

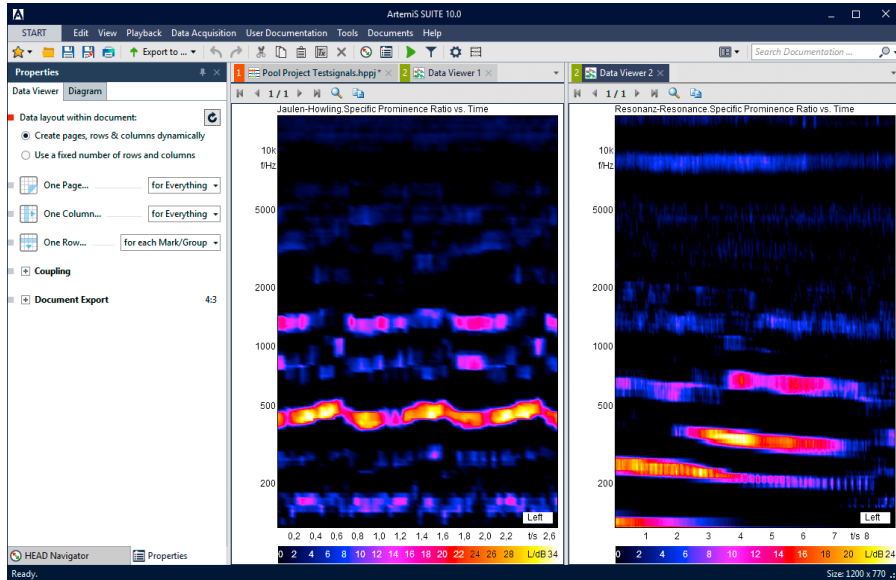
**ArtemiS SUITE Psychoacoustics Module (Code 5012)**

Expansion module for the evaluation of sound measurements based on psychoacoustic parameters

**Overview**

The psychoacoustics module provides various functions and parameters for the instrumental, analytical description of audively-perceived sound quality.

Particularly the analyses Loudness vs. Time (DIN 45631/A1, ISO 532-1, ANSI S3.4-2007) and Sharpness vs. Time (according to DIN 45692, Aures and von Bismarck) make the analysis of sound files possible under consideration of the specifics of the human hearing.



**Features**

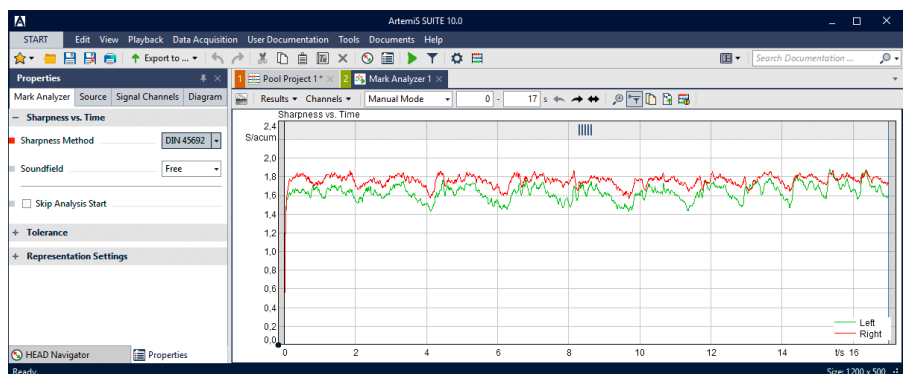
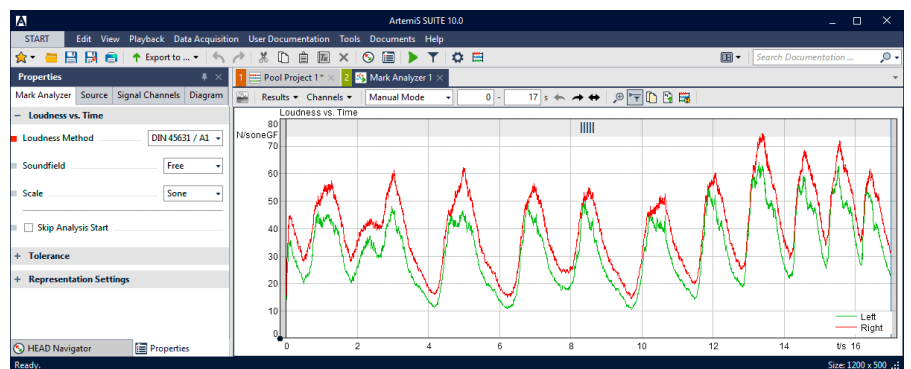
- Expansion module of the ArtemiS SUITE with psychoacoustic analyses
- Articulation Index vs. Time
- Indication of the N5-percentile value in the legend at the calculation of loudness according to DIN
- Loudness vs. Time / Spec. Loudness vs. Time according to DIN 45631/A1 / ISO 532-1 / ANSI S3.4-2007 (FFT/FFT 3rd Octave)
- Sharpness vs. Time according to DIN 45692 / ISO 532-1 / ANSI S3.4-2007 (FFT/FFT 3rd Octave)
- Specific Prominence / Specific Prominence vs. Time
- Fluctuation Strength vs. Time / Specific Fluctuation Strength / Specific Fluctuation Strength vs. Time
- Speech Interference Level vs. Time
- Speech Intelligibility Index vs. Time

**Requirements**

- ArtemiS SUITE Basic Framework (Code 5000)
- ArtemiS SUITE Basic Analysis Module (Code 5001)

**Scope of Supply**

- License file
  - ArtemiS SUITE Psychoacoustics Module (Code 5012)



Analysis results and properties of the analyses Loudness vs. Time (upper diagram) and Sharpness vs. Time (lower diagram).

