

# Non-contact 3D Measurement Systems

SENSORS

3D SYSTEMS

SPECTRO  
COLORIMETERS

GONIO  
PHOTOMETERS

OPTICAL  
COMPONENTS

## MICROMESURE 2 Systems

The MICROMESURE 2 system, equipped with CHR or CCS Confocal Chromatic Sensors is the ideal tool for non contact surface measurement, including 3D roughness, shape metrology and 3D microtopography.

Designed BY the Confocal Chromatic Sensor creators, FOR the Confocal Chromatic Sensor use, the MICROMESURE 2 system fully exploits the extraordinary performances of STIL's non contact sensors in various applications and fields.

Delivered with all the necessary control & acquisition hardware and software, the MICROMESURE 2 system is a «turn key» device that is immediately operational after its installation.



## Advantages

### Due to Confocal Chromatic sensors

- Non contact dimensional measurement
- Nanometric and Micrometric resolutions
- White light sensor (no speckle, wide measuring range)
- Coaxial measurement (no shadowing)
- High local slopes on specular (reflective) surfaces
- Insensitive to ambient light
- Insensitive to object's reflectivity: allows working on any type of surface
- Thickness & Form Measurement of transparent objects
- Wide measuring ranges capabilities (from 20  $\mu\text{m}$  to 24 mm)

### Due to high quality scanning system

- Point scanning system allows to define scans dimensions and resolution without hardware constraints
- Real metrology on each measured points thanks to linear encoders
- Flatness and orthogonality corrections
- Equipped with double turret
- User friendly Software
- Modular design (1, 2 or 3 axes) to adapt the configuration to the exact needs of the user



## Applications

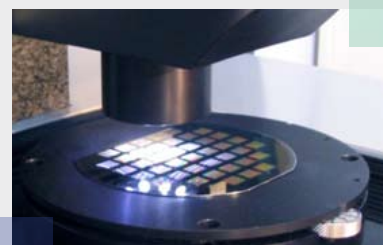
- Form and texture analysis
- Fine mechanics inspection
- Surface characterization
- 3D altitude and thickness topography / profilometry
- Roughness measurement
- Dimensional metrology

## Industrial and Research Laboratories Fields

- Mechanics (roughness, tribology, 3D metrology, corrosion analysis ...)
- Textile (3D metrology, thickness topography ...)
- Glass industry (float glass on line thickness control, 3D metrology ...)
- Microelectronics (roughness, 3D metrology, defects analysis ...)
- Optics (roughness, 3D metrology...)
- Cosmetics (tribology, 3D metrology ...)
- Road & tires (tribology, 3D metrology ...)
- Nuclear fuel industry (roughness, tribology, 3D metrology, corrosion analysis ...)

## Options & Accessories

- Linear encoders on X & Y axes
- Video Camera
- Double turret
- Vibration damping stand
- Metrology artifacts:
  - Calibrated groove (depth 10  $\mu\text{m}$ )
  - Roughness standard ( $R_a=0.8\mu\text{m}$ )
  - Optical flat (140 mm diameter)
  - Offset setting reticle
- Post processing software: SPIP from Image Metrology



## Technical specifications

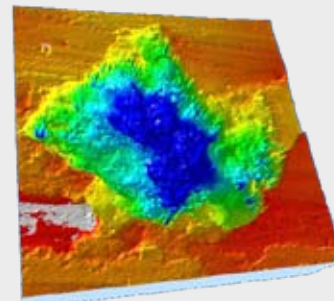
### Scanning system Specifications

Translations	Units	X Axis	Y Axis	Z Axis	Remarks
Travel	mm	100	100	50	Up to 300mm on request
Positioning accuracy (max)	$\mu\text{m}/100\text{mm}$	10	10	-	without encoder
Positioning accuracy (max)	$\mu\text{m}/100\text{mm}$	1	1	1	with encoder
Positioning resolution	$\mu\text{m}$	0.1	0.1	0.1	
Flatness (with correction)	$\mu\text{m}/100\text{mm}$	1	1	-	
Maximum speed	mm/s	20	20	5	

