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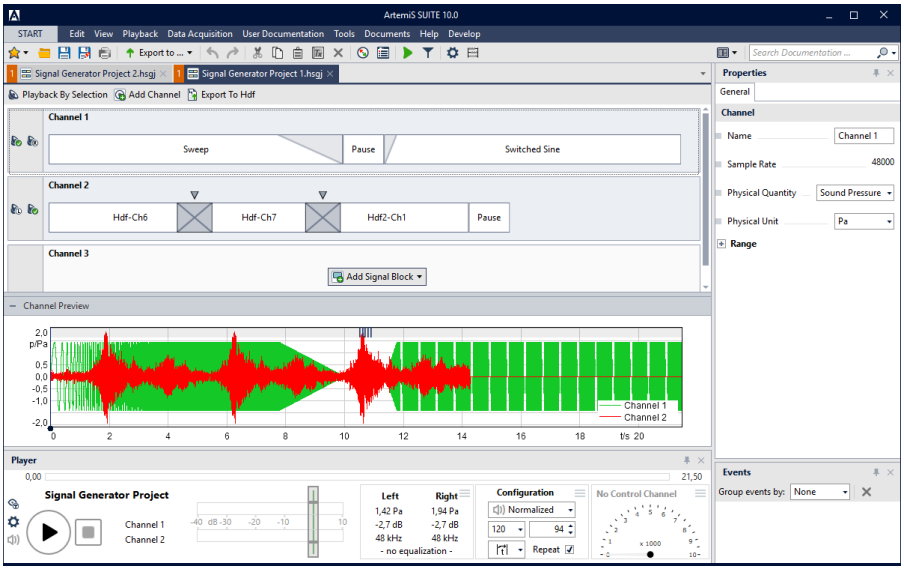
DATA SHEET

Signal Generator Module (Code 5021)

Extension module for creating and editing artificial and other signals



Overview

The Signal Generator is used to create simple or complex signals with configurable frequency and reference quantity on the computer.

For the generation of synthetic signals, a range of predefined, parametrizable functions as well as editable mathematical formulas is provided.

The user-friendly interface makes it easy to generate excitation signals, e.g. for the determination of transfer functions, stimuli for fundamental psychoacoustic research, or other “advanced” acoustic test signals.

Beyond that, signals and signal sequences can be concatenated into new files with any order and length and can be processed further.

At any time, the current status is automatically displayed in a preview diagram and can be listened to via the Player.

Users can save their work as a Signal Generator Project and re-open it later to continue their work.

Features

- Signal Generator Project for creating and editing artificial and other signals generated
  - periodic or non-periodic basic wave forms, e.g. sweeps
  - mathematical functions
  - existing recordings

Application areas

- Creation and editing of measurement and test signals, e.g. for
  - determination of transfer functions with shakers or speakers
  - sound design
  - troubleshooting
  - fundamental psychoacoustic research
  - closer examination of measured acoustic phenomena
  - jury tests

Signal Generator Project

- Unlimited number and size of generated channels
- Flexibly configurable physical quantities and measurement units
- Inclusion of reference quantities
- Sampling rates jointly configurable for all channels
- Configurable amplitudes and signal levels

Signal generation

- Predefined, parametrizable functions
  - Sine / sweep / switched sine / stepped sweep / rectangle / triangle / pseudo noise / random noise / AM/FM / Fourier / RPM sweep
- Mathematical formulas
  - Configuration with mathematical functions and configurable variables
  - Definition of custom variables, e.g. from rpm data in a file or an existing channel in the Signal Generator Project
  - Automatic error display

Editing functions

- Custom concatenation of artificial and recorded signals or signal sections
- Easy, intuitive editing of the order of sections via drag and drop
- Free Hand Mode for manually editing of curves

Preview and playback

- Preview (diagram) of the time-domain signal and FFT spectrogram (in the Generator)

Playback

- Player for 2-channel playback

Storing

- Saving of signal collection and configuration as a Signal Generator Project
- Saving of results as a multi-channel HDF file

Signal Generator Project

The Signal Generator Project combines easy handling with comprehensive functionality. Within a Signal Generator Project, any number of channels can be created and each channel can be configured independently of the others.

Uncomplicated operation

All operations are performed in a single interface, allowing user, for example, to quickly create a sine tone with a specific frequency and amplitude or a run-up across a specific frequency range.

