



**ArtemiS Analysis Software,  
 (Code 5000\_5001)**

**Included in the purchased parts package of ASM 00 (Code 5000) and ASM 01 (Code 5004) of the ArtemiS suite.**

Software for Windows® XP / VISTA™ / Windows® 7 for the recording, analysis, modification, documentation and management of multi-channel sound and vibration signals in the time and frequency domain

- Programmable flow control for automating frequently needed procedures
- Level vs. time / Level vs. RPM (or any other reference quantity with selectable step width)
- Fast Fourier Transformation (FFT) with an eligible number of supporting points
- FFT vs. time / FFT (Average) / FFT (peak hold) / FFT vs. RPM
- Order Spectrum vs. time / Order Spectrum vs. RPM
- Harmonic distortion / Harmonic distortion vs. time / Harmonic distortion vs. frequency
- Power spectral density vs. time / Power spectral density vs. RPM
- Specific loudness according to DIN 45631, ANSI S3.4-2007, ISO 532 B (based on FFT or digital filters) or HEAD algorithm
- Third octave / octave analyses (from FFT)
- Reverberation time vs. band
- Bypass (presentation of the time signal and analysis simultaneously)
- Display of the total level: LIN, A, B, C, D (ISO 7196) loudness, sharpness

- IIR filter (max. 4) with eligible filter characteristics
- Conversion of physical units (e.g. g to m/s<sup>2</sup>)
- Filters for frequency weighting, e.g. A weighting
- Vector summation e.g. for the determination of the vector sum of triaxial accelerometer signals
- Channels can be selected by means of editable filters
- Adjustable frequency offset for order analyses, e.g. for examining electric motors
- Display of the analysis results in 2 D or 3 D format (vs. time or RPM)
- Export of „living“ diagrams to Microsoft® Word and Power Point® documents
- Integration and differentiation
- Reference quantity editor (e.g. smoothing, manipulation of RPM curves)
- Pulse wizard for the generation of revolution speed data in recordings without RPM signal
- Statistical evaluation of measurement data (average value, maximum and minimum value, the sum and the difference of time signals)
- Display and export of calculation results as single value (minimum, maximum, average)
- Up- / downsampling of time signals
- Percentile values
- Distribution density
- Tolerance scheme editor for automatic tolerance checks

**ArtemiS**

**Basic Software  
 Tool Packs (ATPs)  
 Data Acquisition Module  
 ADA-CAN**

**ArtemiS**

is a modular software, which, in addition to the base version, can be extended by various Tool Packs (ATPs) and the data acquisition module ADA-CAN.

The modular design allows users to set up a custom ArtemiS system optimally suited for their needs.

The extension modules offer advanced functions in addition to those provided by HEAD Data Portal, the software for the structured and cross-linked documentation and organization of data, the programmable HEAD Recorder, Flow Control, basic analysis functions, evaluation and documentation tools, which are included with the base version.

More detailed information about the features of the base version, the ATPs and the ADA-CAN module briefly presented here can be found in the respective datasheets.

- The mobile workspace (Pack & Go) allows for an uncomplicated archiving of complete ArtemiS projects, the individual work environment respectively its dislocation e.g. to another computer included
- Automatic generation of a backup file
- Display of the Documentation Summary in the ArtemiS info box
- Data import / export via ASCII, WAV, MP3 and AFX files
- Result diagram export via JPEG, BMP, or TIFF format
- Excel and Word export
- File export
- Automated reporting with standardized templates
- HEAD Noise Metrics: Software tool allows the calculation of different noise metrics for combustion engines

**ATP 01  
Playback  
Included in delivery of ASM 11  
(Code 5011)**

Extension module for the playback of audio signals and the measurement of human hearing capabilities

