



DirectShear™ Sensors

Shear Stress Instrumentation



Complete sensor systems for non-intrusive, direct, simultaneous mean and fluctuating wall shear stress measurement



Micromachined sensor heads in stainless steel housings for flush-mounted installation

Sensing System Overview

- Micromachined floating element sensor that enables time-resolved, one-dimensional, direct shear stress measurements
- Compact, robust sensor package for flush mounting
- Optimized Capacitive Sensor Unit (CSU) for high dynamic range and bandwidth
- Suite of sensor performance ranges and form factors for different applications
- Originally developed for NASA

Applications

- Instrumentation-grade skin friction sensing
- Aerodynamic drag research
- Detection of flow separation
- Wind tunnel instrumentation

Benefits

- Direct measurement – no heat transfer calibration
- Non-intrusive – minimal flow disturbance
- High resolution, dynamic range and bandwidth
- Highly accurate, quantitative measurements



Multiple sensor head form factors, materials, and finishes available to meet installation requirements



The SCU provides low-noise power and bias voltages to the sensor head and conditions the analog voltage signal for output to a DAQ

Sensor Heads

- Non-intrusive — backside contacts for minimal flow disturbance
- Standard stainless steel cylindrical housings available with or without shoulder and key for alignment and detachable cable
- Custom housing form factors, materials, and finishes available
- Integrated 1x4 arrays now available
- Suite of six sensor models available for different applications (see spec table)

Capacitive Sensor Unit (CSU)

- Enables mean and fluctuating capacitive sensor measurements
- Available as a rack-mountable 2U standalone unit or 3U CompactPCI® module
- Standalone unit provides low-noise AC and rechargeable Li-ion battery power sources and LED status indicators
- Multi-channel units also available

“CompactPCI®” is a registered trademark of the PCI Industrial Computer Manufacturers Group.

Sensor Model	Shear Stress [Pa]	Bandwidth [kHz]	Element Size [mm] x [mm]	Sensitivity [mV/Pa]	Resolution [mPa]
CS-D10	10	0.75	2 x 0.5	100	0.1
CS-D50	50	1.5	2 x 0.4	40	0.1
CS-D100	100	2.5	2 x 0.4	10	1
CS-A05	300	5	1 x 0.2	1	1
CS-A10	1000	10	0.5 x 0.15	0.3	5
CS-A20	5000	20	0.5 x 0.15	0.08	10

Now Available For Purchase

With a deep knowledge of aerospace test and over two decades researching best-in-class sensor development techniques, IC² delivers scientific-grade precision sensors that push the envelope of aerospace measurement accuracy and performance.