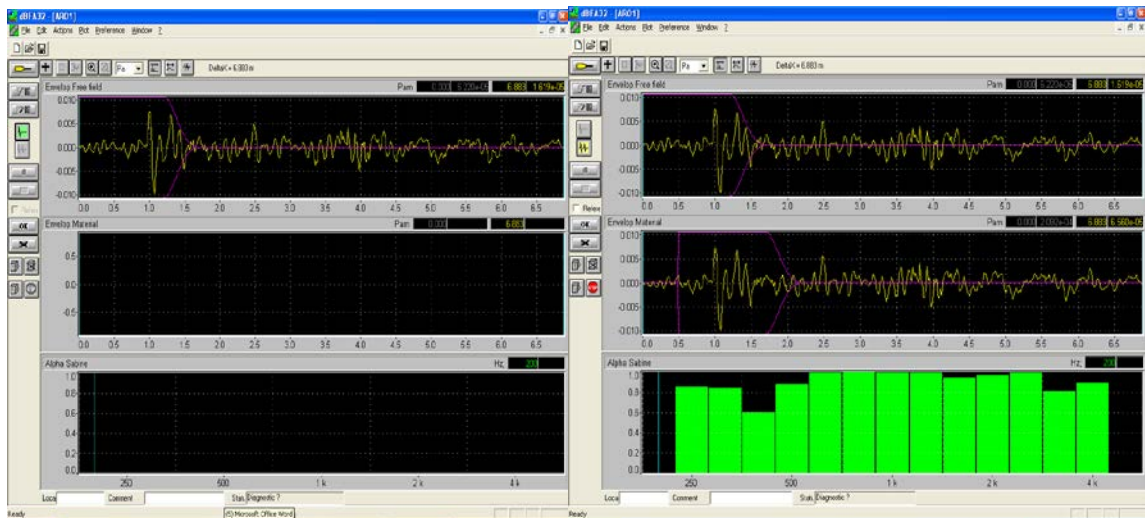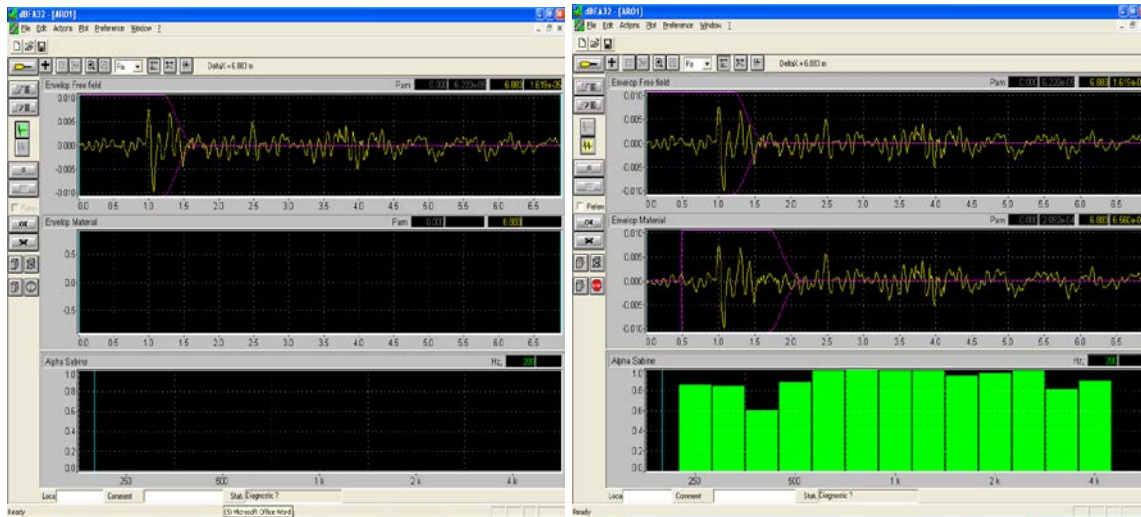# ΣΥΣΤΗΜΑ ΚΑΤΑΓΡΑΦΗΣ ΗΧΟ-ΑΠΟΡΟΦΗΤΙΚΟΤΗΤΑΣ ΟΔΟΣΤΡΩΜΑΤΩΝ ADRIENNE ΜΕ ΔΙΚΑΝΑΛΙΚΟ ΣΥΣΤΗΜΑ SYMPHONIE

How to use road adsorption with dBFA 4.611?

