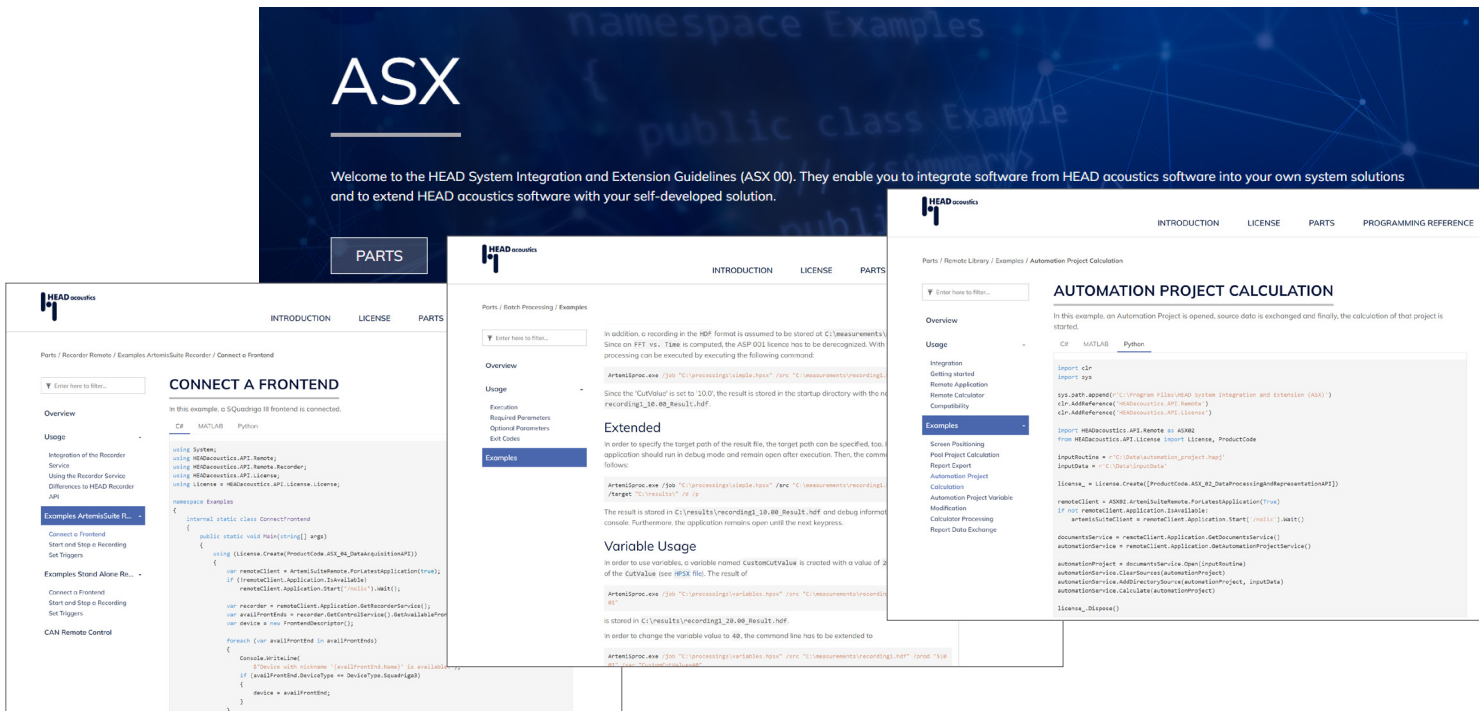




HEAD System Integration and Extension (ASX 01 – ASX 10)

Codes 5090ff

HEAD System Integration and Extension (ASX)

With the flexible ASX programming interfaces, you can control selected ArtemiS SUITE functions from your own software and extend ArtemiS SUITE with custom analyses, filters, and other functionality. ArtemiS SUITE does not need to be installed to perform measurements with the Recorder, execute Automation Projects, or generate Reports.

