

3D Microscope, 3D Laser Topography and 3D Gyration Scanning system! **All in one!**

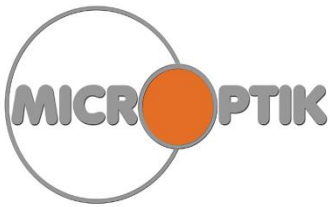
LR Top-eye P5 LT Gyration 3D Scanning system

3D scanning workhorse

LR Top-Eye P5 LT G

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The art of innovation

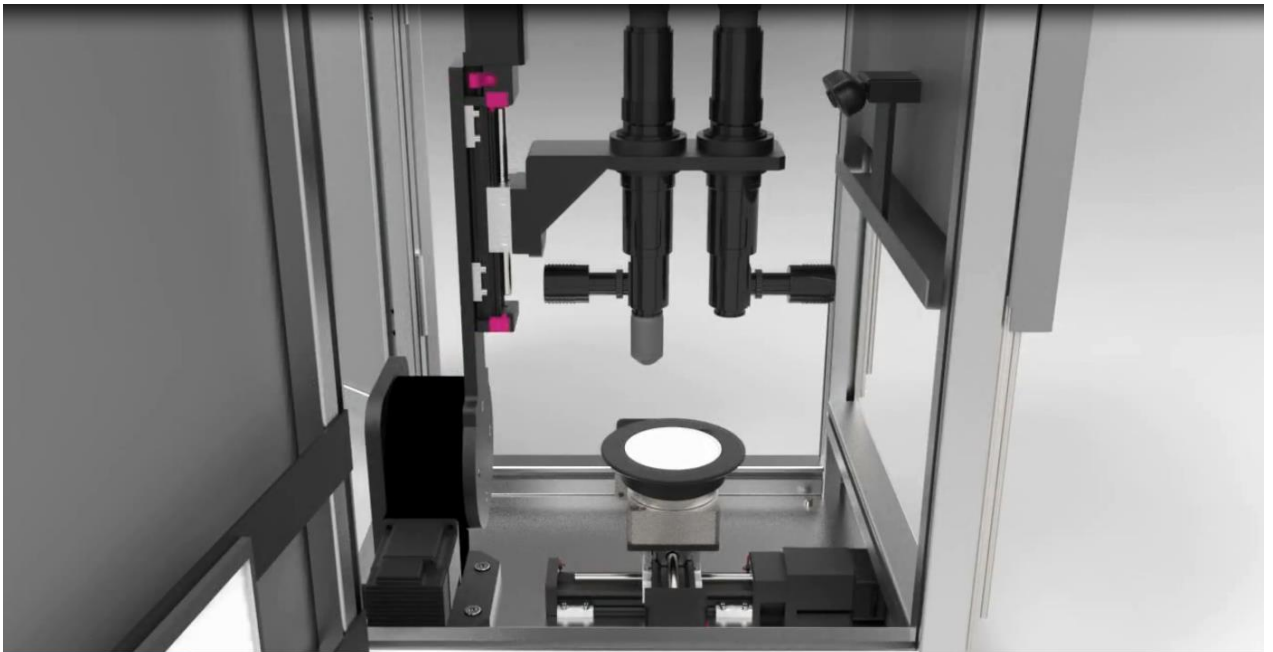


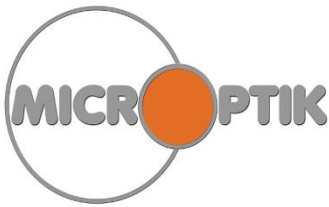
3D

- Microscopy,
- Laser Topography &
- Gyration scanning:

All in One!

