

GX series specifications

		GX71	GX51
Optics		UIS2 optical system (infinity-corrected)	
Microscope body	Intermediate magnification	Zoom incorporated (1 x-2 x) Clicks in the two intermediate positions (can be released)	—
	Imprinting of scale	All ports Reversed positions (up/down/left/right) from observation positions seen through the eyepiece	All ports Reversed positions (up/down) from observation positions seen through the eyepiece
	Power source	Power source for illuminator (12 V 100 W halogen) incorporated	
	Focusing	Manual, Coarse and Fine coaxial handle. Focus stroke 9 mm (2 mm above and 7 mm below the stage surface)	
	Output port	Front port — Video and DP system (reversed image, special video adapter for GX) Side port — Video, DP system (reversed image)	Side port (option) — Video, DP system (upright image)
Observation tube	Super widefield (F.N. 26.5)	U-SWB130, U-SWTR-3	—
	Widefield (F.N. 22)	—	U-BI90, U-TR30H-2
Illuminator	Observation method	Brightfield, darkfield, simple polarized light, DIC, fluorescence	Brightfield, darkfield, simple polarized light, DIC
	Illuminator diaphragm	FS/AS manually controlled, with centering adjustment	
	Light source	100 W halogen (standard), 100 W mercury, 75 W xenon (option)	
Revolving nosepiece	Manual operation	Sextuple for BF/DF, quintuple for BF/DF/DIC, Quadruple for BF with centering	
	Motorized operation	Sextuple for BF/DIC, quintuple for BF/DF/DIC	
Stage	Standard type	Right handle stage for GX (X/Y stroke: 50 x 50 mm)	
	Option	Flexible right handle stage, left short handle stage (each X/Y stroke: 50 x 50 mm) Gliding stage, rotatable stage for GX	
	Stage insert plate	A set of teardrop and long hole types	
Image recording	Digital camera, video camera	OLYMPUS DP series etc, attachable using appropriate adapters	
Combined weight		Approx. 39 kg (BF, DF and DIC observations, combined with DP72)	Approx. 28 kg (BF, DF and DIC observations, combined with DP21)
Power consumption		170 VA, 140 W	

UIS2 objective lens specifications

Objective lenses	Magnifications	N.A.	W.D. (mm)	Cover Glass Thickness*1 (mm)	Resolution*2 (μm)
MPLAPON	50x	0.95	0.35	0	0.35
	100x	0.95	0.35	0	0.35
MPLAPON	100xOil ¹³	1.4	0.1	0	0.24
MPLFLN	1.25x ^{14,15}	0.04	3.5	—	8.39
	2.5x ¹⁵	0.08	10.7	—	4.19
	5x	0.15	20.0	—	2.24
	10x	0.30	11.0	—	1.12
	20x	0.45	3.1	0	0.75
	40x ¹⁶	0.75	0.63	0	0.45
	50x	0.80	1.0	0	0.42
MPLFLN-BD ¹⁷	5x	0.15	12.0	—	2.24
	10x	0.30	6.5	—	1.12
	20x	0.45	3.0	0	0.75
	50x	0.80	1.0	0	0.42
	100x	0.90	1.0	0	0.37
MPLFLN-BDP ¹⁷	5x	0.15	12.0	—	2.24
	10x	0.25	6.5	—	1.34
	20x	0.40	3.0	0	0.84
	50x	0.75	1.0	0	0.45
	100x	0.90	1.0	0	0.37
LMPLFLN	5x	0.13	22.5	—	2.58
	10x	0.25	21.0	—	1.34
	20x	0.40	12.0	0	0.84
	50x	0.50	10.6	0	0.67
	100x	0.80	3.4	0	0.42
LMPLFLN-BD ¹⁷	5x	0.13	15.0	—	2.58
	10x	0.25	10.0	—	1.34
	20x	0.40	12.0	0	0.84
	50x	0.50	10.6	0	0.67
	100x	0.80	3.3	0	0.42

Objective lenses	Magnifications	N.A.	W.D. (mm)	Cover Glass Thickness*1 (mm)	Resolution*2 (μm)
MPLN ^{18,19}	5x	0.10	20.0	—	3.36
	10x	0.25	10.6	—	1.34
	20x	0.40	1.3	0	0.84
	50x	0.75	0.38	0	0.45
	100x	0.90	0.21	0	0.37
MPLN-BD ^{18,19}	5x	0.10	12.0	—	3.36
	10x	0.25	6.5	—	1.34
	20x	0.40	1.3	0	0.84
	50x	0.75	0.38	0	0.45
	100x	0.90	0.21	0	0.37
LCPLFLN-LCD	20x	0.45	8.3-7.4	0-1.2	0.75
	50x	0.70	3.0-2.2	0-1.2	0.48
	100x	0.85	1.2-0.9	0-0.7	0.39

*1 — : Applicable to the view of specimens with/without a cover glass

0 : Applicable to the view of specimens without a cover glass.

*2 Resolution values are calculated with the aperture diaphragm fully opened.

*3 Specified oil: IMMOL-F30CC.

*4 Field numbers are limited (up to F.N.22). Not compatible with F.N.26.5.

*5 Analyzer and polarizer are recommended to the usage with MPLFLN1.25x or 2.5x.

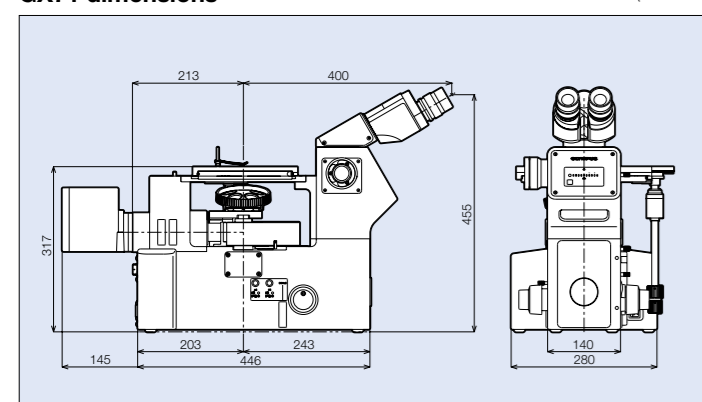
*6 The MPLFLN40x objective lens is not compatible with the differential interference contrast microscopy.

