

The screenshot displays the ArtemiS SUITE software interface. The main window is titled "Strike for Automatic Parameter Determination" and shows a "Configuration Stroke Monitoring" plot with a peak at 1.200s. Below it is a "Response Time Signals" plot. A "Level Monitoring" table is visible at the bottom left:

Ch. 3@SQuariga II	+26x	+26y	+26z

Overlaid on this is the "Select Measurement Method" dialog box, which offers three options:

- Structure-borne Measurement:** Perform transfer function measurements with an impact hammer or vibration shaker for structure-borne transfer paths. The recorded transfer functions can be used in the IFD Model. Sampling Rate [Hz]: 12000.
- Point Source Measurement:** Perform transfer function measurements with a volume velocity source or volume acceleration source for airborne transfer paths. The recorded transfer functions can be used in the IQD Model. Sampling Rate [Hz]: 48000.
- Speaker Measurement:** Perform transfer function measurements with a loudspeaker for airborne transfer paths. The recorded transfer functions can be used in the P2P Model. Sampling Rate [Hz]: 48000.

In the background, the "Manage Recordings" window shows a list of recordings with columns for DOF, Measured Excitations, Excitation Type, Description, and File Name.

ArtemiS SUITE
Project

Code 50610

APR 610 TPA – Data Acquisition

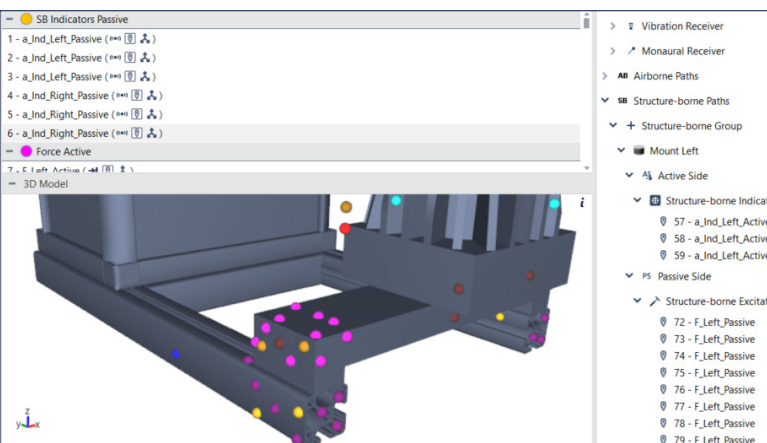
TPA – Data Acquisition is part of the TPA package of ArtemiS SUITE, enabling both structure-borne and airborne sound measurements. For this purpose, the ArtemiS SUITE modules Impact Measurement (APR 430 is required) and Recorder (APR 040 is required) are available.

OVERVIEW

APR 610 TPA – Data Acquisition Code 50610

TPA – Data Acquisition enables the measurement of transfer functions for TPA Projects. Visual and acoustic feedback mechanisms ensure fast and reliable assessment of measurement quality, enabling accurate results to be obtained within minimal measurement time.

For additional support, the Measurement Point Library enables intuitive and well-structured configuration of the measurement setup. The subsequent data acquisition can be performed using either Impact Measurement (Roving Hammer) or the Recorder. HEAD acoustics provides the corresponding hardware as an all-in-one solution from a single source.



KEY FEATURES

Measuring transfer paths for TPA Projects (APR 600 is required)

Using the Measurement Point Library (included in APR Framework) together with an optional 3D model enables optimal visualization and guidance for identifying measurement points, connecting sensors, and performing other tasks.

Automated verification of the measurement setup for potential errors

Seamless integration of Impact Measurement and the Recorder for simplified hardware configuration

Fast, assistant-guided workflow for performing the measurements

Measurement procedures

- › Structure-borne sound measurements using Impact Measurement (Roving Hammer) or the Recorder
- › Volume velocity and speaker measurements using the Recorder

Advantages of the Impact Measurement

- › Automatic configuration of the required measurement parameters using only a few test strokes
- › Acoustic and visual feedback for monitoring each hammer stroke, enabling immediate identification of invalid strokes

APPLICATIONS

- › Easy and user-friendly measurement of transfer functions for TPA Projects

DETAILS

Configuring the Measurement Setup Using the TPA Project

(APR 600 is required)

The TPA Project provides the overarching workflow for performing full transfer path analyses. The Measurement Point Library, a 3D model (created manually or imported), and the model tree are available for configuring the measurement setup. These tools enable intuitive and structured configuration for both structure-borne sound and airborne sound measurements.

