AT-5000 EasyApp
Battery Powered Rotor Telemetry System

Applications
- Torque testing for half-shafts / propshafts and driveshafts
- Replacement of slip rings and in-line torque transducers
- Torsional strain testing
- RTD temperature measurement
- Voltage measurement

Highlights
- Easy application and installation
- Small size – typically requires only 0.7 to 0.9 inch (17.78 to 22.86 mm) radial shaft clearance
- Long battery life – 150 hours for 1000 ohm strain gage; 50 hours for 350 ohm/operation
- Digital telemetry
  – high data integrity and noise immunity
  – exceeds legacy FM telemetry and slip rings
- Two systems (Channel A and B) can be used side-by-side for multi-channel requirements
- Manual shunt calibration invoked at transmitter

A replacement for slip rings and legacy FM telemetry
A revolutionary advance in miniature telemetry, the AT-5000 series replaces slip rings and legacy FM telemetry, offering a perfect solution for applications requiring dependable data retrieval and easy installation.

The AT-5000 EasyApp utilizes a small battery powered transmitter mounted using an aramid fiber strap to directly measure, digitize, and transmit true torque data from rotating halfshafts, driveshafts and rotors of all sizes and speeds. The system is also used for temperature, voltage, and acceleration sensing.

How it works:
The AT-5000 EasyApp uses a long life lithium battery to excite a strain gage, and to power the AT-5000 telemetry electronics on the rotating shaft. The small signal resulting from torque applied to the shaft is amplified, anti-alias filtered and digitized (typically at 11718 samples per second). The digital data is reliably RF transmitted off the rotating shaft to a nearby pickup coil, which is connected to a Receiver. The Receiver converts the digital data to an analog voltage output (adjustable from 0 +/- 1.0 to +/- 10 volts). This DC to 1 kHz (or optionally higher) bandwidth voltage output can be fed directly to a data acquisition system, FFT analyzer or an oscilloscope.

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Transmitter Modules - Sensor Inputs

Three transmitter modules are available:
1. **Full Bridge Strain Gage**: Including other bridge-style transducers, including pressure transducers, resistive accelerometers, load cells, torque transducers, etc.
2. **Temperature**: Type K thermocouple is standard. Standard range is -58 to 750 °F / -50 to 400 °C. RTD sensors can also be used; contact Accumetrics.
3. **Voltage**: 0 to 100 mV. External voltage divider can be provided for high voltage measurement. **Voltage**: Up to 2700 V measured with optional external dropping resistor

Channel A
- Transmitter: 7812 samples per second; DC to 1.2 kHz frequency response; 4 MHz transmitter.

Channel B
- Transmitter: 11718 samples per second; DC to 1.2 kHz frequency response; up to 5 kHz bandwidth available; AC coupling also available.

Transmitter Module Specification
- Non-linearity: <0.1% of full scale (typical).
- Digital Resolution: 12 bits (0.025% of full scale).
- Gain Drift: 100 PPM/°C typical, exclusive of external gain resistor.
- Offset Drift: 0.7 μV/°C typical (0 - 85 °C).
- Bandwidth: DC to 1.2 kHz (up to 5 kHz bandwidth available; AC coupling also available).
- Power: Typically <4 mA current draw from 3.6 V battery, excluding sensor excitation.
- Temperature: -40 to 185 °F / -40 to 85 °C. High Temperature option is available.

Specifications are provided for a 2.81 mV/V typical input.

Battery Specifications
- Battery Voltage: 3.6 volt open circuit; 3.4 volts loaded. Low battery indication is transmitted to receiver at approximately 2.7 volts.
- Bridge Excitation: 2/3 length AA; Single use Lithium battery. Note: Non-rechargeable batteries. Do not store or use in applications with exposure to >302 °F / 150 °C temperatures.
- Battery Life: 50 hours for 350 ohm strain gage, 150 hours for 1000 ohm strain gage, 250 hours for thermocouple use. (Continuous use).

Receiver Specifications
- Power: 12 Volts Nominal (9 to 18 VDC). Optional AC power supply 90-240 VAC, 12 VDC output.
- Output Range, Output Signals, and Adjustments: ±10 Volts. Output gain can be adjusted to allow lower outputs (i.e., 5 volts). RSSI (Received Signal Strength Indicator) -2 to +4 Volts (antenna signal strength). Zero adjust, Gain adjust, and Unipolar/Bipolar output selection.

Dimensions
- NEMA style box: 3” x 6” x 4.25” height / width / depth
- Temperature: 32 to 125 °F / 0 to 50 °C

Pickup Coil Choices
- Flexible Loop: 24” / 610 mm ID includes 10 ft cable to receiver.
- Rigid Brass Loop: Rugged 1/4” brass loop. 1.25” x 1.61” x 2.94” phenolic base. Includes 10 ft cable to receiver.
- Miniature Stub: Potted ferrite stub pick up with integral 10 ft cable. For small diameter 0.9” to 2” max / 22.86 mm to 50.80 mm shafts.

About Accumetrics:
Accumetrics Inc., was founded in 1992, and became a part of the PCB Group in 2013. The company designs and assembles digital telemetry systems that transmit sensor data from rotating structures using wireless techniques, preserving the integrity of the data even in environments with high levels of electromagnetic interference.

We can provide a range of solutions from single channel products, such as strain gage torque measurements, to advanced multichannel systems that transmit data from hundreds of sensors.

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