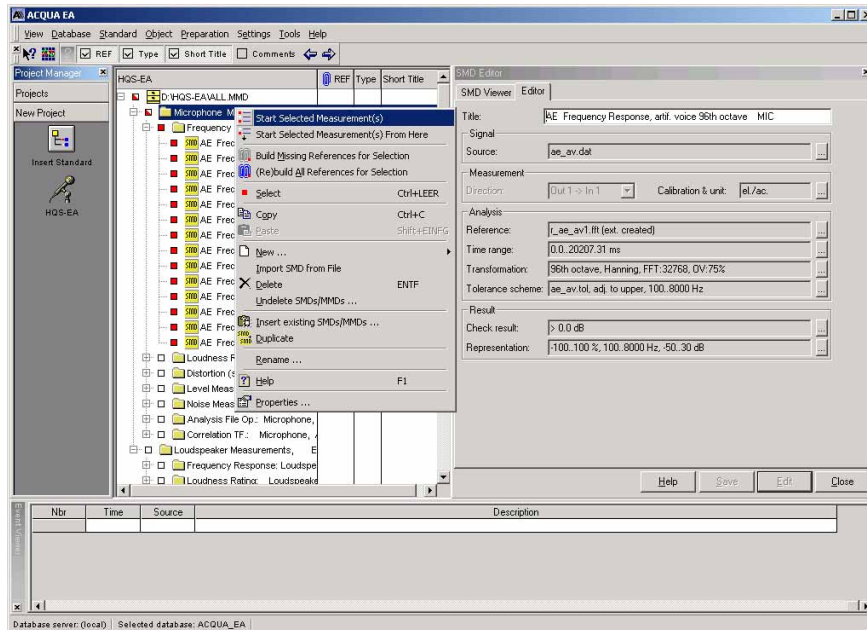


OVERVIEW

HQS-EA (Code 6773)

HEAD Quality Standard Electroacoustics



Screenshot ACQUA EA with HQS-EA

OVERVIEW

HQS-EA is a standard developed by HEAD acoustics for the analysis of electroacoustical parameters of microphones, loudspeakers and other acoustic transducers as well as hearing aids in the time and frequency domain.

Combined with the HEAD acoustics communication quality analysis system ACQUA and the calibrated front end MFE VI, HQS-EA with its predefined measurement descriptors and automated measurement sequences allows the fast and easy acquisition, analysis and documentation of measurement data.

FEATURES

- Analysis in the time domain, determination of level
- Analysis in the frequency domain, determination of transmission function, distortion factor, rub & buzz, noise, correlation, impulse response, loudness rating
- Essential parameters modifiable by user
- Automated measurement sequences
- Individually definable default settings
- Linearization of any kind of acoustical source (e.g. loudspeakers) at a given point in space

APPLICATIONS

- Quality control
- Conformance testing
- Research & Development

MEASUREMENT SIGNALS

The following measurement signals are used in the measurement descriptors:

- Sine
- Sine Stepped Sweep
- Multisine
- Pseudo Noise
- Artificial Voice (P.50)
- Composite Source Signal (CSS)

MEASUREMENT DESCRIPTORS

For the determination of the electroacoustical parameters of microphones, loudspeakers, other sound transducers or hearing aids the following measurement descriptors are available in HQS-EA:

Level

This measurement descriptor can be used to determine signal levels and sensitivities of microphones and loudspeakers.

Frequency Response

The frequency response of electroacoustical transducers as well as transmission paths can be determined. The analysis can be performed in n-th octaves or in FFT resolution.

Distortion

All characteristic values of upper harmonic behavior can be determined:

THD, THD+Noise, even harmonics 1..n, odd harmonics 1..n, harmonics 1..n.

All these characteristic values can also be shown vs. frequency in combination with the measurement descriptor 'Analysis File Operations'.

Rub & Buzz

The system is suited for quality tests of loudspeakers. The good system dynamics allow a reliable determination of rub & buzz. By means of this parameter faulty electroacoustic

components such as e.g. misadjustments of moving coils can be reliably detected.

Noise

This measurement descriptor serves to determine the noise of active amplifier components. In combination with the measurement descriptor 'Analysis File Operations' it can also be used for determination of signal-to-noise ratios.

Moreover, it can be used for determination of disturbance noise subsequent to the stimulation of a measurement object by a signal.

