SMARTdiagnostics®

KCF technologies
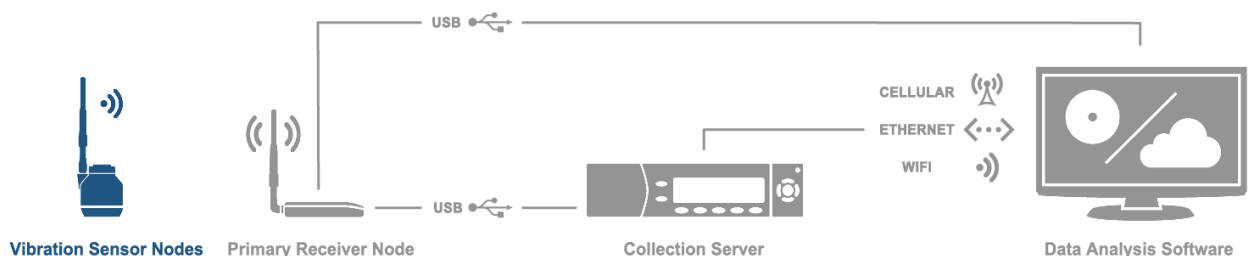
Vibration Sensor Node (SD-VSN-2)

The SmartDiagnostics® family of innovative wireless sensor products enables cost-effective predictive maintenance for industrial equipment. The system provides continuous remote monitoring of key performance indicators to track the operating health of equipment.

- Optimized for long battery life
- Full time series data sets up to 5 times per minute
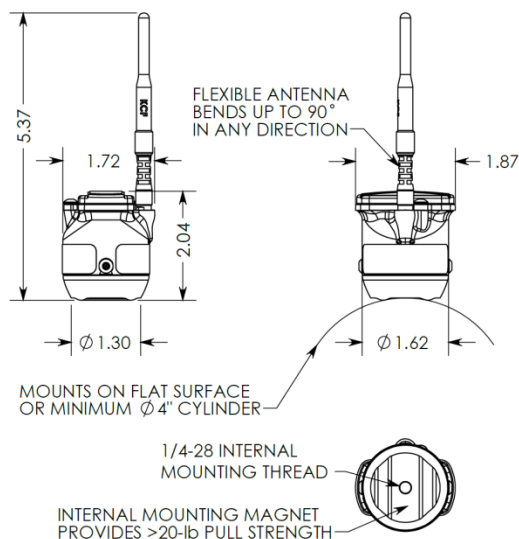- Expandable to hundreds of nodes per system

Give Your Machines a Voice™

Reliable Monitoring

Vibration Sensor Nodes provide health monitoring in the most hard-to-reach, rugged locations. Each node communicates via a direct wireless link to a Primary Receiver Node, from which the data is imported into SmartDiagnostics® Software for viewing and analysis.

Flexible Configuration

The system is highly configurable and scalable. A system can have hundreds of sensor points, each of which can be configured to transmit data on a user-selected frequency, and unique indicators can be implemented to warn users of potential machine health issues.

Cost Effective

Easily installed without the downtime, expense, and labor costs of old-fashioned, hard-wired sensors. Simply place the sensors where you need them and within minutes they'll transmit data. SmartDiagnostics® can predict failure before it occurs, saving money spent on unnecessary replacements and extending machine life. At the same time, energy costs are reduced, as properly maintained machines are more efficient.

USB

CELLULAR

ETHERNET

WIFI

USB

Vibration Sensor Nodes   Primary Receiver Node   Collection Server   Data Analysis Software

Vibration Sensor Node Specifications

Mechanical

Weight	4.1 oz (115 g)
Enclosure Material	Anodized aluminum and high-strength polycarbonate

Environmental

Storage Temperature	-40 to 238 °F (-40 to 120 °C)
Min. Operating Temp.	-4 °F (-20 °C)
Max. Operating Temp.	230 °F (110 °C) surface @ 72 °F (22 °C) ambient 212 °F (100 °C) surface @ 105 °F (40 °C) ambient 167 °F (75 °C) surface @ 167 °F (75 °C) ambient
IP Rating	IP65, dust-tight and impervious to water jets
Impact Resistance	Survives 5-ft drop onto concrete surface
Hazardous Certification	Class I, Division 2 (model SD-VSN-2N)

Wireless Radio

Radio	KCF DART™ Wireless 2.4GHz ISM band, FCC ID #Z5ISD2
Range	800ft (244m) line-of-sight (site survey recommended for installation)
Antenna	Steerable antenna, providing 360° directional coverage. Optional RP-SMA connector for tethered antenna (model SD-VSN-2-A)

Power

Power Source	3-Volt Lithium Manganese Dioxide (CR123A) KCF Energy Harvester (optional)
Battery Life	Full spectrum acquisition every: • 60 minutes – 8 years • 15 minutes – 6 years • 2.5 minutes – 2 years Note: battery life is somewhat reduced at extremely cold temperatures

Accelerometer

Range	+/- 19 g typical, +/- 16 g nominal
Resolution	13 mg
Noise Floor	5 mg RMS @ 256 Hz / 19 mg RMS @ 8192 Hz
Transverse Sensitivity	10% Typical
Frequency Response	+/- 5% 0-2700 Hz, +/- 3 dB 2700-4000 Hz
Samples per Acquisition	1600
Spectral Lines	800
Anti-Aliasing Filter	4000 Hz low-pass cut-off, 3rd-order Sallen-Key
Sampling frequency	64 Hz – 8192 Hz configurable (see table)

Temperature Sensor

Range	-4 to 167 °F (-20 to 75 °C)
Resolution	+/- 1 °F (+/- 0.5 °C)

5.37
1.72
2.04
Ø 1.30
1.87
Ø 1.62

FLEXIBLE ANTENNA BENDS UP TO 90° IN ANY DIRECTION

MOUNTS ON FLAT SURFACE OR MINIMUM Ø 4" CYLINDER

1/4-28 INTERNAL MOUNTING THREAD

INTERNAL MOUNTING MAGNET PROVIDES >20-lb PULL STRENGTH

Accelerometer Sampling

Sampling Frequency (Hz)	Sample Duration (s)	Spectral Resolution (Hz)
8192	0.2	5.0
4096	0.4	2.5
2048	0.8	1.24
1024	1.6	0.62
512	3.2	0.31
256	6.4	0.16
128	13	0.08
64	26	0.04

Configurations

Part Number	Description
SD-VSN-2	Standard vibration sensor with flexible antenna
SD-VSN-2-A	Standard vibration sensor with RP-SMA connector for tethered antenna
SD-VSN-2-N	Class I, Division 2 Certified vibration sensor for use in hazardous locations (US and Canada ETL control number 4008627)