



## MHC On-Site Instruments

- On Site Instruments for real time condition monitoring
- Detect failure modes for shaft speeds > 0.25 rpm
- Record & replay readings from pre-planned routes

## MHC-On-Site Instruments

**Hand held, rugged instruments giving you instant access to powerful CM diagnostics.**

If you need information on the condition of rotating machinery and you need it now, the MHC-Memo instruments are for you.

- With Standard and Super Slo modes of measurement, it's easy to monitor down to rotational speeds as low as 0.25 rpm (that's 4 minutes per revolution !).
- What's more, you don't need to know design details like bearing type, size or number.

From day one, MHC-Memo instruments give you crucial information for implementing proactive, rather than reactive, maintenance. Even on machinery you have never monitored before. Unlike traditional vibration analysis, sensor placement is easy as it's unaffected by the plane of the bearing or at any specific orientation.



Make no mistake, the outstanding speed and ease of use of the MHC-Memo range are not gained by compromising performance or sensitivity to developing faults. In fact, our unique, patented and well established MHC technology has gained an enviable reputation across all industrial sectors. With thousands of MHC instruments in use around the world you'll not be alone.

### MHC-On Site Instruments

MEMO	Classic	Kit	Standard mode only non-data logging handheld instrument + standard accessories
MEMO	Classic Plus	Kit	Std. & Super Slo mode non-data logging handheld instrument + standard accessories
MEMO	Pro	Kit	Full functionality Data Logging portable instrument + standard accessories
MEMO	View	Pro	Set-up, download & reporting PC software for MEMO Pro
MEMO	View	Lab	Frequency diagnostic PC software for use with MEMO Pro

### Introduction

MHC-Memo instruments monitor high frequency Acoustic Emissions (AE) signals naturally generated by deterioration in rotating machinery. Our unique way of detecting and processing these signals gives you condition related information in the easiest possible form. They are state of the art Condition Monitoring instruments with extreme sensitivity to developing faults. With thousands of MHC portables in use worldwide and countless successes on ball, roller, white metal and journal bearings, this is a claim we can substantiate.

#### How do they work ?

As the mechanical condition of machinery deteriorates, energy loss processes such as impacts, friction and crushing generate sound wave activity that spans a broad range of frequencies. By detecting only the high frequency part of this signal with special AE sensors it is possible to detect miniscule amounts of activity (e.g. a slight rub, a brief impact or the crushing of a single particle in the lubricant). The patented MHC sensor gives improved repeatability and is remarkably rugged. With its magnetic front face its also quick to use.

A crucial step is to process these signals so that faults can be easily detected at an early enough stage to allow maintenance to be planned but not to constantly give false alarms. This is where the Standard and Super Slo methods come into their own.



**Distress® increased from 4 to 26 however FFT Vibration MISSED this!**

#### Headphones (with built-in ear defence) :

Irrespective of whether you are in Standard or Super Slo mode you can listen to the nature of the signals in the headphones. The special audio circuitry filters out normal vibrations and audible sounds to let you clearly hear rubs, impacts etc. as they happen. Different fault types sound like isolated clicks, once per rev scuffing or frying food. The combination of the headphones and the optional MHC-Airborne sensor provides a powerful detection capability for air and vacuum leaks.

It is important not to confuse our MHC instruments with simple vibration meters. The high frequency detection of MHC instruments provides an inherently better Signal to Noise Ratio (SNR). It is this fundamental characteristic combined with our patented signal processing methods that gives exceptional sensitivity to developing faults without the need to enter machine or bearing details.

# MHC-On-Site Instruments

## Finding lubrication problems

Distress® readings are taken every month. When items are found with a value greater than 10 its time to re-grease. The reduction in Distress® confirms the improvement. No need to know the speed, bearing type etc.

