

Slow Machines - MHC-SloPoint - Slow Machines - MHC-SloPoint - Slow Machines



INTELLIGENT MACHINE SURVEILLANCE
machine speeds from 60 down to 0.25 rpm and below

MHC-SloPoint™

On-line condition monitoring module for very slowly rotating machinery



HOLROYD
INSTRUMENTS

What is MHC-SloPoint™?

The MHC-SloPoint is a versatile condition monitoring module specifically designed to provide continuous surveillance of very slowly rotating machinery based on unique and patented AE technology. In this way the ever vigilant MHC-SloPoint is able to provide an early indication of a wide range of machine faults without the need for detailed design information or bearing ISO numbers. It can be used as either a **STANDALONE** unit or an intelligent interface to your existing **SCADA** and **PLC** systems.

Setting up the MHC-SloPoint couldn't be easier since internal memory automatically stores the most significant values of the powerful range of signal characterisations; dB Level, Peak, Intensity and Extent. Intelligent alarms can then be simply set in the knowledge of the values associated with normal running and the programmable time delay (ie alarm hold-off times) to prevent false alarms. This ensures you will only be alerted to sustained changes in machine condition. These sophisticated alarms have independently programmed set-points and switching criteria based on parameter combinations. To prevent tampering with the MHC-SloPoint settings all of the programmable features can only be modified through the Field Programmer (FPI) since there are no switches, buttons or knobs on the main unit front panel.

Analogue outputs of dB Level, Peak, Intensity and Extent are also provided to allow simple interfacing to SCADA or more complex data acquisition systems.

Typical Applications

The versatile outputs and unique detection technology at the heart of the MHC-SloPoint opens up limitless application possibilities to very slowly rotating machinery :

- Leisure attractions
- Heavy lifting gear
- Water treatment sites
- Marine propulsion
- Process machinery

So whether you're interested in :

Lubrication condition (effectiveness, water contamination, particle ingress or wear debris)

Bearing condition (whether journal, ball or roller type)

Gearbox condition (slow speed drives)

At last the MHC-SloPoint offers an affordable and simple way to monitor your crucial slow speed machinery.

Features (see Specifications on back page for full details)

- **Machine speeds from 60 to 0.25 rpm**
(slower speeds also available on request)
- **Dual Intelligent Alarms**
Designate criteria for each on dB Level, Peak, Intensity and Extent
Programmable set-points and time delays (alarm hold-off)
Manual reset (remote contact closure) or automatic
- **Smart Logging**
Saves processed values for the last 128 days
Optional memory freeze on alarm.
No-need to reset or re-configure after power interruption
External disable so only logs when machine is running
- **LED indication of alarm and power status**
- **Handheld Programmer**
Gives security to set-up, Displays current values, Reviews past trends
- **Versatile Outputs**
Switched NPN transistor for relays, PLC / SCADA systems etc.
Analogue for SCADA / PC (two available, both externally selectable)
- **Built-in MHC/AE Sensor Excitation**
- **Adaptable Sensor Options**
MHC compatible sensors, 50 ohm phantom drive sensors (internally set option), standard, waterproof and submersible sensors, structure borne or airborne detection, special sensor options available (see below)

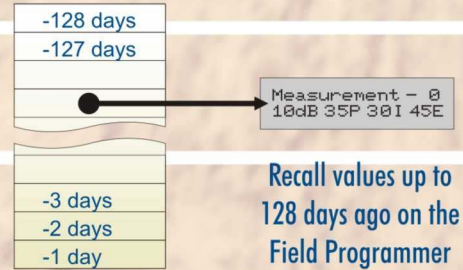


LOG
ALARM
INTERFACE

The Power to Remember

The MHC-SloPoint is fitted with internal non-volatile memory which enables it to remember values of dB Level, Peak, Intensity and Extent for the last 128 days. Each reading represents the most significant value that the machine generated in each 24 hours of operation. Logging can be on a continuous 'First In First Out' basis or can be automatically frozen whenever an alarm condition is met. In this way the critical trends of dB Level, Peak, Intensity and Extent over the last 128 days are instantly available to be viewed on the Handheld Programmer at any time.

