measuring Microscope

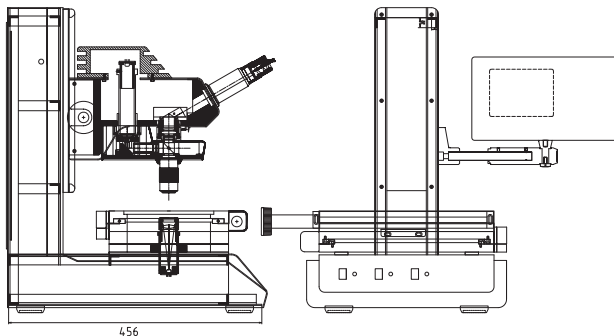
MM214V & MM214D Series



Model : HO-MM214V-50X

## Features

- ▶ Quick and accurate non-contact optical measurement
- ▶ Long working distance objectives, up to 100x magnification
- ▶ Digital 1 micron readout
- ▶ Graduations on the eyepiece holder enable angular measurements by rotating the eyepiece.
- ▶ The quick release system for long stroke measurements
- ▶ Digital video camera head (Optional)
- ▶ LED HB lighting sources
- ▶ Bright field observation
- ▶ Infinity-correction optical system
- ▶ Polarized observation (Optional)
- ▶ Optional motorized controls
- ▶ Illumination intensity can be adjusted for most convenient and suitable illumination.
- ▶ The XY measuring stage range available up to 400x200mm



We offer various optional accessories designed to increase microscope usability.

MM214 is a new series of innovative measuring microscopes from Holmarc designed for industrial and scientific measurements. These microscope are designed for delivering maximum measuring accuracy. It can be used for measurements as well as inspection of miniature parts and specimens which are too small to be measured without the assistance of a microscope. The instrument can measure semiconductors, small electronic and electrical components, biological specimens, micro-electro mechanical systems (MEMs), miniature machined parts, miniature molded items etc. The microscope has long working distance objective, eye piece fitted with reference cross wire, precision XY measuring stage, optical linear scales fitted to the X,Y and Z stages, digital read out (DRO) and object illumination systems. This instrument can be considered to be an essential tool for any laboratory either life science or physical science handling miniature components, parts and specimens.

## Object Illumination

There are three types of illuminations to choose from: Co-axial illumination, bottom illumination and angled illumination. In all these cases, high bright LED is used as light source for long life and cool lighting.

## X,Y stage and Z stage

All the three linear stages have precision rolling contact bearings to ensure straight-line accuracy and repeatability in measurements. The stages are fitted with optical encoders having 1 micron resolution.

XY stage has leadscrew drives with fine and extra fine movements with hand knobs. There are clutch mechanisms for both these stages to disengage the leadscrew from the stage for quick positioning. The stage has glass top for bottom illumination. Travel for X stage is 200 mm and Y stage is 100 mm. Z stage is driven by rack and pinion through hand knobs fitted on both sides with a fine positioning mechanism on right side. Optical head is fitted to the Z stage. Vertical measurements can be taken by repeated focusing at the points of interest.

## Digital Read Outs

Digital read outs with 1 micron resolution is fitted to the vertical column at ergonomical eye sight location. The read outs have large LED display and various programmable features like error compensation, calibration, etc..

## MM214 Series

### Model : HO-MM214V-50X

#### Specifications

Effective Magnification : 50X (up to 1000X Available)  
 Vision : Binocular  
 Working Distance : 34mm  
 Working Throat : 100mm  
 Objective Design : PLAN APO Infinity LW Objective  
 Stage : XYZ High Precision Stage  
 Travel (X,Y&Z): 100 x 200 x 100mm  
 DRO : XYZ coordinate data  
 Resolution : 0.00005"/0.001mm  
 Z Axis Single Channel DRO 0.001mm resolution  
 Illumination : Variable High Bright LED  
 Angled, Bottom & Coaxial Illumination

### Model : HO-MM214D-50X

#### Trinocular Model

C-Mount camera adapter is available in this model.  
 All other specifications are same as that of Model : MM214V





**Applications**

- Small Size Die & Mold
- Drill Bits
- Inserts
- Fine Pitch Connector
- Gears etc.

Holmarc's TM215VM is an affordable measuring microscope in TM215VM Series are well suited for wide range of applications from shop-floor inspection, measurement of tools and machined parts to precise measurement of test tools in a measuring room. It is designed as a monocular optical system with an angular measurement dial, suited for measuring angles. Angle measurement is performed easily by turning the angle scale disc to align the cross-hair reticle with the workpiece image. It can also be used to check the shape of screws and gears by attaching an optional reticle. Designed for those who prefer to measure with their own eye, the monocular eyepiece tube model is available. The C-Mount Video Head model provides easy video monitoring.

Bottom, Angled and co-axial illumination are provided in TM215V Series. A high bright Green LED is employed as the co-axial light source. Illumination intensity can be adjusted for most convenient and suitable illumination.

The eye piece of this microscope is fitted with cross wire and measuring scale. The cross wire acts as a reference point for taking fine measurements. The XY stage used is of measurement grade fitted with precision micrometers of 1micron resolution. The micrometers can be either conventional engraved type or with digital display depending on the application. As the cross wire is fitted to only one eyepiece, these microscopes are monocular generally. Measurements are taken by movement of the stage. The crosswire is aligned with the first reference line or a point on the specimen or test object. Then the stage is moved watching the image to the second point on the object. Actual measurements are provided by micrometer reading. The depth can also be measured precisely using the micrometer on Z stage on which the optics head is fixed. By lowering or raising optics head, a point can be made in to focus or out of focus. By bringing the two points at different depths into focus one by one by moving the Z- micrometer, the depth can be obtained from the micrometer readings. Digital readout for XY stages are also available. The quick-release system is enabled on all long XY measuring stage, which is especially useful in longstroke measurements. Large-size grip knobs are provided on both sides of the column for focusing using the fine/coarse movement.

**MICROVIEW™ Measuring Microscope**  
TM215V Series Model : HO-TM215VM-50X

**Features**

- ▶ Excellent for precise measurements of angles, lengths, diameters, and any distances on the specimen.
- ▶ Angle measurement is performed easily by turning the angle scale disc to align the cross-hair reticle with the workpiece image.
- ▶ Long working distance objectives,
- ▶ X,Y & Z stages available with linear scales and DRO unit.
- ▶ Precise and Easy to Use.
- ▶ Can be used to verify surface finish and to measure surface defects
- ▶ Ideal for measurements of hardness test indentations.
- ▶ Suitable for thread inspection and verification of tool angles.

Magnification  
**Model : HO-TM215VM-50X**  
Specifications  
 Effective Magnification : 50X (up to 1000X Available)  
 Vision : Monocular  
 Working Distance : 34mm  
 Working Throat : 100mm  
 Objective Design : PLAN APO Infinity LW Objective  
 Angular Measurement Unit : 0.1 Degree Scale  
 Stage : XY High Precision Stage  
 Travel (X,Y) : 25 x 25mm (Available range up to 400x200mm)  
 XY Measurement Resolution : 0.00005"/0.001mm  
 Illumination : Variable High Bright LED  
 Angled, Bottom & Coaxial Illumination





## Tool Makers Microscope

Model : HO-TMM-01 & HO-TMM-02

Holmarc's Tool maker's microscopes are multi-functional measuring instruments which are primarily used for inspection and measurement of miniature mechanical and electronic parts and tools. These microscopes are used to view and measure linear distances, thread pitch, thread angles, tool edges, tool wear surfaces etc. and are ideal for photo-lithographic labs, nano-technology labs, biomedical labs etc. Our tool maker's microscopes are equipped with a cross hair reticle on the eyepiece, coupled with protractor on the tube. The cross wire acts as a reference point for taking fine measurements. The XY stage is fitted with precision micrometers having a resolution of 10 microns and the measurements are taken by the movement of the stages. Digital micrometer with 1 micron resolution is available as an optional accessory. The instrument uses high bright LED for transmitted illumination as well as for oblique illumination. The standard model consists of 2X microscope objective and 15X eyepiece. Additional eyepieces and objectives are available as optional accessories. All optics are coated with broadband multilayer AR to get the clear and flare less images.

