Introduction to MP5

MP5 is a compact portable 4 channel data collector that is designed for route-based data collection in the field. With optional software modules, MP5 can conduct field balancing, ODS testing and Bump Testing as well. For measurements in harsh environments, MP5 is manufactured with a ruggedized housing by a dual injection molding process and protective sealing to provide an IP 65 rating. MP5 is equipped with a large 5-inch color (800 x 480 high resolution) touch screen. The combination of Microsoft's powerful WinCE operating system and touch screen operation provides a user friendly and intuitive interface. MP5 acquires measurement signal with precision 24-bit sigma delta AD converters to provide a high dynamic range, up to 40 kHz maximum bandwidth.

MP5

4 channel data collector/ machinery condition analyzer

BENSTONE
Condition monitoring

Route Based Data Collector

Combined with iSee, the powerful PC software built for machinery condition monitoring project, MP5 is your best choice for route-based data collection in the field. MP5 supports simultaneous tri-axial measurement, saving many work hours in the field. MP5 measures bearing fault signal via true peak detection on a high-pass filtered time waveform. This field-proven technology provides sensitive and accurate readings from the early stage of bearing damage, and you can track the damage development from the trending analysis feature of iSee PC software.

Envelope spectrum or **Enhanced Enveloped spectrum measurement is a standard feature for confirming bearing failure. Temperature and other process parameter measurements are also supported in the data collector program.
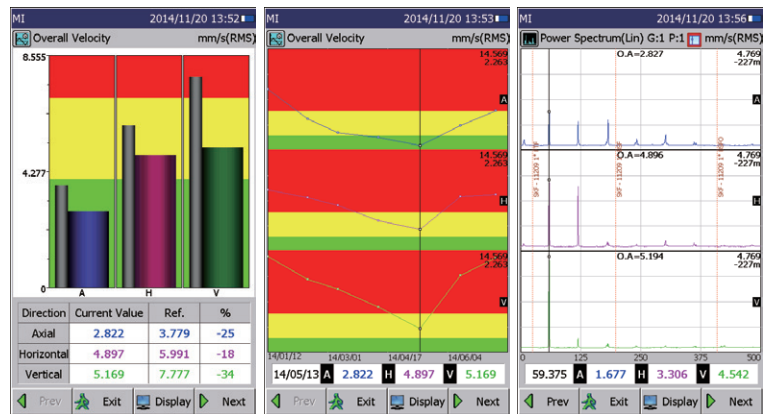
Triaxial measurement gives global view of machine conditions and saves work hours.

Measure and save multiple sets of archive data and display it on a trend chart.

Measure power spectrum or envelope spectrum with a triaxial sensor, and display the pre-defined fault frequencies on the spectral plots.

Conduct bump test and show the results with power spectrums or FRF functions to investigate the natural frequencies of a structure.


Bump Test module

MP5's powerful Bump Test module allows you to conduct bump test on a structure and measure its FRF, coherence, and cross power spectrum functions. This useful module helps you to investigate the resonance of a machine, conduct structural reinforcement and reduce the vibration level of a machine running at resonance zone. The test data can be imported to a 3rd party software, like ME'Scope, for further modal analysis to derive its modal shapes, natural frequencies and damping values.

