OPTIKA
MICROSCOPES
ITALY

VIDEO AND PHOTO APPLICATIONS

Video and Photo Cameras

OPTIKA

Italian headquarters

OPTIKA Microscopes belongs to the group "M.A.D. Apparecchiature Scientifiche" and, with its almost 40 years experience in the field of scientific instrumentation, is worldwide known as a leading Company for optical microscopes' production and distribution.

The Company, a team of 70 people in 3 different European locations, is engaged in the development of new models, production, quality control, sales and after-sales service.

OPTIKA microscopes excellence, concerning quality, innovation, competitive prices and customer assistance, reaches the end users through a wide network of national and international distributors.
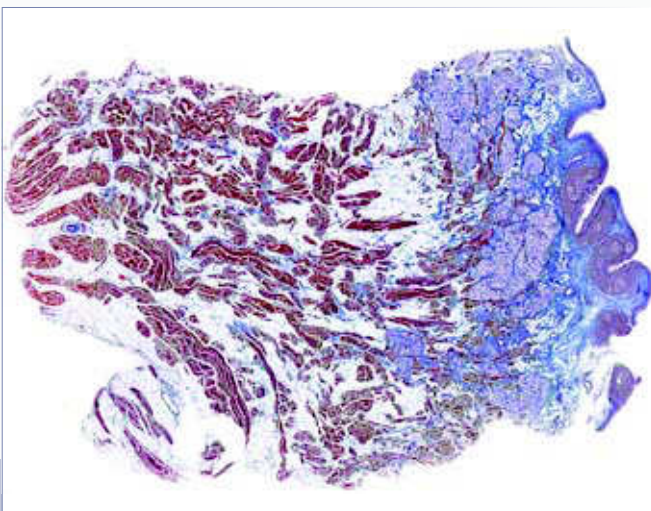
OPTIKAM® Budget SERIES Low-cost USB cameras

THE SERIES

A wide range of instruments fulfilling any requirement in photo/video field. It has never been so easy to get impressive images from your microscope. Thanks to different resolutions, both digital cameras (to be used with pc or TV set) can meet the demands of either a professional user or people who are looking for an economic but valuable product.
The Pro LT cameras are designed to be used on trinocular microscopes by using specific adapters (optional accessories). It will be easy to connect these instruments to any microscope, biological or stereo, by C-mount.
The models with optical eyepiece adapter, are ready to be used (by means of one of the two eyepieces) on monocular and binocular microscopes too, both biological and stereo.

OPTIKAM Budget Series
Low-cost USB cameras for general purpose

OPTIKAM Pro Series
High Performance cameras with advanced software package

OPTIKAM CCD Cooled Camera
Very high-sensitive camera with cooled CCD

DIGI
Universal photo & video (1080p) camera

EDUCAM
Multimedia cameras

VC SERIES
CCD videocameras for general purpose

OPTIKAM® Budget SERIES Low-cost USB cameras

NEW

OPTIKAM B05	Eyepiece Camera
Sensor	CMOS 1/4"
Resolution	800x600 pixels (0,48 Mpixels)
Frame Rate at Full Resolution	25 frames/sec
Frame Rate at VGA Resolution	30 frames/sec
Optical Format	1/4"
Aspect Ratio	4:3
S/N Ratio	52 dB
Dynamic Range	60 dB
Sensitivity	2,0 V/Lux-second
C-Mount:	No
Adapters for stereomicroscopes	30,5mm dia.
Calibration slide	None
System Requirements	Windows 2000 / XP SP2 / Vista, USB port
Software	Optika Vision Lite
Capture Features	Continuous auto white balance, continuous auto exposure
Included with the camera	1.8 m USB cable, carton box

