

# MHC - Sigma™

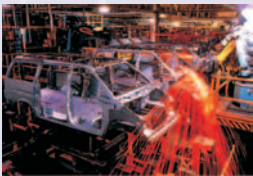
ultra-smart condition monitoring sensor for short duration intermittent machinery

Patent Pending



- |   |   |
|---|---|
| <b>Intelligent processing of interrupted signals</b>  | <b>Auto rejection of start-up &amp; slow-down</b> |
| <b>Programmable alarm criteria &amp; output</b>       | <b>Internal 12 month daily trend history</b>      |
| <b>Ideal for long term, on-line application</b>       | <b>Compact &amp; Affordable</b>                   |
| <b>Optional dual channel interface / display unit</b> | <b>PC set-up &amp; download software</b>          |

condition monitoring just got easier



ideal for  
**stacker cranes,  
indexing conveyor drives,  
product elevators,  
lift systems,  
make-up pumps  
etc..**

The MHC-Sigma smart sensor is a ground-breaking solution to monitoring the condition of machinery that operates intermittently, randomly and only for short durations†. In the past these machines have been problematic for instrumented condition monitoring typically requiring operation / production to be interrupted while the machine was run continuously in a 'maintenance mode' to allow a Condition Monitoring measurement to be made. Now for the first time MHC-Sigma allows continuous autonomous monitoring of such machinery without any disruption to production or operations.

MHC-Sigma is a complete, stand alone single channel monitoring and warning system which incorporates the following functions :

- Signal detection (high frequency transducer & signal conditioning)
- Signal processing (intelligent signal reconstruction and Distress® & dB Level computations)
- Alarm (flexible, user configurable alarm settings)
- Data-logging (automatic non-volatile memory of trended values over the last 384 days)
- Digital interface (enables PC connection\* for set-up & memory download)

At its heart MHC-Sigma is based upon the field proven Distress® and dB Level signal characterisations, which have been in widespread use across industry for almost two decades. This approach enables sensitive condition monitoring of rotating machinery and is unique in not requiring you to input shaft speeds, bearing details, etc.. This simplifies set-up and eliminates a possible source of error in interpretation.

MHC-Sigma further simplifies and reduces the cost of installation in the following ways :

- All functions integrated into a compact sensor housing
- Stand-alone (switched output directly drives LED indicator or compatible relays)
- Direct connection to PLC (alarm can be directly connected to a 0 to +5V digital input) Direct connection to SCADA (0 to +10 VDC analogue values & 0 to +5 VDC alarm output)
- Set-up mode when linked to PC gives full visual feedback of settings on actual waveforms
- Optional Sigma Interface Unit has internal screw less terminals and LED status indicators, alarm reset buttons & sockets for quick PC connection\* to allow sensor set-up and downloading of the sensors 384 day trend

† NOTE : MHC-Sigma works equally well for long durations and even continuous running.

\* PC connection requires spare PC USB port, SI/RT/C interface and MHC-Sigma sensor set-up software

**Don't leave it to chance,  
put some science  
into keeping your site running !**

<b>Signal Measurement</b>	
Measurement Cycle	
a)	Distress Description Range Resolution
b)	dB Level Description Dynamic Range Resolution
<b>Auto signal validation</b>	
Running detection	
Start up rejection	
Slow down rejection	
<b>Alarm Output</b>	
General	
Electrical	
Principal Operation	
Secondary Operation	
Reset	
Alarm set-up	

10 seconds of validated composite signal. Contributing signal segments must have a minimum duration of 500ms.

Fault indicating parameter.  
0 to > 40 (typical).  
1 unit.

Logarithmically scaled mean signal level.  
0 to 90 dB (i.e. 30,000 to 1).  
1 dB.

Adjustable 5 dB or greater in 1dB increments (set-up via SI/RT/C interface\*).  
0 secs to 10 secs. (set-up via SI/RT/C interface\*)  
-0 secs to - 10 secs. (set-up via SI/RT/C interface\*)

1 qty. programmed via SI/RT/C into its non-volatile memory.  
Normally +5 VDC (@ 10 mA max.) switched to 0V when in alarm.  
Alarm acts on both Distress & dB Level as an OR function. Continuous switching action occurs when alarm level is reached or exceeded for six consecutive measurement cycles. Alarm output repeatedly changes between normal and alarmed state (i.e. +5 VDC, 0 V, +5 VDC, 0 V, +5 VDC, 0 V etc...) if the sensor has been powered up for 24 hours but failed to complete a measurement cycle.  
Alarm is reset by interrupting the + 24 VDC power supply.  
Set up of criteria for alarms Principal Operation is via SI/RT/C Interface\* and PC running MHC-Sigma sensor set-up software.