Rotor Balancing

The MP5 with the (optional) balancing software package can balance your rotating machines in the field with industry leading balancing techniques like; single plane, dual plane, overhung dual plane, 3 plane, 4 plane and 3 weights balancing. This advanced balancing software makes it very simple to balance machines in-field with a very high level of accuracy. Now with multiple-point balancing, vibration in BOTH horizontal and vertical directions are minimized at the same time. By enabling coast-down measurements for 1X vibration, the heavy spot is identified correctly with only one measurement, saving you time, money and increasing safety. This technique prevents the user from danger by putting the trial weights in the wrong place and shortens the time required to balance. Other features / functions are :
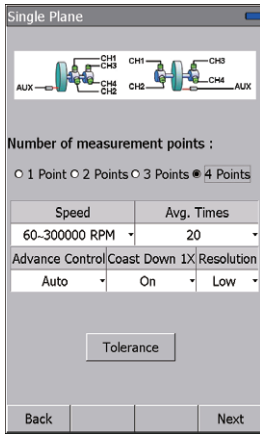
Select up to 4 measurement points for single or dual plane balancing.
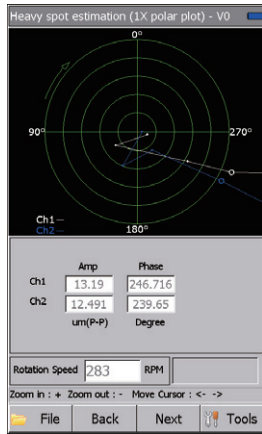
Find out the heavy spot location from a single coast-down measurement of 1X vibration.
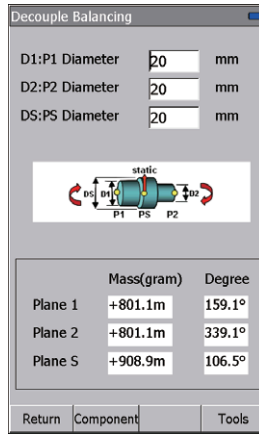
Conversion of dual plane balancing into static and couple balancing.

- Multi-point balancing
- Component calculation
- Drill depth calculation
- Allowable residual unbalance calculated from the ISO 1940 standard
- Unequal radii calculation
- Decoupled balancing (couple + static)
- Review historical vibration data on a polar plot
- Review historical balancing data on a polar plot
- Heavy spot estimation with one shot measurement
- Redo a previous balancing job with saved balancing factors
- Continue an unfinished balancing job from a saved file

ODS Test module

MP5's ODS Test module allows you to conduct ODS test on a running machine and measure its FRF, coherence, and cross power spectrum functions. With the reference vibration sensor connected to channel 1, and a triaxial vibration sensor connected to channel 2, 3 and 4, MP5 saves your time for the measuring tasks in the field via real-time four channel measurements. By importing the test data to a 3rd party software, like ME'Scope, you may derive the Operational Deflection Shapes of your machines easily. The ODS test helps to find out how the structure deflects at certain running speed, provide useful information for structural reinforcement.
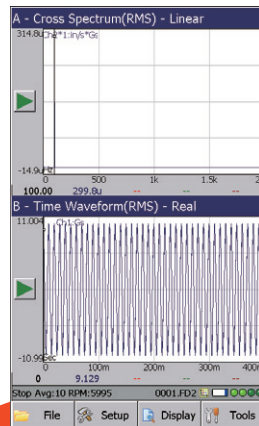
Measure cross power spectrums for investigating the operational deflection shapes (ODS) of a machine.
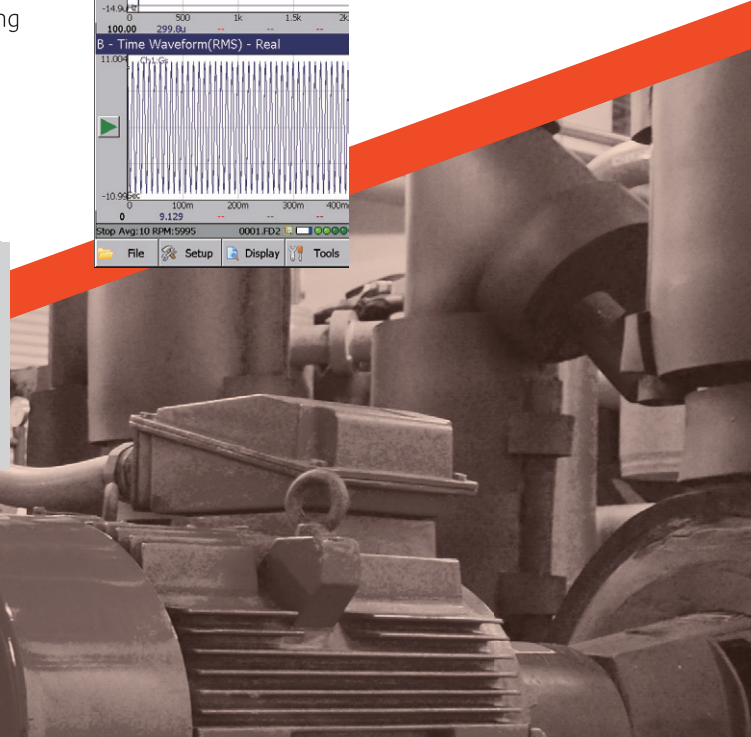
Specifications

