

MHC-Memo ProTM

route mode condition monitoring data collector including software



- hierarchical point names (site, area, machine, point)
- multiple routes (upto 6 max)
- Upto 435 points per route
- 0.25 rpm very slow speed measurements
- manual data entry (pressure, temp etc)
- data time & date tagged
- 2340 point auto logs
- 15 spectrum files
- real time clock

Based on the successful MHC-Memo the MHC-Memo Pro instrument extends and enhances your measurement and data capturing capabilities in the field. This coupled with new PC based software, that's bundled **with** the machine, provides the user with a package of unparalleled capability at an affordable price.

So simple to use

In many cases it takes **just 15 seconds** and is as simple as :

- 1 - Attach the sensor
- 2 - Switch it on
- 3 - Distress <10 if's OK!



(standard mode example)

The power of AE is that it **directly** detects the mechanical degradation processes whilst being insensitive to general noise & vibration of normal running.

As a result the MHC-Memo Pro can be applied to virtually all-rotating equipment including those where traditional vibration methods can be difficult to apply. These include very slowly rotating equipment (super slo mode), plain bearings and complex gearboxes. It's so sensitive that many lubrication problems can be picked up before any significant damage has really occurred thus preventing any permanent damage that may later lead to machine failure.

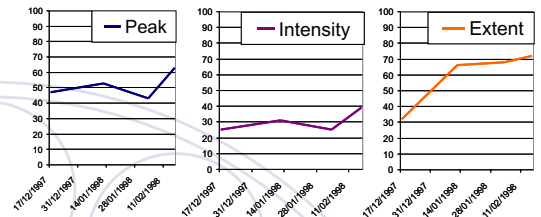
Standard

In "standard" mode it measures the unrivalled Distress and dB for assessing the state of general rotating equipment (from 1000's down to 35rpm) without the need to know speed or bearing details (see typical uses for examples). Ideal for variable speed machinery.

Dist: 07 dB Lev: 15
[compare]

Super Slo

"Super Slo" is a unique measurement technique that's been proven in the field for four years allowing **unique** monitoring of slowly rotating equipment from 60rpm down to an incredible 0.25rpm ! Based on a statistical assessment the parameters Peak, Intensity, Extent & dB Level can be trended with the MHC-Analysis Pro software to reveal subtle problems that other CM techniques struggle to detect. The example below shows trending to failure of the Peak, Intensity & Extent parameters. The bearing actually **failed** after the last reading !!!! (note : machinery in good working order typically has an extent of less than 5)



00dB 03P 05I 02E
[go] [compare]

Manual Entry

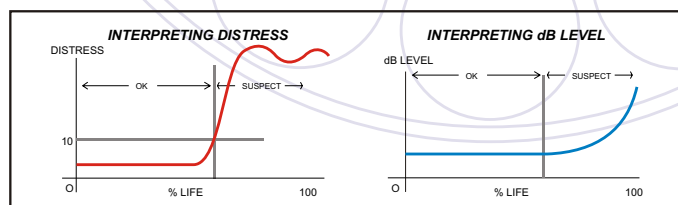
For more diverse situations there is the "Manual Entry" facility to capture numeric data manually though the keyboard. This could be used as a secondary or tertiary indicator of problems with machines (e.g. motor current, temp, pressure etc).

Motor Current
[->] 45.900 [+]

Quick Checks

The "standard" and "super slo" modes can be used "off route" to allow you to measure and assess any machines which may not be on the currently loaded routes.

Great for doing quick comparisons with other machines in the same area or as a quick "check" to see that all is well !



condition monitoring just got easier



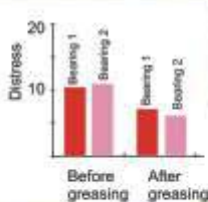
ideal for
bearings - gears - motors
pumps - fans - RBC's
HVAC - mixers
variable speed machines
etc...



Typical uses

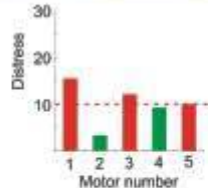
Identifying lubrication problems

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 speed, bearing type etc.



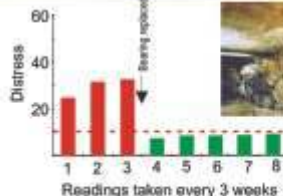
Instant "health" checking

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.



Trending to failure

Distress highlighted a problem in Month 1. dB Level was trended to track progressive wear. The gearbox appeared perfect to the site engineer even in month 5 but seized shortly after.



Real time data is shown in all examples



Hierarchical routes

Annotation of the measurement points has been substantially improved by adopting a hierarchical structure to measurement point descriptions. It is now possible to organise your routes in terms of SITE, AREA, MACHINE and POINT each of which can be up to 16 characters long. In addition it is now possible to have up to 6 routes loaded at the same time, each of which can have 435 measurement points, giving a total coverage of 2610 points each of which is uniquely time & date stamped to maintain traceability throughout the measurement chain.

