

## Features

### Modular software

- Basic Framework (Code 5600)  
Tools for aurally accurate playback, previewing, editing, etc.
- Time Data Analysis Project HSP 01 (Code 5601)  
Preparation, analysis and processing of acoustic measurement data from soundscape measurements

### Basic Framework

- Player  
Binaural, aurally accurate playback (using frontends and headphones from HEAD acoustics)
- Map Viewer  
Graphical display of a soundwalk and exact measurement positions in a map
  - GPS data and internet connection (OpenStreetMap) must be available
- Video Viewer  
Video playback (videos recorded with SQobold, for example)
- Documentation  
Display and editing of documentation as well as creation of Documentation Templates
- Channel-Editor  
Editing channel properties
- Data Lister  
Detailed examination of selected files

- HEAD Navigator  
Tree structure for selecting files (comparable with Windows Explorer)
- File Viewer  
Quick view for displaying diagrams, images, etc.
- Export  
(e.g. for documentation)  
WAV, AFX, MP3, PDF, PPT, image

### Time Data Analysis Project

- Analysis and comparison of acoustic measurement data from soundscape measurements
- Available analyses
  - FFT vs. Time
  - Level vs. Time
  - Loudness vs. Time
  - Sharpness vs. Time
  - Specific Tonality (Hearing Model)
  - Specific Tonality (Hearing Model) vs. Time
  - Tonality (Hearing Model) vs. Time
  - Tonality (Hearing Model) Frequency vs. Time
- Representation of the time signal
- Excel export of single values (according to ISO 12913-2) and analysis results, each on an individual sheet of one XLSX file

## DATA SHEET

### HEADscape (Code 5600)

Software for analyzing and classifying soundscape measurements according to ISO 12913-2

### Overview

Using HEADscape, even inexperienced users are able to analyze and process soundscape analyses according to ISO 12913-2. This includes the preparation of recorded data for the calculation of relevant parameters (calculation of acoustic and psychoacoustic indicators, etc.), the documentation of the measurement data and the export of the calculated results.

The Basic Framework provides essential tools that allow users, for example, to visualize, to edit and to play back their measurements, as well as to analyze video and GPS data.

The actual analysis tasks are performed by the Time Data Analysis Project (module HSP 01). The project is clearly structured, so that all analyses and processing steps can be performed intuitively. The project provides the individual values required by ISO 12913-2 at the push of a button.

HEAD acoustics is one of the pioneers concerning soundscape developments and offers perfectly matched hardware and software solutions.

- Sound Pressure Level
  - A and C weighted
  - Percentiles
- Loudness
  - Average
  - Cubic Mean
  - Percentiles and quotients
- Additional single values (optional)
  - Fluctuation Strength  
Average and percentiles
  - Roughness (Hearing Model)  
Average and percentiles
  - Sharpness  
Average and percentiles

## Overview:

### Basic Framework (Code 5600)

#### Player

The player allows measurements to be played back aurally accurate. A condition for this is correct equalization, which is guaranteed with frontends and headphones from HEAD acoustics.

Aurally accurate playback is not only important for the evaluation of soundwalks; aurally accurate playback is also of primary importance for soundscape applications in the laboratory.

#### Map Viewer

The Map Viewer displays and localizes selected recording positions of a soundwalk in an OpenStreetMap map. If GPS data are available in a measurement (e.g. using SQobold or SQadriga III), the Map Viewer automatically evaluates the coordinates and time information and displays them graphically in the map.

#### Video Viewer

The Video Viewer displays videos, recorded with SQobold or SQadriga III, in a separate window.

#### Documentation

The Documentation Viewer summarizes all documentation (user and system documentation) linked to a measurement.

The User Documentation can be edited and new Documentation Templates can be created.

