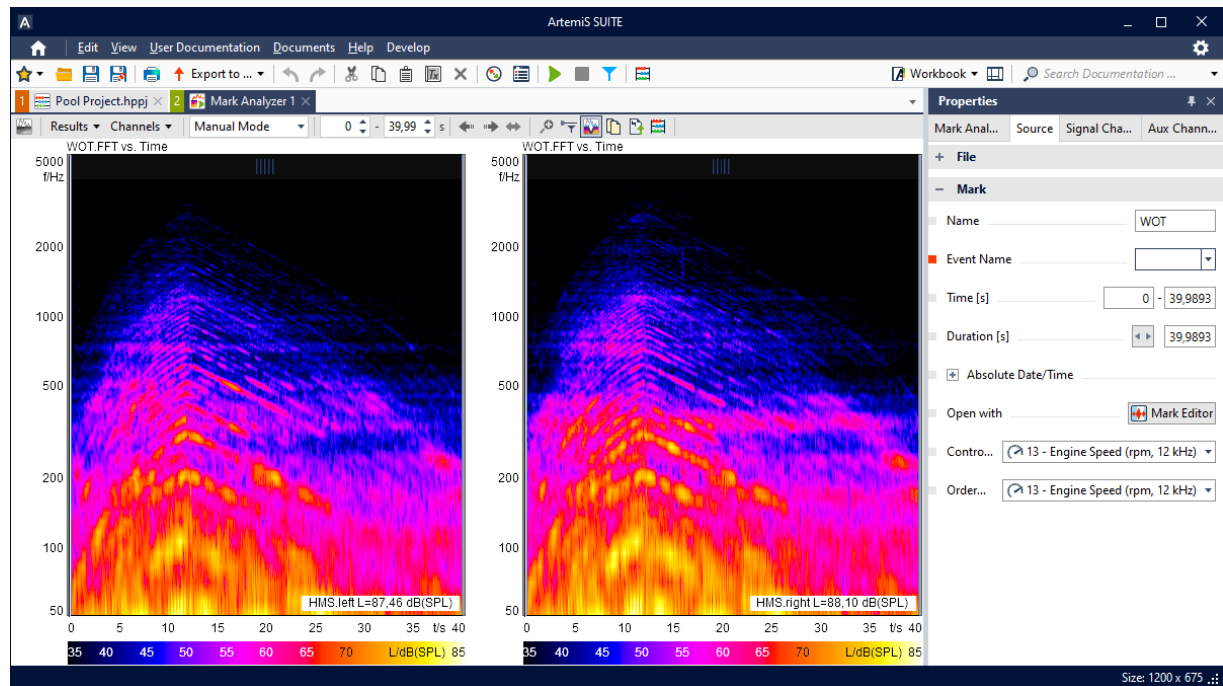




ArtemiS SUITE
Signal Processing

Code 51001

ASP 001 Basic Analysis

Basic Analysis of ArtemiS SUITE provides users with spectral (FFT, octave, etc.), level, and other analyses to solve demanding product validation and troubleshooting tasks interactively and efficiently in **Pool Projects, Automation Projects, Standardized Test Projects, and Metric Projects.**

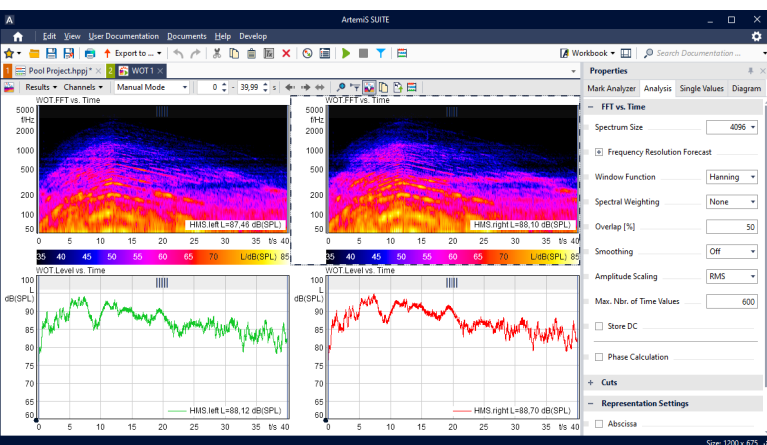
OVERVIEW

ASP 001 Basic Analysis

Code 51001

Many measurement tasks can already be solved with level analyses and spectral analyses. Basic Analysis provides these essential analysis tools which can be performed in the usual user-friendly manner.