Using the MHC-Analysis Pro software that's supplied free of charge with each MHC-Memo Pro you can tailor your route to have any mix of "standard", "super slo" or "manual" data entry modes in any order that you require. The built in LCD display guides you to the next machine so you're never lost on your route!

MHC-Memo Pro also lets you view the previously taken readings for each measurement point so you can see if the value has changed from last time.

Auto Log files

Auto log allows the MHC-Memo Pro to behave as a mini data-logger by repeatedly taking measurements (either in "standard" or "super slo" modes) up to a maximum limit of 2340 sets of readings. Not only that but you can also have multiple records each with a different name (e.g. for different machines) provided the total number of sets of readings does not exceed the 2340 limit. This is useful for monitoring machine start-ups & shut-downs or where there is no easy physical access to the measurement point (e.g. carousel or robot vehicle bearings). The data is presented in ASCII text format for easy imports into spreadsheet programs like MS Excel.

Spectrum files

MHC-Memo Pro has the capability to capture the data for up to 15 frequency spectra up to 1kHz bandwidth. These can be later downloaded to a PC for analysis with AE-LAB (included with the system) to reveal frequency dependent features of the envelope spectrum and relate them to machine defect modes..

headphones (included) allow audio feedback of problems



specifications

MHC-Memo Pro kit

Includes	
	Instrument
	Software CD
	Standard sensor
	Heavy duty carry case
	"Ear defender" headphones
	25 monitoring pads
	2 sets of rechargeable NiMH
	230V UK battery charger
	Cables

Standard Sensor (other variants available just ask)

Sensing element	Piezoelectric resonant @ ~100kHz
Attachment	Magnetic front face
Size	60(l) x 32(O/D)mm
Weight	250g (inc cable)
Cable	1m TNC, 50 ohm coax
Op temp	0 - 70 deg C

Instrument

Measurements	Standard : Distress, dB Level. Super Slo : Peak, Intensity, Extent, dB Level. Manual entry : -99999 to 999999
Route capacity	6 max
Points per route	435
Auto logs	2340 data sets
Spectra	15 max
Data storage	Non volatile
Display	2 x 16 backlight LCD alphanumeric
Keypad	Sealed membrane
Power save	After 8 mins
Audio out	Hi/Lo ranges
Comms	RS-232 supplied with data cable
Op. Temp	0 - 50 deg C
Battery type	2 x PP3 / MN1604 (9v or equivalent)
Battery life (backlight off)	8hrs (NiCd/NiMH) 34hrs (alkaline) 80hrs (LiMn)
Size	115(w) x 220(h) x 52(d)mm
Weight	800g (approx)
Protection	Rubber surround

Sensors variants (contact factory for more info)



all specifications subject to change without notice

Distress® and Extent® are registered trademarks of Holroyd Instruments Ltd

The internal battery for the real time clock normally lasts for 5+ years. This should only be replaced by the manufacturer.



(included **FREE** with MHC-Memo Pro)

MHC-Analysis Pro™

route creation, transfer, trending & reporting software

95,98,Me,NT,2000,XP

- hierarchical point names (site,area,machine,point)
- fully automatic operation with MHC-Memo Pro (unload data with a single button)
- links to picture files with markers for identification purposes
- trending of Standard, Super Slo & Manual data entry from MHC-Memo Pro
- action lists for comparing data across different routes
- point classifications
- DBase format database
- manual database editing functions
- improved printout quality functions

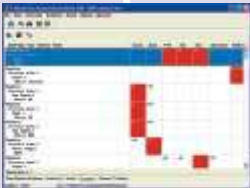
action lists



trends



exceptions



missed points



transfers



What is MHC-Analysis Pro

MHC-Analysis Pro is a software package that's supplied **FREE** with each MHC-Memo Pro to let you realise the full potential of the MHC-Memo Pro instrument. It comes with a license allowing its use on as many PC's as required within your organisation at no extra charge.

It integrates seamlessly with the MHC-Memo Pro instrument to provide a comprehensive workflow from the creation of a route (of your choice) to unloading the data and displaying & reporting the results.

Evolved from the earlier MHC-Analysis software MHC-Analysis Pro still maintains a simple & easy to use interface, but under the bonnet there have been substantial changes to extend & improve it's capability.

Using relational database architecture it is now possible to include measurement points into ANY route. And the standard DBase format allows it to be more accessible to third party software & tools.

The hierarchical point names allows each point to be identified more easily and the ability to link each measurement point to a unique picture file ensures that any confusion is eliminated.



By using the power of action lists it is also possible to group & organise data into more logical orders. e.g. one order for route data collection and another for viewing/reporting.

The new measurement point classification function allows the user to "tag" each measurement point with a number that can be instantly re-called with the "search" function. The number may be used for instance to grade a machines criticality to your company operation or to identify that it needs to be monitored on a more regular basis.



Grouping data for trends and reports

MHC-Analysis Pro introduces a new function called ACTION LISTS. Think of this as a sub-list of the whole of the database. You can now "group" your measurement points to analyse the same type of machines in specific sites & areas, different types of machines in specific sites & areas or similar machines across different sites & areas. Invaluable for providing a company wide perspective on the state of its extractor fans (say).