*7 "BD" refers to brightfield and darkfield objective lenses

*8 Slight vignetting may occur in the periphery of the field when MPLN-BD series objective lenses are used with high-intensity light sources such as mercury and xenon for darkfield observation.

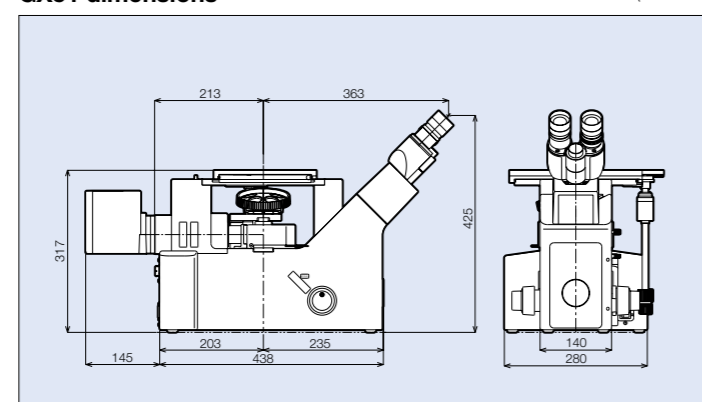
GX71 dimensions

(unit:mm)



GX51 dimensions

(unit:mm)



OLYMPUS®

Your Vision, Our Future

Inverted Metallurgical Microscopes

GX SERIES

UIS2
World-leading optics

INVERTED METALLURGICAL MICROSCOPES

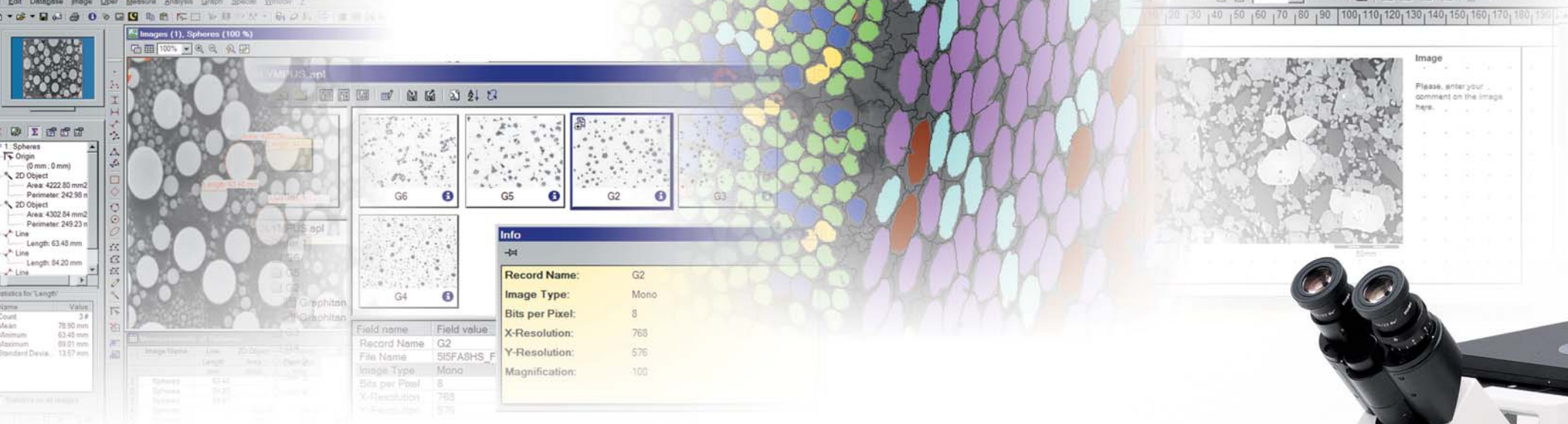


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- OLYMPUS CORPORATION is FM553994/ISO9001 certified.
- Illumination devices for microscope have suggested lifetimes. Periodic inspections are required. Please visit our web site for details.
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- Images on the PC monitors are simulated.
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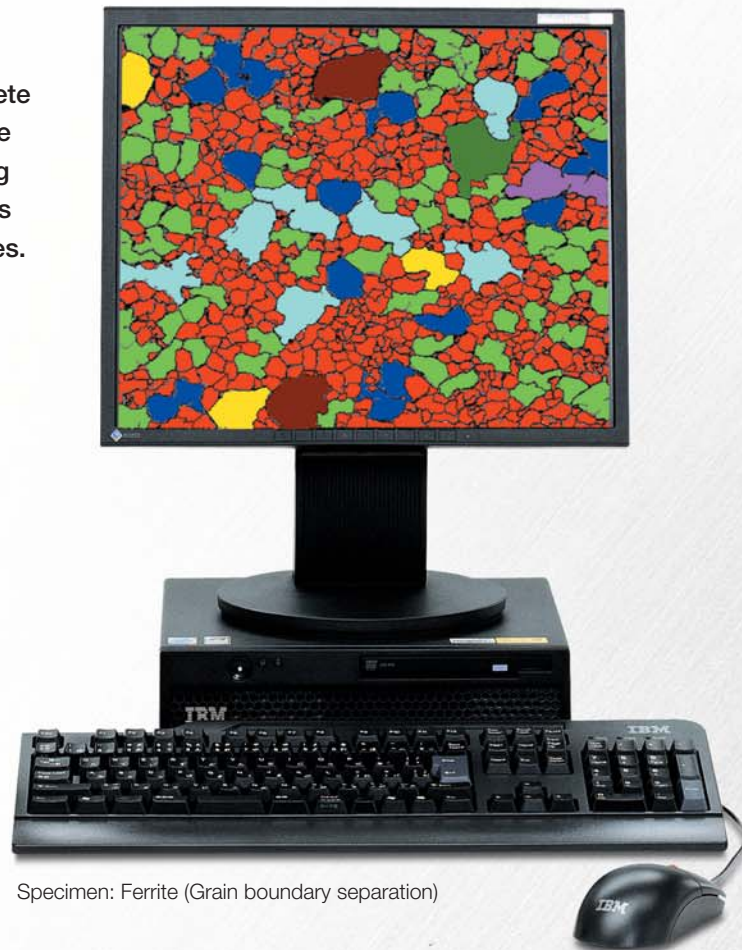
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World-class UIS2 optics take digital micro imaging systems to the next generation

