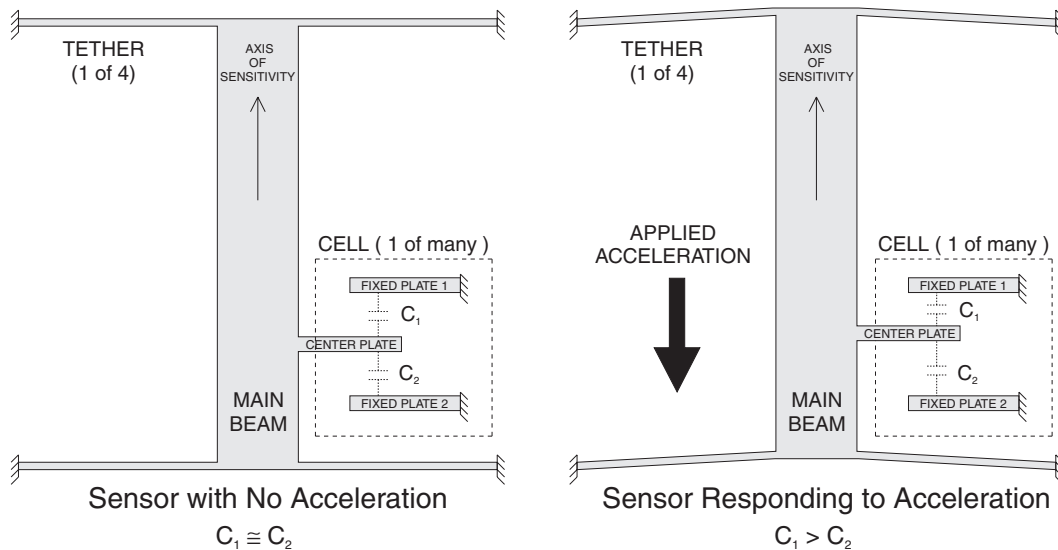


## Accelerometer Theory of Operation

Summit Instruments accelerometers employ polysilicon surface micro-machined sensors each capable of measuring positive and negative acceleration along one axis.

Each sensor consists of a tethered main beam with center plates at right angles to the main beam as shown in the following diagram.



Each of the center plate fits between two adjacent fixed plates, forming a capacitive divider. The two fixed plates are driven with an equal amplitude but opposite polarity square wave signals.

With no acceleration, the two capacitances are approximately equal and the center plate will be at approximately 0 volts. Any applied acceleration causes a mismatch in plate separation which results in greater capacitive coupling from the closer fixed plate; a voltage output can thus be detected on the center plate. The acceleration signal is contained in the phase relative to the driving signal, thus a synchronous demodulator technique is actually used to extract the relatively low frequency acceleration signal.

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