

UHL Video Measuring Microscopes



MS2
MS3
MS4



Techn. Mikroskopie
Feinmechanik



MS

Diversified Applications



From hard concrete to shearing blades

Almost all types of material e.g. metal, plastics, ceramics and etc., allows verification through our measuring microscopes. Consequently, the measurements are always achieved force-free and are suitable also for soft materials like e.g. rubber or very filigree assembly parts. The measurable objects are just as different as the definite applications of our customers: from inspection laboratories of cement factories examining suitable DIN air void specifications of hard concrete up to manufacturers of safety razors handling fully automatic measurements of shearing blades in production lines.

Since 1943 microscopes and precision mechanical assembly elements are produced in Asslar. In order to cope with customers' increased demands on costs, delivery times, quality and flexibility, the production philosophy has since then undergone radical changes: Away from standard microscope in fixed configuration to a modular building system using standard assembly parts, from which a customer-specified unit can be completed in shortest time. This modular concept runs through the complete product range of the company UHL.

Positioning units, optical assembly elements and measuring microscopes up to software are constantly enlarged by add-on components. This flexibility of building-up the standard units presented herein enables us to solve unusual measuring problems.

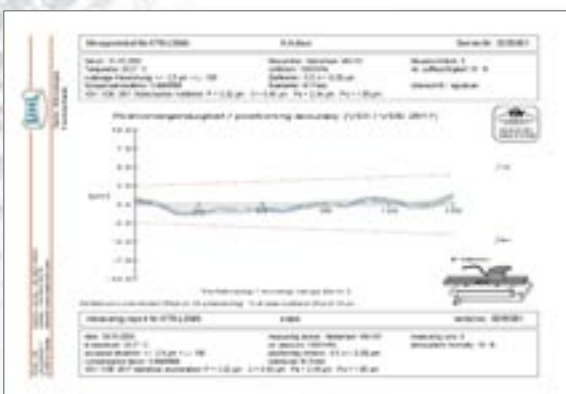
The UHL measuring microscopes of the MS-assembly range justify the highest demands on accuracy, flexibility and longevity. Excellent optic, stable base stands and highly exact measuring stages ensure the achievement of a long life-time of accurate measuring results.

Modular Assembly

In order to secure maximum rigidity and high immunity against thermal and mechanical influences, the base stands are made of grey cast iron or granite.

The precision measuring stages are play-free equipped with optical linear scales as well as backlash-free ball screws and crossed roller guides. Due to the excellent exact translation of the stages, it is simply sufficient for a linear compensation of the individual axis to reach the indicated system accuracy. A segmented linear error compensation can additionally be carried out. These compensations can, when desired, naturally be checked and renewed.

As an ISO 9001 certified company, we supply of course each unit with a test certificate in accordance to VDI/VDE 2617.





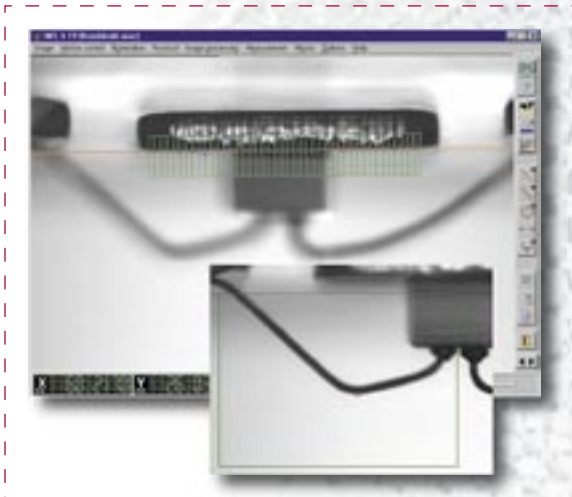
MS

Measuring of Microscopic Structures

MS2 – Probably the world’s smallest optical measuring machine



Optical measuring units are preferably applied in cases of relatively small and filigree assembly parts where mechanical measurements with high accuracy are hardly possible. The MS2 is specifically created for this requirement in the industrial areas of fine finishing techniques, watches and clock fabricators and medical techniques. Despite its minimal size, the MS2 offers a full performance capability comparable to other larger and more expensive measuring machines. Depending on the software arrangement, the MS2 is suitable for either inspection of primary samples and single parts control or for fully automatic measurements of series-produced parts. Due to its extensive scope of accessories, the MS2 can be fitted exactly to desired usage. Bayonet system or lens turret are available for quick changes of the objectives. Different lighting arrangement e.g. coaxial incident light, transmitted light, oblique incident light or ring light, allows anytime an optimum illumination.



Measuring of contacting points on semi-conductors.

