

Motic®

INDUSTRIAL CATALOGUE





Table Of Contents	1
Zoom Video System	
Z14	2
Stereomicroscopes :	
SMZ-168	3
SMZ-140 / 143	4
K-Series	5
SFC-11/12	6
Stereomicroscope Stands	7
Stereomicroscope Accessories	8
Semiconductor :	
PSM-1000	9
Plan Apochromatic Objectives	10
Illumination :	
K2401 & MLC150	11
Digital Microscopy Cameras :	
Moticam 480	12
Moticam 2000	13
Moticam 3000 / Moticam 3000C	14
Moticam 5000 / Moticam 5000C	
Software :	
Motic Images Advanced 3.2	15
Motic Quality (Standard)	16
Glossary	17
<ul style="list-style-type: none">• Numerical Aperture• Resolving Power• Working Distance• Parfocal Length• Infinity correction system• Greenough system• Common Main Objective [CMO]• Focal Length• Object field• Depth of focus• Bright field illumination and dark field illumination• Apochromatic objective	

Digital zoom system for authentication, assembly inspection, and quality assurance.



● Z14

Z14		
Zoom Body	Image	Bright field erect
	Zoom Type	Manual/Automatic
	Magnification	1x - 14x
	Zoom ratio	1 : 14
	Maximum Magnification	144.0x [using 1.5x aux objective and 19" monitor]
	Working Distance	172mm [Standard 0.5x objective]
	Zoom Adjustment	By hand remote, foot pedal, and software
Auxiliary Objectives		1.0x and 1.5x
Camera	Sensor	1/4" CCD [Sony]
	Maximum Pixels	795 x 596 [470K]
	Effective Pixels	752 x 582 [440K]
	Recognition	>480 lines
	Output	USB, Composite, S-Video
	System	PAL
	Scanning Frequency	15.625 KHz [horizontal], 50Hz [vertical]
	White Balance	Auto/Manual [1/50 - 1/10,000]
	Sensitivity	1 Lux
Stand		Standard Plain Stage
	Frame Installation	Mounting diameter : Ø74mm
	Focusing Adjustment	48 mm
	Stage Plate	Black and white
	Light Source	Cold Light Illuminator [optional]
Power Consumption		4.2 W [maximum]

Zoom ratio of 6.7:1 and excellent optical performance combined with cost efficiency.

**Model Variations : SMZ-168 T with trinocular tube;
SMZ-168-60 with 60° observation tube.**



● SMZ-168-BL



● SMZ-168-60



● SMZ-168-TL

		SMZ-168	SMZ-168-60	SMZ-168 T
Microscope body	Optical System	Greenough		
	Magnification	0.75x - 5x	0.75x - 5x	0.75x - 5x
	Zoom ratio	6.7 : 1	6.7 : 1	6.7 : 1
	Working distance	113mm	113mm	113mm
	Tube inclination angle	35°	60°	35°
	Interpupillary distance adjustment	Diopter Adjustment both eyestubes: ±5 Interpupillary adjustment: 52mm to 79mm		
	Video camera adaptability	n/a	n/a	C-mount [CCD 0.3x / CCD 0.65X not included]
	Zoom adjustment knob	Left/right - single shaft horizontal knob Interpupillary distance high/low magnification stopper incorporated		
Auxiliary objectives	0.3x, 0.63x, 0.75x, 1.5x, 2x			
Eyepieces	High Eyepoint Widefield 10x, Field Number [F.N.] = 23mm			
Stand		168P		168L
		Basic incident illumination stand		Transmitted illumination stand
	Focusing Adjustment	50mm		50mm
	Stage plate	Black & white		Black & white, Frosted glass plate
	Light source	Cold light illumination [optional] Fluorescent ring illuminator attachable [optional]		Transmitted illumination : Halogen 12V/10W Reflected illumination : Halogen 12V/10W

Cost effective option to meet the various needs of the industry.

Model Variations: SMZ-140 (60) with 60° observation tube, SMZ-143 with trinocular tube, Digital DMW-143.



