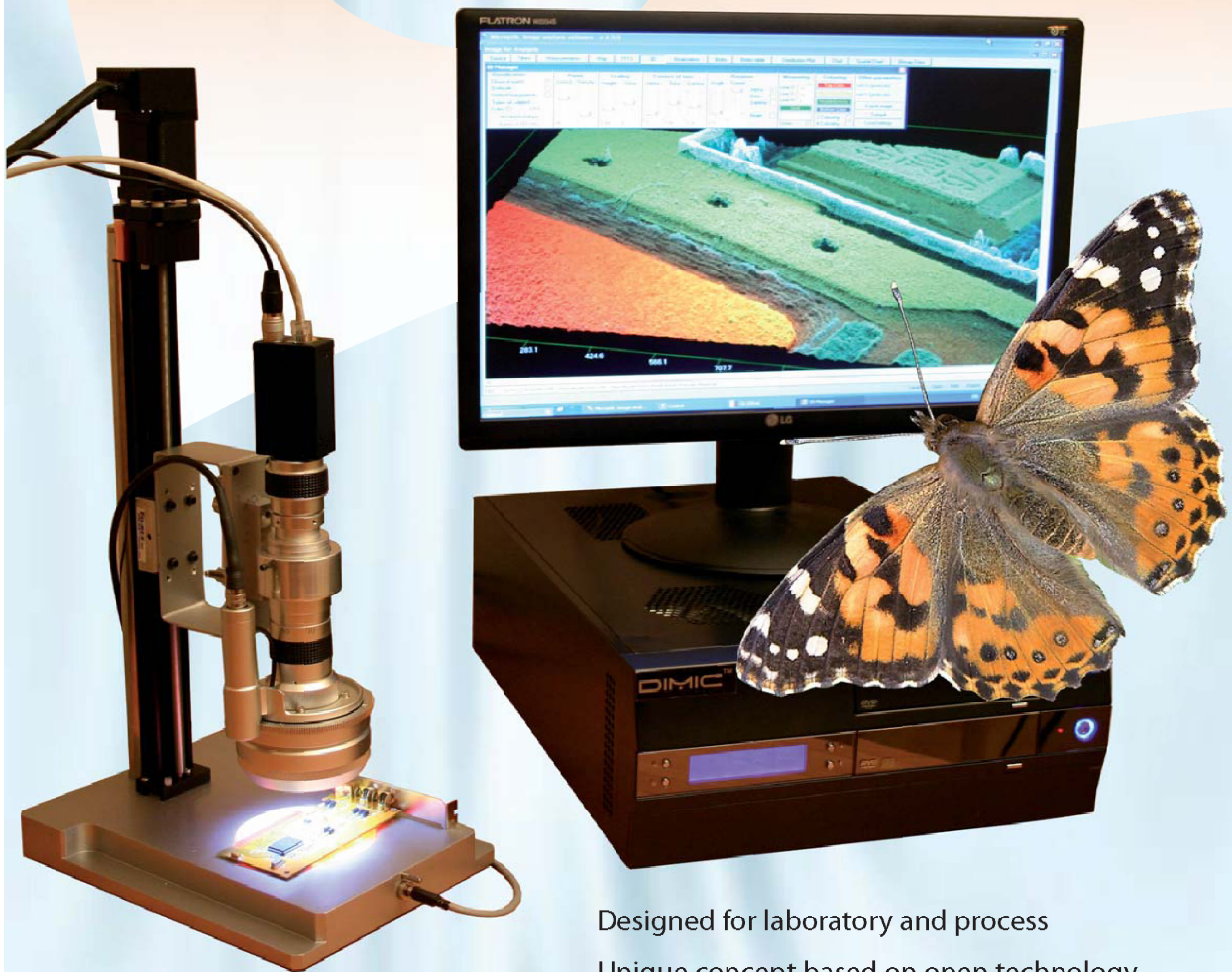


DIMIC™

## Digital Video Optical Microscopy systems



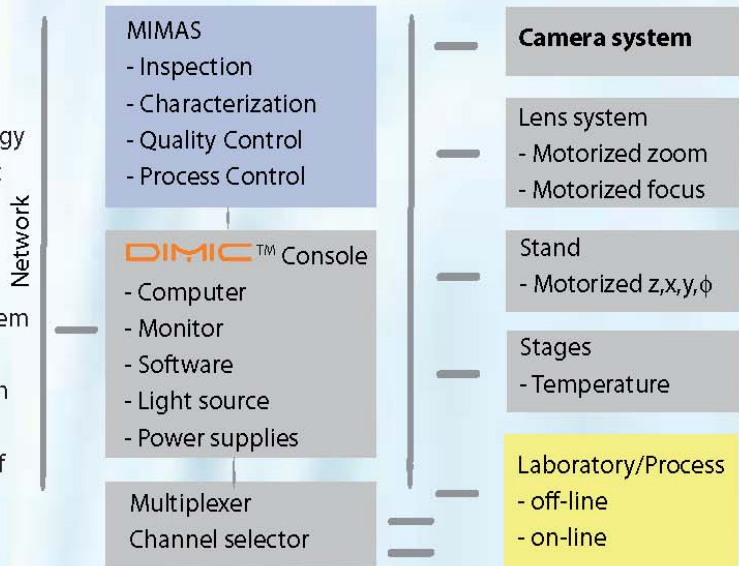
- Designed for laboratory and process
- Unique concept based on open technology
- Plug and Play system
- Largest selection of high end optics and illumination
- Most powerful processor for demanding tasks
- User friendly, powerful and highly adaptive software
- Windows™ based operating system



Vision in technology

# Concept

Micro-optik is proud to present our new Digital Optical Microscopy system. The **DIMIC** microscopic system is based on a unique concept with open technology where all the building blocks are the best available in the market with a proven track record in performance. For all the applications, microscopic and machine vision components are added to the system console with a simple plug and play. We offer the largest range in selection of high end optics, from low magnification all the way to 7000x with an infinite range of adaptors.



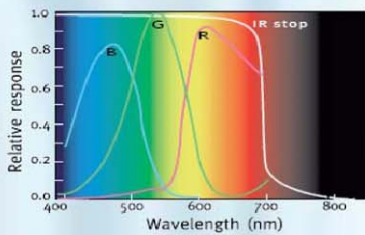
The Micro-optik systems offer precision, high resolution and quality solutions in optical design for all applications including failure analysis, real time analysis, quality control, diagnoses and many more. Our team of experts are at your service to help you out in choosing the right components for a standard **DIMIC** system or a tailor made solution.

The software is user friendly, powerful and highly adaptive to allow microscopic analysis for almost any application. The Windows™ based operating system offers an infinite flexibility for the user to add any software package on board of the console. Microptik offers both manual and 3D motorized high precision stands with the broadest range in control with a large stretch and fine focus control block.



## High quality cameras & lenses

We use cameras with UXGA resolution and incorporates a 1/1.8" progressive scan Bayer mosaic colour progressive scan sensor. The sensor has an array of 1624 (h) x 1236 (v) 4.4 µm square pixels. The camera has built in RGB filters which allow the acquisition of high quality images.