OPTIKAM B1	C-mount and Eyepiece Camera
Sensor	CMOS 1/,3"
Resolution	1280 x 1024 pixels (1,3 Mpixels)
Frame Rate at Full Resolution	15 frames/sec
Frame Rate at VGA Resolution	30 frames/sec
Optical Format	1/3"
Aspect Ratio	4:3
S/N Ratio	44 dB
Dynamic Range	71 dB
Sensitivity	1,0 V/Lux-second
C-Mount:	Yes
Optical adapter	0,5x (for eyepiece tube)
Adapters for stereomicroscopes	30,0mm dia., 30,5mm dia.
Calibration slide	76x24mm micrometric calibration slide
System Requirements	Windows 2000 / XP SP2 / Vista 32-64bit / Win 7 32-64bit, USB 2.0 port
Software	Optika Vision Lite
Capture Features	Continuous auto white balance, continuous auto exposure
Included with the camera	1.8 m USB cable, carton box

OPTIKAM B2	C-mount Camera
Sensor	CMOS 1/3"
Resolution	1600 x 1200 pixels (2 Mpixels)
Frame Rate at Full Resolution	10 frames/sec
Frame Rate at VGA Resolution	25 frames/sec
Optical Format	1/3"
Aspect Ratio	4:3
S/N Ratio	56 dB
Dynamic Range	60 dB
Sensitivity	1,0 V/Lux-second
C-Mount:	Yes
Optical adapter	None
Adapters for stereomicroscopes	None
Calibration slide	76x24mm micrometric calibration slide
System Requirements	Windows 2000 / XP SP2 / Vista 32-64bit / Win 7 32-64bit, USB 2.0 port
Software	Optika Vision Lite
Capture Features	Continuous auto white balance, continuous auto exposure
Included with the camera	1.8 m USB cable, carton box

Special model designed for trinocular microscopes only. This camera does not include any optical adapter for biological microscopes nor stereomicroscopes. Especially designed for heavy applications, the **Optikam B-2** is very robust and does not need the installation of any driver in your computer.

OPTIKAM® Budget SERIES Low-cost USB Cameras

OPTIKAM B3	C-mount and Eyepiece Camera
Sensor	CMOS 1/2"
Resolution	2048 x 1536 pixels (3,14 Mpixels)
Frame Rate at Full Resolution	8 frames/sec
Frame Rate at VGA Resolution	30 frames/sec
Optical Format	1/2"
Aspect Ratio	4:3
S/N Ratio	44 dB
Dynamic Range	71 dB
Sensitivity	1,0 V/Lux-second
C-Mount:	Yes
Optical adapter	0,5x (for eyepiece tube)
Adapters for stereomicroscopes	30,0mm dia., 30,5mm dia.
Calibration slide	76x24mm micrometric calibration slide
System Requirements	Windows 2000 / XP SP2 / Vista 32-64bit / Win 7 32-64bit, USB 2.0 port
Software	Optika Vision Lite
Capture Features	Continuous auto white balance, continuous auto exposure
Included with the camera	1.8 m USB cable, carton box

OPTIKAM B5	C-mount and Eyepiece Camera
Sensor	CMOS 1/2,5"
Resolution	2592 x 1944 pixels (5,04 Mpixels)
Frame Rate at Full Resolution	8 frames/sec
Frame Rate at VGA Resolution	30 frames/sec
Optical Format	1/2,5"
Aspect Ratio	4:3
S/N Ratio	40,5 dB
Dynamic Range	60 dB
Sensitivity	1,0 V/Lux-second
C-Mount:	Yes
Optical adapter	0,5x (for eyepiece tube)
Adapters for stereomicroscopes	30,0mm dia., 30,5mm dia.
Calibration slide	76x24mm micrometric calibration slide
System Requirements	Windows 2000 / XP SP2 / Vista 32-64bit / Win 7 32-64bit, USB 2.0 port
Software	Optika Vision Lite
Capture Features	Continuous auto white balance, continuous auto exposure
Included with the camera	1.8 m USB cable, carton box

