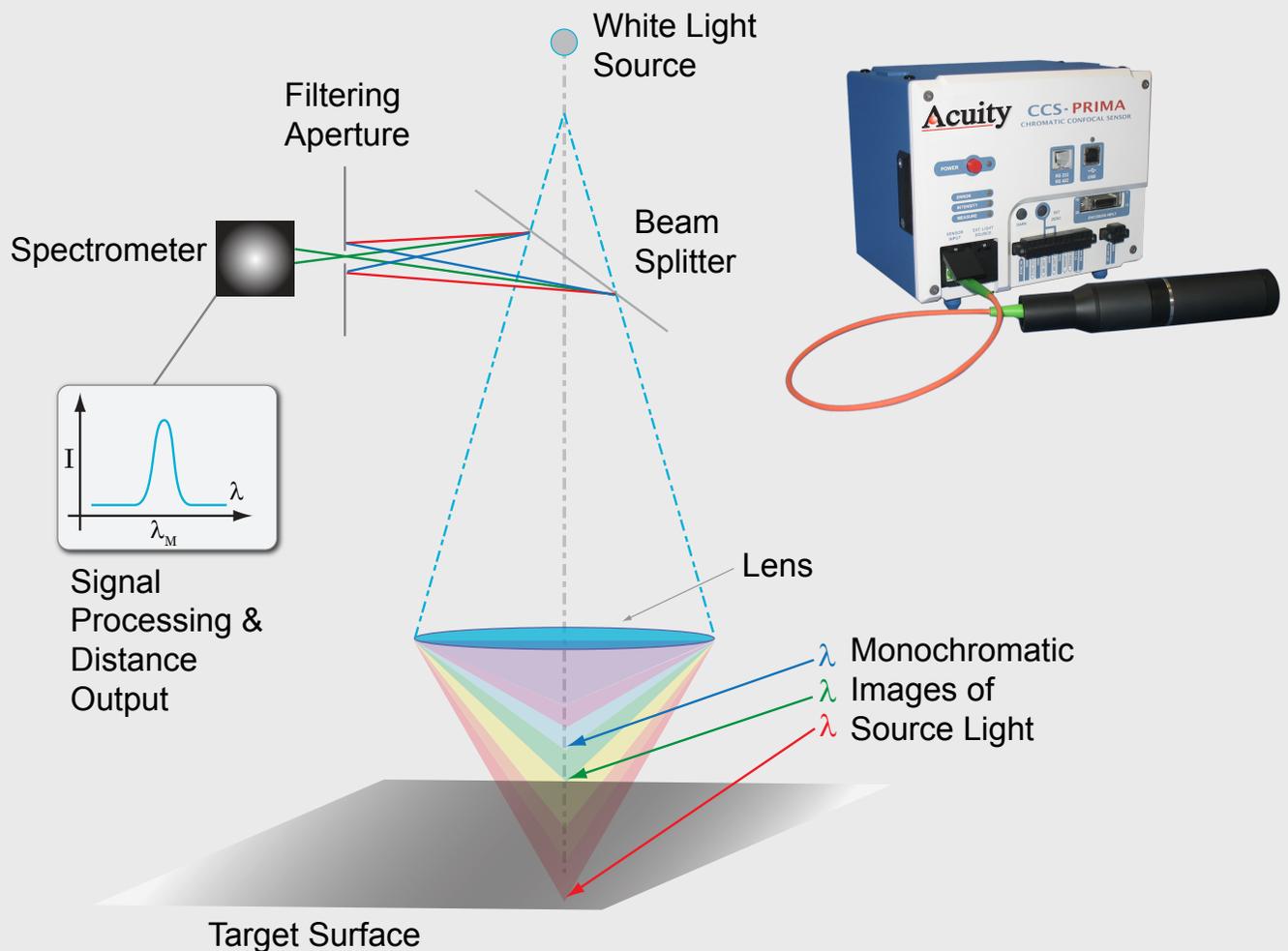


### Displacement sensor components

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

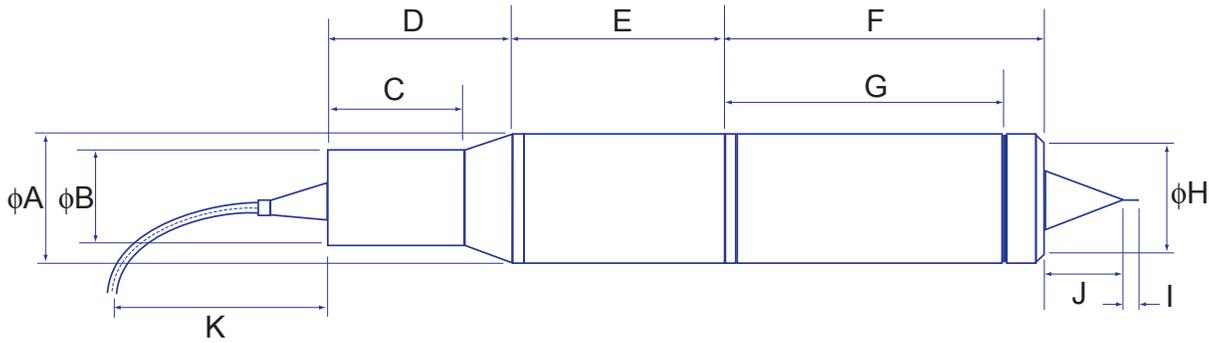
In our confocal chromatic imaging principle, a polychromatic white light is focused onto the target surface by a multilens optical system. These lenses disperse the light into monochromatic stages (colors) along the measurement axis. A specific distance to the target is assigned to each color's wavelength 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