The optical system, heart of a microscope, uses our UIS2 infinity-corrected optical system evolved from the industrial leading UIS optical system. High quality images are obtained for every observation method, and the performance of the digital camera is maximized for the ultimate flexibility. Digital images transferred to a PC can be easily used by use of advanced image analysis software.

The GX series is Olympus' most advanced inverted metallurgical microscope system. With addition of motorized functions, complete integration into all digital imaging subsystem is possible to provide advanced solutions for cutting edge research by its digital imaging system in pursuit of high quality and simplicity, motorized modules which increase observation efficiency, and other beneficial features. The GX Series also strongly promotes environmentally-friendly manufacturing with a lead-free optical system.



Specimen: Ferrite (Grain boundary separation)



GX51+DP21

Specimen: 8-layer printed circuit board (Section)

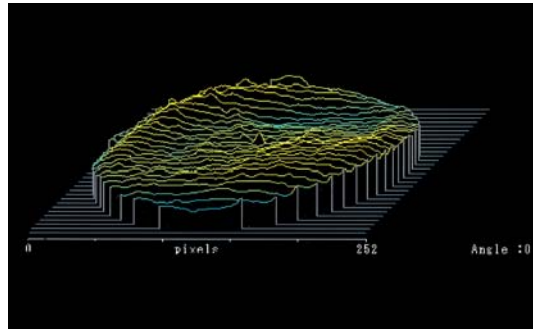


GX71 (motorized model) +DP72

Images of the world's highest order created with UIS2 wavefront aberration control

A new standard of the objective lens performance, using wavefront aberration control

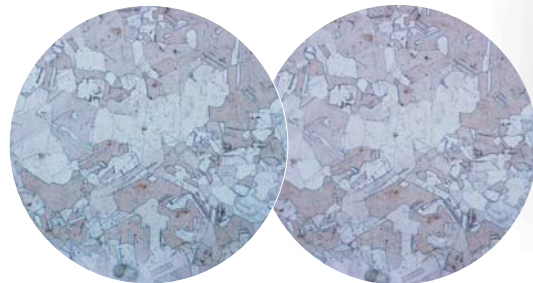
The Olympus UIS2 objective lenses set a new standard, with wavefront aberration control in addition to common performance standards of N.A. and W.D. Olympus challenges farther highest order optics which has not been fulfilled by the conventional standards. We offer excellent performance objective lenses by minimizing the aberrations that lower resolution.



An example of 3D display of a wave front measured with a laser interferometer. The flatter the surface of the lens, the better the aberration correction becomes.

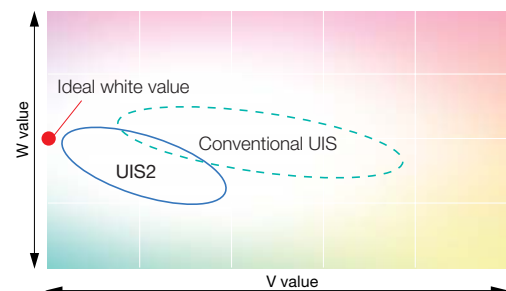
Natural color reproduction faithful to the specimen

UIS2 objective lenses realize natural color reproduction without any chromatic shifts using stringently selected high transmittance glass and advanced coating technology that provides high transmittance which is flat over an ultra-wide band wavelength. In addition, since the total optical system, including the tube lens is designed to reproduce a natural color, clear images faithful to the specimen are obtained even with digital imaging.



UIS2 image Conventional image

Color temperature comparison

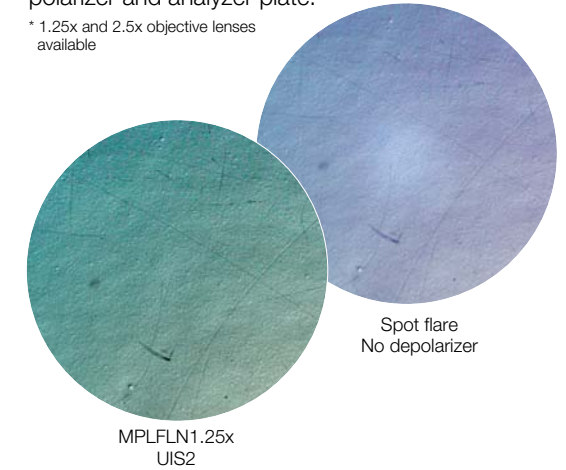


A comparison of the color temperature of UIS2 objective lenses and conventional UIS objective lenses. The color temperature of the UIS2 objective lenses is within a range which is very close to the color temperature target, which represents ideal white value.

Removes spot flare during ultra low magnification observation.