The microscopes of the MS2 assembly range can be equipped with the following components:

Base stand:

MS2-105	Base stand of granite with column for receiving Z-axis
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Z-axis:

LT5-NSOC	50 mm movement range, without measuring system, 5 μ m straightness / flatness
LT5-NSMA	50 mm movement range, with measuring system, 1 μ m straightness / flatness

Precise Positioning and High Resolution

XY-Measuring stages:

KT5-NSOC	50 x 50 mm movement range, without measuring system, 5 μ m straightness / flatness
KT5-NSMA	50 x 50 mm movement range, with measuring system, 1 μ m straightness / flatness
KT5-LSOC	100 x 50 mm movement range, without measuring system, 5 μ m straightness / flatness
KT5-LSMA	100 x 50 mm movement range, with measuring system, 1 μ m straightness / flatness



Tube systems:

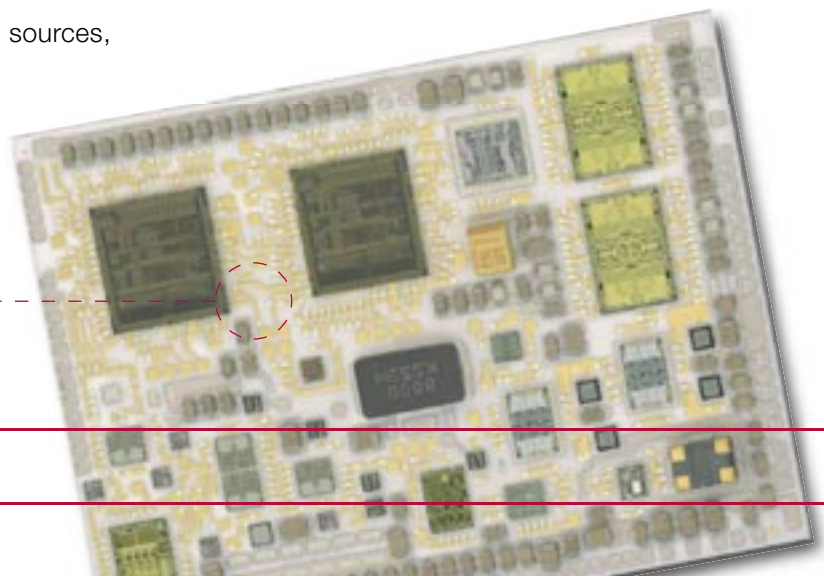
MS2-303	Incident light tube with halogen lighting 6V 10W, RMS thread
MS2-304	Incident light tube with halogen lighting 6V 10W, bayonet change
MS2-305	Incident light tube for fibre optic light source (incl. fibre glass), RMS thread
MS2-306	Incident light tube for fibre optic light source (incl. fibre glass), bayonet change



Lighting:

MS2-502	Transmitted illumination 6V 10W
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See Accessories for objectives, turrets, light sources, extra lighting and software.





MS

Universal Applications

MS3

The measuring microscope MS3 is an universal applicable unit with a medium size measuring range of 100 x 100 mm to 150 x 100 mm and additionally with an adjustable height Z-drive at the stand column. The motorized Z-axis with a movement range of 50 or 100 mm can be equipped with tubes for VX-objectives (longer working distance) or M-objectives (Teleplan). Despite its stable stand of grey iron casting, the nicely-formed unit is still placeable on a normal working table. High flexible application is guaranteed by an extensive variety of fittings and accessories. The robust, mechanical version ensures a long life-time of high measuring accuracy.

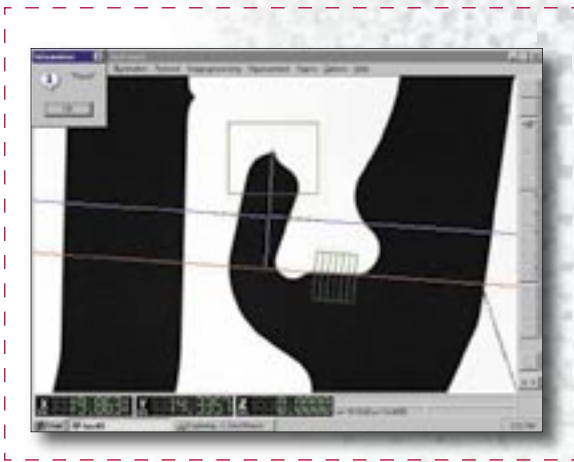


Base stand:

MS3-104	Base stand of grey iron casting with additionally adjustable height (200 mm) for receiving Z-axis
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Z-axis:

LT5-NSOC	50 mm movement range, without measuring system, 5 µm straightness / flatness
LT5-NSMA	50 mm movement range, with measuring system, 1 µm straightness / flatness
LT5-LSOC	100 mm movement range, without measuring system, 5 µm straightness / flatness
LT5-LSMA	100 mm movement range, with measuring system, 1 µm straightness / flatness

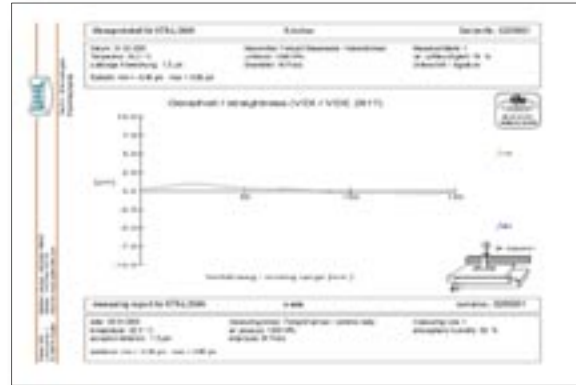


Measuring of sheet stamping parts in series production.