Level analyses represent the amplitude of a signal as a logarithmic value in dB. However, many acoustic examinations go beyond a simple sound level analysis, as both the overall sound pressure level and the frequency-dependent distribution of the level have a significant influence on the perception of a sound event. For this purpose, Basic Analysis provides the spectral analyses.



KEY FEATURES

Basic Analysis includes several analyses:

- › Spectral analyses
 - › FFT vs. Time
 - › FFT (Average)
 - › FFT (Peak Hold)
 - › 1/n Octave Spectrum (FFT)
 - › 1/n Octave Spectrum (FFT) vs. Time
 - › 1/n Octave Spectrum (FFT) (Peak Hold)
 - › Power Spectral Density vs. Time
 - › Power Spectral Density (Average)
 - › Power Spectral Density (Peak Hold)
- › Level analyses
 - › Level (single value)
 - › Level vs. Time
 - › Level vs. Time (filtered)
- › Analyses to characterize the decay behavior of a room
 - › Reverberation Time
 - › Reverberation Time vs. Band
- › Frequency Weighting filters to perform a channel-selective spectral weighting

The analyses can be used in Pool Projects (APR 010 is required), Automation Projects (APR 050 is required), Standardized Test Projects (APR 220 is required), and Metric Projects (APR 570 is required)

APPLICATIONS

- › Troubleshooting
- › Sound-Engineering

DETAILS

Various basic analyses facilitate the daily work routine and allow customers to examine input signals more closely.

FFT vs. Time, FFT (Average), FFT (Peak Hold)

The Fourier analysis calculates the frequency spectrum of a signal which is sectioned (windowed) on the time axis. The original signal is subdivided into several blocks with N samples each. In the time-dependent analysis variant, FFT vs. Time, the results of the individual blocks are displayed successively in a spectrogram.

Using FFT (Average), the results of the individual blocks are averaged. The FFT (Peak Hold) analysis determines the peak value from all calculated short time spectra.

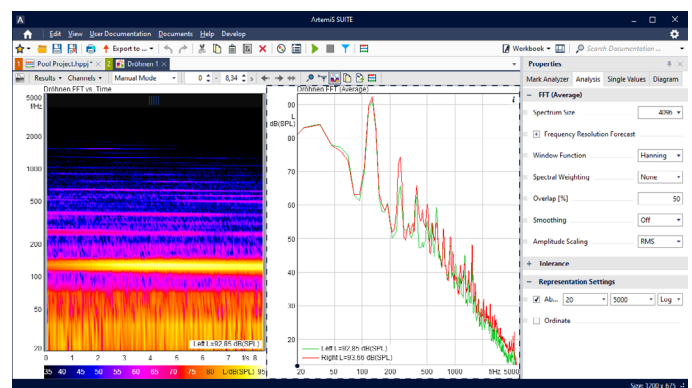
1/n Octave Spectrum (FFT), 1/n Octave Spectrum vs. Time, 1/n Octave Spectrum (Peak Hold)

Using 1/n Octave analyses, the partial bands are calculated by adding the corresponding spectral bands from an FFT spectrum. This method processes the signal block-wise, i.e., the signal is subdivided into blocks prior to the analysis. As a result, either an averaged spectrum or a time-dependent spectrogram can be calculated.

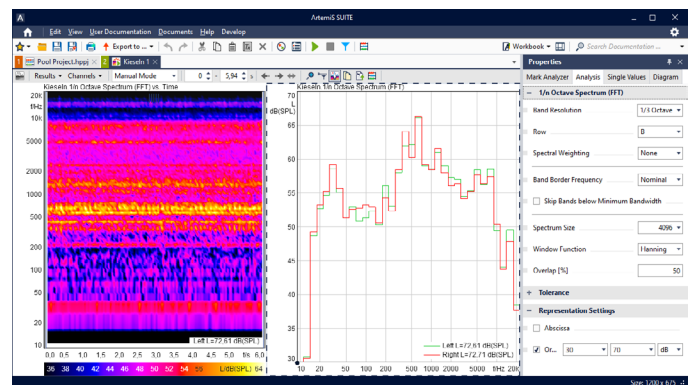
Filter-based 1/n Octave analyses are available with Octave Analysis (ASP 007 is required).

