

AT LAST - AFFORDABLE & EFFECTIVE ON-LINE MONITORING FOR YOUR ROTATING MACHINERY


MHC - SetPoint™

Roll & Shaft Support Bearings

Around the Clock

Motors - Pumps - Gearboxes - Fans

Gear - Bearing - General Lubrication faults



MHC-SetPoint™
Holroyd Instruments Ltd

DC Alarm1 Alarm2

Sen+ Sen- Ana 1 Ana 2 AGND MPX

Alarm 1 Alarm 2 Reset Disable +24V/DC 0V

Machine Surveillance

STANDALONE - PLC - SCADA - PC

The image shows a black rectangular monitoring module with a central D-sub connector. It features two rows of screw terminals. The top row is labeled: Sen+, Sen-, Ana 1, Ana 2, AGND, and MPX. The bottom row is labeled: Alarm 1, Alarm 2, Reset, Disable, +24V/DC, and 0V. In the center, there are three LEDs: a green one labeled 'DC', a yellow one labeled 'Alarm1', and a red one labeled 'Alarm2'. The module is set against a background of a clock face with the text 'Around the Clock' and 'Machine Surveillance' overlaid. A gear icon is also present. The entire scene is framed by a dark border with yellow text on the sides and top.

Machine Surveillance for the 21st Century



HOLROYD
INSTRUMENTS

What is MHC-SetPoint™?

The MHC-SetPoint is a versatile condition monitoring module that provides continuous surveillance of your critical rotating machinery based on unique and patented AE technology. In this way the ever vigilant MHC-SetPoint is able to provide an early indication of a wide range of machine faults without the need for detailed design information, shaft speeds 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-SetPoint couldn't be easier since internal memory automatically stores the maximum values of the field proven Distress and dB Level parameters. 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 to prevent false alarms) 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-SetPoint settings all of the programmable features can only be modified through the Field Programmer (FP1) since there are no switches, buttons or knobs on the main unit front panel.

Analogue outputs of Distress and dB Level are also provided to allow simple interfacing to SCADA, PC or dedicated data acquisition systems.

Features (see Specifications on back page for full details)

- Dual Intelligent Alarms**
 Designate criteria for each on Distress, dB level or both
 Programmable set-points and time delays (alarm hold-off)
 Manual reset (remote contact closure) or automatic
- Lost Signal Alarm**
 Warns of faulty sensor wiring when signal drops below a defined limit
- Smart Logging**
 Saves processed values for the last 128 days,
 Optional memory freeze on alarm, entirely non-volatile memory
 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 Field Programmer (FP1)**
 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, one externally selectable)
- Built-in AE Sensor Excitation**
- Adaptable Sensor Options**
 MHC compatible, 50 ohm phantom drive, standard, waterproof and submersible sensors,
 structure borne or airborne detection, special sensor options also available

LOG
ALARM
INTERFACE



What can it detect?

The versatile outputs and unique detection technology at the heart of the MHC-SetPoint allows limitless application possibilities to most rotating machinery. Here are some examples:

- Lubrication Condition**
 Use to alert when lubrication is inadequate (eg because of lack of grease or water/particulate contamination because of seal failure.)

 Use as part of an intelligent greasing system.
- Bearing Condition**
 Use to provide early warning when journal, ball and roller bearings are starting to deteriorate.

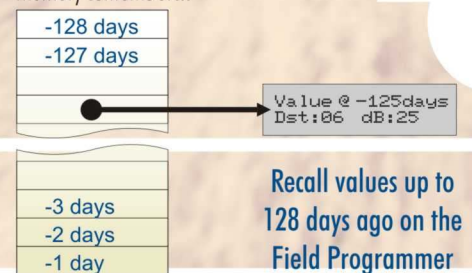
 Use to provide warning of rapid failure modes to minimise secondary damage.
- Gearbox Condition**
 Use to provide early warning of gearbox degradation (shaft bearings and gear teeth).

 Use to provide warning of rapid failure modes to minimise secondary damage.

The Power to Remember

The MHC-SetPoint is fitted with internal non-volatile memory which enables it to remember values of Distress or dB Level 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 Distress and dB Level over the last 128 days are instantly available to be viewed on the Field Programmer at any time.

when power is eventually restored the MHC-SetPoint carries on from where it left off; same alarm set-points and time delay, same alarm status, same logger memory contents etc..



