HEAD acoustics

DATA SHEET

ArtemiS SUITE
Overview

Code 50000 – 51801

ArtemiS SUITE Overview

ArtemiS SUITE is a universal software for sound and vibration analysis. The modular structure enables users to combine various ArtemiS SUITE Projects (APR) and ArtemiS SUITE Signal Processing (ASP) tools into flexible and customizable solutions.

OVERVIEW

APR, ASP	TITLE	FUNCTION
APR 000	APR Framework	Basis of ArtemiS SUITE
APR 010	Pool Project	Central Project
APR 020	Report	Central Project
APR 030	Database	Special Application
APR 040	Recorder	Data Acquisition
APR 050	Automation Project	Central Project
APR 080	RPM Generator	Data Preparation
APR 100	Compact Analysis Project	Special Application
APR 110	Playback Filters	Special Application
APR 190	Sound Engineering Project	Data Processing
APR 200	HDF Tools	Data Processing
APR 210	Signal Generator Project	Data Preparation
APR 220	Standardized Test Project	Central Project
APR 300	Sound Intensity Measurement	Special Application
APR 400	ODS Project	Structural Analysis
APR 410	Shape Comparison Project	Structural Analysis
APR 420	Modal Analysis Project	Structural Analysis
APR 430	Impact Measurement	Structural Analysis
APR 500	Jury Testing - SQala Basic	Jury Testing
APR 570	Metric Project	Sound Quality Index
APR 610	TPA Data Acquisition	Transfer Path Analysis
APR 620	TPA Project	Transfer Path Analysis
ASP 001	Basic Analysis	Data Analysis
ASP 002	Basic Analysis vs. Control Channel	Data Analysis
ASP 003	Advanced Analysis	Data Analysis
ASP 004	Advanced Analysis vs. Control Channel	Data Analysis
ASP 005	Modulation Analysis	Data Analysis
ASP 006	Order Analysis	Data Analysis
ASP 007	Octave Analysis	Data Analysis
ASP 101	Psychoacoustics - Basic Analysis	Data Analysis
ASP 102	Psychoacoustics - Basic Analysis vs. Control Channel	Data Analysis
ASP 103	Psychoacoustics - Advanced Analysis	Data Analysis
ASP 104	Psychoacoustics - Advanced Analysis vs. Control Channel	Data Analysis
ASP 106	Speech Intelligibility Analysis	Data Analysis
ASP 201	System Analysis	Data Analysis
ASP 202	System Analysis vs. Control Channel	Data Analysis
ASP 203	Sound Power Analysis	Data Analysis
ASP 301	Offline Filters	Data Preparation
ASP 302	Data Preparation	Data Preparation
ASP 303	Statistics	Data Processing
ASP 304	Batch RPM Generator	Data Preparation
ASP 305	Channel Calculation	Data Processing
ASP 501	Jury Testing - SQala Net	Jury Testing
ASP 502	Jury Testing - SQala Server	Jury Testing
ASP 701	DATaRec 4 Support	Data Acquisition
ASP 702	MDM Recording	Data Preparation
ASP 703	MDF4 Export	Import / Export
ASP 704	MTS-RPC Conversion	Import / Export
ASP 705	UFF Conversion	Import / Export
ASP 706	MECALC Support	Data Acquisition
ASP 801	Basic Decoder	Data Preparation

APPLICATIONS

All tasks from recording (or import) to various processing and analysis operations to the final report (or export)

DATA ACQUISITION

- Recorder
- MECALC Support
- DATaRec 4 Support

DATA PREPARATION

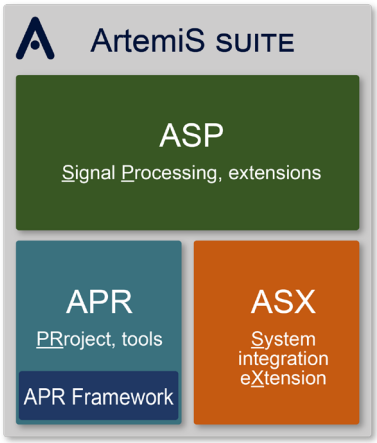
- RPM Generator
- Signal Generator Project
- Offline Filters
- Data Preparation
- Batch RPM Generator
- MDM Recording
- Basic Decoder