## ■ Optoelectronic Controllers Specifications

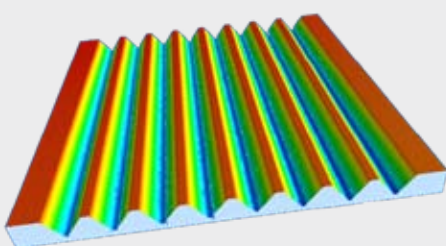
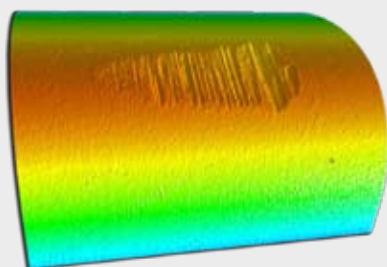
Controllers	CHR150	CHR150-L	DUO	CCS-Prima	CCS-Optima
Technology *	CCS	CCS	CCS & CSI	CCS	CCS
White Light Source	Halogen	LED	Halogen	LED	LED
Min. measuring rate (Hz)	30	30	40	100	100
Max. measuring rate (Hz)	1000	1000	2000	2000	5000
Intensity setting	no	Manual	no	Software	Software
Altitude measurement	yes	yes	yes	yes	yes
Thickness measurement	yes	yes	yes	yes	yes

For detailed specs : see «SENSORS» paragraph



\* STIL dimensional sensors are based on two distinctive proprietary technologies:  
 - Chromatic Confocal Sensing (CCS)  
 - Confocal Spectral Interferometry (CSI)

## ■ Optical Pens Specifications

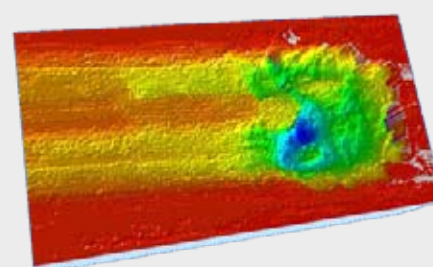


Reference	Meas. range	Accuracy along Z	Resolution along Z	Lateral resolution	Max slope
Units	µm	µm	µm	µm	deg.
CL1-MG210	>110	0.02	0.005	1.10	43
CL1-MG140	>110	0.02	0.005	1.55	43
CL2-MG210	>300	0.06	0.012	1.30	28
CL2-MG140	>300	0.06	0.012	1.55	28
CL2-MG70	>300	0.06	0.012	2.60	28
CL3-MG140	>1 100	0.20	0.025	2.00	27
CL3-MG70	>1 100	0.20	0.025	4.00	27
CL4-MG35	>2 500	0.40	0.075	4.00	22
CL4-MG20	>2 500	0.40	0.075	6.00	22
CL5-MG35	>10 000	0.90	0.280	8.00	14
CL5-MG20	>10 000	0.90	0.280	11.0	14
CL6-MG35	>20 000	3.00	0.600	8.00	8.6
CL6-MG20	>20 000	3.00	0.600	12.8	8.6

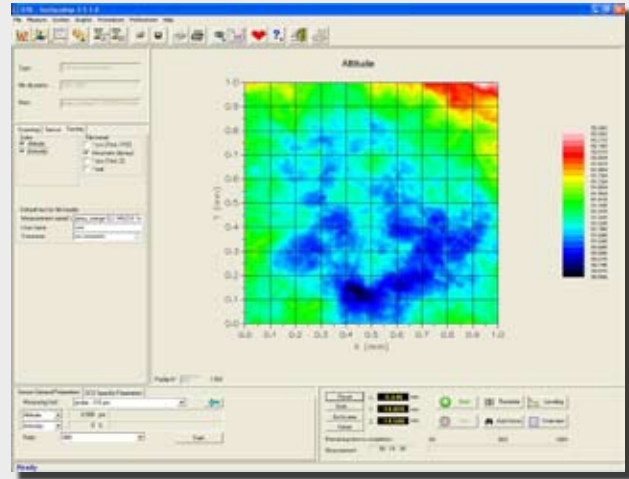
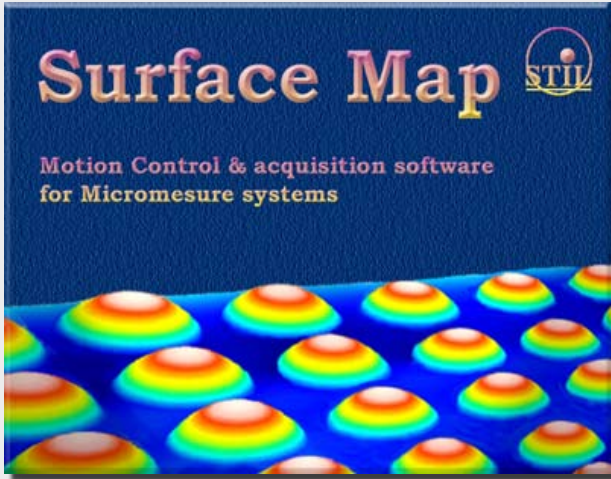
For detailed specs : see «SENSORS» paragraph