● SMZ-140



● SMZ-140 (60)



● SMZ-143

		SMZ-140	SMZ-143	SMZ-140 (60)
Microscope Body	Optical System	Greenough		
	Magnification	1x - 4x		
	Zoom ratio	4 : 1		
	Working distance	80mm		
	Tube inclination angle	45°		60°
	Interpupillary distance adjustment	Diopter Adjustment both eyetubes: ±5° Interpupillary adjustment range: 54mm - 76mm		
	Video camera adaptability	n/a	CCD adapter [0.4x included] 0.5x [optional]	n/a
	Zoom adjustment knob	Left/right single-shaft horizontal knob, high/low magnification stopper incorporated		
Auxiliary objectives		0.35x, 0.5x, 0.63x, 0.75x, 1.5x		
Eyepieces		Widefield 10x, Field Number [F.N.] = 20mm		
Stand		N2GG	FBGG	1104S
		Compact transmitted illumination stand	Transmitted illumination stand	Incident illumination stand
	Focusing Adjustment	48mm	50mm	48mm
	Stage plate	Black and white, Frosted glass plate		Black and white plate
Light source	Transmitted illumination: Halogen 12V/10W Reflected illumination: Halogen 12V/15W	Transmitted illumination: Halogen 12V/10W Reflected illumination: Halogen 12V/10W	Cold light illumination [optional] Fluorescent Ring Illuminator attachable [optional]	

**Infinity optics, versatile, common main objective [CMO],
ideal in all inspection applications.**

**Models : K400 with 4 magnification steps, K500 with 5
magnification steps, K700 with zoom ratio of 5.2 : 1.**



Models		K400	K500	K700
Microscope body	Optical System	Infinity, common main objective (CMO)		
	Convergent Angle	14°		
	Magnification	4 Step Changer [6, 12, 25, 50 ratio]	5 Step Changer [6.4, 10, 16, 25, 40 ratio]	6x - 31x Zoom range : 5.2 : 1
	Working Distance	89mm		
	Observation tube inclination	45°		
	Interpupillary distance adjustment	Adjustment range : 54mm to 76mm		
	Diopter adjustment	Diopter adjustment on both eyetubes. Adjustment range : ±5 diopter		
	Auxiliary objectives	0.3x, 0.5x, 0.625x, 1.5x, 2x		
	Eyepieces	Super Widefield 10x, Field Number [F.N.] = 23		
Stand		2112	2111	2111
		Large working area incident illumination stand	Transmitted illumination stand	Transmitted illumination stand
	Focusing adjustment	50mm		
	Stage plate	Black & White	Black & White, Frosted glass plate	
	Light source	Cold light illumination system [optional] Fluorescent ring illuminator attachable [optional]	Transmitted illumination : Halogen 12V/10W Reflected illumination : Halogen 12V/10W	

Simple, effective lightweight stereomicroscopes with high-quality optical performance.

Model Variation : SFC-12 Trinocular



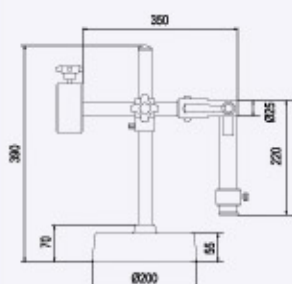
● SFC-11



● SFC-12

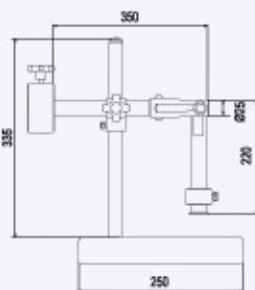
Models		SFC-11			SFC-12		
		A	B	C	A	B	C
Microscope Body	Optical System	Greenough					
	Convergent Angle	12°					
	Magnification	1x, 2x turret	1x, 3x turret	2x, 4x turret	1x, 2x turret	1x, 3x turret	2x, 4x turret
	Working Distance	95mm					
	Observation tube inclination	45°					
	Interpupillary distance adjustment	Adjustment range : 54 -76mm					
	Diopter adjustment	Provided on left tube only. Adjustment range : ±5 diopter					
	Video Camera Capability	n/a	n/a	n/a	CCD adapter mountable [0.4x included]		
	Eyepieces	Widefield 10x, Field Number [F.N.] = 20mm					

2105: UNIVERSAL STAND



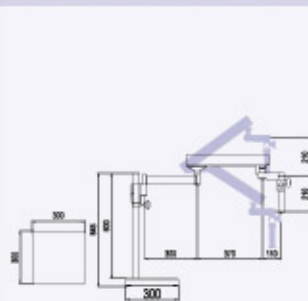
- 25mm - Vertical Pole Diameter
- 32mm - Focusing Pole Mount Diameter
- 200mm - Diameter of base
- 350mm - Height of pole
- 465mm - Max distance from pole to optical centre

