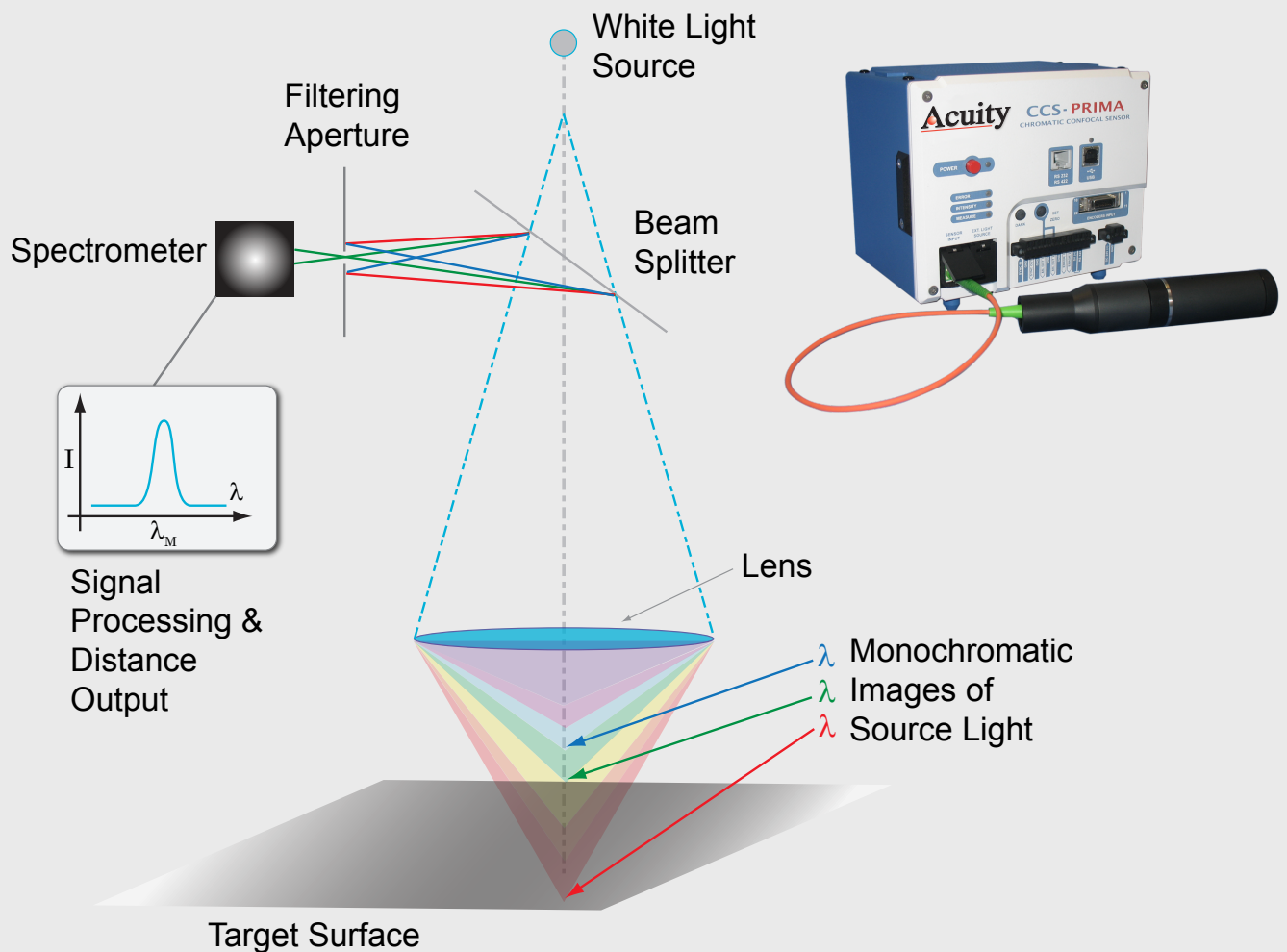


Displacement sensor components

The CCS Prima confocal sensor is an ultra-precise displacement measuring system. Each system is comprised of an optoelectronic controller, an optical pen and a fiber-optic connection cable. The controller houses the white light source, hardware for signal processing and ethernet communications. The optical pen is a non-contact measurement probe which focuses the emitted light and collects the reflected signal for transmission, via optical fibers, to the controller. Acuity offers a variety of pen configurations to suit your application's range and resolution requirements.






