

Wireless Sensor Telemetry System

Series M540 Multi-Channel Digital Telemetry System

- Accepts up to three channels of strain gage or thermocouple based transducer measurements
- 14-bit resolution and digital transmission provides accurate error free data
- Integrated strain gage driver with excitation and shunt mode for setup and verification of data
- Medium to short range operation
- Rugged environmentally sealed housing
- Powered by battery or induction power



Description

Michigan Scientific *Series M540 Digital Telemetry System* is designed for transmitting up to three channels of strain or thermocouple based transducer measurements using a very small transmitter package. This system offers 14-bit resolution and a fully differential amplifier for high common mode rejection with anti-aliasing filter prior to digitization. The strain gage driver is configured with its own gain and shunt resistor making system configuration flexible.

The system is designed with RF diversity features and error checking to prevent data loss and corruption due to reflections or shadowed transmissions from the transmitter. Output data is provided as high-level $\pm 10V$ analog on a rear connector for direct interface with most data acquisition systems, or the data can be captured in digital format for immediate display and collection via an Ethernet port to a PC. Analog output options include options for data cutoff frequencies and adjustment of zero offset. Indication of transmitter and receiver status is provided by LED indicators on the receiver's front panel. Analog output signals can be monitored for quality of transmission, low power conditions, and shunt status at the transmitter.

Typical applications include measurements on rotating equipment and where access by a wired sensor is not possible. The system's hardened design is intended for operation in hostile environments where vibration, extreme temperatures, high accelerations, and contaminants are present. These features ensure successful data measurements using our newest technology. Please visit our website at www.michsci.com for a complete list of telemetry based measurement devices and accessories.

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Specifications

PARAMETER	SPECIFICATION
TRANSMITTER	
Data transmission method	2.4 GHz carrier with FSK modulation
Analog channels	1 to 3 strain gauge bridge or thermocouple
ADC resolution	14-bit, no missing codes
ADC sample rate	15,000 samples per second
Analog image rejection filter	3-pole Bessel; 5,000 Hz at -3 dB
Digital anti-aliasing filter (FIR)	fc=1,076 Hz at -3 dB; fc=1,201 Hz at -100 dB
Data Bandwidth	DC to 5000 Hz
Bridge drive excitation voltage	3.0 Vdc
Bridge amplifier input range	customer specified (mV/V)
Operating temperature	-40 °F to +257 °F (-40 °C to +125 °C)
Power requirement	6 Vdc to 9 Vdc / 65 mA
Dimensions (L x W x H)	0.90" x 0.50" x 0.20" (23 mm x 13 mm x 5.1 mm) PCB only 1.71" x 0.77" x 0.25" (43 mm x 19 mm x 6.4 mm) enclosed
Weight	0.08 oz (2.5 g) PCB only 0.42 oz (12 g) enclosed
RECEIVER	
Output at full scale	±10 V
DAC output resolution	14-bit, resolving down to 1.22 mV
DAC update rate	15,000 updates per second
Data filter cutoff selections	100 Hz, 5.00 kHz at -3 dB
Channel filter type	2-pole Bessel
Current output per channel	±35 mA
Operating temperature	-40 °F to +158 °F (-40 °C to +70 °C)
RF antenna connector (2)	reverse polarity SMA
Power requirement	9 to 36 Vdc / 500 mA
Dimensions (L x W x H)	7.0" x 3.5" x 1.5" (180 mm x 89 mm x 38 mm) non-induction 7.0" x 3.5" x 2.5" (180 mm x 89 mm x 64 mm) with induction
SYSTEM GENERAL	
RF channels available	16