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#AH127 - Precision Force Transducers

Force transducers are devices capable of transforming a force into a proportional electrical signal. The TSD125 series force transducer elements are cantilever beam load cells incorporating thin-film strain gauges. Because the strain elements have been photolithographically etched directly on the strain beam, these transducers are rugged while maintaining low non-linearity and hysteresis. Drift with time and temperature is also minimized, because the strain elements track extremely well, due to the deposition method and the elements close physical proximity.



Forces are transmitted back to the beam via a self-centering pull-pin to insure accurate force measurements. The cantilever beam is mounted in a sealed aluminum enclosure which includes a 3/8" diameter mounting rod for holding the transducer in a large variety of orientations.

Device	Full Scale Range (FSR)	10 Hz Noise	1 Hz Noise
TSD125C	50 gram	2.5 mg	1 mg
TSD125D	100 gram	5 mg	2 mg
TSD125E	200 gram	10 mg	4 mg
TSD125F	500 gram	25 mg	10 mg

Specifications

Nonlinearity:	+/- 0.025% FSR
Hysteresis:	+/- 0.05% FSR
Nonrepeatability:	+/- 0.025% FSR
30 Minute Creep:	+/- 0.025% FSR
Temperature Range:	-10 C to 70 C
Thermal Zero Shift:	+/- 0.03% FSR/degree C
Thermal Range Shift:	0.03% Reading/degree C
Recommended Excitation:	10 VDC (+/- 5VDC)

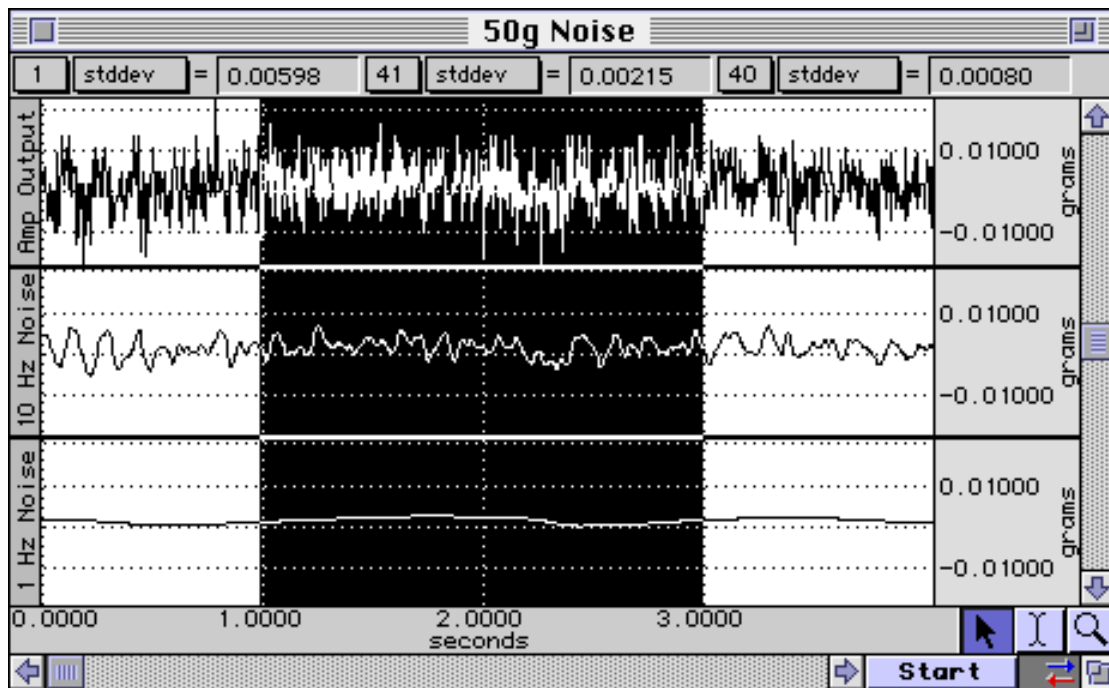
The following graphs illustrate actual data taken with the TSD125C (50 gram force transducer) and TSD125F (500 gram force transducer). The force transducers were connected directly to a DA100A amplifier with the excitation set to ± 5 Volts. The DA100A gain was set to 1000. The RMS noise output was determined by calculating the standard deviation of the amplified and calibrated signal over a period of time.

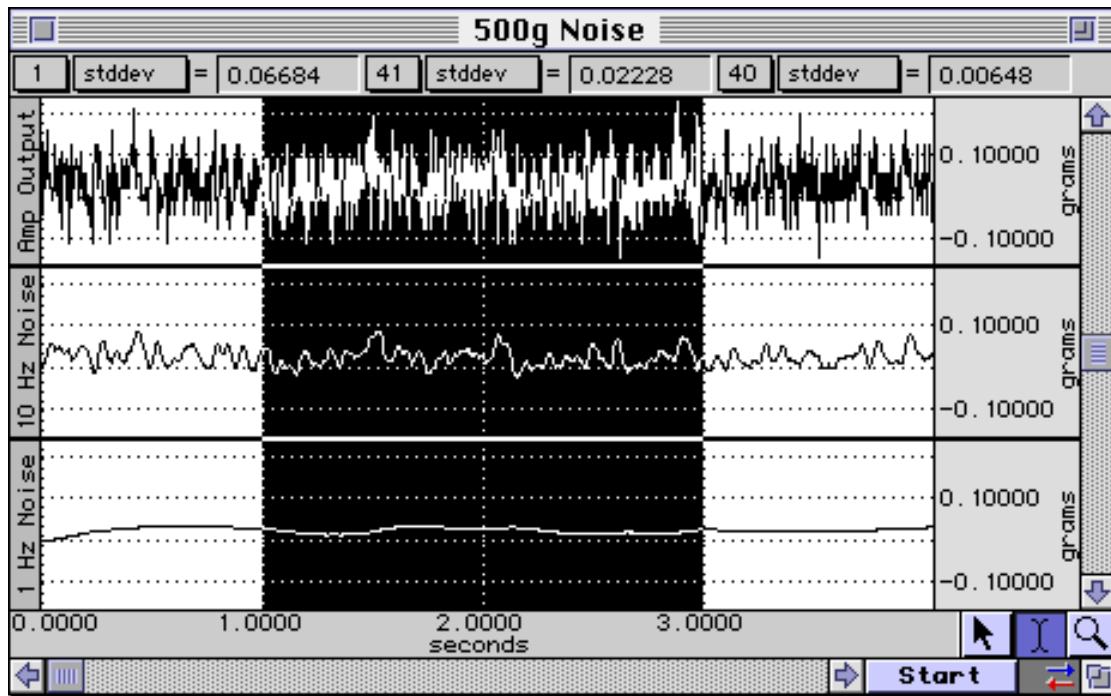
The RMS noise of each force transducer was determined in three different settings:

Channel 1: RMS Noise at DA100A output

Channel 40: RMS Noise after 10 Hz Low Pass IIR real time filtering

Channel 41: RMS Noise after 1 Hz Low Pass IIR real time filtering





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