

Plate Force Sensor **PFS** AD7821 series

Features

- Plate type 6 component force & moment sensor
- High accuracy sensor with 0.03% in Fz load direction, 0.05% in Fx and Fy load direction
- High sampling rate up to 10kHz
- Robust against electrical noise



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Features

Plate type 6 components of force sensor

Plate force sensor is installed on the surface of the road and measures force in 6 components (Fx, Fy, Fz, Mx, My, Mz)



High accuracy with 0.03% for Fz, 0.05% for Fx and Fy

With high-precision measurement data, vehicle behavior against the road surface can be analyzed accurately.

High sampling rate up to 10kHz

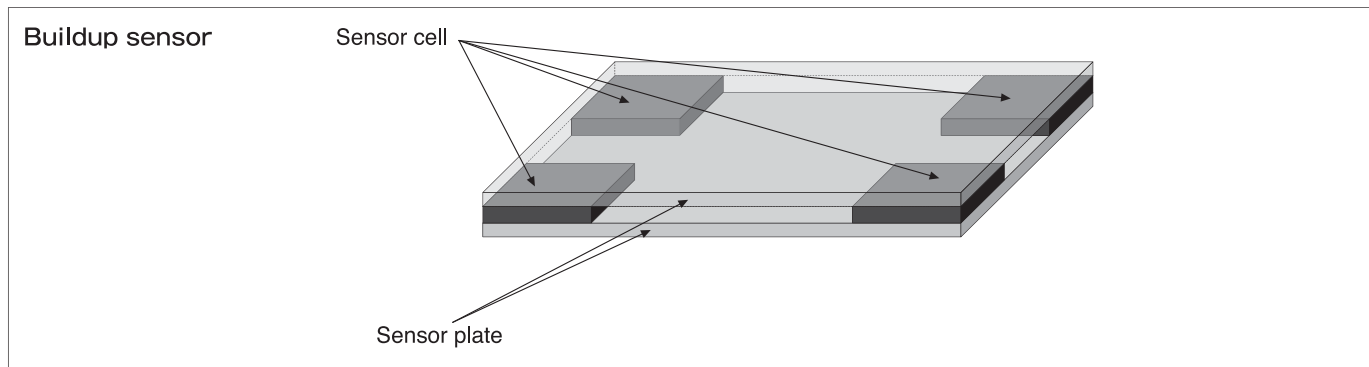
High sampling rate for measuring high speed vehicle. (over 300km/h)

Robust against electrical noise

Eight strain gauges are installed for detecting distributed forces at the sensor spring element. High-precision A/D converter is embedded inside the sensor unit and directly converts gauge signals. Therefore, data transmission from sensor to Sensor Signal Processor (SSP) is done digitally. This structure makes sensor system very robust against electrical noise and made sensor free from cabling restrictions.

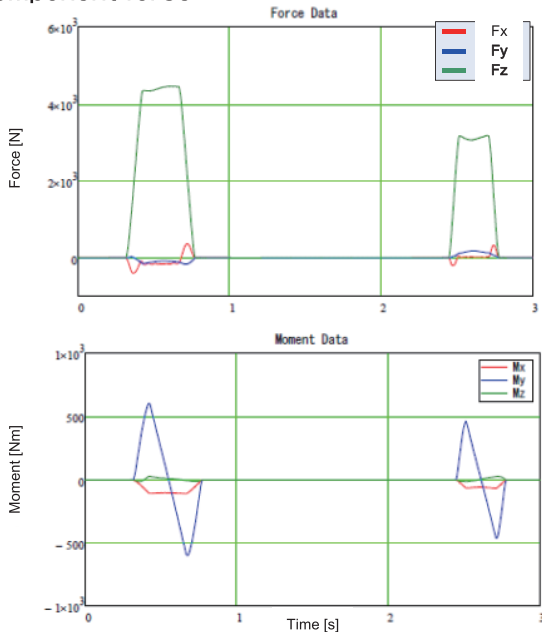
Build up sensor

PFS can be configured to large scale sensor by combining multiple sensing cells and work as one large 6 components force measurement system without degrading accuracy and other performances. Any size and capacity requirement can be supported. (Option)