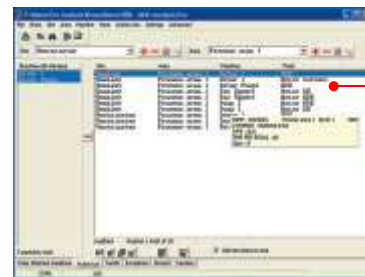
Once you have a list you can then graph (TREND) the data and check if the point has gone above a pre-set alarm level in the ALARM EXCEPTIONS. You can even convert an exceptions list into an action list or a ROUTE to ensure that that point will be measured on your next tour.

MHC-Analysis Pro MISSED POINTS will tell you if you were unable to take a reading the last time that point was on a route!

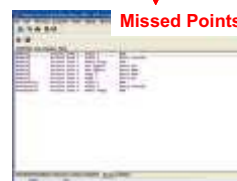
With the help of the action lists it is now possible to have lists of machine points for just the Analysis and a different one for the data collection; handy for conveyors where you may want to analyse the pair of bearing on the same roll but you actually collect data by walking down one side and then the other!

ACTION LIST

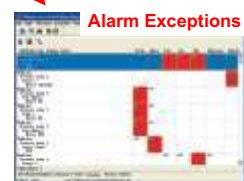
A subset of the database from which from which TRENDS, EXCEPTIONS & MISSED POINTS summaries are derived. The action list may also be converted to a ROUTE to create a customised guided tour of your facility.



TRENDS
Graphical viewing of data collected with preset alarm values and linked pictures as a visual reminder



MISSED POINTS
Shows points were missed on a route



EXCEPTIONS
Shows points that are in alarm based on the preset alarm levels

Minimum requirements :Win 95,98/NT/2000/Me/XP, Pentium 400MHz, 64MB RAM, 800 x 600 screen, 10MB disc space, CD-ROM, spare RS-232 serial port.
Optional :CD-writer (advised for backups), Sound card



(included FREE with MHC-Memo Pro)

AE-LAB™

frequency diagnosis software

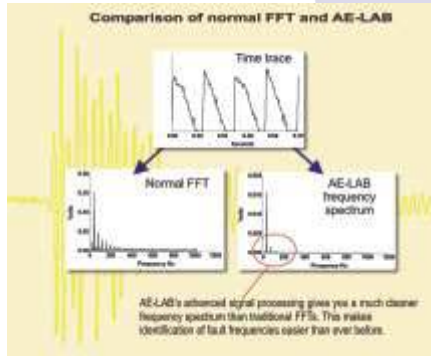
95,98,Me,NT,2000,XP

- dedicated frequency analysis to 1kHz for AE envelope signals
- cleaner spectra
- integrated bearing defect calculator & worksheet
- harmonic cursor modes
- works with MHC-Memo Pro to capture up to 15 spectra in the field
- user notes

AE-LAB™ software is supplied FREE with each MHC-Memo Pro. So not only do you get a truly instant assessment of your machine's condition you can also delve deeper to diagnose the problem.

For standard mode measurements the MHC-Memo Pro allows the user to capture the data for up to 15 spectra in the field which can then be unloaded onto a PC at a later date for analysis. You don't need to type in details at this stage, just collect the spectra data.

In the office unload the captured spectra files to your PC and use AE-LAB's™ frequency analysis to reveal, within seconds, defect characteristics such as once per rev, ball spin frequency, shaft speeds and inner & outer race defect frequencies.



AE-LAB™ goes one step further and uses specially developed advanced signal processing together with the superior signal to noise ratio of AE (acoustic emission) to give you a much cleaner spectrum than with other FFT (fast fourier transform) CM techniques.

Use AE-LAB's™ integrated defect frequency worksheet to calculate and overlay markers on the spectra to indicate the fault frequencies together with readings in both Hz and CPM (cycles per minute).

You can even add user notes to remind you of the conclusions or any actions that you make for the next time or export spectra data as ASCII to other apps like MS Word & Excel.

With AE-LAB you're just a click away from the information you need !

Files date stamped & user named

Retrieve previously stored signal

Defect freq. storage & retrieval

File storage

Pre-calculated defect frequencies

Defect frequency calculator

Defect frequency markers

AE envelope frequency spectrum

Flexible cursor functions

DEFECT FREQUENCY WORKSHEET

For each spectrum you can enter machine specific details (rpm speeds, bearing details etc) and AE-LAB's™ will instantly calculate the defect frequencies and overlay them on the spectra.

Not only that but AE-LAB™ can remember these (and other measured points) for future reference. There's even the facility to add user notes about each machine



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www.holroyd-instruments.com

Minimum requirements :Win 95,98/NT/2000/Me/XP,
 Pentium 400MHz, 64MB RAM, 800 x 600 screen, 10MB
 disc space, CD-ROM, spare RS-232 serial port.
 Optional :CD-writer (advised for backups)