CENTRAL PROJECTS

- Automation Project
- Pool Project
- Standardized Test Project
- Report

DATA PROCESSING

- HDF Tools
- Statistics
- Sound Engineering Project
- Channel Calculation



DATA ANALYSIS

- Basic Analysis
- Basic Analysis vs. Control Channel
- Advanced Analysis
- Advanced Analysis vs. Control Channel
- Modulation Analysis
- Order Analysis
- Octave Analysis
- Psychoacoustics - Basic Analysis
- Psychoacoustics - Basic Analysis vs. Control Channel
- Psychoacoustics - Advanced Analysis
- Psychoacoustics - Advanced Analysis vs. Control Channel
- Speech Intelligibility Analysis
- System Analysis
- System Analysis vs. Control Channel
- Sound Power Analysis

DATA IMPORT / EXPORT

- MDF4 Export
- MTS-RTC Conversion
- UFF Conversion

Special tasks

STRUCTURAL ANALYSIS

- Modal Analysis Project
- ODS Project
- Shape Comparison Project
- Impact Measurement

MISCELLANEOUS

- Sound Intensity Measurement
- Compact Analysis Project
- Playback Filters
- Database

JURY TESTING / SOUND QUALITY INDEX

- Jury Testing - SQala Basic
- Jury Testing - SQala Net
- Jury Testing - SQala Server
- Metric Project

TRANSFER PATH ANALYSIS

- TPA Project
- TPA Data Acquisition

Programming tasks for extensions

PROGRAMMING INTERFACES

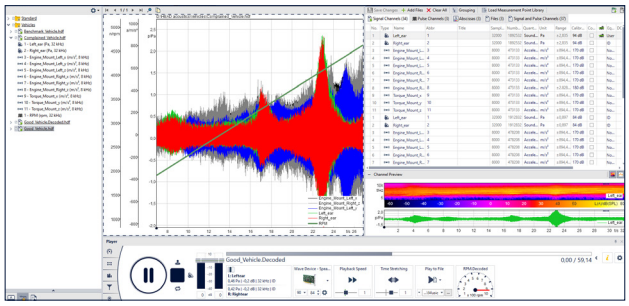
- ASX 01 Data Access API
- ASX 02 Data Processing and Representation API
- ASX 03 SQala Extension API
- ASX 04 Data Acquisition API
- ASX 05 Documentation and Metadata API
- ASX 06 Data Processing Add-In API
- ASX 07 Local Processing Service
- ASX 08 Local Processing Service

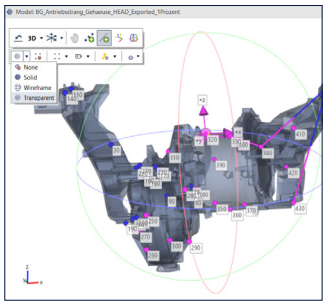
BASIS OF ARTEMIS SUITE

APR 000
APR Framework
Code 50000

Required for individual ArtemiS SUITE compositions for connecting APR and ASP to consistent units

- Player, Data Viewer, Channel Editor, User Documentation, Sensor Library, Measurement Point Library, ...





DATA ACQUISITION

APR 040
Recorder
Code 50040

Universal recorder for several signal types: sound, vibration, pulse, bus data, ...

- Frontend Selection, Channel Configuration, Online Monitor, Trigger, Flow Control, ...

