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m+p SO Analyzer

Dynamic Signal Acquisition and Analysis

The m+p SO Analyzer acquires multichannel FFT and time data while displaying the data in real time for general FFT analysis and optional structural analysis, rotating machinery, acoustics and many other advanced applications. Acquisition, analysis and reporting are integrated within a common user interface for ease of use, and requiring a minimum of training.

Key Features

- Real-time data acquisition, analysis and reporting in one package
- MS Windows like user interface
- Wizard-driven set-up of all measurement parameters for quick and easy operation
- Free installation of the SO Viewer to actively view/analyze data on any MS Windows/Office PC
- Supports a range of front-end hardware for maximum system flexibility, from the 4/8-ch portable m+p VibPilot to hundreds of input channels for highest lab performance
- Supports National Instruments acquisition hardware (USB, Ethernet, Wifi, PCI and PXI modules)

DSA Standard

Data Acquisition

- Multi-channel FFT and time history data acquisition
- Continuous or triggered measurements
- Peak and rms time history data reduction
- Real-time acceleration to velocity and displacement computations
- Display and storage of all intermediate results

Time History Recording

- Time recording to memory or file, limited to 2 M samples per channel, max. 16 channels

Data Analysis

- High-resolution online FFT analysis using the 2D/3D viewers of the m+p SO Analyzer eReporter
- Copy & paste ActiveX elements to MS Word and PowerPoint
- Data import and export for *.UFF, *.SOT, *.RPC III file format
- Data import for m+p VibControl file format

DSA Pro

includes all DSA Standard features plus:

Time Recorder

- Unlimited throughput to disc acquisition with scheduled recording
- Typical throughput of 102 KSamples/second for 96 channels using standard PC hardware
- Online display of time or spectrum data while recording

Post-Processing

- Analysis of large measured or imported time data files
- Wide range of analysis functions with up to 128,000 spectral lines (FFT, PSD, FRF etc.)
- Automated, comprehensive test reporting using the Reporting Wizard
- User programming for automation of tasks
- All data import/export filters
- Calculator

DSA Add-Ons

- Real-time acoustic analyzer
- Additional input channel drivers
- Sound intensity mesurement
- Temperature logging with NI 9211 or NI 9233

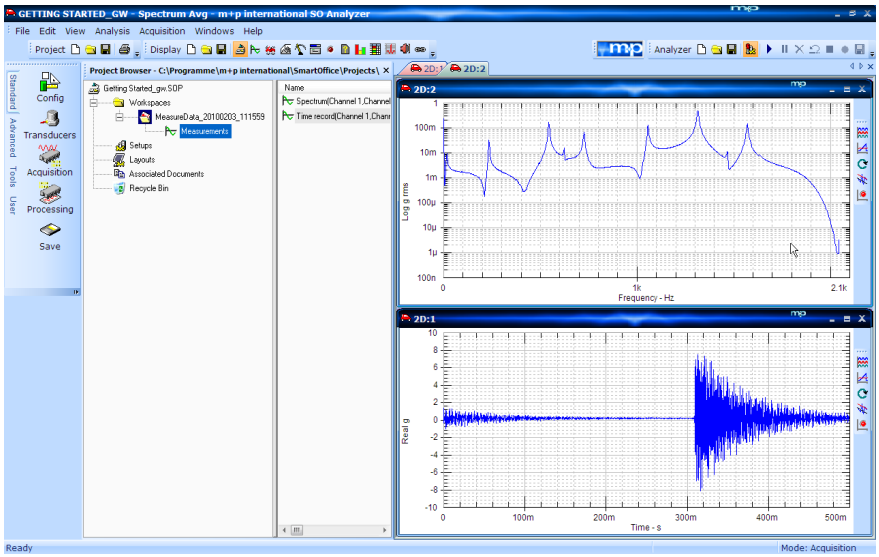
Applications

- Multichannel recording of vibration signals
- Rugged portable, mobile and stationary systems
- Online and offline analysis in the time and frequency domain

Overview

The Windows based Dynamic Signal Acquisition and Analysis software uses intelligent wizards that guide the user step by step through the process of data acquisition and analysis. Alternatively, the user can access any set-up menu directly for faster operation.

