Vibration monitoring: monitoring your machine’s pulse with precision.

ifm.com/gb/octavis
Systems for vibration monitoring. The optimum solution for every requirement.
Early detection of potential faults and their causes on the basis of individual vibration characteristics and other influencing factors.

Avoid damage to machine components, tools or workpieces via permanent monitoring and very short response times. The integration into the PLC makes it possible to adjust the vibration monitoring to the process of the machine or the plant.

The ifm group of companies: our own development and production with high quality standard. The detection and integrated evaluation of vibration signals serves as a basis for the seamless integration of online condition monitoring into manufacturer-independent automation and control systems.
Trend monitoring: detecting impending damage at an early stage to avoid consequential costs.

Vibration monitoring

Simple:
monitoring of the overall status of the machine

Standardised:
compliant to ISO 10816

Safe:
protection against machine damage

Flexible:
easy integration in the application

Reliable:
longer uptime

**Machine protection and remote maintenance.**

The monitoring of wind power gear boxes or pumps in the water supply concerning wear and stress makes it possible for the operator to organise efficient maintenance. Alarm outputs serve to protect the system, to trigger remote maintenance and to facilitate targeted analysis.

![Diagram of vibration monitoring metrics](image-url)
What vibration reveals about machine health.

Even if in peak condition, all machines generate vibrations during operation. However, due to unbalance, misalignment or looseness, these vibrations will increase to a level that will have a negative effect on the functionality and service life of the machine. The ISO 10816 standard defines precise vibration limit values for industrial machines that can be used to assess the machine condition from new to critical. With ifm’s product portfolio, the vibration behaviour can be monitored precisely and according to your requirements. Even only slightly increased vibration velocities will be detected and signalled. This is how impending defects can be detected and remedied at an early stage to avoid expensive damage and downtime.
Acting rather than reacting:
increase availability, reduce maintenance costs, assure quality.

Condition monitoring

- Safe:
  permanent condition monitoring of critical machines

- Anticipate:
  machine diagnosis for early damage detection and avoidance of serious consequential damage

- Optimise:
  maintenance actions can be planned

- Long service life:
  make optimum use of the residual life of components

- Economical:
  make production processes transparent – meet TCO (total cost of ownership) concepts

- Precise:
  Counters detect values such as exposure time and machine uptime and support production based on key indicators.

Monitor up to 4 measurement points.

With the sensor type VSA / VSP machine vibrations can also be measured at inaccessible places. Up to 4 measuring points can be monitored and documented with the diagnostic electronics type VSE. The Ethernet and fieldbus interfaces simplify networking and remote diagnostics.

Detect vibration and shocks at an early stage

Undetected unbalance, misalignment or bearing damage lead to unexpected failures and shorter service lives. The VV sensor detects the main indicators of impending machine damage. Triggered raw data acquisition (BLOB) enables further analyses.
The most efficient way to avoid unplanned downtime

With condition-based monitoring, imminent machine damage can be detected at an early stage. This enables predictive maintenance planning, which in turn allows for consistent product quality and the associated efficient use of resources. The vibration products from ifm reliably detect and evaluate vibration data. This is how the current machine status is transmitted to the controller or the IT infrastructure as a status value and, if necessary, as a warning or alarm signal. Counter functions also facilitate the calculation of component lifetimes influenced by the frequency and intensity of impacts, temperature or speed.

Intelligent vibration sensors type VN
On board display, history storage for documentation, for rotating machines >120 rpm.

Intelligent vibration sensors type VV
Detection of numerous vibration parameters with optional raw data acquisition (BLOB) for extended analyses as well as integrated machine uptime detection based on the vibration values.

Acceleration sensors type VSA / VSP / VSM
Different types, also for mounting in difficult to access areas. Various measuring ranges with voltage output (100 mV/g) or current loop (0...10 mA). Connection to the VSE diagnostic electronics.

Intrinsically safe acceleration sensor type VSP0xA
For the measurement of vibration in hazardous areas. Connection to the VSE diagnostic electronics installed outside the ATEX zone via a barrier.

Diagnostic electronics type VSE
4-channel diagnostic module with additional process value inputs, integrated history memory, networking possible.

Vibration diagnosis on a mixing tool.
Unplanned standstills of critical machines cause huge cost. Permanent condition monitoring of the whole plant makes it possible to act with foresight and to optimise the process.

Our solution for condition monitoring of machines.
ifm.com/gb/condition-monitoring
Measuring forces: minimise scrap and consequential damage to machine tools.

Dynamic: monitoring of dynamic forces, e.g. in milling processes

Fast: response times of 1 ms

Safe: machine, tools and workpieces are protected against expensive consequential damage

Preventive: early condition monitoring avoids unplanned failures

Integrated: direct connection to the machine control via a fieldbus interface
Monitor spindle vibration, avoid standstills.

Incorrect settings and process parameters as well as incorrectly selected or defective tools can quickly have far-reaching consequences: The spindle and workpiece may crash, the spindle may be permanently overloaded, or the manufacturing quality may be insufficient or the workpiece may be damaged. The resulting unplanned downtimes and increased rejects reduce plant efficiency and cause unnecessary costs. These costs are unnecessary because damage to the machine tool and workpiece can be efficiently prevented.

Through permanent monitoring and diagnostic of the spindle’s vibration behaviour, collisions or excessive cutting forces will be detected within a millisecond and a corresponding switching signal will be output.

