What's new in ACQUA 6.0.100

Significant changes since 5.1.200

With ACQUA 6 the traditional two-channel telecommunication measurements were extended to multi-channel (see below). For this enhancement, the internal storage format of the SMDs had to change in an incompatible way. **Accordingly, SMDs are no longer compatible with older ACQUA versions once they are altered in ACQUA 6.0.100.**

New features

Multi-channel measurements with SMDs

In this new ACQUA version you can for the first time measure and analyze three or more channels at once using an SMD. This allows, for example, to calculate the transfer functions of multiple HATS at the same time or to measure the delay of many A²B channels in one take.

Besides being valuable for multi-channel setups, this technique can also simplify existing single or dual channel measurement workflows: Up to now, consecutive measurements often required different measurement channel setups and thus different hardware configurations. In future, more of these analyses can be covered by one multi-channel hardware configuration.

In order to enable the multi-channel measurements, the SMDs contain several new configuration options. The internal storage format of SMDs changed substantially. Hence, SMDs are no longer compatible with older ACQUA versions once they have been altered in ACQUA 6.0.100. Executing measurements or viewing results will not convert a SMD. A warning message appears in the title of the SMD, if an amended SMD is opened in an older version.

Please find detailed information on multi-channel SMDs in chapter Detailed changes in SMD editor.

*core*BT2

General

> With ACQUA and labCORE, two Bluetooth® wireless technologies are supported:
  - Bluetooth Classic: For Bluetooth Classic audio and HID profiles.
  - Bluetooth Low Energy (LE): For all supported Bluetooth Low Energy audio profiles.

New LC3plus codec for Bluetooth Classic profile A2DP

> Adds the LC3plus codec to the A2DP source profile and the A2DP sink profile.

> Requires *core*BT2-LC3plus-A2DP (Code 7784).

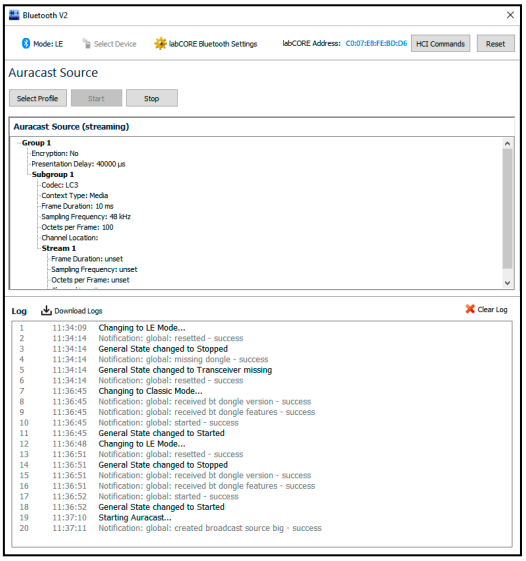
New HID (Human Interface Device) profile for Bluetooth Classic

> *core*BT2HID enables *lab*CORE to act as a human interface device and connect to the DUT. The profile provides e.g. automatic control of smartphone volume during measurements by scripts.

> If *lab*CORE only has a *core*BT2HID license but no licenses for Bluetooth audio profiles, no block is applicable in hardware configuration. Instead, the Bluetooth settings are quickly accessible via a button at the top menu bar of hardware configuration or via ACQUAlyzer > Settings.

> Requires *core*BT2HID (Code 7786) and the transceiver from *core*BT2 (Code 7782).

Beta version of Auracast™ Broadcast Audio profiles for Bluetooth Low Energy



Auracast Source and Auracast Sink

> The new Auracast profiles for *core*BT2LE enable *lab*CORE to act as a source or sink for Auracast™ Broadcast Audio. *lab*CORE can establish a broadcast, discover sources or receive audio data respectively.

> The encryption of Auracast streams is possible if test applications or test objects require it.

> Requires *core*BT2LE (Code 7787) and the corresponding transceiver connected to *lab*CORE. Requires *core*BT2LE-Auracast (Code 7788).

Known Issues

> Operation as Auracast source: Stopping a running Auracast source stream automatically resets the Bluetooth stack. This, unfortunately, requires to re-select the Auracast profile for starting a new stream.

> Operation as Auracast sink: When connecting to a different set of streams than before, certain settings may not be applied correctly. Therefore, select Reset in the upper right corner to reset the Bluetooth stack before connecting to a different Auracast source or a different set of streams within the same Auracast source.
Re-connecting to the same set of streams works as expected without reset. Therefore, the reset is not executed automatically.