In addition the internal status of the MHC-SloPoint is unaffected by interruptions to the power supply. So when power is eventually restored the MHC-SloPoint carries on from where it left off; same measurement settings, same alarm settings, same alarm status, same logger memory contents etc..



Recall values up to 128 days ago on the Field Programmer



Standard
For general use on machinery



Waterproof
For environments where total submersion is required

Mounting
For attaching sensor (customisation)

Compatible sensors

The standard MHC compatible sensor is a good general purpose device suitable for most industrial situations.

However there are places where the standard sensor just will not do. In these tricky situations we can provide a number of solutions which we have found cater for most of our customers needs.

Note : Products described in this leaflet contain patented technology

Versatile Alarming

The MHC-SloPoint comes with two switching outputs which have independent set-points so that you can set two severity levels (eg one as warning and the other as an alarm for action). The set-points for each of these outputs is independent and can operate on dB Level, Peak, Intensity and Extent simultaneously (using an OR function) as below :

Alarm if value > dB Level set-point value OR
Peak set-point value OR
Intensity set-point value OR
Extent set-point value

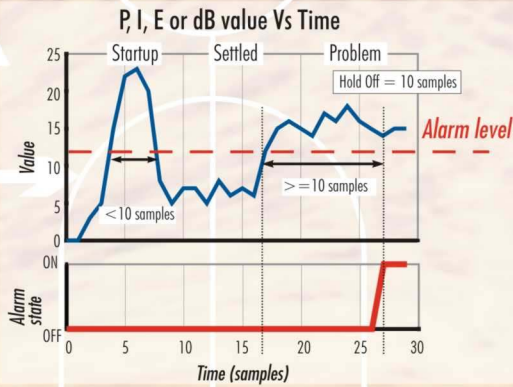
The alarm time delay ('hold-off') allows signal transients or "glitches" in the processed values to be ignored. The alarm time delay works like this:

Alarm if value > alarm level for the pre-programmed time delay

In the following example the alarm condition is only

activated when 10 consecutive values for dB Level, Peak, Intensity or Extent exceed the alarm level thereby ignoring transient activity like machine startups.

Alarms are transistor output (NPN) and can be reset with the Field Programmer, remote contact closure (eg manual reset button) or automatically using pre-programmed reset timing.



and lots more

What does it monitor?

The MHC-SloPoint is capable of monitoring virtually any rotating piece of equipment rotating at speeds from 60 rpm down to 0.25 rpm without knowing anything about the detailed design of the machinery :

- Low speed drives
- Shaft/drum/roll support bearings
- Turntable bearings
- Slew rings
- Settling tank scrapers
- Rotating kilns
- Cranes
- Tank agitators

How does it work?

The principles of detection employed in the MHC-SloPoint have been beta trialled in industry for a period of 4 years prior to product launch. Wide dynamic range circuitry, diffuse field detection and proprietary signal processing methods combine to make the innovative signal processing in the MHC-SloPoint second to none. Whilst no CM technique can guarantee to provide early warning of all possible fault conditions the patented technology underpinning the MHC-SloPoint has an exceptional track record on all types of rotating machinery.

Put simply high frequency Acoustic Emission (AE) signals are detected and processed to characterise both transient activity and overall magnitude as dB Level, Peak, Intensity and Extent. Although signal levels are lower at high frequencies and slower machine speeds (requiring the use of sensitive sensors) they are strongly affected by machinery fault processes including friction and impacts. In general slowly rotating machinery in very good condition produces minimal transient activity (typically giving an Extent value less than 5) and an increase in Extent is often the first sign of problems (eg from increased impacts due to poor lubrication or damaged surface condition). Peak and Intensity add further to the detection and trending capability. The dB Level characterisation provides a useful means of detecting more continuous activity associated with both accumulated damage and generalised friction within moving parts.