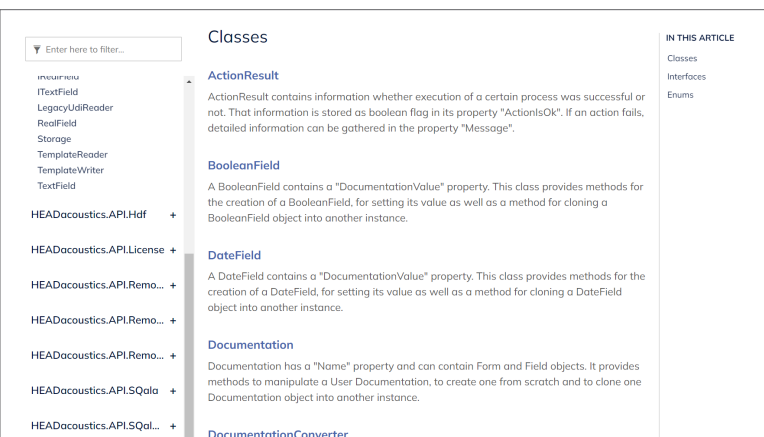
OVERVIEW

HEAD System Integration and Extension (ASX 01 – ASX 10)

Code 5090ff

The ASX 01 to ASX 10 programming interfaces enable you to integrate ArtemiS SUITE with your software and develop solutions tailored to your specific requirements. For example, you can use your software to remotely control the Recorder, process measurements, and then have them processed by Automation Projects. The results can subsequently be exported from a Report as PDF or PowerPoint files.

You can also extend ArtemiS SUITE with your own analyses, filters, and other functionality, implement your own jury test step types into the SQala jury testing software, and much more.



KEY FEATURES

ASX Programming Interfaces:

- › ASX 00 (license-free)
Programming and application examples as well as programming references
- › ASX 01 (Code 5091)
Processing HDF and HSVX files
- › ASX 02 (Code 5092)
Controlling projects and processes of ArtemiS SUITE automatically and interactively
- › ASX 03 (Code 5093)
Programming and integrating your own step types into the SQala jury testing software
- › ASX 04 (Code 5094)
Controlling the Recorder of ArtemiS SUITE
- › ASX 05 (Code 5095)
Creating and editing User Documentation
- › ASX 06 (Code 5096)
Using your own analyses and filters in various projects of ArtemiS SUITE
- › ASX 07 (Code 5097)
Executing Automation Projects (automation specifications)
- › ASX 08 (Code 5098)
Performing stand-alone measurements using the Recorder of ArtemiS SUITE
- › ASX 09 (Code 5099)
Generating Reports
- › ASX 10 (Code 5110)
Updating FE models automatically and calculating MAC values based on shape tables

DETAILS

ASX 00

SYSTEM INTEGRATION AND EXTENSION GUIDELINES

- › Documentation with application examples, a programming reference, and code examples in C#, MATLAB®, and Python

ASX 00 includes comprehensive documentation with easy-to-use application examples and programming guidelines, enabling you to start programming right away.

ASX 00 also includes a complete format specification for the Sensor Library of ArtemiS SUITE (*.senx), enabling you, for example, to automatically convert existing sensor information to the SENX format.

ASX 01

DATA ACCESS API

- › Reading, modification, and writing of HDF and HSVX files using your software (HDF Library / HSVX Library)

With ASX 01, you can extend your software solutions to directly process HDF files (time signals, 2D and 3D analysis data). This includes, for example, processing and saving HDF files (signal and pulse channels, analysis results) as well as convenient access to single values and their threshold values.

HSVX Library is a subset of HDF Library. It enables convenient access to single values and their threshold values in one or more HSVX files. Single values can be read with HSVX Library, further processed with your software solutions, and then exported again as HSVX files.

With ASX 01, you can, for example, evaluate HDF and HSVX files using custom tolerance checks and utilize them for your own metrics.