Recall values up to 128 days ago on the Field Programmer

In addition the internal status of the MHC-SetPoint is unaffected by interruptions to the power supply. So



Standard
For general use on machinery



Waterproof
For environments where total submersion is required

Mounting
For attaching sensors (customisation)

Compatible sensors

The standard sensor provided with your MHC-SetPoint 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-SetPoint 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 Distress, dB Level or both simultaneously (using an OR function) as below:

Alarm if value > Distress set-point value
OR
> dB Level set-point value

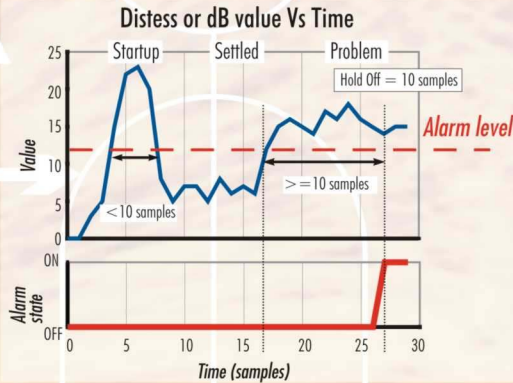
The alarm time delay ('hold-off') allows signal transients or "glitches" in the processed values to be ignored. The alarm time delay works like this:

Alarm if value > Alarm level for the programmed time delay

In the example shown the alarm condition is only activated when 10 consecutive values for Distress or dB Level exceed the alarm level thereby ignoring transient activity like machine startups. A new value (sample) is calculated every 10 seconds.

In addition there is a LOW LEVEL alarm (fixed set-point) which is activated if the dB Level falls and stays below 5 dB for 24 hours. In this way short term power interruptions are ignored but attention is drawn to long term drops in signal due to cable damage etc. (this feature can be inhibited if not required).

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.



Field Programmer (FP1)

The Field Programmer (FP1) is the user's interface to the MHC-SetPoint. It allows the unit to be tailored to the specific requirements of the operator and provides the means to access present and stored values of Distress and dB Level. The FP1 also provides a level of anti-tampering as no unauthorized changes to the operation of the MHC-SetPoint 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-SetPoint units.



Whatever the industry
The MHC-SetPoint Delivers!



ing Bosses

ors onto your machinery
n service 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.

What does it monitor?

The MHC-SetPoint is capable of monitoring virtually any rotating piece of equipment down to approximately 30rpm without knowing anything about the detailed design of the machinery (e.g. exact rpm, bearing ISO number, previous history etc)

- Fans (air cond, extraction, blowers etc)
 - Motors (fixed and variable speed)
 - Pumps (centrifugal, screw, lobe etc.)
 - Gearboxes & pulley drive systems
 - Bearings (plain, ball, roller etc)
 - Roll & shaft support bearings
- and lots more

How does it work?

The principles of detection employed in the MHC-SetPoint have been widely proven in portable instruments throughout UK industry. Wide dynamic range circuitry, diffuse field detection and proprietary signal processing methods combine to make the MHC approach second to none. Whilst no CM technique can guarantee to provide early warning of all possible fault conditions the patented MHC approach 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 (Distress parameter) and overall magnitude (dB Level parameter). Although signal levels are lower at high frequencies (requiring the use of more sensitive sensors) they are strongly affected by machinery fault processes including friction and impacts. In general rotating machinery in very good condition produces minimal transient activity (Distress values less than 5) and an increase in Distress is often the first sign of problems (eg from increased impacts due to poor lubrication or damaged surface condition).

The power of the Distress parameter lies not only in its extreme sensitivity to developing faults but also in its direct and near universal interpretation across rotating machinery. Since it does this without the need for empirically derived look-up tables or calculated defect frequency information it provides a less ambiguous monitoring parameter than competitive methods.

Although dB Level is affected by rotational speed it provides a useful means of detecting more continuous activity associated with both accumulated damage and increased friction within moving parts.