Hardware: Symphonie
Software: dBFA 4.611

Introduction:

Adrienne method is based on ISO/DIS 13472-1, In situ measurement for road surfaces with using 1 channel microphone, single loudspeaker and MLS signal.

In this tutorial we give you a quick startup on how to use road adsorption with symphonies 1 channel and 1 output for signal generator for MLS signal.

Please follow the procedure step-by-step.

1) HARDWARE SETUP

Complete the following steps before turning on the laptop.

- Connect the black Symphonies processor box to the laptop by using the appropriate cable and Symphonie PCMCIA serial card. The serial card slides into either one of the two serial ports located on the left side of the laptop. The other end of the cable is connected to the four-pin connection port on the backside of the Symphonies processor box. This is the side of the box with only one connection port.
- Mounting accessories as show below.
- Next, take a microphone, connect microphone to Channel 1 (In 1) and Lemo 4 pin (male) to output (out) of the black Symphonies processor box.

Now turn on the laptop computer.
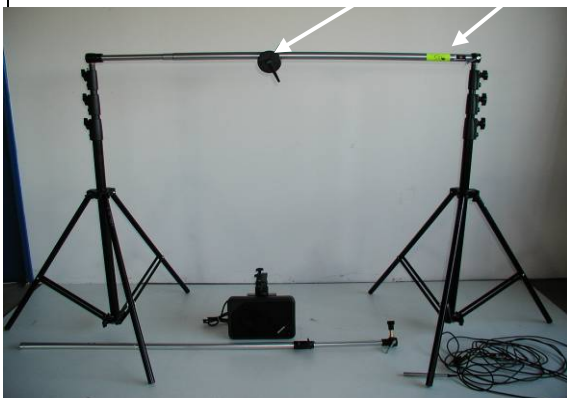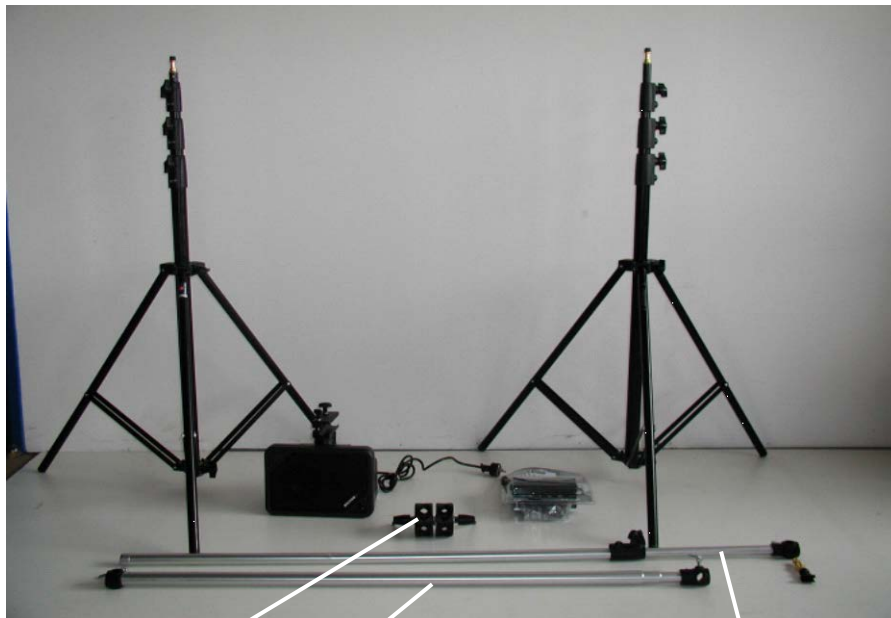
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2. Software Setup

- When the laptop has booted up and you have entered into the Windows environment find the **dBFA32** program (in Start/All Programs).