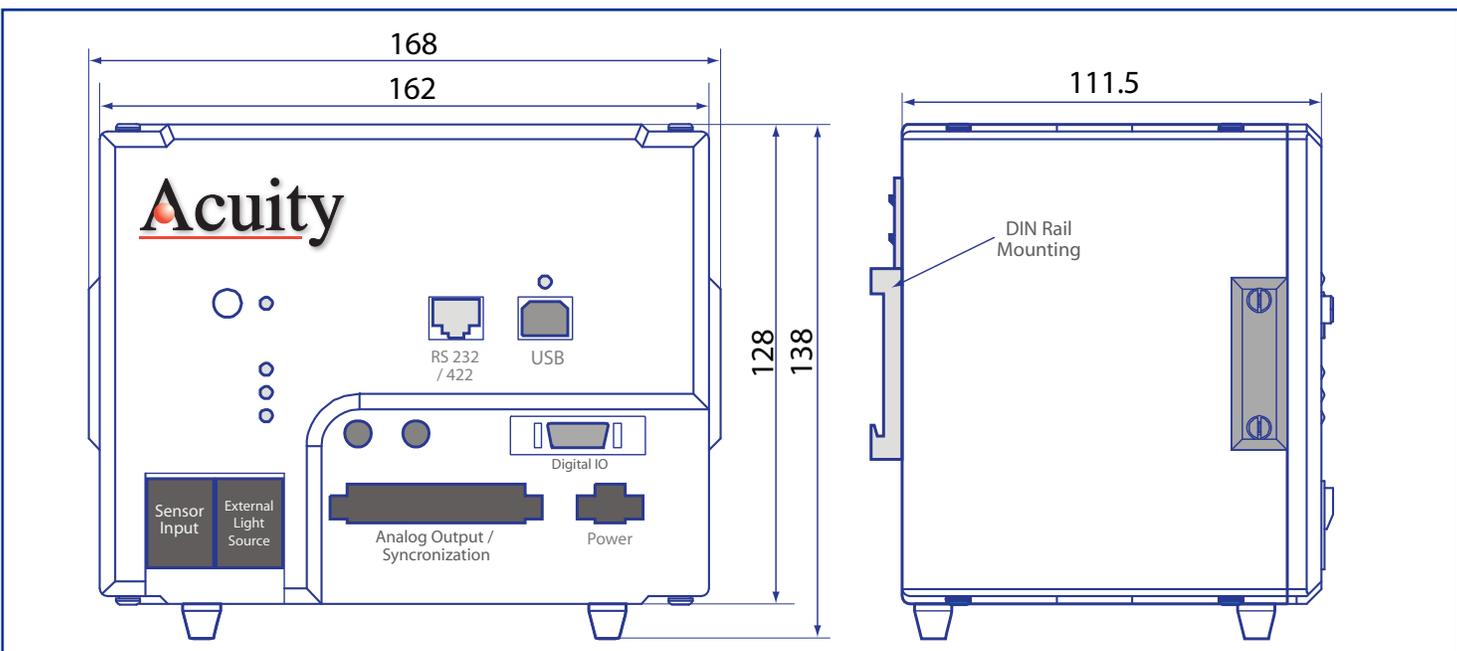
Each measurement system consists of the Prima controller, a modular measurement pen and a fiber optic cable. The sensor system is factory calibrated based on the selected pen and magnifier configuration. Each Prima controller can retain up to 20 different calibration files, allowing users to swap measurement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

<b>Prima Controller</b>															
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														
<b>Confocal Pens</b>	<b>CL1</b>	<b>CL2</b>			<b>CL3</b>		<b>CL4</b>		<b>CL5</b>		<b>CL6</b>				
															
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°				
<b>Magnifier Options</b>	<b>MG210</b>	<b>MG140</b>	<b>MG210</b>	<b>MG140</b>	<b>MG70</b>	<b>MG140</b>	<b>MG70</b>	<b>MG35</b>	<b>MG20</b>	<b>MG35</b>	<b>MG20</b>	<b>MG35</b>	<b>MG20</b>		
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														
<b>Sensor Cable</b>															
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														