Holmarc offers two models of Tool maker's microscopes which differ only in XY measuring stage, model no. HO-TMM-01 and HO-TMM-02. HO-TMM-01 model is fitted with 25 x 25mm travel XY stage and HO-TMM-02 is fitted with 50 x 50mm travel XY Stage.

### Key Features

- Both transmitted and reflected Illumination intensity can be adjusted.
- Angle measurement is performed easily by turning the angle scale disc to align the cross-hair reticle with the work piece image.
- Bright field observation, clear and flare less image, wide field of view.
- Two XY stages with different travel ranges models are available (25 x 25mm & 50 x 50mm)



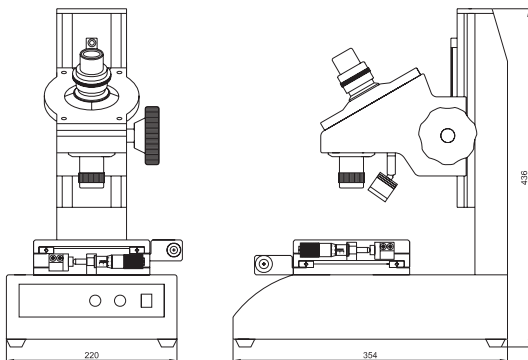
### Specifications & Tolerances

Total Magnification	.....	30X
Objective	.....	2X (Working Distance: 67mm, NA: 0.07)
Eyepiece	.....	15X (View Field Diameter: 13mm)

Optical Tube	Eyepiece protractor
Monocular Inclined angle 30 degree	Rotation ..... 360°
90° Cross-Hair reticle	Graduation ..... 1°
Diopter Adjustable	Minimum Reading ..... 6' (by vernier)

XY Stage (Model No. HO-TMM-01)	XY Stage (Model No. HO-TMM-02)
Travel ..... 25 x 25 mm	Travel ..... 50 x 50 mm
Size ..... 100 x 100 mm	Size ..... 150 x 150 mm
Stage Glass ..... 60 x 60 mm	Stage Glass ..... 90 x 90 mm
Max. Work piece height 115 mm	Max. Work piece height 107 mm
Max. Work piece weight 5Kgs	Max. Work piece weight 5Kgs
Drive ..... Micrometer	Drive ..... Micrometer
Resolution ..... 10 microns	Resolution ..... 10 microns

Transmitted Illumination	.....	High Bright LED, Intensity Adjustable
Reflected Oblique Illumination	---	High Bright LED, Intensity Adjustable
Power Supply	.....	230V, 50Hz
Dimensions	.....	354 x 220 x 436mm



### Optional Accessories

**Digital Micrometer Head**  
(2 Nos. required for XY stage)  
Travel = 25mm, Resolution = 1 micron  
(Model No. HO-TMM-DM1)

**Eyepieces**  
10X, FN - 13mm  
(Model No. HO-TMM-E10)  
20X, FN - 10mm  
(Model No. HO-TMM-E20)

**Objectives**  
5X, WD - 33mm, NA: 0.10 (Model No. HO-TMM-MO5)  
10X, WD - 14mm, NA: 0.14 (Model No. HO-TMM-MO10)



# Digital Inspection Microscope

DIM213D Series



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www.holmarc.com



MODEL : HO-DIM-5MP07

## Specifications

### Objective

Type	: Infinity corrected Long WD
Magnification	: 20X
Numerical Aperture NA	: 0.42
Working Distance	: 20mm
Focal Length FL	: 10mm
Resolving Power	: 0.7 μm
Depth of Focus	: 1.6 μm

### Camera Unit

Sensor	: CMOS
Sensor Size	: 1/2.5"
Interface	: USB2.0
Pixel Size	: 2.2x2.2 micron
Maximum resolution	: 2592x1944, full resolution mode
Frame rate at resolution	: 7 fps at 2592x1944, full resolution 37 fps at 1024x768 & 78 fps at 640x480
Output bits per pixel	: Selectable, 8 bit, 10 bit or 12 bit
Dynamic Range	: 70.1 dB

### Angled Illumination Unit

Illumination	: LED based
Type	: Array
Colour	: Pure White
Luminosity control	: Continuously variable
Housing material	: Aluminium

### Back Illumination Unit

Condenser lens type	: Achromatic Corrected
Numerical Aperture	: 0.55 max. (variable)
Working distance	: 15mm
Illumination	: LED based
Power	: 3W
Colour	: Pure White
Luminosity control	: Continuously variable
Polarizer	: Linear polarizing film
Housing material	: Aluminium black anodized

### Tube lenses

Lens type	: Achromatic Corrected
Focal lengths	: 200mm
Imaging area	: 288X215 micron with 1/ 2.5" sensor : 320x240 micron with 1/ 2" sensor
Optional	
150mm FL Tube lens	
Imaging area	: 384X286 micron with 1/ 2.5" sensor : 426x320 micron with 1/ 2" sensor
250mm FL Tube lens	
Imaging area	: 230X171micron with 1/ 2.5" sensor : 256x192 micron with 1/ 2" sensor
300mm FL Tube lens	
Imaging area	: 192X143 micron with 1/ 2.5" sensor : 213x160 micron with 1/ 2" sensor

Holmarc introduces a new and innovative product for digital inspection that offers automated optical inspection, imaging and documentation. Digital inspection microscope HO-DIM213D provide you with a broader range of functionality, flexibility and portability, expanding your capabilities beyond the traditional optical microscope. Our digital inspection product line features high quality digital imaging & video inspection stations and microscopy illumination products. It covers the entire spectrum from UV to IR.

Holmarc Digital Inspection System utilize the finest quality optical components for crisp, accurate and colour correct specimen viewing. Combine these with one of our fine quality CCD or CMOS cameras to build a product documentation station. It is ideal for inspection of a wide range of objects such as synthetic and natural fiber, semiconductor, integrated circuits, solder joints and facilitates various processes such as surface analysis, quality control, defect analysis, metrology, biomedical imaging etc.

A wide range of adapters & auxiliary lenses, cameras, lighting options, video capture cards and stands are available to provide a custom solution.

### Features

- ✓ Long working distance Infinity Corrected Objective
- ✓ Superior image quality
- ✓ Easy to set
- ✓ Angled and Back illumination for In depth viewing
- ✓ Depth Measurement Using Micrometer Controlled Mechanism
- ✓ Flexible Positioning Unit
- ✓ Polarized Imaging

Because of continuous product improvement, the various data listed are subject to change without notice. Please confirm before ordering.

We pay individual attention to our customers, and are ready to customize any of the parts to meet their needs. Contact us at sales@holmarc.com



## Super Long Working Distance Plan apochromatic Microscope Objective

### MICRO VIEW SLWD Series - Bright Field Inspection

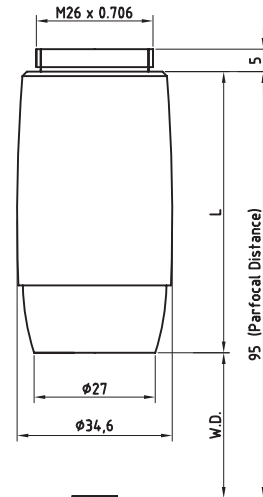
HOLMARC developed super long working distance microscope objective for high image quality inspection and analysis application. All objectives have flat image surface over 42mm field of view, highest standard in the objective design. Thanks to its advanced optical design including an aspherical element and optimized coatings that minimize ghosting and flare while providing exceptional color balance than conventional objectives. All lenses are Plano Apochromats. These objective lens is chromatic aberration corrected for red, blue, and yellow.