Principles of Operation

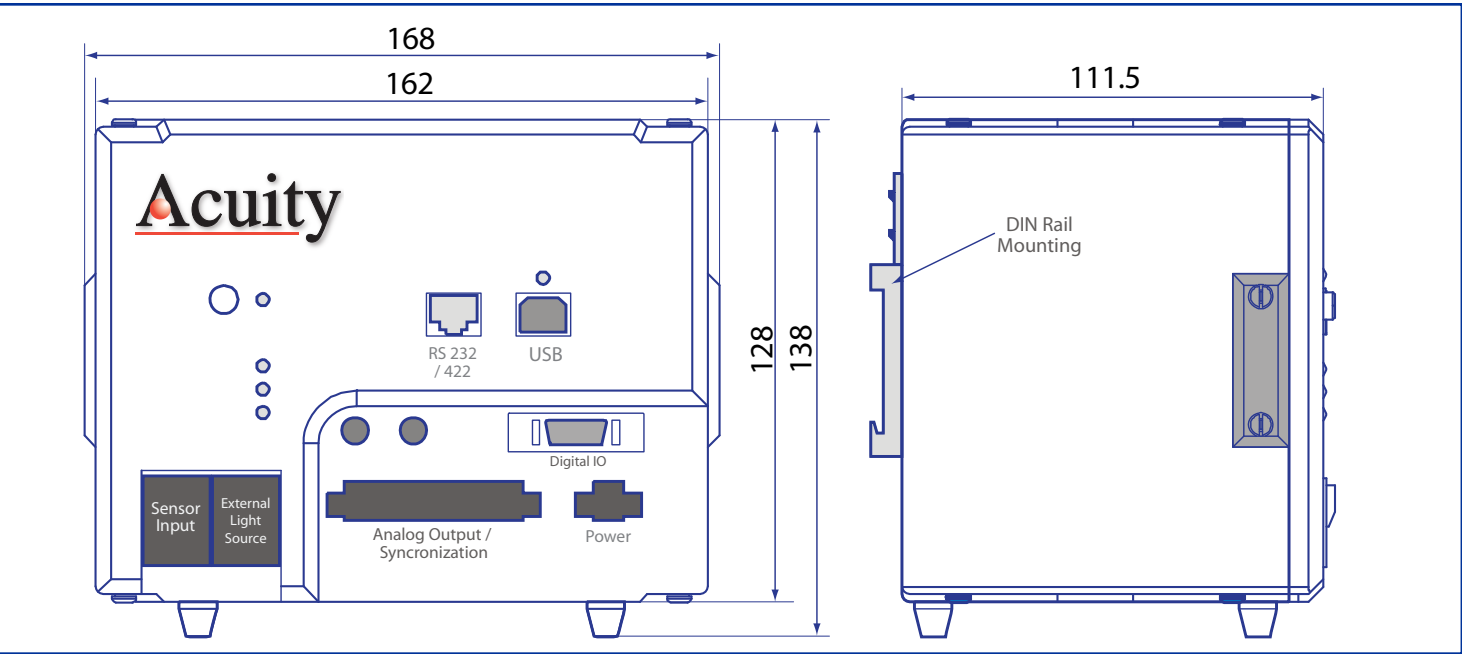
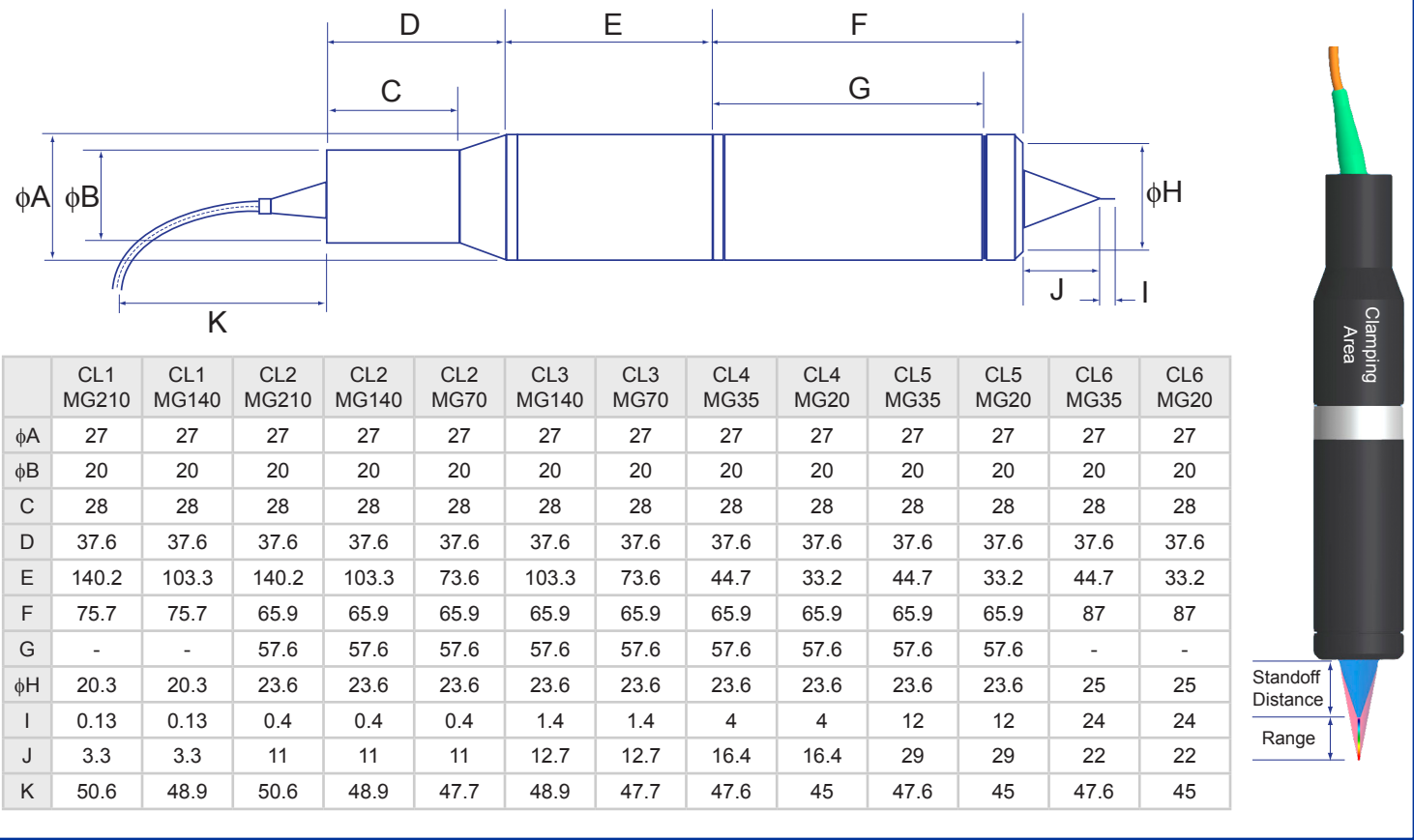
In our confocal chromatic imaging principle, a polychromatic white light is focused onto the target surface by a multilens optical system. These lenses disperse the light into monochromatic stages (colors) along the measurement axis. A specific distance to the target is assigned to each color's wavelength in a factory calibration. Only the wavelength which is exactly focussed on the target is used for the measurement. This light reflected from the target surface is transmitted from the probe, through a confocal aperture and onto a spectrometer which detects and processes the spectral changes and calculates distances. These distance measurements are transmitted at high speed via ethernet communications protocol.