- Instant acoustic assessment of measured signals with and without filtering
- Acoustic feedback during the interactive manipulation of filters
- A / B comparisons through synchronized acoustic juxtaposition of selected time sequences
- Playback with simultaneous display of the analysis results and the indication of current playback positions via running cursor
- Variable setting of the playback speed, the level and the channel with optical response, if playback is not realized with the original settings
- Audio-synchronized video playback (recorded with HEAD Recorder) in the Mark Analyzer
- Audiometer (complying with DIN EN 60645) for the measurement of human hearing capabilities (not for medical purposes)

**ATP 02  
Psychoacoustics  
Included in delivery of ASM 12  
(Code 5012)**

Extendible module to evaluate sound measurements with psychoacoustic parameters

- Sharpness vs. time  
DIN 45692, Aures or von Bismarck
- Loudness vs. time / Spec. Loudness vs. time  
DIN 45631/AI, ANSI S3.4-2007, ISO 532/B (based on FFT or digital filters) or HEAD algorithm
- Roughness vs. time / Spec. Roughness / Spec. Roughness vs. time
- Fluctuation Strength vs. time / Spec. Fluctuation Strength / Spec. Fluctuation Strength vs. time
- Tonality vs. time
- Articulation Index vs. time
- Speech Intelligibility Index vs. time
- Speech Interference Level vs. time
- Spec. Prominence / Spec. Prominence Ratio vs. time
- Display of the analysis results in Hz or Bark
- Percentile display of the psycho-acoustic parameters
- Loudness Adaptation

**ATP 03  
Signature Analysis  
Included in delivery of ASM 13  
(Code 5013)**

Extension module for the analysis of signals as a function of a reference quantity (e.g. RPM, pressure etc.) for order analysis and order filtering

- Reference Quantity vs. time
- Display of analysis results (e.g. psychoacoustic parameters with ATP 02 oder ATP 06) vs. Reference Quantity
- Harmonic Distortion vs. RPM
- Gated Time Cuts / Gated Time Cuts (Average)
- Order Analysis, Order Spectra (averaged / peak hold), Order Level curves
- Order filters (IIR filters)
- Tracking filter with variable frequency offset (in Hz) for all order analyses
- Analysis of rotational vibrations

ATP 03 expands the functionality of other ArtemiS modules by adding the possibility to calculate analysis functions not only vs. time, but vs. any reference quantity (referred to as "vs. RPM" in the following):

- ATP 03 and ATP 02:
- Articulation Index vs. RPM
- Loudness vs. RPM / Spec. Loudness vs. RPM
  - Order Loudness vs. RPM / Order Loudness vs. time
  - Order Loudness vs. RPM / Order Loudness vs. time / Spec. Order Roughness vs. RPM / Spec. Order Roughness vs. time
- Roughness vs. RPM / Spec. Roughness vs. RPM
- Sharpness vs. RPM
- Fluctuation Strength vs. RPM / Spec. Fluctuation Strength vs. RPM
- Spec. Prominence Ratio vs. RPM
- Speech Intelligibility Index vs. RPM
- Tonality vs. RPM
- ATP 03 and ATP 04
  - 1/nth Octave vs. RPM (filter)
- ATP 03 and ATP 05
  - Auto Correlation vs. RPM
  - Auto Spectrum vs. RPM
  - Impulse Response vs. RPM
  - Coherence vs. RPM
  - Cross Correlation vs. RPM
  - Cross Spectrum vs. RPM
  - Transfer Function vs. RPM

- ATP 03 and ATP 06
  - Hearing Model Impulsiveness vs. RPM
  - Hearing Model Roughness vs. RPM
  - Hearing Model Spec. Impulsiveness vs. RPM
  - Hearing Model Spec. Roughness vs. RPM
- ATP 03 and ATP 07
  - Cepstrum vs. RPM DFT
  - Curtosis vs. RPM
  - Degree of Modulation vs. RPM
  - Modulation Freq. vs. RPM
  - Modulation Spec. vs. RPM
  - Tonality DIN 45681 vs. RPM
  - Tone-to-Noise vs. RPM
  - VFR vs. RPM

**ATP 04  
1/nth Octave Analysis  
Included in delivery of ASM 14  
(Code 5014)**

Extension module for the existing 1/nth octave analysis with recursive, digital filters according to the ANSI norm standard

