

Precision Measurement News

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In This Issue

LSO Series: the Industry's Most Rugged, High-Precision Servo Inclinator with 0.1 Arc Second Resolution



Sherborne Sensors LSO series is a range of rugged, high-precision gravity referenced servo inclinometers,

offering resolution to 0.1 arc second (0.00003 degrees), with a variety of features for exceptional reliability within demanding industrial and military environments, the product offers:

- Available ranges from $\pm 1^\circ$ to $\pm 90^\circ$
- ± 5 VDC or 4-20mA output
- Electrical terminations via six-way connector LSOC or solder pins LSOP
- Fully self-contained and able to connect to a DC power source and readout or control device, to form a complete tilt measurement system
- Environmentally sealed to IP65
- Operable temp range -18 to +70°C
- 1500g shock survivability

Recommended accessories include an optional mating connector, [DTI series](#) digital display

[LSO Series: the Industry's Most Rugged, High-Precision Servo Inclinator with 0.1 Arc Second Resolution](#)

[Testing & Calibration Services](#)

[Capabilities Focus: Custom Designed Inclinator and Tilt Measurement Systems](#)

Capabilities Focus: Custom Designed Inclinator and Tilt Measurement Systems



With our extensive in-house engineering capabilities, **Sherborne Sensors** offers not only a large range of standard sensors but also unique expertise in the design,

development and manufacture of precision custom inclinometers and tilt measurement systems that meet specific customer application and conformance requirements. This brief shall be the first in a series of Precision Measurement News articles, highlighting our unique specialty and bespoke capabilities within these and other measurement areas.

indicator and power supplies [XT-0102](#) and [XT-0103](#). All [LSO series](#) inclinometers are 100% tested and calibrated at the factory prior to shipment, and are accompanied by a two-year comprehensive warranty and are included under our new Guaranteed On-Time Delivery program.

With its robust design and exceptional measurement capabilities, the [LSO series](#) is particularly well-suited for a wide range of applications, including bore-hole mapping, dam and rock shifts and other geophysical, seismic and civil engineering studies; ballast transfer systems for offshore barges, ships and marine applications; level control and calibration systems; pipeline leveling and setting tilt of grading machines; large machinery installation and other electronic level applications; railway track monitoring; and train tilt and braking control applications.

To discuss whether your specific application requirements might be a good fit for the [LSO series](#), please contact our North American sales and distribution center on toll-free (in the US) at (877) 486-1766, corporate headquarters at +44 (0)870 444 0728; via email at sales@sherbornesensors.com, applications@sherbornesensors.com or visit www.sherbornesensors.com.

Testing & Calibration Services

Periodic recalibration of precision measurement instrumentation is recommended to ensure product performance accuracy, while extending useful service life. Recalibration is particularly important for sensors that are continuously deployed in challenging environments. Sherborne Sensors offers full in-house recalibration services for all types of inclinometers, accelerometers, force transducers and load cells, both Sherborne Sensors product and other manufacturers' models, within the ranges defined below:

Inclination: $\pm 360^\circ$ to within 5 seconds of arc

Acceleration: Up to $\pm 20g$ to within 0.001g

Force/Load: Tension and Compression 10 gm (0.35 oz) to 300 tonnes (660,000 lbf)

While it is recommended that sensors receive recalibration every 12 months, certain factors, as detailed below, may suggest the need for more or less frequent service:

- Environmental conditions
- Frequency/duration of use

Inclinometers

The **Sherborne Sensors** standard product range includes gravity referenced servo inclinometers, oil damped servo inclinometers, piezoresistive advanced MEMS based solid state inclinometers, and capacitance based clinometers. Resolution can be achieved down to 0.1 arc seconds, with ranges from $\pm 1^\circ$ to $\pm 90^\circ$. Here are just a few examples of the field-proven customer product modifications available:

- IP68 sealed enclosures (dustproof and waterproof under extended immersion)
- Wireless connectivity
- Specialty cable types and lengths
- Electronic low-pass filters, to achieve specific output frequency characteristics
- Mechanical damping of servo mechanisms with specialized fluids, to address specific environmental shock and vibration considerations
- Specialized voltage input and output
- EMC/RFI radiation and emissions shielding
- Performance characterization over specific temperature ranges
- Electronic stress screening (ESS), to eliminate premature component field failure
- Specialized connectors (including airborne, MIL-SPEC, EMC and water resistant)
- Mounting of multiple individual sensors within specialized enclosures
- Specialized exterior finishes
- Multi-axis sensors, housed in both standard and specialized enclosures
- Complete, fully calibrated tilt and level measurement system offerings, to include sensors, displays, power supplies and data storage

We look forward to hearing from you to discuss your specific application requirements, which may incorporate these features, or others not listed here. To locate your nearest authorized **Sherborne Sensors** representative, please contact our North American sales office toll-free (in the US) at (877) 486-1766, corporate headquarters at +44 (0)870 444 0728; via email at sales@sherbornesensors.com, applications@sherbornesensors.com or visit our website at www.sherbornesensors.com.

- Level of accuracy required
- Importance of measurement data
- Company quality assurance (QA) procedures
- International/national/local regulations

Specialized calibration engineers, under the direction of the **Sherborne Sensors** Quality Department, perform all recalibrations, following internationally recognized procedures. A test report is produced, which defines product reference, serial number, listing of all certified standards, as well as certification numbers and a chart of all measured values and related errors. Environmental conditions during recalibration are also clearly defined, including temperature, humidity and gravity. In cases where a transducer is showing performance after recalibration that is below original specification, a defect report will be issued, highlighting the deviation and, where appropriate, a cost to bring performance back to its original specification. Finally, all Sherborne Sensors recalibrated transducers are supplied with a calibration certificate, traceable to international standards.

In addition to recalibration, sensors and indicators are also routinely pre-calibrated at the **Sherborne Sensors** facility, complete with connector/cable/accessories already fitted and - where applicable -pre-programmed display instrumentation, to form a complete measurement system with optimal performance characteristics. An overview of standard system level components and accessory offerings may be found on our website, at www.sherbornesensors.com or you may contact our North American sales office toll-free (in the US) at (877) 486-1766, corporate headquarters at +44 (0)870 444 0728; via email at sales@sherbornesensors.com, applications@sherbornesensors.com.

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