Dr · Jordan · Design

AkuLap

Professional Audio Measurement System

www.dr-jordan-design.de

User Manual for building acoustics ISO 140 ISO 717 ISO 16283-1

Preface

Modern acoustic measurement systems, such as **AkuLap**, offer a variety of sophisticated methods of measurement. These processes are very complex and require normally a long-term training.
Therefore, AkuLap has automatic measuring methods, which allow measuring reliably many acoustic parameters by non - specialists. The experience of our designers and acousticians has been summarized in this automated system. The goal is to require as little as possible user interaction. At the same time, we can prevent operator errors. For experienced users we have many advanced features even for very special use cases.
The measurement results are written in a clear report. Therefore, you can print this report to easily archive or send them by email.

In this Quick Start Guide, the most important information is summarized. For more information, please refer to the general guidance of AkuLap or the advanced literature.

Warning

This analysis system can generate many synthetic signals. With inappropriate signal levels you can easily damage your equipment (e.g. loudspeakers) or your ear.

Therefore always start with low signal levels and increase the volume carefully.

Wear ear protection.

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AkuLap is a professional tool for powerful real-time signal and system analysis.
By using the PC environment, it is not only a cost efficient replacement for classical laboratory equipment. AkuLap offers more powerful features combined with a comfortable user interface. Typical applications are acoustic measurements, room and building acoustics and noise monitoring.
If you run Akulap on a notebook or even a tablet PC, you can easily build a mobile measurement system.

Akulap can use many different front ends. In most cases, you will have the most advanced setup, which consists of a Laptop and a USB measurement microphone.

1 General Description

With this compact measuring system, you can perform a wide range of acoustic measurements in a simple way.

The system consists of a computer and one measuring interface that you connect via USB. Depending on your requirements and you can connect high-precision type approved measurement microphones.

- By using the PC environment you get a large user interface
- Short learning curve
- Measurement results can be quickly and easily exported for documentation as a graphic or table
- Modular system: You can use different vendors manufacturer for measurement microphones.
- Modern computers provide high computing power. The functions are available for advanced analysis. Today measurements are possible, which could not be offered so far in this price range.

1.1 Features for building acoustics

- Sound insulation according to ISO 140 and ISO 16283-1
- Air borne sound
- impact level via tapping machine
- Includes wizard for fast and easy measurements. Training phase is very short. Automatic error detection
- Report generator complies to DIN EN ISO 717-1/ 2
- C, Ctr and CI
- R'w, DnTw, L'nw, L'nTw, etc.
- Includes a room manager to structure all measurements and results
- Average of different measurement positions
- Graphical and numerical results
- Combine several results to one Multi-plot
- Option: measure source and receiving room simultaneously with 2 USB microphones

2 Building acoustics air borne sound insulation

2.1 Background

The measurement setup consists of a source room and a receiving room with a partition wall. With a loudspeaker pink noise is applied to the source room. In both rooms the sound level (typically with 1/3 octave resolution) is measured. In addition, we need the reverberation time and the background noise in the receiving room. Together with some geometry data Akulap calculates the sound insulation report.

2.2 Procedure

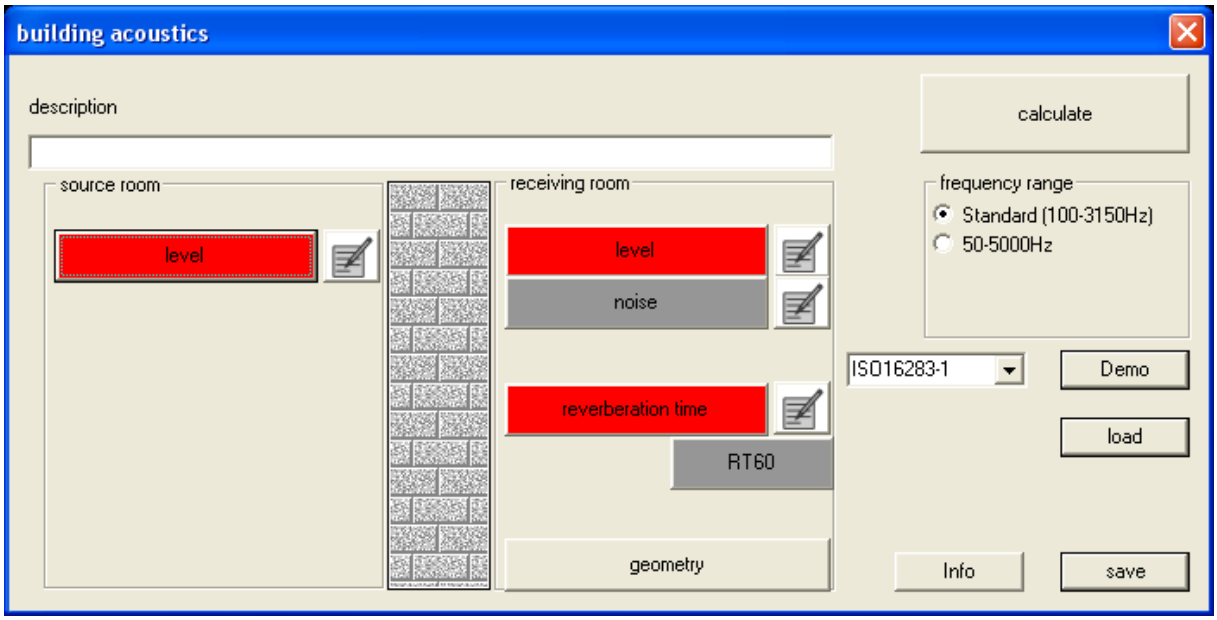
- Start the pink noise generator in the source room
- Measure sound level in the source and receiving room
- Stop the noise generator
- Measure reverberation time in the source room
- Optionally measure the background noise in the receiving room
- Start the building acoustic module
- Copy all measurement data
- Enter some geometry data
- Enter general information for the measurement setup
- Akulap creates the final report

