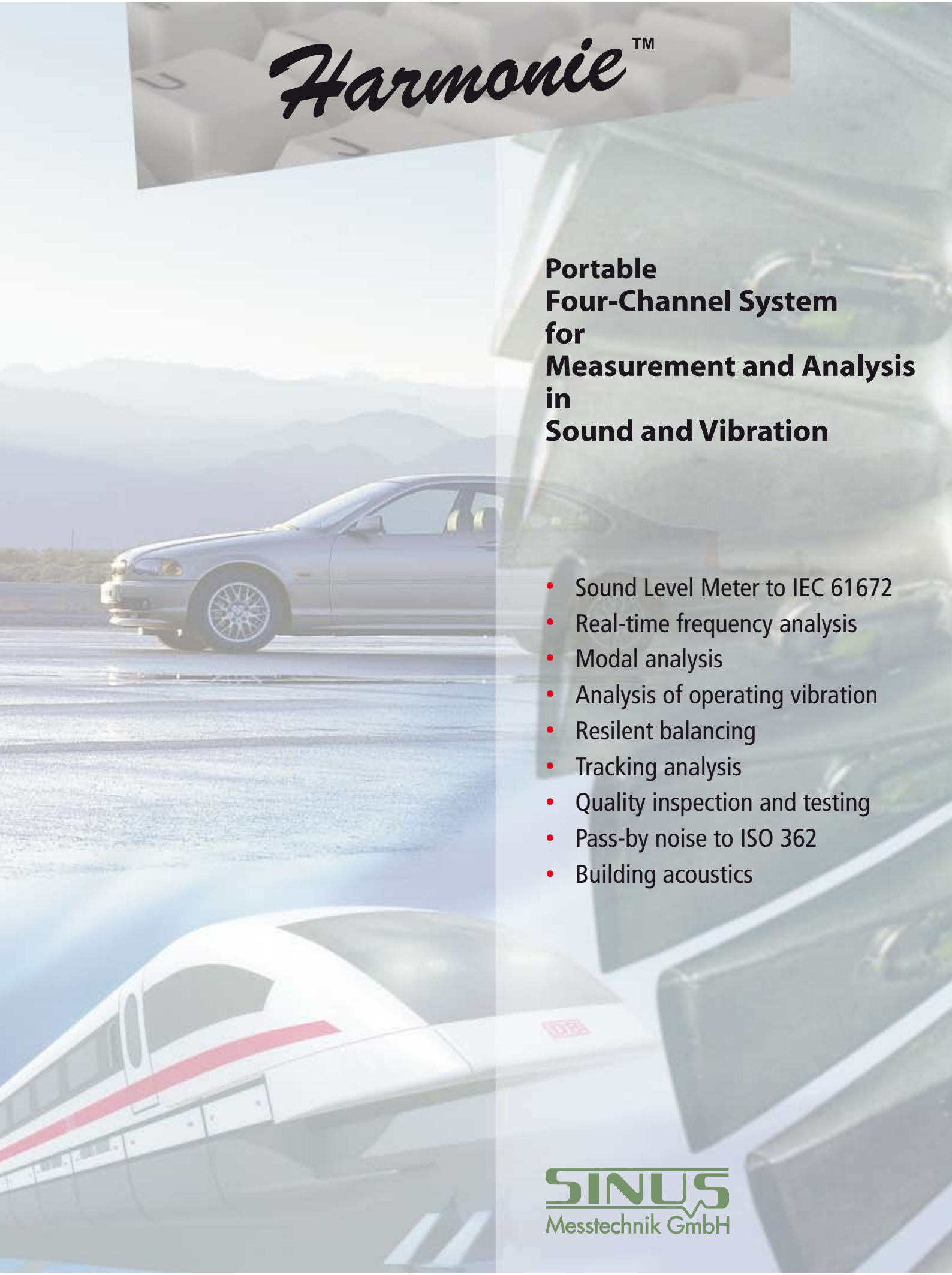
Harmonie™



Portable Four-Channel System for Measurement and Analysis in Sound and Vibration

- Sound Level Meter to IEC 61672
- Real-time frequency analysis
- Modal analysis
- Analysis of operating vibration
- Resilent balancing
- Tracking analysis
- Quality inspection and testing
- Pass-by noise to ISO 362
- Building acoustics

SINUS Messtechnik GmbH

Harmonie™

Four-Channel System for Sound and Vibration Measurement and Analysis in Mobile and Stationary Applications

This powerful and versatile system features small dimensions and minimum power consumption. Its integrated sensor interface allows commonly used sensors to be connected. It is prepared for the Smart-Sensor interface standard.