ASP 701
DATaRec 4 Support
Code 51701

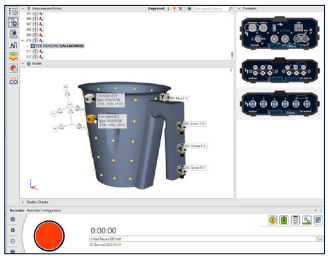
Using DATaRec 4 frontend systems with the Recorder

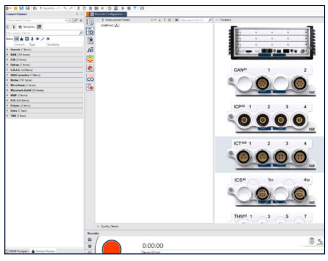
- Easy configuration for all measurement chain elements

ASP 706
MECALC Support
Code 51706

Using the DECA**Q** series from MECALC with the Recorder

- Easy configuration for all measurement chain elements
- Synchronized measurements with HEAD*lab* via PTP





DATA PREPARATION

ASP 302
Data Preparation
Code 51302

Embedding several processes for signal preparing

- Mark by Time, Mark by RPM, Point Map, Merge Channels, ...
- Point Map, Channel / File Difference /Statistic Point Map, ...

APR 210
Signal Generator Project
Code 50210

Creating simple or complex synthetic signals with configurable quantities

- Predefined, parameterizable functions

APR 080
RPM Generator
Code 50080

Generating reference quantities for signals for which the mechanical acquisition of, e.g., RPM is difficult or impossible

- Easy-to-use generation of reference quantities, e.g., RPM curves

ASP 304
Batch RPM Generator
Code 51304

Generating reference quantities (e.g., RPM) for multiple similar signals at the same time

- Generation of reference quantities in batch mode using templates from APR 080

ASP 301
Offline Filters
Code 51301

Filtering and editing signals

› Equalization Filter
› IIR Filter, FIR Filter, ...
› Differentiate, Integrate, Resample, Mapping, Envelope, ...

ASP 702
MDM Recording
Code 51702

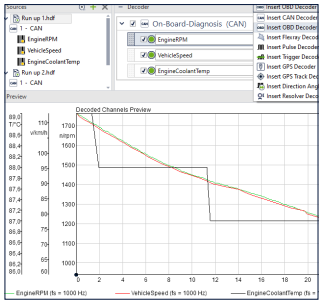
Performing openMDM measurement tasks

› Automatic generation of a Recorder Task List from an openMDM XML task file, ...

ASP 801
Basic Decoder
Code 51801

Extracting coded signals from recordings

› Decoders: CAN FD, CAN, OBD-2, WWH-OBD, FlexRay, GPS, Pulse, Trigger, Resolver, ...



CENTRAL PROJECTS

APR 050
Automation Project
Code 50050

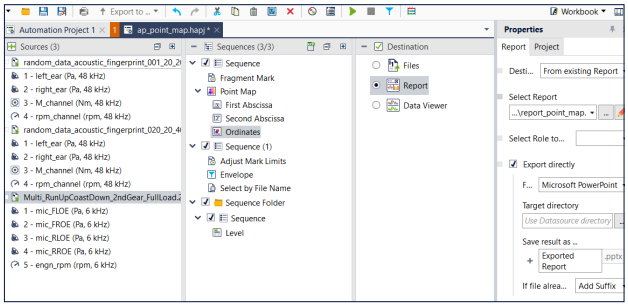
Processing, analyzing, and reporting tasks that need to be performed in a repetitive way without user interaction

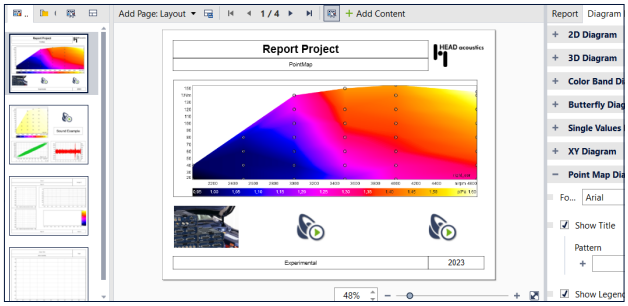
› Optimally applicable for smaller and larger preprocessing and postprocessing tasks

APR 010
Pool Project
Code 50010

Processing, analyzing, and reporting tasks that need to be performed in an interactive way

› Individual compiling of dynamic, flexible, and easy-to-use processing solutions





APR 220
Standardized Test Project
Code 50220

Executing standardized test series from data acquisition to individual data analysis and processing to the final report

› Data acquisition based on an automatically generated Task List

APR 020
Report
Code 50020

Automated reporting from Automation Projects, Pool Projects, and Standardized Test Projects with a single click

› Easy-to-use configuration of new reports which can also be used as templates

The multifunctional central projects are ideal for interactive or completely automatic processing, analyzing, and filtering to the finalized report.