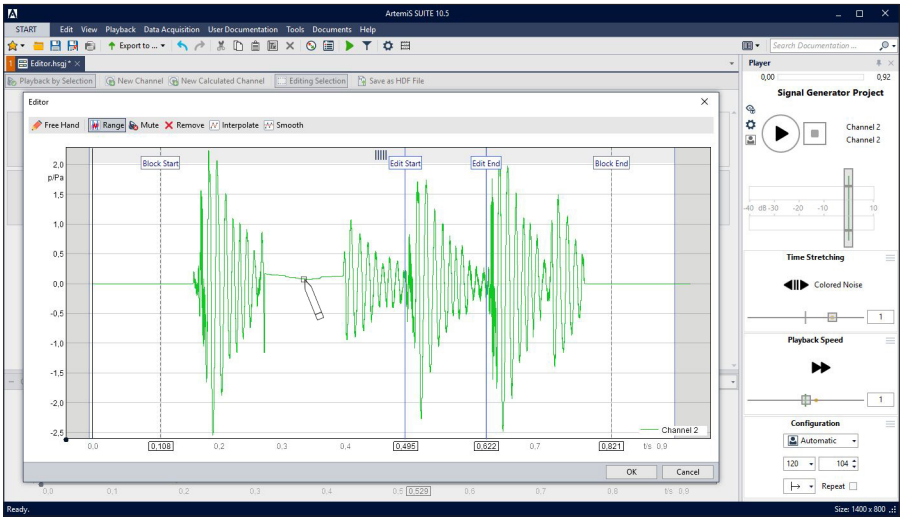
Intuitive editing

Simply and effectively, users can edit any signal range of one or more channels manually. There are various tools available, such as mute, interpolate, and smooth. Furthermore, the Free Hand Mode allows users to change the whole curve intuitively in the selected time range, just like in a graphics program.

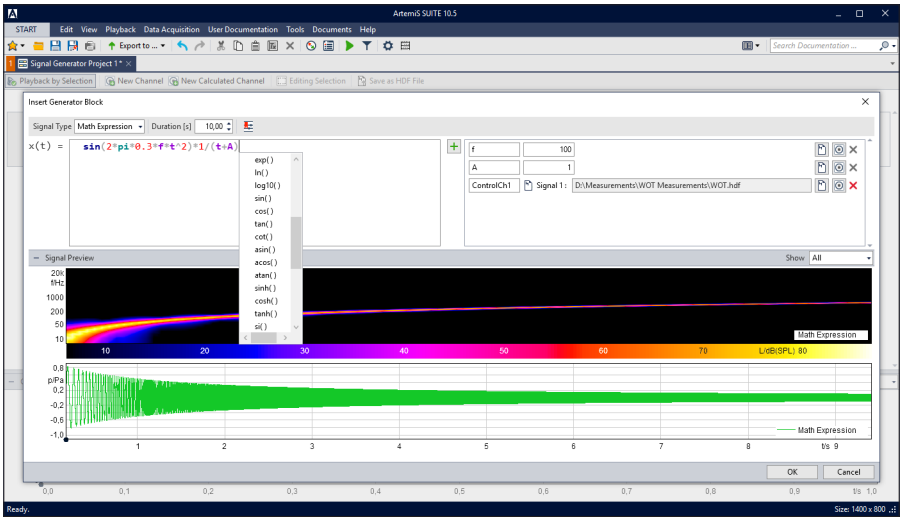
Concatenating and editing multiple signal sections is very easy, too. Users can combine any number of recordings and artificial signals into a new signal and rearrange the order of the components according to their needs via drag and drop.

In addition, the Calculated Channels function allows users to generate any number of channels with each other in order to create a new channel. With the help of mathematical expressions, users can define, how existing channels are to be calculated with each other.

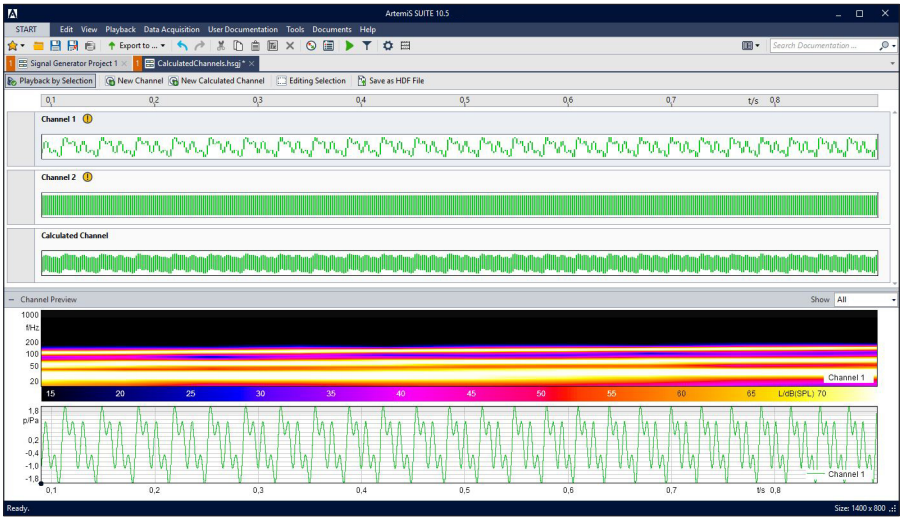
With the options in the settings window, individual channel properties, such as sampling rate, physical quantity, measurement range, etc. can be configured conveniently. Beyond that, it is possible to cross-fade between individual signal blocks, to insert pauses, etc.



In the Editor diagram, all channels can be post processed manually. Using the Free Hand Mode, users can redraw the whole curve graphically with a pen.