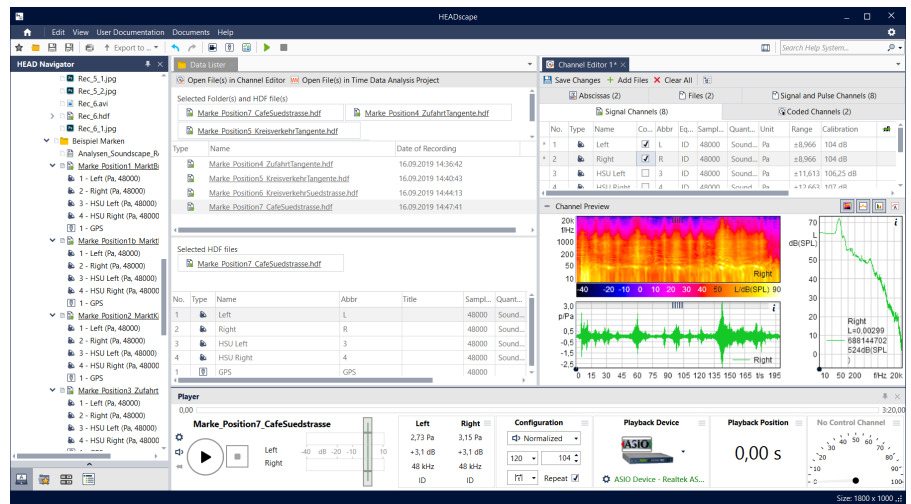
#### Channel-Editor

The Channel Editor can be used to edit channel properties, e.g. the physical quantities, which are displayed in tabular form.

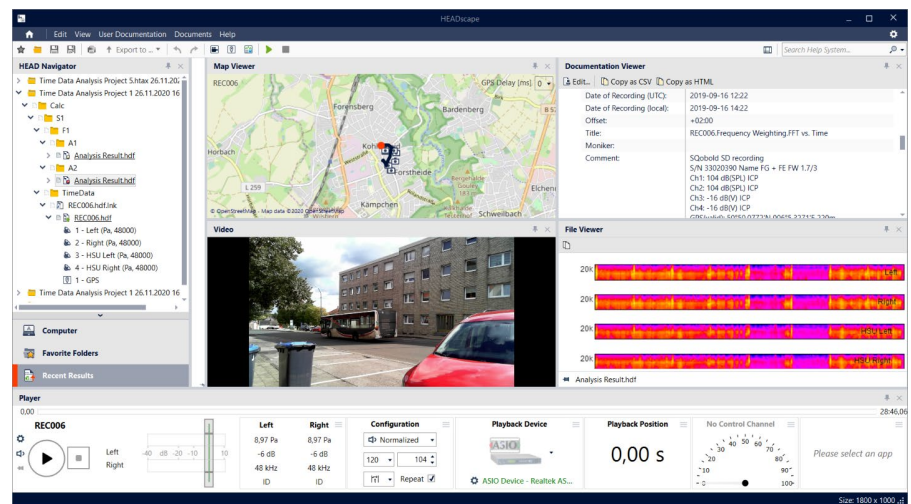
In order to compare several files with each other with ease, any number of channels can be displayed in an overview.

#### Data Lister

The Data Lister displays HDF files including the complete path of the folder or HDF file selected in the HEAD Navigator.



Channel Editor and Data Lister provide a quick overview of the measurement selections made in HEAD Navigator. Furthermore, they are used to review and prepare measurement data and analysis results.



All tools can be freely configured via drag-and-drop. With the help of practical docking icons, individual work spaces can be created and stored with just a few mouse clicks.

#### File Viewer

File Viewer is used for quick and easy visualization of data in various formats (HDF, DAT, BMP, EMF, GIF, JPG, PNG, WMF, HTM, HTML, XML, PDF).

#### Export options

WAV, ATFX.

Single diagrams or whole pages including diagrams can be exported as PowerPoint, PDF, or image.

## Overview:

# Time Data Analysis Project HSP 01 (Code 5601)

## Operating concept

The Time Data Analysis Project is designed to allow even inexperienced users to perform analyses of acoustic measurements quickly and safely in accordance with ISO 12913-2.

## Analyses: FFT / Loudness / Level

In order to fulfill all tasks required in the standard regarding the description of an acoustic environment (calculation of acoustic and psychoacoustic indicators), all necessary analyses are available.