OPTIKAM B9	C-mount and Eyepiece Camera
Sensor	CMOS 1/2,3"
Resolution	3488 x 2616 pixels (9,12 Mpixels)
Frame Rate at Full Resolution	2 frames/sec
Frame Rate at Middle Resolution (1,3Mp)	15 frames/sec
Frame Rate at VGA Resolution	30 frames/sec
Optical Format	1/2,3"
Aspect Ratio	4:3
S/N Ratio	40,5 dB
Dynamic Range	63 dB
Sensitivity	1,0 V/Lux-second
C-Mount:	Yes
Optical adapter	0,5x (for eyepiece tube)
Adapters for stereomicroscopes	30,0mm dia., 30,5mm dia.
Calibration slide	76x24mm micrometric calibration slide
System Requirements	Windows 2000 / XP SP2 / Vista 32-64bit / Win 7 32-64bit, USB 2.0 port
Software	Optika Vision Lite
Capture Features	Continuous auto white balance, continuous auto exposure
Included with the camera	1.8 m USB cable, carton box

NEW

OPTIKAM® Pro SERIES Hi-Performance cameras with advanced software package

C-mount cameras for video and still-image capturing with high performances.
These cameras are delivered with our complete OPTIKA VISION SOFTWARE PACKAGE (see page 31-34).
LT versions do not include any eyepiece adapter.
Ideal for professional trinocular microscopes.

	OPTIKAM® PRO 3LT	OPTIKAM® PRO 3	OPTIKAM® PRO 5LT	OPTIKAM® PRO 5
Resolution	2048 x 1536 pixels **(3.2 Mpixel)**		2560 x 1920 **(5.0 Mpixel)**	
Sensor	CMOS 1/2,5"		CMOS 1/3"	
Pixel Size	3.2 µm x 3.2 µm		2.77 µm x 2.77 µm	
Imaging Area	6.55 mm x 4.92 mm		7.33 mm x 5.44 mm	
Frame Rate at Full Resolution	6 frames/sec		4 frames/sec	
Frame Rate at Half Resolution	21 frames/sec		15 frames/sec	
Optical Format	1/2"		1/1.8"	
Aspect Ratio	4:3		4:3	
S/N Ratio	43 dB max		42 dB max	
Dynamic Range	61 dB		61 dB	
ADC	10 bit		10 bit	
Data Output (Uncompressed Video)	3x8 bit		3x8 bit	
Exposure Range	0.2 -231 msec		0.125-249.7 msec	
Sensitivity	1.0 V/Lux-second		1.2 V/Lux-second	
System Requirements	Windows XP SP2 / Vista 32-64bit / Win 7 32-64bit, USB 2.0 port		Windows XP SP2 / Vista 32-64bit / Win 7 32-64bit, USB 2.0 port	
Software	Optika Vision® software package, TWAIN interface		Optika Vision® software package, TWAIN interface	
Capture Features	Continuous auto white balance, continuous auto exposure, averaging, subsampling (decimation)		Continuous auto white balance, continuous auto exposure, averaging, subsampling (decimation)	
Optical adapter	None	0,41x with additional ring adapter for stereomicroscopes	None	0,41x with additional ring adapter for stereomicroscopes
Included with the camera	3 m USB cable, 76x24mm micrometric calibration slide, C-mount cap, box		3 m USB cable, 76x24mm micrometric calibration slide, C-mount cap, box	

OPTIKAM® Pro Cool 3 3,3Mpixel Cooled CCD Camera

A new CCD cooled camera for fluorescence applications

* Scientific-grade CCD chip
* 3.3Mega pixels resolution (2048X1536 pixels)
* 12 bit color RGB
* The Peltier cooling system lowers the temperature of 30° to room temperature
* Angle light control function, obtaining a long Fluorescence Image
* CNC aluminum alloy metal case