- 1/nth octave analysis with digital filters according to the ANSI S1.11, IEC 1260
- In addition to octave and 1/3 octave analysis, other fractions of an octave are possible, too

**ATP 05  
System Analysis (Code 5015)  
Included in delivery of ASM 15  
(Code 5015)**

Extension module for examining dynamic system characteristics

- Transfer Function / Transfer Function vs. time / Impulse Response / Impulse Response vs. time
- Auto Spectrum / Auto Spectrum vs. time / Cross Spectrum / Cross Spectrum vs. time
- Auto Correlation / Auto Correlation vs. time / Auto Correlation vs. bands
- Cross Correlation / Cross Correlation vs. time / Cross Correlation vs. bands
- Coherence / Coherence vs. time / Coherent Spectrum / Multiple Coherence / Multiple Coherent Spectrum / Partial Coherence / Partial Coherent Spectrum

## **ATP 06**

### **Adv. Psychoacoustics Included in delivery of ASM 16 (Code 5016)**

Extension module for sophisticated psychoacoustic analyses

- The hearing model allows analyses with a time and frequency resolution resembling that of human hearing
  - Hearing Model: Impulsiveness vs. time / Hearing Model: Roughness vs. time / Hearing Model: Spec. Roughness / Hearing Model: Spec. Roughness vs. time / Hearing Model: Spectrum vs. time / Hearing Model: Spec. Impulsiveness / Hearing Model: Spec. Impulsiveness vs. time
- High-resolution spectral analysis (HSA): effective identification of resonances and orders in rapidly changing signals
  - HSA (Average) / HSA vs. time / HSA vs. RPM
- Relative Approach: Reliable detection of patterns in signal curves
  - Relative Approach 2D / Relative Approach 3D

## **ATP 07**

### **Advanced Analysis (Code 5017) Included in delivery of ASM 17 (Code 5017)**

Extension module for advanced analysis

- Filter Pool
  - Envelope
- Analysis Pool
  - Modulation Spectral analysis
  - Time signal vs. rotation (RPM)
  - Level vs. time (filtered) / Level vs. RPM (filtered)
  - Tone-to-Noise Ratio / Tone-to-Noise Ratio vs. time
  - Sound Power Measurements
  - Modulation Frequency vs. time
  - Degree of Modulation vs. time
  - Modulation Spectrum / Modulation Spectrum vs. time / Modulation Spectrum vs. Frequency Bands
  - Weighted Modulation
  - Wavelet Analysis
  - Gated Fourier Transformation / Gated Fourier Transformation vs. time
  - Envelope
  - VFR (Average) / VFR vs. time
  - Kurtosis vs. time
  - Cepstrum / Cepstrum vs. time
  - Tonality DIN 45681 / Tonality DIN 45681 vs. time
  - Speech Transmission Index (STI: STITEL / STIPA / RASTI)

## **ATP 08**

### **Online Analysis Included in delivery of ASM 18 (Code 5018)**

Extension module for signal and systems analysis in real-time mode

- Online presentation of the following analysis: time / FFT / FFT vs. time / Auto Spectrum / Cross Spectrum / Auto Correlation / Cross Correlation / Frequency Response / Impulse Response / Cepstrum / Octave Spectrum / 3rd Octave Spectrum / Coherence / Liftered Spectrum / Sound Intensity
- Mobile online diagnostics
- Structural analyses
- Clear, concise and easily configurable sensor list
- Operation via keyboard or mouse
- Systematic display of all diagrams, functions, and operating elements in one surface

## **ATP 09**

### **Advanced Filters Included in delivery of ASM 19 (Code 5019)**

Extension module for the modification of time signals with FIR filters and variable filters

