DEWESoft®
measurement innovation

SOUND QUALITY

PRODUCT SOUND ENGINEERING ANALYSIS AND CHARACTERIZATION OF PRODUCT SOUND

THE INDISPENSABLE TOOL FOR SUCCESSFUL SOUND ENGINEERING - MAKE YOUR PRODUCT SOUND RIGHT

INTRODUCTION

Sound quality measurement is an indispensable tool for successful sound engineering; to make the sound of your machines appealing to the user, tweak product sound and realize the maximum of your market potential.

Asses the sound appeal of products with ease and take sound design to the next level with Dewesoft Sound Quality solution. The system is a combination of award winning X3 software, SIRIUSm DAQ system, class 1 quarter inch microphone and DEWESoft Sound Quality plugin.

The Dewesoft solution enables real-time and post analysis and supports calculation of Loudness according to ISO 532-1 and 532-2. It also includes a range of other sound quality metrics, such as sharpness, articulation index, speech intelligibility, noise criterion, noise ratings.

LEARN MORE:
https://dewesoft.com/applications/acoustics/sound-quality

FUNCTIONALITY

The sound quality of the noise from a product is of increasing importance when assessing the overall quality of the product.

The auditory perception of sound is a subjective matter, but objective measurement and testing is possible by applying a range of Sound Quality parameters or metrics that reflect the psychoacoustic properties of the human perception of sound, e.g. loudness, sharpness, noise criterion, noise rating, articulation index, articulation index extended, speech intelligibility. They all have the advantage that they conclude with a single number on the characteristic properties of the sound.

KEY FEATURES

- **Loudness:** Calculation according to ISO 532-1 and 2: Acoustics - Methods for calculating loudness - Zwicker method and Moore-Glasberg method
- **Sharpness:** Sharpness calculated from specific loudness, which is determined according to ISO 532-1 and 532-2
- **Articulation index, extended:** Evaluation of speech perception while other sounds are present.
- **Speech Intelligibility:** Metric for evaluation of speech intelligibility.
- **Noise Rating (NR):** Utilized in Europe for rating indoor noise sources.
- **Noise Criterion (NC):** Utilized in USA for rating indoor noise sources.
- **Monaural and Binaural analysis:** Select desired measurement method before measuring or measure both at the same time.
- **Time-varying and stationary signals support:** No limits when it comes to different use cases.
- **Real time and post analysis:** Calculation of metrics is supported in real time as well as in post analysis.
- **Measurement expandability:** Bundled with award winning Dewesoft X Professional - advanced and easy-to-use data acquisition and analysis software.
- **Future-proof Application:** Lifetime free upgrades and support - our solutions are constantly being improved.
- **Powerful DAQ system:** Bundled with renowned SIRIUS DAQ system supporting sampling rates of 200kHz.
- **Analog inputs:** Even more analog inputs than required for monaural or binaural Sound Quality analysis

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APPLICATIONS

Sound quality testing is an important design concept for anyone who wants to evaluate and improve the sound of their product or individual components to make it perceived as right or desirable to the user. The testing is applied in:

- Automotive Noise, Vibration and Harshness (NVH), automotive designs, including components
- Electronic devices, such as loudspeakers, microphones, amplifiers or headphones
- Domestic appliances, e.g. lawn mowers, refrigerators, computers

It is applied by R&D departments of industry players for:

- Benchmarking and improvement - Target setting
- Modelling and simulation - Prediction
- Reactive engineering - Testing and troubleshooting - Validation

SOFTWARE: DEWESoft X3	
Recommended	
Processor:	Intel Core i7 with 4 Cores (3rd generation or higher)
RAM:	8 gigabyte (GB)
Hard drive:	Solid-state drive (SSD)
Graphic card:	Compatible with DirectX 11
Display:	1280x720 (HD Ready)
Operating system:	Windows 10 64-bit
*Actual requirements may be different due to specific setup configuration.	