LR Top-Eye P5 LT G



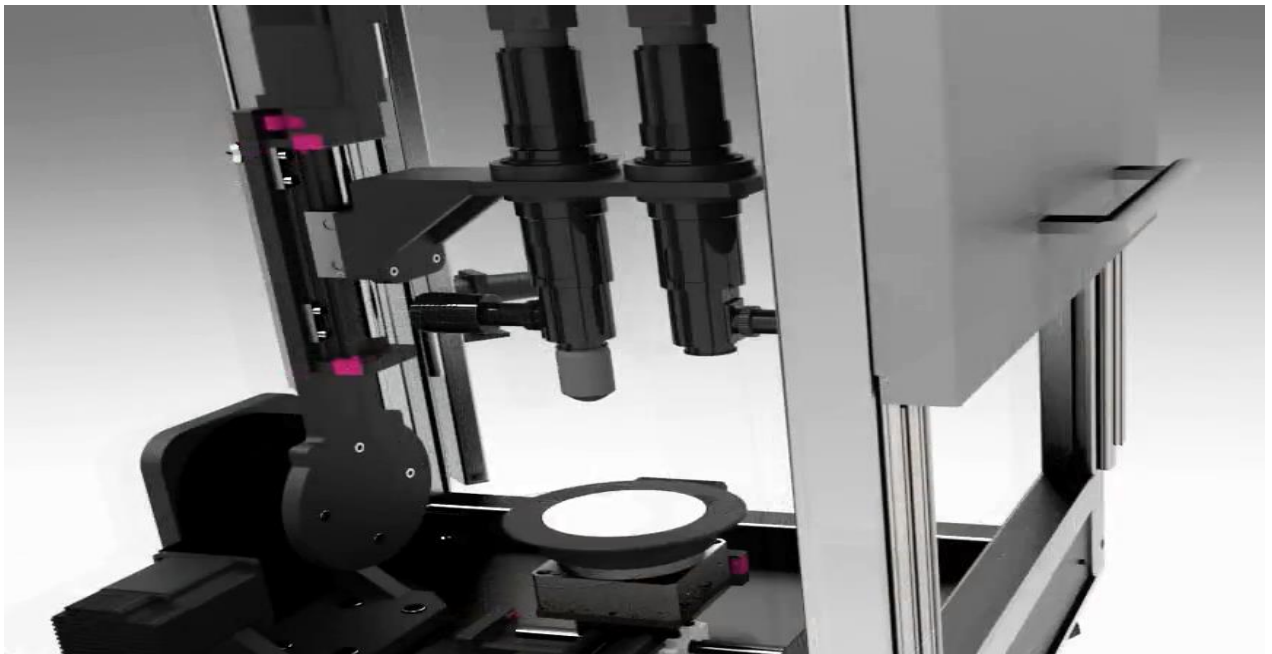
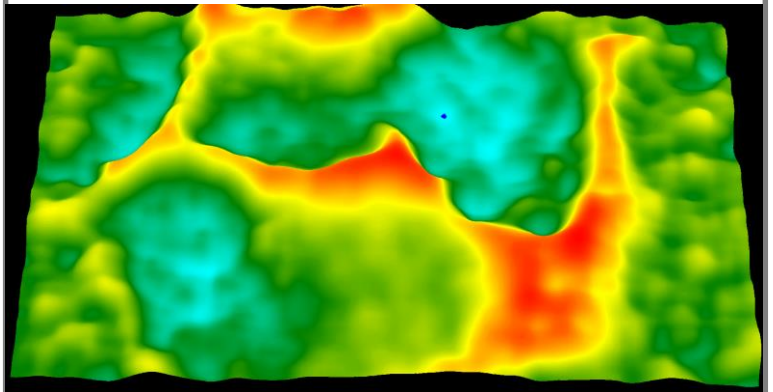


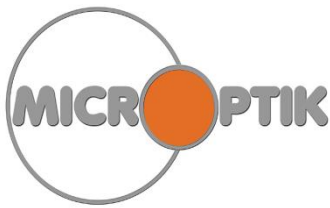
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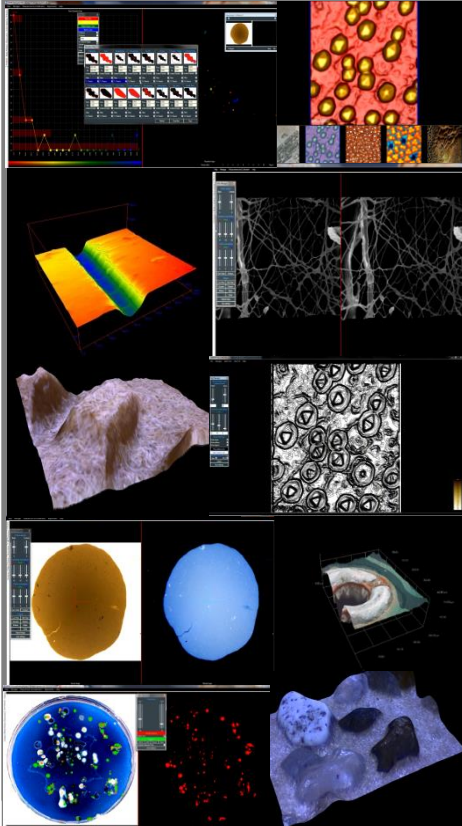
3D Microscopy:

Excellent Image Quality | From low till high magnification (7000x) 18 MPixel | Ultra high Depth of field images | 6 fully automated motorized axes | Automated tilt ($-90^{\circ} - 0^{\circ} - 90^{\circ}$) X,Y,Z, ϕ =z tilt, Θ = rotation | Proprietary auto calibration for all magnifications. Large samples of any form, No sample preparation | Tilting of sample for hard to access defect inspection | Never lost navigation | Full scan of complete sample | 3D reconstruction and surface profiling | Easy add on accessories (i.e. heating cooling stages) | Extremely versatile and powerful software | High throughput of any procedure | Particle counting (morphometric analysis) | Fibre analysis | Topography analysis | Superposition of layers | And more.....