Visual support ensures fast configuration of the measurement equipment. Impact hammers, shakers, receivers, force application points, sensors, microphones, artificial heads, and sound sources can be defined with ease and positioned in a clear and organized manner.

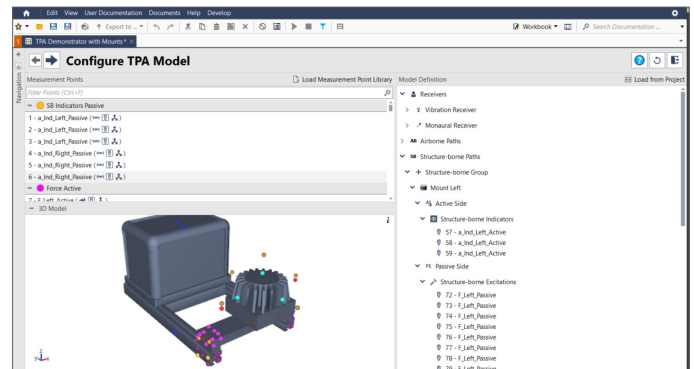
With all representations being interconnected, even extensive measurement setups remain clearly structured. A single click on a measurement point in the 3D model automatically displays the corresponding positions in the model tree. Any adjustments made at one location are automatically adopted.

Planning Data Acquisition

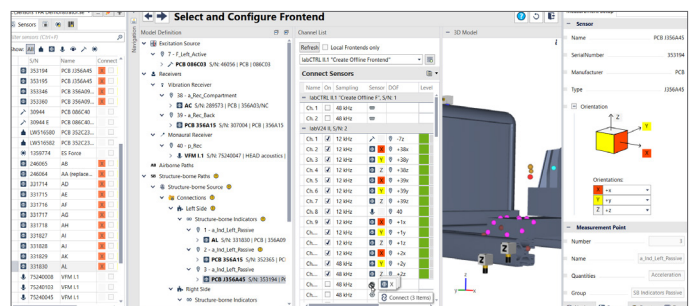
Once the measurement setup has been configured, the TPA Project workflow proceeds to TPA – Data Acquisition in order to plan the data acquisition process.

During the structured planning of data acquisition, different excitation sources can be defined for each excitation point of the TPA model. Supported excitation methods include hammer tips made of plastic, rubber, or steel, shakers from Qsources, loudspeakers (e.g., HXL), or other (user-defined) excitation devices.

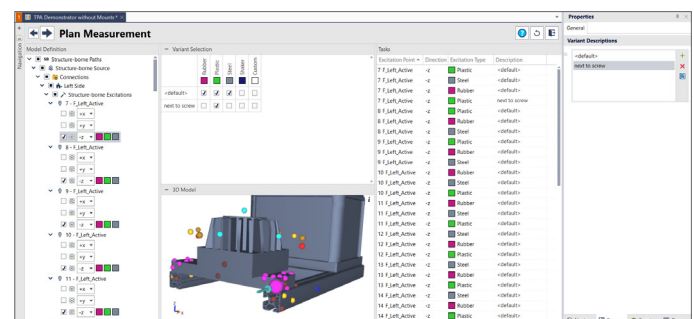
A single excitation source may likewise be applied repeatedly to the same point. Clear distinction is achieved through a freely selectable description, for example, "Plastic – next to screw".



Model configuration



Frontend configuration



Planning data acquisition

Selecting the Measurement Variants

TPA – Data Acquisition offers two measurement options:

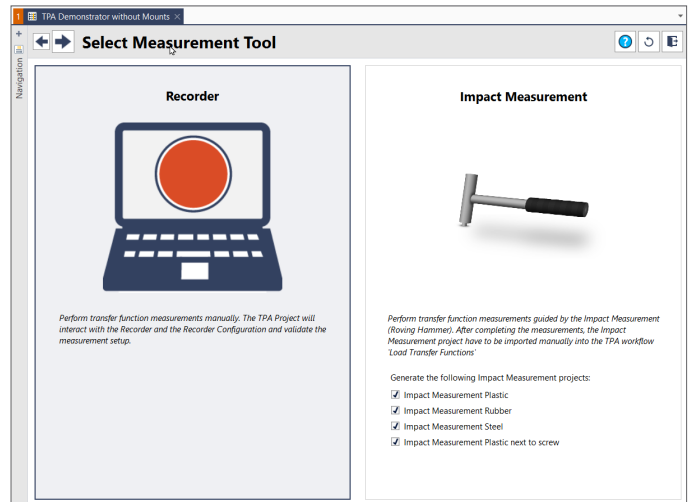
- > Recommended: Impact Measurement (Roving Hammer) (ARP 430 is required)
 - > APR 430 is the optimal solution for structure-borne sound measurements using an impact hammer. The workflow provides both a step-by-step guidance through the measurement and immediate acoustic and visual feedback on the quality of the hammer strokes, ensuring that invalid strokes are detected at once. A few trial strokes are sufficient to define the measurement parameters, upon which the sampling rate, window length, pretrigger time, and trigger thresholds are automatically adjusted.
- > Recorder (APR 040 is required)
 - > The Recorder enables structure-borne sound measurements using an impact hammer or shaker, but it does not provide automatic quality checking of the impact measurements.
 - > Volume velocity measurements or volume acceleration source measurements can only be performed using the Recorder.

