

## Precision Measurement News November 2011



### Sherborne Sensors Launches LSW Gravity-Referenced Servo Inclinometer

It has been an exciting few months at the Sherborne Sensors' factory, and particularly so with the launch of the LSW series, a family of rugged, high-precision inclinometers.

Designed for use in demanding all-weather applications, the LSW is available in angular ranges  $\pm 3^\circ$  to  $\pm 90^\circ$ , is extremely robust and can operate in temperatures ranging from -4 to 158 degrees Fahrenheit. The sensor is also designed to survive shock levels up to 1500g and is utilized in physically challenging environments or where high levels of shock and vibration are present. For example, the LSW series is typically deployed in offshore industries, military, civil engineering, geophysical and seismic studies; together with bore-hole mapping and the monitoring of dam or rock shifts.

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### Specmanship vs. Reality

When it comes to specifying a sensor nothing is more paramount than its accuracy and its precision and it is critical to recognize the fundamental differences between the two. This can prove to be a difficult task for the specifier so our Managing Director, Mike Baker, wrote an article on this which you may like to read in the November issue of industry publication [Sensors](#).

Accuracy, a qualitative concept, indicates the proximity of measurement results to the true value, while precision reflects the repeatability or reproducibility of the measurement.

### Top Tips for the Specifier

- Repeatability is the single most important sensor performance parameter; without it no amount of compensation or result correction is going to be meaningful.
- Consider the environmental temperature range within which the sensor will operate. Thermal errors, particularly those associated with the zero output of the sensor, will dominate.
- Do not overspecify the operating range of the

Additional features of the sensor system include a durable stainless steel case, weatherproof to IP67 and resistant to immersion in water. Also featured is a field replaceable weatherproof moulded IP68 connector/cable system, which enables the LSW to connect to a DC power source and readout for a complete operating system.

Sherborne Sensors can customize all of its inclinometers' designs and manufacture to conform to specific customer requirements. For more information on the LSW series click [here](#).



## Rediscovering Existing Technologies In The Shipping Industry

"...Foul-cankering rust the hidden treasure frets,  
But gold that's put to use more gold begets..."

William Shakespeare, Venus and Adonis

Sensors serve a critical purpose in the shipping & marine industry to ensure accuracy, reliability, efficiency and communications capability. Our VP of Business Development, Jesse Bonfeld, recently wrote an article examining some of the applications served by sensors in this industry which you may like to read in [Supply Chain Digital](#).

The requirement for ultra-reliability and long-life precision sensors in the shipping & marine industry and the continued innovation in sensors technology has ensured a thriving market and growing demand for custom solutions. However, with spending budgets under more pressure than ever, major benefits can be gained by re-opening existing, field-proven technologies and using those funds that remain available for research and development to bring old technology up to date with today's standards. Existing inertial sensors supporting applications in the shipping & marine industry include:

sensor "just to be safe." Manufacturers state the sensor's safe over-range limits and these should be sufficient in themselves. By overspecifying your sensor, you will reduce its signal magnitude and zero-based errors will increase as a percentage of the measurement range.

- Do not confuse resolution with accuracy- they have no relation to one another.

- If the sensor is to be used long-term, consider the effect of the sensor's long-term stability. Progressive deterioration in sensor characteristics can have disastrous consequences and this emphasizes the need for periodic recalibration. Typically, 12 months is an acceptable recalibration period, but you will have to consider both the operating environment and the consequence of the sensor reporting inaccurate data.

- For any given application, calculate the total error that can be expected from the sensor by referring to the data sheet performance parameters, being careful to include only those that are pertinent to the specific application.

Ultimately, to avoid costly errors, you must take out a careful study of the accuracy parameters pertinent to your particular application before you select a sensor. An error or misjudgment at the outset may prove very costly indeed.



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## Quick Links

**Inclinometers** - Monitor how much a vessel is pitching or rolling. If a ship tilts excessively in an active wave environment then it could lead to a ship capsizing. The accuracy, repeatability, and robust design of these sensors allow owners and operators to extend the ability to work at or near the limit of their equipment, maximizing profitability, minimizing downtime, and maintaining the highest possible productivity. The depth of offshore oil wells is now well beyond five miles and the leveling of these structures relies heavily on the tilt information obtained from precision inclinometers. These technologies ensure stability, control and accurate positioning.

**Load cells** - these convert a force into an electrical signal and offers measurement of tension, compression and shear forces. In the marine industry they are often used for hoist loads, platform retention, towing forces and mooring loads and systems.

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