The power of the dB Level, Peak, Intensity and Extent parameters lies not only in their extreme sensitivity to developing faults but also in the limited amount of information they need to perform their analysis; just the period of revolution measured in seconds from 1 (60 rpm) to an amazing 255 seconds per revolution (that's less than 0.25 rpm !!). Specifically the MHC-SloPoint and interpretation of its outputs does not need a once per rev signal, empirical look up-tables, machine design information or calculated defect frequencies. The combination of this with the benefits of AE technology means that the MHC-SloPoint provides an easier to implement and a less ambiguous monitoring parameter than alternative methods.

Field Programmer (FP1)

The Field Programmer (FP1) is the user's interface to the MHC-SloPoint. It allows the unit to be tailored to the specific application requirements and provides the means to access present and stored values of dB Level, Peak, Intensity and Extent. The FP1 also provides a level of anti-tampering as no unauthorized changes to the operation of the MHC-SloPoint can be made without it. Using the FP1 for viewing and programming is easy using the built-in keypad to respond to the menus displayed on the LCD alphanumeric display.

Importantly with just one FP1 you can set-up and interrogate any number of MHC-SloPoint units (or other products in the range such as MHC-SetPoints).



Whatever the industry
The MHC-SloPoint Delivers!



Bosses
fit into your machinery
(vice available)

Ruggedised Submersible
For severely aggressive environments
where total submersion is required



Custom
Specialised customisation service
to individual user requirements

Items not shown to scale

Attachment is easy. With an integrated M8 mounting thread you have the choice of drilling & tapping or using a mounting boss which can be bonded permanently to your machinery.

We can even provide special customisation services to exactly meet your needs. Call to discuss your requirements.

MHC-SloPoint TM is a trademark of
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Outline Technical Specifications MHC-SloPoint™

- **Outputs :**
2 qty. NPN transistor outputs current sinking (1.6V @ full 0.1A DC load current)
- Alarm O/P 1 & 2 works on dB, Peak, Intensity & Extent
- Programmable switching set-points (0 to 99)
- Programmable time delay / alarm hold-off (0 to 255 measurement periods)
- Alarm reset (manual or automatic)
- Analogue O/P 1 defaults as Intensity (20 mV/dB) but remotely selectable as dB Level (20 mV/dB).
- Analogue O/P 2 defaults as Extent (20 mV/%) but remotely selectable as Peak (20 mV/dB).

FP 1 interface (15 pin 'D' type)

- **Internal Logging :**
Continuous logging with option to freeze in alarm state
- Stores processed max values of dB Level, Peak, Intensity and Extent / 24 hours of operation

128 sets of values stored in non-volatile FIFO memory

- **Hardwired Control of Operation :**
External reset & disable
- External selection of parameters on Analogue O/P 1 & 2 (MPX)

- **Inputs :**
AE Sensor input - MHC compatible 10 VDC sensor excitation
- 50 ohm, 24 V DC phantom drive (internally set option)

- **Physical (sizes in mm):**
Size - 110 (l) x 75 (h) x 50 (w)
- Mounting - DIN46277-2, DIN46277-3 rail or wall/panel
- Screw terminal connections

- **Electrical**
24 V DC @ 50 mA (typ. with outputs unloaded) from a low noise power supply (<40mV pk-pk ripple & noise)

Field Programmer (FP1)

