Post Processing Task S55

QC Module of the KLIPPEL ANALYZER SYSTEM (QC Ver. 7, dB-Lab Ver. 212)

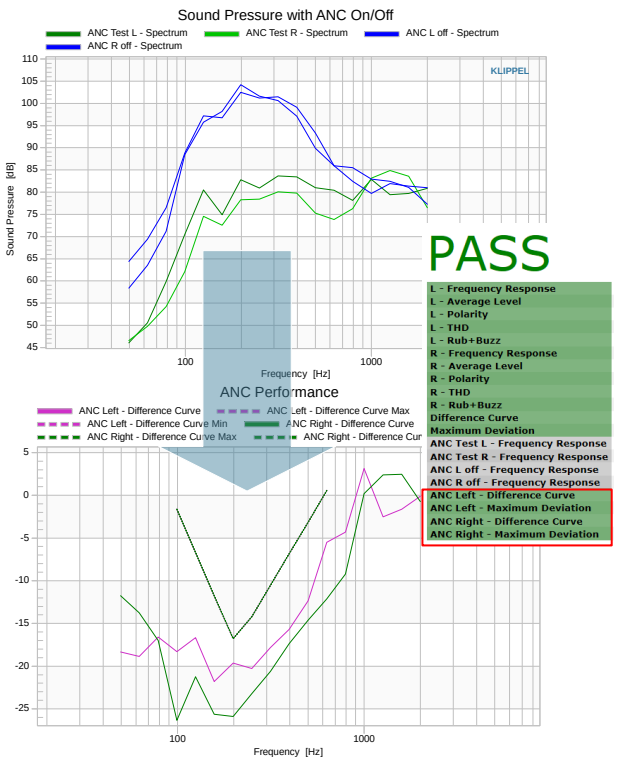
Document Revision 1.6

FEATURES

- Combine test results
- Apply limits
- Use any measured curve or value

BENEFITS

- Derive higher level results
- Examples:
  - Stereo mismatch
  - Signal-to-noise ratio
  - Relative Measures (e.g. curve to level)
  - Sound attenuation
- Similar to PPP Module



DESCRIPTION

The Post Processing (PP) Task is a task of the Klippel QC Software. It can access and combine test results of any preceding measurement task in the test sequence. The resulting curves or single value measures can be checked against limits. This task is designed to be extended to customer needs.

The Post Processing Task is free of charge and can be used in QC Standard or in the R&D framework. It is not available in QC Basic software.