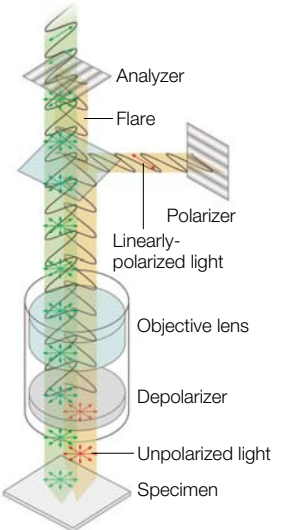
When a low reflection specimen is observed in ultra low power magnification, spot flare may hinder precise observation. In UIS2 ultra low magnification observation, a depolarizer built into the objective lens end removes spot flare and, a clear, high contrast image is obtained by combining a set of polarizer and analyzer plate.

* 1.25x and 2.5x objective lenses available



Spot flare removal principle conceptual diagram

Since the light reflected from the surface of the objective lenses is the linearly-polarized light "as is", it is eliminated by analyzer at Crossed Nicol position and has no affect on the image. On the other hand, the light passed through the depolarizer at the end of the objective lens becomes unpolarized light, and when the unpolarized light reflected from the specimen passes through the analyzer, only the linearly-polarized light that matches the vibration direction of the analyzer passes through and forms an image.



Promotes environmentally-friendly ecologization and weight reduction

Olympus was the first to consider the environment and to tackle ecologization of microscopes. As part of this, on introduction of UIS2 optical system, eco-friendly glass free of lead and arsenic is used in the objective lenses and the major Semi-apochromatic UIS2 objective lenses are lightened by approximately 2/3. This contributes to prevention of environmental pollution, improvement of operability of objective lenses replacement, etc.

*Some UIS2 objective lenses are the same weight as conventional objective lenses

High-performance research and quality control are enhanced by automated modules

Operations that you want to save — various powered modules fulfill your requirements

Thanks to various motorized modules, speedy magnification change, easy observation mode selection from brightfield to simple polarizing and illumination filter switching are performed through hand control panel or PC. Automation allows the operator to focus on the crisp UIS2 images. You only need to add the automation you need without adding any extras.

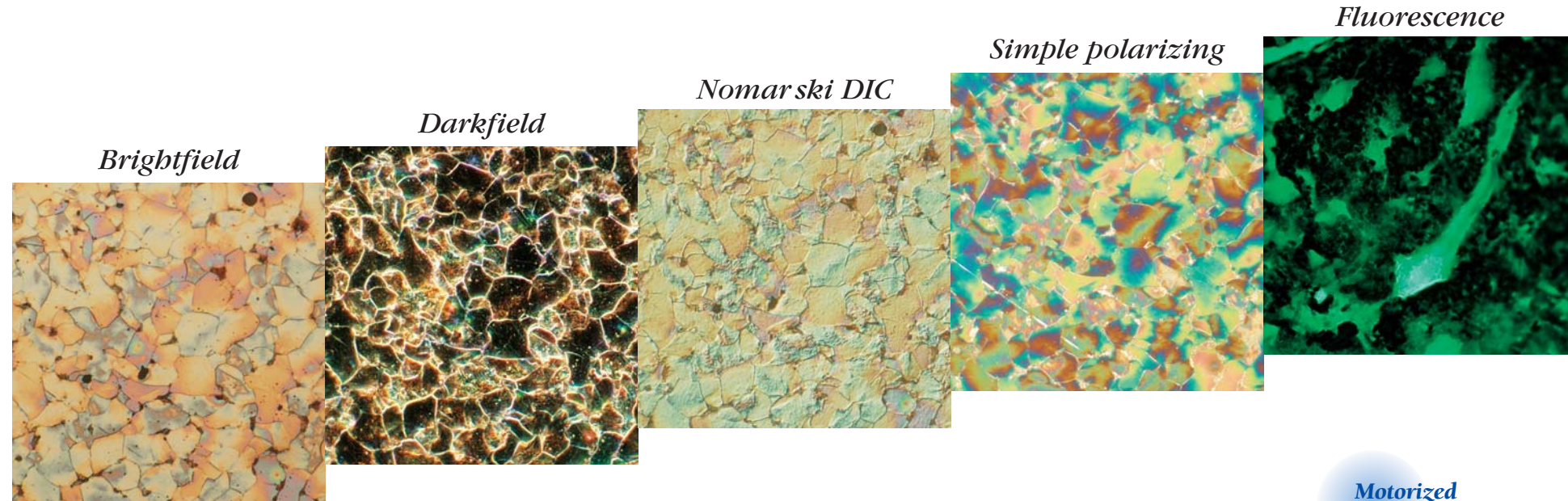
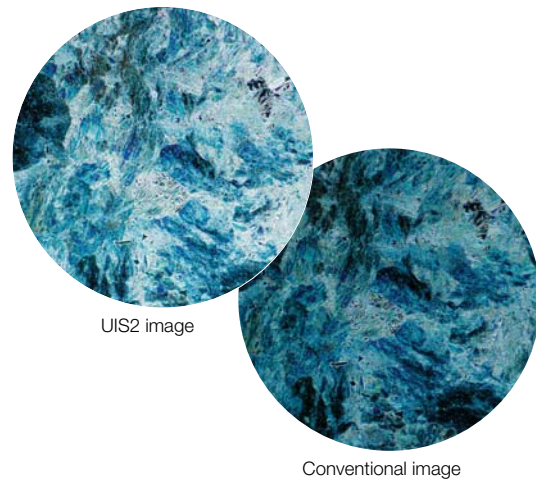
*Motorized revolving nosepieces U-D6REM, U-D5BDREM and motorized filter wheel U-FWR can also be added onto the GX51.
*Image analysis software analySIS series is necessary for control from a PC.

Getting the optimized image with any observation method

The UIS2 infinity-corrected optical system was developed with Olympus unique knowledge — and the GX series is designed to maximize its performance in the context of inverted metallurgical microscopes. The results are sharp, detailed images with excellent contrast and consistently high clarity with any and all observation methods. Equipped with 100W halogen lamp and newly improved efficiency, the GX series microscopes provide the intense and even illumination.