› The key feature of the Automation Project is that processing steps are defined only once, performed automatically, and reused for all further processing or reporting.

› The Pool Project features an optimized interactive mode of operation and is very easy to use.
› The Standardized Test Project is designed to measure several operating states of test objects and to examine them in different ways.
› A Report excels with its high efficiency and ease of use and covers the entire scope of possible applications from simple one-page reports to complex presentations completed at the push of a button.

DATA ANALYSIS

ASP 001
Basic Analysis
Code 51001

Spectral, level, and other basic analyses

› FFT vs. Time, 1/n Octave Spectrum (FFT), Power Spectral Density, ...
› Level , ...

ASP 002
Basic Analysis vs. Control Channel
Code 51002

Basic analyses vs. control channels (RPM, force, ...)

› FFT vs. RPM, 1/n Octave Spectrum (FFT) vs. RPM,
› Level vs. RPM, ...

ASP 003
Advanced Analysis
Code 51003

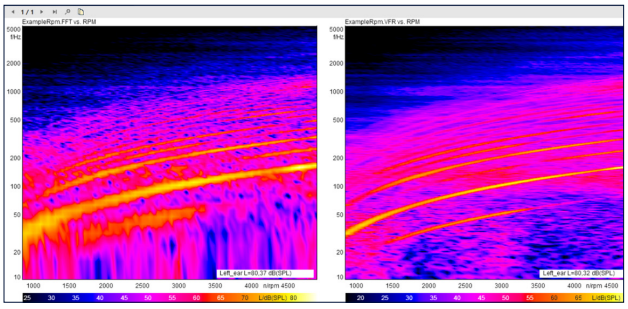
Spectral analyses with a high or variable frequency resolution and other sophisticated analyses

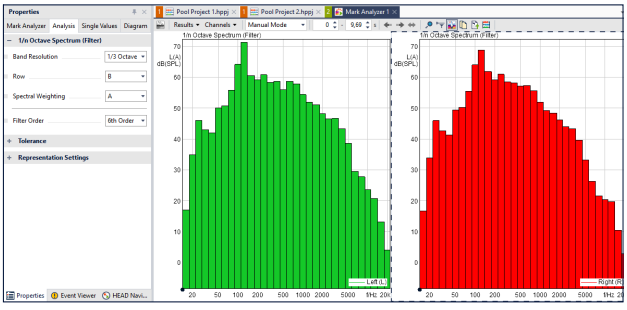
› HSA, VFR, ...
› Wavelet, Cepstrum, Gated DFT, ...

ASP 004
Advanced Analysis vs. Control Channel
Code 51004

Sophisticated analyses vs. control channels (RPM, force, ...)

› HSA vs. RPM, VFR vs. RPM
› Cepstrum vs. RPM, ...





ASP 005
Modulation Analysis
Code 51005

Analyses the examination of modulated signals with regard to their frequency, strength, and change over time

› Modulation Frequency, Modulation Spectrum, Degree of Modulation, Weighted Modulation, ...

ASP 006
Order Analysis
Code 51006

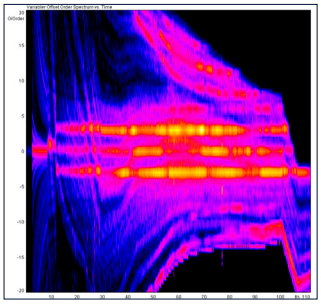
Analyses for the calculation of sounds containing different signal components

› Order Spectrum, ...
› Several order algorithms: Variable DFT Size, RPM-sync. Resampling, Time Domain Averaging