Apart from four input and output channels for highly dynamic signals, Harmonie has additional inputs for rotational speed and slowly-fluctuating operating data. This makes Harmonie especially suitable for measurements in vehicles and on test stands.

Harmonie was developed for use in the following fields:

- Car manufacturer and their subcontractors
  - Design and development
  - Quality assurance
- Engineering services
- Environmental and labor protection

- **Frequency analysis**

  Real-time 1/1-1/3 oct band analysis, FFT, auto and cross spectra, transfer function, coherence • Cantilever to ISO 9052 • Transient analysis module • Psychoacoustics module • Sound recording

- **Sound intensity**

  Active and reactive in real-time • Determination of sound power according to DIN ISO 9614 • Real-time FFT • Sound recording

- **Building acoustics**

  Airborne and impact sound transmission lost to ISO 717, ISO 140, DIN 52210 • Measurement of reverberation time by the noise, pulse and sweep sine methods • Real-time 1/1-1/3 oct bands • Signal generator • Sound recording

- **Environmental noise measurement**

  Noise monitoring • Long-term measuring system • Real-time 1/1-1/3 oct bands • Triggered sound recording • Approved for verification

With SAMURAI™ SINUS Messtechnik offers a complete modular software package for noise and vibration measurement & analysis. Additional we offer from competent partners a wide range of application software. The driver interface for Windows2000/XP allows to create customized software through the user.

Through its standardised interface (PCMCIA), Harmonie can work together with any common notebook or PC under Windows®.

- **Modal analysis**

  Geometry editor • SDOF, MDOF and Handfit • Structure modification
- **Analysis of operating vibration**

  Determination of vibration modes in frequency and time • Visualisation by geometry and animation modules
- **Resilient balancing**
- **Tracking analysis**

  Measurement of vibration and speed signals • Evaluation and visualisation of waveforms, tracking and FFT spectra as well as 1/1-1/3 oct-band spectra • 3D-waterfall and colour graphs
- **Passing-by noise to ISO 362**
- **Quality inspection and testing**
- **SINUS Measurement Toolbox for MATLAB**

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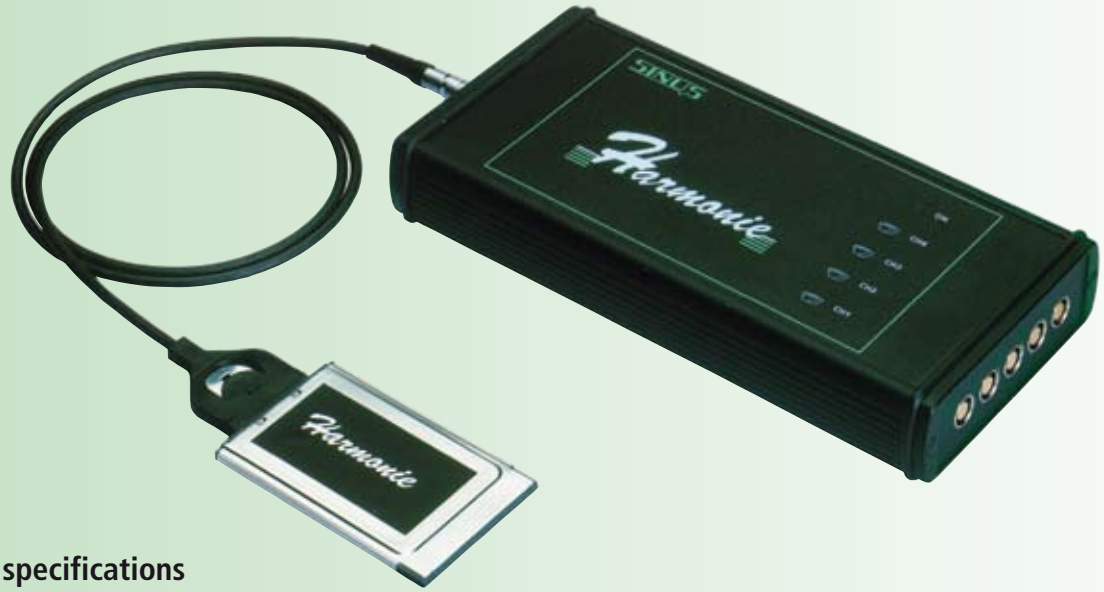
Technical Specification