We use the new and fast GiGE Vision™ interface standard. GiGE Vision™ is the first standard to allow for fast image transfer using low cost standard cables over very long lengths. Standard gigabit Ethernet hardware allows single/multiple digital microscope camera connection to the DIMIC™ system with low cost cables (CAT5e or CAT6) and standard connectors.



Micro-optik provides a wide selection of microscopic lenses which can be used for various applications. The portfolio of lenses include, high magnification zoom lenses, high magnification fixed lenses, rotation lenses, large format sensor lenses, low magnification video lenses, lenses for fluorescence, auto focus zoom lenses with many accessories. Our DIMIC™ standard microscopic configuration offers 12X lenses.



For high magnification applications requiring the balance between optical performance, large zoom range and price, the 12X zoom is an ideal choice. This great combination of zoom range, coupled with larger field coverage, means that you will now

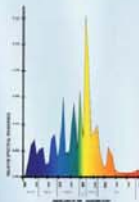
be able to view a wider range of parts with a single video inspection system and eliminate the need for bulky microscopes. With optional lens adapters and the 12:1 zoom ratio a dynamic magnification of 0,007-503x (0,8 micron resolution) is reached for inspection for a wider range of applications.



# Illumination



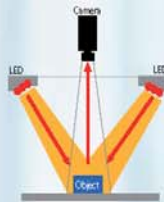
Our standard light modules are designed specifically for applications that require bright, white light in tight spaces. The module delivers superior Lumens/Watt illumination: three times brighter than halogen equivalents. Three separate components make up the module – the metal halide lamp with an integrated cooling mounting block, ballast and connector. The metal halide lamp inside the light module maximizes the sensitivity of the camera due to its dispersion characters in the 300nm-800nm spectral range.