OPTIKAM Pro Cool 3	CCD Cooled Camera
CCD chip manufacturer, model	Sony, ICX412AQ
CCD scan mode	interline transfer
CCD size	1/1.8"
Pixels	3.46micron x 3.46micron
G sensitive	455 mV
Resolution	2080 x 1536 pixels (3,2 Mpixels)
Filter	R, G, B Bayer
C-mount	Yes
Frame Rate at Max Resolution	5 frames/sec
Frame Rate at VGA Resolution	30 frames/sec
Low-speed readout	Yes
A/D conversion	12 bit
Peltier cooling system	- 30° effective temperature lowering
Fan	30x30/5000rpm
Power supply	5V external power supply
Exposure control	automatic, manual
Exposure time	1ms - 60minutes
Angle light control	Yes
White balance	automatic, manual
Parameter controls	image size, brightness, gain, exposure, RGB
Data interface	USB2.0/480Mb/s
USB cable	2.5meters
Calibration slide	76x24mm micrometric calibration slide
System Requirements	Windows 2000 / XP SP2 / Vista 32-64bit / Win 7 32-64bit, USB 2.0 port
Software	Optika Vision FL

DIGI Full HD Video/Photo Camera

The Model

OPTIKA Microscopes is pleased to introduce a new model of digital camera, fitted with USB connection and AV output for HDTV or TV set with standard resolution.

All you need to capture pictures and videos from your microscope, or simply from the surroundings is in this 2-in-1 model.

Other advantages of the new DIGI camera are the possibility to record videos and to use it as a standard digital camera, for personal use.

The camera sensor has a resolution of 5MPixels (8Mpixels through interpolation), it is provided with 3X optical zoom and a very bright 3'' LCD display.

The system also includes specific adapters that allow the use on all microscopes and stereomicroscopes models with diameter of the eyepiece holder of 23mm or 30mm .

A complete software will allow you to process, file and work with the captured images.

The camera includes a 1GB SD memory card.

DIGI	Digital Photo and Video Camera
Sensor	5.0 MP 1/2.5" CCD Sensor
Resolution (PHOTO)	8Mp (3200x2400 pixels) 5Mp (2595x1944 pixels) 3Mp (2048x1536 pixels)
Resolution (VIDEO)	1440x1080 (HD 1080p, 30fps) 1280x720 (HD 720p, 60fps) 1280x720 (HD 720p, 30fps) 848x480 (480p, 60fps) 320x240 (QVGA, 30fps)
Lens	3x optical zoom lens
Digital zoom:	4x (2x in 1080p mode)
File format:	JPEG, MOV, WAV
Internal Memory:	32MB
External Memory:	1GB SD card included (up to 32GB SDHC)
LDC display:	3"
TV out:	HDTV Component Out, PAL/NTSC system supported
Interface:	USB 2.0
Voice Recorder:	Yes
Microphone:	Internal (stereo), mic jack
Speaker:	Yes
Nightshot:	Yes (both in still image and video modes)
E.I.S.:	Electronic Image Stabilization
C-Mount:	No
Optical adapter	1x (for eyepiece tube)
Adapters for stereomicroscopes	30,0mm dia.
Battery:	Li-Ion rechargeable
Remote Control:	Yes, IR transmission

NEW
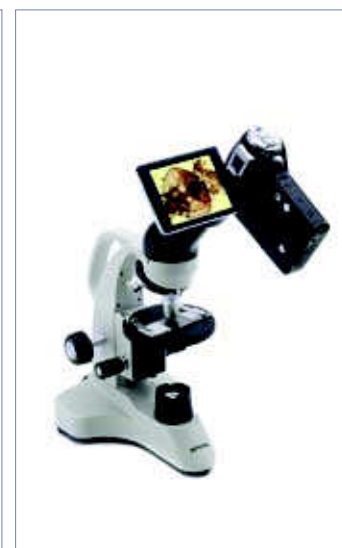
TB-2 Tablet PC with Integrated Camera

Finally, something new in digital microscopy !
A Tablet PC with 10" LCD touch screen, in combination with a 2Mp C-mount camera:
an universal system wich can be installed on every trinocular microscope.