The brightest Darkfield images than ever

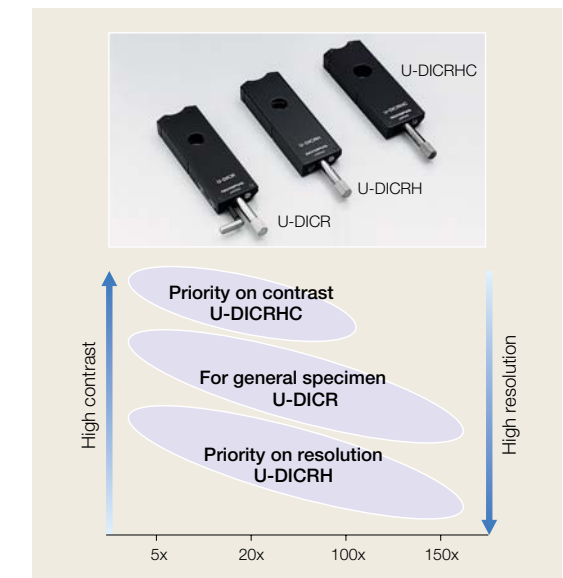
The UIS2 contrast has improved brightness and delivers better sensitivities for holes or flaws on metallographic structure.



The GX71 motorized configuration requires the control box, IX2-UCB and the cable, U-REMMT.

Nomarski DIC system provides an optimum image suited to the sample

Olympus Nomarski DIC observation uses a simple observation switching slider type single prism system. Three different DIC prisms are provided: the U-DICR for all imaging applications, high resolution U-DICRH, and high contrast U-DICRHC, so that the best resolution and contrast matched to the state of the sample are obtained. Since the exit pupil position of the objective lens is standardized by the series, the position of the DIC prism does not have to be switched when the magnification was changed by switching the objective lens.



Polarized light: optimizing contrast in the observation of metallographic and crystal structures

The combination of three key components enables high-contrast reflected light polarized observation with a sensitive tint: the rotating stage GX-SRG for GX, the polarized slider GX-POTP with wavelength plate, and an analyzer slider, GX-AN360 or GX-AN. In addition, use of the binocular tube U-BI90CT (with GX51 only) makes it possible to observe an anisotropy on the specimen surface caused by reflection (also known as conoscopic image observation). The rotating stage GX-SRG also provides an unrestricted choice of framing angles when taking in photomicrography.



* GX-SRG rotatable stage is not used for motorized revolving nosepiece configuration due to a possibility of confliction. 50x or higher objective lenses may restrict the use of GX microscope with GX-SRG.

Digital micro imaging solutions for obtaining high quality microscopic images

Digital imaging ? No, it is digital micro imaging

High resolution objective lenses, high transmittance optical system and uniform brightness illumination system extract maximum performance from the digital camera. Our microscope digital cameras offer high contrast images with color reproduction faithful to the sample. The DP20 microscope digital camera, which can also be used alone, and the DP72 microscope digital camera, which is completely controlled via PC for all observation methods from brightfield to fluorescence, are available. Choose the camera matched to your purpose and budget. Olympus offers digital micro imaging solutions for microscopes based on many years of optoelectronics technologies.

