



AT-4500 EasyApp

Induction Powered Rotor Telemetry System

Applications

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

Highlights

- Simplicity - easy to install and operate
- Capable of high g-force applications
- Small size - transmitter typically requires less than 1.4"/35.56 mm of radial shaft clearance
- Environmentally rugged transmitter, mud/ice/splash resistant
- Digital Telemetry - high data integrity and noise immunity
- Induction power for continuous use without batteries
- Easy-to-apply aramid fiber straps for most shaft diameters
- A single transmitter can be reused on varied shaft sizes
- Excellent rotor-to-pickup-coil movement tolerance
- High precision/low noise measurements, 16 bit resolution
- High sample rate (26484 Sa/sec) with bandwidth up to 8.3 kHz
- Remote shunt calibration control
- Adjustable analog voltage output (factory setting $\pm 10V$ full scale)



The AT-4500 EasyApp system is a rugged, high bandwidth, high speed, 16 bit rotor telemetry system primarily used for full bridge strain gage torque measurements, but it can also be used for rotor voltage and RTD temperature signals. This system is easily installed, without any shaft modification, using an aramid fiber strap. Using wireless technology, sensor data can be directly acquired for broadly varied applications -- from vehicle drive shaft torque to large generator excitation voltage.

How it works:

A set of coils (one inside the transmitter, and one stationary loop coil) induce power across an air gap, for both sensor excitation and for powering the telemetry transmitter. The rotor sensor or voltage signal is amplified, anti-alias filtered and then digitized. EMI resistant digital data is transmitted off the rotating shaft to the pickup coil, which is connected to the receiver by coaxial cabling. The receiver converts the digital data to high bandwidth analog voltage output (adjustable from 0 +/- 1.0 to +/- 10 volts). The voltage output signal is then connected to the user's data acquisition system. Rotation is not required for system to operate.



AT-4500 Transmitter



Receiver front / back

Technical Specifications

Model Number	AT-4500	
Digital Sampling	16 bit resolution; 26484 samples per second continuously	
Bandwidth	DC to 2 kHz standard transmitter anti-alias filter setting Optional: DC to 10 kHz, and/or AC coupled input (2.8 Hz -3dB typical)	
Zero Drift	.001%/°F	
Gain Drift	.001%/°F	
DC Resolution	<.003% of full scale	
Noise Spectral Density	<.0005% of full scale per $\sqrt{\text{Hz}}$ typical (of signal at transmitter input, at ± 2.778 mV/V range)	
Linearity	.05% of full scale	
Full Scale Input-strain gage	1.51, 2.78, 5.55, 9.09 mV/V full scale input range.	
Full Scale Voltage/ RTD	Voltage: mV to 100 V peak (or 2700 V with use of 32 to 355 °F optional HV voltage dropping assembly cable); RTD: 0 to 180 °C	
Strain Gage (Note: the strain gage is not included; contact Accumetrics for strain gaging if needed)		
Bridge Resistance	350 or 1000 ohms preferred.	
Bridge Excitation	5 VDC (ratiometric signal measurement is used)	
Shunt Calibration	Unipolar shunt calibration may be invoked from the receiver at any time	
System Outputs and User Adjustments		
DC Coupled Voltage	Adjustable (optional) receiver output corresponding to a full scale signal sensor input.	
AC Coupled Voltage	Optional AC coupled secondary output. High pass filtering: 5 to 725 Hz. AC output gain: 1 to 9X	
Frequency Output	(Optional) 10 kHz ± 5 kHz can be provided as an analog signal alternative to voltage output data	
Output Filter	2000, 1000, 200, 20 and 2 Hz output filtering selectable. (Optionally, up to 8.3 kHz bandwidth)	
Output Gain	User selectable factors of 0.25 to 1.5x	
Zero (offset)	Trim pot and coarse adjustment total of $\pm 40\%$ of full scale range	
Symmetry	Trim pot adjustment $\pm 0.5\%$ of full scale + or - single side adjustment range	
Shaft Diameter Range	2" / 50.8 mm and greater to large shaft outside diameters by varied strap lengths (smaller ODs if used with optional shims)	
Transmitter Mounting Requirements	Radial height needed above shaft (including strap and tightening yokes, but not including stationary pickup coil <1.4"/35.56 mm typical. Axial length required: 1.81"/46.0 mm)	
Airgap Spacing (Typical) to Pickup	Radial air gap 0.5-1.0"/12.7 to 25.4mm, depending on application	
Cables	<ul style="list-style-type: none"> - Strain gage input cable (quantity 3 supplied): 6"/152.4 mm long, 26 AWG TFE, with 4 position 0.100" header - Receiver to Tuning Enclosure: two 24 foot coaxial cables (Data: BNC connector, RF power: TNC) - Tuning enclosure to Pickup Coil: two 8 AWG Litz wires (in one cable sheath), 10 foot long - Contact factory if longer cables are required 	
Power and Data frequency	Power: 106 kHz (rectified by transmitter to provide 5 VDC on rotor). Data: 13.56 MHz	
Receiver Dimensions	3.0" x 10.5" x 7.1" height/width/depth (76.2 mm x 266.7 mm x 180.3 mm)	
Power for the Receiver	9 to 15 VDC input, 30 watts.	
Receiver Accessories	Mains: 90-264 VAC 47-63 Hz to included 12 V 5A in-line power supply	
Receiver Indicator LEDs	AC Power: Yellow; Shunt Calibration On: Green; Data: Green	
Signal Strength LEDs	Data signal strength: LED bar graph. Low transmitter induction power: Red LED	
Temperature	Transmitter: -40 to 185 °F / -40 to 85 °C, Receiver: 32 to 125 °F / 0 to 50 °C, Power supply: 32 to 105 °F / 0 TO 40 °C	

Housing Chart

Transmitter for > 2.0" / 50.8 mm Diameters



Radial Height	1.25" to 1.55" / 31.75 mm to 39.37 mm
Axial Length	1.8" / 45.72 mm
Weight	0.45 lbs. / 0.204 kgs



6 British American Boulevard Suite 103-F,
Latham, NY 12110 USA

Phone 518-393-2200 ■ **Toll-free** 888-684-0012

Fax 716-684-0987 ■ **Email** telemetry@pcb.com

Website www.accumetrix.com

© 2015 PCB Group, Inc. In the interest of constant product improvement, specifications are subject to change without notice. PCB, ECHO, ICP, Modally Tuned, Spindler, Swiveler and TORKDISC are registered trademarks of PCB Group. SoundTrack LXT, Spark and Blaze are registered trademarks of PCB Piezotronics. SensorLine is a service mark of PCB Group. All other trademarks are property of their respective owners.

Accumetrics-AT4500-0418

Printed in U.S.A.

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.

visit us online at www.accumetrix.com