TELEMETRY SIMPLIFIED

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. AT-4500 can also be used for rotor voltage and RTD temperature signals. The system is easily installed, without any shaft modification, with an aramid fiber strap. As an induction powered system, no batteries are required. Using wireless technology, sensor data can be directly acquired for broadly varied applications – from vehicle drive shaft torque to large generator excitation voltage.

AT-4500 uses a set of coils (one inside the transmitter, and one stationary loop coil) to induce power across an air gap, for both sensor excitation and to power 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 the system to operate.

TYPICAL 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

Simplicity – easy to install and operate
Small size – transmitter typically requires less than 1.4" (35.56 mm) of radial shaft clearance
Environmentally rugged transmitter, mud/ice/splash resistant
High data integrity and noise immunity
Excellent rotor-to-pickup-coil movement tolerance
High sample rate (26484 Sa/sec), bandwidth up to 8.3 kHz
Adjustable analog voltage output (factory setting ±10 V full scale)
**SPECIFICATIONS**

**Performance**
- Digital Sampling: 16-bit resolution; 26,480 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 - 3 dB typical)
- Zero Drift: 0.01% per °F
- Gain Drift: 0.01% per °F
- DC Resolution: <0.003% of full scale
- Noise Spectral Density: <0.005% of full scale per Hz typical
  - (of signal at transmitter input, at ±2.778 mV/V range)
- Linearity: 0.05% 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 [1] 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 ±40% of full scale range
  - Symmetry: Trim pot adjustment ±0.5% of full scale + or – single axis 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 25.4 mm), depending on application
  - Power and Data Frequency: Power: 106 kHz (rectified by transmitter to provide 5 VDC on rotor). Data: 13.56 MHz

**SPECIFICATIONS (continued)**

**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)

**Receiver**
- Power: 9 to 15 VDC input, 30 W

**Accessories**
- Mains: 90-264 VAC 47-63 Hz to included
- Dimensions (H x W x D): 3.0 x 10.5 x 7.1 in (76.2 x 266.7 x 180.3 mm)
- 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

**Supplied Accessories**
- Cables [2]
  - 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

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**ACCUMETRICS**

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