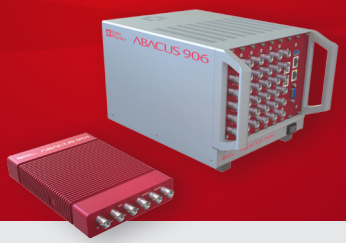
Data Physics



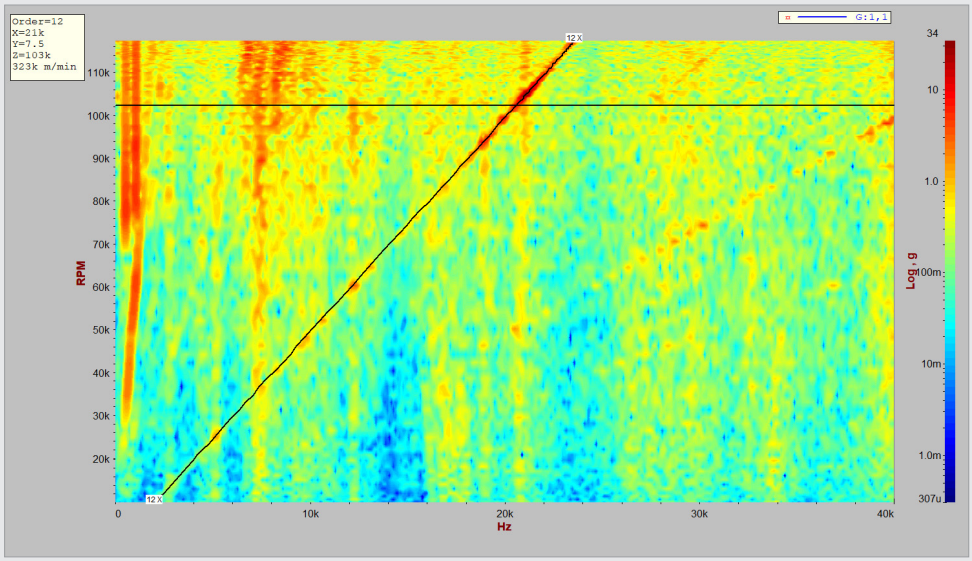
900 Series Software
SignalCalc®

RPM Analysis

DP930-11, -18, -27W

RPM Analysis provides measurements synchronized to the speed of a shaft for monitoring rotating machinery. A tach channel on the unit reads the RPM from a once per rev or multiple pulses per rev tachometer signal and tags each measurement with the current RPM.

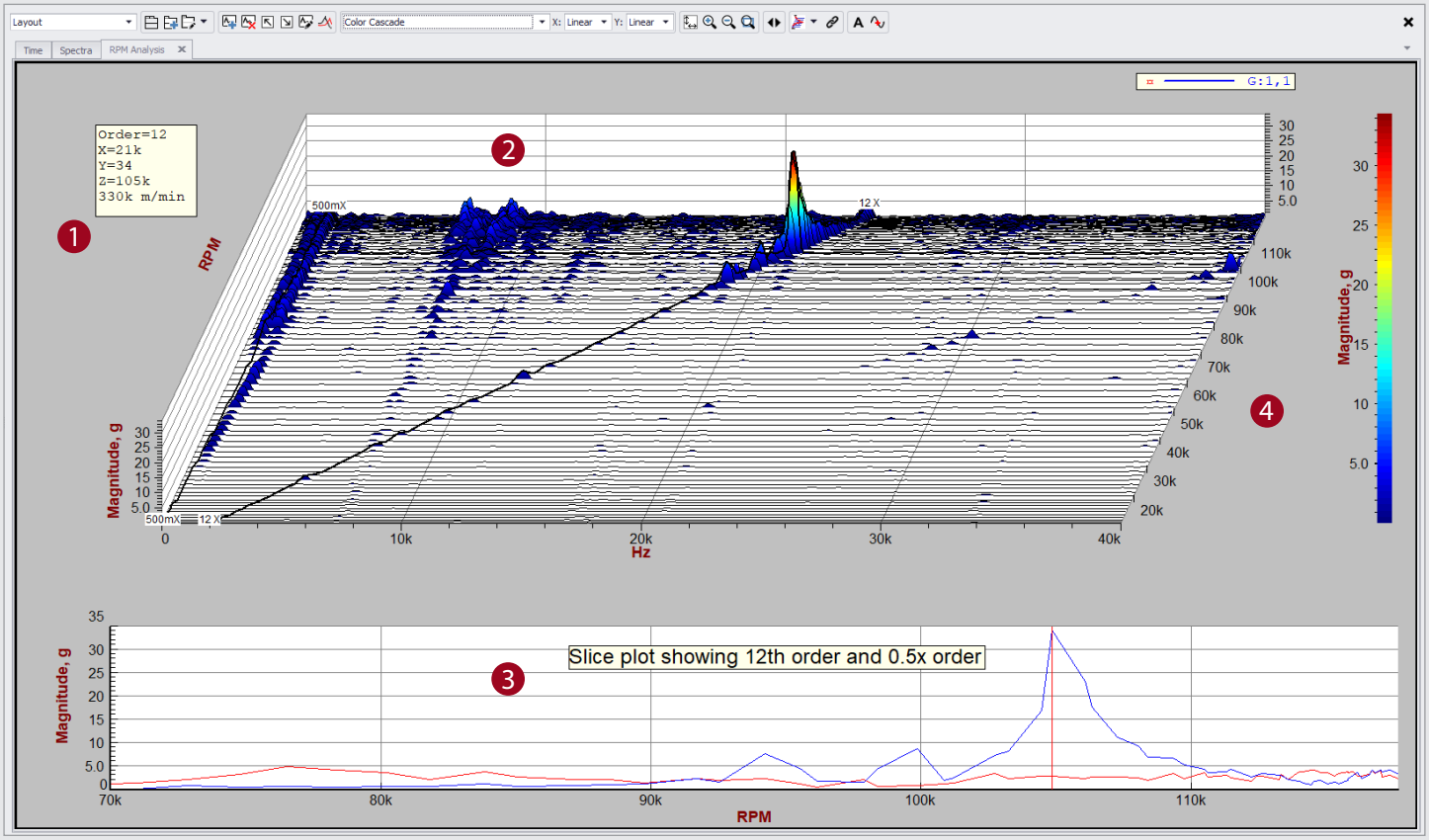
The RPM value of the rotating shaft can be used to trigger a measurement and also to pace waterfall displays. When used in conjunction with the waterfall option, RPM spectral maps can be displayed and saved.