**Analogue outputs (2 qty.)**

General  
Electrical

Analogue out 1 = Distress, Analogue out 2 = dB Level.  
0 to +10 VDC updated every 10 seconds of validated composite signal  
(1 unit = 100 mV).

**External trigger input**  
General

External contact closure

**Internal trend history**  
Data pair

Single value of Distress and single value of dB Level representing the highest values present or exceeded on 6 consecutive measurement cycles during a 24 hour period.  
384 data pairs.  
Non-volatile, organised as FIFO.

Capacity  
Memory type

**General Characteristics**  
Sensing Element  
Power Requirement

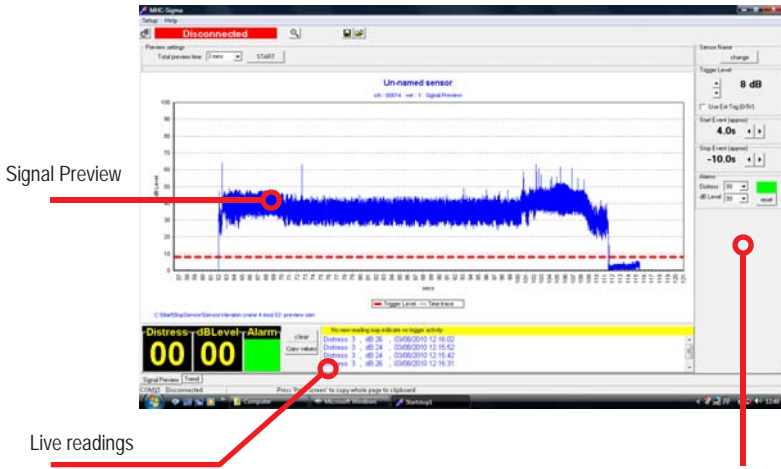
Resonant piezoelectric at ~ 100 kHz.  
24V DC (+/- 10%) nominal @ 50mA  
Power supply must be approved CE marked (i.e. compliant with EN61000-6-2, EN61000-4-5).  
-15 to +75 deg C (with standard cable).  
54 mm (L) x 35 mm (W) x 19 mm (H)  
~ 75 g including 1 m cable.  
Polyurethane coated mild steel.

Operating Temperature  
Dimension  
Weight  
Housing Material

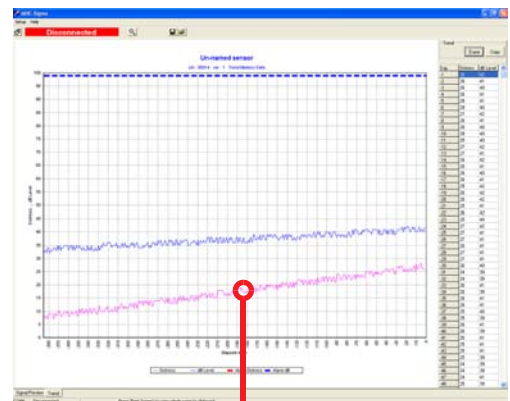
\* SI/RT/C interface (purchased separately) connected to a PC running the MHC-Sigma sensor set-up software with a spare PC USB port

specifications subject to change without notice

Example of MHC-Sigma setup software

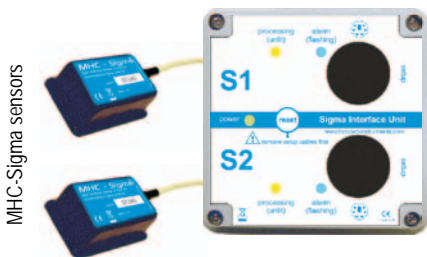


Sensor settings



Historical alarm trend

**Sigma Interface Unit**



**Sigma Interface Unit**

Number of channels  
Dimensions  
Material  
Internal connections  
Indicators  
Operating Temperature  
Inputs

2  
115(w) x115(l) x 64(h) mm  
PVC grey splash proof  
Screw less terminations  
Power, Processing and Alarm LED  
-15 to +75 deg C  
Power 24V DC @ 50mA per sensor (without external loads)  
Power supply must be approved CE marked (i.e. compliant with EN61000-6-2, EN61000-4-5)  
2 x External Trigger (contact closure)  
2 x SI/RT/C interface connectors  
Sensor/Alarm RESET button  
Alarm open collector output (100mA)  
2 x analogue (direct from sensor)

Outputs

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[www.holroyd-instruments.com](http://www.holroyd-instruments.com)



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Patent Pending