ASP 007
Octave Analysis
Code 51007

Analyses with recursive filters for the calculation of 1/n octave analyses

› 1/n Octave Spectrum (Filter), ...
› Filters: IEC 61260 series, ANSI S 1.11



ASP 101
Psychoacoustics - Basic Analysis
Code 51101

Analyses for an analytical description of perceived sound quality taking into account the specifics of human hearing

- (Specific) Loudness, Sharpness, Tonality, ...
- Aures, von Bismarck
- DIN 45692, 45631/A1, 45681, ISO 532-1, 532-3, ANSI S3.4-2007

ASP 102
Psychoacoustics - Basic Analysis vs. Control Channel
Code 51102

Psychoacoustic analyses vs. control channels (RPM, force, ...)

- (Specific) Loudness vs. RPM, Sharpness vs. RPM, Tonality vs. RPM, ...
- Aures, von Bismarck
- DIN 45692, 45631/A1, 45681, ISO 532-1, 532-3, ANSI S3.4-2007

ASP 103
Psychoacoustics - Advanced Analysis
Code 51103

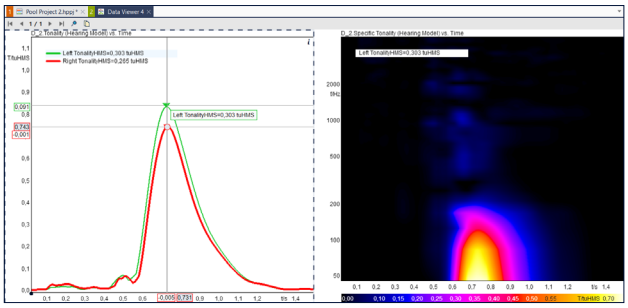
Sophisticated analyses according to the Sottek Hearing Model

- (Specific) Loudness, (Specific) Roughness, (Specific) Tonality, (Specific) Impulsiveness, Spectrum, ...
- DIN 38455, ECMA 418-2 (1st, 2nd), ECMA 74 (15th, 17th)
- Relative Approach, ...

ASP 104
Psychoacoustics - Advanced Analysis vs. Control Channel
Code 51104

Sophisticated analyses based on the Sottek Hearing Model vs. control channels (RPM, force, ...)

- (Specific) Loudness vs. RPM, (Specific) Roughness vs. RPM, (Specific) Tonality vs. RPM, (Specific) Impulsiveness vs. RPM, ...
- DIN 38455, ECMA 418-2 (1st, 2nd), ECMA 74 (15th, 17th)



ASP 106
Speech Intelligibility Analysis
Code 51106

Analyses to investigate the intelligibility of speech and the extent to which noises affect it

- Speech Intelligibility, Speech Interference Level vs. Time, Articulation Index, ...

ASP 201
System Analysis
Code 51201

Analyses for examining dynamic systems

- Transfer Function, Impulse Response, Auto / Cross Correlation, Auto / Cross Spectrum, Coherence, Distortion, ...

ASP 202
System Analysis vs. Control Channel
Code 51202

Analyses for examining dynamic systems vs. control channels (RPM, force, ...)

- Transfer Function vs. RPM, Impulse Response vs. RPM, Auto (Cross) Correlation vs. RPM, Coherence vs. RPM, ...

ASP 203
Sound Power Analysis
Code 51203

Analyses for standard-compliant sound power determination using manual or automated workflows

- Sound Power vs. Time, Sound Power vs. RPM
- ISO: 3741, 3743-1, 3743-2, 3744, 3745, 3746

ArtemiS SUITE provides more than 150 analyses, from basic analyses to psychoacoustic analyses according to the Sottek Hearing Model. The analyses can be applied in Pool Projects, Automation Projects, Standardized Test Projects, and Metric Projects.