M-View SLWD series objectives are optimized for bright field illumination. Ideal for in-line (co-axial) illumination applications. All stated magnifications are based on a tube lens focal length of 200mm. Mounting thread: M26 x 0.706 pitch (36 TPI). These objectives can be used in finite and infinite configuration. For an infinity correction system, a 200mm focal length tube lens is required.



**Super Long Working Distance Design**  
**Bright Field Inspection**  
**Good Color Reproducibility**  
**Flat Image Surface over 42mm Field of View**

Compatible Tube Lens Focal Length: **200mm**  
Mounting Threads: M26 x 36 TPI  
Type: Infinity/Finite Corrected Microscope Objective



[http://www.holmarc.com/super\\_long\\_working\\_distance\\_microscope\\_objective.php](http://www.holmarc.com/super_long_working_distance_microscope_objective.php)

Model	Magnification	Focal Length	Numerical Aperture	Resolving Power	Working Distance
HO-SLWD-5X1	5X	40mm	0.18 NA	1.6um	40mm
HO-SLWD-8X1	8.3X	24mm	0.2 NA	1.5um	40mm
HO-SLWD-10X1	10X	20mm	0.4 NA	0.65um	19mm
HO-SLWD-10X2	10X	20mm	0.33 NA	0.9um	16mm
HO-SLWD-12X1	12.5X	16mm	0.35 NA	0.84um	18mm
HO-SLWD-16X	16.6X	12mm	0.34 NA	0.85um	16mm
HO-SLWD-20X1	20X	10mm	0.35 NA	0.75um	17mm
HO-SLWD-25X1	25X	8mm	0.64 NA	0.4um	8mm
HO-SLWD-40X1	40X	5mm	0.65 NA	0.4um	7mm

## Super Long Working Distance Plan apochromatic Objective with Motorized/Manual Variable Aperture

### MICRO VIEW SLWD-VA Series - Bright Field Inspection

Model		Magnification	Numerical Aperture Adjustment	Working Distance
Manual	Motorized			
HO-VA-SLWD-5X1	HO-VAM-SLWD-5X1	5X	0.01- 0.2 NA	40mm
HO-VA-SLWD-8X1	HO-VAM-SLWD-8X1	8.3X	0.01- 0.2 NA	40mm
HO-VA-SLWD-10X1	HO-VAM-SLWD-10X1	10X	0.01- 0.4 NA	19mm
HO-VA-SLWD-10X2	HO-VAM-SLWD-10X2	10X	0.01- 0.33 NA	16mm
HO-VA-SLWD-12X1	HO-VAM-SLWD-12X1	12.5X	0.01-0.35 NA	18mm
HO-VA-SLWD-16X	HO-VAM-SLWD-16X	16.6X	0.01- 0.34 NA	16mm
HO-VA-SLWD-20X1	HO-VAM-SLWD-20X1	20X	0.01- 0.35 NA	17mm
HO-VA-SLWD-25X1	HO-VAM-SLWD-25X1	25X	0.01- 0.64 NA	8mm
HO-VA-SLWD-40X1	HO-VAM-SLWD-40X1	40X	0.01- 0.65 NA	7mm

Note : Product specifications are subject to change without prior notice.

SLWD-VA Series objectives design are continuation of M-View SLWD series objectives. SLWD-VA Series integrated a circular 7 blades aperture is used between the optical system. It allows user to control the depth of focus and illumination in controlled manner.

For manual version aperture adjustments are provided by a engraved (NA marked) rotating ring on objective. While motorized version include a tiny stepping motor for fine automated controls (Automated Microscopy Systems)



# Telemicroscope

MODEL : HO-TLM-01C



Fig. MODEL : HO-TLM-01A

Fig. Telemicroscope Movements

## Features

- ✓ Long working distance
- ✓ Variable Magnification
- ✓ Superior image quality
- ✓ Easy to set
- ✓ Co-axial Illumination for In depth viewing
- ✓ Roll, Yaw rotation stages
- ✓ XY Micrometer Drive

### MODEL : HO-TLM-01C

#### Specifications:

Working distance range	: 200-2000mm
Field of view	: Detector size and W.D dependable min. 1000micron for 1/4" CCD @ 200mm W.D
Magnification	: 5X variable within the limit
Focusing Type	: Two cam movement with fine focusing
Illumination Options	: Co-axial & angled
Illumination	: High bright warm white 3W LED

Travel Vertical	: Max 1100mm (Tripod based) 500mm using rack and pinion And 600mm slide movement.
X-Y	: 25mm (10micron resolution)

Rotation Roll	: 45°
Yaw	: 360°

HOLMARC Telemicroscope TLM 208 Series is designed for imaging very small area from a distance of 200-2000mm. It allows microscopic imaging at a considerable distance from the object.

It can image a small area of unreachable places which cannot be measured with ordinary instruments. The main application of the instrument is observing the sessile drops in furnaces. It can also be used for temperature deformation study of hot object in the oven. The coaxial illumination in this unit helps for imaging the small parts inside the cylinder. Ordinary illumination maynot work for such application.

Telemicroscope has a built-in slide focusing adjustment. This eliminate the complex focusing jobs. The magnification and field of view depend on the distance from the lens to object. Bringing the Telemicroscope as close as possible to the object will maximize magnification and give you the smallest field of view.



Fig. Telemicroscope sample images taken from a distance of 200mm

#### APPLICATION AREAS

- ✓ Thermal Analysis
- ✓ Stress Analysis
- ✓ Micro level positioning of long distant objects
- ✓ Crack Monitoring etc.



MODEL : HO-TLM-01C

Fig. Telemicroscope with Co-axial Illumination Unit



MODEL : HO-TLM-01B

Fig. Telemicroscope with Boom Stand



# Traveling Microscope

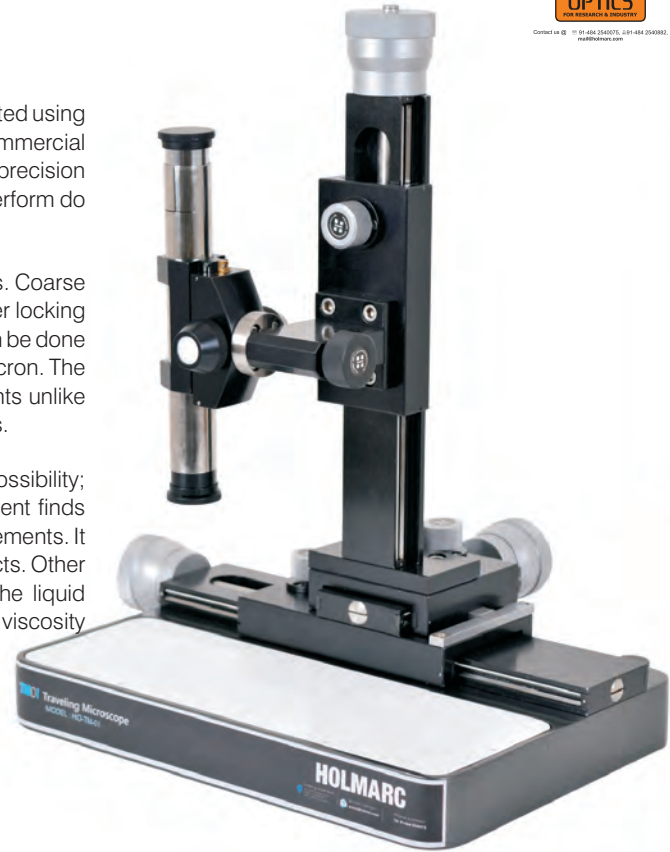
Model : HO-TM-01



Holmarc's Precision traveling microscope model HO-TM-01 is fabricated using precision roller bearing slides in each axis, where as other commercial available models are fabricated using standard dovetail design. The precision roller bearing slides give us frictionless movements which helps to perform do the measurements more accurately than dovetail design.