## Instant "health" checking

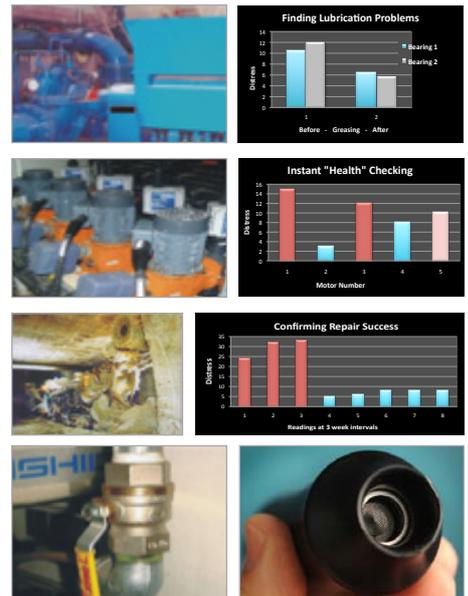
3 of the 5 motors have a Distress® > 10. No need for calculations or previous machine knowledge - it's instant. Since re-greasing gave no improvement its clear there is permanent damage.

## Confirming repair success

Measurements were taken to reveal a developing problem. When the bearing was replaced the reduced Distress® value immediately confirms a successful repair.

## Find leaks FAST!

Save energy & money! Simply plug the airborne sensor (optional accessory) into one of the portable products shown and listen on the headphones - you now have a sensitive leak detector for compressed air. Be suprised how quickly and easily you'll find leaks that you never knew were there.



Real life data shown in examples

See a video demonstration at [www.kittiwakeholroyd.com](http://www.kittiwakeholroyd.com)



## MHC Memo - Classic - Instant Machine Health Checker

The entry level Memo-Classic features Standard mode with a 4 measurement point hold and temporary store feature. Press the ON button, couple the magnetic sensor to the machine and you're away. It couldn't be easier.

The Hold and Store function let's you compare readings on different machines (or parts of the same machine) to home in on the problem and the headphones are a great help in identifying the type of activity.

## MHC – Memo Classic Plus - Instant & Versatile Machine Health Checker

If you like the simplicity of the Memo-Classic but in addition to Standard mode you need Super Slo mode then the Memo-Classic Plus is simplicity itself.

In addition the Memo-Classic Plus has a 32 measurement point non-volatile memory which is ideal for comparing Standard or Super Slo readings on similar machines or keeping track of developments on a machine of current concern.



## MHC - Memo Pro - Route Mode Data Collector with PC Analysis Software

The Memo Pro is able to monitor a near unlimited number of machines on a periodic basis. In addition to storing Standard and Super Slo modes within its walk around routes the Memo Pro can also store manually input values from any other device (e.g. a pressure gauge, kVA meter etc.). The Memo Pro can hold up to 6 routes at a time, each having up to 435 measurement points within a Site, Area, Machine & Point hierarchy.

All readings can be downloaded to the Memo View Pro software package supplied as standard. Memo View Pro features Trend plots, Alarm Levels, Exception Reports, Missed Points List and User Notes. The addition of Capture Spectrum and AutoLog functions make the Memo Pro the ultimate tool for Condition Monitoring specialists.

## MHC-On-Site Instruments

MHC-Memo FEATURE	Memo Classic	Memo Classic Plus	Memo Pro
Headphones	x	x	x
Standard Mode (Std)	x	x	x
Super Slo Mode (Slo)	-	x	x
Manual Input	-	-	x
Software	-	-	Memo View Pro Memo View Lab
AutoLog	-	-	x
Memory (volatile)	4 points	-	-
Memory (permanent)	-	32	2592 points on 6 routes
FFT Frequency Analysis capability	-	-	15 spectra
Route Naming Heiracy	-	-	4 levels
Compare previous Values	-	-	x
PC Interface	-	-	x
Keypad	5 Keys	10 Keys	10 Keys
Full trend analysis software	-	-	x
Coms	-	-	USB
<b>Features common to all variants</b>			
Measurement Std	Distress®, dB Level		
Measurement Slo	Super Slo : Peak, Intensity, Extent, dB Level. (Slo Mode not available on Memo Classic)		
Earphone/defenders	Included		
Carry Case	Included		
Display	2 x 16 backlit LCD alphanumeric, Hold and Compare, Problem Alert, Coupling Alert		
Keypad	Sealed membrane		
Power save	After 8 mins		
Audio out	Hi/Lo ranges		
Dynamic Range	92 dB (40,000 : 1)		
Op. Temp	0 - 50 deg C		
Battery type	2 x PP3 / MN1604 (9v or equivalent)		
Battery life	8hrs with backlight off (NiCd/NiMH), 34hrs (alkaline), 80hrs (LiMn)		
Size	115(w) x 220(h) x 52(d)mm		
Weight	800 g (approx)		
<b>MHC 1000 Series Sensor included as standard</b>			
Attachment	Standard magnetic front face		
Size	83 x 34		
Weight	250g (inc cable)		
Cable	1m TNC, 50 ohm coax		
Op temp	0 - 70 deg C		