Acuity Prima Confocal Displacement Sensor Specifications

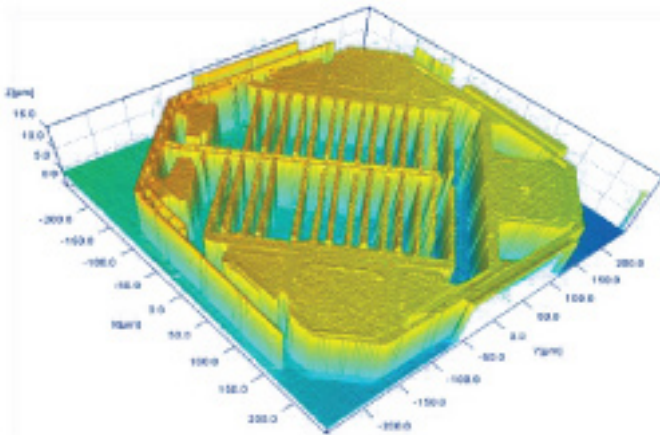
Each measurement system consists of the Prima controller, a modular measurement pen and a fiber optic cable. The sensor system is factory calibrated based on the selected pen and magnifier configuration. Each Prima controller can retain up to 20 different calibration files, allowing users to swap measurement pens.

<div>Prima Controller</div> <div></div>														
Measuring Frequency with 2X frequency		100 - 5000 Hz; Selectable “Double Frequency Mode” for surfaces with varying reflectivities												
Light Source		White light LED with programmable intensity settings												
Measuring Modes		Distance, Thickness; Automatic modes for surfaces with changing reflectivity or slope												
Encoder inputs		Three TTL signal inputs - 30 bit counters												
Analog Outputs		2 configurable outputs [0 - 10V] - 16 bits resolution												
Digital I/O		RS232 / RS422 and USB 2.0												
Synchronization I/O		1 Synchro input (TTL) / 1 Synchro output (TTL)												
Optical Fiber Connection		E2000 type («push-pull») with «Autoprotect» system												
Power Supply / Consumption		24 V DC / 20 W												
Operating / Storage Temperatures		5°C - 40°C, 5%-80% HR no condensation; Storage: -30°C – 70°C												
Environmental		IP 40 (protection from granular matter, no water protection)												
EMC		EN 50081-1 and EN 50082-2 compliant												
Weight		1.4 Kg												
Mechanical		Integrated DIN rail mounting. See Mechanical Specifications												
<div>Confocal Pens</div> <div></div>		CL1		CL2			CL3		CL4		CL5		CL6	
Range (mm)		0.13		0.40			1.4		4.0		12.0		24.0	
Range Beginning (mm)		3.3		11			12.7		16.4		29		22	
Resolution (nm)		8		22			60		130		400		780	
Linearity (µm)		0.035		0.08			0.2		0.3		0.8		1.5	
Max. Target Tilt		+/- 43°		+/- 28°			+/- 25°		+/- 21°		+/- 14°		+/- 8.5°	
<div>Magnifier Options</div>		MG210	MG140	MG210	MG140	MG70	MG140	MG70	MG35	MG20	MG35	MG20	MG35	MG20
Spot Diameter (µm)		1.9	2.8	2.3	3.4	6.9	4	8	8	14	14	24.5	16	28
Lateral Resolution (µm)		0.9	1.4	1.2	1.7	3.5	2	4	4	7	7	12.3	8	14
Min. Measurable Thickness (µm)		7.5	9	14	14	22	38	40	110	120	350	550	590	725
Length (mm)		253.1	217.1	243.3	208.9	176.1	205.9	176.1	145.5	131.7	145.5	131.7	167.6	151.8
Diameter of Pen (mm)		27	27	27	27	27	27	27	27	27	27	27	27	27
Weight (g)		268	195	248	190	189	215	214	155	140	175	160	195	180
Environmental		ATEX / EX approved for hazardous areas												
<div>Sensor Cable</div> <div></div>														
Construction		50 µm core, polyurethane sheathing, 2.8 mm dia.; Optional: Stainless steel sheathing, 5mm dia.												
Connector		E2000 “push-pull” fiber connector												
Lengths		3m standard, 2, 4, 5, 10 m lengths												
Bending Radius		standard cable: static 30 mm; dynamic 40 mm												