Structure-Borne Sound Measurements

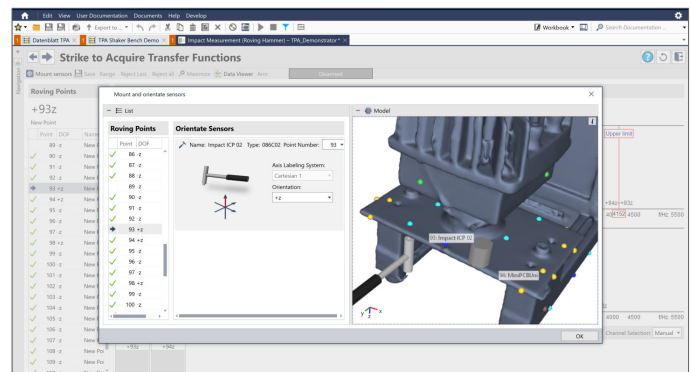
Impact Measurement (Roving Hammer)

The combined workflow of TPA – Data Acquisition and Impact Measurement enables seamless end-to-end acquisition and analysis of the measurement data. The impact measurement is based on the configuration for the employed frontend and the 3D model as defined in the TPA Project, along with the Measurement Point Library.

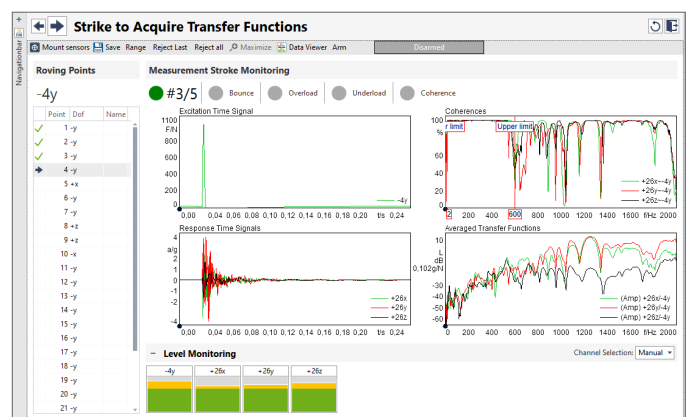
A range of measurement variants—such as different hammer tips or validation configurations—can be flexibly defined for the measurements. The required measurement parameters are determined on the basis of only a few trial strokes. In addition to the sampling rate and block size parameters already defined in the TPA Project, the pretrigger time of the hammer, the trigger thresholds, and the appropriate measurement ranges are automatically determined based on these trial strokes. Following each stroke, visual and acoustic feedback on the impact quality is provided. Double strokes, overloads, or insufficiently modulated strokes are reliably identified by integrated automatic functions, enabling adaptive adjustment of the measurement ranges.



Selection of the measurement procedures



Impact Measurement (Roving Hammer)



Status displays for validating the impact measurements

Recorder

All measurements can also be performed using the Recorder. The Recorder uses the configuration for the employed frontend and the 3D model as defined in the TPA Project, along with the Measurement Point Library. Any missing or improperly installed sensors are indicated immediately. In addition, the 3D model supports visual verification of the complete measurement setup, enabling adjustments to be made at any time.

Multiple hammer tips are available for impact measurements. The selected hammer is displayed with its corresponding position and orientation in both the 3D model and the model tree, ensuring a reliable and efficient measurement process. Successfully acquired measurements are automatically visualized within the tree structure. For validation purposes, both the transfer function diagrams and the coherence function can be displayed. Completed measurements are displayed in the model tree in a clear format, supplemented by a designation and, optionally, a comment.