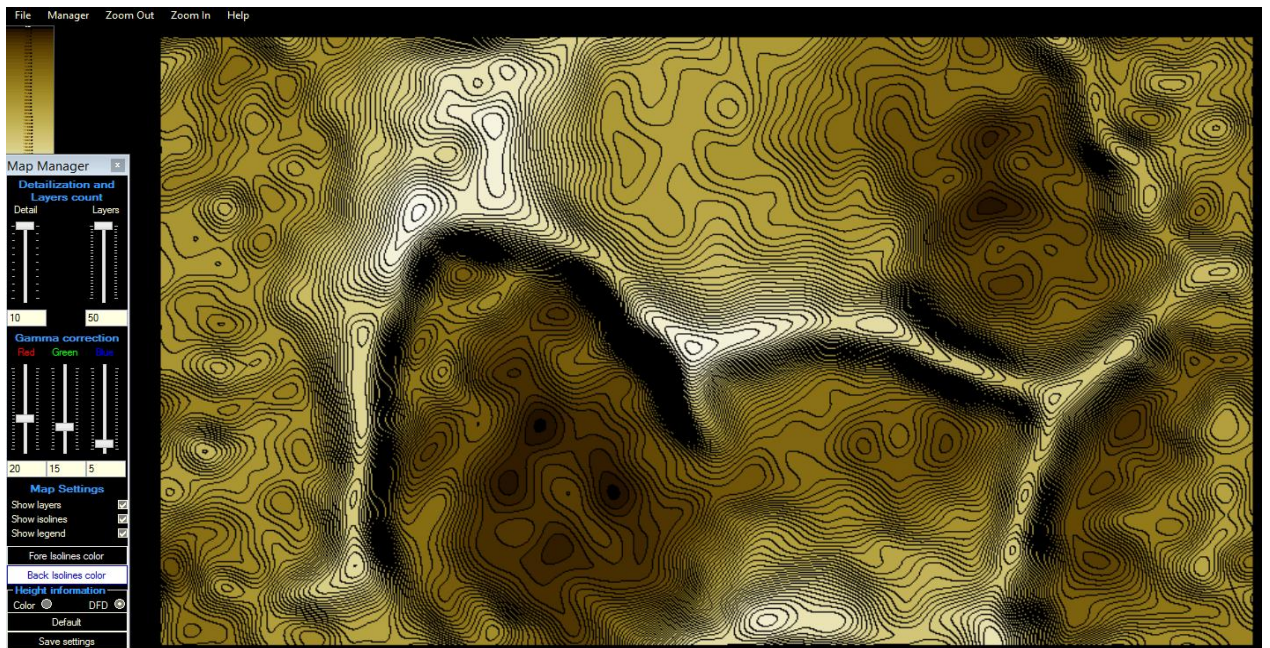
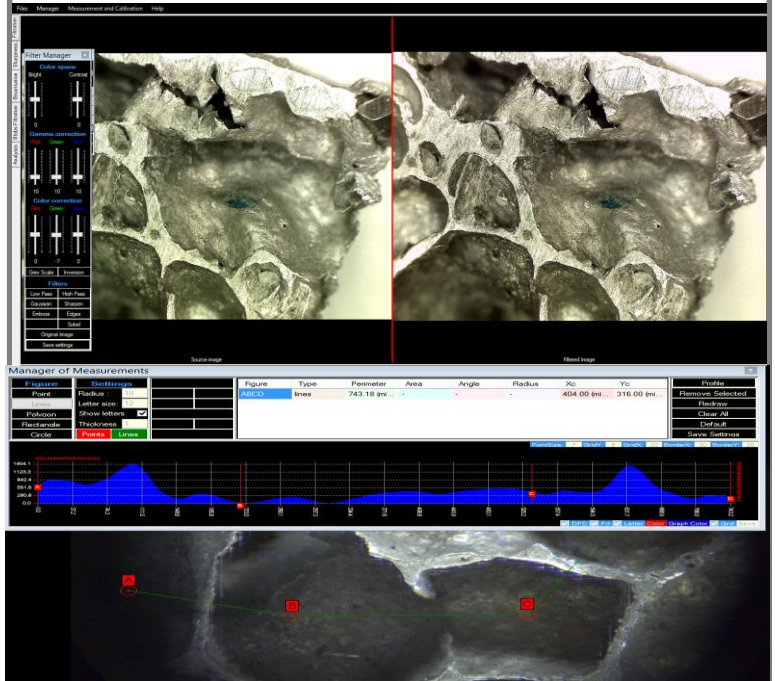


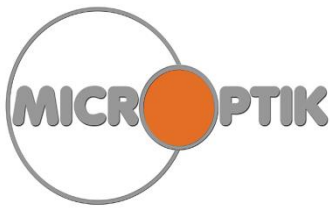
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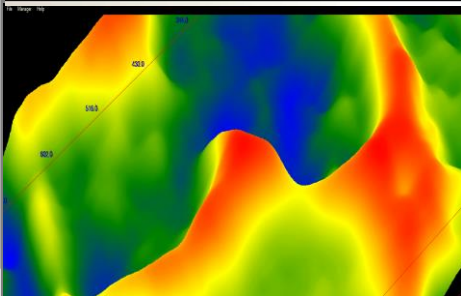
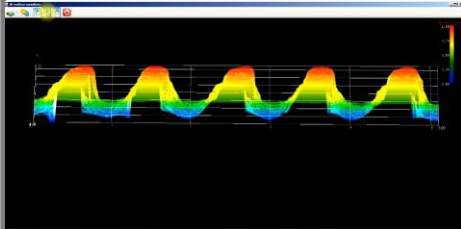
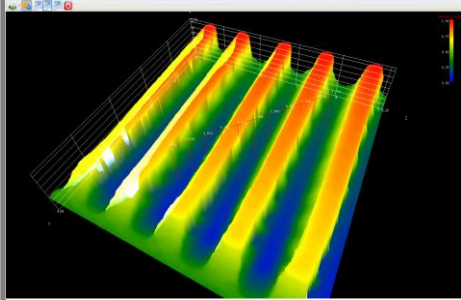
3D Microscopy:

The microscopy features imbedded into the LR Top-eye P5 LT G system can be adapted for all sorts of experiments: Analysis of materials from all angles. | Customized High throughput | For Material analysis, Life science, Quality control, Pharmaceutical, food inspection, forensic and more.





