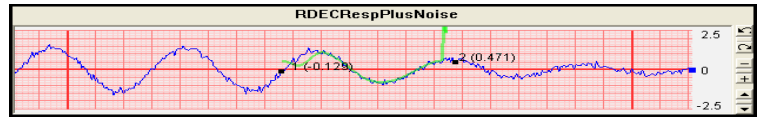
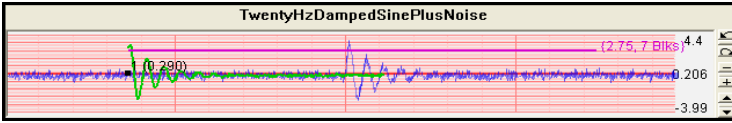


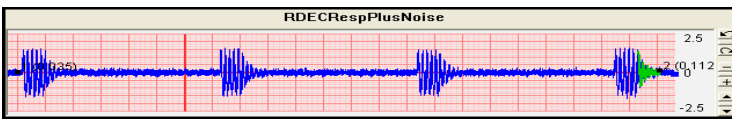
DATA REDUCTION TECHNIQUES

- Reduce the Influence of Noise and Nonlinearities on your Signals
- A full Suite of Digital Signal Processing Techniques are Readily Available
- Isolate Natural Decay of Interest to a Data Overlay for Modal Analysis
- All Overlays can be Analyzed with the Modal Tools Described Below



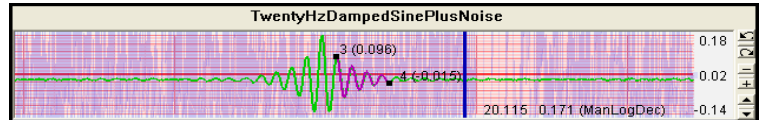
Random Decrement (Real Time and Fixed Block)

- Extract Randomdec Signature from Ambient Response Data using Block Averaging



Wavelet Denoise (Fixed Block)

- Separate Natural Decay from Random Noise using a Wavelet-Based Technique



Pseudo Randomdec (Auto and Fixed Block)

- Average Natural Decays after FES Bursts leaving only the Response of Interest

Auto Correlation (Fixed Block)

- Correlate a Time Slice with Itself to Extract a Useful Signal

Apply Standard Time Domain Modal Analysis Techniques To Natural Decays

Logarithmic Amplitude Picking (1DOF)

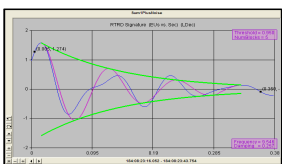
- Fits Decaying Sinusoid to User-Defined Points On or Off of the Data

Logarithmic Decrement (1DOF)

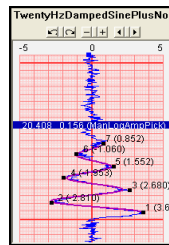
- Counts Peaks and Zero Crossings between Endpoints to fit Decaying Sinusoid Model

Logarithmic Decrement Averaging (1DOF)

- Averages Log Decrement from Successive Peaks between Selected Endpoints to fit Decaying Sinusoid Model

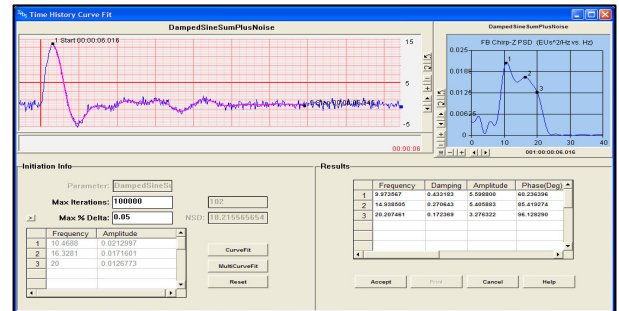


- Logarithmic Envelope shown on Real Time Randomdec Display
- Decays containing more than one Frequency can be sent to the Time History Curve Fit



Time History Curve Fit (MDOF)

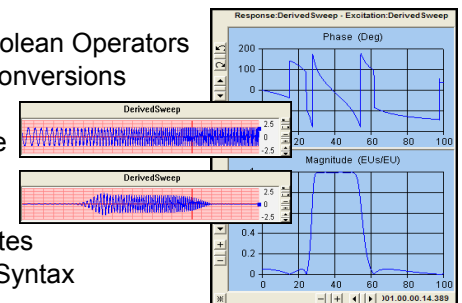
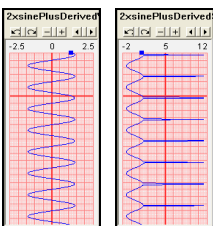
- Extract Frequency, Damping, Amplitude and Phase
- Overlay Immediately Confirms Accuracy of Fit
- Rapid Convergence and Minimal Required Interaction
- Amplitude and Phase can drive ODS



Digital Signal Processing, Signal Generation and Extensive Derived Equation Functionality

