



## ***AT-7000 Motor Monitor***

### ***Digital Telemetry System for Measuring Parameters from Motor and Generator Rotors***

The Accumetrics AT-7000 Motor Monitor is a digital telemetry system capable of continuously monitoring temperatures and other parameters directly from rotating armatures and field windings. A variety of measurement display, trip and alarm options are available, giving operators the ability to react to hazardous or harmful motor operation. The digital nature of the telemetry allows enhanced signal integrity, as compared to older analog telemetry methods. Standard Motor Monitor Systems acquire temperature measurements from rotor mounted RTD's without the need for maintenance-prone sliprings, or troublesome analog FM technologies. System options also allow users to measure rotor voltages and currents, detect ground faults, and monitor shaft torque and torsional vibrations.

#### ***Applications:***

- Over-temperature protection of rotor windings, cages, and bars in AC and DC machines
- Ground fault detection on brushless exciter AC generators and motors
- Specialized multichannel rotor measurements for development and testing purposes, including voltage and current measurements as well as acquisition of signals from rotor-mounted thermocouples, RTD's, strain gages, accelerometers and others.

#### ***Benefits:***

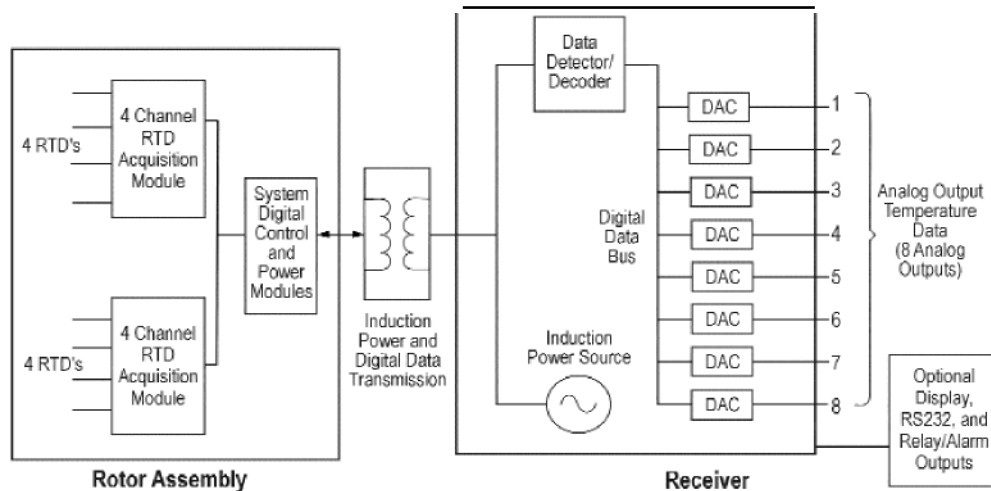
- Continuous protection from catastrophic machine failures
- Maximizing of motor/generator output without jeopardizing rotor integrity
- Development and verification of safe motor loading specifications
- Maintenance free — no slip rings
- Suitable for any size of motor shaft
- Accurate/dependable data acquisition by advanced digital telemetry techniques

#### **System Description:**

The heart of the Motor Monitor System is a digital telemetry transmitter mounted in a fiberglass laminate or metal split-collar clamped around the rotating motor shaft. The transmitter signal conditions and digitizes signals from RTD sensors, Ground Fault detection sensing electronics and other inputs, and transmits a digital data bit stream by wireless communication to a nearby stationary pickup loop. The digital data is recovered at a remote receiver unit and reconverted to analog 4 to 20mA or 0 to 10V output formats. System options include measurement data displays with individual channel alarm and trip relay outputs and RS485/RS232/Ethernet serial communication interfaces. Additional options include field voltage and current measurements, ground fault detection, thermocouples, accelerometers, and strain gages.



### Example of an AT-7000 Motor Monitoring System (8-Channel RTD)



#### SYSTEM COMPONENTS:

**Rotor Collar:** Typically constructed of G10 glass laminate, and sized for specific shaft diameters. This system can be mounted on shafts of virtually any diameter. The rotor collar is typically a two-piece split collar that is bolted together around a rotor. This houses electronics modules that are interconnected by a motherboard. Alternate end-of-shaft rotor mounting is available where applicable.

**Electronic Modules:** These modules are building blocks that allow systems to be customized based on user needs. Each RTD module acquires inputs from 4 RTD sensors, and any number of these modules can be combined in a system. Other modules available are for thermocouples (8 per module), strain gages (4 per module), and voltages and currents (4 per module). Additionally, a variety of ground fault detection circuitry may optionally be added to the system.

**Pickup Loop:** This stationary coil serves two purposes: providing RF induction power to energize the rotating transmitter electronics, as well as receiving the encoded digital data back from the rotor. A 24-ft or other tuned length cable connects the receiver to the pickup coil.

**Receiver:** The receiver converts the digital data to usable output signals and displays. Standard packaging is in industrial NEMA12 enclosures.

**Optional Panel Meters/Alarm Relays:** Consists of optional panel meters, mounted on the front of the receiver enclosure or on a remote panel, with each meter displaying one measurement channel. These optionally provide two programmable alarm relays and RS485/RS232.

### AT-7000 Motor Monitoring System Specifications

Standard RTD Motor Monitor Inputs	Platinum RTD, 100 ohms at 0°C, $\alpha=0.00385$ ohms/ohm/°C.
Other Inputs	Field Voltage, Field Current (from user shunt), thermocouples, strain gages, accelerometers, and more. Also, ground fault signals ( <i>see below</i> ).
Sensor Capacity	Maximum capacity depends on available mounting space; systems with more than 64 sensors are available. RTD inputs are available in multiples of 4 channels; thermocouples: multiples of 8 channels; strain gages: multiples of 4 channels; voltages/currents: 1 voltage/2 current (shunt)/1 ground fault measurement per module.
Measurement Range	RTD's: 0 to 300°C; thermocouples: -50 to 1300°C.
Accuracy	$\pm 2^\circ\text{C}$ for RTD's; $\pm 6^\circ\text{C}$ for thermocouples (exclusive of sensor errors and noise).
Standard Outputs	4 to 20mA current loop, or 0 to 10V analog voltage.
Optional Ground Fault Outputs	Options: 1. Alarm output for ground leakage exceeding a system designed threshold. 2. Analog output of ground leakage current (scaled as a 0 to 10V or 4 to 20mA signal).
Optional RS232, Ethernet	Isolated serial communications for data output.
Optional Displays	1/8 DIN panel meter display.
Speed Range	Dependent on shaft diameter; contact Accumetrics.
Environment-Temperature	Collar: 0 to 85°C operational; 0 to 50°C within accuracy specification. Receiver: 0 to 55°C operational. Higher temperature variations can be supplied.
Cable Length	Tuned cable lengths: 24-ft standard length; 300 ft maximum from pick-up loop to receiver.
Power	85 to 265 VAC; 47 to 440 Hz; 125 VA maximum.