



Watson Industries Application Notes

Marine Communications Satellite Tracking

A ship rolling and pitching in the sea proves to be a difficult dynamic environment. Satellite antennas in such applications require stabilization in order to accurately receive or transmit data. These antennas can only accommodate a small amount of pointing error before being rendered unable to communicate with the satellite.

In the past, many types of gyros have been used for this application, with varying degrees of success: e.g. dynamically tuned gyros are very stable, but have reliability problems; fiber optic gyros have been used, but stability in the environment is an issue.

Watson Industries manufactures a stabilization system that is reliable and provides accurate performance while operating for extended times in an extreme environment. The ARS-E322-1A/80 provides accurate triaxial rate data as an analog voltage and a digital RS-232 signal.



Technical Challenges:

Reliability and accurate rate output over long operating periods are the primary obstacles to providing gyros for this application.

Watson Industries has built algorithms into our gyro packages that actively correct for errors. This operation will keep the gyro accuracy well within requirements for the life of the product.

Watson Experience:

Watson Industries has built gyro packages for this application since 1982.



Watson Industries, Inc.

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Requirements:

- Low Noise: <math><0.03^\circ/\text{sec}</math>
- Wide Bandwidth: 80Hz
- Rate Range: $\pm 50^\circ/\text{sec}$
- Shock: 200G
- Vibration: 5G RMS
- Operating Temperature: -28°C to $+50^\circ\text{C}$

Applicable Products:

- ARS-E322-1A/80
- ARS-E322/222

Typical Options:

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

- Digital velocity input – Watson can support digital velocity inputs in many formats such as GPS and Airspeed Indicators.
- External GPS reference – We have built custom units that utilize GPS data as a reference.
- 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.

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