The project is optimized for two analysis results. By clicking on the toolbar, users are able to view a list of all available analyses and thus switching the selection, if needed. For each measurement, the mark limits can be adjusted individually to provide a quick and precise overview of signal sections, of particular interest, and for optimizing the measurements for export.

The direct comparison of two measurements in one diagram or the simultaneous display of several measurements is also available.

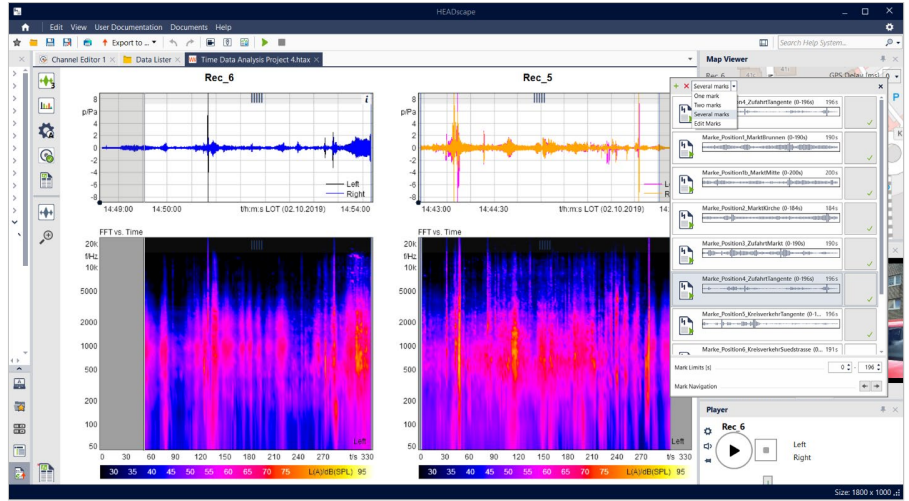
## Time signal representation

The time signal diagram is activated by default and can be used to evaluate measurements at a first glance as well as to adjust the marker in a targeted manner. The diagram can also be used as a reduced preview.

## Export: Single values required for ISO 12913-2 and more

The export function writes all sound pressure and loudness single values required by ISO 12913-2 into an Excel file.

In addition to the single values required by the standard, further psychoacoustic single values can be exported for each measurement.



Even when comparing two measurements, the user interface of the Time Data Analysis Project is clearly structured and allows intuitive operation. The tools can be configured freely, so that, for example, playback via the player or displaying maps and videos is possible at any time.



The Time Data Analysis Project provides the possibility to display two or only one analysis. If further files are added and activated markers are set in the listing, the analysis results of several recordings can also be displayed simultaneously.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1																						
2																						
3	Level (L)	72.94	(dB(SPL))	73.04	(dB(SPL))																	
4	Fluctuation (F10)	0.00805	(vec)	0.00782	(vec)																	
5	Fluctuation (F50)	0.00527	(vec)	0.00554	(vec)																	
6	Loudness (N)	0.00875	(vec)	0.00884	(vec)																	
7	Loudness (N)	92.3	(soneGF)	93.2	(soneGF)																	
8	Loudness (N)	16.8	(soneGF)	17.8	(soneGF)																	
9	Loudness (N95)	15.4	(soneGF)	16.8	(soneGF)																	
10	Loudness (N)	1.45	(soneGF)	1.38	(soneGF)																	
11	Loudness (N5)	19.3	(soneGF)	19.6	(soneGF)																	
12	Roughness (R10)								0.189	(sone)												
13	Roughness (R50)								0.139	(sone)												
14	Roughness (R10)								0.189	(sone)												
15	Sharpness (S)	1.32	(sone)	1.58	(sone)																	
16	Sharpness (S95)	1.25	(sone)	1.32	(sone)																	
17	Sharpness (S)	1.37	(sone)	1.42	(sone)																	
18	Sound Pre (LA)	62.88	(dB(SPL))	62.83	(dB(SPL))																	
19	Sound Pre (L)	70.89	(dB(SPL))	71.01	(dB(SPL))																	
20	Sound Pre (LSA)	59.84	(dB(SPL))	61.48	(dB(SPL))																	
21	Sound Pre (LSA)	60.78	(dB(SPL))	65.18	(dB(SPL))																	