The integration of the vibration monitoring via the fieldbus interface into the machine control ensures optimum evaluation adapted to the current operating status. For example, individual alarm thresholds can be defined for different tools. This ensures that the machine will shut down reliably or change to a safe state before serious damage or downtime will occur.

Avoid consequential damage to machine tools.

Changes in the cutting forces as caused by blunt tooling or swarf jam will be detected on the basis of the changed vibration characteristics. Each tool can be assigned individual tolerance limits e.g. a warning and switch-off threshold. Damage to the workpiece is reliably prevented.
Systems for vibration monitoring. Suitable products for all applications.

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless vibration sensors</td>
<td>For intermittent monitoring of the overall vibration condition of machines and equipment according to ISO 10816.</td>
<td>VW</td>
</tr>
<tr>
<td>Basic vibration sensors and transmitters</td>
<td>For permanent monitoring of the overall vibration condition of machines and equipment according to ISO 10816.</td>
<td>VT</td>
</tr>
<tr>
<td>VT</td>
<td></td>
<td>VK</td>
</tr>
<tr>
<td>Intelligent vibration sensors</td>
<td>For measuring the overall vibration according to ISO 10816 or as a condition monitoring solution for simple machines.</td>
<td>VN</td>
</tr>
<tr>
<td>VV</td>
<td></td>
<td>VV</td>
</tr>
<tr>
<td>Vibration sensor with IO-Link</td>
<td>Enables real-time monitoring of the four categories of machine failure: impact, fatigue, friction and temperature.</td>
<td>VV</td>
</tr>
<tr>
<td>Diagnostic electronics</td>
<td>4-channel diagnostic system for the evaluation of dynamic signals, with additional analogue inputs.</td>
<td>VSE</td>
</tr>
<tr>
<td>VSE</td>
<td></td>
<td>VSE 15x</td>
</tr>
<tr>
<td>Acceleration sensors</td>
<td>Provide the measured machine body sound as a raw signal for downstream vibration monitoring or diagnostics.</td>
<td>VSA</td>
</tr>
<tr>
<td>VSA</td>
<td></td>
<td>VSP</td>
</tr>
<tr>
<td>VSM</td>
<td></td>
<td>VSM</td>
</tr>
<tr>
<td>Accessories</td>
<td>Software: VES &amp; APA tool</td>
<td></td>
</tr>
<tr>
<td>Software for parameter setting and online data monitoring of the intelligent vibration sensors and diagnostic electronics.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical interfaces</td>
<td>Condition monitoring capabilities</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------</td>
<td></td>
</tr>
<tr>
<td>Analogue output</td>
<td>Broadband monitoring + acceleration</td>
<td></td>
</tr>
<tr>
<td>Switching output</td>
<td>Narrow band analysis / FFT</td>
<td></td>
</tr>
<tr>
<td>Signal input (e.g. 4...20 mA)</td>
<td>Temperature</td>
<td></td>
</tr>
<tr>
<td>TCP / IP Fieldbus</td>
<td>Internal trending</td>
<td></td>
</tr>
<tr>
<td>IO-Link</td>
<td>Counters</td>
<td></td>
</tr>
<tr>
<td>Wireless</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display / status LEDs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISO 10816 (v-RMS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broadband monitoring + acceleration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narrow band analysis / FFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal trending</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPC server software VOS</td>
<td>To connect the vibration diagnostics to higher-level systems (SCADA, MES, ERP).</td>
<td></td>
</tr>
<tr>
<td>Accessories / connection technology</td>
<td>A wide product range of connection technology (e.g. sockets, Y-cables) and adapters makes it easy to implement the sensors.</td>
<td></td>
</tr>
</tbody>
</table>
Nothing convinces more than practice: successful use of vibration diagnostics.

**Scania**
The Swedish vehicle manufacturer Scania is one of the world's largest manufacturers of utility vehicles. The plant in Stockholm produces, among other things, powerful engines for trucks and buses. Vibration sensors are monitoring the automated production.

**GKN Aerospace.**
The Swedish company GKN Aerospace from Trollhättan produces high-precision parts for aircraft engines and for aerospace industries. The machine tools have sensors that ensure maximum transparency and highest product quality.

**Smart lock in Eefde**
World Class Maintenance – The highest standards in all corporate sectors lead to an improvement of all processes. These guidelines are also followed for the waterway infrastructure in the Netherlands. On board: vibration sensors from ifm

Would you like to learn more?
Systems for vibration monitoring. From sensor to ERP.

*The gateway for wireless vibration sensors and the wireless VW vibration sensor are excluded from the 5-year warranty.*
Go ifmonline!
Browse, select, order in the ifm webshop
ifm.com

Position sensors
Sensors for motion control
Industrial imaging
Safety technology
Process sensors
Industrial communication
IO-Link

Identification systems
Condition monitoring systems
Systems for mobile machines
Connection technology
Software
Power supplies
Accessories

ifm electronic gmbh
Friedrichstraße 1
45128 Essen
Tel. +49 / 201 / 24 22-0
Fax +49 / 201 / 24 22-1200
E-mail info@ifm.com

WARRANTY
5 years
on ifm products

ifm article no. 78003835 We reserve the right to make technical alterations without prior notice. Printed in Germany on non-chlorine bleached paper. 1/20