Each stage (X, Y and Z) is equipped with coarse and fine movements. Coarse movement can easily be done by moving the stage by hand and after locking the stage at a particular position the fine movement/measurement can be done by the micrometer head. The resolution of the fine movement is 10 micron. The use of micrometer head enables precise and accurate measurements unlike commonly available traveling microscopes with vernier scale readings.

Holmarc offers traveling microscope with three axes measurement possibility; horizontal, vertical and right angled transverse motion. The instrument finds wide applications in general purpose scientific and industrial measurements. It can be used for accurate measurements of diameter of different objects. Other applications include accurate determination of small variation in the liquid levels, determination of refractive index of liquids, surface tension, viscosity etc.



## SPECIFICATIONS

### Horizontal Movements

X direction	Micrometer Head
Coarse Travel	150 mm
Fine Travel	25 mm
Resolution	10 micron

Y direction	Micrometer Head
Coarse Travel	50 mm
Fine Travel	25mm
Resolution	10 micron

### Vertical movement

Z direction	Micrometer Head
Coarse Travel	130 mm
Fine Travel	25mm
Resolution	10 micron

Rotation	360 degree (lockable)
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### Eyepiece

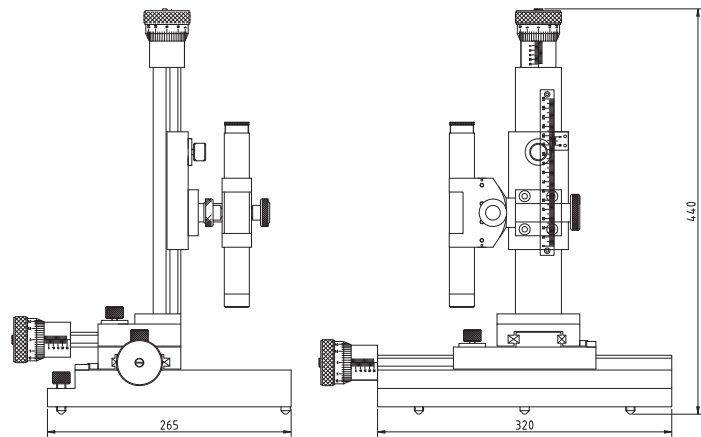
Magnification	10X
Focal length	25mm
Broadband AR coated	
Cross hair reticle	

### Objective

Achromatic Type	
Magnification	3X
Focal length	60mm
Broadband AR coated	

Base construction	Cast Aluminium
Focusing	Manual, rack & pinion

The microscope tube is mounted on a rotating arm which is 360 degree rotatable and lockable. A rack and pinion type focusing mechanism is attached to the microscope tube for focusing the objects. The microscope tube is fitted with 3X long working distance objective and 10X eyepiece with cross hair.



We can provide custom configured traveling microscopes on request.

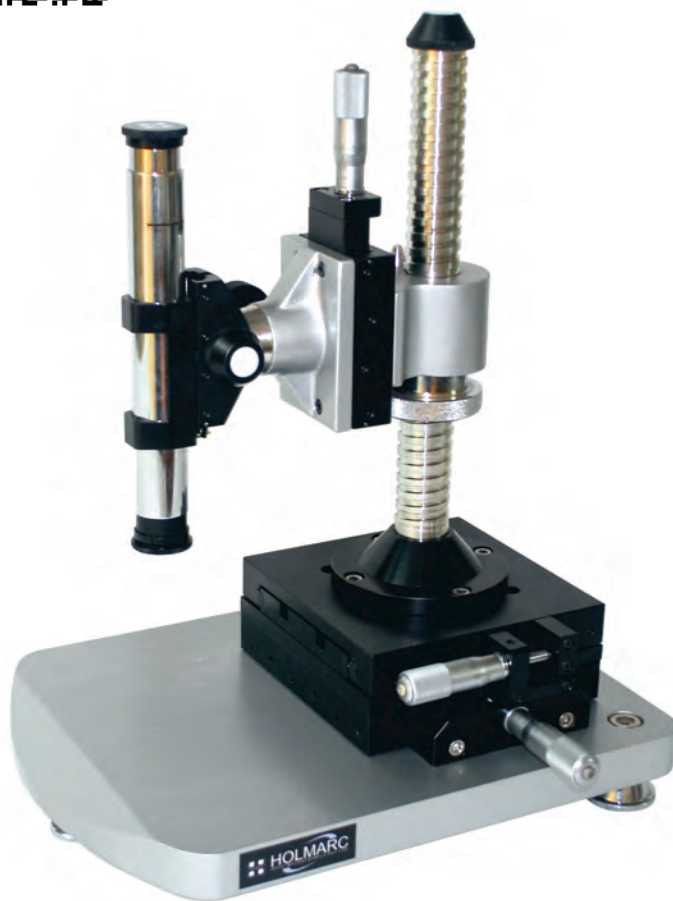
**Contact us at**  
sales@holmarc.com  
mail@holmarc.com  
Ph : 0484 2540 075





# Traveling Microscope

Model : HO-TM-02



Holmarc's traveling microscope model HO-TM-02 is equipped with micrometer driven horizontal X, Y, and vertical Z stages. All the assembly is mounted on a heavy wide base with three point support for extra stability and leveling. The extra wide base can also be used for placing large objects for measurements.

HO-TM-02 can be used for wide applications in general purpose scientific and industrial measurements. Other applications include accurate determination of small variation in the liquid levels, determination of refractive index of liquids, surface tension, viscosity etc.

The horizontal X and Y stages are equipped with micrometer head for precise and accurate measurements. Both stages provide 50mm travel with 10 micron resolution. The vertical stage (Z stage) is equipped with 130mm coarse travel and 25mm fine travel with 10 micron resolution. The coarse movement can be done by rotating the knob by hand and after locking the stage at a particular position fine movement can be done by the micrometer.

## SPECIFICATIONS

### Horizontal Movements

X direction	Micrometer Head
Travel	50 mm
Resolution	10 micron

Y direction	Micrometer Head
Travel	50 mm
Resolution	10 micron

### Vertical movement

Z direction	Micrometer Head
Coarse Travel	130 mm
Fine Travel	25mm
Resolution	10 micron

Rotation	360 degree (lockable)
----------	-----------------------

### Eyepiece

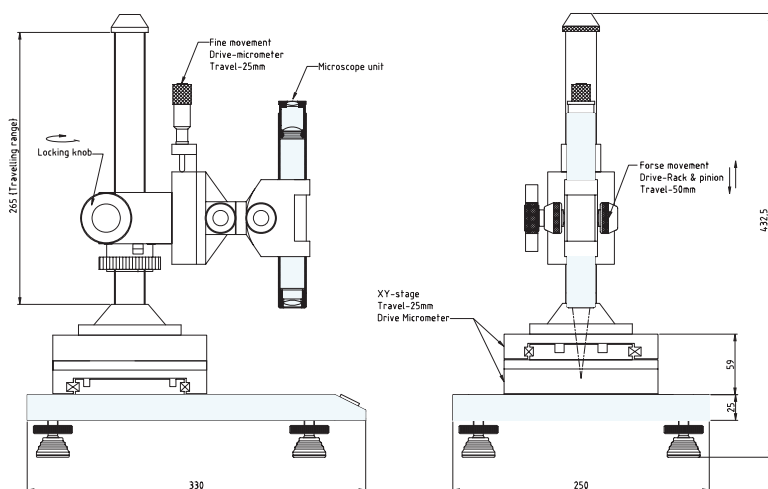
Magnification	10X
Focal length	25mm
Broadband AR coated	
Cross hair reticle	

### Objective

Achromatic Type	
Magnification	3X
Focal length	60mm
Broadband AR coated	

Base construction	Cast Aluminium
Focusing	Manual, rack & pinion

The microscope tube is mounted on a rotating arm which is 360 degree rotatable and lockable. A rack and pinion type focusing mechanism is attached to the microscope tube for focusing the objects. The microscope tube is fitted with 3X long working distance objective and 10X eyepiece with cross hair reticle.