Features and Benefits

Feature	Benefit
RPM Modes	**RPM Sweep:** System continuously monitors rpm during a ramp-up or coast down and triggers measurements based on a specified RPM interval **RPM Stepped:** When the shaft reaches the specified rpm, system performs an averaged measurement reducing the signal noise **RPM Steady (opt 27W):** Measurements are taken when the shaft speed is within a specified rpm band. Useful for monitoring a shaft that is drifting around a specific rpm **RPM Delta (opt 11):** Mode is similar to the RPM Sweep mode but allows for abrupt changes in sweep direction
Auto and Multi Tach Support	System automatically detects rpm information from a single or multiple tachometer channels; pacing and synchronous triggering can be enabled on the same channel or on different tach channels
Data Export	Export to ASCII/CSV, MEscope, UFF, SDF and Matlab
Measurement	**Benefit**
RPM Measurement (opt 11)	FFT-based fixed bandwidth technique ideal for steady state or slow changing rpm measurements
Order Tracking Measurement (opt 27W)	Uses a resampling technique to synchronize the sampling of input signals to the instantaneous angular position of the machine, providing revolution histories and order spectra. Ideal for high speed, rapidly accelerating or decelerating measurements
Demodulation Measurement (opt 18)	Computes amplitude and phase/frequency domain demodulation by computing the Hilbert transform. Useful when signals of interest are mixed with other signals as modulation of frequency or amplitude
Waterfall Analysis (opt 25)	Waterfall analysis combines rotation speed, amplitude and orders on the same graph, enhancing data clarity; helps differentiate structural resonances from order-related vibration
Synchronous Averaging (opt 10)	Process removes the contribution of asynchronous vibration sources from a time or linear spectral average

RPM Analysis



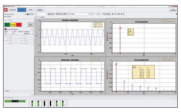
1 Waterfall Compression
Allows data compression along the X-axis and/or the Z-axis for faster waterfall displays. The choices are All, Every Nth, Max Nth, Min Nth, Average Nth and Auto. Compression applied is displayed in the WF legend.

2 Waterfall Formats
Waterfall plots can be displayed in different formats - color cascades, surface maps, spectrograms, color mesh or Campbell diagrams.

3 Waterfall Child Window
Allows the user to examine each individual spectrum or order plot in detail, overlay multiple traces and compare them against maximum or RMS amplitude values as a function of shaft rotating speed or order.

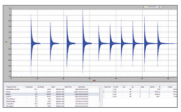
4 RPM Axis
Z-axis on the WF graph can be customized to display rpm, count or time.

Related Applications



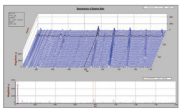
FFT Analysis
DP930-10

Acquire and analyze data using auto and cross spectrum, transfer function, auto and cross correlation, histogram, and synchronous averaging



Recording and Playback Analysis
DP930-23

Record data up to 200 k samples/second simultaneously with real-time measurement or control



Waterfall Analysis
DP930-25

Acquire and analyze multiple FFTs with fixed frequency span, paced at delta time intervals to create a three-dimensional view of frequency content variation over time

NOTE: Continued product improvement necessitates that Data Physics reserves the right to modify these specifications without notice.