ASX 02

DATA PROCESSING AND REPRESENTATION API

- › Automated or interactive control of Pool Projects and Automation Projects, execution of Reports and exports, and further processing using your software

With ASX 02, you can control various projects, including the processes they contain, and integrate them into your workflows. This includes populating predefined Pool Projects and Automation Projects with your data, which can then be processed (e.g., by cutting, filtering, and analyzing measurements, calculating single values, and applying tolerance checks) and subsequently displayed or exported in a Data Viewer or a completed Report.

You can use your own software solution, such as a graphical user interface (GUI), to automate or interactively control your workflows.

ASX 03

SQALA EXTENSION API

- › Programming and integration of custom step types into the SQala jury testing software

With ASX 03, you can extend SQala with your step types, such as MUSHRA (Multiple Stimuli with Hidden Reference and Anchor) tests, and execute them in Local Mode. In addition, you can develop custom buttons, attribute controls, navigation elements, or test environments and integrate the Player's functionality to gain direct access to acoustically accurate playback of HDF files.

The API export enables seamless integration of new elements and methods into the SQala interface, ensuring visual consistency with SQala's native steps and methods.

Note: Step types can only be programmed using C# or .NET Framework.

ASX 04

DATA ACQUISITION API

- › Control of the Recorder from your software

With ASX 04, you can control various functions of the Recorder of ArtemiS SUITE using your software. This includes, for example, starting the Recorder, selecting and connecting a frontend, configuring, applying, and modifying triggers, and starting and stopping measurements. Your Recorder configurations can be saved and reloaded as needed, either completely or selectively.

Alternatively, the Recorder can also be controlled via the CAN bus system, which can be particularly useful for mobile applications or test-bench measurements.

Note: We recommend creating a Recorder configuration (*.hrcx) in ArtemiS SUITE and using it to control the Recorder with ASX 04.

Note: Flow Control and the Recorder Task List are not supported.

ASX 05

DOCUMENTATION AND METADATA API

- › Use of User Documentation and Documentation Templates with your software

With ASX 05, you can seamlessly integrate User Documentation and Documentation Templates into your software and complement them with information from other databases.

You can read, modify, and write external or embedded User Documentation and, for example, automatically supplement test-bench measurements with User Documentation and additional information.

In addition, you can apply Documentation Templates to larger volumes of inventory data to automatically integrate them into the User Documentation.

ASX 06

DATA PROCESSING ADD-IN API

- › Use of custom analyses and filters in various projects

With ASX 06, you can integrate your own analyses, filters, and data exports into the signal flow of ArtemiS SUITE and use them in Pool Projects, Automation Projects, Metric Projects, and Standardized Test Projects just like the existing analyses and filters.

For example, a time signal is transferred to your application, processed there, and the result is then fed back into the signal flow of ArtemiS SUITE. You can use any MATLAB® (*.m, *.p) files and Windows executable (*.exe) files.

Add-ins are available for various applications:

Filter Add-In

(Time signal to time signal)

- › Filtering or processing a multi-channel time signal
- › Calculating a time signal from a time signal

Analysis Add-In

(Time signal to 2D / 3D analysis)

- › Analyzing (2D / 3D analysis) an input signal
- › Calculating a 2D / 3D analysis from a time signal

Post-Analysis Add-In

(Analysis from 2D / 3D analysis)

- › User-specific post-processing of a 2D / 3D analysis result, e.g., integrating a user-specific weighting function or an analysis based on an averaged spectrum (FFT averaged)

Export Add-In

(Export to any user-specific file format)

- › Exporting the input format from any time signals and 2D / 3D files
- › Processing several HDF files of an export file

Export Merge Add-In

- › Creating any data format from multiple HDF data sets for further processing of ArtemiS SUITE data in external software
- › Simultaneous transfer of several freely selectable HDF data sets to MATLAB®, for example, to convert them into a different format there

ASX 07

LOCAL PROCESSING SERVICE

- › Execution of Automation Projects saved as processing specifications (calculation jobs)

With ASX 07, you can take advantage of Automation Projects from the command line once they have been defined and stored as processing specifications (*.hpsx). Even without having ArtemiS SUITE installed, you can leverage the complex processing workflows of the Automation Project and, with ASX 07 running in the background, obtain the results of the processing specifications. A processing specification can be reused for several files. In addition, you can process files in different ways by interactively adjusting predefined variables.