DATA PROCESSING

APR 200
HDF Tools
Code 50200

Converting various types of data files into data sets that can be easily processed

- Channel Sort Tool
- Concatenate Tool
- Merge Tool

ASP 305
Channel Calculation
Code 51305

Extending Calculation Projects (included in APR 000) with customized mathematical operations

- Post-processing multiple channels simultaneously

APR 190
Sound Engineering Project
Code 50190

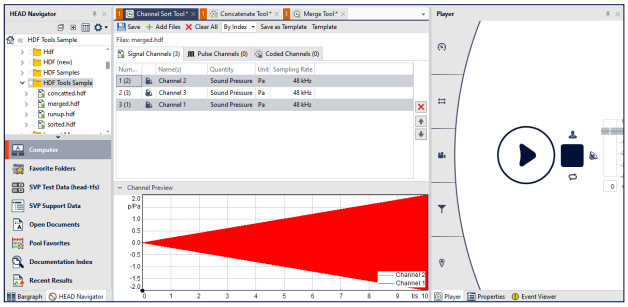
Interactive modification of recordings via a graphic user interface

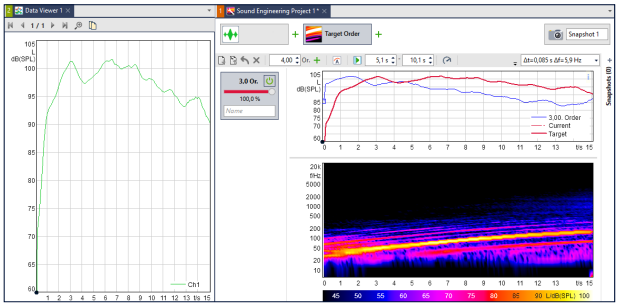
- Eraser, Brush IIR Filter, IIR Order Filter, Target Order, ...

ASP 303
Statistics
Code 51303

Statistical functions, such as Min, Max, Average, Sum, Median

- Channel Statistics, File Statistics, Folder Statistics, Difference, Distribution, Percentile, ...





IMPORT / EXPORT

ASP 705
UFF Conversion
Code 51705

Import and export of UFF files (Universal File Format 58)

- Import of 3D data (two abscissas) is supported, ...

ASP 704
MTS-RPC Conversion
Code 51704

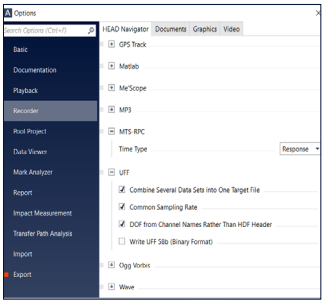
Import and export of MTS-RPC (Remote Parameter Control) files

- Import and export of 2D time data (one abscissa) is supported, ...

ASP 703
MDF4 Export
Code 51703

MDF4 export of the ASAM Measurement Data Format

- Version 4.10 MDF files are written according to the base ASAM standard, ...



STRUCTURAL ANALYSIS

APR 400
ODS Project
Code 50400

Analyzing and animating structures in a defined stationary operating state

- Operating Deflection Shape Project (ODS)
- Time Domain Animation Project (TDA)

APR 410
Shape Comparison Project
Code 50410

Analyzing and comparing deflection shapes

- Comparing simulations with real measurements
- Evaluating component modifications

APR 420
Modal Analysis Project
Code 50420

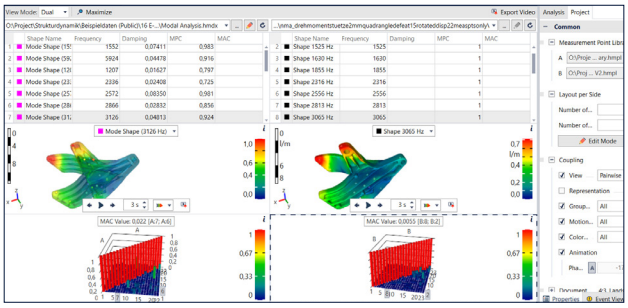
Exploring vibration patterns of simulations or test objects for users of all levels of experience

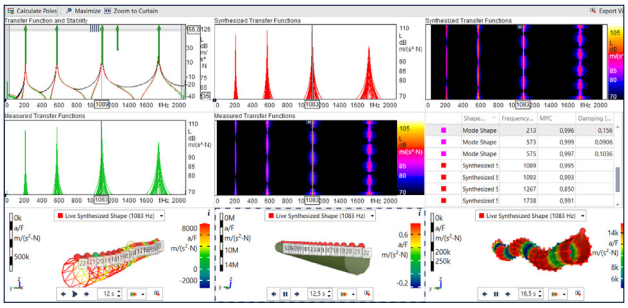
- Intuitive operation
- Artificial intelligence (AI) for automatic model size selection, ...