2105S: SPECIAL UNIVERSAL STAND



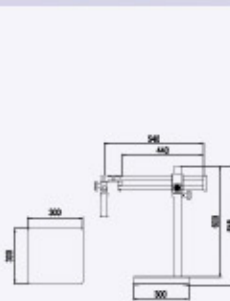
- 25mm - Vertical Pole Diameter
- 32mm - Focusing Pole Mount Diameter
- 250mm - Length of base
- 250mm - Width of base
- 350mm - Height of pole
- 465mm - Max distance from pole to optical centre

2107K: ARTICULATING ARM BOOM STAND



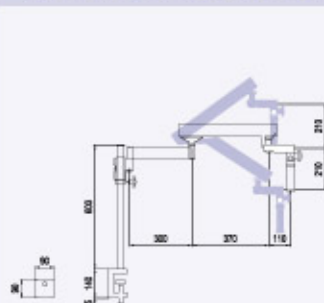
- 36mm - Vertical Pole Diameter
- 32mm - Focusing Pole Mount Diameter
- 300mm - Length of base
- 300mm - Width of base
- 780mm - Max distance from pole to optical centre

2108K: BALL BEARING BOOM STAND



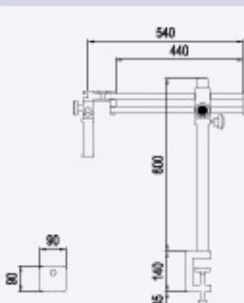
- 36mm - Vertical Pole Diameter
- 32mm - Focusing Pole Mount Diameter
- 300mm - Length of base
- 300mm - Width of base
- 638mm - Max distance from pole to optical centre
- Mild Steel

2109K: ARTICULATING ARM BOOM STAND



- 36mm - Vertical Pole Diameter
- 32mm - Focusing Pole Mount Diameter
- 780mm - Max distance from pole to optical centre
- Table Clamp Type

2110K: BALL BEARING BOOM STAND



- 36mm - Vertical Pole Diameter
- 32mm - Focusing Pole Mount Diameter
- 638mm - Max distance from pole to optical centre
- Table Clamp Type
- Mild Steel

Eyepieces-Stereomicroscopes



Eyepiece	SMZ-168	SMZ-140
WF5x / 22mm	n/a	Available
WF5x / 23mm	Available	n/a
WF6.25x / 23mm	Available	n/a
WF10x / 20mm	n/a	Available
WF10x / 23mm	Available	n/a
WF15x / 13mm	n/a	Available
WF15x / 17.6mm	Available	n/a
WF20x / 10mm	n/a	Available
WF20x / 13mm	Available	n/a
WF30x / 8mm	Available	Available
WF32x / 8mm	Available	n/a

Micrometer Eyepieces-Stereomicroscopes



WF10X 360° : 10°
 (For SMZ-168: SG02T0218A)
 (For SMZ-140: SG02T0207B)
 (For K-Series: SG02.T0218A)



WF10X 14mm : 0.2mm
 (For SMZ-168: SG02T0218B)
 (For SMZ-140: SG02T0207A)
 (For K-Series: SG02.T0218B)



WF10X 14mm : 0.1mm
 (For SMZ-168: SG02T0218C)
 (For SMZ-140: SG02T0208)
 (For K-Series: SG02.T0218C)



WF20X 10mm : 0.1mm
 (For SMZ-168: SG02T0403)
 (For SMZ-140: SG02T02407)
 (For K-Series: SG02.T0403)

Auxiliary Objectives



SMZ-168		SMZ-140	
Magn.	W.D.	Magn.	W.D.
0.3x	324mm	0.35x	200mm
0.5x	192mm	0.5x	133mm
0.63x	156mm	0.63x	110mm
0.75x	130mm	0.75x	89mm
1.5x	50mm	1.5x	33mm
2.0x	34.5mm	n/a	n/a

Camera Adapters



Camera Adapters	SMZ-168	SMZ-140
Photo Adapter 2x	Available	Available
CCD Adapter 0.3x -for 1/3" chip	Available	n/a
CCD Adapter 0.4x -for 1/3" chip	n/a	Available
CCD Adapter 0.5x -for 1/2" chip	n/a	Available
CCD Adapter 0.65x -for 1/2" chip	Available	n/a

"All-in one" laser ready microscope for inspection, testing and repair in the semiconductor industry.