Example of a mathematical formula in a Signal Generator Project: The time-domain curve and an FFT vs. time analysis are displayed immediately.



With the Calculated Channels function, users can switch between several source channels to evaluate the effects in the channel preview immediately.

Generating Signals

Based on a periodic or non-periodic waveform, a sweep or a mathematical function, for example, a user can use it to generate a test signal such as a pure sine tone with a certain frequency and amplitude, or to generate a run-up over a certain frequency range in a certain time.

A special feature is the powerful formula function, which allows signals to be generated from mathematical formulas, e.g. in order to add an artificial engine order to an existing recording.

Snapshot function

The Snapshot function can be used for saving the current state of a calculated channel as new block in a new channel. The new block contains the time signal and can be edited manually.

Automatic preview

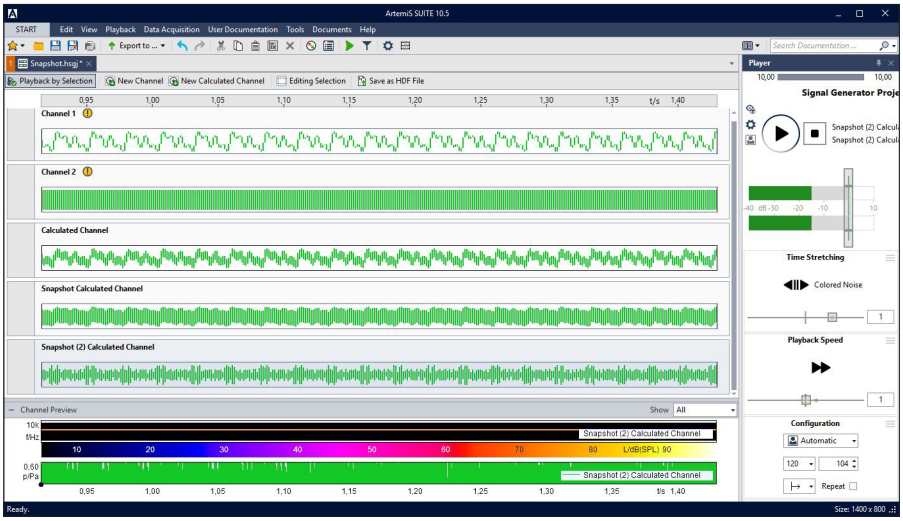
For visual control, a diagram and an FFT spectrogram are available, which provide various cursor modes, color selection for the channels, and shifting / zooming of the display area.

Playback

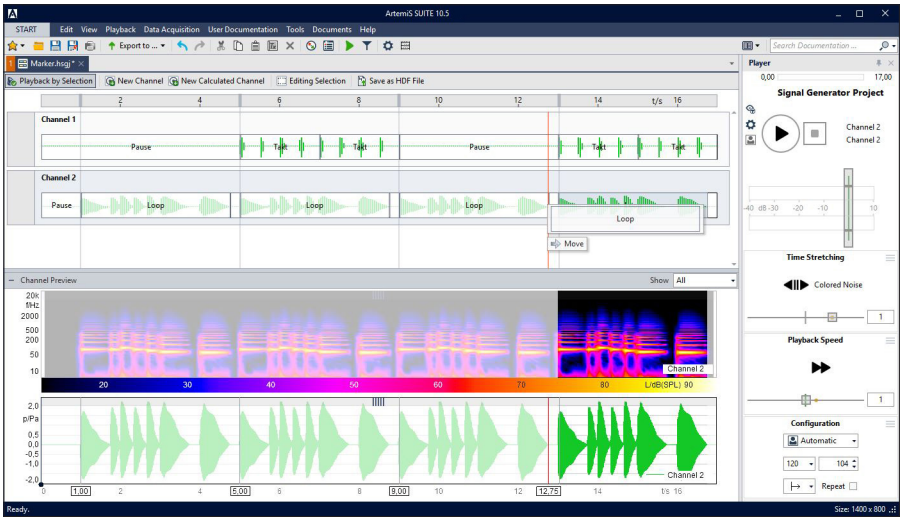
Acoustic control of the current signal chain and configuration is possible at any time using the Player.

Storing as a Signal Generator Project

Not only the result, but also the entire signal collection and configuration can be saved. This allows users to reload existing projects at any time and quickly adapt them to new conditions.



In order to save intermediate results, the snapshot function can be used to create an image of the respective channel as new block in a new channel.



Signal blocks and channels can be positioned exactly with the help of Markers.

Scope of supply

- License file:
  ArtemiS SUITE Signal Generator Module (Code 5021)

Requirement

- ArtemiS SUITE Basic Framework (Code 5000)

Recommended

For measurements of transfer functions with shakers or speakers:

- ArtemiS SUITE Data Acquisition Module - HEAD Recorder (Code 5004)
- *lab*O2 (Code 3731) or *lab*O2-V1 (Code 3731-V1) 2-channel playback equalizer with Line outputs and USB interface
- Front end from HEAD acoustics
- Shakers, speakers