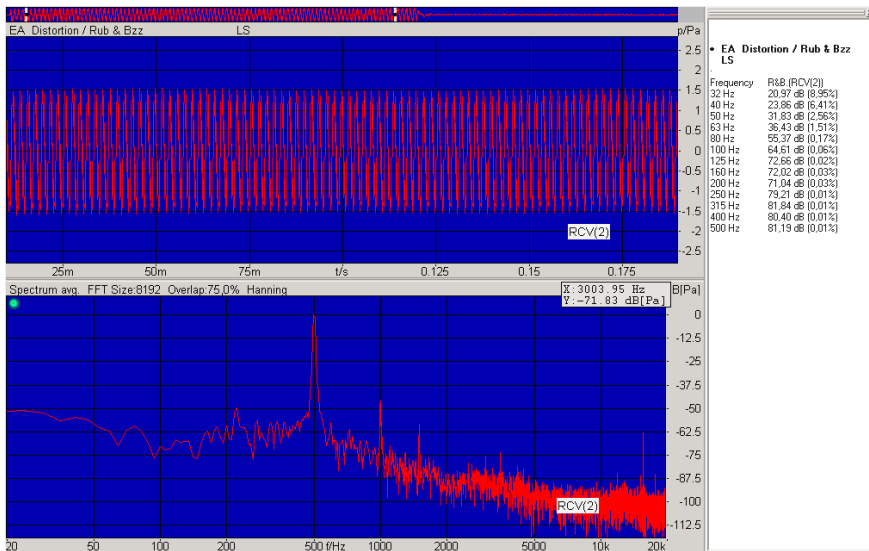
Correlation & Transfer Function

This measurement descriptor serves to determine the transfer functions H1 and H2. In addition the signals of two channels can be correlated where one of the signals is determined as reference channel. Typically this is the input signal of the equipment under test (EUT), e.g. the amplifier input of the loudspeaker amplifier or a reference measurement microphone.

As basis of all analyses autospectra or cross-correlated spectra need to be calculated for both channels.

The following analyses can be performed:

- Correlation function:
 - Auto correlation, Cross correlation (avg./vs.time)
- Transfer function (H1, H2)
- Impulse response
- Group delay
- Coherence



Time data and analysis window as well as result overview for a loud-speaker measurement with „Rub & Buzz“ measurement descriptor

Frequency	Dist.(SND(1))
100 Hz	24,79 dB (5,76%)
125 Hz	32,93 dB (2,26%)
160 Hz	34,40 dB (1,91%)
200 Hz	35,40 dB (1,70%)
250 Hz	36,59 dB (1,48%)
315 Hz	38,20 dB (1,23%)
400 Hz	40,55 dB (0,94%)
500 Hz	40,57 dB (0,94%)
630 Hz	42,00 dB (0,79%)
800 Hz	41,07 dB (0,88%)
1000 Hz	41,54 dB (0,84%)
1250 Hz	40,45 dB (0,95%)
1600 Hz	43,94 dB (0,64%)
2000 Hz	42,24 dB (0,77%)

Table with result values for measurement descriptor „Distortion“

Via the measurement parameter „Window Type“ the position and type of the signal window can be set. The windowing of the impulse response can be used e.g. to exclude room reflections.

Analysis File Operations

This measurement descriptor is not used for measurements, but for performing operations on already existing measurement results (single values and FFT files). These results can be measured and saved e.g. with the measurement descriptor 'Frequency response'.

For example, the following operations are possible:

- Analysis of a single file
- Sum, Average, Minimum and Maximum of the input data
- Operations with up to 30 files

- Saving of results as FFT file
- Optional representation of all input data
- Selection of abscissa unit, dB or Hz

The measurement descriptor can be universally used to show the difference of two frequency responses (e.g. with different test signals or measurement conditions) and to compare this difference signal with a tolerance scheme.

The measurement descriptor can also be used to represent e.g. analysis data which were generated by saving the analysis results as FFT file; it is thus possible to represent level over frequency or level.

Loudness Ratings

The characteristic values SLR and RLR which are common in the field of telecommunication can be determined according to ITU-T P.79.

DELIVERY ITEMS

HQS-EA (Code 6773) comprises:

- CD-ROM with HQS-EA database for direct use with quality analysis system ACQUA

REQUIREMENTS

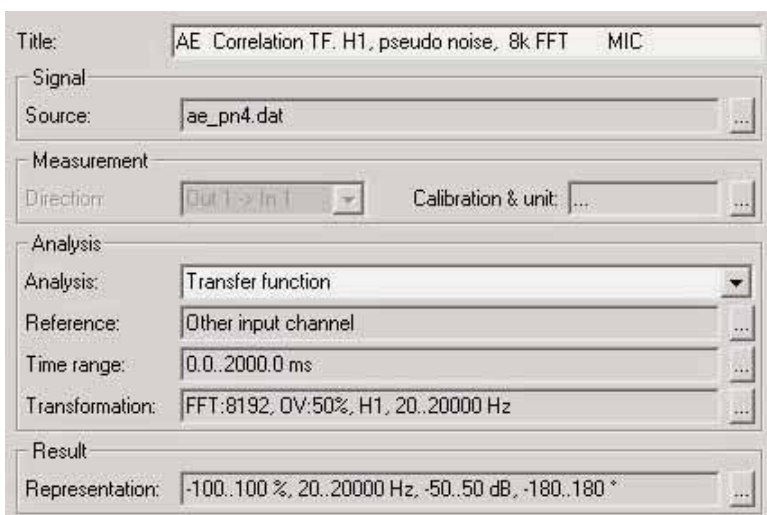
HQS-EA requires one of the following ACQUA software packages:

- ACQUA Basic Version (Code 6810)
- ACQUA-IP Compact (Code 6831)
- ACQUA-HFT Compact (Code 6832)
- ACQUA-GSM Compact (Code 6833)
- ACQUA EA (Code 6835, HQS-EA included in delivery)

OPTIONS

Depending on the ACQUA version used with HQS-EA, the ACQUA software can be extended by the following options:

- **Signal Generator** for easy creation of signal sources
- **„Relative Approach“**: new, patented method for analysis of audible disturbances in the time and frequency domain



Measurement descriptor „Correlation & Transfer Function“ in ACQUA EA SMD Editor

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