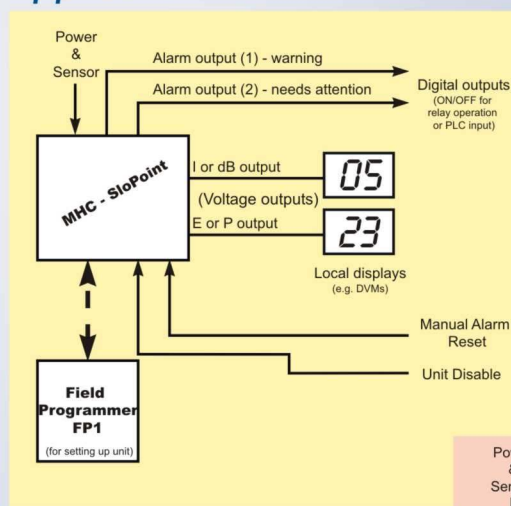
- I/O socket : 15 pin 'D' type connector
- Display : LCD, 2 x 16 alphanumeric characters
- Keypad : 4 button (Up, Down, Menu/Cancel, OK)
- Power Source : Drawn from MHC-SloPoint
- Physical (sizes in mm) :
Size ~190(l) x 110(w) x 32(h)

Typical Sensors

- **Common Features**
Integrated electronics
- 304 s/steel external housing (additional external s/steel jacket on Ruggedised Submersible)
- Attachment via M8 thread to 304 s/steel mounting boss
- **Physical (sizes in mm) :**
Standard : 102 (l) x 32 (O/D)
Submersible : 130 (l) x 42 (O/D)
Ruggedised Submersible : 130 (l) x 44 (O/D)
Standard mounting boss : 11 (l) x 28 (O/D)
Right angle mounting boss : 40 (l) x 40 (O/D)
- **Output**
Integral coaxial cable through a cable gland
- **Options**
Options also available for RF connector (BNC, TNC etc) and 16mm (O/D) conduit exit (consult factory)
- 50 Ohm output for increased drive distances (up to 100m)
- Customisation of sensor & attachments to specific user requirements (contact factory)

All specification subject to change without notice
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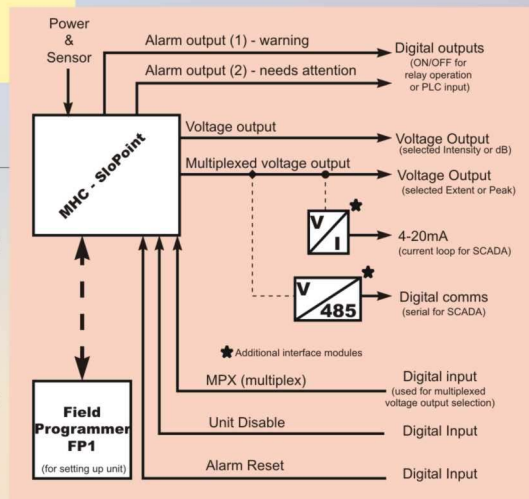
Applications



PLC - SCADA - PC

The MHC-SloPoint will also operate in conjunction with standard PLC, SCADA & PC based data collection systems.

To reduce the cost of processing multiple analogue channels, the MHC-SloPoint has the ability to multiplex Intensity & dB level or Extent & Peak on its two analogue ports so that it can be sampled by a dual channel AtoD converter or similar devices.



In the example to the right the user has opted to use the MHC-SloPoint to interface to a control system to take not only live readings of machine condition through a single analogue port but also to give local alarms of machine condition via dedicated relays (alarm outputs 1 & 2).

Starter Packs

Two starter packs are available at special low prices (one per customer) to give you a head start in implementing effective monitoring for two measuring points which may be on the same machine or on two completely different machines.

Pack 1

- 2 off MHC-SloPoints
- 2 off Standard MHC-Sensors (inc 10m cable & mounting bosses)
- 1 off Field Programmer unit (FP1)
- 1 off Programmer cable



Pack 2 (not shown)

- Contents of Pack 1 plus :-
Painted Steel Box
+24V DC 0.5A power supply
Cable glands
DIN rail

Just wire & power up to go!

Other products in the range

Holroyd Instruments provides a full range of solutions for your machinery condition monitoring needs

- **MHC - Memo** Full function data logger with 1000 point measurement capacity & full Windows analysis software
- **MHC - Classic** The craftsmans tool with hold and compare functions
- **MHC - Solo** Simple and effective - the ideal "look-see" tool
- **MHC-SetPoint** On-line continuous processing module for general rotating machinery



Contact us for more details



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