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3D Laser Topography:

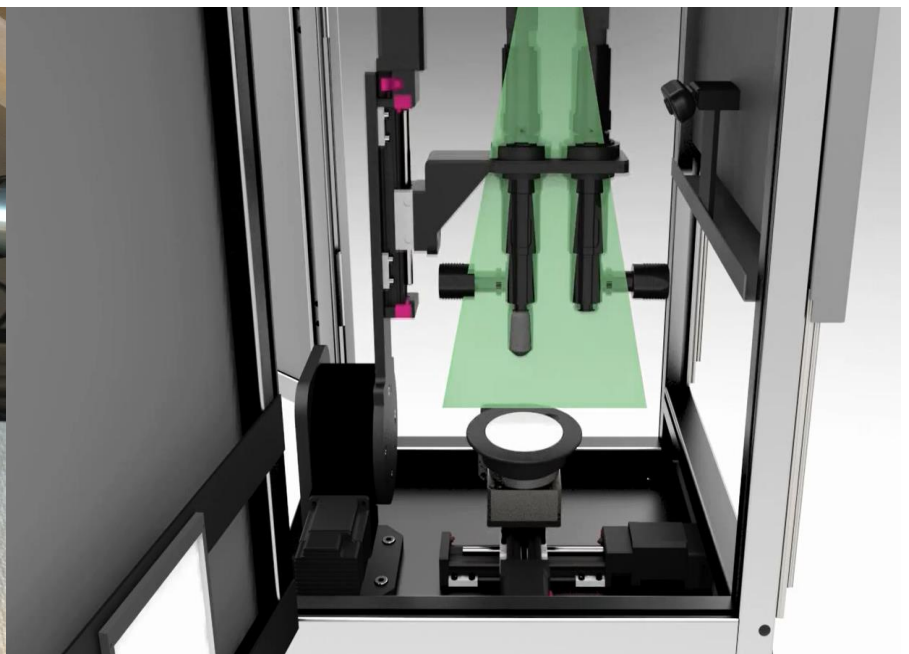
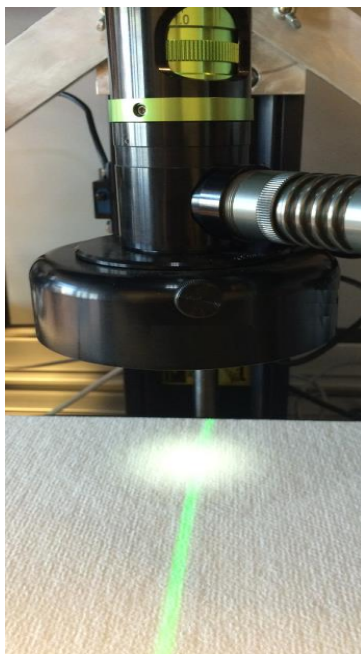
Laser topography is a well known technique for acquiring fast topographies of surfaces. Large samples (i.e. A4 formats) can be acquired in a few seconds. The principles of this technique can be described as follows. A fine laser is focused on the surface of the sample. A camera with an appropriate lens assembly measures the profile of the laser line. Then mathematical processing allows the profile to be converted into a 3D map. The LR Top-eye P5 LT G system goes beyond standard LT technology in utilizing a stereo pair camera configuration where the line of the laser is sandwiched between the field of views of the two camera's. The advantage of a stereo pair LT configuration is that artefacts are inspected from two independent points and hence a much better representation can be reconstructed and hence more insight in the complexity of the sample

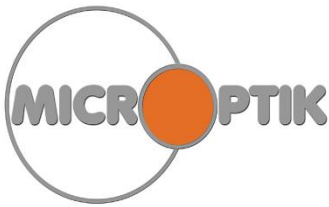
Add on of all sorts of high end accessories:

Tilting tables, robotization, rotation tables, all sorts of illumination, i.e. .UV, VIS, IR, fluorescence, polarisation, DIC , Heating stages. Microplate, inverse microscopy, particle analysis, fibre analysis, topography and many more.

Custom built high throughput analysis.

We can adapt the system for any application





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Use 3D scanner software to generate 3D mesh and texture 3D data sets.



Generating extremely accurate 3D images of objects. Exporting scanned 3D models to STL, PLY, OBJ and DAE file formats. Comparing two objects is a piece of cake. Technique replaces conventional comparison microscopy. Applications: Forensic, Reversed engineering of all kinds of objects. 3D objects can be 3D printed.