# HEADscape Modules

## Basic Framework (Code 5600)

- Player
- Video Viewer
- Map Viewer
- Channel Editor
- Documentation
- Data Lister
- HEAD Navigator
- File Viewer
- Export (PPT, PDF, image as well as WAV, MP3, and ATRX via context menu of the HEAD Navigator)

## Time Data Analysis Project - HSP 01 (Code 5601)

- Analyses
    - FFT vs. Time
      - Spectrum size: 1024/8192 for frequency resolution = low / high
      - Window function: Hanning
      - Spectral weighting: none / A / C as set in the Settings
      - Overlap: 50 %
      - Smoothing: none
      - Amplitude scaling: RMS
    - Level vs. Time
      - Spectral weighting: none / A / C as set in the Settings
      - Time weighting: fast
      - Downsampling: activated
    - Loudness vs. Time
      - Loudness method: ISO 532-1
      - Soundfield: diffuse
      - Scale: sone
      - Skip analysis start: deactivated
    - Sharpness vs. Time (Sharpness: DIN 45692 / Loudness: DIN 45631/A1)
      - Sharpness method: DIN 45692
      - Loudness method: DIN 45631/A1
      - Soundfield: diffuse
    - Tonality analyses according to ECMA-418-2 (1st) / ECMA-74 (17th) / ECMA-74 (15th)
      - Specific Tonality (Hearing Model)
      - Specific Tonality (Hearing Model) vs. Time
      - Tonality (Hearing Model) vs. Time
      - Tonality (Hearing Model) Frequency vs. Time
    - Single values according to ISO 12913-2:
      - Sound Pressure Level, A-weighted ( $L_{Aeq, T}$ )
      - Sound Pressure Level, C-weighted ( $L_{Ceq, T}$ )
      - Sound Pressure Level, percentiles ( $L_{AF5, T}$ ,  $L_{AF95, T}$ )
      - Loudness average ( $N_{avg}$ )
      - Loudness cubic mean ( $N_{rmc}$ )
      - Loudness, percentiles and quotient ( $N_5$ ,  $N_{95}$ ,  $N_5/N_{95}$ )
- Optional single values:
- Fluctuation Strength, average / percentiles ( $F$ ,  $F_{10}$ ,  $F_{50}$ )
  - Roughness (Hearing Model), average / percentiles ( $R$ ,  $R_{10}$ ,  $R_{50}$ )
  - Sharpness, average / percentiles ( $S$ ,  $S_{10}$ ,  $S_{50}$ )

## Scope of supply

- HEADscape Basic Framework (Code 5600)