- **Class 1 to IEC 651 / 804 / 61672**
- **4 input channels for microphones and ICP sensors**
- **120 dB dynamic range for measurements in two channels, each with two inputs in cascade**
- **5 additional channles for slowly fluctuating data, e.g. temperature**
- **2 speed inputs (1/10 Hz... 100 kHz: TTL level; 1/60 Hz ... 1 MHz: ±10 V)**
- **4 output channels**
- **Integrated signal conditioning**
- **20 Bit ADC**
- **Sampling rate per channel 48 kHz/ 51.2 kHz / 96 kHz / 102.4 kHz**



Technical specifications

Input channels 1-4:

Resolution:	16 bit in four-channel mode 20 bit in two-channel mode
Real-time bandwidth	40 kHz
THD+N	> 80 dB
Cross-talk attenuation	> 80 dB
Noise	< 1.4 µV (A) < 2.2 µV (lin. 20 Hz...20 kHz)
Sampling rate	48 kHz or 51.2 kHz
Digital splitting factor	1/2/4/8... 1024 (via DSP)
Anti-aliasing filter	yes (0...22.4kHz)
Max input voltage	V_{Peak} (overmodulation reserve 1dB)
Amplification	-20 dB ... 40 dB in 40 dB steps
Overload detection	indicator for out-of-band frequency
Phase mismatch	< 0.1° at gain –20 dB (20 Hz ... 20 kHz)
Offset adjust	yes
Input filter	DC, AC 0.15 Hz, HP 10 Hz, LP 2 kHz
Channel cascading for dynamic expansion	channel 1-2, channel 3-4
Sensor power supply	microphone ±14 V, +200 V; ICP: 2 mA
Support of IEEE P1451.4	yes

Input channels 5-11: (channels in combination with digital I/O)

Resolution:	12 bit
Sampling rate	total 50 Hz (100 Hz, 200 Hz)
Input voltage	0...15 V for 5 channels
Input resistance	12 kOhm for channels 5-9 2.5 kOhm for channel 10 and 11

Output channels 1-4:

Sampling rate	48 kHz or 51.2 kHz
Bandwidth	0...22.4 kHz
Max. output voltage	±3.16 Vpeak
Attenuation	+10 dB...-50 dB in 1dB steps

Speed Input:

Frequency	1/60 Hz...1 MHz
Input voltage	min TTL, max +15 V

Remote control/ Trigger interface:

Inputs	2 (1 in combination with speed)
Input voltage	min TTL, max +15V
Outputs	2 (in combination with input 8 and 9)
Output voltage	5 V/Off

Connector/Plug:

Input channels 1-4	4 x LEMO7
Output channels 1-4	2 x 6.3 mm stereo jack
Input channels 5-11,speed, remote control,trigger	1 x LEMO8

Power supplies:

Via PCMCIA interface	5 V @ 380 mA

Weights and measures:

Dimensions	215 x 100 x 35 mm³
Weight	750 g

Environmental conditions:

Temperature range	-10°C...+40°C
Humidity	30...90%

Interface:

Notebook/ PC	PCMCIA
Alternative hardware	Harmonie-PCI or Soundbook

System includes:

- Signal processing unit
- PCMCIA card with connecting cable
- Software package with options

Wide range of accessories available

SINUS Messtechnik GmbH

SINUS Messtechnik GmbH, Foepplstrasse 13, D-04347 Leipzig, Tel 0049-341-244290, Fax 0049-341-2442999, www.sinusmess.de