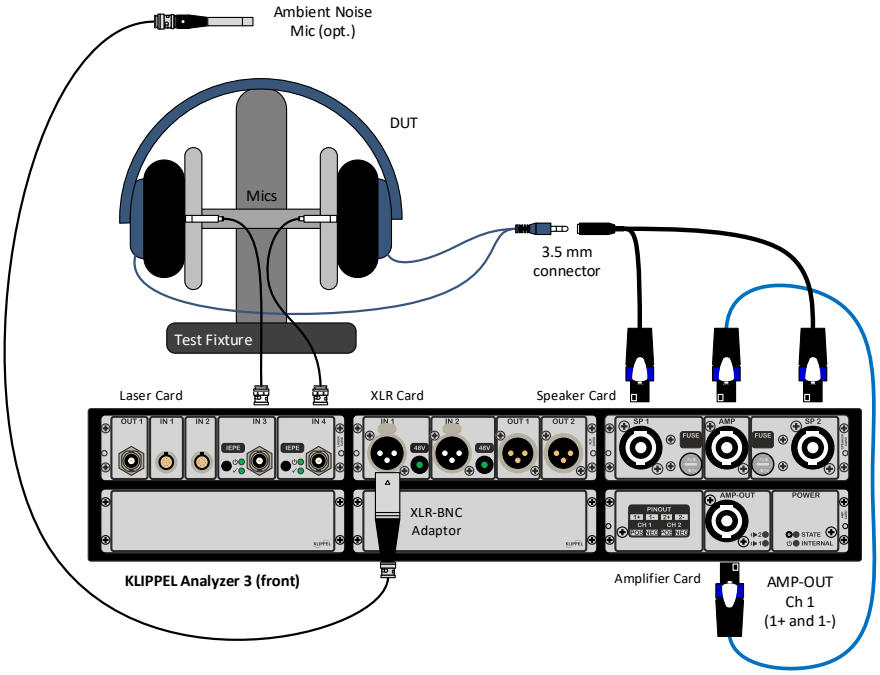
CONTENT

1 Examples

1.1 Stereo Headphone Application (Difference of Frequency Response Curves)

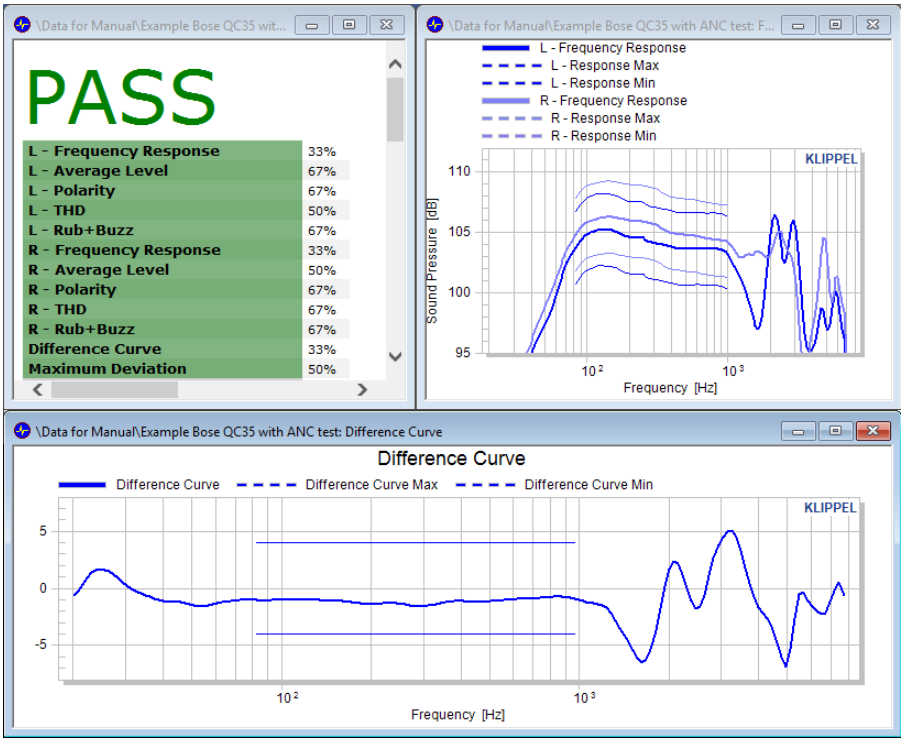
Setup

The deviation of frequency response curves between left and right ear channel may be easily calculated using the Post Processing Task. In addition, the maximum deviation at any frequency may be calculated and checked against limits.



Wired or wireless connections (e.g. Bluetooth®) can be used.

Results



The lower chart shows the deviation of both responses with frequency limits.

1.2 Active Noise Control (ANC) Headphone Performance

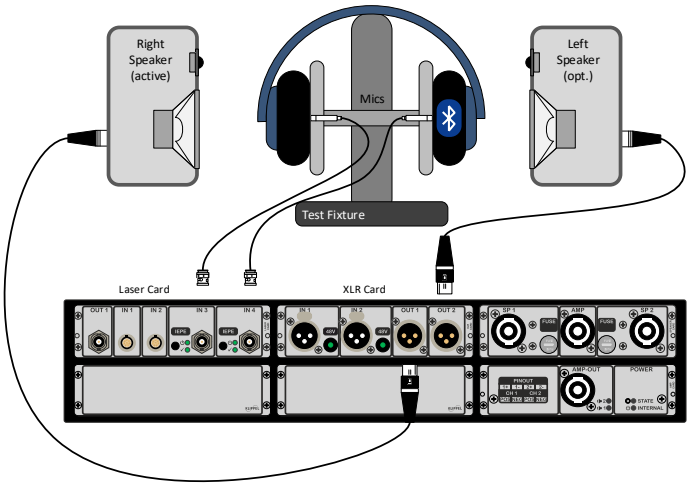
Setup

The performance of active noise cancellation effects can be measured by a two-step test.