For special applications we provide LED lighting components that provide bright illumination to compliment the performance of a vision system. **DIMIC** allows to control the light digitally. We offer the following features:

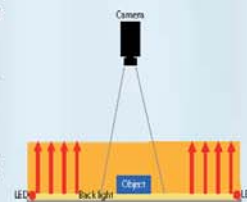
## Direct Illumination

An array of LEDs arranged in a ring or rectangular matrix provides a very bright and concentrated light. The direct illumination is suitable for non-reflective parts, and wherever strong illumination is needed.



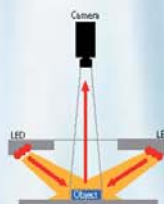
## Back Light Illumination

Back light illumination achieves a highly homogeneous light on a large surface. Back light illumination can be used either to measure very precisely the contour of an object.



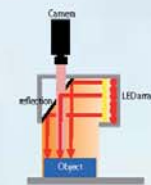
## Horizontal Illumination

A ring of LEDs illuminates the object at a very low angle up to completely horizontal light. This is very helpful to detect scratches, tool marks and edges on reflective parts.



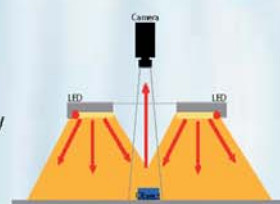
## Coaxial Illumination

Coaxial illumination is the best solution for highly reflective parts and for parts that are covered with a transparent cover, for objects that are checked in their blister packing.



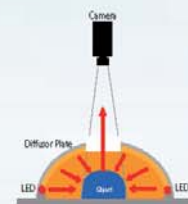
## Flat Ring Illumination

This illumination uses a special light diffusion plate to achieve a highly diffused and homogeneous light field. Flat ring illumination devices are an effective solution for highly reflective parts.

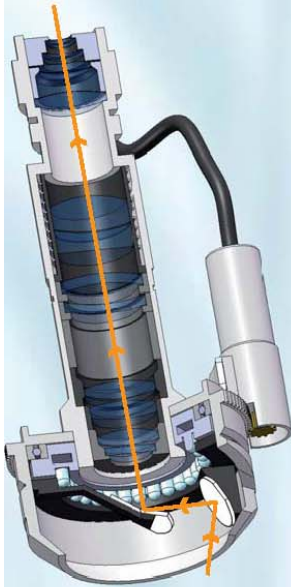


## Dome Illumination

For shiny spherical and convex objects dome illuminations provide a diffuse and homogeneous light without reflections.



# 360 degrees inspection



Micro-Optik has developed a unique new technology for the inspection of objects based on rotation head principle. The head of a high quality lens is equipped with a rotary head which holds a ring of LED lights and a mirror system. The LED ring light illuminates the sample. The rotary head holds two mirrors which guide the light reflected from the sample from a certain angle back to the camera. When the ring rotates the orientation versus the sample changes and another image perspective is obtained. With a continuing of the rotation a better insight in the 3D nature of the sample is obtained. With our topography software the 3D nature of the sample is enhanced. With the variable angle rotary-head, subjects can be captured as desired by operating a 360 degree rotating mirror pair vertically within 45 to 65 angle. Rotation direction and speed can be controlled easily by a single button.

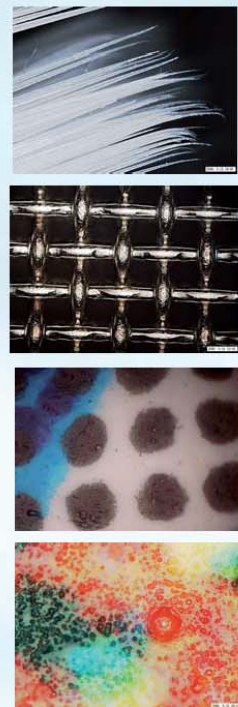


Various images recorded during 360 rotation



- Object 3D nature better visualized.
- 3D 360 degree rotational view with a 45 degree oblique viewing angle.
- Zoom 50x-300x with great depth of field.
- Built in LED lighting with intensity control.
- Digital Control of the LED Light and Rotation (speed and direction).
- Video recording and editing features.
- Perfect investigation in real time mode.