2.3 Measurements

Please refer to the user manuals for level and reverberation measurements.

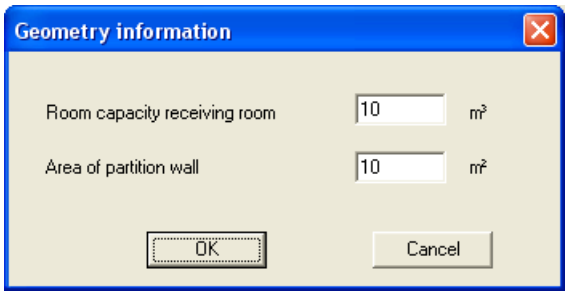
2.4 Evaluation for building acoustics

In this dialog you can enter all measurement results and the geometry information

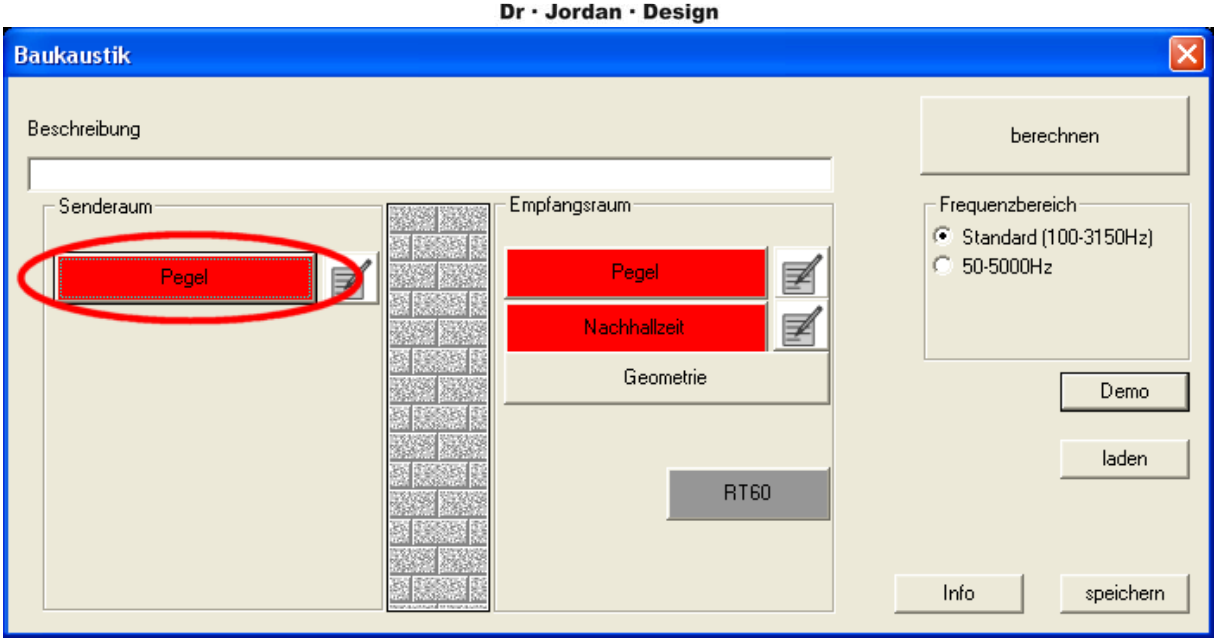


2.4.1 Geometry data

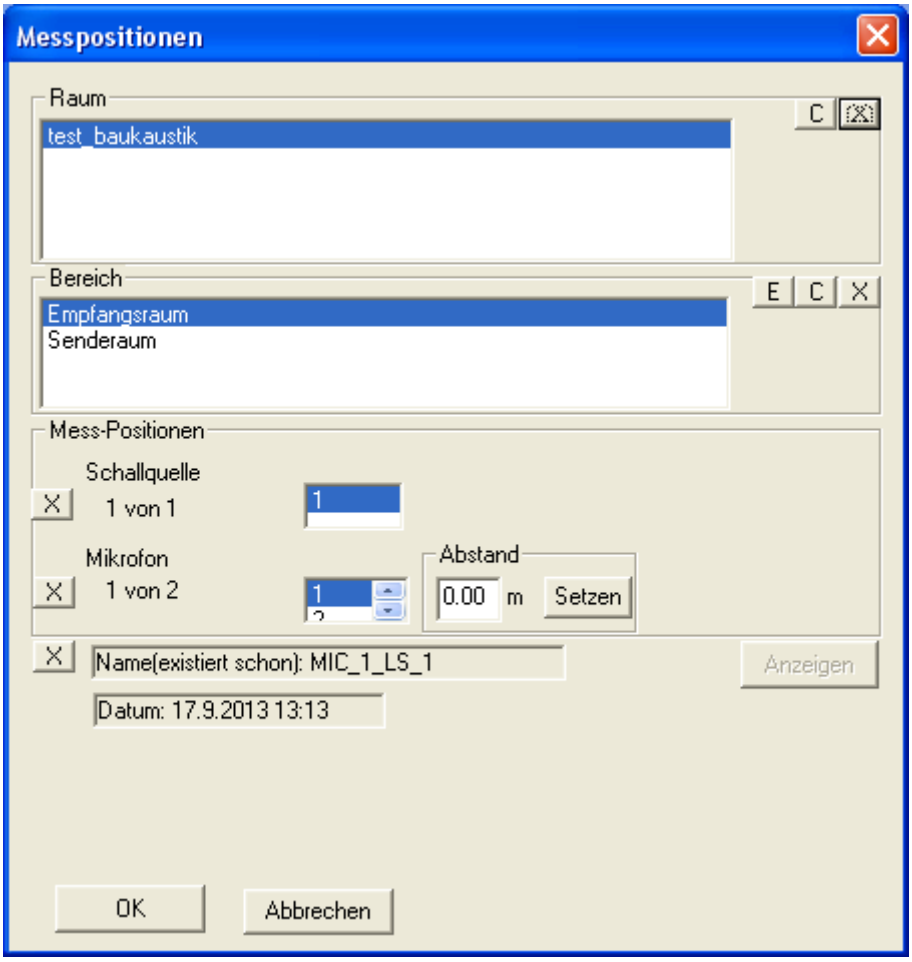