Accuracy right from the start

XY-measuring stages:

KT6-NSOC	100 x 100 mm movement range, without measuring system, 5 µm straightness / flatness
KT6-NSMA	100 x 100 mm movement range, with measuring system, 1 µm straightness / flatness
KT6-LSOC	150 x 100 mm movement range, without measuring system, 5 µm straightness / flatness
KT6-LSMA	150 x 100 mm movement range, with measuring system, 1 µm straightness / flatness



Tube systems:

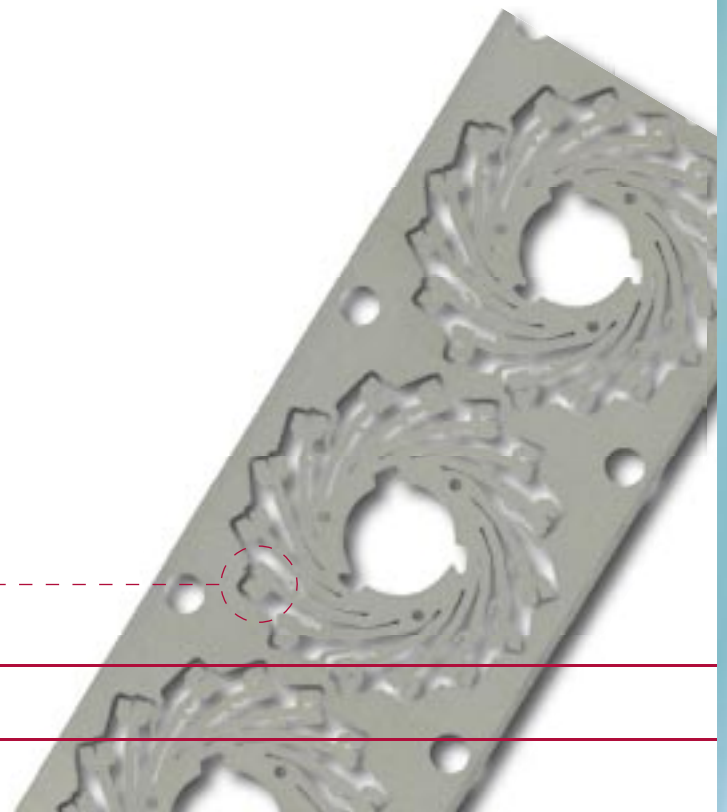
MS3-313	Incident light tube for fibre optic light source (incl. fibre glass), suitable for objective OP1-VX, RMS thread
MS3-315	Incident light tube for fibre optic light source (incl. fibre glass), suitable for objective OP1-VX, bayonet change
MS3-304	Incident light tube for fibre optic light source (incl. fibre glass), suitable for objective OP1-M, bayonet change



Lighting:

MS3-512	Telecentric transmitted illumination for fibre optic light source
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See Accessories for objectives, turrets, light sources, extra lighting and software.





MS

Robust and Reliable

MS4

Due to the movement range of 150 x 150 mm to 250 x 200 mm, this large measuring microscope with grey iron casting stand is just as suitable for large surface objects or multiple usage as also for heavy work pieces with a maximum height of up to 275 mm.

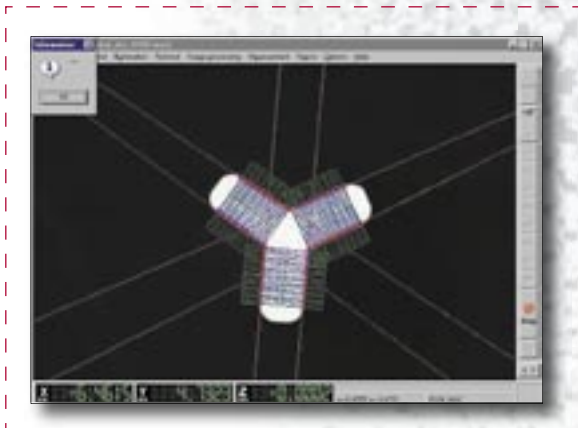
The telecentric transmitted illumination with iris diaphragm and the standard coaxial incident light illumination on fibre glass provide, together with the telecentric measuring objectives or the apochromatic micro objectives with extra long working distance, for brilliant images and sharp edges to secure proper measurements via image processing.

Base stand:

MS4-100	Base stand of grey iron casting with additionally adjustable height (225 mm) for receiving motorized Z-axis
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Z-axis:

LT5-NSOC	50 mm movement range, without measuring system, 5 µm straightness / flatness
LT5-NSMA	50 mm movement range, with measuring system, 1 µm straightness / flatness
LT5-LSOC	100 mm movement range, without measuring system, 5 µm straightness / flatness
LT5-LSMA	100 mm movement range, with measuring system, 1 µm straightness / flatness

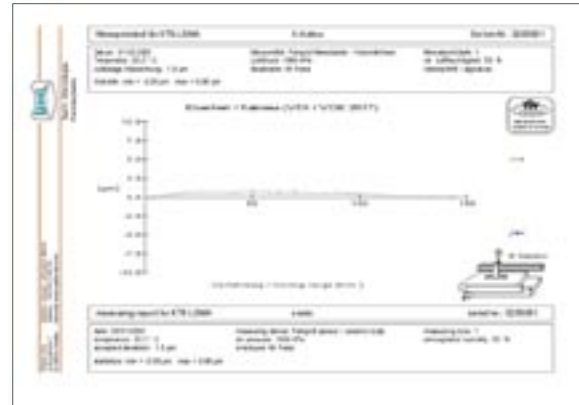


Measuring of spinning jet capillary for the artificial fibre industry.