The compact design of the lens provides adaptation to numerous experiments. The 360 inspection system can also be used as a standard lens by dismantling the rotation head. The lens system has been used in various fields, gemology, electronical industry, life science, biotechnology, pharmaceutical industry, research institutes and many more.



# Stands



Micro-Optik offers motorized high precision stands for all possible applications. Illumination is integrated in accordance with customer requirements. Standard we provide stands with back light illumination.



**Base width ranging** from 40 mm to 225 mm.  
**Travels range** from 15 mm to 5500 mm.  
 Our versatile, modular design yields easy XYZ-rotary combinations.

**Dynamic Microstepping** uses low cost off-the-shelf 8 bit microprocessors to achieve high level of microstepping (any microstep value from 2 to 500) and pulse rate support (800Kbps).



**Coefficient of friction:** 0.09 typical  
**Coefficient range:** 0.04.  
**Repeatability:** 5 microns .  
**Straight line accuracy:** 8 microns over entire travel distance.  
 Screw lead accuracy: 0.076 mm/25 cm.  
 More accurate assemble available on demand.

**Dynamic Configuration** uses Pulse/Dir/Enable/Alarm signals to control and to configure the microstep driver. No more switches, potentiometers or extra communication ports, resulting in cost and space savings.



**Different types of interfaces** - Ethernet, RS-485, and USB 2.0 based motion products to meet your network motion control needs.



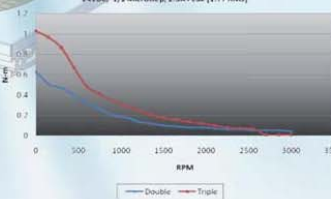
**Higher strength to weight ratio** - uses hard aluminum alloys and a rigid I-beam cross section.

In addition to providing standard motion products, our team of engineers is ready to meet your individual needs through custom engineering.



**Resistant to impact loads**  
 Natural wiping action expels debris. Gradual wear not sudden failure of rolling element type screws and guide-ways.

NEMA 23 Double & Triple Stack  
 24VDC, 1/2 Microstep, 2.5A Peak (1.77 RMS)

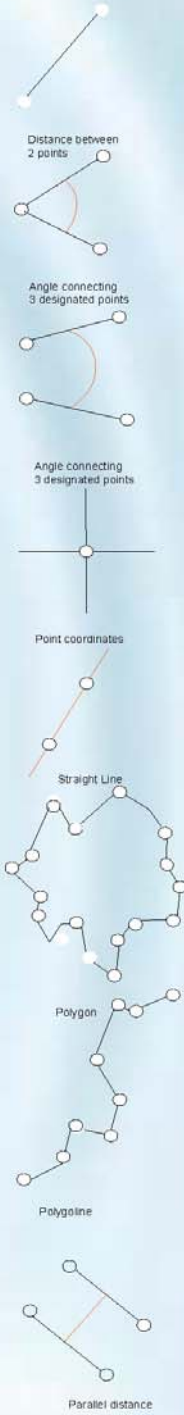


**Corrosion resistant** anodized finish. Operate without lubrication. Spare set of guide-ways built-in on the flip side just in case the primary ones get damaged.

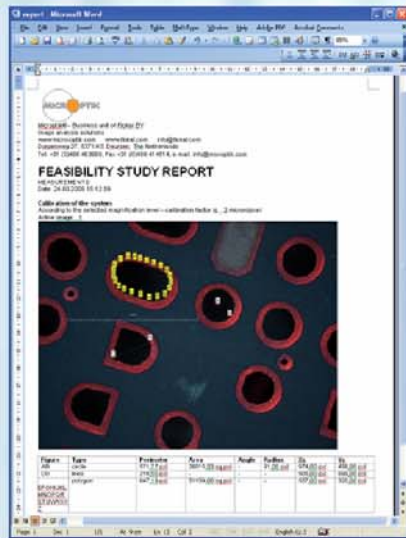
NEMA Size	Stack Size	Max Amp / Phase	Holding Torque	Resistance / Phase	Inductance / Phase	Inertia
11	Single	1.3A	0.06 N-m	1.7 Ohm	1.1 mH	0.05 oz-in <sup>2</sup>
	Double	1.3A	0.1 N-m	1.3 Ohm	0.8 mH	0.07 oz-in <sup>2</sup>
	Triple	1.3A	0.12 N-m	1.9 Ohm	1.7 mH	0.1 oz-in <sup>2</sup>
17	Double	1.7A	0.44 N-m	1.5 Ohm	3.0 mH	0.28 oz-in <sup>2</sup>
	Triple	2.0A	0.59 N-m	1.4 Ohm	2.7 mH	0.37 oz-in <sup>2</sup>
23	Double	2.8A	0.95 N-m	0.9 Ohm	2.5 mH	1.64 oz-in <sup>2</sup>
	Triple	2.8A	1.41 N-m	1.13 Ohm	3.6 mH	2.62 oz-in <sup>2</sup>