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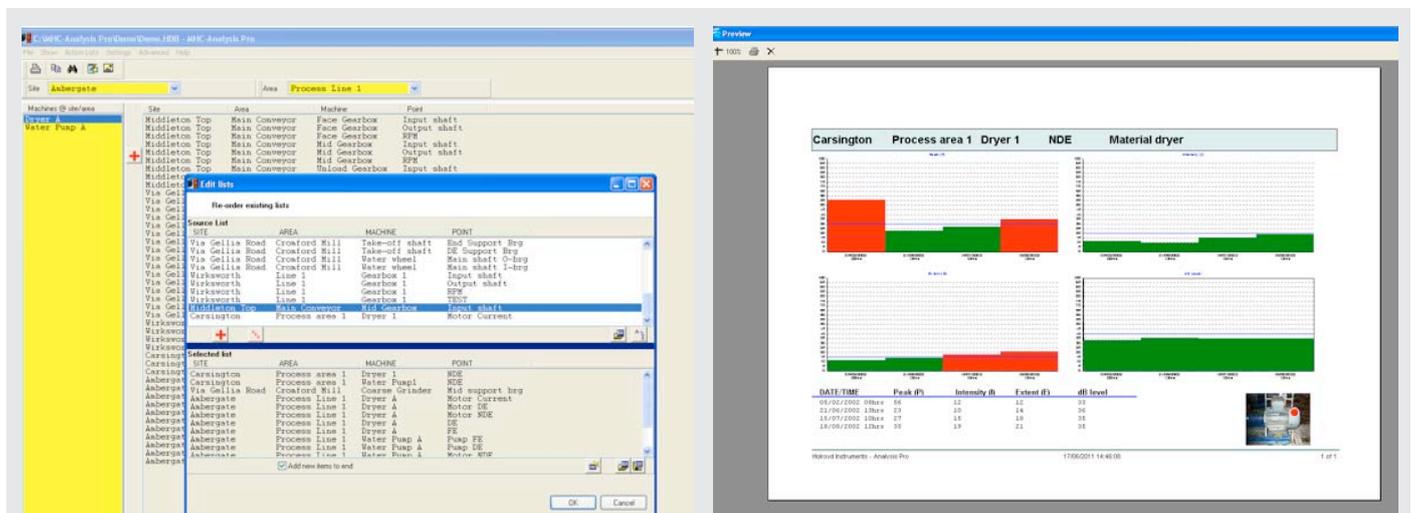
## Memo - Data capture and analysis software :

Memo data capture and analysis software comes in 2 versions:

- Memo View Pro** - a true machine database logging data (past readings, photo, alarm levels ... etc) against a 4 level hierarchical address structure (Site, Area, Machine and Point) with sophisticated report generation capabilities.
- Memo View Lab** - takes the capabilities of Memo View Pro and extends them to include a true frequency analysis with harmonic analysis and export of captured data to third party software packages.

### Memo View Pro

Memo View Pro is a full functionality route mode software package for use with the MHC-Memo Pro instrument. It is designed around a machine database with Site, Area, Machine and Point fields of hierarchy. Measurements are taken in Route lists but can be analysed in flexible Action lists irrespective of which Routes they were taken on. Report generation is simplified using the Exception Report, Missed Points listing and the summary printouts showing graphical trends, tabulated readings and even user input machine photos. Organisation and control of the CM task is further aided by features such as User Notes and a Calendar giving a reminder when measurements need to be taken on specific Routes.