Data management is done with the central eReporter. For displaying data it uses 2D and 3D/Waterfall viewers. The viewers are the same for both the acquisition and the analysis process. A 2D viewer can show single or multiple data records. The Waterfall viewer's main purpose is to show time variances of multiple sequentially acquired data blocks. Both viewers offer a multitude of analysis functions like cursors, mathematical operations and data cuts. Data can also be copied from the viewers and pasted to ActiveX applications like MS Word or PowerPoint, providing the same user interface in those applications.



Acquiring dynamic data

General Data Acquisition and Time Recording

Multichannel data can be acquired as blocks of data or as continuous time data streams. Blocks can be stored as single or averaged functions like spectrum, PSD etc. while time recording provides gap-free storage of time domain data. For time records above 2 M samples data are stored directly to disc[1)].

Data can be viewed online or offline in user-configurable windows.

All intermediate results (calculated functions) can be visualized in real-time on any measurement channel. For instance this allows monitoring of time data, windowed time data, power spectra etc. while measuring a frequency response function. The calculated functions can also be saved. User-definable header information (metadata) can be entered and then be used as annotation in the 2D viewer during measurements or for offline analysis.

1) DSA Pro only

Acquisition Setup

The available parameter options are defined by the individual frontend specifications.

- Unlimited and freely definable list of user-specific header information (metadata) for annotation, data retrieval, sorting and reporting
- Simple parameter entry for the channels in tables including engineering units, transducer calibration data and inputs
- Channel type = excitation, response, inactive; DC or AC coupled; input range, offset, pregain, acoustical weighting; FIR weighting filters hand, arm, body, user defined
- Channel input = V, ICP, Charge
- Enter transducer calibration data or import from Excel
- Source modes: random, burst random, periodic random, sine, stepped sine, burst sine, chirp, sine sweep, multiple level controlled fixed/swept sine and random
- Acquisition setup: sample rate or useful bandwidth, blocksize, arming
- Trigger modes: free run, source, channel, pos./neg. slope, zone entry/exit; level, pretrigger view up to 100%
- Data processing: time record, spectrum, autopower, crosspower, PSD, cross-PSD, FRF, coherence, autocorrelation, crosscorrelation, histogram, probability distribution, probability density, impulse response
- Averaging: none, linear, exponential
- Windows: Uniform, Hanning, Hamming, Flattop, user definable force and exponential
- Throughput to disc[1)]: total acquisition time, storage location on disc, throughput period and sequencing interval
- Auto-ranging: instant graphical feedback, automatic/manual ranging, range up only
- Overload handling: ignore, retry or break
- Save and recall measurement and display setups
- Save calculated functions
- Calibration: calibrate transducers and update calibration database, calibrate offset

General Data Analysis

The m+p SO Analyzer DSA software supports a large number of analysis functions. The analysis functionality and the user interface are the same for acquisition and analysis. Data can be directly measured by the m+p SO Analyzer or imported from other systems. The m+p SO Analyzer allows interfacing with many third-party N&V data acquisition systems. Octave analysis, acoustic intensity analysis and sound quality are available as add-ons.

- High-resolution FFT analysis
- Copy & paste to ActiveX applications
- Data import/export