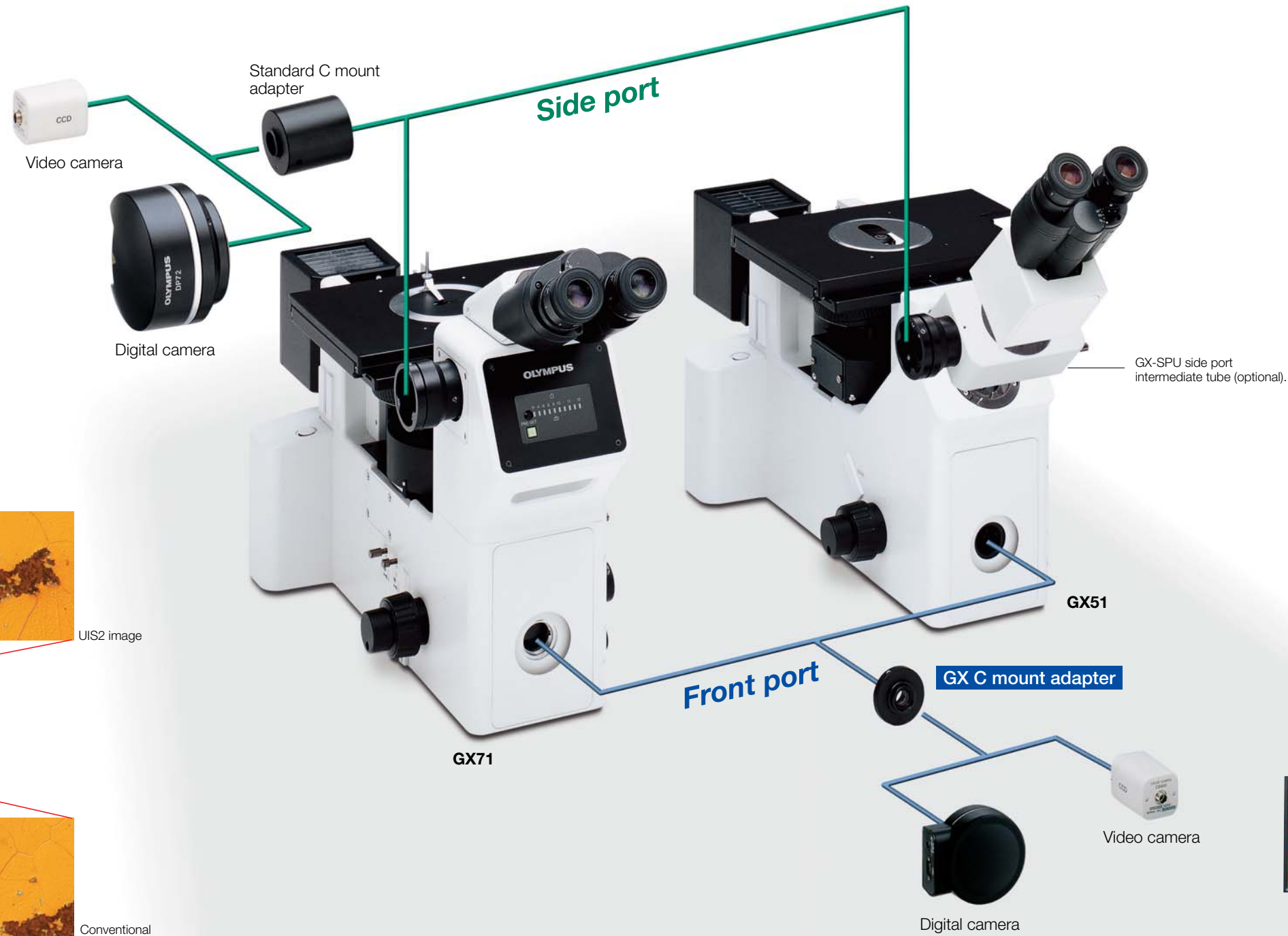
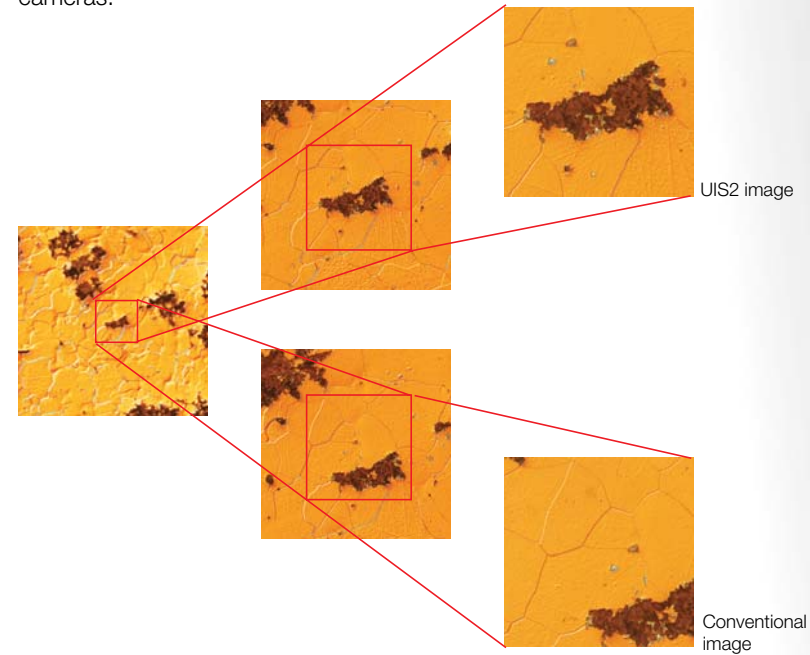
Simultaneous attachment of digital camera and video camera

One of the various digital cameras and a video camera can be attached to a side port* and front port of the GX. The BX2M Series video system can be used with a trinocular observation tube combination. The GX71 can accommodate 3 image digital or photographic cameras.

*The GX51 required an optional side port intermediate tube (GX-SPU).

UIS2 objective lenses with excellent image parcentricity

High power Semi-apochromatic UIS2 objective lenses make the centration tolerance between objective lenses on the microscope nosepiece keep the image within the center of the field of view even with digital cameras.



Microscope digital camera DP21

Smooth live image display. High-speed image capturing which allows sequential shooting.

Live images at 15 frames/second are displayed in high definition television class resolution so that focusing on the monitor is performed easily without any breaks in traveling the stage during observation and faithful color is obtained at a high resolving power. Also, the DP21 can be connected to a PC through an IEEE1394a interface and image recording and measurement and analysis can be performed using our image analysis software.

*DP21 enables image recording and simple measurements without a PC.



Microscope digital camera DP72

Captures high-resolution, high-sensitivity digital images fast — equivalent to 12.8 million pixels in approximately 2.5 seconds

The digital camera DP72, thanks to its high speed hardware, enables to capture high-resolution still images equivalent to 12.8 million pixels in as little as (approx.) 2.5 seconds. The DP72's multiple functions make every phase of the operation simple, from image acquisition through to data filing. Observation images are captured in microscopic detail, with unparalleled clarity and resolution accuracy.



Making the best use of microscope digital imaging, the more freedom, the more comfort

Seamless operation for image acquisition, measurement, advanced documentation and analytical solutions

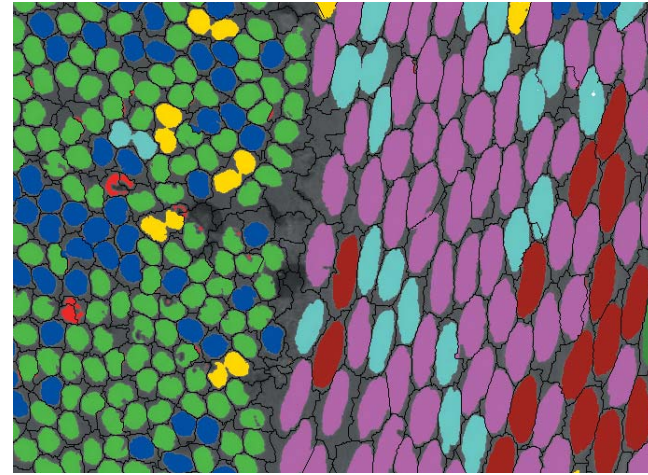
Olympus *analySIS* software has made possible seamless operation from image processing, measurement, and analysis to database and report generation. The *analySIS* software family has several packages for industrial solutions from the top-end to the entry model. The "auto" type has major functions including particle analysis, etc. Customizing to more pleasant software is possible by freely adding the desired functions.

