WHITE PAPER

High RPM Shaft Torque Measurement

Torque telemetry of a strain gage signal at 17000 RPM

ACCUMETRICS INC.
A PCB GROUP COMPANY

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Application: Aerospace High RPM Shaft Torque Measurement

Wireless torque telemetry of a strain gage signal at 17000 RPM

Industry: Aerospace

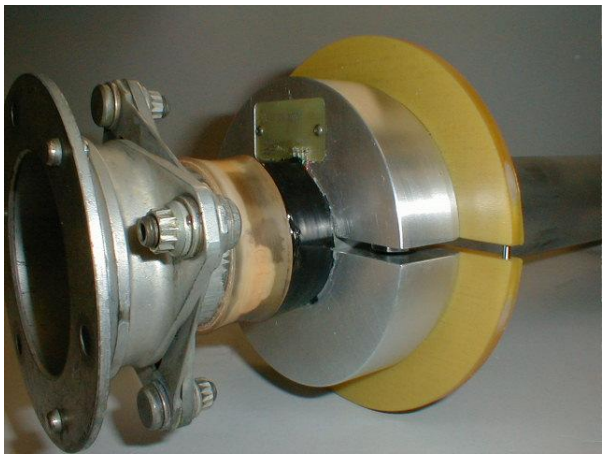
Product: AT-4000 (legacy 12 bit system—see the new 16 bit AT-4400)

Parameters measured: Torque

When the Naval Air Depot needed to measure torque on a 2" shaft OD running at 17000 RPM, Accumetrics was chosen. A metal clamp collar incorporating insulated disks for induction power was used. The system provided continuous digitizing at a rate of 26485 samples/sec of 12 bit data (note: the Accumetrics AT-4400 now provides the same sample rate for 16 bit data). The system provided greater accuracy and less EMI susceptibility than legacy FM telemetry systems.

Benefits:

- Metallic collar design for high G force
- Induction powered- no batteries
- EMI resistant digital telemetry
- Anti-aliased data
- Precision measurements with good bandwidths
- No slip rings; nothing to wear or maintain



The picture shows an aluminum clamp collar securing the Transmitter's single channel electronics module to the high speed shaft. To couple power to the rotating transmitter (and to retrieve the digital data stream coming back to the Receiver), a glass laminate assembly (larger diameter yellow disks) is interconnected to the aluminum collar. A simple pickup loop (not shown) was used to provide the power and data connection to a Receiver located 24 feet away.

Note: The AT-4000 12 bit system has been updated to the AT-4400, providing 16 bit digitizing at 26485 samples per second and unparalleled accuracy.

The AT-4400 can also be configured as an individual cylindrical transmitter module for center-of-shaft mounting.

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