Uncompromising Precision

XY-measuring stages:

KT7-NSOC	150 x 150 mm movement range, without measuring system, 6 µm straightness / flatness
KT7-NSMA	150 x 150 mm movement range, with measuring system, 2 µm straightness / flatness
KT7-LSOC	250 x 150 mm movement range, without measuring system, 6 µm straightness / flatness
KT7-LSMA	250 x 150 mm movement range, with measuring system, 2 µm straightness / flatness
KT8-NSOC	250 x 200 mm movement range, without measuring system, 6 µm straightness / flatness (only applicable without measuring system)



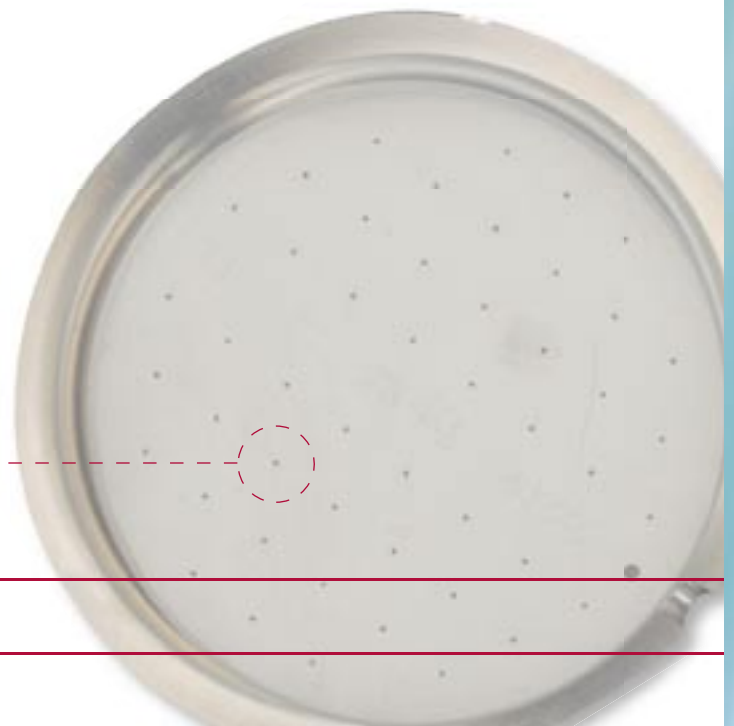
Tube systems:

MS4-310	Incident light tube for fibre optic light source (incl. fibre glass), suitable for objective OP1-VX, bayonet change
MS4-312	Incident light tube for fibre optic light source (incl. fibre glass), suitable for objective OP1-VX, lens turret for 4 lenses
MS4-311	Incident light tube for fibre optic light source (incl. fibre glass), suitable for objective OP1-M, bayonet change

Lighting:

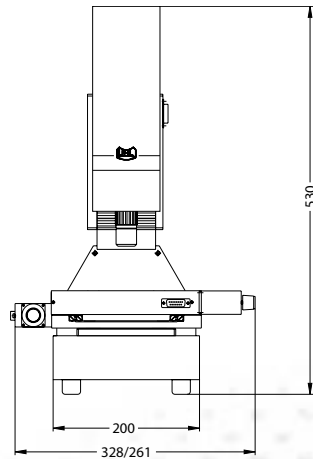
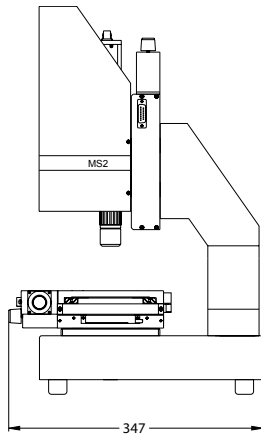
MS4-510	Telecentric transmitted illumination for fibre optic light source, adjustable iris diaphragm
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See Accessories for objectives, turrets, light sources, extra lighting and software.



