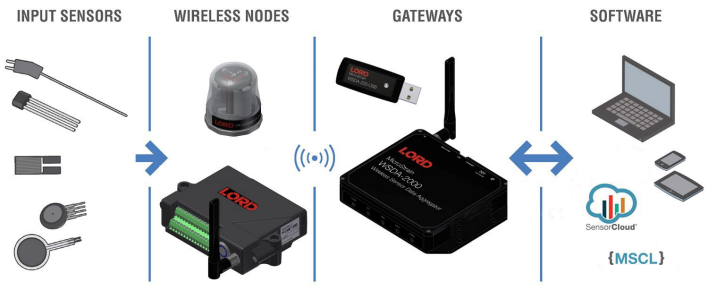
MicroStrain Sensing Product Datasheet

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 ±50 µS
- Up to 1024 Hz sampling
- Noise as low as 1 µV 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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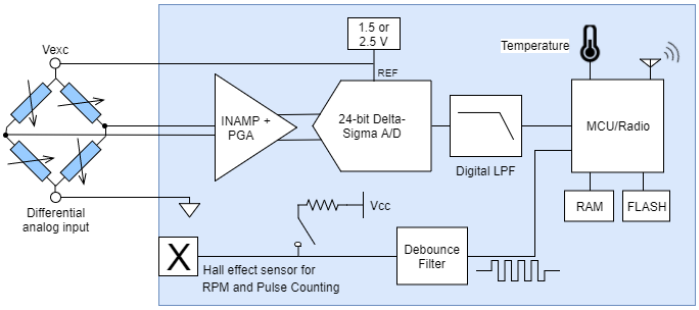
Wireless Torque Sensor

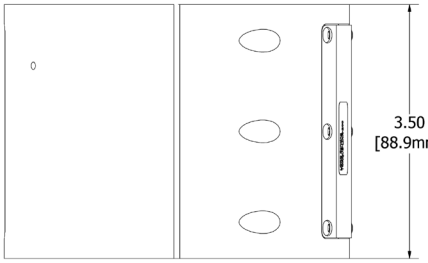
Specifications

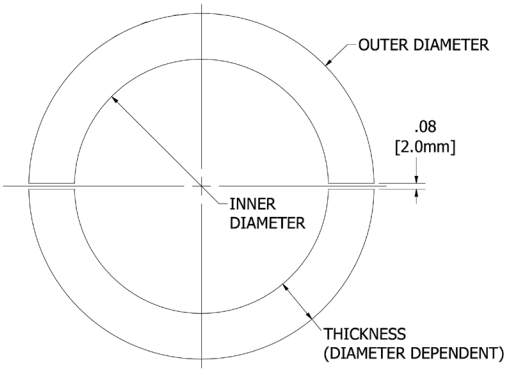
General	
Sensor input channels	1 Differential analog input, 1 RPM/pulse, 1 Internal temperature
Data storage capacity	16 M Bytes (up to 8,000,000 data points)
Analog Input Channels	
ADC Resolution	24-bit
Digital filter	Configurable SINC4 low pass filter for reducing noise
Bridge excitation voltage	Configurable: 1.5 V or 2.5 V (100 mA)
Adjustable gain	1 to 128
Temperature stability	0.172 µV/°C (typical)
Strain calibration	Onboard shunt resistor for deriving linear strain calibration coefficients
Shunt calibration resistor	499k Ohm (± 0.1%)
Integrated Temperature Channel	
Accuracy	±0.25°C
Measurement Range	-40 to +105°C
Operating Parameters	
Wireless comm range	Line of sight: 1 km (ideal), 400 m (typical) Indoor/obstructions: 50 m (typical)
(RF) Radio frequency 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°C
Angular acceleration limit	500*g* sustained, 1000*g* intermittent
Maximum RPM	Operating condition dependent (see user manual)

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	±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
(SDK) Software development kit	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]







Parker LORD

Jl.Radin Inten II No 61 B
Duren Sawit Jakarta Timur,
Jakarta, Indonesia

phone: +62 8139 9291 909
email: Sales@testindo.com
www.testingindonesia.co.id
www.testindo.com