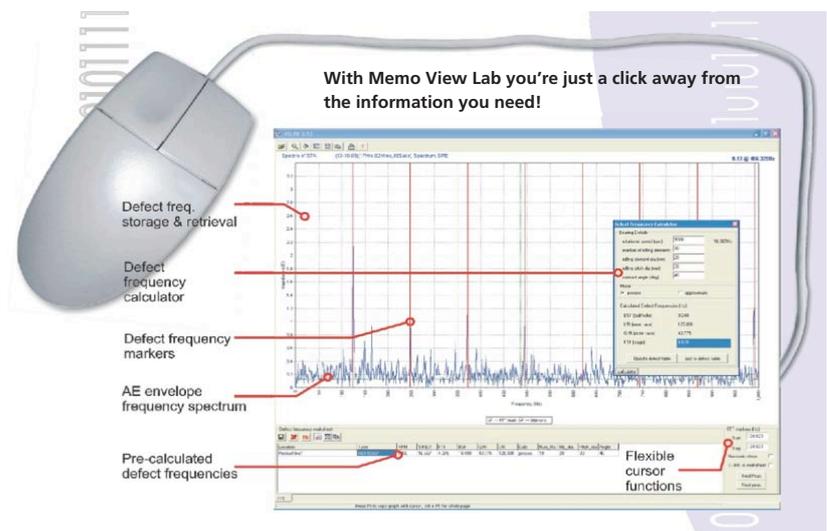
Route planning & machinery detail

Results, alarms, trends, time & date.

### Memo View Lab

Memo View Lab software takes as its input the Capture Spectrum files recorded on the MHC-Memo Pro instrument and displays them as a frequency spectrum to aid in the identification of defects present.

Spectra can be cursor interrogated and overlaid with harmonic markers either manually entered or derived from the defect frequency calculator. Provision is made for exporting of the numerical values of spectra datapoints (e.g. for viewing in a third party spreadsheet).



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## An explanation of the operating modes

### Standard Mode

Standard mode is a powerful way of processing the minor clicks and crunches associated with the earliest stages of mechanical deterioration in machinery rotating down to ~ 35 rpm. dB Level and Distress® values take just 15 seconds and there's no need to enter any information about the machine (such as bearing type, size or number) or even shaft speed. Distress® is so sensitive it will even detect inadequate lubrication giving you the opportunity to remedy the problem before any permanent damage has occurred.

Distress®	Interpretation
0-5	very good condition
5-10	satisfactory condition
10+	suspect condition

### Usual interpretation

### Super Slo Mode

Super Slo mode makes quick work of sensitively monitoring machinery rotating as slowly as 0.25 rpm (4 minutes per rev !). The only information needed is the number of seconds per revolution and the patented Super Slo method does the rest.

Extent®	Interpretation
0-5	very good condition
5-10	satisfactory condition
10+	suspect condition

### Usual interpretation

In just 9 revolutions you'll get the dB Level, Peak, Intensity and Extent® signal characterisations. Each of these has its role to play but for spreading damage (the most usual form of deterioration) it's the Extent reading that is the most powerful.

### Capture Spectrum (requires Memo View Lab)

Capture Spectrum lets you view and analyse the envelope spectrum to reveal repetition (defect) frequencies. If, for example, you need to know whether its an inner race or outer race defect that's causing the increased Distress® then this is the feature for you. (Note : Capture Spectrum is only suitable for machinery rotating above 120 rpm.)

### AutoLog

AutoLog stores a sequence of successive readings of either Standard mode or Super Slo mode. The available AutoLog memory of 2,340 sets of readings can comprise any number of sequences in any combination of Standard and Super Slo modes. The instrument keypad is used to control the length of each AutoLog sequence and to enter its filename at the time of the measurement

**Related products** • MHC-2000 and MHC-3000 series AE Sensors • Spares and Accessories

### About Kittiwake Holroyd Ltd

Holroyd are part of the Kittiwake group of companies. If your business is about condition monitoring of machinery, maintenance of industrial fuels and lubricants or monitoring of exhaust gases then Kittiwake operate in your field of expertise. Established in 1993, Kittiwake has grown into a leading global provider of monitoring and testing technology solutions with offices in the UK, Germany, Greece, USA, and Asia. Innovative technology solutions that make a real difference to your operations. Have a look at our information center on [www.condition-monitoring.com](http://www.condition-monitoring.com) for hints and tips on how to maximize the benefits from your maintenance budget.



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