For the calculation Akulap needs the room capacity of the receiving room and the area of the partition wall. Press the geometry button.



2.4.2 Copy level measurement results



Press the button level for both the source and receiving room. The measurement manager will appear.



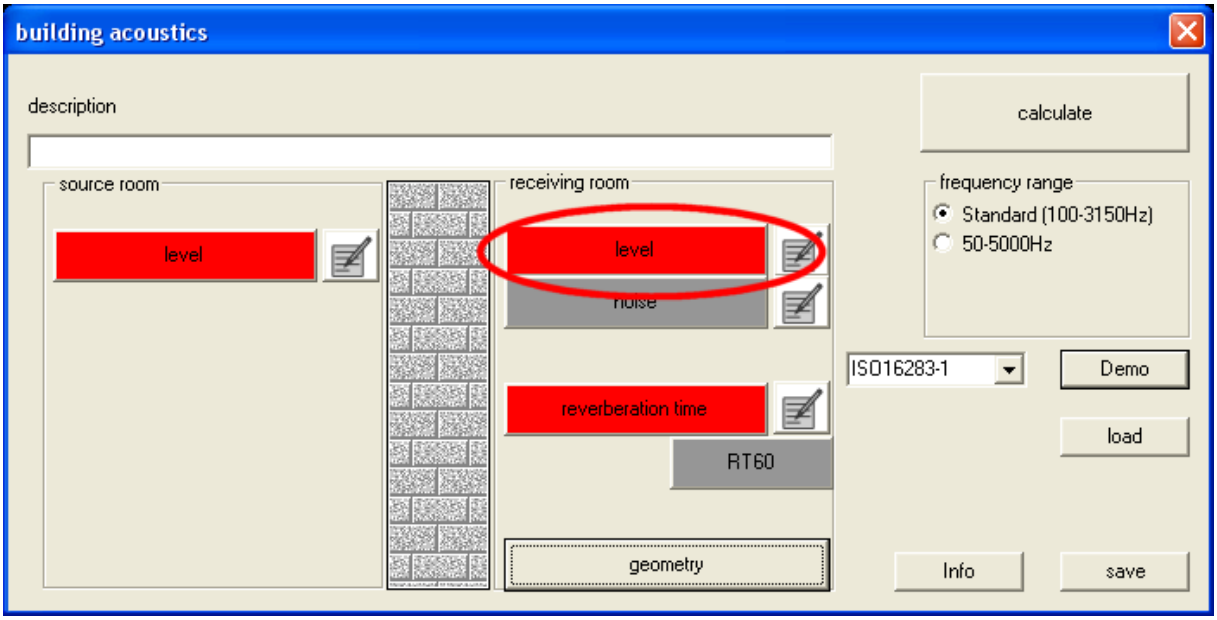
In case you made several measurements in one section, Akulap will average these automatically.