# Digital Traveling Microscope

Model : HO-DTM-01



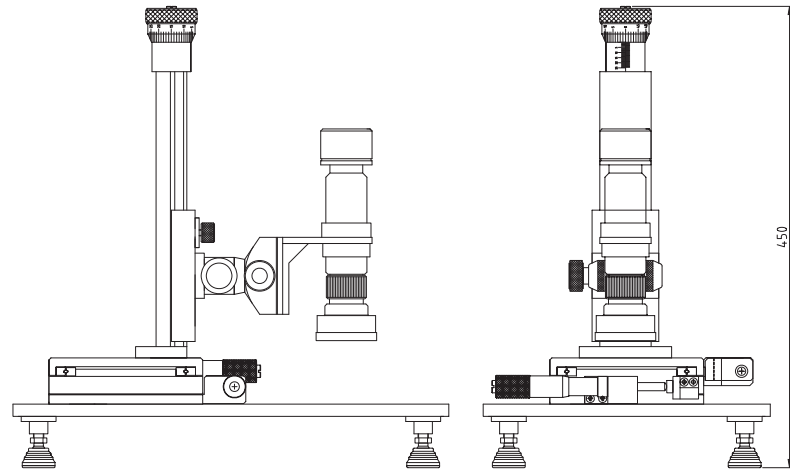
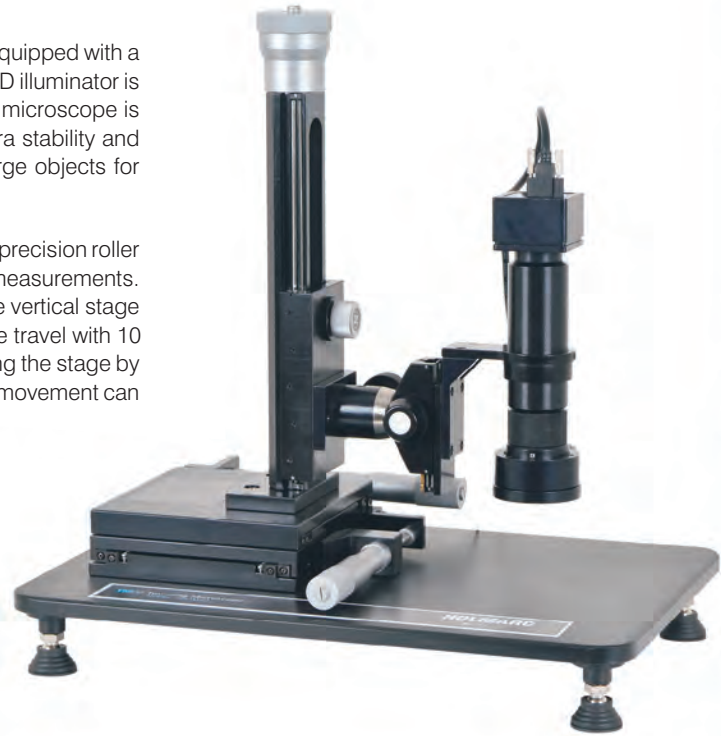
Contact us @ 91-484-2540075, 91-484-2540882  
read@holmarc.com

Holmarc's digital traveling microscope Model : HO-DTM-01 is equipped with a 5MP CMOS color camera instead of an eyepiece. A ring type LED illuminator is provided around the objective for illuminating the objects. The microscope is mounted on a heavy wide base with four point support for extra stability and leveling. The extra wide base can also be used for placing large objects for measurements.

The horizontal (X, Y) and vertical (Z) stages are fabricated using precision roller bearing slides with micrometer head for precise and accurate measurements. Both stages provide 50mm travel with 10 micron resolution. The vertical stage (Z stage) is equipped with 130mm coarse travel and 25mm fine travel with 10 micron resolution. The coarse movement can be done by moving the stage by hand and after locking the stage at a particular position the fine movement can be done by the micrometer head.

The microscope tube is mounted on a rotating arm which is 360 degree rotatable and lockable. A rack and pinion type focusing mechanism is attached to the microscope tube for focusing the objects. The microscope tube is fitted with 3X long working distance objective, ring illuminator and CMOS camera.

An image grabbing software is also provided with HO-DTM-01. With this software the user can capture the image by selecting suitable imaging parameters (like resolution, color or monochrome, exposure, etc.) and save it to a computer for later/further analysis. A reference cross line is integrated in the software for performing the measurements.



## SPECIFICATIONS

### Horizontal Movements

X direction	Micrometer Head
Travel	50 mm
Resolution	10 micron

Y direction	Micrometer Head
Travel	50mm
Resolution	10 micron

### Vertical movement

Z direction	Micrometer Head
Coarse Travel	130 mm
Fine Travel	25 mm
Resolution	10 micron

Rotation	360 degree(lockable)
----------	----------------------

### Objective

Achromatic Type	Achromatic Type
Magnification	3X
Focal length	60mm
Broadband AR coated	

### Camera

Sensor	CMOS Color
Resolution	2592 * 1944 pixels(5MP)
Sensor size	1 / 2.5"
Pixel size	2.2 um x 2.2um
Frame rate	6 fps
Dynamic range	70.1 d
Signal noise ratio	38.1 dB
Exposure time	0.058ms to 3000ms
Sensibility	1.4 V / Lux-sec
Spectral range	380nm - 650nm

Data interface	USB 2.0
Shutter	Electronic Rolling Shutter
Image data format	8bit RAW format
Operating mode	Continuous

Base construction	Cast Aluminium
Focusing	Manual, rack & pinion

# Autocollimator & Accessories



Autocollimator is a versatile non-contact optical instrument for measurement of small angles or tilt movements with very high sensitivity. Holmarc manufactures precision visual autocollimators as well as electronics autocollimators as standard products and these instruments find multitude of applications in shop floor as well as metrology labs for precision measurements of straightness, parallelism, perpendicularity, and flatness.

Autocollimator projects the image of an illuminated reticle to the object under inspection and receive the reflected image from the object. In visual autocollimators, this reflected image of reticle will focus at the position of fixed reference cross wire. Shift in reflected image compared to the fixed reference cross wire represents angle. A dual axis micrometer driven linear stage carry the fixed cross wire near the eyepiece of the instrument. Operator can determine shift and hence the angle by moving the fixed cross wire and aligning it with the reflected reticle image. Graduations on the micrometer give angular measurements directly in arc seconds.

In Electronic autocollimator, the reflected image of reticle will focus on a CMOS camera. The software calculates the shift in reflected image and shows the corresponding angles in seconds, minutes or degrees.

In most cases, the object under inspection may not be having reflective surfaces. In order to carry out inspection, operator needs to fix a plane mirror on the object for reflecting the image back to the instrument. Holmarc supplies a front coated mirror along with kinematic mount as a standard accessory.