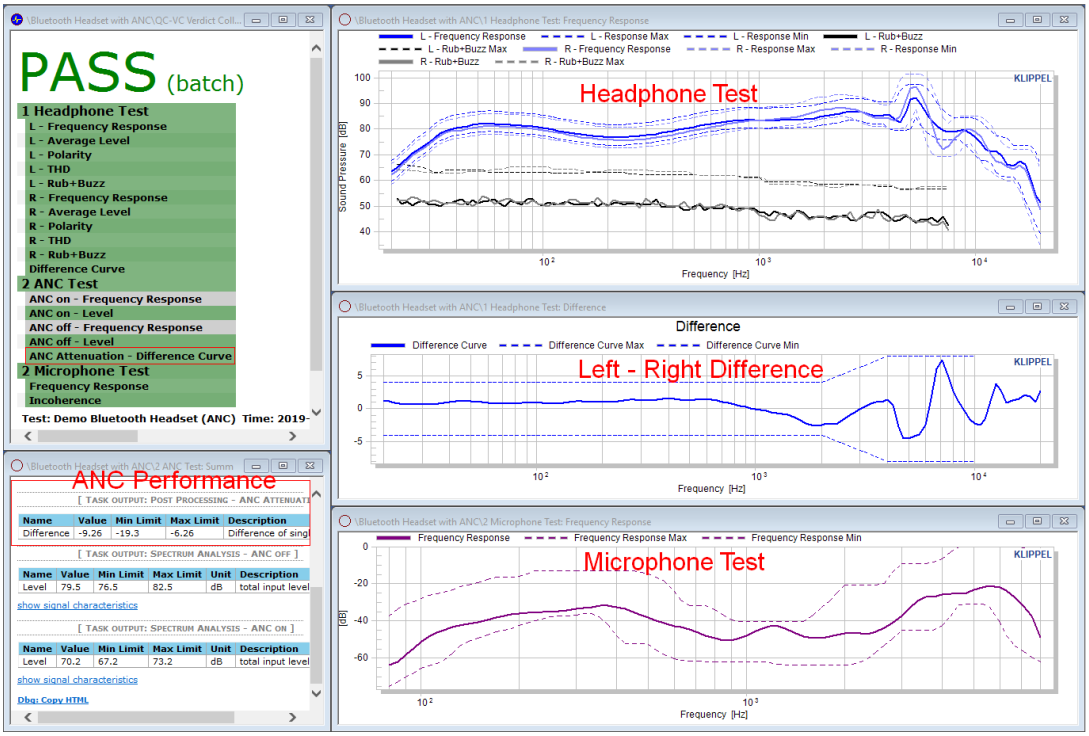
In a first step the average level as a reference without ANC is measured in a defined frequency band. The typical test signal is (pink) noise, that is radiated by two or more speakers simulating a typical environment. Two microphones mounted in a test fixture record the passively attenuated noise level. For such measurements the *Spectral Analysis (SAN) task* can be used.

For the second step the active noise cancellation is activated and adds especially at low frequencies considerable higher noise attenuation. The achieved ANC performance is the difference between both levels from step 1 and 2 for each channel (left and right) individually.

In this example the average levels are compared, hence no curves are available but the ANC performance is available as a single value result in a table (in the example almost 10 dB in a frequency range from 80 Hz to 500 Hz). Clearly the frequency dependent performance can be tested as well using input spectrum instead of the average level.



Results


PASS (batch)
1 Headphone Test
L - Frequency Response
L - Average Level
L - Polarity
L - THD
L - Rub+Buzz
R - Frequency Response
R - Average Level
R - Polarity
R - THD
R - Rub+Buzz
Difference Curve
2 ANC Test
ANC on - Frequency Response
ANC on - Level
ANC off - Frequency Response
ANC off - Level
ANC Attenuation - Difference Curve
2 Microphone Test
Frequency Response
Incoherence
Test: Demo Bluetooth Headset (ANC) Time: 2019-
ANC Performance
Headphone Test
Difference
Left - Right Difference
Microphone Test
KLIPPEL
Frequency [Hz]
Sound Pressure [dB]