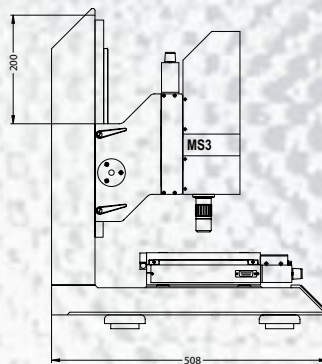
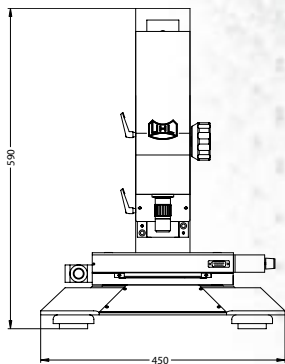
Technical Data

MS



Technical Data MS2:

Measuring range [mm]:	100/50 x 50 x 50
Drive:	Stepping motor with anti-backlash recirculating ball screw
Guiding:	crossed roller bearings
Measuring system:	enclosed photoelectric measuring system with glass scale
Resolution:	0,0001 mm
Accuracy (highest accuracy classification):	1,5 μm + 0,005 x L μm (measuring length L in mm)
Max. permissible load:	8 kg
Operating temperature range:	10°C - 40°C
Working temperature range:	20 +/- 0,5°C
Power supply:	120/230 Vac, 50/60 Hz
Weight base unit:	25 kg



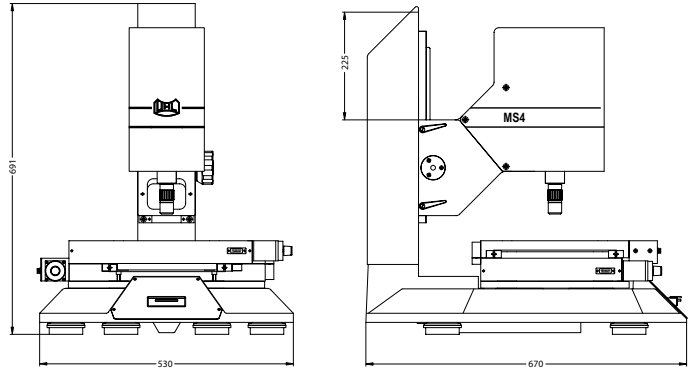
Technical Data MS3:

Measuring range [mm]:	150/100 x 100 x 50
Drive:	Stepping motor with anti-backlash recirculating ball screw
Guiding:	crossed roller bearings
Measuring system:	enclosed photoelectric measuring system with glass scale
Resolution:	0,0001 mm
Accuracy (highest accuracy classification):	1,5 μm + 0,005 x L μm (measuring length L in mm)
Max. permissible load:	8 kg
Operating temperature range:	10°C - 40°C
Working temperature range:	20 +/- 0,5°C
Power supply:	120/230 Vac, 50/60 Hz
Weight base unit:	75 kg

Technical Data

Technical Data MS4:

Measuring range [mm]:	250/150 x 150 x 50
Drive:	Stepping motor with anti-backlash recirculating ball screw
Guiding:	crossed roller bearings
Measuring system:	enclosed photoelectric measuring system with glass scale
Resolution:	0,0001 mm
Accuracy (highest accuracy classification):	1,5 μm + 0,005 x L μm (measuring length L in mm)
Maximum permissible load:	15 kg
Operating temperature range:	10°C - 40°C
Working temperature range:	20 +/- 0,5°C
Power supply:	120/230 Vac, 50/60 Hz
Weight base unit:	125 kg



Customer-specified special unit on the basis of MS2



MS

Brilliant – High-resolution – High-contrast

Accessories

Objectives:

Achromatic incident light objectives, RMS thread, parfocalizing length 45 mm



Objectives	Magnification	Numerical aperture	Working-distance [mm]	Object field with 1/2" CCD [mm]
OP1-V2*	2:1	0,08	45,0	2,5 x 1,6
OP1-V5	5:1	0,18	14,5	1,4 x 0,9
OP1-V10	10:1	0,25	11,0	0,7 x 0,4
OP1-V20	20:1	0,40	1,0	0,3 x 0,2
OP1-V50	50:1	0,65	0,4	0,15 x 0,1

* Parfocalizing length 80 mm

suitable for use with:

B031 lens turret, 3-fold for objective OP1-V

Apochromatic incident light objectives with extra long working distances, parfocalizing length 95 mm, RMS thread



Objectives	Magnification	Numerical aperture	Working-distance [mm]	Object field with 1/2" CCD [mm]
OP1-VX02	2,5:1	0,06	32,5	2,8 x 1,8
OP1-VX05	5:1	0,16	36,1	1,4 x 0,9
OP1-VX10	10:1	0,23	38,9	0,7 x 0,4
OP1-VX20	20:1	0,35	22,5	0,3 x 0,2
OP1-VX50	50:1	0,40	18,3	0,15 x 0,1

suitable for use with:

RV4 lens turret, 4-fold for objective OP1-VX

Always in the right light

Telecentric measuring objectives with long working distances, parfocalizing length 122.5 mm, bayonet connection

Objectives	Magnification	Numerical aperture	Working-distance [mm]	Object field with 1/2" CCD [mm]
OP1-M01	1:1	0,03	88	6,3 x 4,7
OP1-M02	2:1	0,06	85	4,1 x 2,3
OP1-M05	5:1	0,13	62	1,2 x 0,9
OP1-M10	10:1	0,20	52	0,6 x 0,45
OP1-M20	20:1	0,35	30	0,3 x 0,2



Light sources:

TR7	Transformer for 6V halogen illumination, hand-adjustable
TR7-3-S	Transformer for 6V halogen illumination, 3 outlets, control via hand or software
VMP-GL	Fibre optic light source with 30 W halogen reflector lamp, hand-adjustable stepless brightness control
VMP-GLS	Fibre optic light source with 250 W halogen reflector lamp, stepless brightness control via software