ASX 07 can also be used as a batch-processing tool to process large volumes of data using Automation Projects, for example in End-of-Line processes, without further interaction.

Note: The processing specifications required to run Automation Projects must be created with ArtemiS SUITE.

ASX 08

LOCAL RECORDING SERVICE

- › Stand-alone measurements using the Recorder

With ASX 08, you can perform automated measurements using the stand-alone Recorder and frontends from HEAD acoustics without further interaction. The stand-alone Recorder is provided without a user interface, enabling you to focus on your measurement tasks.

Key Recorder functions can be automated, including starting and stopping measurements or excitations, setting the file names, saving and loading settings, and performing automated measurements. For example, when integrating the stand-alone Recorder into your test bench workflows, measurements can be performed automatically, at the push of a button, or using start and stop triggers.

Note: We recommend creating a Recorder Configuration (*.hrcx) with ArtemiS SUITE and using it to control the Recorder with ASX 08.

Note: Flow Control and Recorder Task List are not supported.

ASX 09

REPORTING API

- › Report generation

With ASX 09, you can open a Report template, replace its data sources, and save the modified template as a new Report.

The data bindings in the Report template automatically map new data to the corresponding Report elements. The generated Report can also be exported directly in PDF or PowerPoint format.

When opening the Report in ArtemiS SUITE, the new data is displayed in the respective Report elements.

Note: The Report templates (*.hrpx) required for the Reporting using ASX 09 must be created with ArtemiS SUITE.

ASX 10

STRUCTURAL ANALYSIS – MODEL UPDATING API

- › Automated update of FE models and calculation of MAC values based on shape tables

ASX 10 provides automated model updating for experimental modal analysis, enabling the iterative alignment of simulation results and measurement data. This includes the automated calculation of the Modal Assurance Criterion (MAC) to achieve the best possible agreement between measured and analytical data.

Required information, such as a shape table or a Measurement Point Library, can be imported without the need for a user interface. ASX 10 automatically calculates MAC values based on the imported data and makes these values available together with their associated frequencies. In addition, the results can be filtered using user-definable thresholds or subjected to further processing as required.

ArtemiS SUITE does not need to be installed during model updating.

Note: For intuitive model analysis through visual comparisons of measured and simulated data using color-coded 2D and 3D visualizations as well as interactive animations, we recommend the Shape Comparison Project (APR 410 is required) of ArtemiS SUITE.

LICENSES

ASX 01

Required license when processing HDF and HSVX files; ArtemiS SUITE does not need to be installed:

Code	Product Name
5091	ASX 01

ASX 02

Required licenses when interactively controlling projects and processes; ArtemiS SUITE must be installed in order to use the full range of functions of ASX 02:

Code	Product Name
5092	ASX 02
50000	APR 000 APR Framework
Licensing is required for all ArtemiS SUITE projects and processes, including all analyses, filters, and functions used in Pool Projects or Automation Projects.	

ASX 03

Required license to program customized step types for SQala; ArtemiS SUITE does not need to be installed:

Code	Product Name
5093	ASX 03

Licenses required when executing customized step types in Local Mode of SQala; ArtemiS SUITE must be installed:

Code	Product Name
5093	ASX 03
50000	APR 000 APR Framework
50500	APR 500 Jury Testing – SQala Basic

ASX 04

Required licenses when interactively controlling the Recorder; ArtemiS SUITE must be installed in order to use the full range of functions of ASX 04:

Code	Product Name
5094	ASX 04
50000	APR 000 APR Framework
50040	APR 040 Recorder
Optionally, the Recorder can also be controlled via the CAN Remote Control. For this purpose, the following items are required: › PCAN-USB or PCAN-USB FD adapter › PEAK-System device drivers and tools for Windows 10 and 8.1 (32 bit/64 bit) › Dongle with an ASX 04 license	

ASX 05

Required license to use User Documentation and documentation templates; ArtemiS SUITE does not need to be installed:

Code	Product Name
5095	ASX 05

ASX 06

Required licenses when executing Pool Projects, Automation Projects, Metric Projects, and Standardized Test Projects using customized analyses and filters; ArtemiS SUITE must be installed:

Code	Product Name
5096	ASX 06
50000	APR 000 APR Framework
5091	ASX 01
Licensing is required for the ArtemiS SUITE projects used and for all processes they contain, including analyses, filters, and functions.	

ASX 07

Required licenses to perform Automation Projects; ArtemiS SUITE does not need to be installed:

Code	Product Name
5097	ASX 07
Licensing is required for all processes used within Automation Projects, including analyses, filters, and functions.	

ASX 08

Required licenses to run the Recorder; ArtemiS SUITE does not need to be installed:

Code	Product Name
5098	ASX 08
5094	ASX 04

ASX 09

Required license to run a Report; ArtemiS SUITE does not need to be installed:

Code	Product Name
5099	ASX 09

ASX 10

Required license to run the Model Updating API; ArtemiS SUITE does not need to be installed:

Code	Product Name
5110	ASX 10

The ASX Programming Interfaces are Future-Proof

ASX is continuously developed and will continue to seamlessly connect ArtemiS SUITE with your software solutions to help optimize your processes.

In its current stage of development, ASX covers major workflow steps:

- › Acquisition: ASX 04, ASX 08
- › Documentation: ASX 05
- › Processing: ASX 01, ASX 02, ASX 06, ASX 07
- › Report generation: ASX 02, ASX 09
- › Jury testing: ASX 03

Combining Multiple ASX Interfaces Within a Single Workflow

EXAMPLE

To individually expand and automate an End-of-Line application, you can perform stand-alone measurements using ASX 08, insert User Documentation automatically using ASX 05, process the measurements with an Automation Project using ASX 07, and then process the results in a Report and export them as PDF or PPTX files using ASX 09.

Notes on Licensing and Redistribution of ASX Software Solutions

Dongles with the respective licenses for the ASX 01–ASX 10 programming interfaces used are required for

- › Developing software solutions using ASX 01–ASX 10
- › Running software solutions developed on the basis of ASX 01–ASX 10
- › Running (individual) codes used by ASX libraries

Licensing is also required for all ArtemiS SUITE projects and processes, including analyses, filters, and functions, accessed via ASX 01–ASX 10 when executing the ASX software solutions.

PROGRAMMING PLATFORMS

- › MATLAB® (*.m, *.p)
- › All executable files (*.exe, *.com) written in a programming language that enables the import and use of the NET Assembly API HDF file (ASX 01):
 - » C#, F#, Visual Basic .NET
 - » C++/CLI, Python for .NET
 - » PowerShell Script (*.ps1).Net

SYSTEM REQUIREMENTS

- › Windows 11 x64 (Pro, Enterprise, Education; version: 21H2 or later; languages: US, Western European) or:
- › .NET Framework 4.8 (to use the libraries)
- › HASP dongle driver (to use the libraries)
- › Microsoft Edge

Installing the software and drivers from HEAD acoustics requires administrator rights. Operating the software requires standard user rights.

Python is a registered trademark of Python Software Foundation; MATLAB and MATLAB Compiler are registered trademarks of The MathWorks, Inc.; Microsoft Windows, Microsoft Visual Studio, Microsoft Edge, Microsoft .NET Framework, and C# are registered trademarks of Microsoft Corporation.



Contact Information

Ebertstrasse 30a
52134 Herzogenrath, Germany
Phone: +49 2407 577-0
E-Mail: sales@head-acoustics.com
Website: www.head-acoustics.com