Watson Industries Application Notes

Buoy and Current Monitoring

When a scientific data monitoring sensor is placed into a buoy, a reliable device that can remain in the field for many months at time is needed.

Selecting a sensor for a buoy or current monitoring package can be a difficult task. This is especially true when the device is to be used at high magnetic latitudes near the north pole.

Watson Industries manufactures the SHR series of strapdown heading reference sensors that are well suited for this application. The SHR-360 provides the accurate heading data that is needed for current monitoring. Additionally, the SHR can output bank, elevation, X, Y and Z acceleration and X, Y and Z magnetometer data if requested.

Technical Challenges:

There are several challenges that are involved with deploying a sensor for months at a time in a buoy. A good sensor calibration system is necessary. This is because the sensor must resolve signals that are smaller than the magnetic field of the buoy. It is essential that the sensor be highly reliable because the device will not be able to be maintained. Low power consumption is also a must for similar reasons. The lower the power usage, the smaller the package can be as a whole, and the longer the package can remain deployed. Any installation at high magnetic latitudes makes sensitivity a major issue since a small error in detecting the magnetic field can result in major changes to the heading output data.

The Watson SHR has one of the best magnetometers on the market. The primary concern is finding the best mounting location on the vehicle. See our magnetometer mounting location paper online at www.watson-gyro.com for more information on finding the best location. We also provide free software for calibrating the magnetometer after it has been installed to help to remove any remaining heading errors that may result from its mounting environment.

Watson Experience:

Watson Industries has been manufacturing SHR heading references for this application since 1998.

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Requirements:

- Bank: ±1° accuracy
- Elevation: ±1° accuracy
- Heading: 2° accuracy at 88° inclination
- Installation magnetic calibration

Applicable Products:

- SHR-360
- SHR-S360
- SHR-E360

Typical Options:

We are able to accommodate your custom needs. Shown below is a listing of our most common custom modifications.

- Custom specifications – For certain applications, customers require specifications that are different from our standard units. Watson Industries engineering is willing and able to accommodate these needs.
- Input Voltage – Many different input voltages can be accommodated.
- Output Format – Communications Protocols RS-232, RS-485, RS-422, USB, Syncro.
- Data Format – We have made many products with custom formatted data outputs.
- Sensor Ranges – The ranges for most of our sensors can be expanded or reduced to meet your requirements.

Options specific to this application:

- Sleep Mode – We can minimize power consumption even further by adding a sleep mode to the sensor.
- Package Configuration – This unit can be repackaged to fit different profiles including installation inside a pressure vessel.

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