

## Application Note

### Subminiature LVDTs Provide Accurate Flight Control Surface Position Feedback on UAVs

Unmanned Autonomous Vehicles (UAVs), or Drones as we have come to know them, are playing an ever increasing part in US national security. These high-tech, complex aerial platforms, controlled by a crew miles away, are multi-mission capable, with roles such as aerial reconnaissance, combat weapons platforms, battlefield theater command and control oversight, or as an unmanned in-flight refueling station.

The complex systems employed on UAVs use a myriad of electronic sensors for precise control and feedback. To control the UAVs' attitude (pitch, roll and yaw), actuators are used to exert forces on the flight control surfaces. The precise measurement of the position of these actuators is crucial in maintaining the proper flight path.



The sensors used to measure actuator position need to meet three essential criteria; high accuracy, high reliability and lightweight. All three of these attributes can be found in the [XS-B Series Subminiature LVDT](#).

Measuring less than 2 inches in length, and with a diameter of just 0.188" (4.77mm), the XS-B Series LVDT has become the sensor of choice for numerous manufacturers of UAVs. The 0.5% linearity satisfies the accuracy requirements of most applications. The totally non-contact design eliminates wear related issues, while the time proven/highly reliable coil design affords worry free operation near or exceeding 1 million hours. Environmentally, the XS-B shock survival rating of 1,000 g's, vibration tolerance of 20g's up to 2kHz, and operating temperature range of -67°F to +428°F (-55°C to +220°C), meets or exceeds industry requirements. The corrosion resistant Kovar housing provides dependable mounting.



The *XS-B Series Subminiature LVDT* is available in standard stroke ranges of  $\pm 0.10"$  ( $\pm 2.54\text{mm}$ ) and  $\pm 0.25"$  ( $6.35\text{mm}$ ), with custom designs available in extended ranges.