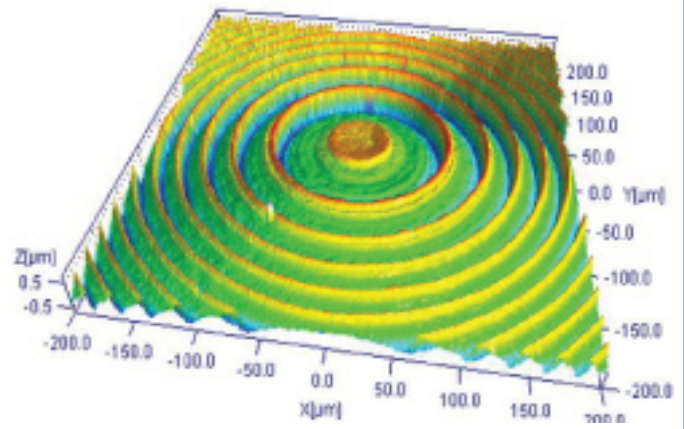
Mechanical Dimensions units in mm



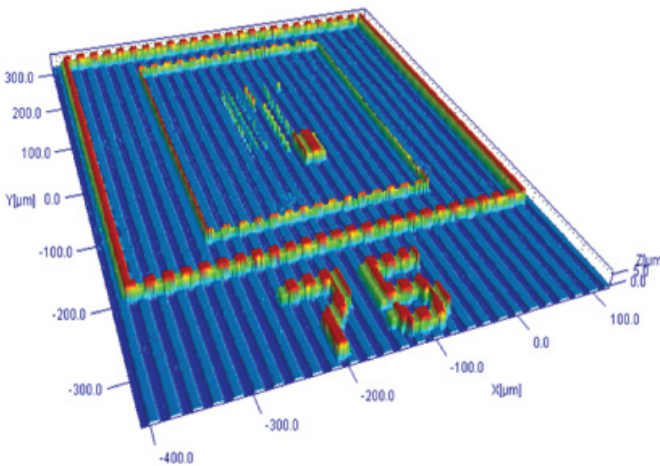
Typical Applications for Confocal Displacement Sensors



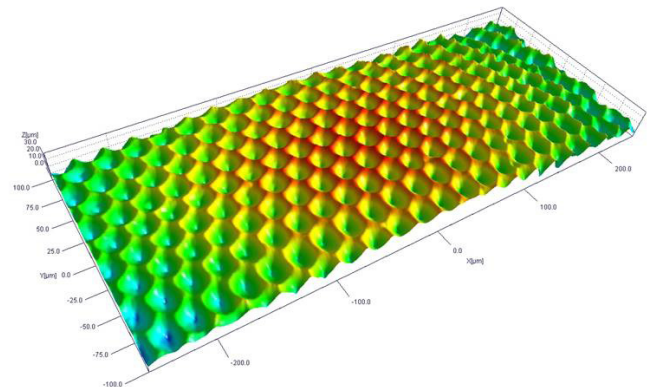
MEMS Profiling (1.5 μm X 1.5 μm sampling)



Specialty Lens Profile (1 μm X 1 μm sampling)



Chrome-Glass Mask Microtopography (1 μm X 1 μm sampling)



Wasp Eye Surface Topography (5 μm X 5 μm sampling)

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