3D Gyration scanning

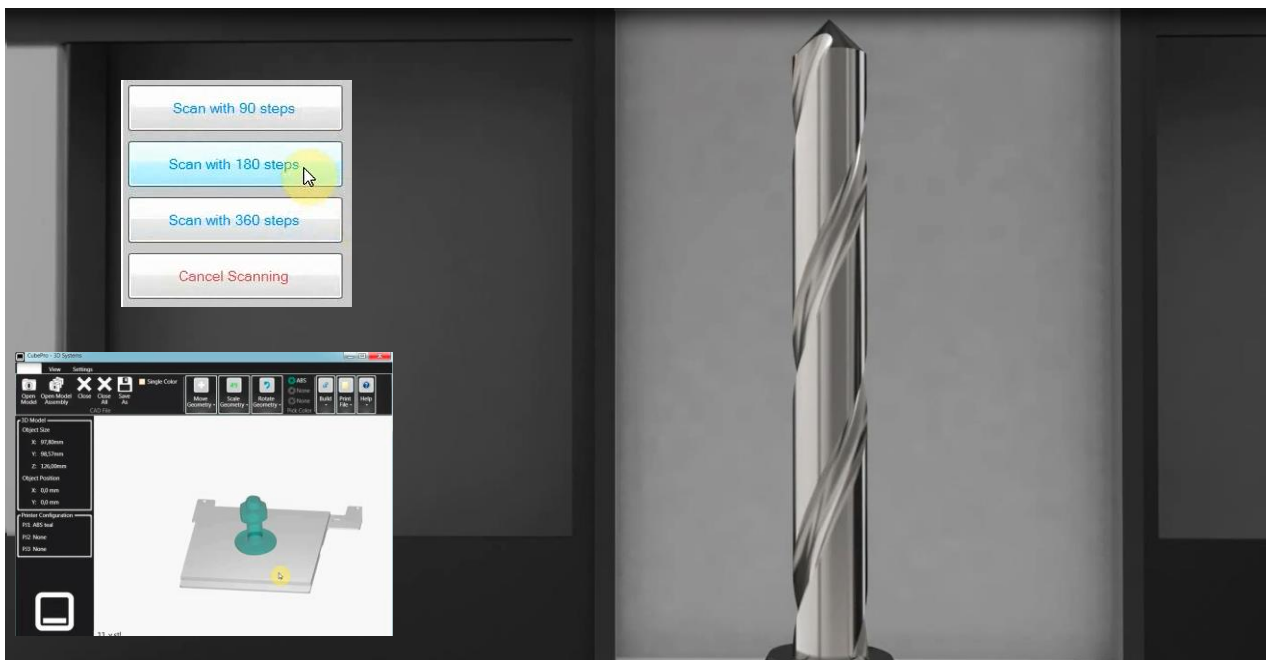
Of large objects with Ultra high resolution.

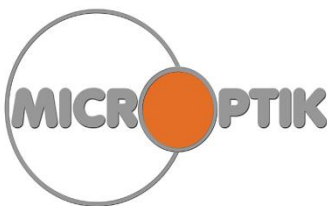
Scanning large objects with highest microscopic details without any artifacts.

Other machines use DFD techniques to scan large objects., however such techniques fail because of lens aberration. The MicroOptik 3D gyration technology produces extremely detailed and accurate 3D scans which can be converted directly into step data files, allowing the user to reengineer products with the greatest ease

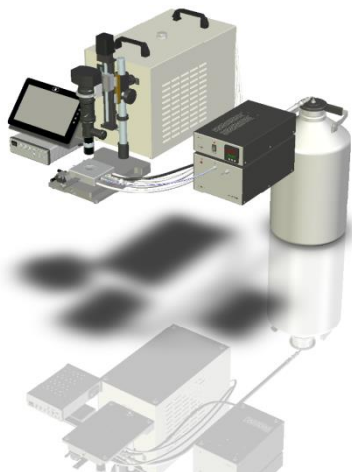


Objects scanned with the LR Top-eye LT G system.





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We produce all possible **Heating and Cooling stages** for microscopy and spectroscopy



We produce **all possible microscopic systems**: 3D inspection, industrial quality control, material analysis, medical and pharmaceutical, forensic, high throughput screening, research and development and many more. We can build hybrid systems, combining Microscopy with Spectroscopy. Confocal and super resolution! We provide all sorts of motorized stands and robotics for all sorts of applications. If it does not exist, we build it!

New in our portfolio: The 3D Maker, turning any conventional microscope into a high end 3D system with superb images, for a very small investment. Come and check out! Visit our stand and win The 3D Maker! Visit us at Hall 4.2 Stand A29. www.microptik.eu

3D Digital Microscopy: Build Your Own System!

A vast field of applications

The field of applications in microscopy has become incredible vast. Ever since digital cameras, advanced optics, sensors, stepper motors and related software came into play, the field of applications has expanded to such an extent that it takes more than a full time job to cope with all the nuances of technologies which are now at hand for the user.

3D Digital Microscopy

The evolution of digital video microscopy has been very fast considering the amount of systems which are now available in the market. For a few hundred Euro's one can nowadays buy a hand held microscope with remarkable good quality. With the rise of microscopy building blocks, which can be bought off the shelf, one can build your own system (BYOS) for prices which are significantly less than some of the renowned brands. The quality of these BYOS systems are superb. Pricewise these BYOS systems are coming more and more in reach for any user. With the appropriate building blocks, one can even construct a high end 3D microscope with a quality which surpasses any other expensive system in the market.



An example of a BYOS 3D Digital video microscope.

The stand and accessories

One aspect in the choice of building your own 3D system is often neglected. This aspect is as important as all the other components needed to build a 3D microscope. The stand on



A motorized stand with accessories

which the microscope is constructed must be very rugged and must have a mechanism to lift the optics in precise steps in a vertical direction. For that purpose there are complete systems in the market which allow a lens to be lifted in steps less than $.1 \mu\text{m}$. Such a stand has a base plate with illumination (for bright field 3D, or if needed for 3D fluorescence analysis), with a vertical bar and a spindle motorized slide powered with a high quality stepper motor.

High quality lens

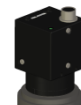
There are many suitable microscopy lenses in the market which are produced by popular lens manufacturers. Any quality lens in this respect can be used which has a certain depth of field and field of view needed for the 3D application. Typical depth of field varies between 2 mm to 10 μm . Typical field of view varies between 2 mm to 10 μm .