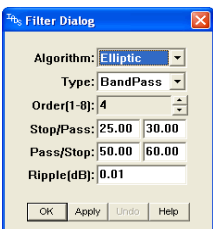
Derived Equations and Signal Generation

- Arithmetic, Trigonometric, Exponential/Logarithmic, Bitwise and Boolean Operators
- Degrees/Radians, Cartesian/Polar and other Coordinate System Conversions
- COM Functions can be called from the Derived Engine, allowing a user to Generate Derived Parameters with Legacy or Custom Code
- Generate Diagnostic Waveforms - Sine, Sweep, Noise and Others
- Time-Based, Statistical, Interpolation and Decimation Functions
- Get/Set Functions for Comprehensive Access to Parameter Attributes
- Create Complex Derived Functions using intuitive IF-THEN-ELSE Syntax



Digital Filtering and Data Editing

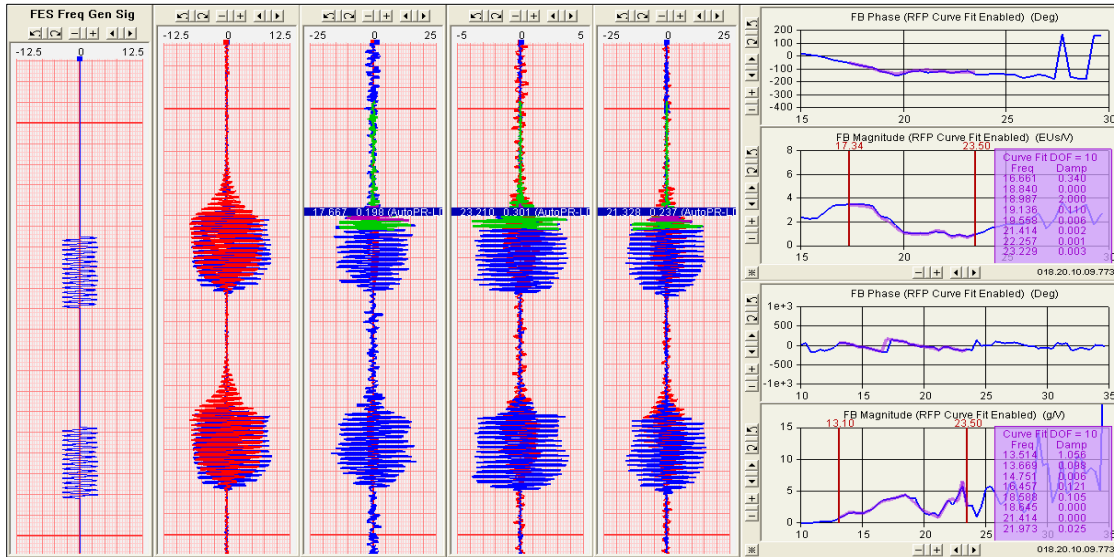
- Confirm the Frequency Response of an IADS Digital Filter using a Frequency Response Plot
- Change Butterworth and Elliptic Filter Specifications (Low, High, Band Pass) in Real Time
- Custom FIR and IIR Filters can be Developed using Derived Equations or COM Functions
- Condition Raw Sensor Data with Wild Point Editing, Spike Detection and Nulling



Automated Modal Analysis

- Time Domain: Log Decrement (LDec) or Pseudo Randomdec followed by a Log Decrement (PRD-LDec)
- Set Frequency/Damping Range and Assign Mode and Symmetry for each Parameter in the Modal Definitions Table
- Analysis Results are Automatically Written to the Summary Log for Display in Flutter Summary Plots
- Frequency Domain Automatic Curve Fit of FES Sweep Response
- Calculate Frequency and Damping from Multiple Stripcharts in Real Time
- Simple Setup for Automation Based on Flutter Excitation System (FES) Parameters

- Flash at FES Start
- Reset Peaks/Averages at FES Start
- Freeze Peaks at FES Stop
- Add Event Marker at FES Start
- Adjust AutoAnalysis BandPass Filters to FES Freq
- Add Sticky Note at AutoAnalysis Filter Change
- Automatically Write Analysis to Summary Log
- Show LogDec Overlay



Stripchart Properties

Display: [Sc.20-ThuFeb2410:27:4]

Parameter: []

Analysis: PRD-LDec

Flap All Stab Rud

Sym

AntiSym

Left

Right

Options

% Reduction: 40.00

Burst: Absolute [20.00]

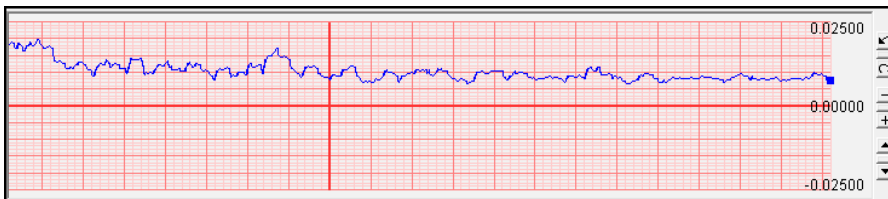
Min Freq: 3.00

Sweep: LP fc: 5.00 HP fc: 60.00

OK Apply Undo Help

Order Analysis

- Available N/2, N, and 2N Order Plots
- Differentiate between Rotational and Structural Signal Components
- Tracking Bandpass Filter allows User to develop Custom Order Plots
- 3D Spectra vs. RPM Order Plots for Design Analysis and Health Monitoring of Rotating Machinery



Cross Plot can be used to Display RPM vs. Order