MICROPHONE	
Model	46BE ¼" CCP Free-field Standard Microphone Set
Frequency range (±1 dB)	10 Hz - 40kHz
Frequency range (±2 dB)	3.15-20 kHz
Dynamic range lower limit with GRAS preamplifier	35 dB(A)
Dynamic range upper limit with GRAS CCP preamplifier	160 dB
Set sensitivity @ 250 Hz (±2 dB)	/
Set sensitivity @ 250 Hz (±3 dB)	3.6
IEC 61094-4 Compliance	WS3F
Temperature range, operation	-30 to 85 °C
Temperature range, storage	-40 to 85 °C
TEDS	yes
Weight	8 g

DAQ SYSTEM - SIRIUSm 4XACC		
Input types	Voltage, IEPE	
ADC Type	24bit delta-sigma dual core with anti-aliasing filter	
Sampling Rate	Simultaneous 200kS/sec	
Dual Core Low Range	**±10V (±500mV)**	**±500mV (NA)**
Input Accuracy (Dual Core)	±0.1% of reading ±10(1)mV	±0.1 of reading ±1(NA)mV
Dynamic Range@10kS (Dual Core)	140 dB (160 dB)	135 dB (NA)
Typ. SNR@50kS (Dual Core)	107 dB (125 dB)	100 dB (NA)
Typ. CMR @ 50Hz/1kHz	140/120 dB	140/120 dB
Gain Drift	Typical 10 ppm/K, max. 30 ppm/K	
Offset Drift	Typical 0.5 µV/K + 2 ppm of range/K, max 2 µV/K + 10 ppm of range/K	
Gain Linearity	<0.02%	
Inter Channel Phase-mismatch	0.02° * fin [kHz] + 0.1° (@ 200 kS/sec)	
Channel Cross talk	>160 dB @ 1kHz	
Input Coupling	DC, AC 0.1 Hz,1Hz	
Input Impedance	1 MΩ (270kΩ for AC coupling ≥ 1Hz) in parallel with 100pF	
Overvoltage Protection	In+ to In-: 50 V continuous; 200V peak (10msec)	
IEPE mode		
Excitation	2, 4, 8, 12, 16 or 20mA	
Compliance voltage	25 Volt	
Output Impedance	>100 kΩ	
Sensor detection	Shortcut: <4Volt; Open: > 19Volt	
Counters (ACC+ type only)		
Inputs	1 digital counter input; 3 digital inputs; Fully synchronised with analog data	
Counter Modes	counting, waveform timing, encoder, tacho, gear-tooth sensor	
General Counter Specifications	See "SIRIUS counter specifications"	
Additional Specifications		
Input connector BNC	BNC	
TEDS support	IEPE mode only	

ORDERING INFO

DEWESOFT SOUND QUALITY - MONAURAL

- DEWESoft SQ: sound quality plugin
- SIRIUSm-4xACC: Sirius mini, 4 Channels
- Free-field Standard Microphone Set: 46BE: G.R.A.S. 1/4" CCP
- Multifunction Sound Calibrator, Class 1: 42AG: G.R.A.S.

DEWESOFT SOUND QUALITY - BINAURAL

- DEWESoft SQ: sound quality plugin
- SIRIUSm-4xACC: Sirius mini, 4 Channels
- Free-field Standard Microphone Set: 2x 46BE: G.R.A.S. 1/4" CCP
- Multifunction Sound Calibrator, Class 1: 42AG: G.R.A.S.

OPTIONAL ACCESSORIES

- Free-field Standard Microphone Set: 46AE: G.R.A.S. 1/2" CCP
- Random Incidence Standard Microphone Set: 46AQ G.R.A.S. 1/2" CCP
- Microphone Holder, POM: AL0008: G.R.A.S. 1/2"
- Microphone Holder, POM: AL0029: G.R.A.S. 1/4"
- Tripod, general purpose, high quality: AL0006: G.R.A.S.