> Operation as Auracast sink: Under rare circumstances, a packet loss rate of up to 0.5% may occur even under good radio reception.

Miscellaneous

> Support for coming pinnae HEL/HER 4.4 ViBRIDGE to simulate near-end bone-conducted speech.

> The ASIO driver can now be used to connect *lab*CORE to other ASIO hosts than ACQUA (32-bit only). Use RC-*lab*CORE for configuration of *lab*CORE in this application.

> The mouth equalizations can now be changed graphically (See Manage Equalizations > Edit).

> Loop mode: Set individual reference angles for each run of HRT I to automate measurements of test objects with multiple preferred directions. The applied angles from the HRT I column are used as offset to these run specific values.

> Conditional execution: Repetition of SMDs can now be conditioned by a variable comparison.

> New API to improve the determination of the Ear Cap Reference Point (ECRP) when using HHP IV for handsets providing non-traditional earpiece.

> Several improvements and bugfixes for HEAD acoustics Signal Editor.

*lab*CORE

> *core*BT2 features require that the connected *lab*CORE runs at least on firmware version 3.4.

> Firmware version 3.2.46 or higher must be installed on *lab*CORE to enable the update to firmware version 3.4.

Detailed changes in SMD editor

New structure of SMD parameters

> The second tier *Source* has been removed. Its parameters (*Source*, *Level Adj.*, *Filter* and *Delayed channels*) move to the top tier *Source*. Second tiers of these parameters are accessible from here via **...**.

> The tier *Sink* is new. It contains the parameters input filters (*Filter in*), the number of recording channels and the recording features if there is no source file.

> The removed parameter *Direction* is substituted by several parameters in different tiers.

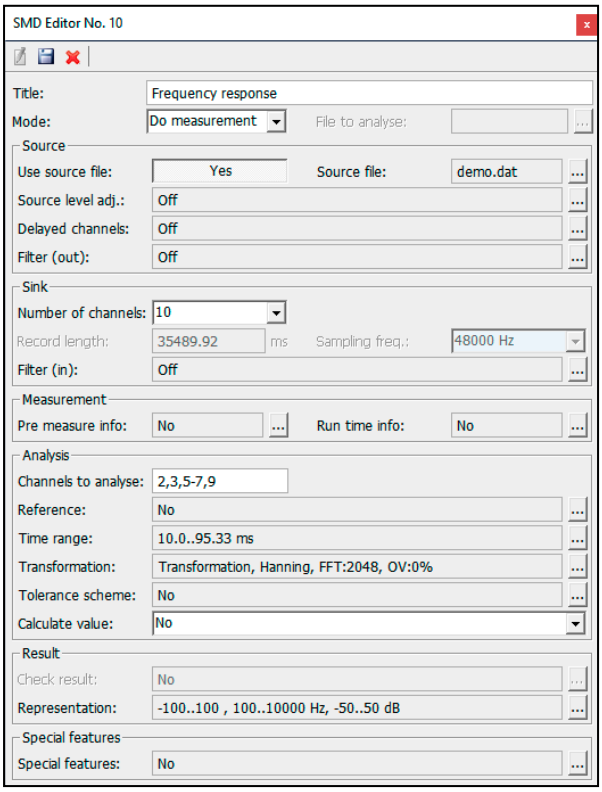
Channel selection in SMD (Channel list)

> The drop-down box with three entries (*Ch1, Ch2, Both*) has been substituted by a text field. Desired channels may be entered there as list and / or range,
e.g. *1,2,4-7,9*.

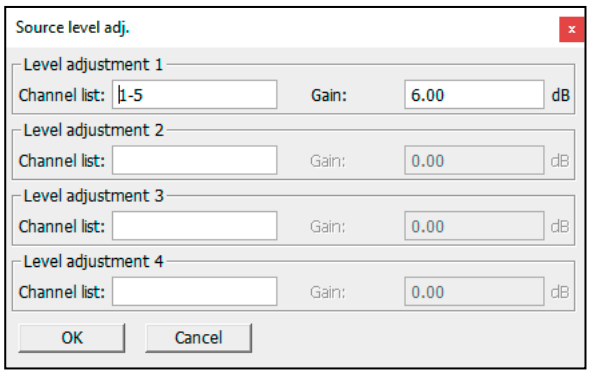
Substitution of parameter *Direction*

> The parameter *Direction* included all relevant information about channel routing of measurements, the channels for playback, the analysis, and the reference. This is no longer sufficient for more than two channels. Specific parameters of following tiers substitute the parameter *Direction*:

- *Source* > *Channels*
  List of channels for playback. Only relevant for SMDs that generate the source signal, e.g. Distortion (sinusoidal). If a source file is applied all channels are played back.
- *Sink* > *Number of channels*
  Number of channels for recording. The applicable range is 2 - 32. All channels up to the highest required channel must be recorded, even if not all are required during analysis.
- *Analysis* > *Channel(s) to analyze*
  According to SMD type, a channel or a list of channels is selectable for analysis
- *Analysis* > *Reference* > *Reference input*
  Input channel for reference measurements



Source level adjust

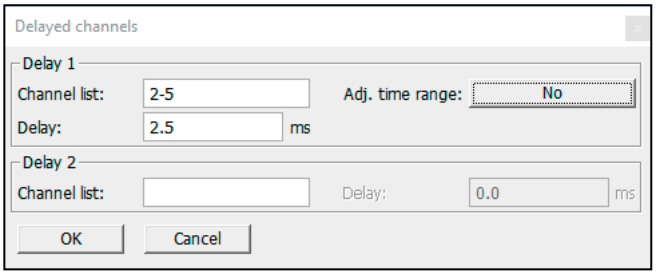


> Four independent configurable gain values are provided for a customized number of channels. There are channel lists for each gain value.

Delayed channels

> A channel list substitutes the drop-down list for channel selection. Further, a second delay is available for another channel list.

Filter (FIR and IIR)



> Filters may be applied to a list of channels.

New: IIR filter (out)

> Same options as for IIR (in).

Special features

> *Source signal*
> With two channels, the target channel was explicit. There is a new parameter *Destination Channel* that determines the target channel.
> Additionally, there is the selectable option *Append*. When selecting *Append*, no channel is overwritten, but the source channel of the recording will be added as a new channel.

> *Threshold channel* is now a field to apply multiple channels.

Reporting

> *Max. channels/table*
> Tables may become too wide when using multiple channels and can therefore now be divided into several tables. The new parameter sets the number of channels for each table. This determines the number of channels, not columns. The number of columns may be higher, e.g. if every value has a correction value.

Channel operations / File operation / Channel combination

> These features are unchanged. If other channels than 1 or 2 are selected for analysis, an error message occurs.

Correction

> For SMDs Level and SMDs Active speech level, *Result* > *Correction* so far allowed to combine, e.g. average, the results of the two channels. This function has been extended to all channels by using the internal variables (_Ch1..._Ch32) in the correction formula. The result will be one value for all channels instead of one value for each channel.

Miscellaneous changes for multi-channel measurements

Handling of reference channels

> So far, reference channels have been copied in a determined channel. Since the number of channels is now variable, they are appended as new channels. This also avoids overwriting of recorded channels.

Measurement progress pop-up

> The pop-up has got additional level meters. The displayed properties have been extended for multiple channels.

Global settings: Amount of recording channels

> For some measurements, more recording channels may be desired than specified in the SMD. *Select Input channels* > *Override number set* in SMD in Measurement settings. The number of channels may only be increased.

Affected SMD types

SMD types including multi-channel functionality

> Active Speech Level (Correction may link results of all channels)

> Correlation & Transfer function (not for impedance measurements)

> Delay (cross correlation)

> Distortion (noise)

> Distortion (sinusoidal)

> Frequency Response

> Level (Correction may link results of all channels)

> Level vs. Time (3D only single channel)

> Loudness rating (LR and Tol., as before no binaural RLR)

> Loudness P.700 (Binaural: Exactly two channels required)

> Modulation (3D only single channel)

> Noise

> Psychoacoustics (3D only single channel)

> Roomacoustics (MLS)

> Speech Intelligibility Index

> Speech Transmission Index

> Time response

> Turntable (3D only single channel)

> Variation of level

SMD types with single channel analysis

As before, but any channel can be selected for analysis.

> 3QUEST

> Distortion (Farina) (Playback via multiple channels possible)

> Echo loss

> EQUEST

> MOS (Mean Opinion Score)

> Out of band

> Relative approach

> SNR (Signal-to-noise ratio) improvement

> STMR

> Time distance

Selection of one or two channels from all channels possible

> Listening Effort (Mono or Stereo; with Stereo two reference channels are selectable)

> Loudness rating (binaural RLR)

> Variation of loudness rating (binaural RLR)

Exactly two channels selectable

> MDAQS

Unchanged

> Delay (2freq) (deprecated)

> DTMF