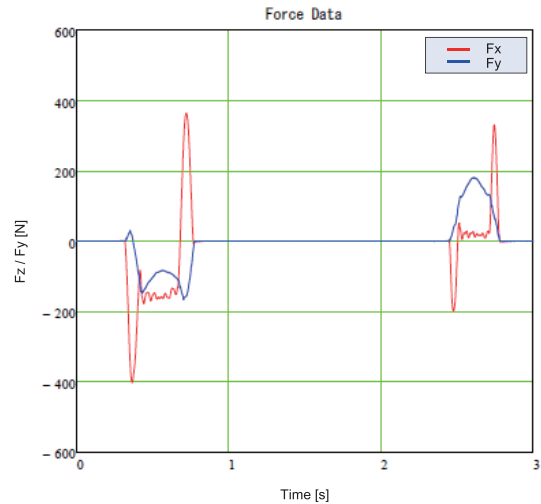


Measurement data

Vehicle coast down running (No acceleration) 6-component force



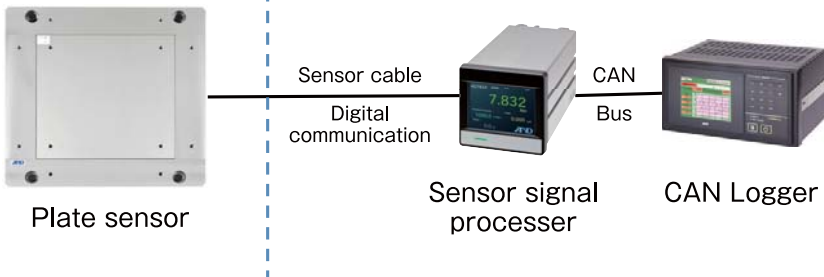
6-component force measurement data Longitudinal and lateral force



System configuration

Measurement site
Outdoor/Indoor

Measurement room
Indoor



Sensor signal processor AD7893

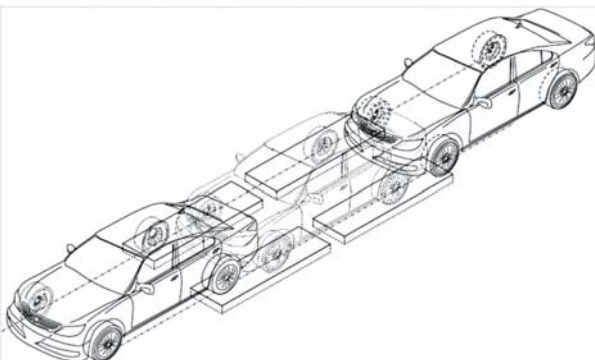
- Compact size
- High computing power
- Flexible I/O



Other applications

Wind force measurement at wind tunnel facility

Wind tunnel application for measuring aerodynamics forces. Four PFS are installed under each of the four tires. Measured data from four sensors can be combined together at SSP and calculate total wind force reaction of the vehicle. Measured data: Aerodynamic lift/pitch/roll/yaw, air resistance and wind force center.



Final car inspection

At the final inspection of newly manufactured vehicle, there are inspections for vehicle alignment, straight driving stability tests.

Driving the vehicle over the long PFS sensor can measure the alignment and stability of the vehicle with very little effort.

Sensor specifications

Items		Specification						Note
Method		Shear strain detection method						
Coordinate direction		X: Longitudinal direction						
		Y: Lateral direction						
		Z: Vertical direction						
Range	Fx	2 kN	3 kN	6 kN	3 kN	6 kN	15 kN	Range can be customized.
	Fy	2 kN	3 kN	6 kN	3 kN	6 kN	15 kN	
	Fz	3 kN	6 kN	12 kN	6 kN	12 kN	30 kN	
	Mx	0.7 kNm	1.0 kNm	2 kNm	1.2 kNm	2.4 kNm	6 kNm	
	My	0.7 kNm	1.0 kNm	2 kNm	1.2 kNm	2.4 kNm	6 kNm	
	Mz	1.0 kNm	1.0 kNm	2 kNm	1.2 kNm	2.4 kNm	6 kNm	
Sensor size		300 mm × 300 mm × 80 mm			400 mm × 400 mm × 86 mm			Size can be customized.
Overload capacity		150% for all component force						
Maximum load		200% for all component force						
Accuracy	Fx, Fy	0.05% R.C.						Including Non-Linear, Hysteresis, Repeatability
	Fz	0.03% R.C.						
	Mx, My, Mz	0.1% R.C.						
Temperature error	Zero	0.003%R.C./deg C						
	Span	0.003%R.C./deg C						
Temperature range for guaranteed results		-10 deg C to +40 deg C						
Operating temperature		-20 deg C to +80 deg C						

AD7893-PFS specifications

Items		Specification		Note
● Measurement/Calculation				
6-component force calculation		Digital model calculation		
Calculation sampling		10kHz		
Measurement items		X-force Fx(N), Y-force Fy(N), Z-force Fz(N), X axis moment Mx(Nm), Y axis moment My(Nm), Z axis moment Mz(Nm)		
Low pass filter		"4th Butterworth Selectable cut-off frequency (1/2/5/10/20/50/100/200/500/1000/2000/5000/None Hz)"		
● Display				
Display item		Measurement items mentioned above		
● Data output				
Output device		CAN		
Output sampling rate		Selectable from 1/2/5/10/20/50/100/200/500/1000 Hz		
● Exterior				
Dimension		W97mm × H97mm × L208mm		
Power supply		AC100V		DC12VAC adapter
Operating temperature range		5 to 40°C		
Operating humidity range		5 to 90%RH		No condensation
Weight		1.2kg		



Safety Warning!

● For proper use, read the instruction manuals carefully before use.

AND ...Clearly a Better Value
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● Appearances and/or specifications subject to improvement without notice.
● Contents of this catalog last updated January 2013.