Holmarc's autocollimator has stainless steel body and high precision optics with LED illumination. A kinematic stage with two axes tilt movements hold the instrument on horizontal plane. Different types of accessories are also provided for performing different applications. Customer can choose the required accessories from the optional accessories list.

### Standard Accessories:-

1. Horizontal alignment stage
2. Plane parallel mirror with mount.

### Optional Accessories:-

- A Right Angle Prism
- B Penta Prism
- C V prism with Flat Mirror and Cross level
- D Mirror with Mount and base plate
- E Tripod
- F Transparent Wedge
- G Penta Prism with Wedge
- H 45 degree mirror with mount
- I Polygon Mirror with mount
- J Vertical stand with height adjustment & 3 axis freedom for alignment

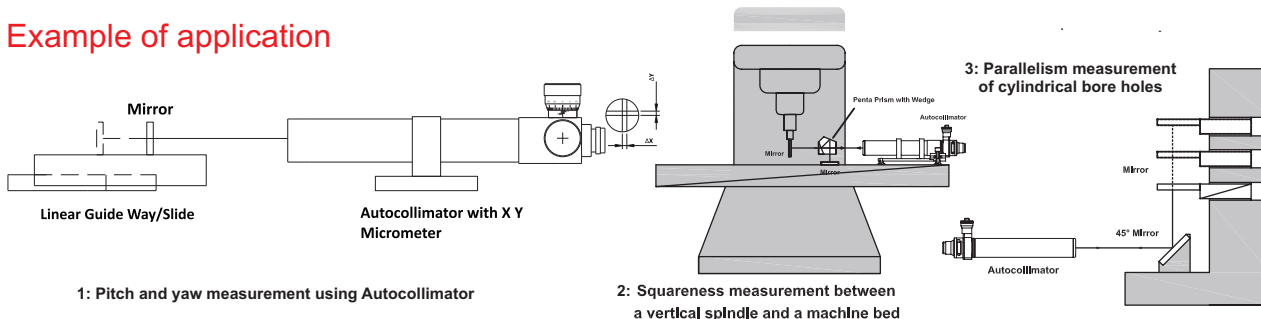


Universal stand for Autocollimator

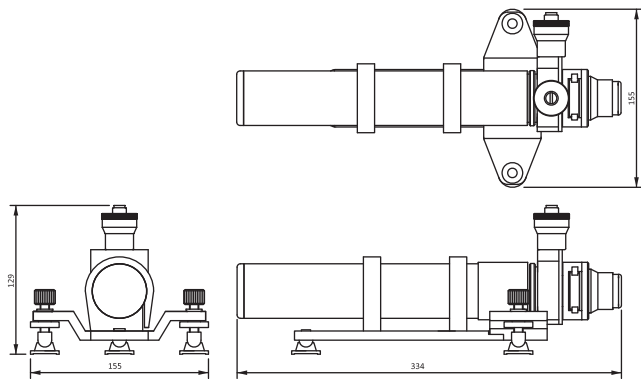
### SPECIFICATIONS

Model	HO-OI-AC3	HO-OI-AC1	HO-OI-EAC
Readout	Micrometer	Micrometer	Software
Measurement axis	Dual (X, Y)	Dual (X, Y)	Dual (X, Y)
Resolution	3 arc seconds	1 arc seconds	0.79 arc seconds
Accuracy over full range	30 arc seconds	10 arc seconds	7.9 arc seconds
Measurement range	±0.5 degree	± 20 arc minutes	Horizontal = ± 17 arc minutes Vertical = ± 12.5 arc minutes
Field of view	1 degree	40 arc minutes	Horizontal = 34 arc minutes Vertical = 25 arc minutes
Clear aperture	30 mm	35 mm	30 mm
Reticle illumination	Green LED- Variable intensity	Green LED- Variable intensity	Green LED- Variable intensity

### Example of application







**Features**

- High accuracy Angle measurements.
- Non-contact measurement.
- Repeatable Measurements.
- LED illumination.

**Applications in Mechanical Engineering**

- Measurement of parallelism of two surfaces
- Measurement of perpendicularity of two surfaces
- Parallel setting of rolls
- Pitch and yaw measurement of slides
- Measurement of roll-angle
- Straightness measurement
- Flatness measurement
- Squareness measurement between a vertical spindle and a machine bed
- Parallelism measurement of cylindrical bore holes
- Testing of accuracy of rotary tables and index tables

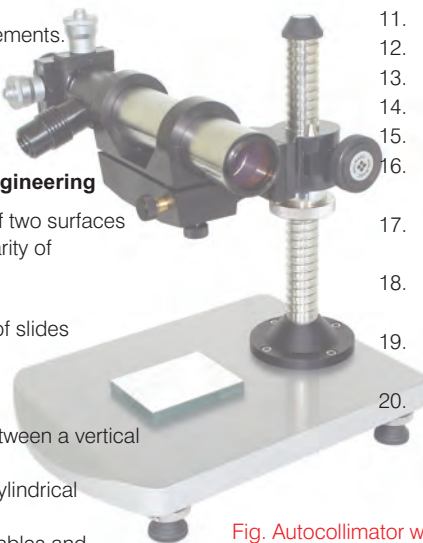


Fig. Autocollimator with Vertical Stand (Height adjustment and 3 axis freedom for alignment)

**Applications in Optical Engineering / Optical Industry**

1. Testing of parallelism with Collimator and Telescope
2. Testing of opaque wedges and plane parallel plates
3. Testing of transparent wedges - evaluation by double cross
4. Testing of transparent wedges - evaluation by reference mirror
5. Testing of transparent wedges - simultaneous determination - of wedge angle and refractive index
6. Testing of transparent wedges - evaluation by angular deviation
7. Testing of the 90° angle of a 90° - glass prism
8. Testing 45° angles of 90° - glass prism
9. Relative measurement of angular error of prisms
10. Testing of camera objectives
11. Radius measurement of concave spherical surfaces
12. Radius measurement of convex spherical surfaces
13. Measurement of focal length of lenses and optical systems
14. Measurement of back focal lengths of lenses & optical systems
15. Measurement of the centration error of spherical surfaces
16. Measurement of centration error of lenses in transmission using Collimator and Telescope
17. Measurement of centration error of lenses in transmission using Autocollimator and Mirror
18. Flatness testing of reflecting surfaces using collimator & telescope
19. Flatness testing of reflecting surfaces using an Autocollimator
20. Control of wedges and plane parallel plates

**Optional Accessories :** See accessory codes



Right Angle Prism



Penta Prism



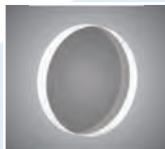
V-Prism with Flat Mirror and Cross level



Plane Mirror with Mount and Base Plate



Plane Parallel Mirror



Transparent Wedge



Penta Prism with Wedge



45 degree Mirror with mount



Polygon Mirror with Mount



**Vertical Stand**  
with height adjustment and 3 axis freedom for alignment

**E Tripod**

## HOLMARC Digital Autocollimator DAC216 Series

### Precision Metrology | Advanced Solutions

Measuring angle, straightness, flatness, squareness, and parallelism

- ✓ Calibration of rotary tables
- ✓ Verification of angle standards
- ✓ Remote angular monitoring operations



HOLMARC DAC216 series Autocollimators are PC-based instruments which are designed to operate in the lab as well as in a machine shop environment. No external controller is required. The standard interface is a single USB connection for power input and data output.

DAC216 series Autocollimators are high-precision dual axis angle measurement system that utilizes digital imaging technologies to measure the two angular positions relative to the reflective surface. Their exceptional accuracy and high resolution make them suitable for applications including the calibration of rotary tables, verification of angle standards and for remote or long term angular monitoring operations. The main applications are in calibration laboratories, optics labs, opto-electronic laboratories and productions, laser based industries, space laboratories, etc.