## Technical Data

### Loudness vs. Time / Specific Loudness vs. Time

Calculation method: DIN 45631/A1 / ISO 532-1 / ANSI S3.4-2007 (FFT / FFT/3rd Octave)  
Soundfield: Free / Diffuse  
Scale: Phon / Sone, Hz / Bark  
Window Function: Rectangle / Hanning / Hamming / Blackman / Bartlet / Kaiser-Bessel 8 - 16 / Flat-top / Gauss 8, 16, 32  
Spectrum Size: 16 - 2<sup>23</sup> Samples  
Overlap: Selectable  
Frequency scale: Hz / ERB / Bark  
Scale: Phon / Sone, Hz / Bark  
Max. Nbr of Time Values: Selectable  
DIN 45631/A1: Transient oscillation effects (display in diagram) can be suppressed

### Sharpness vs. Time

Sharpness method: Aures / von Bismarck / DIN 45692  
Soundfield: Free / Diffuse  
Loudness Algorithm: DIN 45631/A1 / ISO 532-1 / ANSI S3.4-2007 (FFT / FFT/3rd Octave)  
Window Function: Rectangle / Hanning / Hamming / Blackman / Bartlet / Kaiser-Bessel 8 - 16 / Flat-top / Gauss 8, 16, 32  
Spectrum Size: 16 - 2<sup>23</sup> Samples  
Overlap: Selectable  
DIN 45631/A1: Transient oscillation effects (display in diagram) can be suppressed

### Fluctuation Strength vs. Time / Specific Fluctuation Strength / Spec. Fluctuation Strength vs. Time

Frequency Scale: Hz / Bark  
Resolution: 1/1 Bark / 1/2 Bark  
Max. Nbr of Time Values: Selectable

### Specific Prominence Ratio / Specific Prominence Ratio vs. Time

Bands: 1/3 Octave / Critical Bands  
Spectrum Size: 2<sup>12</sup> - 2<sup>16</sup>  
Overlap: Selectable  
Resolution: 1/24 Octave / 1/48 Octave / DFT  
Critical Band Calculation: Geom. Extrapolation / Iteration ECMA-74 8th Edition / Iteration ECMA-74 9th Edition

Show Tones Only

Compensate Threshold of Hearing

User Tolerance File: Selectable

### Articulation Index vs. Time

Extended AI: Calculation allowing values <0 % and >100 %  
Method: Filter / FFT  
Spectrum Size: 16 - 2<sup>23</sup> Samples  
Overlap: Selectable  
Window Function: Rectangle / Hanning / Hamming / Blackman / Bartlet / Kaiser-Bessel 8 - 16 / Flat-top / Gauss 8, 16, 32  
Band Border Frequency: Nominal / Octave / Decade  
Filter order: 4. Order / 6. Order  
Time Weighting: Manual / Fast / Slow / Impulse  
Time Constant [ms]: Selectable

### Speech Intelligibility Index vs. Time

Bands: 1/3 Octave / Octave / Critical Bands  
Insertion Gain: HDF file selectable  
Time Weighting: Manual / Fast / Slow / Impulse  
Time Constant [ms]: Selectable  
Speech Spectrum: Standard / Idealized / User-defined [HDF / DAT]  
Vocal Effort: Normal / Raised / Loud / Shout  
Distance [m]: Selectable  
User-defined Spectrum: Selectable [HDF / DAT]

### Speech Interference Level vs. Time

SIL Type: SIL-3 (1 kHz, 2 kHz, 4 kHz)  
SIL-4 (500 Hz, 1 kHz, 2 kHz, 4 kHz)  
P-SIL (500 Hz, 1 kHz, 2 kHz)  
Time Weighting: Manual / Fast / Slow / Impulse  
Time Constant [ms]: Selectable

### Available for all Analyses

Representation Settings: Individual scaling of the axes in the analysis result  
Add Tolerance Scheme: Display of tolerance curves with tolerance test of the analysis result  
Cuts: Extracting of 2D curves from the three dimensional spectrum (Cut Mode: First Abscissa / Second Abscissa / Free selectable cuts)

### Single Values

Available for all 2D analyses as well as for 3D analyses that have been reduced to two-dimensional curves using cuts.

Only Single Values

as Result: Selectable

Abscissa Range: Selectable

Options: Average / Sum / Min / Max / Percentile

Definition of threshold values for whose compliance the determined single values shall be tested for.

Quantity: Selectable

Unit: Selectable

### Extensions (ASM 13)

The Signature Analysis Module of the ArtemiS SUITE (ASM 13) extends the functionality of other modules. The following analyses are available in the combination of the Psychoacoustics Module (ASM 12) with the Signature Analysis Module (ASM 13):

Specific Prominence Ratio vs. RPM, Articulation Index vs. RPM, Specific Order Loudness vs. Time, Specific Order Roughness vs. RPM, Speech Intelligibility Index vs. RPM, Order Roughness vs. Time, Specific Order Roughness vs. Time, Specific Order Loudness vs. RPM, Order Loudness vs. RPM, Order Loudness vs. Time, Order Roughness vs. RPM, Fluctuation Strength vs. RPM, Specific Fluctuation Strength vs. RPM, Sharpness vs. RPM, Specific Loudness vs. RPM, Loudness vs. RPM