● PSM-1000 with stand / stage

PSM-1000		
Focus Adjustment		With coaxial coarse and fine focusing wheels [right/left] [50mm travel range, 0.1mm/rev. for fine adjustment, 4mm/rev. for coarse adjustment]
Trinocular tube	Image	Erect Image
	Pupil distance	Siedentopf type, adjustment range: 55mm-75 mm
	Field Number	24mm
	Optical pass ratio	Switchable [eyepiece/laser = 100/0 or 0/100] Simultaneous observation [50:50]
Main unit	Tube lens [correction]	1x [ultraviolet and infrared] and 2x [visible]
	Laser work	Pull out beam splitter for laser work
	Applicable laser	1064/532/355nm NWR laser
Camera mount		C-mount adapter
Illumination system		Reflective illumination for bright field [Koehler Illumination] with aperture diaphragm
Light source [optional]		150W cold light source, light guide length 2m.
Objective nosepiece		Parcenterable, outward, rotary type for bright field lens [with 4 mounts], detachable
Objectives [optional]		ELWD Plan Apo, ELWD Plan Apo [Parfocality Adjustable]
		ULWD Plan Apo, ULWD Plan Apo [Parfocality Adjustable]
Loading weight on optical tube		20.5kg
Mass [main unit/light source]		6.8kg/2.5kg

Superb optics with long working distances for crisp, detailed, aberration free images.

Model Variations : Extra Long Working Distance [Parfocality adjustable], Ultra Long Working Distance; Ultra Long Working Distance [Parfocality adjustable]



PLAN APO
ELWD, STANDARD



PLAN APO ULTRA
ULWD, STANDARD



PARFOCALITY ADJUSTABLE PLAN APO
ELWD, ADJ



PARFOCALITY ADJUSTABLE PLAN APO ULTRA
ULWD, ADJ

Lens optical character	Magnification	N.A.	W.D. (mm)	Resolution (um)
ELWD Standard	2x	0.055	34.0	5.0
	5x	0.140	34.0	2.0
	10x	0.280	33.5	1.0
	20x	0.420	20.0	0.7
	50x	0.550	13.0	0.5
ELWD Parfocality Adjustable	2x	0.055	34.0	5.0
	5x	0.140	34.0	2.0
	10x	0.280	33.5	1.0
	20x	0.420	20.0	0.7
	50x	0.550	13.0	0.5
ULWD Standard	50x	0.420	20.5	0.7
	100x	0.550	13.0	0.5
ULWD Parfocality Adjustable	50x	0.420	20.5	0.7
	100x	0.550	13.0	0.5

K2401: Economic, sturdy, shadow- free, pure-white fluorescent ring illumination for stereomicroscopes



● K2401

MLC150: An industrial designed illumination



● SP990075

● SP990072



● MLC-150

K2401

Mounting on microscope body	Clamping with mounting ring [special screw on adapter for SMZ168]; mounting ring causes a decrease in working distance of approximately 10mm, SMZ168 adapter decreases working distance by 5 mm
Input Voltage	115 V, 220 V
Input frequency	50/60 Hz
Lamp output power	12W
Colour Temperature	6400K
Light Output	510Lm
Lamp Life	500 hours
Weight	252g

MLC150

Light Guide	Type	Flexible	Flexible	Ring Light	Bifurcated gooseneck	1-arm gooseneck
	Fiber	Length	1,500mm	2,000mm	1,000mm	500mm
Type		Glass				
Fiber Bundle Diameter	Ø7mm	Ø5mm	Ø5mm	Ø8mm	Ø5.6mm	
Proximal Diameter	Ø15mm					
Distal End Diameter	Ø15mm	Ø7mm	Ø61mm	Ø9mm	Ø13mm	
Distal End Type	Std. straight tip	Right angle line	Ring	Std. straight tip	Std. straight tip	
Colour Temperature	500K - 3700K, Using blue filter can increase colour temperature above 5600K.					
Lamp Output Power	150W					
Bending Radius	Ø18mm	Ø18mm	Ø225mm	Ø200mm	Ø200mm	
Emitter Dimensions	220(H) x 193(W) x 112(D) mm					