Model : DAC216-F286B

#### Specifications

##### Angular Range

Horizontal	2053.43 Arc Sec
Vertical	1540.073 Arc Sec

##### Angular Resolution

Maximum	0.79 Arc Sec
Minimum	3.21 Arc Sec

##### Readout Rate

Maximum	0.059 Sec
Minimum	0.25 Sec

##### Operational Range (Full Angular Range)

Minimum	0
Maximum	1.83m
Minimum measurement	10mm dia. mirror at 1.5m
Illumination Source	Laser or LED
Battery	Rechargeable 18650 Li-ion

Battery Backup for the Illumination : 16-22 Hrs

Measurement Mode : Fully automatic- PC based

Interface : USB 2.0

Measurement Axis : X & Y



The DAC216 series Autocollimator can be operated with a remote computer or as a stand-alone instrument. Stand-alone unit utilizes a compact tablet PC for displaying accurate deflection of reflective mirror. The tablet pc is also loaded with the fully featured software which provides graphical output of measurements and complete set of functions for the instrument setup, alignment and measurement in addition to other useful functions and information.

Resolution of DAC216 series autocollimator starts from 0.16 arc-seconds in both X & Y axes with a system accuracy of  $\pm 0.16$  arc-seconds at close range and  $\pm 0.32$  seconds in overall range. As always, all of our products can be customized to fit your specific application.

## For faster measurement

Faster measuring autocollimators are used for applications such as scanning the angular changes of devices or assemblies using a reflector.

#### Specifications

Model	DAC216-F286A	DAC216-F286B
XY Measurement range	3470 x 2739 Arc Sec	2053 x 1540 Arc Sec
Resolution	5.4 Arc Sec	3.2 Arc Sec
Clear aperture	40mm	
Illumination	Laser or LED	
Rate of measurements	120 fps.	
Minimal reflector diameter	$\varnothing 10$ mm (mirror) $\varnothing 30$ mm (glass)	
Operational Range	1.5m	
Interface	USB 3.0	

MEASUREMENT SPEED  
**120 FPS**

## For high resolution measurement

#### Specifications

Model	DAC216-R900A	DAC216-R900B
XY Measurement range	737 x 527 Arc Sec	653 x 490 Arc Sec
Resolution	0.16 Arc Sec	0.25 Arc Sec
Illumination	Laser or LED	
Rate of measurements	120 fps.	
Minimal reflector diameter	$\varnothing 10$ mm (mirror) $\varnothing 30$ mm (glass)	
Operational Range	1.5m	
Interface	USB 3.0	

MEASUREMENT RESOLUTION  
**0.16 Arc Sec**

All models come with two axis tilting platform, target mirror and DAC software. Two axis tilting platform is a three point mounting system which establishes a planar reference. A leveling base provides 3 dimensional adjustment control which allows fine adjustment in azimuth and elevation in the range of  $\pm 4^\circ$  and  $\pm 1^\circ$  roll adjustment.



# Fizeau Interferometer

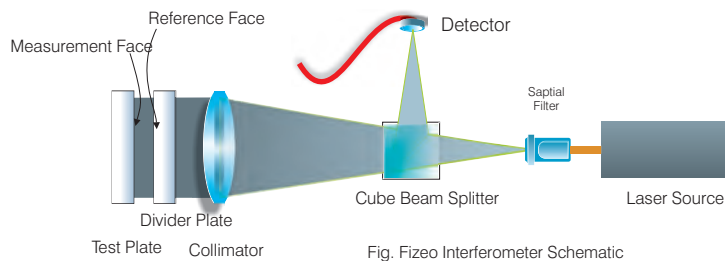
MODEL : HO-OFIZ-215



Most versatile interferometer, Fizeau enables measurements of flat and spherical surfaces using non contact configuration. Its reference and measurement optical paths are the same, making this a compact, vibration-resistant system. Fizeau Interferometer is in a way similar to a Fabry-Perot interferometer as both consist of two reflecting surfaces. In a Fizeau interferometer, however, the second surface is usually totally reflecting. An angled beam splitter captures the reference and measurement beams.

Holmarc Fizeau interferometer has open and vertical configuration. It is made suitable for routine measurements of both flat and spherical surfaces. DPSS laser is used as the light source. Optical layout in vertical direction makes the placement of test components easy. The fringes are captured by CCD camera and analyzed by a computer. This equipment can be used for quality control of optics in manufacturing as well as for routine inspection in laboratories.

It is used to measure optical components such as flats, prisms, lenses, or precision metal parts such as bearings, sealing surfaces or polished ceramics. Measurements can be made using the static fringe analysis software. The interferometer basically comes with high optical quality of  $\lambda/20$  reference flat. The reflection from the test surface interferes with the reflection from the reference flat, producing the fringes. The shape and the quality of the fringes depends on the surface quality of the test flat. The fringes are digitalized using a high resolution CCD camera. By analyzing the fringes we can obtain the P-V flatness, RMS flatness, 3D surface plot etc.

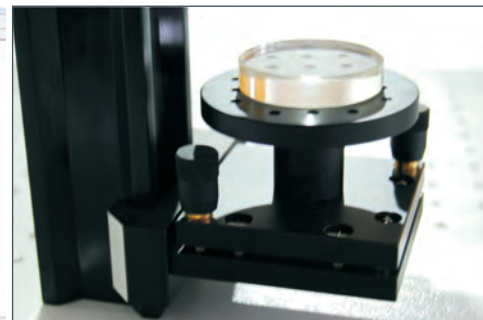
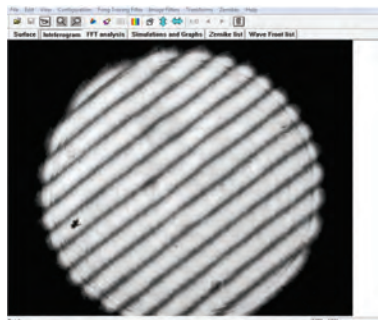
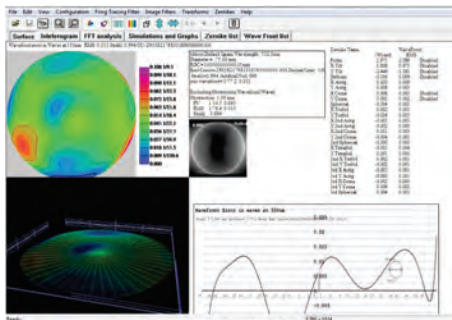


Specifications	
Max Sample Size	: $\geq 100\text{mm}$
Reference Flat	: $\lambda/20$ PV , 100 mm Diameter
Accuracy	: $\geq \lambda/20$ PV
Laser Source	: 532nm ,5.0mW DPSS
Alignment	:By Tip/Tilt sample base
Camera	:CCD Res.1280x1024
Analysis	:Using Fringe Analysis Software
Weight	: Approx. 20Kg
Power supply	: 220V, 50Hz

The Instrument is designed vertically to fix the test sample easily. The tip/tilt test base allows the test sample to align with the reference surface. High quality aberration corrected optical design enhances performance. The reflection flats and reference spheres are optional. Custom solutions are also possible on request.

### Components Included

DPSS Laser Source 532nm (5 mW), Spatial Filter Assembly Beam Splitter, Collimating lens with mount, Reference Flat with mount, Test Flat mount, Zoom lens with CCD etc.