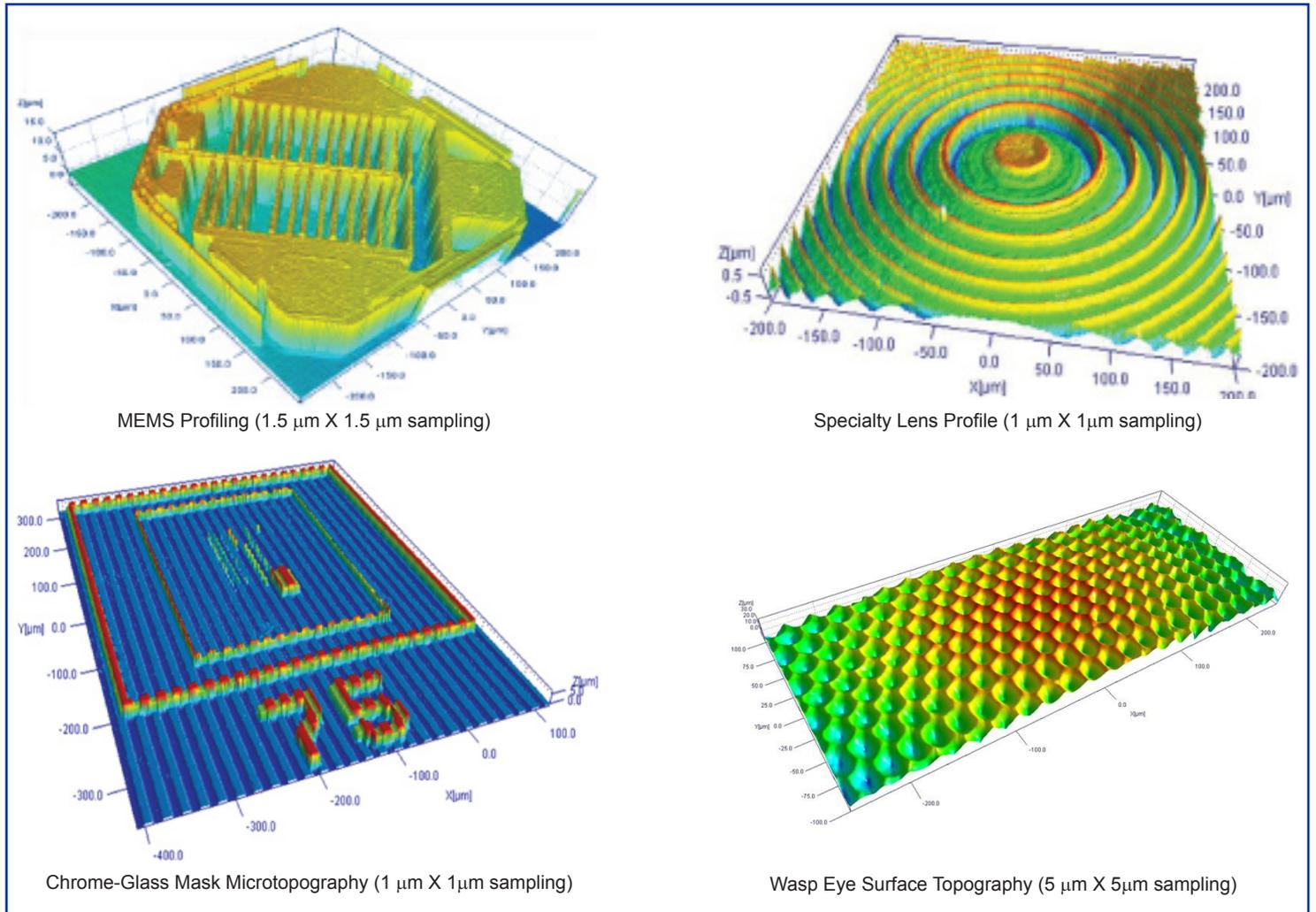
Mechanical Dimensions units in mm



	CL1 MG210	CL1 MG140	CL2 MG210	CL2 MG140	CL2 MG70	CL3 MG140	CL3 MG70	CL4 MG35	CL4 MG20	CL5 MG35	CL5 MG20	CL6 MG35	CL6 MG20
$\phi A$	27	27	27	27	27	27	27	27	27	27	27	27	27
$\phi B$	20	20	20	20	20	20	20	20	20	20	20	20	20
C	28	28	28	28	28	28	28	28	28	28	28	28	28
D	37.6	37.6	37.6	37.6	37.6	37.6	37.6	37.6	37.6	37.6	37.6	37.6	37.6
E	140.2	103.3	140.2	103.3	73.6	103.3	73.6	44.7	33.2	44.7	33.2	44.7	33.2
F	75.7	75.7	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	87	87
G	-	-	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	-	-
$\phi H$	20.3	20.3	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	25	25
I	0.13	0.13	0.4	0.4	0.4	1.4	1.4	4	4	12	12	24	24
J	3.3	3.3	11	11	11	12.7	12.7	16.4	16.4	29	29	22	22
K	50.6	48.9	50.6	48.9	47.7	48.9	47.7	47.6	45	47.6	45	47.6	45



## Typical Applications for Confocal Displacement Sensors



## Contact Acuity

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