Microscopy camera that connects to three visual sources- simultaneously



● Moticam 480

Image Device	1/3" CCD
Lens	12mm
Effective Pixels	768 x 494 (NTSC) / 752 x 582 (PAL)
Still Image Resolution	640 x 480
TV Horizontal Resolution	480 TV lines
Scanning mode	525 lines interlaced (NTSC) , 625 lines interlaced (PAL)
Frame rate	30 frames / second (320 x 240)
Data Transfer	7.5 MB /second
Minimum illumination	1 Lux
Lens Mount	C-mount
Shutter Speed	[1/60 - 1/10000] (NTSC) / [1/50 - 1/10000] (PAL)
White Balance	Automatic/manual
Output Modes	S-Video / RCA / USB
Video Output	Transmission across Motic software direct into memory of PC
USB Standard	USB1.0/1.1
Microscope adapters	28mm, 30mm, 34mm, 35mm
Power Supply	12V universal switching power supply [110V - 220V]
Recommended system requirements	Windows 98SE, 2000, XP, ME, PII, RAM64, HDD 300 MB unused

2.0 Megapixel resolution and complete image control- digital camera.



● Moticom 2000

Image Device	1/2" CMOS
Lens	16mm
Effective Pixels	1600 x 1200
Still Image Resolution	1600 x 1200
Scanning Mode	Progress scan mode
Frame rate	10fps @ 1600 x 1200 , 40fps @ 800 x 600, 40fps @ 400 x 300
Data Transfer	480 MB/ second
Minimum Illumination	3 lux
Lens Mount	C-mount
Shutter	Automatic / Manual
Video Output	Transmission across Motic software direct into memory of PC
White Balance	Automatic / Manual adjust using software
Output and Power Supply	USB2.0, self-powered from computer
Microscope Adapters	4 different sizes included
Recommended system requirements	P4 1GHz or higher, HDD 1GB unused, RAM 256 MB, Display Memory 32 MB, Windows2000 & XP

High-resolution 3.3 and 5.0 mega pixel versatile microscopy cameras with noise reduction and sensitivity for fluorescence capturing.

Model Variations : Moticom 3000C [Cooled] and Moticom 5000C [Cooled]



● Moticom 3000C

● Moticom 5000C

● Moticom 3000

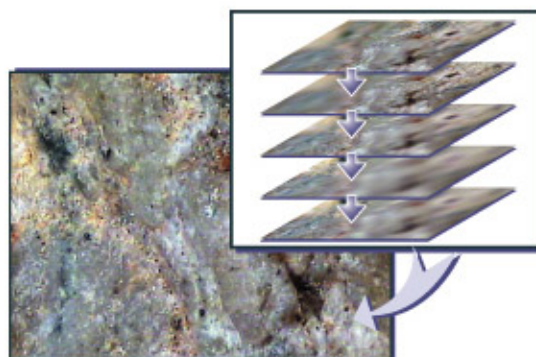
● Moticom 5000

Features	MC3000 / MC3000C	MC5000 / MC5000C
Image Device	1/2" CCD	2/3" CCD
Cooling Device [3000C / 5000C version]	Peltier Device	
Effective Pixels	3.3 megapixels	5.0 megapixels
Still Image Resolution	2080 x 1542	2580 x 1944
Scanning Mode	Progressive scan method	
Shutter	Automatic / Manual	
Auto Exposure	Available	
White Balance	Automatic / Manual	
Binning options	2 x 2, 3 x 3, 4 x 4 [colour, black/white]	
Noise Reduction	9.8e-	
Pixel Size	3.45µm x 3.45µm	3.4µm x 3.4µm
Transfer Speed	20MHz 8-bit; 10MHz 10-bit	
ROI	Software control size and image	
Data Output	IEEE 1394	
Dimensions	105 x 80 x 63 mm	
Weight	700g	
Power Consumption	310 mA @ 12V (3.72W) Moticom 3000 / Moticom 5000 560 mA @ 12V (6.72W) Moticom 3000C / Moticom 5000C	
Recommended system requirements	P4 1GHz or higher, HDD 1GB unused, RAM 256 MB, Display Memory 32 MB, Windows 2000 & XP	

User-friendly application software for the acquisition of images, diagnosis of images, image processing, precise measurement, and information sharing.