A typical high quality microscopic lens

Camera

A good quality digital camera with a suitable format fitting the lens, with appropriate software is required to make a 3D microscopic system. There are quite good camera's in the market which can be used for this purpose. Typical parameters are: USB2 or USB 3, 10 MP, pixel size $1.7 \mu\text{m}$.



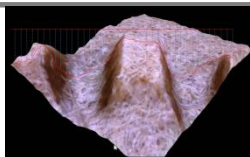
A digital camera

Illumination accessories

For applying 3D microscopy (i.e. dark field) additional illumination can be provided through ring or coaxial light. All of these accessories are available in the market.

Controller and PC

Once all the modules are assembled (motorized stand, lens, camera and illumination) the automation needed to generate 3D images is

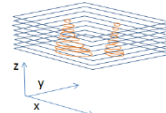


accomplished through a controller which can control the camera, stepper motor and illumination. Such controllers are available in the market



A controller and PC Software

Software which controls the whole system is the final module which is needed to generate the 3D consolidated images. The principles of the 3D reconstruction is based on so called DFD (Depth From Defocus) algorithms.



A 3D stack of images

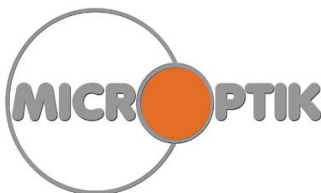
In this process images are acquired and stacked while lifting the lens in the z direction. For each image taken the sharp part is considered and the non sharp part is disregarded. After the acquisition process the z stack is reconstructed. As the steps of the z axis are known as well as the x and y dimensions of the images, a realistic 3D picture can be generated with realistic dimensions.

3D acquisitions at tilted angles

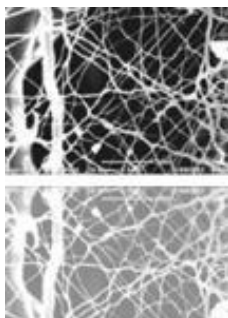
If only the z-axis is moved, details which are positioned perpendicular towards the z axis, can not be seen and hence not 3D reconstructed. The last couple of years technology has been developed using more sophisticated motorized stands which allow such lateral inspections. Appropriate software can be used to control the system and process the data.



An advanced motorized stand with 5 positioning vectors



The art of innovation



Mishell ®

Is perhaps the most sophisticated Image analysis software package available on the market today. Simple to use and incredible sophisticated when it comes to the specific application. Mishell has originally been designed to control an Image analyzer system developed by MicroOptik in conjunction with an Image analysis task. Still as to day this conjunction is valid. The software is delivered with all machine vision systems our company provides. However, as more and more clients became to realize the capabilities of the software we have offered our clients and others the software as a stand alone product. Therefore all the beautiful image analysis tools are not available and in one package.

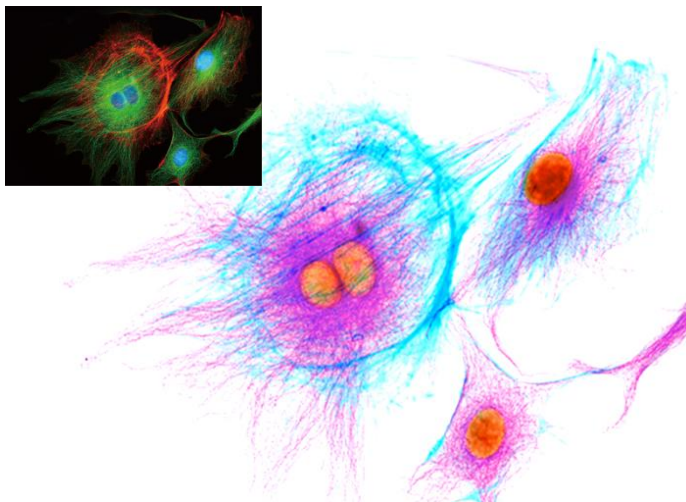
The complete Mishell package consists of the following building blocks: **MiCam** (camera interfacing), **MiMea** (2D measurements, size and shape parameters, profiling), **MiDab** (database), **MiMap** (contour plots), **MiReg** (reporting), **MiVim** (3D visualization), **MiPis** (particle size analysis), **MiFis** (fiber inspection), **MiMis** (morphology) **MiPor** (pore size analysis). Further in this flyer we will elaborate further on these building blocks. Each of these blocks have unique features which the user can choose. **MiAp** (Image Analysis Applications). With respect to the last: Mishell can interact with many devices MicroOptik provides which relates with images analysis. For a start, through Micam, Mishell can interact with practically any camera system on the market. Beyond that it can also be used to integrate all sorts of instrumental control features, like stepper motor -, heating & cooling-, illumination-, temperature, IO- boards and many more. This is convenient for clients who want to set up a machine vision project. All has been programmed and the client simply has to connect all the devices with the wizard which comes with the package.:



Mishell links all hardware components together and makes it working as one analyzer system

Mishell Image analysis Software package a sophisticated Tool for infinite applications