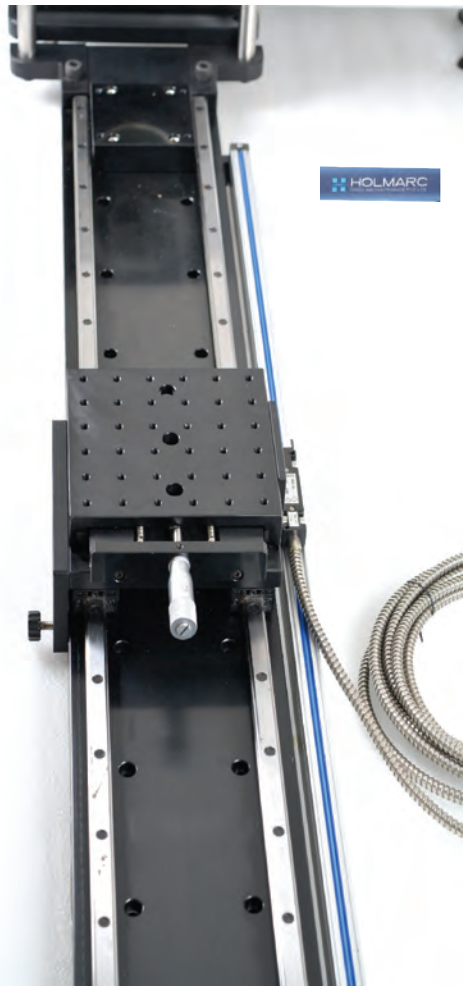
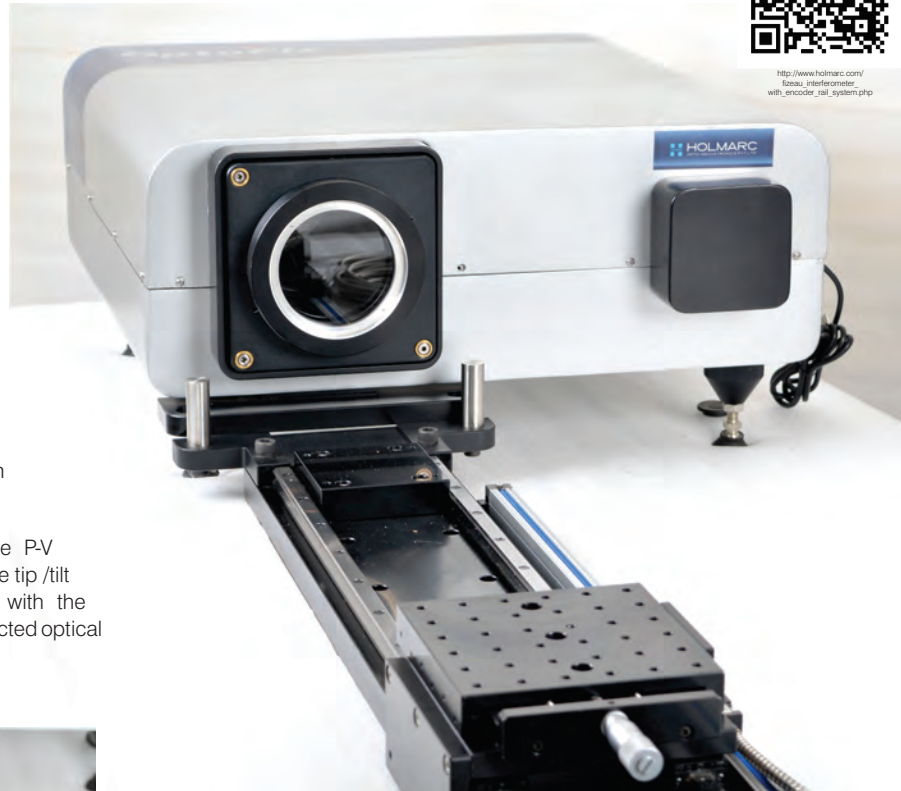


## Fizeau Interferometer with encoder rail system

MODEL : HO-OFIZ-216A

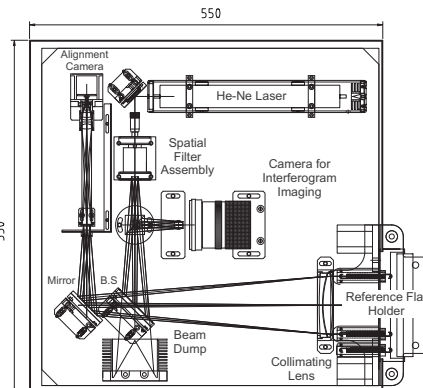
Fizeau Interferometer is one of the simplest and most versatile interferometers and is popular for routine measurement of both flat and spherical surfaces. It is used to measure optical components such as flats, prisms, lenses, or precision metal parts such as bearings, sealing surfaces or polished ceramics. Measurements can be made using the static fringe analysis software. The interferometer basically comes with high optical quality ( $\lambda/20$ ) reference flat. The reflection from the test surface interferes with the reflection from reference flat producing fringes. The shape and quality of the fringes depends on surface quality of the test flat. The fringes are digitalized using a high resolution CCD camera.

By analyzing the fringes we can obtain the P-V flatness, RMS flatness, 3D surface plot etc. The tip /tilt test base allows the test sample to align with the reference surface. High quality aberration corrected optical design enhances performance.



### Specifications

Max Sample Size	: $\leq 100$ mm
Reference optics	: Accepts any standard Bayonet mounts
Accuracy	: $\leq \lambda/20$ PV
Laser Source	: DPSS 5.0 mW / 632.8 He-Ne laser
Beam Expander	: 60x Microscope objective with pinhole.
Collimating lens	: 500 mm Focal length, 100 mm diameter Achromat lens.
Alignment	: camera based
Camera 1	: 3.0 Megapixels CCD with selectable resolution
Camera 2	: 5.0 Megapixels CCD with selectable resolution
Analysis	: Using Fringe Analysis Software (Open fringe & Quick fringe)
Weight	: Approx. 25Kg
Power supply	: 220V, 50Hz
Translation stage	: Manual linear translation stage with optical encoder
Travel & Resolution	: 1200 mm Travel length and 2 Micron resolution.
Encoder Output	: With the pc interface and software



### Optical Setup

Spatial filter assembly and a positive achromatic lens are used to expand and collimate the He-Ne laser. After the collimating lens the reference flat is fixed. The light reflects back from the Reference flat. A cube beam splitter is placed near the beam expander which reflects the reflected light to the zoom lens and CCD. One portion of this reflected light falls on alignment camera which is used for align mode. The reflected light from the test sample also retrace the same path and interfere.

# KGC

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THROUGH RESEARCH & INNOVATION

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LABORATORY WITH OUR**

## **PRODUCT CATALOG**

**For South East Asia Inquiries:**

**KGC RESOURCES SDN BHD (223165-D)**  
No. 2-2-3, Jalan Setia Prima E  
U13/E Setia Alam, Seksyen U13  
40170, Shah Alam, Selangor  
Malaysia

WhatsApp Us at: +6014 964 9880  
Call Us at: +603 3341 2880  
Search Us at: [www.kgcscientific.com](http://www.kgcscientific.com)  
Email Us at: [sales@kgcscientific.com](mailto:sales@kgcscientific.com)  
or [info.kgc00@gmail.com](mailto:info.kgc00@gmail.com)

**For Indonesia Inquiries:**

**PT KGC SAINTIFIK**  
Jalan Kamal Raya (Kompleks Ruko CBD)  
Blok A2-07, Cengkareng Timur  
Jakarta Barat 11730  
Indonesia

WhatsApp Us at: +62 899 7255 675  
Call Us at: +62 212 2522 110/+62 212 2522 114  
Search Us at: [www.kgcscientific.com](http://www.kgcscientific.com)  
Email Us at: [sales@kgcscientific.com](mailto:sales@kgcscientific.com)  
or [info.kgc09@gmail.com](mailto:info.kgc09@gmail.com)