If the data is valid, the button will change its color to green.

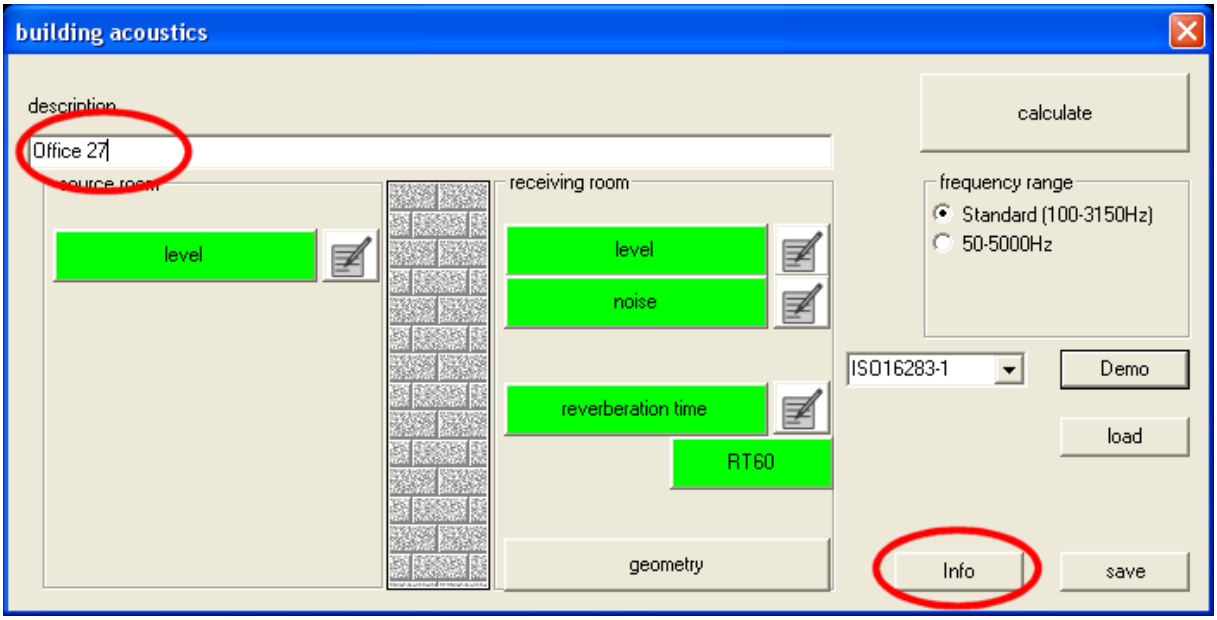
Continue entering the data for the receiving room and optionally for the background noise measurement.