- The dBFA window will appear.
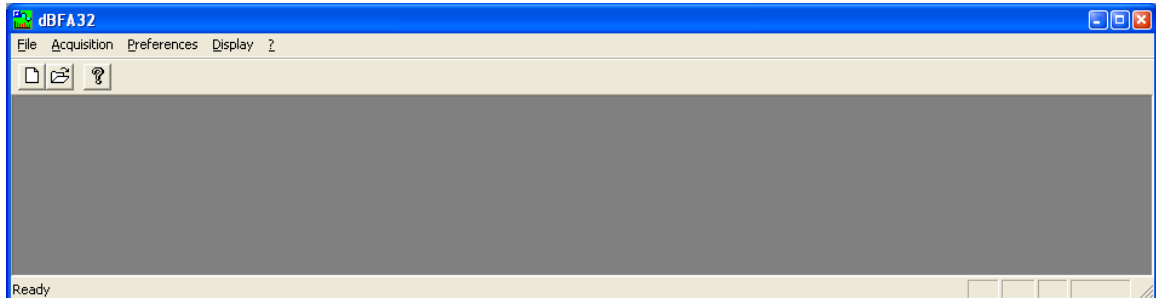
- Goto **Acquisition** then to **Hardware configuration.**
- Click **>>** to choose your Hardware peripheral: **Symphonies.**
- Highlight the hardware peripheral you will be using and click **OK**.
- Click on **Transducer** to choose a transducer (eg. **MCE 212**) for the **1st** channel input.
- Click on **Calibrator** to choose a sound calibrator (eg. **CAL 01**).
- Click on **Enable** to enable the channel.
- Click **OK** when all is done.