## ■ Video Camera Specifications

Video Camera (Optional)	Units	V CX50	V CX250
Type	-	Color CCD	
Resolution [pixels]	-	752 x 582	
Gain	-	Automatic	
Field of view	mm <sup>2</sup>	5.2 x 4.1	1 x 0.8
Pixel size on object	µm <sup>2</sup>	7 x 7	1.4 x 1.4
Lighting	-	4 quadrants LED	



## ■ Control and Acquisition Software Functions



SurfaceMap Control & Acquisition Software	
Main Functions	
Type of acquisition	Profile Scanning (X, Y, Oblique)
	Surface Scanning
	Points series acquisition
	Repetitive Measurements
	Multi acquisition sequence
	Video image (if camera option)
Scanning parameters setting	Dimensions
	Step along each axis
Sensor parameters setting	Altitude Mode
	Thickness Mode
	Optical pen choice
	Averaging
	Double frequency (if available)
Scanning type	Constant speed (with backlash compensation)
	Constant speed (back & forth)
	Step by step
	Z following
Data saving	Folder selection
	Format selection (binary, csv)
User's Supervision	Measurement Progress
	X, Y & Z Coordinates
	Sensor Status
Automatic Procedures	Hardware homing
	Leveling
	Autofocus
	Recentering
	Preview

## ■ Post Processing Software Functions

SPIP Post processing		4 modules Version	8 modules Version
Main Functions			
Basic Module	Plane correction / Flattening	yes	yes
	Cross section & Profiling	yes	yes
	Altitude Histogram	yes	yes
	Fourier Transform	yes	yes
	Correlation functions	yes	yes
	Image Substraction & Addition	yes	yes
	Color coding	yes	yes
	Zoom	yes	yes
	Transformation : Mirrors, rotations	yes	yes
	Plug-in interface	yes	yes
Copy, print & save functions		yes	yes
Roughness Analysis (ISO 25178 + ANSI B46.1)		yes	yes
3D Visualization Studio		yes	yes
Filter Module		yes	yes
Extended Fourier Analysis			yes
Grain Analysis			yes
Batch processing			yes
ImageMet Explorer			yes