Tablet PC specifications	TB-2L	TB-2W
PCU	Intel Atom 1.6GHz	
Screen	10" Touch	
Hard Disk	160 GB	
RAM	1GB (Max 2GB)	
Graphics Card	GMA950	
LAN	Ethernet port	
USB 2.0	3 ports	
VGA output	Yes	
W-LAN	Wi-Fi adapter	
Bluetooth	Yes	
SD Card Reader	Yes	
OS	Linux Ubuntu	Windows 7
Image Analysis Software	Image J	Optika Vision Lite

USB Camera specifications	
Sensor	CMOS 1/3"
Resolution	1600 x 1200 pixels (2 M pixels)
Frame Rate at Max Resolution	10fps
Frame Rate at VGA Resolution	25fps
S/N Ratio	56 dB
Dynamic range	60 dB
Sensitivity	1,0V/lux-second
Calibration slide	Yes

EDUCAM® Multimedia Cameras

EDUCAM®

The EDUCAM® video camera is especially designed to meet the various requirements in the educational field. When it is connected to a professional monitor or simply to a TV set, EDUCAM® is able to carry out many different functions.

It can be used as an episcope, for the reproduction of texts, documents, photographs - as an enlarger, to enlarge small objects, insects, minerals - for video-microscopy, connected to microscopes used in Biology or to stereomicroscopes - as an overhead projector, for the projection of drawings - as a camera for teleconferences - as a camera for conferences, assemblies, meetings - as a camera for filming, with the help of a video recorder.

Its ultra-high sensitivity enables to record clearly even in low-light conditions.

The special lens enables you to focus from 0,76 cm, up to an infinite distance. An extremely sensitive microphone (only on Multimedia models), captures the teacher's voice during the lesson, or sounds

and noises from the surrounding area, that can be heard via the TV itself, or via a separate amplifying system.

The microphone can be switched off if required.

The special 50 or 65cm flexible arm (12mm dia.) and the heavy weight of the base (approx. 2.7 Kg), make EDUCAM® versatile, sturdy and stable at the same time.

The CCD camera is placed on the end of the flexible arm that can be safely twisted in any position, even projecting from the base, without affecting the system stability. A special joint allows the head to rotate without damaging the wires inside the flexible arm. All models are equipped with an external power supply and dual adapter for video-microscopy (for biological and stereo microscopes).

For the connection to a PC, a USB video grabber is available as option (see next page, CONV-USB video grabber). In the model EDUCAM USB, the video grabber is built-in.