1.3 Maximal Distortion in Multiple Bands

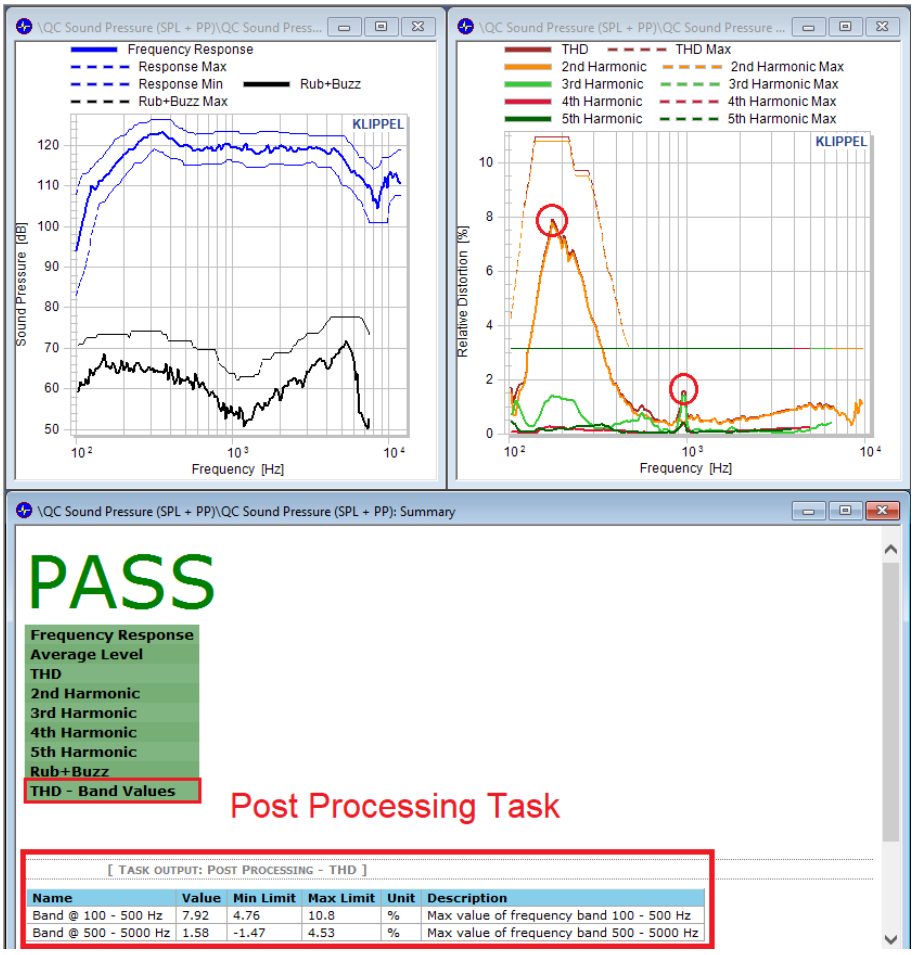
Setup

The maximal distortion value may be easily calculated in multiple bands using the Post Processing task. The calculation can be applied to any distortion curve (THD, 2nd Harmonic…) at the frequency bands defined in the parameter page.

In the following example, the max. THD is calculated in 2 different bands:

- Low frequency band: from 100 to 500 Hz
- High frequency band: from 500 Hz to 5 kHz

Results



1.4 Minimal Impedance of a Bass Reflex System

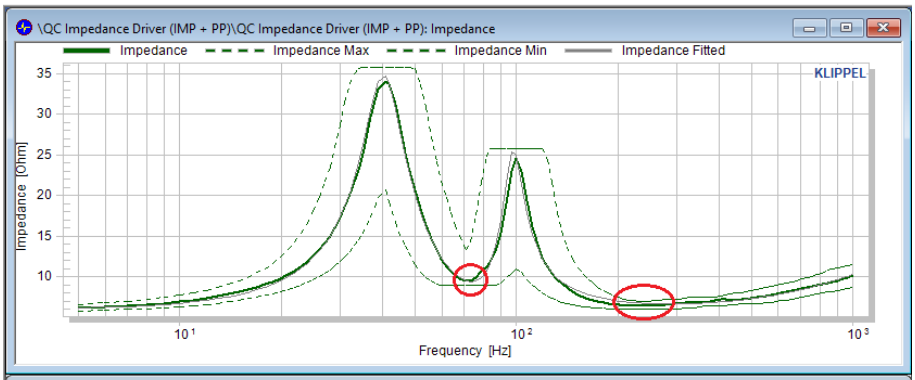
Setup

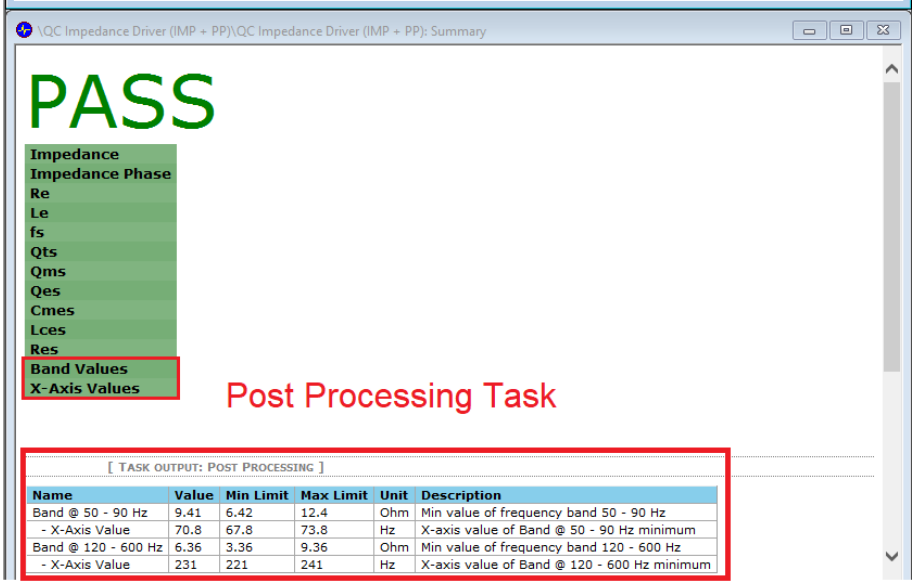
The minimal impedance value as well as its frequency may be easily calculated using the Post Processing Task. In the following example, the impedance curve of a vented box system is measured.