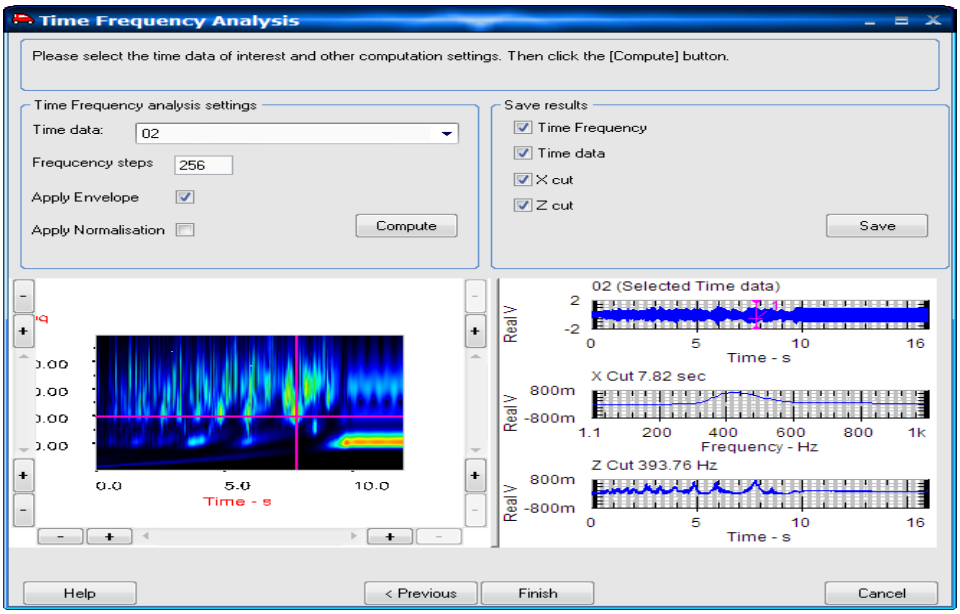
Analysis with the 2D Viewer

- Same display functionality online and offline
- Unlimited number of displays and unlimited number of traces per display
- Change appearance of chart, plot area, axes, grids, traces, cursors
- Add header information to display
- Y-axis type: real, imaginary, amplitude, phase, log, dB, real+imaginary, amplitude+phase, log+phase, dB+phase, Nyquist
- Y-axis scaling: autoscale, free, fixed, rms, peak, peak-peak with automatic data conversion
- X-axis type: lin, log, octave
- X-axis scaling: autoscale, free, fixed
- Unlimited number of cursors
- Cursor functions: harmonic, nudge, seek to peak, seek to max, show value, show difference, RMS and Q factor calculation between/at cursor(s)
- Display calculator functions: acoustic weighting and unweighting, 1/1 and 1/3 octave, fft, integrate, differentiate, square root, orbit
- Tacho/frequency readout from time data
- Least squares fit analysis
- Amplitude distribution statistics: standard deviation, skewness, kurtosis
- Zooming, scrolling and rescaling with mouse, scroll mouse or keyboard entry
- Data cuts
- Export to clipboard for Excel import

1) DSA Pro only

Analysis with the 3D Viewer

- Same display functionality online and offline
- Unlimited number of displays and up to 1024 traces per display
- Change appearance of chart, plot area, axes, grids, traces, cursors
- Traces as line, plate, shaded plate, surface, shaded surface, bar, shaded bar, 2D colour plot XZ and ZX, colours configurable
- XYZ cursors and harmonic cursors
- Y-axis: real, imaginary, phase, log, dB; rms, peak and peak-peak scaling
- X-axis: lin, log, octave, order
- Z-axis: rpm, time, order, Z, record number
- Zooming and rescaling with the mouse
- 3D viewer for analog tacho inputs on any number of channels for RPM spectral maps and manual order tracks.[1)]



2D and waterfall displays

Post-Processing[1)]

The additional Post-Processing function of the DSA Pro software provides the same advantages and functionality as the acquisition setup, with record size and sample rate being predefined.

- Simultaneous processing of multiple data sets (channel data)
- No limits on input sample rate, size or number of channels

1) DSA Pro only

Real-Time Acoustic Analyzer (DSA Add-On)

The DSA add-on Real-Time Acoustic Analyzer supports real-time octave analysis.

Acquisition Setup

- Time domain based octave analysis, compliant with ANSI S1.4 and IEC 61672
- Octave spacing: 1, 1/3, 1/6, 1/12, 1/24
- Internal or external A/B/C weighting filters
- Start and stop frequency
- Response: fast, slow, impulse, custom, linear avg., LEQ
- Averaging: none, peak OASPL, peak bands, linear

Post-Processing[1)]

- Same as Acquisition, with record size and sample rate being predefined

Operating System

- Microsoft Windows XP Pro/7 Pro 32 or 64 bit

1) DSA Pro only

Ingenieurbüro
Dollenmeier GmbH
Regensbergstrasse 16
CH-8157 Dielsdorf
www.ibdoll.ch
Tel. 044 885 45 11
Fax 044 885 45 12

Germany
m+p international Mess- und Rechnertechnik GmbH
Phone: (+49) (0)511 856030
Fax: (+49) (0)511 8560310
sales.de@mpihome.com

United Kingdom
m+p international (UK) Ltd
Phone: (+44) (0)1420 521222
Fax: (+44) (0)1420 521223
sales.uk@mpihome.com

China
Beijing Representative Office of m+p international
Phone: (+86) 10 8283 8698
Fax: (+86) 10 8283 8998
sales.cn@mpihome.com

USA
m+p international, inc.
Phone: (+1) 973 239 3005
Fax: (+1) 973 239 2858
sales.na@mpihome.com

France
m+p international Sarl
Phone: (+33) (0)130 157874
Fax: (+33) (0)139 769627
sales.fr@mpihome.com

www.mpihome.com

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