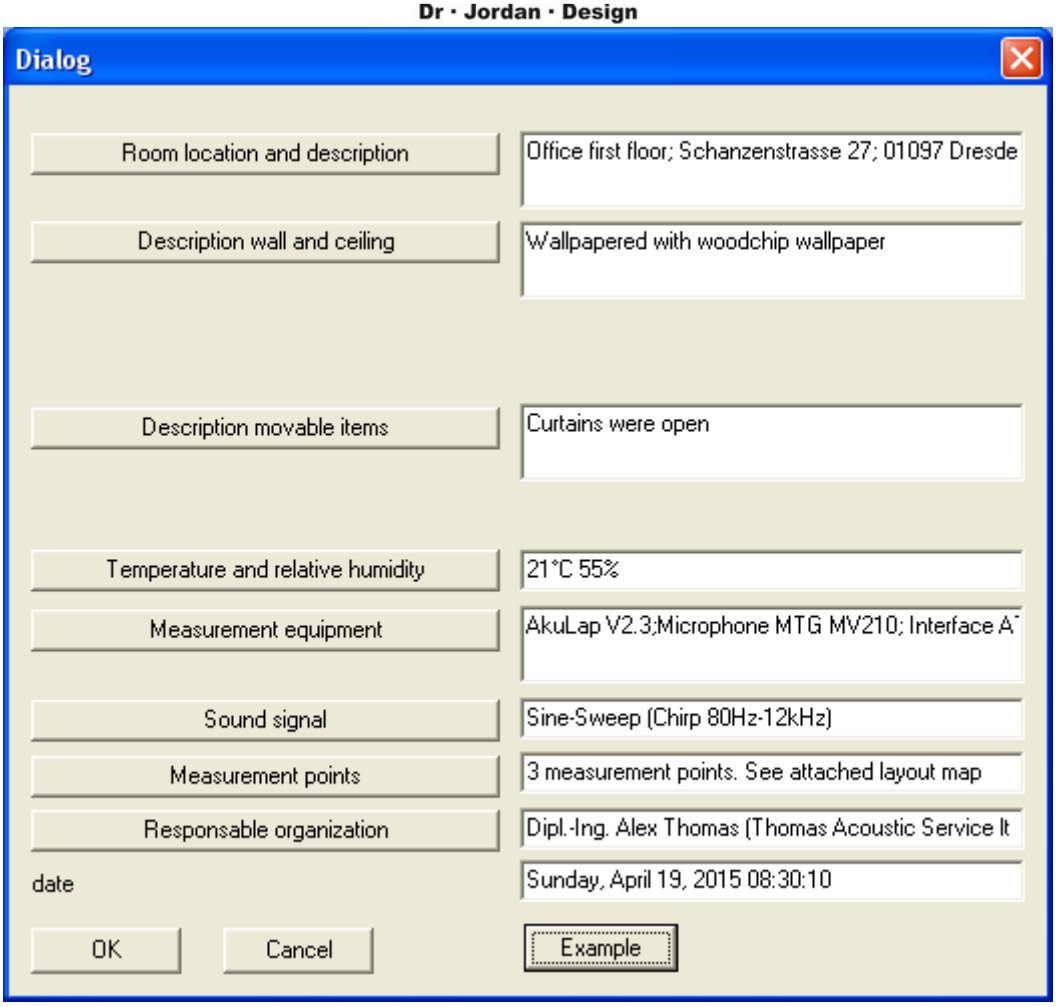
2.4.3 Copy reverberation measurement results

Equivalently select the reverberation measurement data.