*Add-in software (cast iron analysis, film thickness measurement) for performing special analysis is also available.



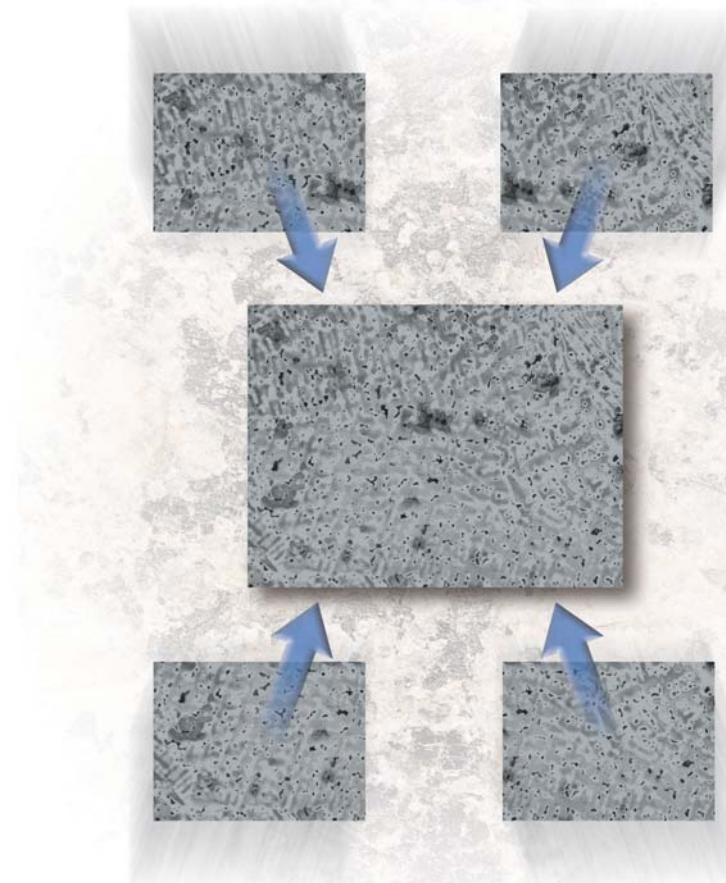
Particle Analysis

Automatic separation of particles within a given image is possible using the integrated separator function. Users can set a specific "detection area" or ROI (region of interest). Many other parameters can be used to measure all particles automatically, or carry out statistical data processing.



Stitching Images

Multiple adjacent images can be stitched together into one, in a natural way that doesn't show abrupt joints. This function is especially useful for observing large areas which cannot be captured in a single image.



analySIS packages example

The software package varies by area.

imager

- Camera and Microscope Control
- Measurement
- Database
- Report

docu

- Camera and Microscope Control
- Measurement
- Stitching Images
- Extended Focal image
- 3D Image
- Database
- Report

auto

- Camera and Microscope Control
- Measurement
- Stitching Images
- Extended Focal image
- 3D Image
- Particle Analysis
- Database
- Report

Camera and Microscope Control

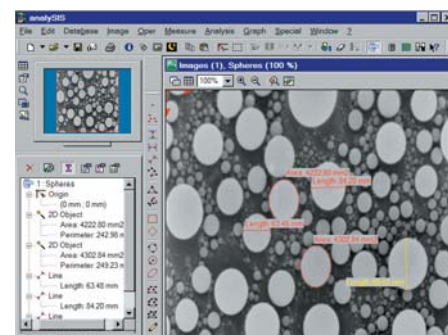
This allows digital camera and microscope* operations to be controlled from the software. A complete series of processes, from initial observation to final report creation, can be completed on your PC.

*Controllable cameras are limited to models introduced in this catalog and microscopes are limited to our microscopes. Controllable functions vary according to the models.



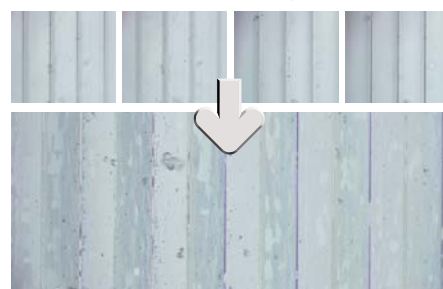
Measurement

Counting particles...measuring dimensions...calculating the distance between two lines...*analySIS* software handles tasks like these with ease. Results can also be saved/output together with the images.



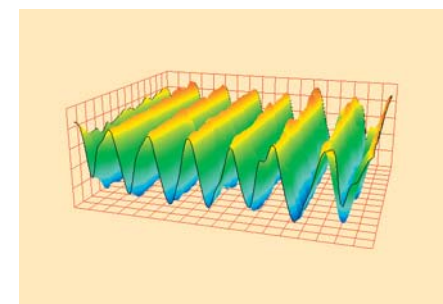
Extended Focal image

Multiple images of the same area, each focused at a different position, can be combined to produce a single, wholly-focused image. This function allows clear imaging of samples with different height levels on the surface, which cannot be observed all together at the same time conventionally.



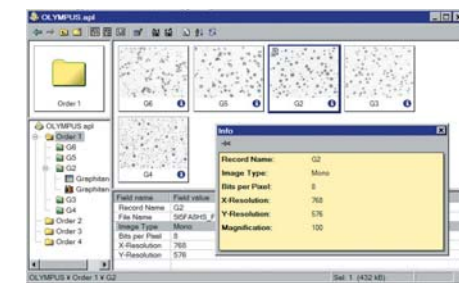
3D Image

By adding height/texture information to multi-focused images obtained with the "Extended Focal Image" (see above), you can create realistic 3D views.