Lighting:

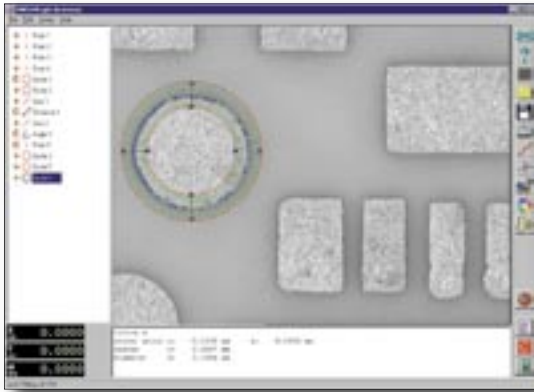
RL.01	Fibre optic ring light for objective OP1-VX
RL.02	Fibre optic ring light for objective OP1-M
MS2-501	Oblique incident light illumination, 2 lamps on jointed arms, 2x 6V 5 W
MS2-506	Oblique incident light illumination, dual armed fibre optic light guide





MS

Quick Results



Clear arrangement of the user interface.



Freely formatted and coloured result protocol.



Supports up to 4 cameras.

OMS

The flexible, easy-to-learn measuring software for dual dimensional measurements of primary samples and small batches through either hand-operated or motor-operated measuring microscopes, for use in laboratories or production areas.

- Element-related combination of geometrical forms in a tree structure.
- Simple manual placement of the measuring points in the video image via the mouse.
- Immediate result display in a text protocol.
- Easily programmable measuring sequences via teach-in with possibility of automated edge findings.
- Rectangular, circular, lattice and interactive image screen masks can be created as measuring frames for quick, visual control.

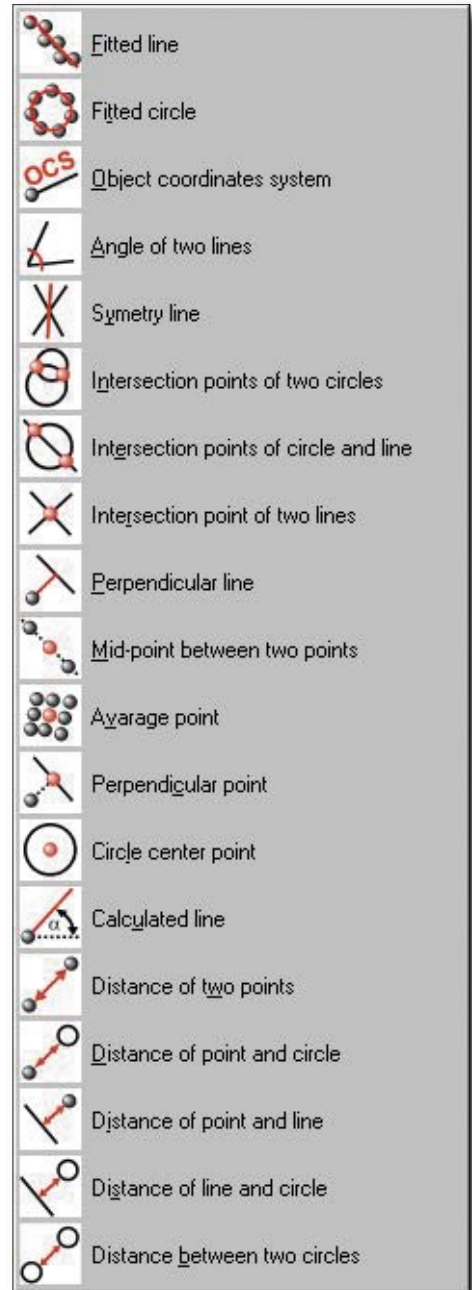
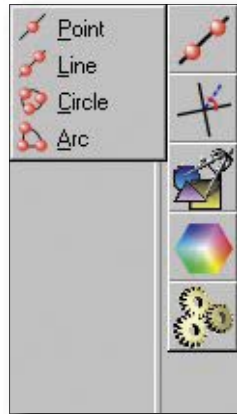
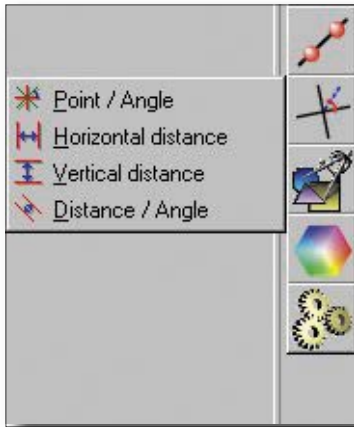
Measuring software system UHL OMS:

VM4-OMS Complete system for three axis

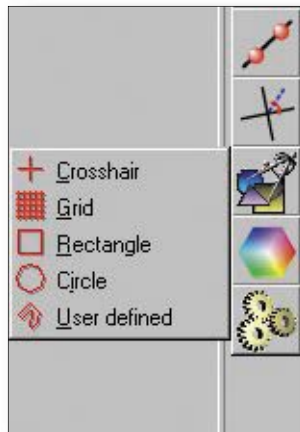
Consisting of following components:

