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TIMKEN
Where You Turn

TIMKEN

The CMS System

Online Condition Monitoring Systems



CONDITION MONITORING
SOLUTIONS

The CMS System

Online Condition Monitoring Systems



Timken offers a wide range of condition monitoring solutions, including the CMS System, which will help you:

- Monitor your critical equipment
- Avoid unplanned downtime
- Increase profits through early detection and
- Improve workplace safety.

Efficient and profitable production

Timken's CMS system is a modular, software-controlled, online machine condition monitoring system with automatic data evaluation. It is applied by leading industries around the world to detect faults early, to help avoid production losses through unplanned downtime and to reduce overall maintenance costs.



The CMS system contains four types of measuring units, each with a specific task. This allows you to select the most cost-effective installation to meet your particular requirements.

- **Shock-pulse measurement** for ball and roller bearings supplies data on bearing damage, lubrication condition and the effects of alignment and load. In many applications, the bearings may be the only machine elements that need monitoring.
- **Vibration severity measurement** is the ISO-recommended method for general condition monitoring. It helps detect the most common mechanical faults, such as imbalance and loose parts.
- **Analog signal monitoring** is used to correlate data on flow, effect, pressure, temperature, etc., input as analog voltage or current signals, with shock pulse and vibration measurements.
- **Vibration monitoring with spectrum analysis** allows you to target specific fault symptoms and receive a machine-specific condition evaluation.

The core of the CMS system is the Condmaster®Pro software program. This program receives the measuring results, evaluates the data and presents the results. Based on extensive empirical data, international standards and machine statistics, the evaluation result is an easy-to-understand color code, highlighting potential trouble spots. By calibrating and adjusting limit values, you can fine tune the automatic evaluation process with precision and receive an immediate, reliable diagnosis.

CMS: The complete online monitoring system

A CMS system can contain up to 240 measuring units for bearing condition and vibration severity. It is supplied with 230 or 115 V AC and connected in series via the data cables in one- or two-LAN networks. A system unit with alarm relay connects the measuring units to a PC. Up to nine systems can be managed by CondmasterPro.

For remote monitoring, use a connection via modem. Up to one week's measuring results are stored in the units to be recalled at suitable intervals.

All settings are made from the PC. Measuring interval and sequence are set individually for each unit; alarm limits and relay connection for each channel.

BMS units for bearing monitoring measure shock pulses on 16 channels. The signal is picked up by shock-pulse transducers, installed on the bearing housings and connected with coaxial cables.

VMS units for vibration severity monitoring measure the RMS value of vibration velocity on eight channels. They have four relays to steer external alarm devices.

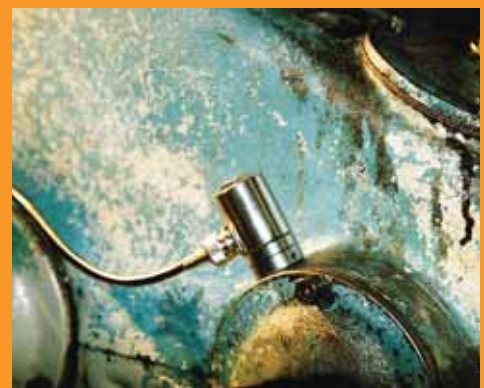
An AMS board with 16 channels can be installed in each BMS or VMS unit to monitor voltage or current lines carrying analog data on any customer-defined quantity. Each unit also can be equipped with RPM boards with four channels.



The BMS and VMS systems have stainless steel housings for use in harsh environments. Sixteen bearing or eight vibration channels are available per unit. A circuit board for 16 analog signals plus four rpm channels can be added.



A VCM unit for EVAM® vibration analysis has eight or 24 channels for vibration and eight for rotational speed. This unit contains a PC and is connected via computer network.



Robust vibration and shock-pulse transducers are connected by coaxial cables. Transducer lines can be sealed and protected against mechanical damage.

Condmaster® Pro Software



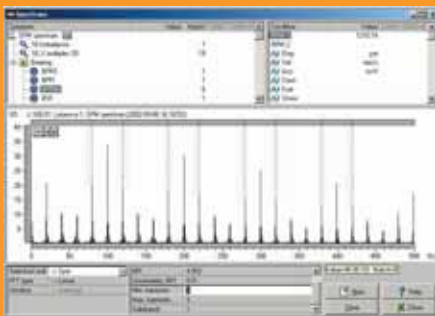
Your primary tool for fast fault detection is the graphical overview, which identifies potential trouble spots.