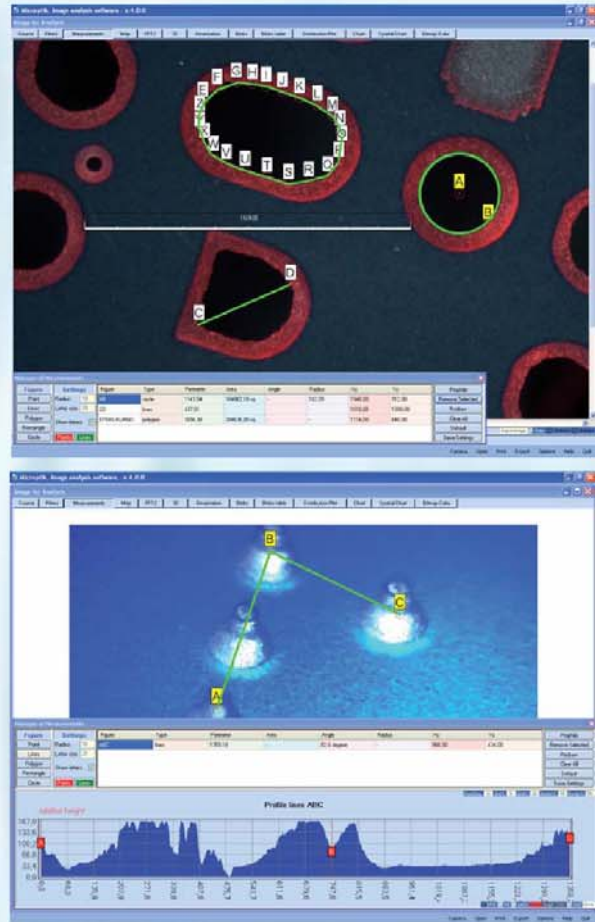
# 2D measurements



**DIMIC** allows to make any kind of manual geometrical measurements using Point, Line, Polygon and Circle tools. It allows to perform: measurement between two points; consecutive line measurements; perpendicular line measurements; circle measurements; measurements between parallel lines; angle measurements; polygon perimeter and area; XY coordinates of the objects; 3D profiles; colour profiles; etc. The profile features are convenient for quality control inspection. Profile can be obtained from any kind of measurement. All measurements and calculations can be exported as pictures or as standard MsOffice files for further processing.



When a real values for the line size is entered in a calibration window, the system will automatically recalculate the calibration factor and all other measurements as well. To activate stored calibration factor just double click on it in calibration window.



System allows to calculate and store different calibration factors for different lenses and magnifications. Calculation and storing of the calibration factor is a very simple procedure. Just put calibration glass on the observation plate. Take a picture and measure the line.

1424.00

Name	Value (µm)	Scale Factor	Real Value	Units
Default	71.2	0.00416102670489491	2.96265101389516	centimetre(cm)
Lens: 100X	71.2	0.311797792808989	222	micrometre(microm)
Lens: 40X	71.2	13.860255261739	14141	nanometre(nm)

Current settings: Name: Lens: 40X; Scale Factor = 1.0000; Units: nanometre(nm)