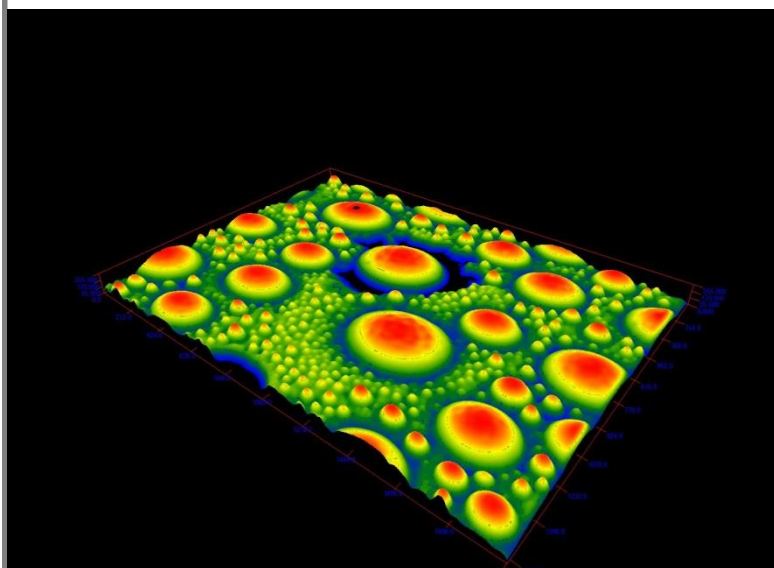
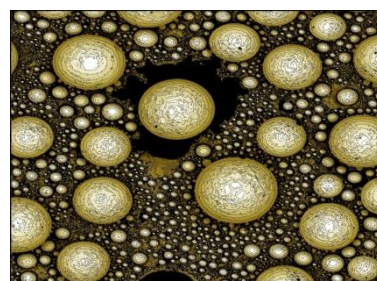
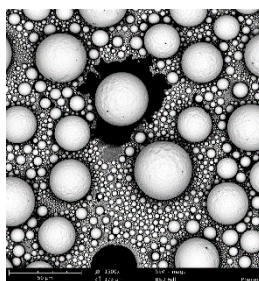
The MicroOptik Mishell Image analysis software package is the most sophisticated software of its kind available in the market.



Example of filter manager options to enhance Low Light Fluorescence images

All sorts of image analysis

One of the many functions MiVim has to offer (SEM Stereopair 3D visualization)



More information!



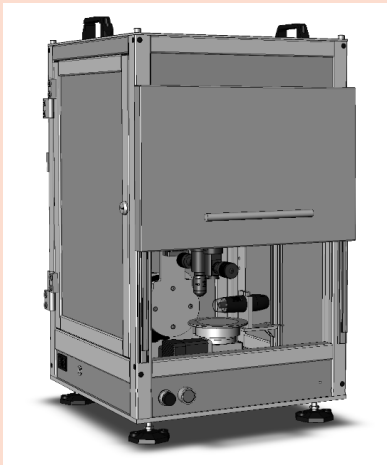
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LR Top-eye P5 LT Gyration system description



Item	Impression	Description
1	<p>High end Image analysis platform. Unprecedented in computing power! There is no match for this beast!</p> 	<p>High end ATX Midi Tower Dual GPU Layouts SSD Kingston HyperX FURY 120 GB SSD hard drive (2.5 inch) SATA III HDD Western Digital Red Pro WD2001FFSX 2 TB Hard drive (3.5 inch) SATA III Motherboard Asus X99-A Motherboard Socket Intel 2011-3 RAM Kingston HX424C15FBK4/16 16 GB DDR4-RAM PC-memory kit 2400 MHz 4 x 4 GB Processor Intel® Core™ i7 i7-5820K Graphics Card PNY VCQK2200-PB 4 GB Power supply hermaltake, PS-TR2-0600NPCGEU-G, PSU, CPU Cooling System Zalman FX 100 Operation software Windows 7 + Microsoft Office package + Team viewer + Skype</p>
2	<p>High quality LED screen</p> 	<p>Iiyama XB3070WQS-B1 LED-monitor 76.2 cm (30 inch) Energylabel C 2560 x 1600 pix 16:10 5 ms. Screen diagonal (76.2 cm) (30 Inch) Resolution: 2560 x 1600 pix Interface HDMI, DVI, DisplayPort, VGA Reaction time 5 ms</p>
3	<p>The LR (Lab-Robot ®) Top-Eye™ P5 LT G</p> 	<p>The LR (Lab-Robot ®) Top-Eye™ P5 LT G, is a high end ALL PURPOSE Professional 3D Digital video microscopic system combined with 3D laser topography and 3D Gyration scanning. The fully automatic 5 axis system allows easy navigation of low and high magnification at any place of the sample. Illumination can be arranged through co-axial, ring or back light, allowing all sorts of dark field, or bright field experiments to be carried out. The system allows sophisticated 3D reconstruction techniques to be applied, for the optical microscope as well as the Laser topography and Gyration.</p> <ul style="list-style-type: none"> - 18Mpixel Image analysis system - Extended Depth of Field Images - Never lost 3D navigation - Rugged system for heavy duty applications - Full automated QC customer specific recipe analysis - With fully automated calibration of X, Y and Z axis. - With Laser Topography module - With 3D Gyration module - Adaptable for all possible applications.