APR 430
Impact Measurement
Code 50430

Performing impact hammer measurements

- Roving Hammer, Roving Accelerometer
- Easy-to-use guided workflow, ...





MISCELLANEOUS

APR 030
Database
Code 50030

Easy searching for recordings and analysis results

- Quick indexing of data, ...

APR 110
Playback Filters
Code 50110

Interactive filtering of time signals in real-time during playback

- Online filtering of signals

APR 100
Compact Analysis Project
Code 50100

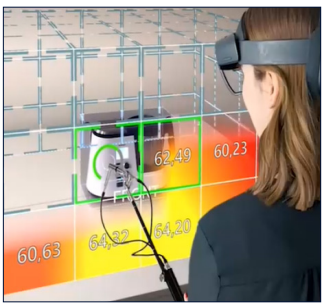
Interactive examination of recordings via an easy-to-use analysis user interface

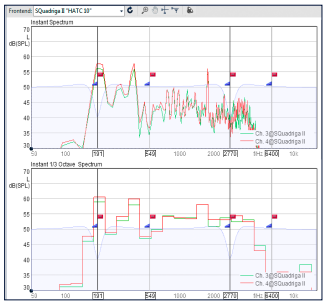
- FFT, Level, Loudness, Sharpness, Single Value, Tolerance Scheme, ...

APR 300
Sound Intensity Measurement
Code 50300

Performing sound intensity measurements and determining sound power (ISO 9614)

- Optional use of HoloLens 2 Augmented Reality glasses, ...





JURY TESTING / SOUND QUALITY INDEX

APR 500
Jury Testing - SQala Basic
Code 50500

Creating and performing listening tests (no expert knowledge is required)

› Paired Comparison, Category Judgment, Simultaneous Category Judgment, ...

ASP 501
Jury Testing - SQala Net
Code 51501

Interactive monitoring and supervision of listening tests with multiple participants in listening studios

› Status overview for all individual participants, ...

ASP 502
Jury Testing - SQala Server
Code 51502

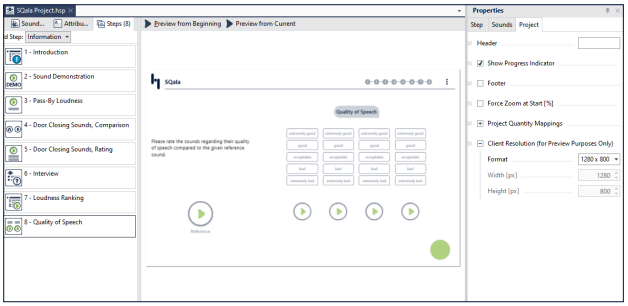
Managing and saving SQala projects

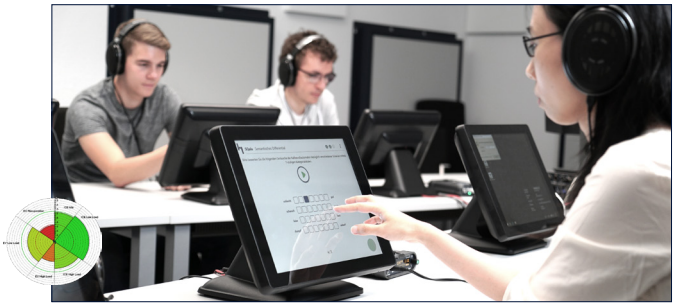
› Connection between SQala Server and individual SQala Clients

APR 570
Metric Project
Code 50570

Developing metrics, e.g., based on the results of SQala listening tests

› Manual and semi-automatic design of sound quality indexes, ...