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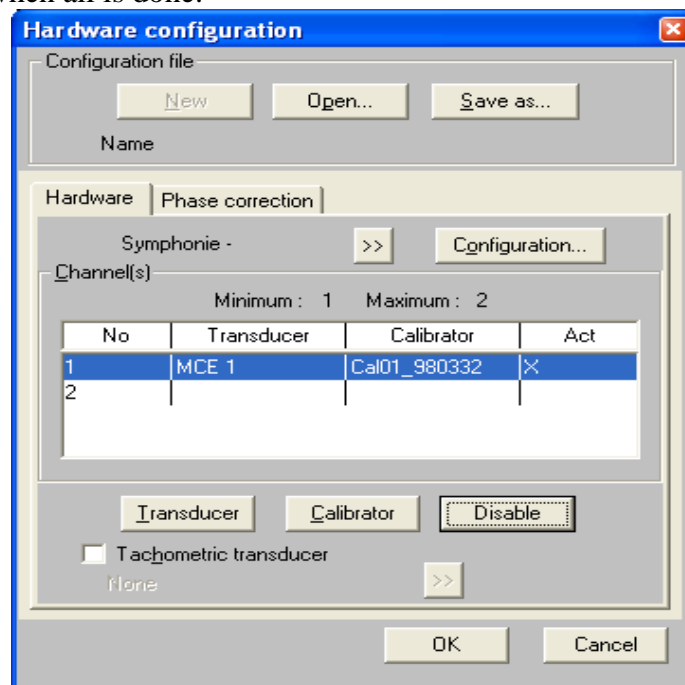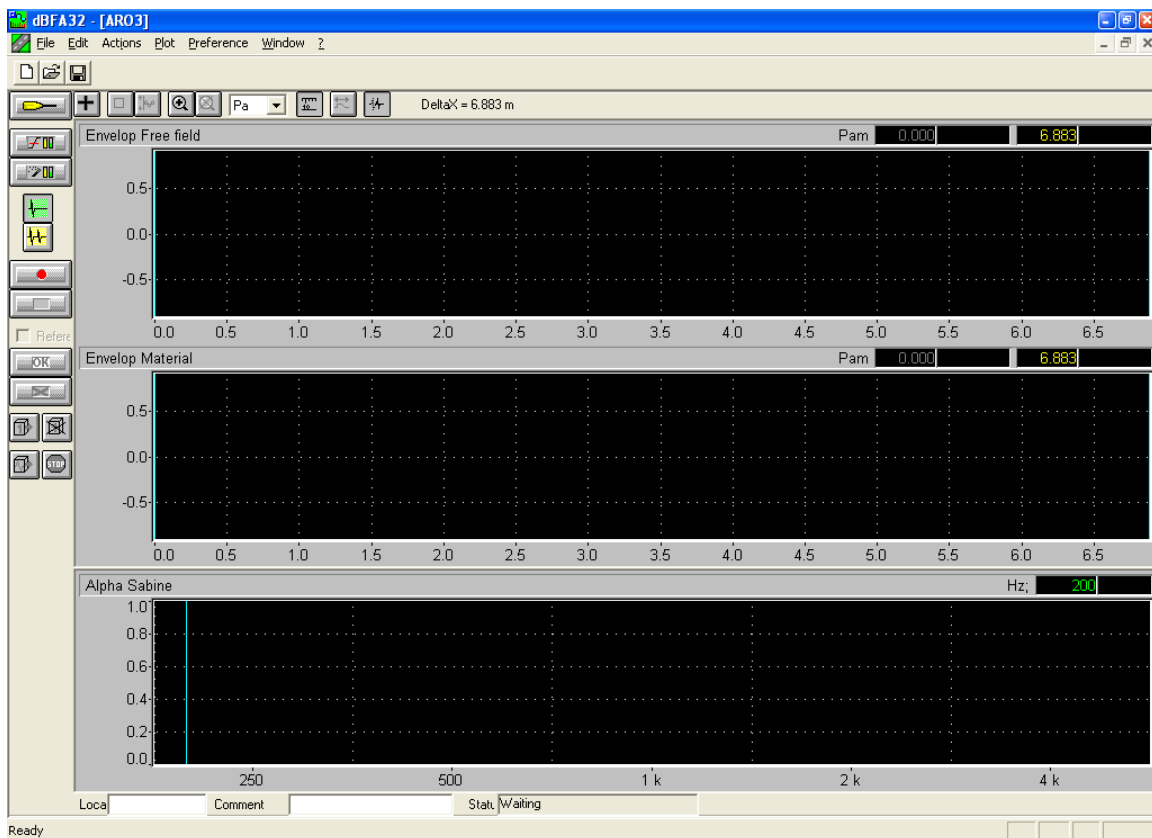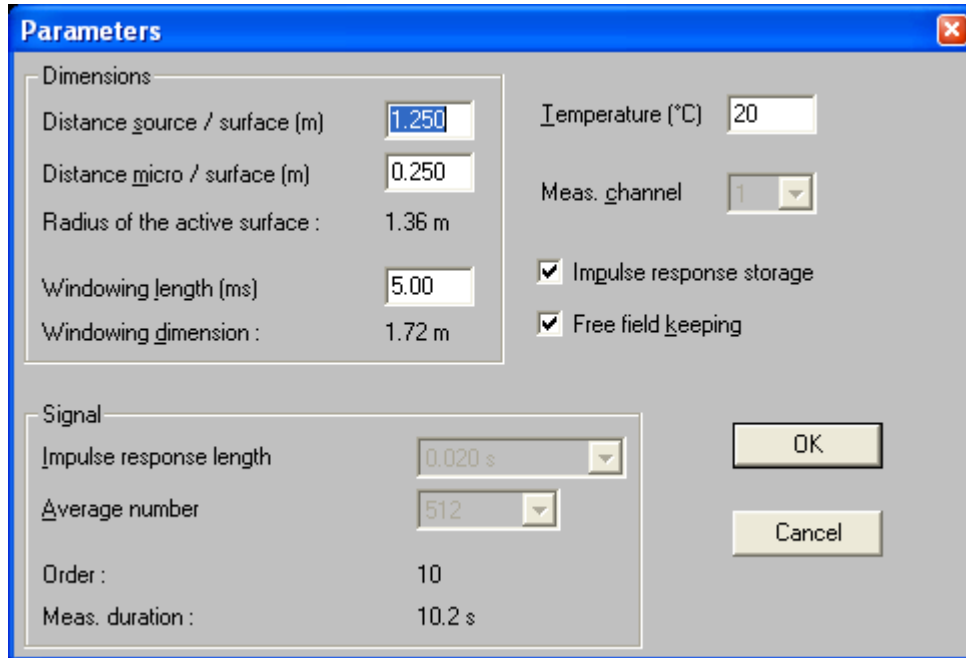Locked Bag 52 – Pusat Mel Subang Jaya – 47509 SUBANG JAYA - MALAYSIA
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- Click on the **Acquisition**.
- Choose **New measurement set-up.**
- Select **Road adsorption mode file**.
- Click **OK.**