Power Spectral Density vs. Time, Power Spectral Density (Average), Power Spectral Density (Peak Hold)

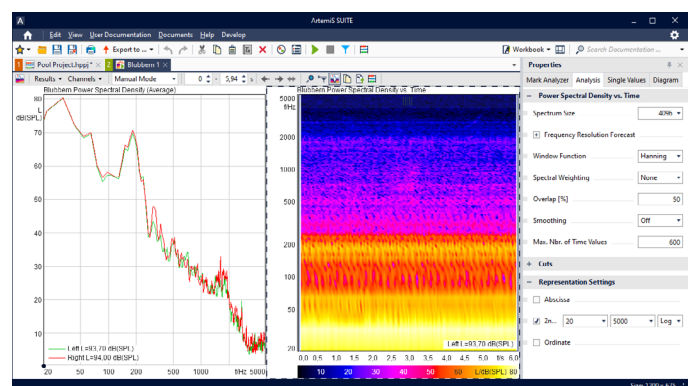
The Power Spectral Density analysis calculates the power spectral density (PSD) of an input signal versus time. It is comparable with an FFT vs. Time analysis. Whereas this analysis relates the power to the bandwidth corresponding the DFT (sampling rate divided by DFT length), power spectral density always relates power to 1 Hz. Therefore, the results are independent of the spectrum size, even for signals having a high noise ratio.



FFT vs. Time, FFT (Average)



1/n Octave Spectrum (FFT) vs. Time, 1/n Octave Spectrum (FFT)



Power Spectral Density (Average), Power Spectral Density vs. Time

Level, Level vs. Time, Level vs. Time (filtered)

The level analysis is a simple signal analysis to represent the amplitude of a signal as a logarithmic value in dB. Level (Single Value) determines the level of an input signal as single value. Level vs. Time determines the level variation of the input signal versus time, Level vs. Time (filtered) the filtered level variation of the input signal versus time.

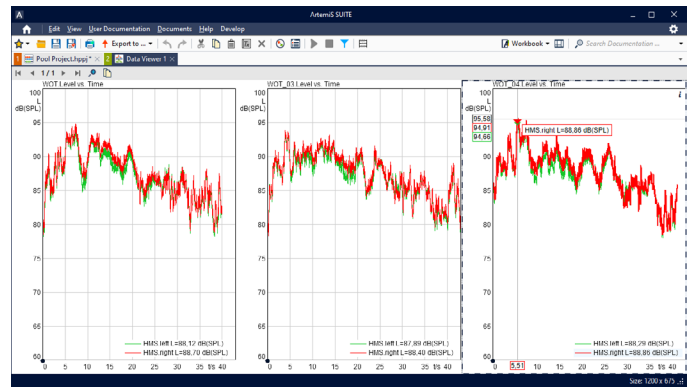
Reverberation Time, Reverberation Time vs. Band

Reverberation Time analyses calculate the reverberation time of a room from a suitable input signal. For determining the reverberation time, the room to be measured is excited with a broadband noise signal according to ISO 3382. The Reverberation Time analysis designates the period until the sound pressure has fallen to 1 % of the excitation signal value.

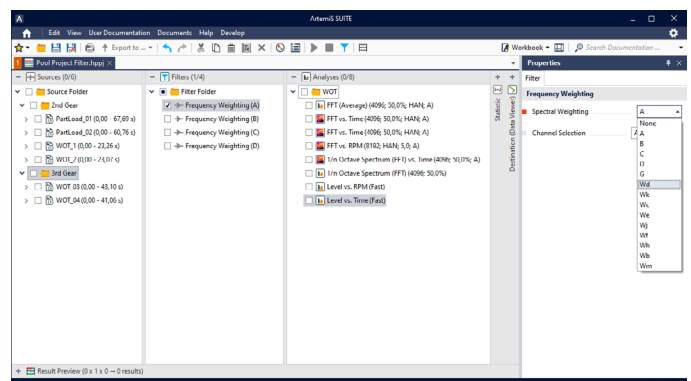
Frequency Weighting

Frequency Weighting is a filter to perform a channel-selective spectral weighting of the input signal in Pool Projects, Automation Projects, and Standardized Test Projects.

Using the Pool Project, the Frequency Weighting element can be applied at various points in the signal processing chain. In the Filter Pool, the weighting is performed in the time domain. In the Analysis Pool using FFT-based analyses, the weighting is performed in the frequency domain, whereas with non-FFT-based analyses, e.g., in the Filter Pool, the weighting is performed in the time domain.



Level vs. Time



Frequency Weighting

Required: APR Framework (Code 50000)
and/or: HEAD System Integration and Extension (ASX) programming interfaces



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