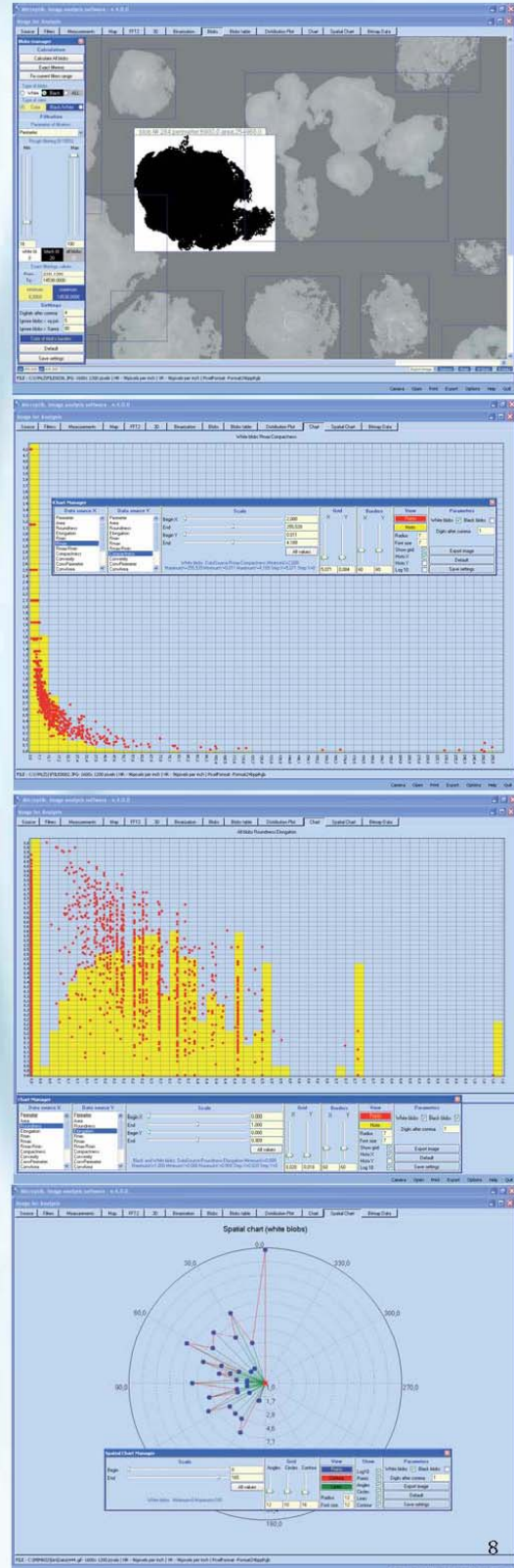
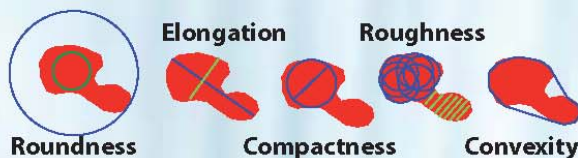
Color of name: Save and Exit



# Particles/Defects counting

**DIMIC** allows to make fast detailed calculation of the geometrical features of the particles/defects or any kind of blobs on the inspected area. A compilation of different filtration methods and powerful engine for image preparation, allows to extract relevant information quickly and to clean up unnecessary data. The software allows to obtain:

- **X/Y coordinates** of the object and its **gravity center/ Height/Width/Perimeter/Area of the object.**
  - **Elongation** - locates the centre of gravity, builds the longest axle in the particle and the axle orthogonal through the centre. The value of elongation is 100% minus the relation between the longest and the orthogonal axle. The elongation of a circle is 0, all other forms are  $>0 <100\%$
  - **Roundness** - locates the centre of gravity and builds the biggest inner and the smallest outer circle around it. The value of roundness is the relation between the inner and the outer circle. The roundness of a circle is 100%, all other forms  $<100\%$
  - **Compactness** - is calculated as the relation between the objects area and its perimeter ( $[4*p*A]/p^3$ ). A perfect circle has a compactness of 100%.
  - **Roughness** - is the relation outer the areas which can build by circuits of 80% of sieve diameter and the build area. It is a characteristic number for all domes sticked out of a particle.
  - **Convexity** - builds a rubber band around the particle and determines the inner area. The value of convexity is the relation between the area of the particle and the build rubber band area. It is a characteristic number for all indentations of a particle.
- And much more ...