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- Click on ▭ to define parameter.

Parameters

Dimensions

Distance source / surface (m) 1.250
Distance micro / surface (m) 0.250
Radius of the active surface : 1.36 m

Windowing length (ms) 5.00
Windowing dimension : 1.72 m

Temperature (°C) 20
Meas. channel 1

☑ Impulse response storage
☑ Free field keeping

Signal

Impulse response length 0.020 s
Average number 512

Order : 10
Meas. duration : 10.2 s

OK   Cancel

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3. Measurement

- Microphone should be facing up and speaker facing down.
- Turn on speaker power supply.
- Click on [⏵❚❚] button to perform autorange before measurement start.
- Click on [●] button for free field measurement.
- Click on [OK] button add result into .CMG file.
- Click on [✕] button to redo.
- Opposite the microphone and speaker.
- Click on [●] button for surface measurement.
- Click on [OK] button add result into .CMG file.
- Click on [✕] button to redo.
- To view the result double on each line.

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Dual channel real-time
sound and vibration
measurement system

Symphonie

01dB
Symphonie

01dB-
METRAVIB

Symphonie

Symphonie consists of one or two transducers (microphones, accelerometers or intensity probe) connected to a small acquisition unit (single or dual channel), which transfers data in real-time to a notebook computer.

Symphonie has now become a reference product in the **01dB-Metravib** offer. Its real-time performance allows simultaneous analysis in both time and frequency domains.

Symphonie replaces at the same time the traditional measurement instruments (sound level meters, frequency analysers, digital tape recorder, intensity meters, etc.).

Symphonie combines several instrument functions: Recording the raw audio signal (like a DAT recorder) while Measuring the noise level time history (like a data logging integrating sound level meter) and Showing the changing real-time frequency spectrum (like a frequency analyser).

Audio recordings can be played back directly from a time history plot through the computer sound system.

This unique availability, unique in the marketplace, guarantees a complete and powerful analysis of any noise and vibration environment.

The numerous data processing functions of **Symphonie** noise and vibration application software packages allow the user to quickly and efficiently generate a measurement report.