- Filters with variable time and frequency curves
- Simultaneous activation of any number of filters
- FIR filters with filter characteristics adjustable in the given frequency range
- Parametric IIR filters
- Harmonic filters
- Variable filters / variable tracking filters (ATP 03) with variable attenuation or amplification
- Use of transfer functions as filtering functions
- Time-stretching or compressing of audio signals without affecting the pitch
- Changing the pitch of audio signals without affecting the signal length
- Interactive, mouse-controlled filter design; the influence on the signal can be visualized immediately via spectrum morphing

## **ATP 10**

### **Generator and Editor Included in delivery of ASM 20 (Code 5020)**

Extension module to generate synthetic signals and to edit signal sequences

- Signal and function generator for various artificial signals, e.g. audio, acceleration or RPM signals
- Signal editor for mixing and editing audio signals

## **ATP 11**

### **Advanced Documentation Included in delivery of ASM 22 (Code 5022)**

Extension module for the sophisticated, automatic documentation of measurement and analysis results

- Report Generator (creation of report templates, predefined settings for graphics, tables and calculation parameters, automatic inclusion of user-defined information etc.)
- User-specific adjustment of the protocol format

## **ATP 14**

### **Calculation Included in delivery of ASM 27 (Code 5027)**

Extension module in order to calculate channel-oriented operations, statistical and vectorial functions of calculation, and to generate user-defined functions

- MATLAB®-Add-in for the integration of MATLAB® calculations in ArtemiS
- „Add-Ins“ (in C++ written, user-defined calculations)
- „Channel-Calc-Element“ for the channel-wise calculations

**ATP 15  
Advanced Import & Export  
Included in delivery of ASM 23  
(Code 5023)**

Extension module to import /export measurement data and analysis results which are to be processed further with third-party systems (e.g. application software)

- Direct export of analysis results in the BLK format according to ME'scope (modal analysis, ODS)
- SDF (import / export)
- PC-208, SONY (import)
- UFF 58/58b (import / export)
- PAK (import / export)
- MATLAB® (import / export)
- TEAC „Quick Vu“ (import)
- TEAC TAFFmat (import)
- OggVorbis (import / export)
- Polytec (import / export)
- MTS RPC (export)

**HEAD Recorder  
(Code 5000\_5004)  
The HEAD Recorder is included  
in the purchased parts pack-  
age of ASM 00 (Code 5000)  
and ASM 04 (Code 5004) of  
the ArtemiS suite**

Versatile recording software with innovative concept for front-ends supported by HEAD acoustics.

**ADA-CAN  
Data Acquisition Module for Re-  
cording of CAN Bus Signals and  
OBD-2 Information  
Included in delivery of ASM 24  
(Code 5024)**

ADA CAN: Extension module for recording CAN signals from the CAN bus. Based on databases (.dbc) from Vector Informatik (not included), CAN data can be extracted offline or during the recording.

Furthermore ADA-CAN allows the recording of OBD-2 information (Vehicle Speed, Engine RPM, Throttle Position etc.).

**Requirements:**

- **ArtemiS basic software:**
  - Up-to-date graphics driver with DirectX9 support
  - ≥ 8 MB graphics card (graphics card with 64 MB or 128 MB recommended)
  - NET Framework 3.5 (HEAD Data Portal)
  - Recommended: SQL Server 2005 Express Edition (HEAD Data Portal)
  - Microsoft® Office (32 bit)
  - Windows® XP (32 bit: Professional - languages: US / Western European)  
≥ 1.5 GHz Pentium (or comparable)  
≥ 1 GB RAM
- OR
- Windows® VISTA™ (32 bit and 64 bit: Business, Ultimate - languages: US / Western European)  
≥ Core2Duo Processor 2 GHz  
≥ 2 GB RAM
- OR
- Windows® 7 (64 bit and 32 bit: Professional, Enterprise, Ultimate - languages: US / Western European)  
≥ Core2Duo Processor 2 GHz  
≥ 2 GB RAM
- **ATP 08:**  
Screen resolution: ≥ 1024 x 768
  - **ATP 14:**  
≥ Microsoft® Visual Studio 6.0  
MATLAB® (for MATLAB-AddIn)  
as of version 6.5 R13