	Desktop-PC with a 15" TFT-Monitor
	Software Package OMS
	3-axis stepping motor control system with Joystick
	2 cold light sources 30W
	B/W Camera

Everything in one view



Meaningful symbols simplify learning of the functions

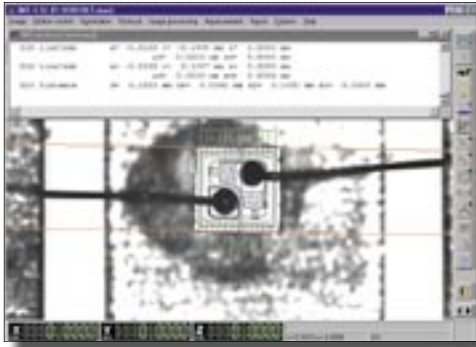


Multiple functions for computing and combining of geometrical elements are readily available.

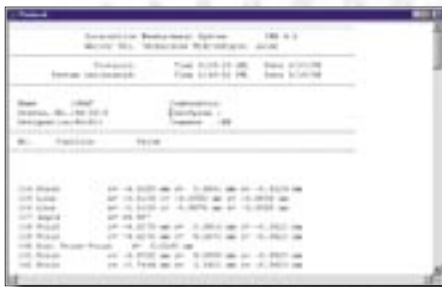


MS

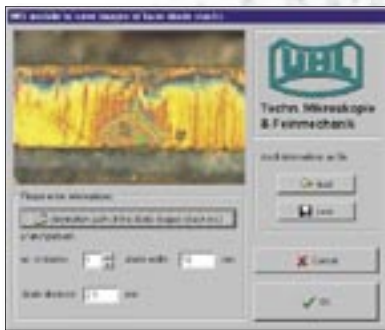
Fully Developed Software



Measuring of Bondpads.



Freely-editable text protocol.



Customer-specified added module for input of product information.

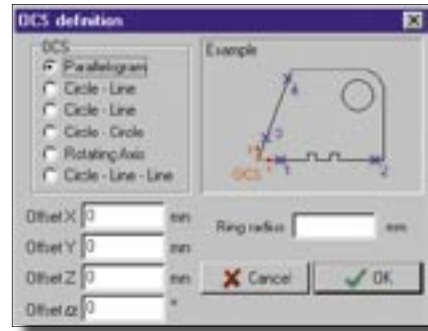
IMS

The efficient fully-automated and highly integrated measuring software for the measuring of series parts. Usable for recurring measuring tasks up to integration in CIM production plants.

- Space-saving, one-screen solution with integrated video image.
- Simple creation of measuring programmes per Teach-In.
- Direct recording of measuring results in an adaptable text protocol.
- Fast auto-focusing routine per image processing for depth measurements.
- Flexible and efficient Macro-speech for complete control of measuring sequence with variables, subroutines, database connection and text print-out in a comfortable Macro editor.
- User-guided measuring sequence through display and input windows, Yes/No answering and programming interface for any desirable display window.
- Modular concept with programming interface for extending units e.g. measuring probes, laser sensors, label printer, bar code readers.
- 6 prefabricated types of object coordinating systems, easily selectable via diagrams.
- Predefined measuring functions for fast and simple combination of geometrical elements.
- Analog control of lamps for up to 4 VMP-GLS fibre optic light sources to obtain high reproduction of measuring results.
- Multiple image processing functions and filters e.g. grey scale recording, LaPlace filter, Sobel filter, Focusing filter, Low-pass filter and Median-filter.
- Objective administration for several objectives.

Highly precise control techniques

- 3 password protected user levels for safe-guarding of system settings and calibrating data.
- Simple to operate due 8 free definable quick start buttons for calling up automated measuring sequences (macros).
- Connection possibilities for maximum 3 CCD cameras.
- Possible usage of colour camera.
- CNC motor control for up to 12 axis.
- 8 optical isolated inputs, 16 switched relay exits for pneumatical clamping fixtures, loading and unloading of parts, and communication with SPS-controls.



Dialogue for the definition of object coordinating systems.



Efficient editor for macro language.

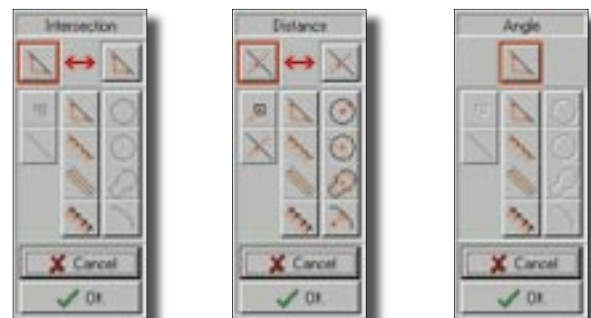
Measuring Software UHL IMS

VM4-IMS Measuring software system UHL IMS, complete system for three axis

Consisting of following components:

	Desktop-PC with a 15" TFT Monitor
	Software Package IMS
	3-axis stepping motor control system with Joystick
	Cold light sources 250W
	B/W Camera

With a resolution of 50,000 micro steps per rotation, the stepping motor control system F9S-3-M allows a high exact positioning. In connection with a linear measuring system, a closed loop can be realized.