Click on a point to view the details: measurement results, graphical trends, comments and more.

| Date/Time | Alarm type | Number | Status | Value |
|---------------------|-----------------------|----------|---------|----------|
| 2004-03-09 15:22:00 | Control panel error | 7-200-04 | Fan-NEC | 1 bit |
| 2004-06-23 09:15:00 | Oil level | 7-200-04 | Fan-NEC | 26.7 l3 |
| 2004-07-01 11:09:00 | Temperature | 7-200-04 | Fan-NEC | 55 °C |
| 2004-07-01 11:09:00 | ISO 2372 axial | 7-200-04 | Fan-NEC | 3 mm/s |
| 2004-04-04 09:00:00 | ISO 2372 horizontal | 7-200-04 | Fan-NEC | 8.5 mm/s |
| 2004-04-04 07:43:00 | Fault: Out of balance | 7-200-04 | Fan-NEC | |

Alarm lists are generated on the basis of automatically applied evaluation rules that can be modified by customer-defined thresholds. You also can program alarm-delay conditions, log all alarm messages on a printer and connect any or all measuring channels to the main alarm relay.



An EVAM spectrum highlights the selected fault symptoms and states their velocity value in relation to overall machine vibration.

Vibration analysis with EVAM®

VCM-20 units are measuring computers for vibration analysis in frequency ranges up to 20,000 Hz. A unit has eight or 24 vibration channels and eight rpm channels, allowing synchronous and asynchronous measurement. VCM-20 units are connected via PC network. Measuring results are analyzed and stored locally in the VCM unit. The channel configuration and the measuring assignments are set up in CondmasterPro.

Measuring units have stainless-steel housings and sealed cable connections. The transducer lines are monitored for transmission quality and electric faults. Transducers, cables, connectors and other installation equipment are high-quality products, designed for harsh industrial environments.

Full control with online condition data

The CondmasterPro universal condition monitoring software platform is used for both handheld instruments and online systems. CondmasterPro stores basic data on machines and measuring points, using a familiar numbering system defined by the customer.

The expert knowledge needed to evaluate machine condition is integrated in the software – a complete bearing catalog, lubricant data, bearing life calculation, the ISO limit values, mathematical models for spectrum analysis and fault-symptom detection and much more.

You set the measuring times and measuring sequences, select the values to be stored and define the alarm condition. Via relay connections, you can control external alarm devices and automatic shut down.

You only activate the measuring functions you need and automatically exclude all others. Thus, you can work exclusively with the CMS system, but you can also activate the functions for use with Timken handheld instruments.



- Single-user PC or network
- Remote monitoring via modem and GSM
- Up to nine systems linked to one database

A tool for efficient maintenance

For required input data, you receive instructive menus, default values and online help texts. "Copy" and "edit" functions save time when setting up machines and measuring points in a database.

The most powerful part is Evaluated Vibration Analysis Method (EVAM®). It is much more than traditional spectrum analyzing programs. In addition to nine general condition parameters, you can select fault symptoms for special analysis and work with machine-specific evaluation criteria.

As always, Timken emphasizes the main requirements of industrial condition monitoring – fast and easy fault detection through automatic data evaluation.

- Graphical overview of your facilities and equipment
- Alarms highlighted in green-yellow-red
- Machine-specific evaluation of vibration data



Fully committed

In every industry, the goal is the same – maximize uptime, safety and profitability.

Any unscheduled downtime must be avoided. Any unsafe condition must be identified.

Any repair must be made immediately.

The Timken Corporation has a broad offering of condition monitoring products and services that includes portable instruments, continuous monitoring devices and online systems. We can help you maximize uptime with the development of cost-effective solutions to achieve maximum output and reliable service. Increasing the useful life and productivity of your machinery directly impacts the bottom line.

When you choose Timken, you gain access to an industry leader with more than 100 years of experience in industrial applications. Every design, production phase and service call is driven by one thing – exceeding the expectations of our customers. You can rely on Timken for products, services, analysis and ongoing technical support to help maximize uptime, reduce maintenance costs and improve productivity. Timken is committed to being your friction management solutions provider.

Friction management solutions

Industrial customers turn to Timken to provide comprehensive friction management solutions. Extending beyond bearings, these solutions include related parts and accessories, expert sales and service support, integrated logistics and a host of other programs to help keep your systems running efficiently. We help customers analyze performance and recommend solutions that make sense for their unique operating systems and conditions.

First, the bearing. Then:

How do you monitor the health of your bearing?
You can use StatusCheck, handheld devices or Timken Reliability Services.

How do you plan to lubricate the bearing?
There are many advantages to using Timken lubricants.



Do you need a simplified method of lubricating bearings?
Use Timken G-Power and M-Power single-point lubricators.

Do you plan to protect machinery from contamination?
There are many advantages to using Timken's line of industrial seals.