NEW
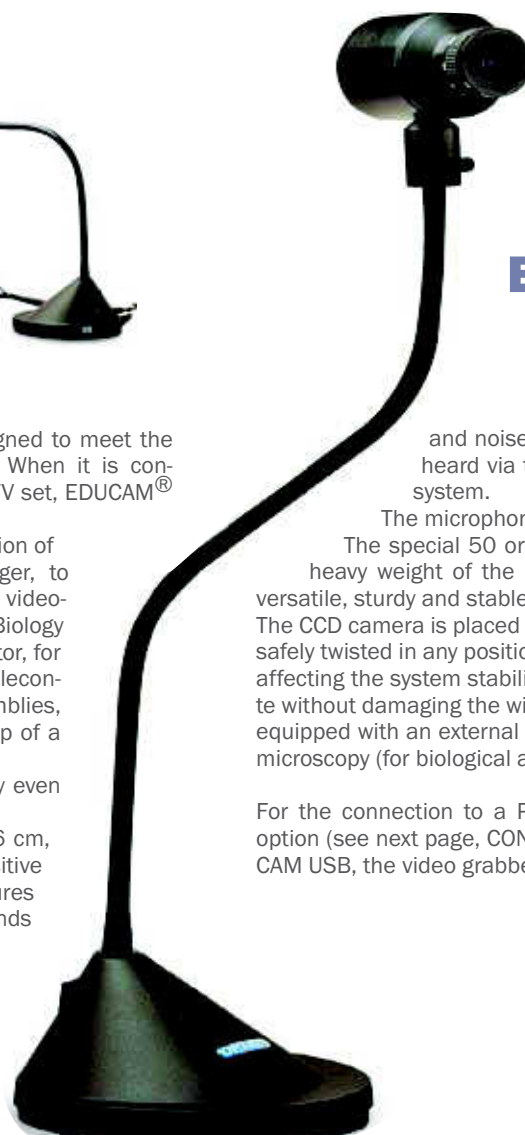
Technical Features	MULTIMEDIA 4083	MULTIMEDIA PRO 4083.1	STUDENT 4083.2	STUDENT PRO 4083.3	MIC 4083.5	USB 4083.4
CCD element	1/3"	1/3"	1/4"	1/4"	1/4"	1/3"
Resolution (TV lines)	380	380	330	330	330	380
Total pixels	290.000	290.000	270.000	270.000	270.000	290.000
Signal/noise ratio	>48 dB	>48dB	>48dB	>48dB	>48 dB	>48dB
Sensitivity (lux/F:1.2)	1 lux	1 lux	1,5 lux	1,5 lux	1,5 lux	1 lux
Electronic shutter	yes	yes	yes	yes	yes	yes
Automatic gain control	yes	yes	yes	yes	yes	yes
White balance (auto)	yes	yes	yes	yes	yes	yes
Video signal	PAL (NTSC opt.)	PAL (NTSC opt.)	PAL (NTSC opt.)	PAL (NTSC opt.)	PAL (NTSC opt.)	PAL (NTSC opt.)
USB output	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	yes
Digital resolution	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	640x480 pixels
Working distance	>0,76 cm	>0,76 cm	>0,76 cm	>0,76 cm	>0,76 cm	>0,76 cm
Objective	8 mm	8 mm	8 mm	8 mm	8 mm	8 mm
Magnification	> 90x	> 90x	> 90x	> 90x	> 90x	> 90x
Microphone	yes	yes	- - - - -	- - - - -	- - - - -	yes
Audio signal	analogic	analogic	- - - - -	- - - - -	- - - - -	analogic
Voltage	12Vdc	12Vdc	12Vdc	12Vdc	12Vdc	12Vdc
Power adapter 230/12Vdc	included	included	included	included	included	included
Flexible arm length	50 cm	65 cm	50 cm	65 cm	- - - - -	65 cm
Base diameter	17 cm	17 cm	17 cm	17 cm	- - - - -	17 cm
Weight	3,4 Kg	3,5 Kg	3,3 Kg	3,4 Kg	0,4 Kg	3,5 Kg
Microscope adapters	included	included	included	included	included	included

VC SERIES CCD Cameras

The Model

VC-01 Videomicroscopy system
Videomicroscopy system composed by a colour CCD TV camera [VC02], complete with Bio & Stereo Microscope adapter tube, integrated power supply unit, cables and manuals.

VC-02 CCD Camera
Mid-resolution colour CCD TV camera complete with cables, SCART adapter & manual. Technical specifications:
- 1/3"CCD SONY sensor
- picture elements 500[H]x582[V]
- Horizontal resolution 340 TV lines (PAL)
- Sensitivity 0.34lux/F=1.2
- Video output BNC VBS 1.0Vp-p, 75 Ohm
- Audio output microphone 500m mV/47 KOhm
- S/N ratio > 48 dB
- Gamma correction > 0,45 - Auto white balance
- Back light compensation on/off switch
- Auto gain control
- Auto line lock with external phase adjustment
- Wide range automatic electronic shutter 1/60[1/50]~1/100,000
- Anti flick function user selectable
- Auto IRIS VD/DD user selectable
- Lens mount C/CS with back focus adjustment
- Operating temperature 0º to + 40º
- Dimension 57 (L) x 51 (W) x 140 (h) mm - Weight 600g

VC-03 High-resolution CCD camera
High-resolution colour CCD TV camera. Complete with cables, manual & integrated power supply. See VC02 for technical data except for :
- Picture elements 752[H]x582[V]
- Horizontal resolution 480 TV lines (PAL)

VC-04 High-resolution videomicroscopy system
Videomicroscopy system composed by an high-resolution colour CCD TV camera [VC03], complete with Bio & Stereo Microscope adapter tube, integrated power supply unit, cables and manuals.