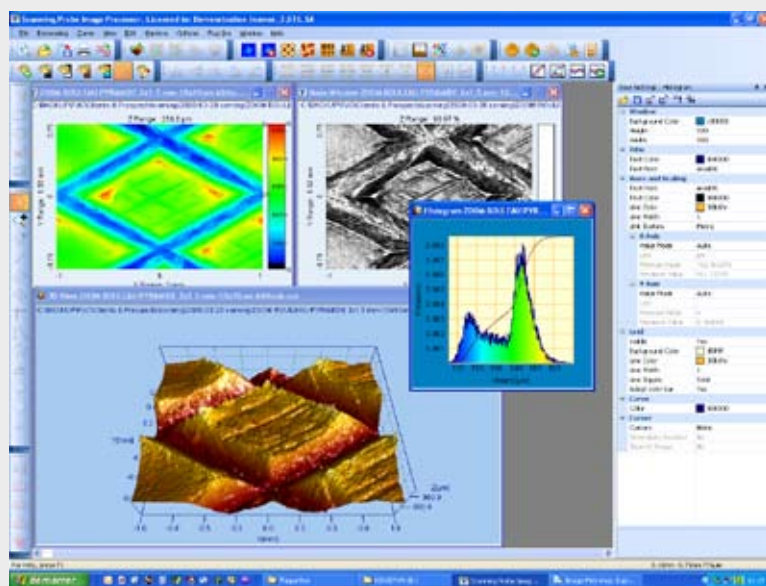


### ● Scanning Probe Image Processor SPIP™

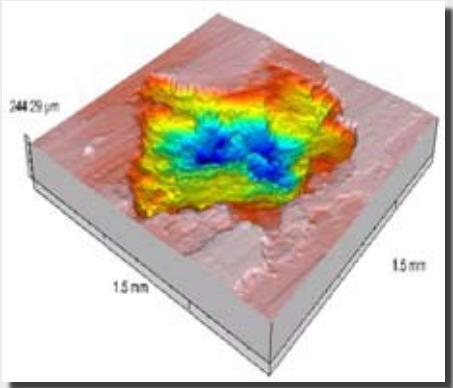
Image Metrology was founded as a world-wide leading supplier of software for nano and microscale image processing. Over the years, the Scanning Probe Image Processor, SPIP™, has become the de-facto standard for image processing at nanoscale.

SPIP provides customers with state-of-the-art image processing software for microscopy, including:

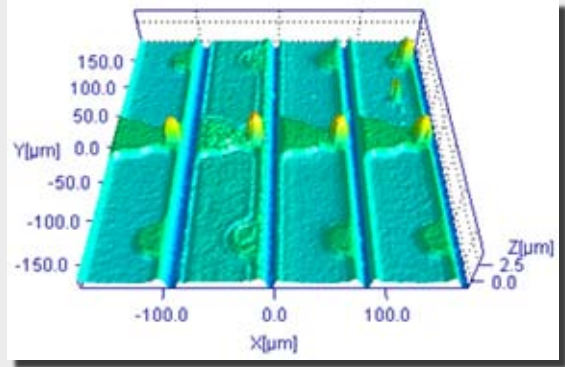
- Correction tools for creating the most accurate presentation of the “true” surface,
- Automated analysis techniques ensuring high accuracy, quality and cost efficiency,
- Visualization and reporting tools enabling convincing and impressive communication of results.



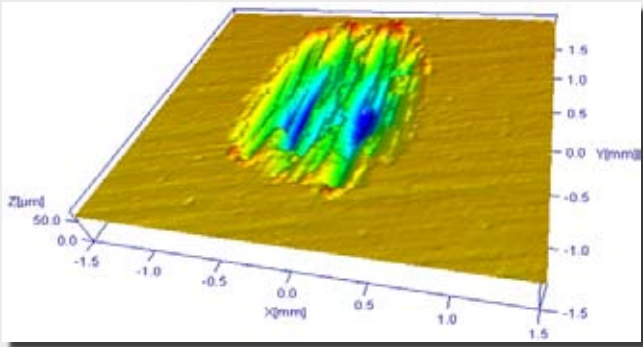
## ■ Measurement examples



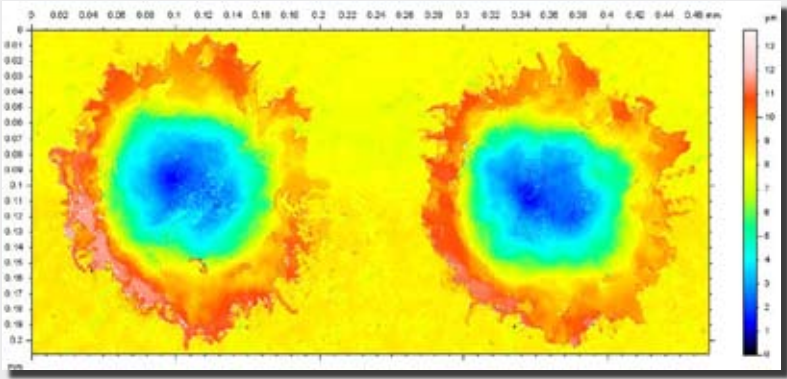
Porosity in brake lining material  
3D view



Color filters for LCD display panels  
3D view



Tribology – metallic part wearing test  
3D view



Laser impacts on a metal plate  
Height measurement