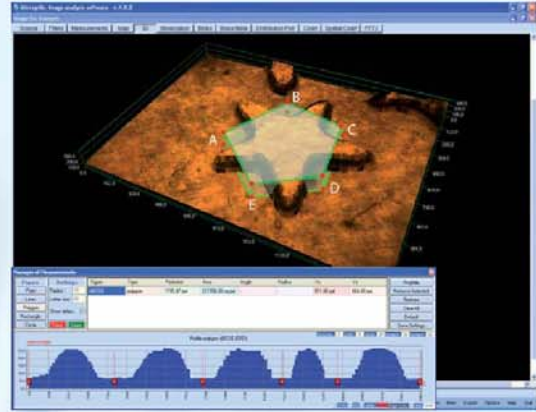




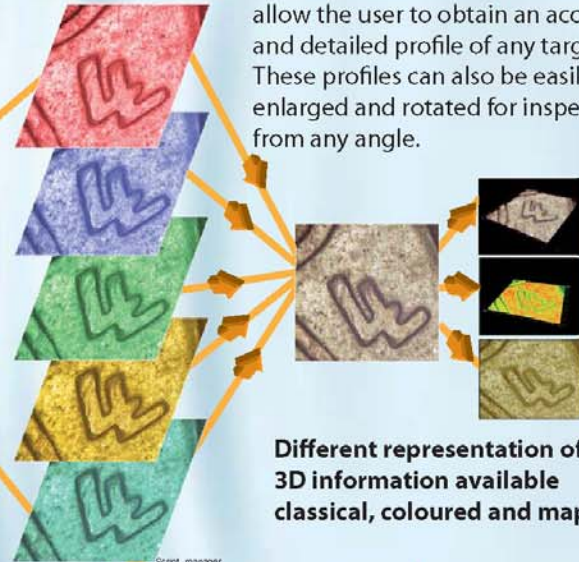
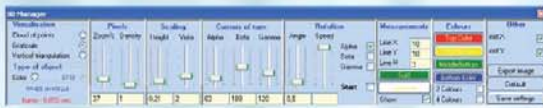
# 3D synthesis & Control

A major advantage of digital microscopes over optical microscopes is their ability to easily create 3D images. The 3 dimensional profiles of observation targets are often unclear when using only 2 dimensional images. The ability to create 3 dimensional images from a "stack" of 2 dimensional images in the Z-axis is one of the most important functions of digital microscopes.

**DIMIC** allows to make 3D images based on height and color reflection information. Just few mouse clicks and user will obtain 3D scanned model. For better visualization we realized different methods of Volume Rendering - cloud of points, graticule, vertical triangulation. User friendly interface allows to obtain best results.



The **3D measurement functions** allow the user to obtain an accurate and detailed profile of any target. These profiles can also be easily enlarged and rotated for inspection from any angle.