TRANSFER PATH ANALYSIS

APR 610
TPA Data Acquisition
Code 50610

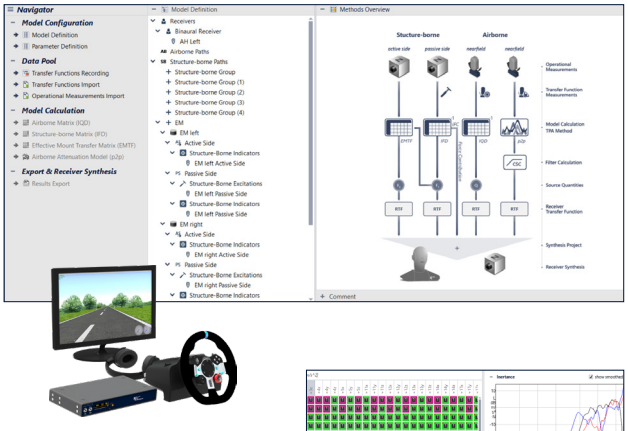
Easy recording of transfer functions with the Recorder

› Step-by-step guidance for setting up the measurement configuration, ...
› Use of the Measurement Point Library
› Optional: 3D model
› Automatic check for incorrect configurations

APR 620
TPA Project
Code 50620

Performing transfer path analyses or creating input data sets for PreSense (Code 7600ff), the interactive simulator for NVH assessment, and Prognoise (Code 4914), the BTPS software

› Step-by-step guidance for performing the TPA model, ...
› Methods: IFD, EMTF, p2p, IQD
› ISO 20270:2019



SYSTEM REQUIREMENTS

- Windows 11 x64
  (Pro, Enterprise, Education; version: 21H2 or newer; languages: US, Western European)

or:

  Windows 10 x64
  (Pro, Enterprise, Education; version: 1809 or newer; languages: US, Western European)

- Xeon E5-1680, Core i7-7700, Core i5-8250U, Ryzen 5 1500X, Ryzen 5 2500U (recommended: Core i7-9700KF, Core i9-9980HK, Ryzen 5 3600, Ryzen 9 4900HS)
- 8 GB RAM (recommended: 16 GB)
- DirectX 9.0c-compliant graphics adapter with 512 MB (recommended: 2 GB)
- Display with WXGA resolution (1366 x 768) (recommended: FHD resolution (1920 x 1080))
- .NET Framework 4.8
- HASP dongle driver
- HEAD USB driver (optional)
- Microsoft 365 x86, Microsoft Office 2021 x86, Microsoft Office 2019 x86, Microsoft Office 2016 x86 (optional)

In order to install software and drivers from HEAD acoustics, administrator rights are required. To operate the software, only standard user rights are needed.

ASX INTERFACES

ASX (HEAD System Integration and Extension) programming interfaces enable the integration of ArtemiS SUITE into users' software applications and the extension of ArtemiS SUITE with users' software applications. Furthermore, various functionalities, such as projects, analyses, and operating processes can be (remotely) controlled.

ASX 01 (Code 5091)
Data Access API
- Reading, modifying, and writing HDF and HSVX files (single values, ...)

ASX 02 (Code 5092)
Data Processing and Representation API
- Interactive control of several APR and ASP

ASX 03 (Code 5093)
SQala Extension API
- Programming user-specific test steps for SQala

ASX 04 (Code 5094)
Data Acquisition API
- Interactive control of the Recorder

ASX 05 (Code 5095)
Documentation and Metadata API
- Creating and editing User Documentation

ASX 06 (Code 5096)
Data Processing Add-In API
- Integrating user-specific analyses or filters into ArtemiS SUITE

ASX 07 (Code 5097)
Local Processing Service
- ArtemiSproc.exe for remote control of Automation Projects

ASX 08 (Code 5098)
Local Recording Service
- ArtemisRec.exe for remote control of the Stand Alone Recorder

ASX 00
(System Integration and Extension Guidelines)
Documentation – Batch Processing – Sensor Library
- Detailed documentation with various examples, practical model applications, and programming references

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