WHITE PAPER

Tugboat Drive Torque

Torque data from an offshore tugboat's main propeller driveshaft

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Application: Tugboat Drive Torque

Torque data from an offshore tugboat's main propeller driveshaft

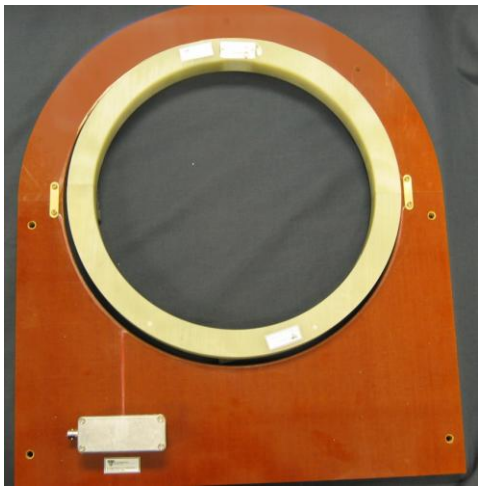
Industry: Marine

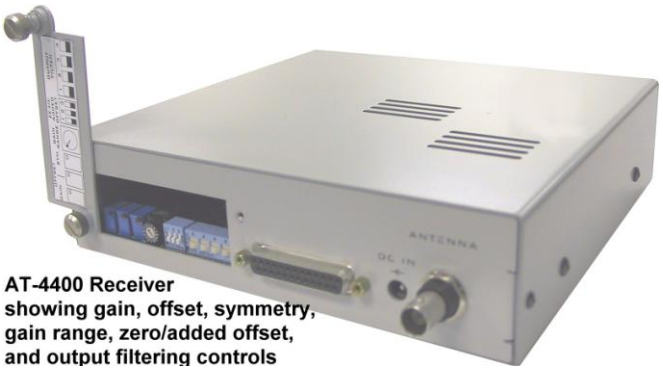
Product: AT-4400

Parameters measured: Torque

Torque measurement equipment on shipboard apparatus needs to be easily installed, highly reliable, and require little or no maintenance. An AT-4400 16 bit digital telemetry system was chosen for monitoring torque from a 12.5" diameter main driveshaft during studies of an offshore tug's engine efficiency (gas mileage). The telemetry system used induction power to eliminate any needs for replacing batteries. The 16 bit digital data provided dependable high signal integrity, high resolution data to the user. Digital data was transmitted back to a remote Receiver via the induction power cable; the Receiver supplied 0 +/- 10V data to the user's data acquisition and analysis system, which used the torque and other sensor data to compute engine operational efficiency.

The AT-4400 uses precision instrumentation amplifiers, anti-alias filtering and a 16 bit high resolution digitizer to capture on-rotor torque signals at a rate of 26,495 samples per second. The digital data (which is naturally very EMI resistant) is decoded at the remote receiver to an analog output signal. The AT-4 provides user-adjustable output stage amplification and filtering for further user flexibility.





AT-4400 Receiver showing gain, offset, symmetry, gain range, zero/added offset, and output filtering controls

The picture on the left shows an AT-4400 split clamp-on collar for the 12.5" main drive shaft. For ruggedness, a phenolic stationary pickup coil was used (mahogany colored outer shape). A tuning enclosure can be seen on the lower left. A rear view of the Receiver is shown on the right. The Receiver's front panel has the on-the-fly shunt calibration switch.

The AT-4400 can be also be supplied in component form for center of shaft mounting.

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