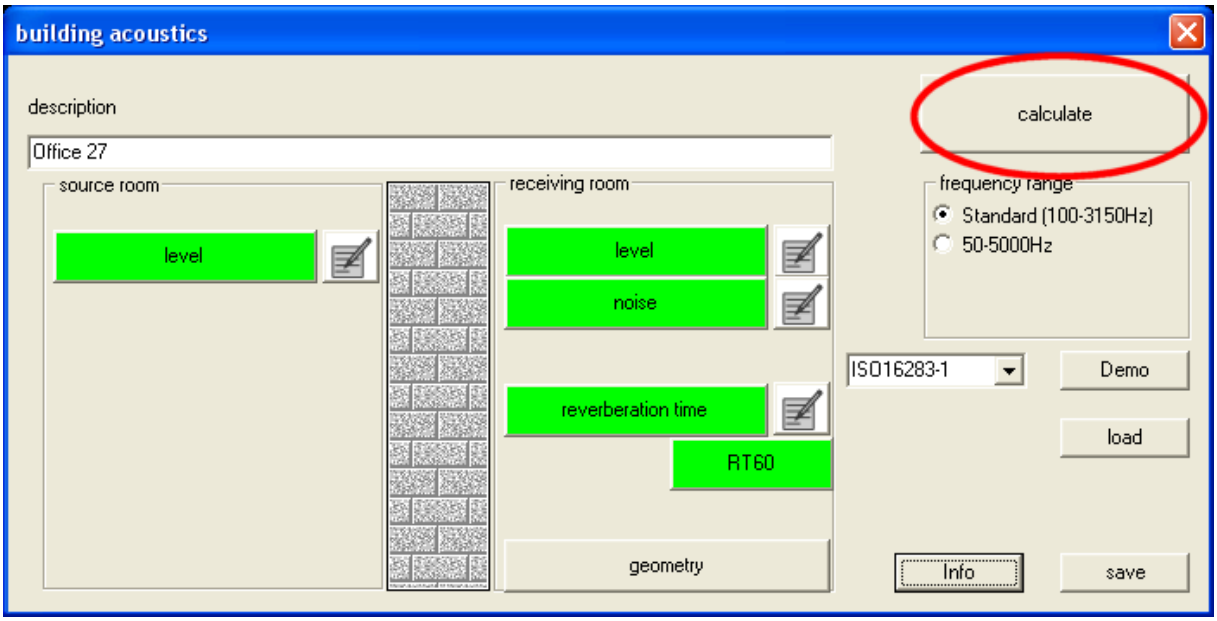


2.4.4 Enter measurement information data

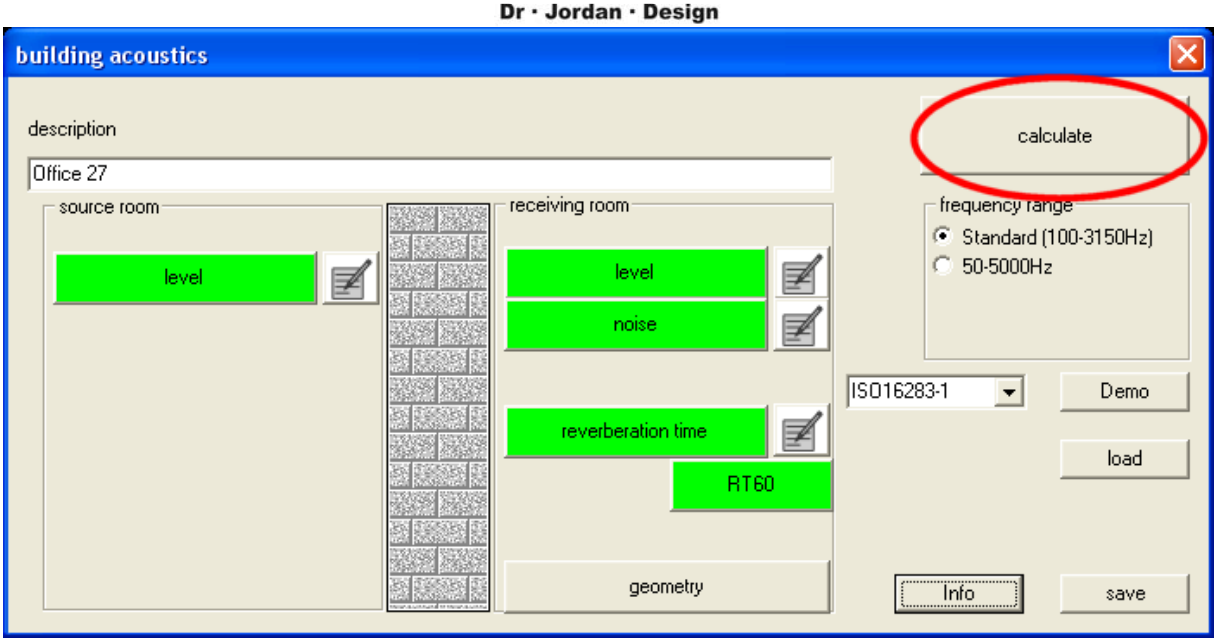




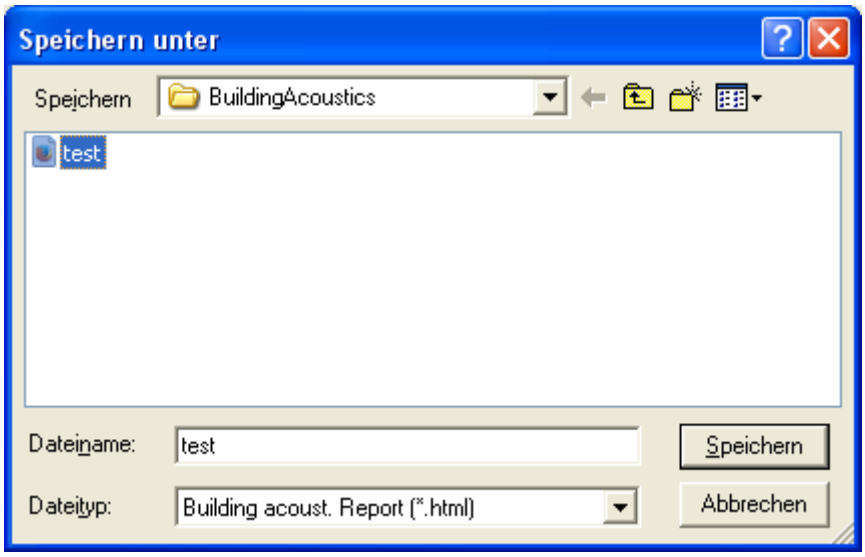
2.4.5 Start the report generation



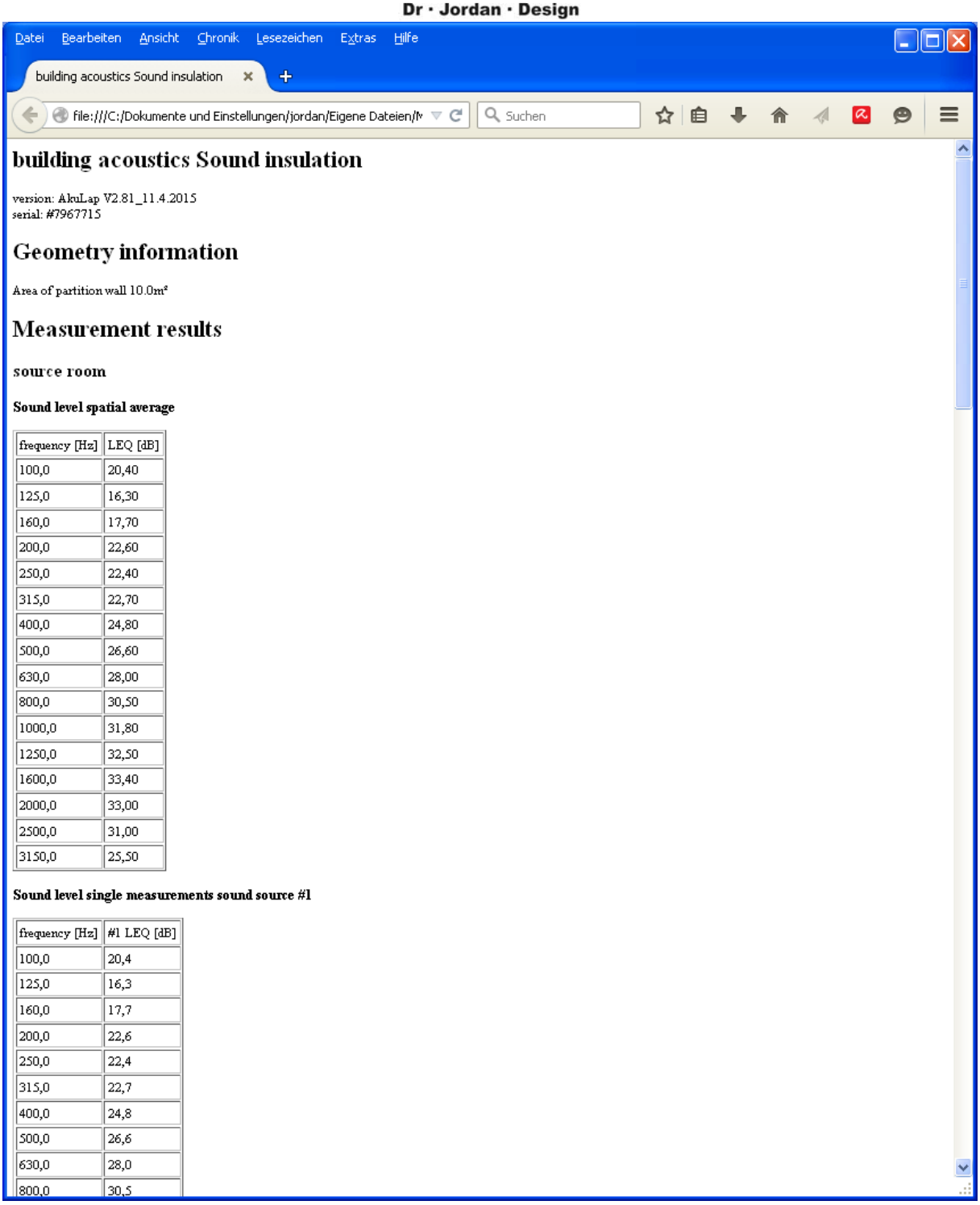
Press the calculate button.



Select a file name to store the data.



After a few seconds the Internet browser will open with the report



Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

building acoustics Sound insulation

file:///C:/Dokumente und Einstellungen/jordan/Eigene Dateien/M

Suchen

building acoustics Sound insulation

version: AkuLap V2.81_11.4.2015
serial: #7967715

Geometry information

Area of partition wall 10.0m²

Measurement results

source room

Sound level spatial average

frequency [Hz]	LEQ [dB]
100,0	20,40
125,0	16,30
160,0	17,70
200,0	22,60
250,0	22,40
315,0	22,70
400,0	24,80
500,0	26,60
630,0	28,00
800,0	30,50
1000,0	31,80
1250,0	32,50
1600,0	33,40
2000,0	33,00
2500,0	31,00
3150,0	25,50

Sound level single measurements sound source #1

frequency [Hz]	#1 LEQ [dB]
100,0	20,4
125,0	16,3
160,0	17,7
200,0	22,6
250,0	22,4
315,0	22,7
400,0	24,8
500,0	26,6
630,0	28,0
800,0	30,5