Main functions

A great flexibility:
- Multiple transducers: microphones, accelerometers, sound intensity probe, etc.
- Signal conditioning of most types of transducers
- Digital inputs/outputs (remote controls)
- Signal generator (white and pink noise, sinus, loop)
- Dual channel
- FFT and digital filtering Class 1 (IEC 61260)
- Manual or remote automatic calibration
- Tachometric measurements

Real-life applications:
- Noise and/or vibration monitoring
- Digital tape recorder
- Real-time spectra in octaves and third octaves from 20 Hz (option 1 Hz) to 20 kHz
- Real time spectra in narrow bands
- Sound intensity spectra and sound power determination according to ISO9614
- Transient signal analysis
- MLS acquisition mode and impulse response calculation for room acoustics analysis
- Noise source event coding
- Multitasking with external applications (weather parameters, remote access and control of the system by modem, etc.)
- Analysis down to 1/48th octave bands
- Loudness, PNL, PLNT in real-time, EPNL
- Sound quality

Hardware

The **Symphonie** hardware is a powerful two-DSP low-consumption acquisition unit powered by the Notebook PcCard (PCMCIA) interface.

The design of the unit allows the system to fulfil type 1 specifications of IEC60651 and IEC60804, while the digital filters fulfil class 0 specifications of IEC61260.

Software packages

dBENV32 : Environmental noise

The **dBENV32** environmental noise package, consisting of **dBTRIG32** (for measurement) and **dBTRAIT32** (for data processing) modules, is a powerful investigation tool that can be used for a wide range of applications, such as noise complaints, impact noise studies or surveillance of noise in urban areas, with identification and quantification of the significant noise sources. With **dBENV32**, **Symphonie** combines the features of a data logging integrating sound level meter, a digital tape recorder and a real-time frequency analyser at the same time. Overall levels can therefore be acquired simultaneously to third octave spectra and the raw signal over long periods of time.

Audio recordings are stored on the computer hard disk and may be played back through the computer sound system, for noise source identification, directly within the data processing module **dBTRAIT32**.

dBFA32 : Industry

With the **dBFA32** software package, **Symphonie** becomes a real-time narrow (FFT) and broad (1/N octaves) band analyser designed for industrial noise and vibration applications.

The **dBFA32** software suite consists of a large number of modules such as real-time analysis, digital signal recording, sound intensity and sound power measurements (according to ISO9614), transient signal and impulse response analysis for modal investigations or acquisition of an additional tachometric channel. Several analysis modules for post-processing are also available: signal editing, operations on spectra, time frequency, etc.

Symphonie complies with the legislation requirements regarding noise at the working place, noise control of industrial areas and machinery noise labelling.
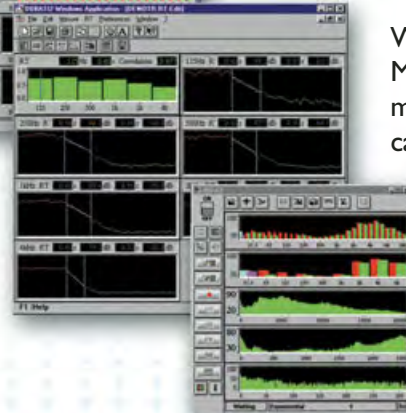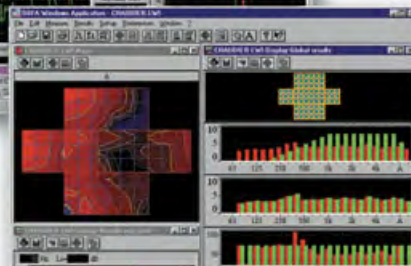
dBBATI32 : Building acoustics

With the **dBBATI32** software package, **Symphonie** becomes an efficient building acoustics analyser.

The **dBBATI32** software package allows the user to perform a complete study of any building, including reverberation time and spectrum measurements. Calculations of airborne and impact sound insulation criteria are carried out according to ISO717 specifications (and equivalent standards: ASTM, JIS, ...).

With its optional MLS acquisition mode, **dBBATI32** can also calculate most room criteria (intelligibility, etc.).

