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™

<table>
<thead>
<tr>
<th>Reliable Monitoring</th>
<th>Flexible Configuration</th>
<th>Cost Effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>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.</td>
<td>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.</td>
</tr>
</tbody>
</table>
# Vibration Sensor Node Specifications

## Mechanical
- **Weight**: 5.3 oz (150 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, Groups A-D, T5 (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). Repeater SD-R adds 2400ft (730m) of range.
- **Antenna**: Steerable antenna, providing 360° directional coverage.

## 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 nominal with individual NIST-traceable calibration
- **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)

## Configurations
<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD-VSN-2</td>
<td>Standard vibration sensor with flexible antenna</td>
</tr>
<tr>
<td>SD-VSN-2N</td>
<td>Class I, Division 2 Certified vibration sensor for use in hazardous locations (US and Canada ETL control number 4008627)</td>
</tr>
</tbody>
</table>

## Accelerometer Sampling

<table>
<thead>
<tr>
<th>Sampling Frequency (Hz)</th>
<th>Sample Duration (s)</th>
<th>Spectral Resolution (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8192</td>
<td>0.2</td>
<td>5.0</td>
</tr>
<tr>
<td>4096</td>
<td>0.4</td>
<td>2.5</td>
</tr>
<tr>
<td>2048</td>
<td>0.8</td>
<td>1.24</td>
</tr>
<tr>
<td>1024</td>
<td>1.6</td>
<td>0.62</td>
</tr>
<tr>
<td>512</td>
<td>3.2</td>
<td>0.31</td>
</tr>
<tr>
<td>256</td>
<td>6.4</td>
<td>0.16</td>
</tr>
<tr>
<td>128</td>
<td>13</td>
<td>0.08</td>
</tr>
<tr>
<td>64</td>
<td>26</td>
<td>0.04</td>
</tr>
</tbody>
</table>

### Handling and Care

Please consult Application Note on proper use:
[https://kcftech.com/smartdiagnostics/resources](https://kcftech.com/smartdiagnostics/resources)