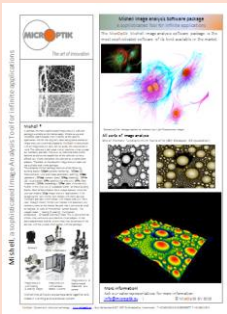

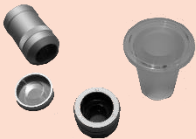
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LR Top-eye P5 LT Gyration system description

Item	Impression	Description
3.1	Lab-Robot™ housing 	System will come in an industrial housing. The housing is built from strong aluminium frames and allows the user to enter from all angles into the system. Delicate electronical parts such as controller and wiring are protected. The framework allows carrying out experiments with high magnification with low vibration interference. The system can easily be transported by the handles which are mounted on the housing.
3.2	Five parameters for positioning 	The P5 system has five parameters to control the visualistaion of the sample: Motorized X Axis Motorized Y Axis Motorized Z axis Motorized Ø (tilt z) axis (optional Motorized) Φ table All of the motorized axis are controlled through the Mishell software through a controller which is installed in the LR
3.3		CMOS chip 1936 x 1216 Pixels. Min 50 fps Up to High resolution 4912 x 3684 pixels (18 MB) USB3
3.4		Magnification from 500- 5000 Automatic detection of magnification. + accessories
3.5		MiZL 80500 Co-axial, dented; with LED illuminator; high resolution, zoom body with zoom range:0.6X~6.0X; Objective depending on application 20 – 200 X
3.6		MiZL 80500 Co-axial, dented; with LED illuminator; high resolution, zoom body with zoom range:0.6X~6.0X; revolver with 20.3mm matching size, available for 4 auxiliary objectives
3.7		For special lenses, please request our extensive MicroOptik Lens catalogue.
3.8	 <p>Example (does not need to represent final parts)</p>	Relevant reticules will be delivered and related calibration protocol

LR Top-eye P5 Lt Gyration system description






	Impression	Description
4	<p>Mishell software</p> 	<p>Mishell</p> <p>See details Flyer Mishell</p> <p>All software features described in “minimum technical requirements are incorporated.”</p>
5	<p>Polarizer and aperture accessories</p> 	<p>For suppressing reflection phenomena of samples.</p>
6	<p>Accessories for improving quality of illumination (i.e diffuse light adapters)</p> 	<p>Various accessories will be provided to improve quality of illumination and hence quality of image.</p>

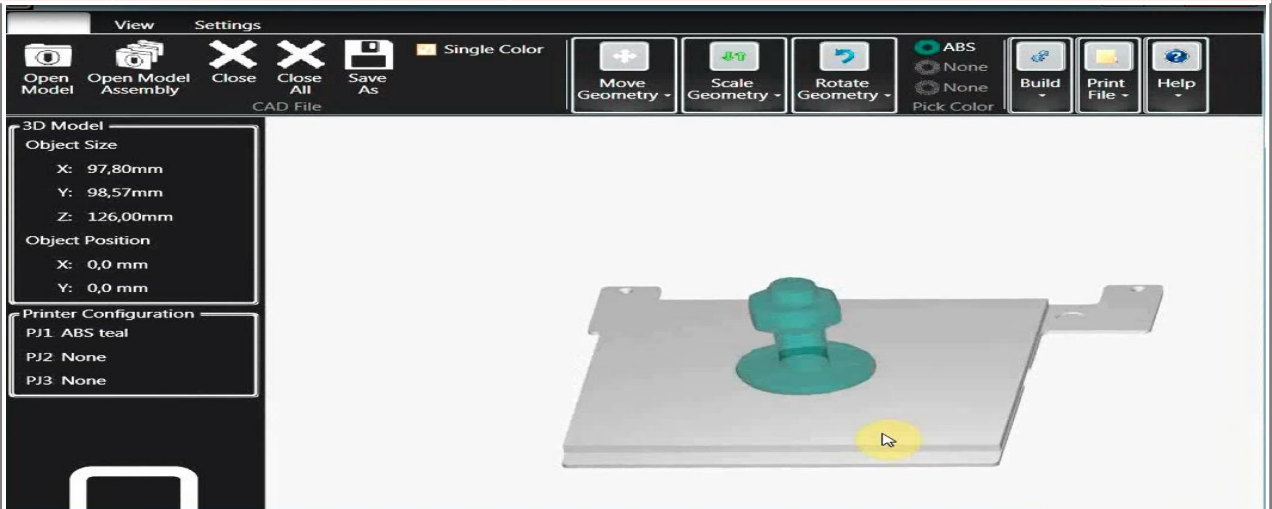


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LR Top-eye P5 Lt Gyration system description

	Impression	Description
7	3D Laser Topography module   	<p>High-quality Topography</p> <p>An abundance of analytical topography tools</p> <p>Easy to operate, by a simple mouse click</p> <p>User friendly, powerful and highly adaptive software</p> <p>3D modeling, Cross sectioning, Cut and Slice and many more</p> <p>Windows™ based operating system</p> <p>Laser module Depends on application i.e. Laser Class : IIIa, IIIb</p> <p>Wavelength : 532nm Output Power : <5mW, <10mW </p> <p>Output Mode : Continuous Input Voltage : 3V DC Operation</p> <p>Current : <300mA Operation Temp. : 15°C to 30°C Optics :</p> <p>Glass lenses with A/R coating - fan angle 90 degrees Divergence : <0.4mrad Expected Lifetime : > 5000 hours Case Material : Brass Length : 65mm Diameter : 16 mm</p>
8	3D Gyration Module  	<p>Ultra high resolution 3D Gyration module to scan large objects into editable 3D models (i.e STL, PLY, OBJ and DAE file formats)</p> <p>Combination of rotation table (stepper motor controlled) sample mounting clamp, LED screen and High resolution camera with lens.</p> <p>Exportable to AutoCad® or Solid Works®</p> <p>Or to 3D printer software.</p> <p>Software for 3D Gyration is provided by 3D G Ap in Mishell.</p> <p>3D G is fully integrated.</p>



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