MHC-SetPoint™ and Distress® are trademark and registered trademarks of Holroyd Instruments Ltd

Outline Technical Specifications

MHC-SetPoint™

- **Outputs :**
 - 2 qty. NPN transistor outputs - current sinking (1.6V @ full 0.1A DC load current)
 - Switch O/P 1 works on both Distress & dB Level
 - Switch O/P 2 as for O/P 1 with additional low dB Level set-point (<5 dB)
 - Programmable (non-volatile) switching set-points (0 to 99)
 - Programmable (non-volatile) time delay & alarm hold-off (0 to 255 readings)
 - 2 qty. analogue outputs (0 to 2 V DC) updated every reading (~ 10 sec intervals)
 - Analogue O/P 1 defaults as Distress (20 mV/unit) but remotely selectable as dB Level (20 mV/dB) via MPX
 - Analogue O/P 2 designated as dB Level
 - Manual / automatic reset
 - FP 1 interface (15 pin 'D' type)
- **Internal Logging :**
 - Continuous logging with option to freeze in alarmed state
 - Stores processed max values of Distress & dB Level over 24 hours of continuous operation
 - 128 pairs of values stored in non-volatile FIFO memory
- **Hardwired Control of Operation :**
 - External reset & disable
 - External selection of parameter on Analogue O/P 1 (MPX)
 - Internal 20 dB gain reduction
- **Inputs :**
 - AE Sensor input - MHC compatible 10 VDC sensor excitation (50 ohm impedance 24 VDC phantom drive optional)
- **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 VDC @ 50 mA (typ) - low noise power supply (linear preferred) outputs unloaded

Field Programmer (FP1)

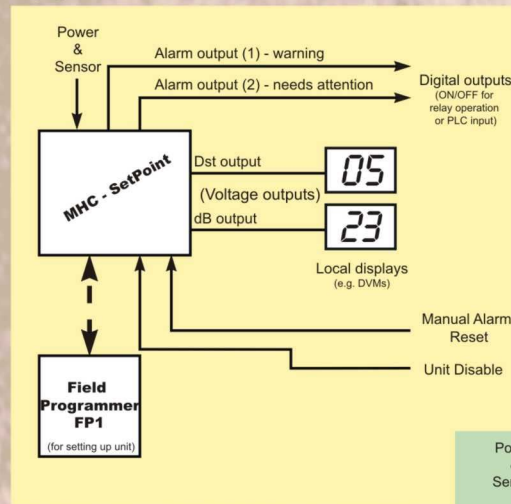
- I/O socket : 15 pin 'D' type connector
- Display : LCD, 2 x 16 alphanumeric characters
- Keypad : 4 button (Up, Down, Menu/Cancel, OK)
- Power Source : Drawn from MHC-SetPoint
- Physical (sizes in mm) : Size ~190(l) x 110(w) x 32(h)

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**
 - 10m of supplied coaxial cable through a cable gland (longer lengths available at extra charge)
- **Options**
 - Options also available for RF connector (BNC, TNC etc) and 16mm (O/D) conduit exit
 - 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

Applications



PLC - SCADA - PC

The MHC-SetPoint 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-SetPoint has the ability to multiplex Distress and dB level on a single analogue port so that it can be sampled by a single channel of an AtoD converter or similar devices.

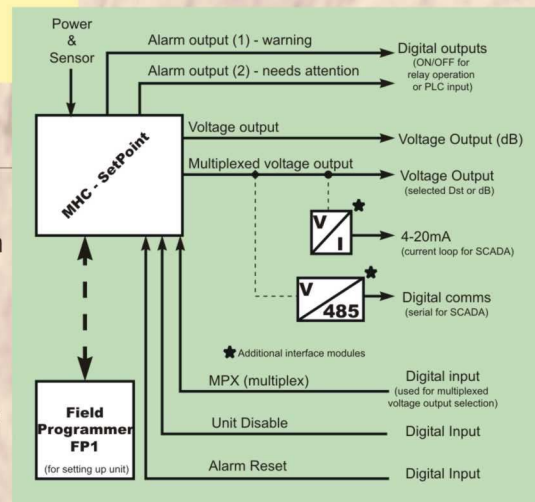
In the example to the right the user has opted to use the MHC-SetPoint to interface to a control system to take not only live readings of machine condition through a single analogue port but also to give local alarms of machine condition via dedicated relays (alarm outputs 1 & 2).

STANDALONE

The MHC-SetPoint operates unsupervised in a standalone mode where your machinery will be continuously checked for deterioration.

A typical setup is shown to the left where the user requires alarms for early and late failures and optional displays of Distress or dB Level.

When the alarm is activated by the MHC-SetPoint use the FP1 to instantly review the trend over the past 128 days.



Starter Packs

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

Pack 1

- 2 off MHC-SetPoints
- 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 portable solutions for your machine maintenance toolbox including

- **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



Contact us for more details.



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