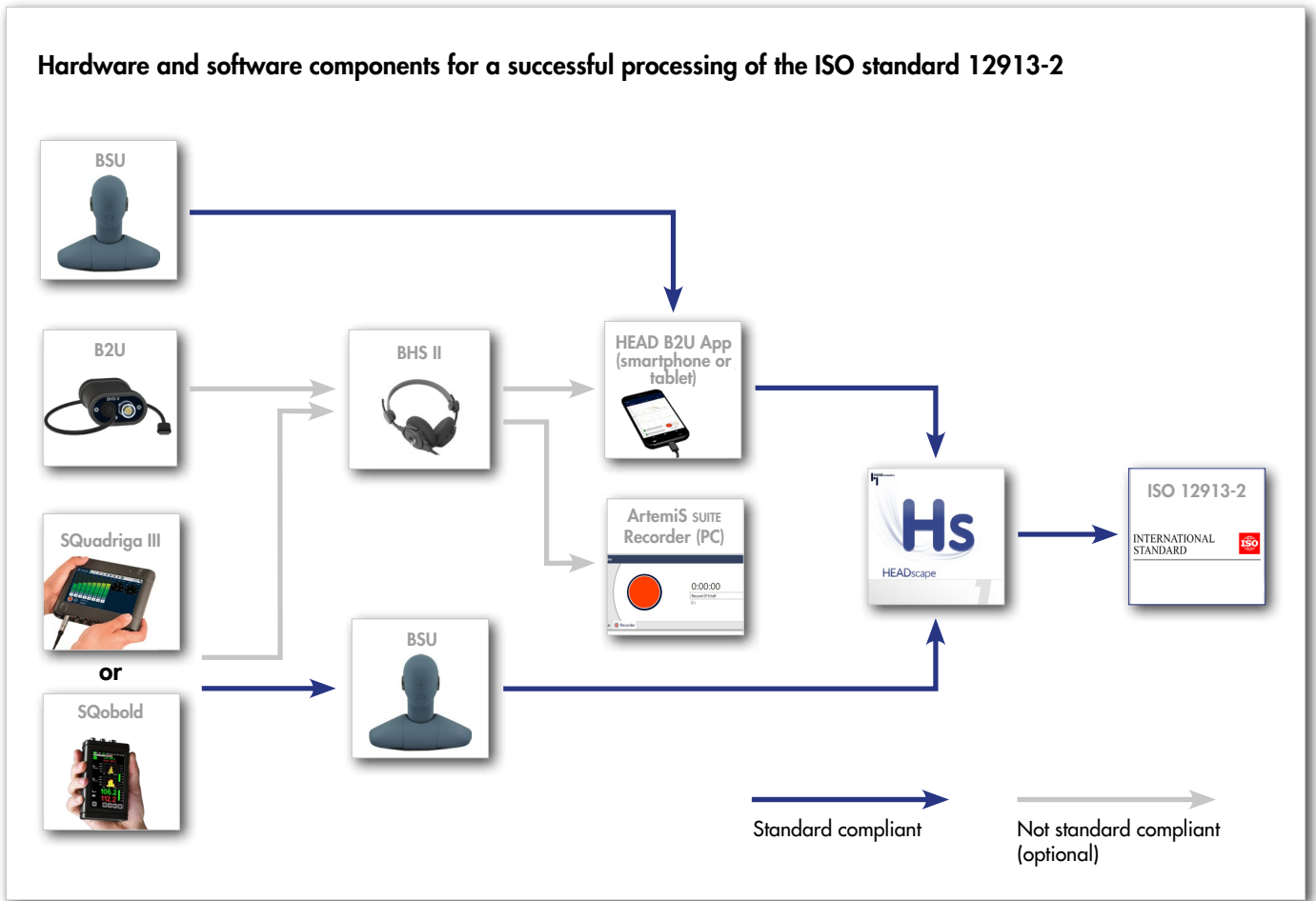
### Optional

(not included)

- Time Data Analysis Project HSP 01 (Code 5601)

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## Hardware and software components for a successful processing of the ISO standard 12913-2



### ISO 12913-2 standard compliant



**BSU**  
Flexible sound-scene measuring device, via HEAD B2U App (smartphone), SQobold, or SQadriga III

### Frontends from HEAD acoustics

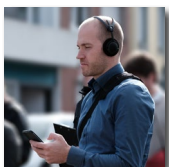


**SQobold**  
Compact, mobile stand-alone frontend for BSU and the BHS II headset, ...



**SQadriga III**  
Mobile stand-alone frontend for BSU and the BHS II headset, ...

### Optional hardware from HEAD acoustics

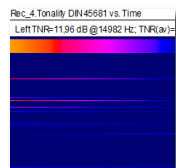


**B2U**  
Mini and mobile measuring device for aurally accurate recordings with the BHS II headset, ...

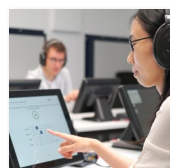
### Further solutions from HEAD acoustics for soundscape measurements and analysis



Binaural recording and playback systems  
Headphones, HEADlab systems, artificial heads, head-shoulder units (HSU), ...



Recording and analysis software ArtemiS SUITE  
Psychoacoustic analyses, a total of more than 130 analyses, ...



**SQala** jury testing software  
Perception data acquisition and evaluation, ...