At the bottom of the report, you will find a link to the PDF report

Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

building acoustics Sound insulation

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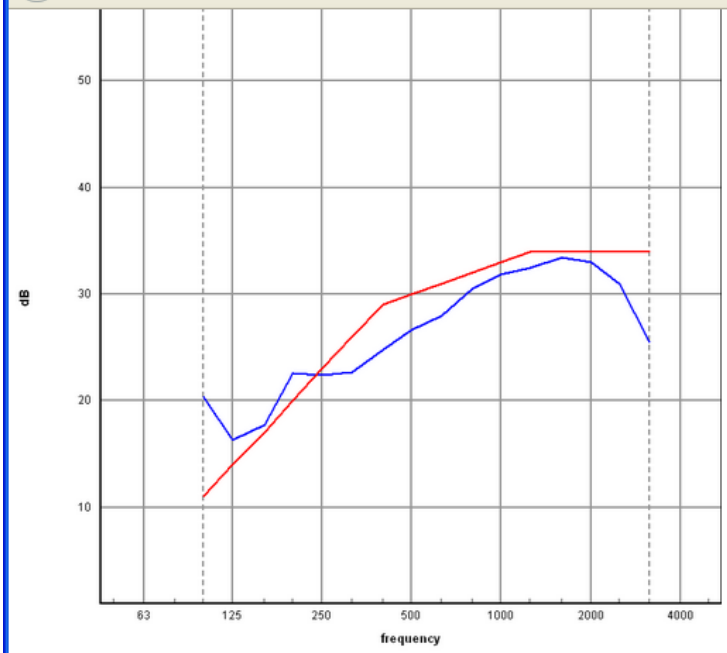
Suchen



Building sound insulation R' in 1/3-octave bands

frequency [Hz]	LEQ [dB]
100,0	20,40
125,0	16,30
160,0	17,70
200,0	22,60
250,0	22,40
315,0	22,70
400,0	24,80
500,0	26,60
630,0	28,00
800,0	30,50
1000,0	31,80
1250,0	32,50
1600,0	33,40
2000,0	33,00
2500,0	31,00
3150,0	25,50

Results as PDF file

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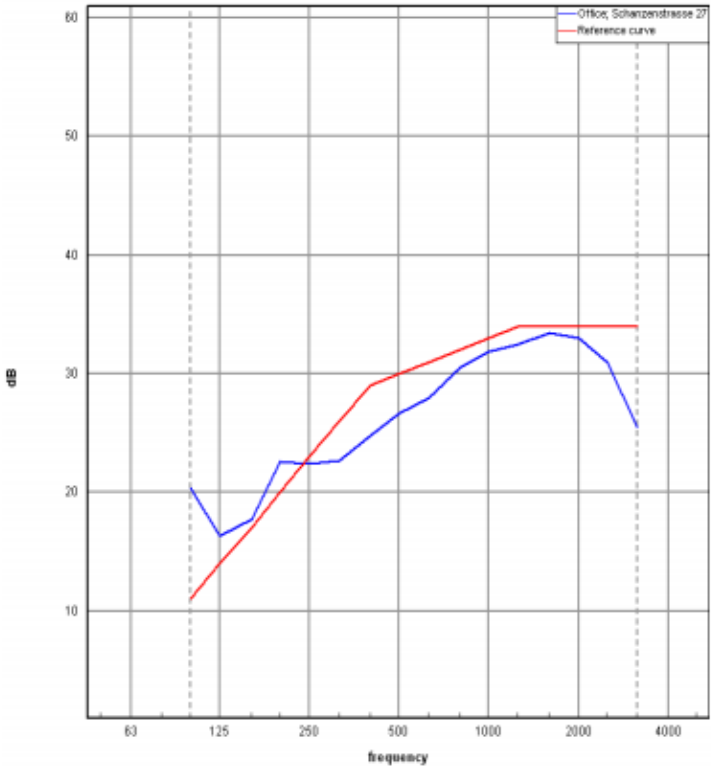
Report Air sound insulation ISO 16283-1

Information for room and setup

Room location and description	Office first floor; Schanzenstrasse 27; 01097 Dresden
Area of partition wall	10.0m²
Room capacity receiving room	100.0m³
Description wall and ceiling	Wallpapered with woodchip wallpaper
Description movable items	Curtains were open
Temperature and relative humidity	21°C 55%
Measurement equipment	**AkuLap V2.3;Microphone MTG MV210; Interface ATD-2;Loudspeaker Fostex PA578**
Sound signal	Sine-Sweep (Chirp 80Hz-12kHz)
Measurement points	3 measurement points. See attached layout map

Building sound insulation R' in 1/3-octave bands

frequency [Hz]	R' [dB]
100	20.4
125	16.3
160	17.7
200	22.6
250	22.4
315	22.7
400	24.8
500	26.6
630	28.0
800	30.5
1000	31.8
1250	32.5
1600	33.4
2000	33.0
2500	31.0
3150	25.5



Sound insulation ISO 717-1 R'w (C;Ctr): 30 (-2;-3)dB

Friday, April 17, 2015 06:40:44 / Dipl.-Ing. Alex Thomas (Thomas Acoustic Service ltd.)