

Torque-Link-200 Wireless Torque Sensor



Torque-Link-200 - Specialized analog sensor node designed to fit over rotating shafts for wireless strain and torque measurements

The Torque-Link-200 allows users to transform standard driveshafts into wireless torque transducers by application of one strain bridge. The node supports high resolution, low noise data collection from 1 differential input channel at a sample rate up to 1 kHz. An integrated hall effect sensor enables reporting of RPM and total pulses allowing for the derivation of real-time power in torque applications.

LORD Sensing Wireless Sensor Networks enable simultaneous, high-speed sensing and data aggregation from scalable sensor networks. Our wireless sensing systems are ideal for test and measurement, remote monitoring, system performance analysis, and embedded applications.



PRODUCT HIGHLIGHTS

- Two to six inch diameter shaft (standard), more sizes available on request
- One differential input channel (standard) for full-bridge strain gauge integration (two channels optional)
- Ideal for static and dynamic torque measurements with full temperature compensation and bending cancellation
- Alternative gauge configurations enable axial and bending measurements
- Rugged ABS housing designed for remote, long-term installation on cylindrical shafts
- Application-specific designs available on request

FEATURES AND BENEFITS

HIGH PERFORMANCE

- Lossless data throughput
- Node-to-node synchronization of $\pm 50 \mu\text{s}$
- Up to 1024 Hz sampling
- Noise as low as $1 \mu\text{V p-p}$
- High resolution 24-bit data
- Datalog up to 8 million data points

EASE OF USE

- Installs over existing strain elements and shafts with no mechanical modifications
- Configurable housing geometry will accommodate any shaft size
- Wireless data transmission allows installation on rotating components without a slip ring
- Battery operated or optional near field power for battery-free operation.

APPLICATIONS

- Condition-based monitoring (CBM)
- Health monitoring of rotating components, aircraft, industrial equipment, and vehicles
- Static and dynamic torque measurements
- Contact sales for details about mining, agriculture, and construction applications

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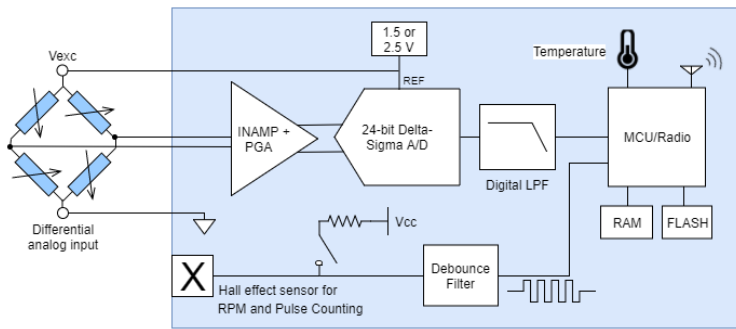
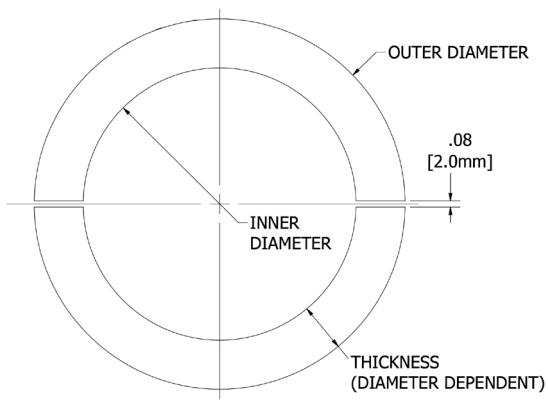
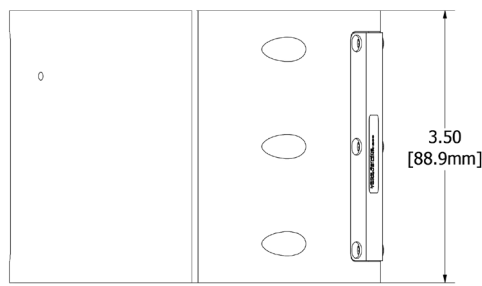
Specifications

General	
Sensor input channels	1 Differential analog input, 1 RPM/pulse, 1 Internal temperature
Data storage capacity	16 M Bytes (up to 8,000,000 data points)
Analog Input Channels	
ADC Resolution	24-bit
Digital filter	Configurable SINC4 low pass filter for reducing noise
Bridge excitation voltage	Configurable: 1.5 V or 2.5 V (100 mA)
Adjustable gain	1 to 128
Temperature stability	0.172 $\mu\text{V}/^\circ\text{C}$ (typical)
Strain calibration	Onboard shunt resistor for deriving linear strain calibration coefficients
Shunt calibration resistor	499k Ohm ($\pm 0.1\%$)
Integrated Temperature Channel	
Accuracy	$\pm 0.25^\circ\text{C}$
Measurement Range	-40 to $+105^\circ\text{C}$
Operating Parameters	
Wireless communication range	Line of sight: 1 km (ideal), 400 m (typical) Indoor/obstructions: 50 m (typical)
Radio frequency (RF) transceiver carrier	License-free 2.405 to 2.480 GHz with 16 channels
RF communication protocol	IEEE 802.15.4
Power source	High performance: 1.5 V Lithium AAA (L92) recommended; Lower performance: Alkaline AAA - decreased temperature range and battery life
Power consumption	Configuration dependent (see user manual section 13.4)
Operating temperature	-40°C to $+60^\circ\text{C}$
Angular acceleration limit	500g sustained, 1000g intermittent
Maximum RPM	Operating condition dependent (see user manual section 13.3)

Sampling	
Sampling modes	Continuous, periodic burst, or event triggered
Sampling rates	Up to 1024 Hz
Sample rate stability	± 5 ppm
Network capacity	Up to 127 nodes per RF channel depending on settings: http://www.microstrain.com/configure-your-system
Synchronization between nodes	± 50 μsec
RPM Sensing	
Sensor input	Open collector, open drain or digital pulses from hall effect or other source
Range	0.1 to 100 Hz (6 to 6000 RPM)
Accuracy	$\pm 0.1\%$ (typical)
Physical Specifications	
Dimensions	See image below
Environmental rating	IP 66, tested to DO-160 standards for temperature variation, humidity, and vibration
Enclosure material	ABS thermoplastic
Integration	
Compatible gateways	All WSDA gateways
Software	SensorCloud™, SensorConnect™, Windows 7, 8 & 10 compatible
Software development kit (SDK)	http://www.microstrain.com/software/mscl
Regulatory compliance	FCC (U.S.), IC (Canada), CE, RoHS (EU), MIC (Japan)

Example Diameters (other sizes available)

Shaft Diameter	Torque-Link Thickness	Torque-Link Outer Dia.
2.00in [50.8mm]	.675in [17.1mm]	3.37in [85.6mm]
3.00in [76.2mm]	.646in [16.4mm]	4.31in [109.5mm]
4.00in [101.6mm]	.618in [15.7mm]	5.26in [133.5mm]
5.00in [127.0mm]	.589in [15.0mm]	6.20in [157.4mm]
6.00in [152.4mm]	.560in [14.2mm]	7.14in [181.4mm]



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