



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
- 95 hours for 1000 ohm and 75 hours for 350 ohm strain gages, continuous use
- 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 half-shafts, 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.



AT-5000
EasyApp System



Technical Specifications

Model Number AT-5000

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 measure with optional external dropping resistor

Transmitter Modules - Sampling Rate / Typical Bandwidth

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 (DC to 5 kHz available); 6 MHz transmitter frequency. (Channel A and B units can be co-located for 2-channel use.)

Transmitter Module Specification

Non-linearity	<0.1% of full scale (typical)
Digital Resolution	12-bit (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	95 hours for 1000 ohm and 75 hours for 350 ohm strain gages, 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 76.20 mm x 152.40 mm x 107.45 mm
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

Housing Chart



Transmitter for > 0.9"/22.86 mm Diameters		Transmitter for > 2.0"/50.8 mm Diameters		Transmitter for > 8.0"/203.2 mm Diameters	
Radial Height	0.78" to 0.87" / 19.80 mm to 22.10 mm	Radial Height	0.67" to 0.76" / 17.00 mm to 19.30 mm	Radial Height	1.0" to 1.1" max / 25.40 mm to 27.95 mm
Axial length	2.0" / 50.80 mm	Axial length	2.0" / 50.80 mm	Axial length	2.0" / 50.80 mm
Weight	0.185 lb / 0.085 kg	Weight	0.152 lb / 0.067 kg	Weight	0.233 lb / 0.11 kg



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About Accumetrics:

Accumetrics, Inc. provides digital telemetry systems used in a variety of applications such as aerospace, marine, defense, agriculture, transportation, milling operations, energy, and power generation. Systems transmit sensor data from rotating structures using wireless techniques, preserving the integrity of the data even in environments with high levels of electromagnetic interference. Measurement solutions range from single channel products, such as strain gage torque measurements, to advanced custom multichannel systems. Accumetrics, Inc. is a subsidiary of PCB Piezotronics, Inc., and PCB® is a wholly owned subsidiary of MTS Systems Corporation. Visit Accumetrics at www.accumetrix.com. Additional information on MTS can be found at www.mts.com.

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