VC-05 Eyepiece CCD camera
Simple eyepiece camera with CCD sensor. 340 TV Lines (PAL).

CONV-USB Video Grabber
Analogic to Digital signal converter for PC.
Real time video capture from camcorder, VCR or camera. User friendly software easily stores and manages images & videos. Real time/full size Video capture window. Video capture resolution 352x288 pixels ; image capture resolution 1600x1200. Video conference software enclosed.
The CONV-USB video grabber comes with a CD with drivers for Windows 98, SE, ME, 2000, XP and Vista. It also includes the following software:
Win TV-32; Win TV2000; Microsoft NetMeeting; DVD MovieFactory.

OPTIKA VISION® SOFTWARE PACKAGE

Optika Vision is a software family included with our Optikam series.
There are two versions: Lite and Pro, designed to satisfy the needs of both the beginner and the advanced user.

Optika Vision Lite is provided for all the Optikams, DIGI and Tablet PC. It can be used for storing, reporting and linear measurements.

Optika Vision Pro is included exclusively with the Optikam Pro series for professional image acquisition and analysis.

A freeware bundle is supplied as bonus for additional user experience.

SOFTWARE

OPTIKA VISION® SOFTWARE PACKAGE

OPTIKA VISION® LITE is a software developed by Optika Microscopes with the main purpose to be a handy and simple tool for our costumers using our Optikams and other digital microscope cameras. It has a simple user interface and can be used for image acquisition, line measurements and documentation. It is available in seven languages: English, Italian, French, Spanish, German, Swedish and Polish.

IMAGE AND VIDEO ACQUISITION
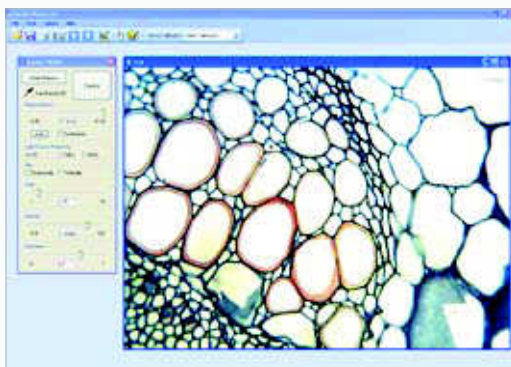
You can capture still images using a live preview that makes it possible to precisely focus your image and change image parameters in order to have a perfect final result. The image can be saved separately in BMP, JPG or TIFF formats.
It is also possible to import saved images from other sources.
Moreover:
- Image stacks acquisition (adjustable time steps),
- Square or round grid on live preview,
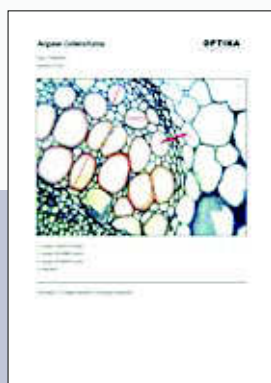- Video acquisition function included.

MEASUREMENTS
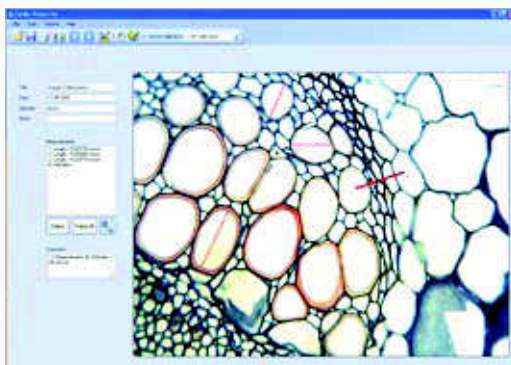
Linear in-scale measurements can be made in any unit you like, using a simple calibration and measurement tool.
The data can be exported to a spreadsheet document for further elaboration. There is also the possibility to indicate special objects in the image and to make comments.

DOCUMENTATION

A report can be generated simply by printing the document on a normal printer or to a PDF.
The document can be personalized with your own logo.

