Machine Monitoring System
SKF simple Online Monitoring System

To save time and money in the field, SKF Reliability Systems offers low cost simple 4-channel online monitoring System.

**Introduction**

The SKF Machine Monitoring System (MMS) CMRS530 series is simple monitoring system. It converts a vibration input signal to a user-defined broadband value proportional to True RMS, True Peak or True Peak-to-Peak of vibration velocity, acceleration, acceleration enveloping or displacement. The Alert/Danger relay outputs and 4-20 mA output signal can directly interface to a Process Control System. (DCS or PLC)

**Features**

- 4-CH simultaneous monitoring
- With Alert and Danger as two independent set points with LED indication and contact relay outputs
- Individual channel live bargraph displays
- Programmable group Alert or Danger
- Selectable frequency span
- 4-20mA output signals
- Buffered raw output signals
- API 670 compliant

The basic model provides 4 input from ICP accelerometers or proximity probes. Each channel provides 1 Alert relay, 1 Danger relay and 4-20 mA output suitable for Process Control system. (DCS or PLC). On the front panel are live bar graph displays with Alert and Danger levels, Alert/Danger relay status for each channel, and common system “OK” relay status. The buffered vibration raw signals are accessible from the front panel BNC connectors. On the front panel is a keypad for configuration of each channel.

**Functional description**

The conversion of raw vibration signal from an accelerometer to a standard ISO or non-standard velocity signal is done by filtering, integration, and analogue True RMS or True Peak processing.

In acceleration enveloping, the conversion of the raw acceleration signal to proportional peak value of the defect signal is done by band pass filtering, rectifying and low-pass filtering.

The full-scale value of the velocity, acceleration, acceleration enveloping, and displacement is output as 4-20 mA and can be further converted to a 1–5 VDC output voltage by using a 250 Ohm precision resistor.

The Alert/Danger set points from 0 to 110% of full scale for each channel are adjustable using the front panel keypad. Each Contact Relay has adjustable delay of 0.1 to 10 seconds and can be independently configured as Normally open (NO) or Normally closed (NC) and latching or non-latching. Latched relays can be reset locally or by remote contact closure. 4-BNC connectors mounted on the front of the MMS unit provide easy access to each buffered transducer signal (both the un-filtered vibration signal and DC bias voltage.)

Portable test equipment or analyzers (e.g. SKF Microlog) can be connected to the buffered outputs without disturbance to any monitoring function. The buffered transducer output signals are also available on the screw terminals at the rear of the unit for permanent connection when needed.
Specifications

Power requirement
- Supply voltage: 90 - 240 VAC
- Supply Current: 100 mA @ 220 VAC
- Power Consumption: 22 W
- Relay rating
  - Switch voltage: 24 VDC
  - Switch current: 20 mA

Input
- Sensor: Accelerometer, Velocity transducer, Eddy-probe sensor.
- Sensor sensitivity: Selectable via dip-switch
- Sensor approvals: For CE approved systems, the sensor must be CE approved
- Sensor OK detection: Continuous monitoring of the MMS bias and signal voltage. If voltage exceeds preset limits, the 4 to 20mA output currents is reduced to less than 2mA.
- Analogue Input: 4 - 20 mA, 1 - 5 VDC

Output
- Buffered output: 4-BNC connector, screw terminals
- Buffered output Sensitivity: Same as a sensor sensitivity
- Accuracy: ±5% of full-scale range with single pole filter -3dB points at specified frequencies for ISO and ISO filters

Environment
- Operating temperature: -20 to 80 °C (-4 to 176 °F)
- Storage temperature: -55 to 125 °C (-67 to 257 °F)
- Relative humidity: 0 to 95 % relative humidity non-condensing

Mechanical
- Weight: 0.7 Kg
- Enclosure: Aluminum die-casting, IP65
- Color: Blue & Gray front panel
- Input / Output Wiring Connector: Screw terminal type
- Dimension:
  - Wide: 260 mm (10.24 in.)
  - Height: 160 mm (6.30 in.)
  - Depth: 90 mm (3.54 in.)

Miscellaneous
- CE Certificated according to EN 60950-1

SKF Machine Monitoring System Configuration

Hardware Configuration
1: SKF MMS Device
2: SKF Portable Instrument
3: DCS or PLC
4: Vibration Sensors & Cable
Ordering Number: CMRS 200W-00-CM

Each channel is configurable in the field via Dip Switches:

<table>
<thead>
<tr>
<th>Channel</th>
<th>Signal Characteristics</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Input Sensor Type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sensitivity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequency Range</td>
<td></td>
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<tr>
<td></td>
<td>Configuration</td>
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<tr>
<td>Ch1 to Ch4</td>
<td>Velocity Transducer</td>
<td>By Dip Switch setting</td>
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<tr>
<td></td>
<td>100 mV/ips</td>
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<tr>
<td></td>
<td>1 to 500Hz</td>
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<td>10 to 1,000Hz</td>
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<tr>
<td></td>
<td>0 to 5,000Hz</td>
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<tr>
<td></td>
<td>0 to 10,000Hz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acceleration Transducer</td>
<td>By Dip Switch setting</td>
</tr>
<tr>
<td></td>
<td>100 mV/g or 500 mV/g</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 to 500Hz</td>
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<td>10 to 1,000Hz</td>
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<td>0 to 5,000Hz</td>
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<td>0 to 10,000Hz</td>
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<tr>
<td></td>
<td>Eddy probe Sensor</td>
<td>By Dip Switch setting</td>
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<tr>
<td></td>
<td>7.87 mV/㎛ or 3.94 mV/㎛</td>
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<td>1 to 500Hz</td>
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<tr>
<td></td>
<td>Analogue Signal</td>
<td>By Dip Switch setting</td>
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<tr>
<td></td>
<td>4 - 20 mA or 1 - 5 VDC</td>
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<tr>
<td></td>
<td>By Dip Switch setting</td>
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</tbody>
</table>

Display Unit, Full Scale, Alert & Danger Level, Alert & Danger Relay output, Time Delay for each Channel, Common System Ok Relay output is configured by Simple Configuration Software.

Note: Unit shipped from factory has default Dip Switches set for all channels as follows:

<table>
<thead>
<tr>
<th>Input Sensor</th>
<th>Sensitivity</th>
<th>Frequency Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Accelerometer</td>
<td>- 100 mV/g</td>
<td>- 10 to 1,000 Hz</td>
</tr>
</tbody>
</table>

Installation and Training

Installation and training available throughout your local SKF supplier or representative.

SKF Reliability Systems

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