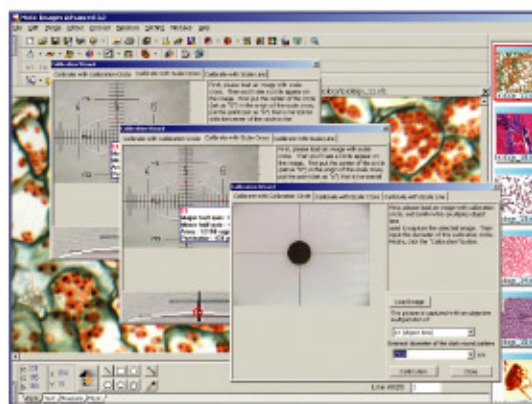
Capture Functions:

- Still, auto-capture and video
- ROI, auto exposure and white balance
- High-resolution ROI preview
- Real-time 3-D imaging
- Background calibration
- Noise reduction
- Prolong Exposure - for insufficient illumination



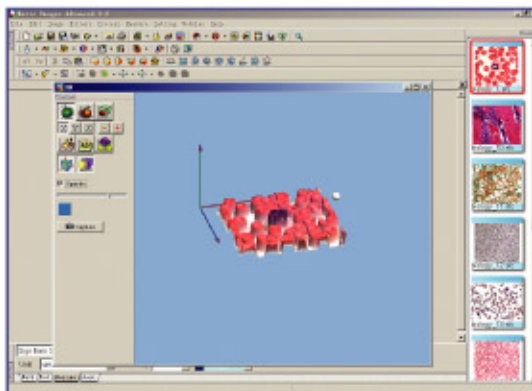
Measurement Functions:

- Calibration of camera with various methods
- Precise measurement of various shapes
- Lock measurements on image for sharing
- Manual segment the image with thresholds for Red, Green, Blue and Grey scale
- Auto-calculate the segment image
- Export data in Excel format



Applications:

- Motic Multi-Focus - combination of images at different depths
- Motic Assembly - combination of up to 100 images to form a complete image of the sample
- Motic Report - instantaneous report generation with image(s) and data information
- Distance Sharing - images transfer in real-time and archive via intranet or internet



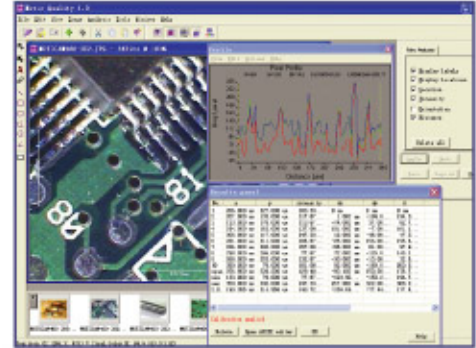
Minimum System Requirements

CPU	Pentium II or equivalent
Hard Disk	Space 300 MB
Display Card	4 MB
RAM	64 MB
Other Equipment	Sound card, loud speakers, microphone

Quality and production application software for tolerance assurance, intensity distribution, precise measurement, and batch reporting.

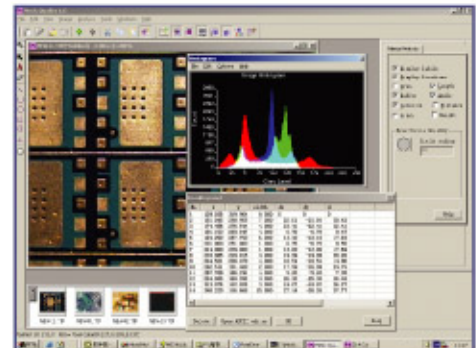
Measurement Functions:

- Calibration of regular application camera and special continuous zoom system
- Precise measurement of various shapes
- Auto lock of measurement shapes for quick batch process
- Measurement of light intensity for a selected ROI



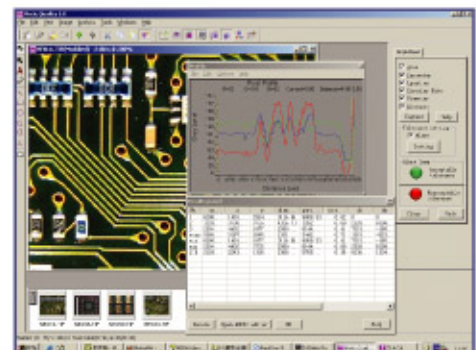
Applications:

- Tolerance warning system - reject or accept particular batches based upon user's setting indication
- Spatial calibration - measurement of X and Y difference from two selected points
- Intensity analysis - histogram of Red, Green, Blue, and Grey scale for identifying depth and intensity of batch production



Process Function:

- Real - time filters in ROI
- Real - time tolerance testing and indication
- X & Y scale super impose for location recognition
- Image histogram to analyzing gray scale
- Statistical Process Control (SPC) Batch Reporting



Software Application:

CPU	PIII 800MHz above
RAM	256 MB above
Hard Disk	4 GB above
System requirement	Windows 2000 / XP
Others	Illumination, sound card, speaker, microphone
Application temperature	-10 - 50°C
Storage temperature	-20 - 60°C
Humidity	40-95%
Display card	32 MB above

1. N.A. : Numerical Aperture

N.A. determines resolving power, focal depth, and luminosity of the image. The larger N.A. is, the higher resolving power and smaller focal depth are.

$$N.A. = n \cdot \sin\theta$$

n is an index of refraction made by the medium between an objective and a sample. n=1.0 for air. θ is an angle made by the ray of light that goes through one end of an objective and an optical axis.

2. R: Resolving Power

Minimum distinguishable space between points. N.A. and wavelength λ determine resolving power.

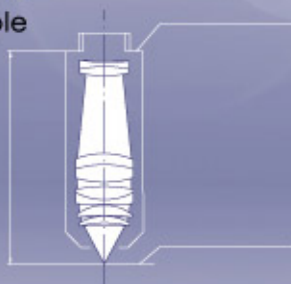
$$R = \frac{0.61 \lambda}{N.A.}$$

3. W.D. : Working Distance

Distance between the surface of the sample and the surface of the objective when in focus.

4. Parfocal Length

Distance between the surface of the sample and the objective mounting position when in focus.



5. Infinity correction system

An optical system in which the image is formed by an objective at infinity and at an intermediate image plane by the tube lens.

6. Greenough system

An optical system which utilizes twin lens at different angles to produce a stereo effect.

7. Common Main Objective (CMO)

A stereo optical system that utilizes a single large object to depict the image in a stereo effect to infinity.

8. F : Focal Length

Distance between a principal point and a focal point. F1 is a focal length of objective, F2 is a focal length of tube lens. Magnification is determined by the ratio of tube lens focal length and objective focal length.

$$\frac{\text{Focal length of tube lens } F2}{\text{Focal length of objective } F1}$$

(Ex.) $1x = \frac{200mm}{200mm}$

(Ex.) $10x = \frac{200mm}{20mm}$

9. Object field

(1) Range [diameter] of specimen observable with a microscope.

$$\text{Real field of view (mm)} = \frac{\text{Field number of eyepiece}}{\text{Magnification of objective} \cdot 200\text{mm factor}}$$

*Field number of eyepiece is 24mm

(Ex.) Object field for 1x objective is

$$\frac{24\text{mm}}{1} = 24\text{mm}$$

(Ex.) Object field for 10x objective is

$$\frac{24\text{mm}}{10} = 2.4\text{mm}$$

(2) Object field on TV monitor

$$\text{Object field of view (mm)} = \frac{\text{Size of CCD Camera Image Element}}{\text{Magnification of objective} \cdot 200\text{mm factor} \cdot \text{magnification of video adapter}}$$

* Size of 1/2" CCD image element is 4.8 x 6.4mm

(Ex.) Real field of view for 1x objective is 4.8 x 6.4mm

Real field of view for 10x objective is 0.48 x 0.64mm

10. D.F. : Depth of focus

Range around the focal point in which the image is still clear. The larger the N.A., the smaller the focal depth.

$$D.F.(\mu\text{m}) = \frac{\lambda}{2 \cdot (N.A.)^2}$$

$$\lambda = 0.55 \text{ microns } (\mu\text{m})$$

$$\text{Focal depth in this case is } \frac{0.55\mu\text{m}}{2 \times (0.7)^2} = 0.56\mu\text{m}$$

11. Bright field illumination and dark field illumination

In bright field illumination the ray of light reflected upon the object goes through the objective giving a bright background.

In dark field illumination the ray of light is shut off by a central stop in the ray path, thus only allowing diffracted light to pass through the objective.

12. Apochromatic objective

Apochromatic objective is chromatic aberration corrected for red, blue and green.