OPTIKA VISION® SOFTWARE PACKAGE

OPTIKA VISION® PRO is a new generation of microscope image analysis instruments, especially developed for our Optikam Pro series, which contains various tools for processing and analysis of digital microscope images. It includes powerful tools for image capturing, adjusting, operating and measuring. You have also the possibility to create your own database for easy organisation and storage of your images.

IMAGE ACQUISITION
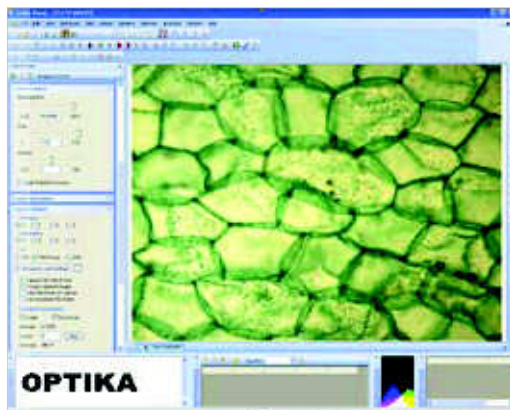
Optika Vision® Pro makes still image acquisition with vast possibilities to control the image output according to your needs. There are functions such as white balance, automatic exposure, frame average, sub-sampling, hue, saturation and intensity controls, to mention a few.

POST ELABORATION AND MEASUREMENTS

Optika Vision® Pro also offers the possibility to make various types of enhancements and adjustments of the captured image and calibrated measurements of lines, angles and areas. You can also perform manual counting and measure the light density of your acquired image.

ORGANIZE YOUR WORK

For easy storage and fast upload you can organize your images into a database where it is possible to search for the images using keywords. In Optika Vision® Pro you can also arrange images into groups in order to combine, calculate the average or create a multi-focus composition of the images.

DATABASE STORAGE

SOFTWARE

OPTIKA VISION® SOFTWARE PACKAGE

FREEWARE

The Optika Vision® software package also contains a bundle of imaging, video and image analysis software that are freely available from the Internet. They are provided free of charge, as provided for in the original license, as an aid in the use of your Optika product.

EMAMCAPTURE
AMCap is a small yet fully functional video capture and preview application compatible with Microsoft™ DirectShow (formerly ActiveMovie, hence the name). It is based on the sample AMCap source code from the Microsoft DirectX 9 SDK.

GIMP
GIMP is the GNU Image Manipulation Program. It is a freely distributed advanced software for tasks such as photo retouching, image composition and image authoring. It works on many operating systems, in many languages.

Combine Z
This small software combines pictures to increase depth of focus.

Image Tool (not for Windows 7)
ImageTool is an advanced image processing and analysis program for Windows. It can acquire, display, edit, analyze, process, compress, save and print greyscale and colour images. It can read and write over 22 common file image formats.

Image analysis functions include dimensional (distance, angle, perimeter, area), automatic (or manual) **object/cell counting and full analysis functions**, and greyscale measurements (point, line and area histogram with statistics). ImageTool supports standard image processing functions such as contrast manipulation, sharpening, smoothing, edge detection, median filtering and spatial convolutions with user-defined convolution masks.

ImageTool also has built-in scripting capabilities that allow the user to record repetitive tasks and playback saved scripts to automate image analysis. ImageTool was designed with an open architecture that provides extensibility via a variety of plug-ins for example image acquisition using either Adobe Photoshop plug-ins or Twain scanners is built-in.

ImageTool provides for geometric transformations and magnification up to four levels. All analysis and processing functions are available at any magnification factor.
ImageTool also provides for image annotation with text, arrows, rectangle, ellipses and polygon.

MBF ImageJ
ImageJ is a public domain Java image processing program that runs on any computer with a Java 1.4 or later virtual machine.
It can display, edit, analyze, process, save and print 8-bit, 16-bit and 32-bit images of various image formats. It supports "stacks", a series of images that share a single window. It is multithreaded, so time-consuming operations such as image file reading can be performed in parallel with other operations.