



NanoScanTechnologies
Reasoned innovations

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Double Cap Technique

Capacitance sensors are mostly used as translation sensors, in various positioning systems. It is quite simple and cheap. Typical system is drawn in pic 1. One capacitance (C1, or C2) is normally used for displacement measurement, signal are being processed with PID controller, and calculated force are being applied to control object. Quite big disadvantage is nonlinear response from sensors(pic 2. C1(x) dependence, or C2(x)), it can

be written as $C(x) \sim \frac{1}{x}$, this dependence causes

different sensors response at the beginning and end of the translation range, up to 10 times which leads to problem with PID controller tuning, and different resolution (accuracy), it means quite big translater non-uniformity. **Nano Scan Technologies** uses advanced technology based on two sensors measurement, which arranged at opposite sides of the scanner. When first capacitance is increasing, another is decreasing. This can be written as following

dependence: $\Delta C \sim \frac{1}{X} - \frac{1}{X_0 - X}$; You can

see this dependence at Pic. 2. Linearity of this curve is much better for system linearization, response difference is much smaller, just 2 times, scanner becomes more uniform in resolution and linearity terms. This technology is using in all our scanners, Ratis model.