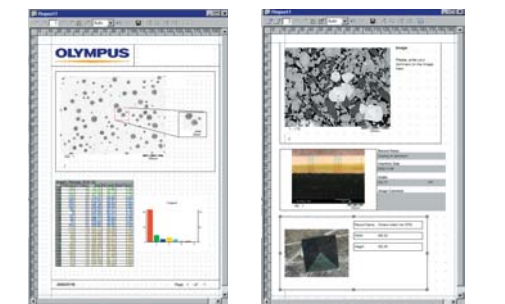
Database

The software systematically stores all your images, analysis results, datasheets, graphs, and other acquired data. This makes it easy to grasp the complete picture, and to search for whatever data you need.



Report

Images can be freely laid out and edited. Some example documentation templates are provided, or you can create original formats, producing professionally-finished reports and documents in whatever styles you choose.

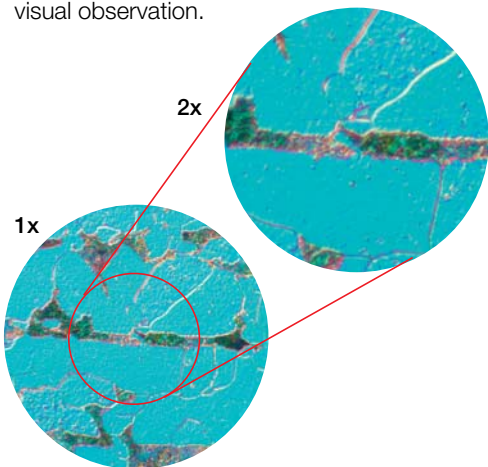


Top-notch performance for today's leading-edge research



Zoom function for easy framing

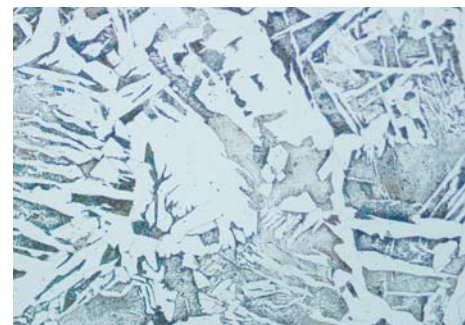
The 1x-2x zoom facility acts on all ports, shows critical specimen detail more clearly and makes accurate framing especially easy as well as allowing image capture at the same magnification as the visual observation.



Truthful reproduction of specimen in image forming and acquisition

Viewing images are not reversal, the exact reproduction of specimen in vertical/horizontal directions. The true reproduction makes it easier to compare the images with digital photos.

*Images are reversed if seen via a video/digital camera attached to the side/front port.



Ideal for every observation method from brightfield to fluorescence

Simply by changing the position of the GX71's mirror unit turret, it is quick and easy to alternate between brightfield, darkfield, Nomarski DIC, simple polarized light and fluorescence observation. The Olympus universal objective lenses accommodate all observation methods. There is no need to change the objective lens type each time the observation method is changed. The GX71 also employs super widefield eyepieces (F.N.26.5), for an efficient orientation and observation process.



Superb performance and reliability for all kinds of routine observation and documentation



Single lever switchover for brightfield/darkfield observation

The versatile GX51 performs brightfield, darkfield, Nomarski DIC and simple polarized light observations. Switching between brightfield and darkfield observation is done with a single lever, located close to the operator's hand. Changing to Nomarski DIC observation is a simple matter of inserting the DIC-slider.



Expandable functionality

A wide variety of optional units can be easily attached to the GX51, allowing such system upgrades as linking to a digital or video camera via an intermediate tube (GX-SPU).



Designed for ease to use and efficiency

Good working efficiency is the top design priority of the GX51, which was specially developed for handling routine inspection tasks. Its most frequently used operating features are located at the front, while incorporation of the tilting tube U-TBI90 (elevation angle 35-85 degree) allows the operator to work in an easy, natural posture and conduct observations comfortably in a standing position.



GX71/GX51 ACCESSORIES

Compatible with transmitted light polarized observation

Transmitted light polarized observation combination

Transmitted light polarized observation, which is ideal for transparent specimens or fine powders, can be performed by combining illumination pillar IX2-ILL100.



GX71 observation tubes
The super widefield binocular observation tube (U-SWBI30) and super widefield trinocular observation tube (U-SWTR-3) are provided for the GX71.



GX51 observation tube
Besides trinocular tube U-TR30H-2, the lineup includes binocular tube U-BI90, for use in combination with an eyepoint adjuster, and tilting tube U-TBI90, which allows observations to be made in whatever posture suits the individual user.



Intermediate tubes
Other high-performance accessories are available to meet a variety of applications. Included are an intermediate tube (IX-ATU), which allows attachment of a trinocular observation tube, a side port intermediate tube (GX-SPU) and an eyepoint adjuster (U-EPA2).



Scales
In addition to the calibration scales for each objective lens, grain size reticules and square scales can also be recorded. Up to 3 scales can be freely combined in a single slider.

Compatible with macro observation and photographing

Drawing attachment / U-DA

As well as its conventional use as drawing attachment, this accessory also provides a macro observation function. When combined with a trinocular observation tube, the macro images are stored as photomicrographs or retained in the digital camera.

*Use in combination with 10x lens for drawing attachment U-DAL10x.



Lamp housing
A variety of light sources to accomplish bright and even illumination are provided, according to your purpose.



Revolving nosepieces
Sextuple revolving nosepieces and quintuple revolving nosepieces with DIC slider compatibility are also provided.



Filters
The GX series comes with a select range of filters, including neutral density, color temperature conversion and green filters. Two slider slots are provided, each allowing introduction of up to three filters.

SYSTEM DIAGRAM