Technical specifications

General characteristics

Connection	To the computer, interface PC CARD Type II (PCMCIA)
Power supply	From the computer
Dimensions	85 x 35 x 220 mm
Weight	560 g
Computer	Pentium, RAM 16 MB, Windows 95/98 or better and PCCard Type II

Analogue section: Inputs

Impedance	1 MΩ
Coupling	DC or AC
Connections	Two 7 pin LEMO connectors
Conditioning	Microphone preamplifier (28 V -10 mA), condenser microphone (0 or 200 V), ICP accelerometer (4.3 mA), direct input for voltage signals
Counter	Tachometer (accuracy 0.02%) / TTL external input
Max. voltage	Peak to peak: 20 V, Overload protection
Phase match	< 0.1° if channel 1 gain = channel 2 gain
	< 0.5° if channel 1 gain <> channel 2 gain
Filters	High-pass filter from 0 to 10 Hz
Electrical Noise	5 dB(A)

Analogue section: A/D conversion

Resolution	18 bits sigma/delta.
Sampling	51.2 kHz max. with an oversampling factor of 64
Anti aliasing	Butterworth, 120 dB/octave
Offset	Automatic adjustment
Overmodulation	Indicated
Signal / Noise	> 90 dB per range
Amplification	Up to 65 dB in steps of 1 dB

Analogue section: Outputs

Type	Parallel during acquisition
Sampling	From 100 Hz to 51.2 kHz
Connections	One 4 pin LEMO connector
D/A converter	Dual channel 18 bit at 51.2 kHz / Sigma delta digital/analogue Synchronous recomposition per channel
Max. voltage	Peak to peak: 5 V
Other	Insert voltage for calibration reference

Digital section

Connections	Two input and two output channels
Processors	Double TMS320C31 + 1 TMS320C203
Performance	100 MFLOPS
Words	32 bit coding
SRAM	128 K x 32 bits
RAM	Dual port 48 K x 8 bits
Connector	Mini Din (PS/2)

Sound level meter mode (dBTRIG32) *

Functions	Lp, Leq, Peak, Slow, Fast, Impulse
Freq. analysis	Spectra in octaves and third octaves by digital filtering from 20 Hz up to 20 kHz in real-time
Audio	Acquisition up to 20 kHz
Weightings	A, B, C, G, Lin
Time base	Down to 20 ms in real-time, down to 1 ms in post-processing
Options	Dual-channel acquisition, 115 dB maximum dynamic range
	Digital filtering from 1 Hz to 20 kHz and overall vibration levels according to ISO2631, frequency analysis down to 1/48th octaves
	Psychoacoustics (PNL, PNLT, in real-time), expert mode, loudness/sharpness

Building acoustics mode (dBBATI32) *

Functions	Spectra acquisition, measurements and analysis of reverberation times, computation of sound insulation (ISO717, ASTM, JIS)
Freq. analysis	Spectra in octaves and third octaves by digital filtering from 12,5 Hz up to 20 kHz in real-time
Time base	Down to 20 ms in real-time, down to 1 ms in post-processing
Generator	Pink and white noise
Options	MLS signal generator, room criteria (RASTI, STI, etc.)

Analyser mode (dBFA32). Different Packages Available *

Functions	Spectra acquisition and analysis (narrow and broad bands)
	Signal acquisition and signal editing
Freq. analysis	Spectra in octaves and third octaves by digital filtering from 20 Hz up to 20 kHz in real-time
FFT analysis	Autospectra and cross-spectra (1 pass and 2 passes)
Time acquisition	Up to 20 kHz (on two channels)
Trigger	Manual, automatic or by remote control
Generator	Pink noise, white noise, sinus, loop
Results	Storage, print, copy/paste, exportation, etc.
Options	Transient analysis module, sound intensity and sound power (ISO9614) modules, signal editing, tacho recordings order analysis, MATLAB interface

See appropriate datasheet

Dual channel
Type 1 approved with dBTRIG (PTB)
115 dB dynamic range
Real-time
Multi-tasking
Multiple transducers
PC-based system

Design : S

Rev. : August 2004

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