Hardware Feature	Technical Specifications
Operating system	Windows CE™
Number of input channels	4 analog channels and 1 aux channel
Connector of input channels	Channel 1, 2: BNC, Channel 2, 3, 4 LEMO 4 pin and Aux: LEMO 6 pin
Channel coupling	AC, DC, IEPE
Aux channel	Tacho signal input and power supply
DSP processor	TI TMS320C6713B
External memory	SD card
Battery	Li-Po 7.4V 5800 mAhr, rechargeable
PC communication interface	USB 1.1, mini B type USB connector
LCD display	800 x 480 5 inch TFT color touch screen
Operating temperature	-10˚C to + 50˚C
Sealing / Ruggedness	IP 65
Housing material	Dual material: hard ABS plastic and soft TPR
Weight	1.3 kg (2.8 lb)
Size	9.6 x 5.2 x 2.5 inch (245 x 132 x 63 mm)
Max input signal range	±20 Volt
Dynamic range	>128 dB (measured from spectrum)
A/D converter	24 bit sigma-delta A/D converter
Frequency range	DC to 40 kHz
Input impedance	1M Ohm

Feature for ODS Test module

FFT real time rate	40 kHZ, dual channel @12800 lines
FFT resolution	100-12,800 lines
Time windows	Hanning window
Analysis functions	power spectrum, cross power spectrum, FRF, time waveform and coherence
Engineering units	Automatic units transform with pre-defined table
Zoom FFT	No
Average	Linear, exponential, peak hold
Trigger	No
Cursor	Single, harmonic, harmonic+ single, peak, band cursor mark cursor

Feature for Bump Test module

FFT real time rate	40 kHZ, dual channel @12800 lines
FFT resolution	100-12,800 lines
Time windows	Force/Exponential
Analysis functions	power spectrum, cross power spectrum, FRF, time waveform and coherence
Engineering units	Automatic units transform with pre-defined table
Zoom FFT	No
Average	Linear, exponential, peak hold
Trigger	Channel 1 triggering, pre/ post triggering
Cursor	Single, harmonic, harmonic+ single, peak, band cursor mark cursor

Feature for Rotor Balancing

Rotor type for balancing	Single plane, dual plane, 3 plane, 4 plane, overhung dual plane, 3 weights balancing, multi-point balancing for single and dual palne.
Balancing speed	60 rpm to 300,000 rpm
Order resolution	Low, normal, high, 0.03, 0.015, 0.008, and 0.004
Average number	10, 20, 50 and 100
Balancing grade	Built-in ISO 1940 standard or user defined
Tools	1X coast down order trace, decoupled balancing (static and couple), unequal radii, component calculation, drill depth, vibration history, balancing history and recalculation of balancing coefficients.

Feature for Data Collector

Types of measurement	Overall acceleration, overall velocity, overall displacement, overall bearing condition (true peak detection of HP filtered waveform), time waveform, power spectrum (up to six sets), demodulated spectrum, Crest factor, temperature, process parameters.
Vibration sensors	support simultaneous 3 axis measurement or single axial
Filters for overall value	2Hz-1kHz, 5Hz-1kHz, 10Hz-1kHz, 2Hz HP, 5Hz HP, 10Hz HP
Overall display	Bar chart or trend chart (shown with latest 9 historical data)
Spectrum display	Show band alarm or fault frequencies.
Time waveform display	Show waveform and/ or orbit
Search	Search train, machine or point
Tools	Add note, skip point, hide archive points, show all points, show archive points only, insert or delete unscheduled points

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Condition monitoring

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