Airborne Sound Measurement Using the Recorder

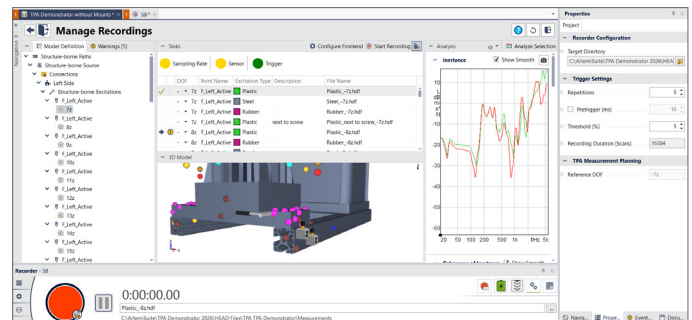
For the determination of airborne-sound-induced sound contributions, various acoustic measured quantities are acquired during operation. These include the near-field airborne-sound radiation measured with microphones, the acoustic impedance determined using a calibrated volume-velocity source, and the acoustic receiver transfer function at the ear, which is measured using an artificial head (Binaural Transfer Path Analysis, BTPA). Based on these measurement data, the airborne-sound-induced components along the respective transfer paths are identified and evaluated as part of the modeling and synthesis process.

Seamless Integration in the TPA Project

The fully acquired measurement data are automatically integrated into the TPA workflow and are immediately available for model calculation and subsequent synthesis without any additional conversion steps.

Hardware Support

HEAD acoustics provides hardware solutions for measurement setups of varying complexity that ensure efficient data acquisition. These solutions are designed to accommodate all measurement configurations and support the seamless execution of all measurement processes.



Measurements using the Recorder

LICENSES AND OPTIONS

Required

Code	Product Name	Description
50000	APR 000 APR Framework	Basis of ArtemiS SUITE
50600	APR 600 TPA Project	Performing transfer path analyses
50610	APR 610 TPA - Data Acquisition	Measuring the transfer functions required for TPA Project

50430	APR 430 Impact Measurement	Performing impact measurements (Roving Hammer / Roving Accelerometer)
or		
50040	APR 040 Recorder	Universal Recorder of ArtemiS SUITE for all types of measurements

Optional

(recommended hardware)

For structure-borne sound measurements, we recommend using an impact hammer or shaker (Qsources) along with the required number of accelerometers.
For airborne sound measurements, we recommend using a volume velocity source or a loudspeaker (HXL) along with the required number of microphones and at least one receiver (artificial head measurement system HMS V / HSU III.2).

Code	Product Name	Description
1391	HSU III.2	Artificial head microphone, analog version with ICP microphones
2967	HXL	HEAD loudspeaker for airborne sound excitation
0280	Qsources Qlws	Miniature shaker, self-supporting and self-aligning 250 Hz to 13,000 Hz
0285	Qsources Qsls	Large shaker, self-supporting and self-aligning 22 Hz to 1,000 Hz
0288	Qsources Qwis	Shaker, self-supporting and self-aligning, 25 Hz to 2,400 Hz

Optional

(Measurement equipment from HEAD acoustics)

Code	Name	Description	Availability
3704	labCTRL II.1	HEADlab-Controller A maximum of ten HEADlab modules can be connected	Available
3701	labCTRL I.1	HEADlab-Controller A maximum of ten HEADlab modules can be connected	Discontinued
3702	labCTRL I.2	HEADlab-Controller A maximum of ten HEADlab modules can be connected	Discontinued
31020	labCOMPACT12 II	12-channel HEADlab compact system A HEADlab module can be connected	Available
31021	labCOMPACT24 II	24-channel HEADlab compact system A HEADlab module can be connected	Available
3708	labCOMPACT12	12-channel HEADlab compact system A HEADlab module can be connected	Discontinued
3708-V1	labCOMPACT12-V1	12-channel HEADlab compact system A HEADlab module can be connected	Discontinued
3709	labCOMPACT24	24-channel HEADlab compact system A HEADlab module can be connected	Discontinued
3709-V1	labCOMPACT24-V1	24-channel HEADlab compact system A HEADlab module can be connected	Discontinued
3710	labHSU	2-channel frontend A HEADlab module can be connected	Available
3324	SQuadriga III	Mobile recording and playback system A HEADlab module can be connected	Available
3320	SQuadriga II	Mobile recording and playback system A HEADlab module can be connected	Discontinued
1502	HMS V	Digital artificial head measurement system	Available

(HEADlab modules, for example)

Code	Name	Description
3756	labV8x3-Iso II	24-channel HEADlab input module with HEADlink 2.0 transmission protocol for connecting triaxial accelerometers
3759	labV12-O4 II	Combined HEADlab input and output module with 12 IEPE/ICP inputs and 4 analog outputs for shaker excitations

ICP is a registered trademark of PCB Piezotronics Inc.



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