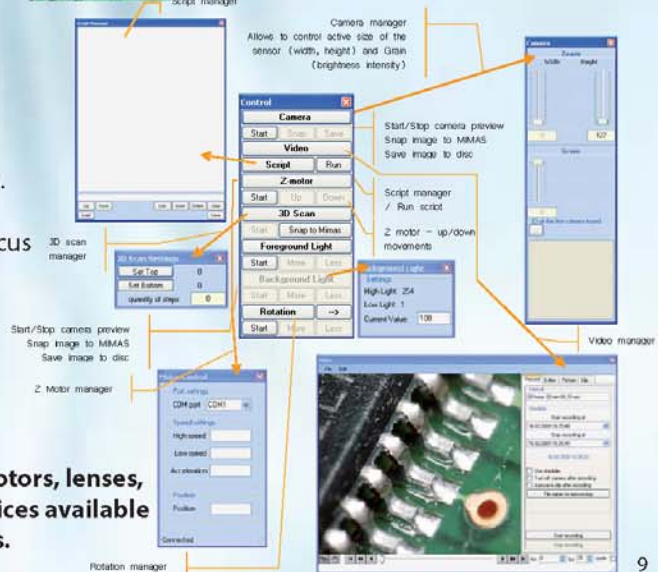


**Unique feature - Script manager - allows to program sequences of commands to**

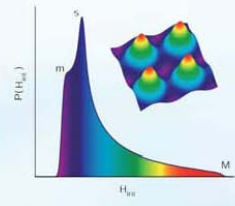
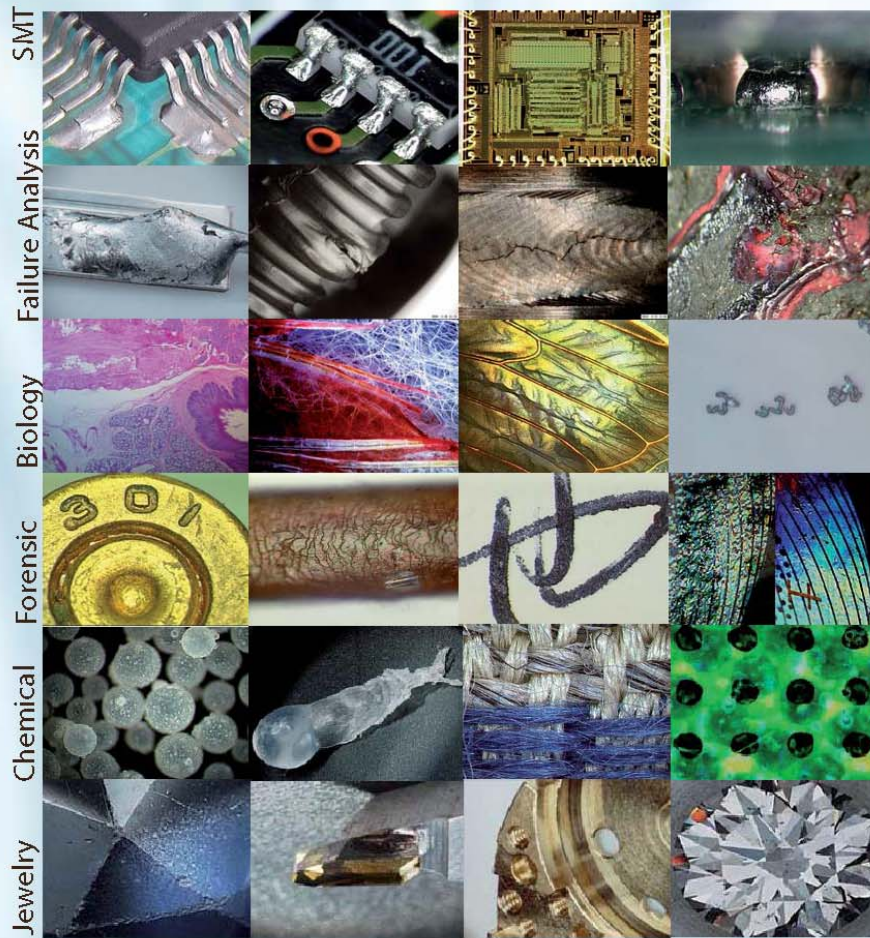
**DIMIC to make the observation process faster and repeatable.**

Image Composition (D.F.D. Method). The D.F.D. method enables image composition using less sampling data than conventional models. The D.F.D. method calculates the positions of projections and depressions in the area in which focus cannot be obtained based on multiple images and obtains the data of height differences. As a result, image composition is enabled with less sampling data than with conventional models. There is no need to capture images at all focus positions, enhancing the efficiency of analysis operations.

**Total control of cameras, motors, lenses, light sources and other devices available through different interfaces.**



# 3D view applications



3D Models of the objects



# Standard configuration

**DIMIC** is based on the principles of open architecture.

We always use top-line modern components to insure best performanse.

Different configurations available on demand.  
We focus on product and service excellence!

Unit	Description
Console	Computer
	<ul style="list-style-type: none"> <li>Processor Intel Core 2 Quad 3 GHz</li> <li>Hard drive Serial ATA II 500 Gb 7200 rpm 32 Mb</li> <li>Memory DDR3 2 Gb 1066 MHz</li> <li>Video-card PCI-E (ATI RADEON 4830)</li> <li>17" TFT screen (Digital fine contrast 5000:1, 1280x1024 - 2ms )</li> <li>Metal Halide light unit: Correlated Colour Temperature 5460K (nominal);</li> <li>Light delivered into Fibre Bundle 500 Lumens (avg); Lamp Life. Laboratory Tested: 500 hours (median).</li> </ul>
Stand	Precise height adjustment. Add on's XY stage, back light accessories and LED homogeneous LED light plates. Weight 6.4 kg
Camera	1/1.8" progressive scan Bayer mosaic colour sensor. Frame rate full frame 25 frames/second Active pixels 1624 (h) x 1236 (v) 4.4 µm square pixels. GigE Vison communication protocol.
Lens	Manual 12X zoom with coaxial illumination or Rotary Head Lens Optional: <ul style="list-style-type: none"> <li>Coupler to thread of objectives</li> <li>5X ICO 0.14NA &amp; 34mm WD</li> <li>50X ICO 0.55NA &amp; 13mm WD</li> </ul>



Optional:

- Coupler to thread of objectives
- 5X ICO 0.14NA & 34mm WD
- 50X ICO 0.55NA & 13mm WD

## Dimic serial code explanation

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