Selectable dialogue for geometrical elements.





MS

Combined Variants

Accuracy requirements	Measuring range [mm]			OMS	IMS	Order Nos.
	x	y	z			
high	100	50	50		●	MS2-MI01
high	100	50	50	●		MS2-MO01
low	50	50	50	●		MS2-MO02
high	150	100	50	●		MS3-MO01
high	150	100	50		●	MS3-MI01
low	150	100	50	●		MS3-MO02
high	250	150	50	●		MS4-MO01
high	250	150	100		●	MS4-MI02
low	250	200	50		●	MS4-MI03

Other equipment variants upon request.



A complete MS-video measuring system consisting of a measuring microscope with an objective, light sources, motor control and measuring computer.

The complete solution



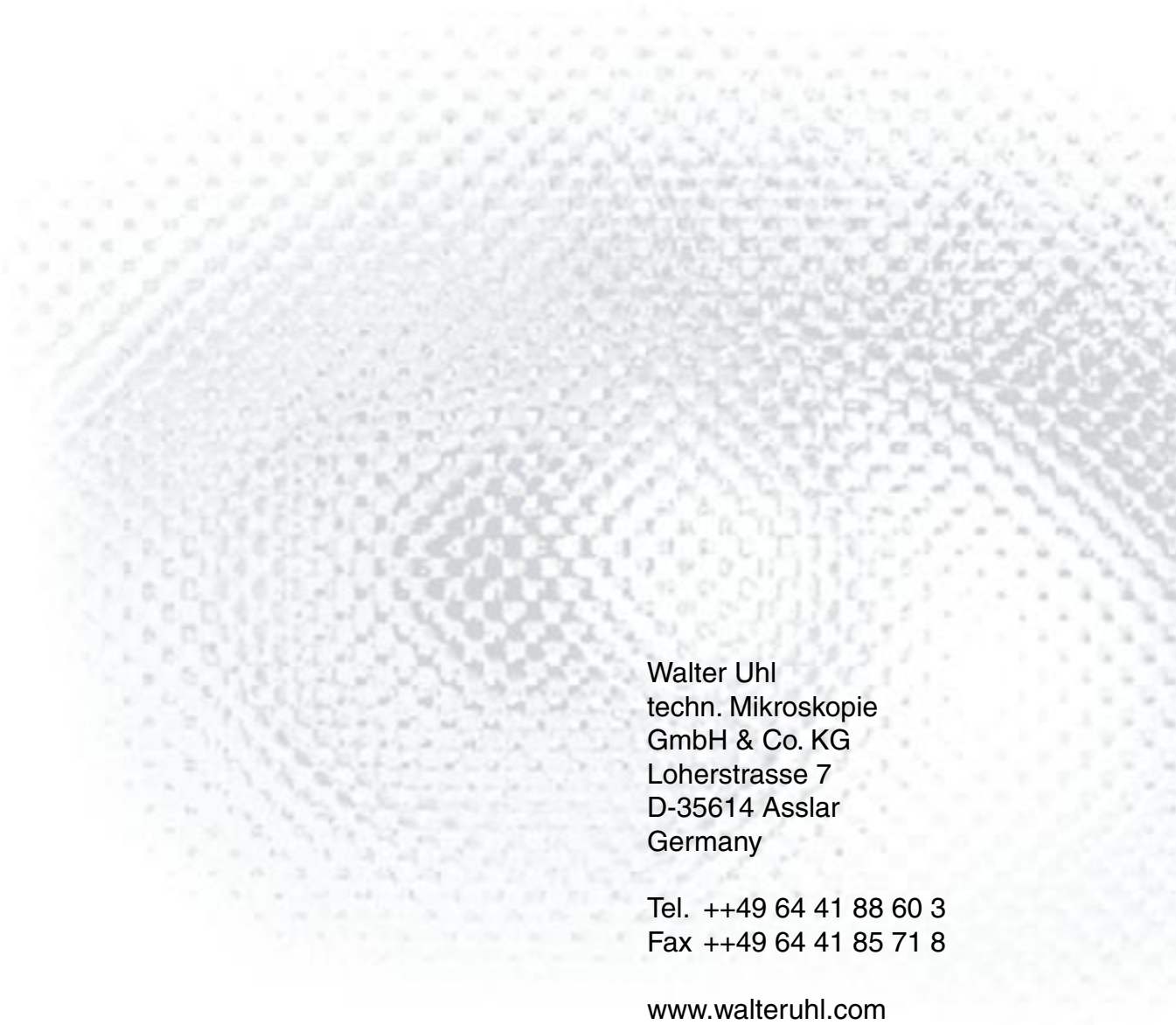
We supply as well complete microscope work stations with steel frames (stable welded construction), integrated Industrial-PC as measuring computer, integrated stepping motor control and cantilever for the monitor and keyboard.

Ordering examples for complete work stations with MS4 and built-in Industrial-PC:

Measuring range [mm]			OMS	IMS	Order Nos.
x	y	z			
250	150	50		●	MS4-AI01
250	150	50	●		MS4-AO01



MS



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