An approximation to the vented box resonance and its impedance (minimal value between the both peaks), as well as the minimal impedance from transducer resonance frequency are calculated and checked against limits.

Note: for a better calculation of the vented box resonance frequency, please refer to the QC Impedance task, which offers an accurate Thiele/Small parameter fitting including the vented box resonance frequency obtained in this example.

Results





Name	Value	Min Limit	Max Limit	Unit	Description
Band @ 50 - 90 Hz	9.41	6.42	12.4	Ohm	Min value of frequency band 50 - 90 Hz
- X-Axis Value	70.8	67.8	73.8	Hz	X-axis value of Band @ 50 - 90 Hz minimum
Band @ 120 - 600 Hz	6.36	3.36	9.36	Ohm	Min value of frequency band 120 - 600 Hz
- X-Axis Value	231	221	241	Hz	X-axis value of Band @ 120 - 600 Hz minimum

2 Requirements

2.1 Software

QC Standard Software or any QC measurement module license for R&D application.

QC software version 6.2 is required to use the Post Processing Task. It replaces the *Diff*-Task. Existing Diff-Tasks in test sequences are automatically updated to the Post Processing task.

The Post Processing Task is not available in QC Basic software

3 Limitations

3.1 Input data	
	Any measured curve or single value can be used as input. User defined curves or single values can be also used. Limits of any measured curve and mean of reference DUT data can be used only with User defined data. The input data must be measured before any post processing can be done.

4 Output

4.1 Processing Option *Two Inputs*	
Difference Curve	If at least one of the input data is a curve, the difference result is curve type and available in chart *Difference*. Available limit calculation modes are • Shifting Limits • Statistics (Standard Deviation), also combined with Shifting Limits • Absolute (Absolute Limits), also combined with Shifting Limits • Alignment of Limits to level or best fit • Jitter
Difference Value	If both input data are singe values, the difference result is single value type and available in a table in the chart *Summary*. Available limit calculation modes are • Shifting Limits • Statistics (Standard Deviation) • Absolute (Absolute Limits)
Maximum Deviation	The Maximum Deviation result is single value type and represents the maximum value of the difference curve. If the difference is single value type, Maximum Deviation is not available (in this case it is identical with the difference result). Available limit calculation modes are • Shifting Limits • Statistics (Standard Deviation) • Absolute (Absolute Limits)
Mean Deviation	The mean deviation provides the mean or RMS value of the difference curve. It is a single value available for curve type only. If the difference is single value type, Maximum Deviation is not available (in this case it is identical with the difference result). Available limit calculation modes are • Shifting Limits • Statistics (Standard Deviation) • Absolute (Absolute Limits)
4.2 Processing Option *Single Input*	
Band Values	The *Band Values* result calculates the maximum, minimum, mean or RMS value of user defined bands of a measured curve. The result values and limits are available in a table in the chart *Summary*.

	Available limit calculation modes are • Shifting Limits • Statistics (Standard Deviation) • Absolute (Absolute Limits)
X-Axis Values	Search of x-axis values where the maximum or minimum band values are located. This result is only available if *Band Values* result is activated and configured in *min* or *max* mode. The result values and limits are displayed together with the *Band Values* results in a table in the chart *Summary*. Available limit calculation modes are • Shifting Limits • Statistics (Standard Deviation) • Absolute (Absolute Limits)

5 References

5.1 Related Modules	QC Measurement tasks, see current price list for available tasks
5.2 Manuals	Post Processing Task Manual QC User Manual

Find explanations for symbols at:
http://www.klippel.de/know-how/literature.html
Last updated: September 01, 2022
Designs and specifications are subject to change without notice due to modifications or improvements.