

VERIFICATION AND TRACEABILITY OF SOUND AND VIBRATION MEASURING INSTRUMENTS



SCS 9001 test bench typical setup

SCS 9001 SYSTEM TO PERFORM COMPLETE CHECK OF:

Sound Level Meter, Noise Dose meters, 1/1 and 1/3 octave Analyzers, Acoustic Calibrators, Microphones and Preamplifiers, DAT Recorders, Vibration Transducers and Vibration Calibrators, Signal Conditioners

ACCORDING TO STANDARDS:

EN 60651, EN 60804, EN 61260, IEC 1672, IEC 225, ANSI S1-4-71, ANSI S1-11-86, BS 5969-81, BS 6698-86

SYSTEM DESCRIPTION

From the first DOS release SCS 9001 in 1994, to the present MS-Windows[®] version, a lot of new features have been added, but in the meantime the system has become much more compact and simple.

The SR-DS360 synthesizer and the high precision reference voltmeter are PC driven through the EEE-488 interface, to generate and measure all the test signals required for the SLM test: RMS levels, crest factors, frequency response, weighting filters, polarisation voltages, etc. The SCS 5013A Front End provides the preamplifier power supply, the low noise amplifier and attenuator, the electrostatic actuator driver. A pistonphone is the class 0 "Acoustic Source Reference".



SCS 5013A Front-end: heart of the SCS 9001 System

ACOUSTIC: MAIN PROCEDURES IMPLEMENTED

Sound Level Meters are electrically tested using the Synthesizer and the Reference Voltmeter for: Full scale attenuation, Self noise, Primary range linearity, Weighting filters, RMS time constant, Peak detector, Averaging, Overload detector.

The **Microphone** test can be performed using an Acoustic coupler by which two microphones are mounted face to face, one of them being the reference; or - alternatively - with an Electrostatic Actuator providing special insulated Microphone grids to be fitted on the microphone under test.

Filters are tested over 17 frequency points, as well as the Filter Response Time according to EN 61260; a supplementary generator is required to generate a test signal up to 250 kHz.



Official certificate specimen (multilanguage)

Calibrators are tested for exact level generated using an Insert Voltage Preamplifier: the actual output frequency and THD can be measured with a THD meter or an FFT Analyzer.

The **Software** interface guides the operator through all the tests and during the compilation of results files, which are automatically read by MS Word for test report generation. Result data are stored in an internal MS Access based data base.

- EASY TO USE AND RELIABLE
- SOUND LEVEL METER AND INTEGRATING SLM
- NOISE DOSE METERS
- 1/1, 1/3 AND 1/N OCTAVE ANALYZERS
- ACOUSTIC CALIBRATORS
- MICROPHONES AND PREAMPLIFIERS
- DAT RECORDERS
- STANDARDS: IEC 651, IEC 804, IEC 1672, IEC 225, IEC 1260, ANSI S1-4-71, ANSI S1-11-86, BS 5969-81, BS 6698-86
- MICROPHONE FREQUENCY RESPONSE TRACING WITH ELECTROSTATIC ACTUATOR OR ACOUSTIC COUPLER
- EXTENSION FOR ACCELEROMETERS SENSITIVITY AND FREQUENCY RESPONSE

ACOUSTIC: procedures details

SOUND LEVEL METER ACOUSTICAL TEST

Sensitivity adjustment

Frequency response

SOUND LEVEL METER ELECTRICAL TEST

A weighting, Lp reading

Autogenerated Self Noise

Linearity Test in the Primary and Secondary Fields

Frequency weighting

Temporal weighting (S, F, I)

RMS Detector

Peak Detector

Temporal Average

Impulse Dynamic Field

Overload Indicator

MICROPHONE ACOUSTICAL TEST

Absolute Sensitivity

Frequency response

CALIBRATORS ACOUSTICAL TEST

Generated Sound Pressure Level

Calibrator Frequency and Distortion

FILTERS VERIFICATION

Relative attenuation

Linear Operating Range

Real-time Operation

Anti-alias filters

Summation of output filters

VIBRATION: procedures details

TRANSDUCER TEST

Absolute Sensitivity

Frequency response

CALIBRATOR TEST

Generated Vibration Level

Calibrator Frequency and Distortion

SCS 9001 SYSTEM (OPTIONALLY) EXTENDED FOR VIBRATION MEASUREMENTS

Accelerometers traceability, Vibration calibrators, Force transducers, Velocimeters, etc.

VIBRATION:

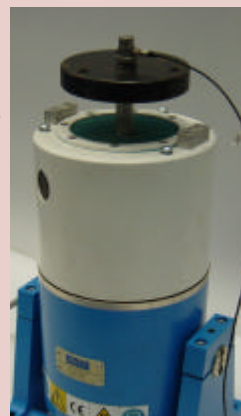
MAIN PROCEDURES IMPLEMENTED

Accelerometers are tested using the Synthesizer, the Reference Voltmeter and a Reference transducer in a back-to-back or side-by-side configuration, using an electrodynamic shaker as a vibration source.

Frequency response and sensitivity can be tested with "unlimited" frequency step.

Linearity range is verified by automatically repeating the test at different vibration excitation levels in "unlimited" resolution step.

Several accelerometers can be traced at the same time, providing a suitable shaker fixture and necessary Force level.



Electrodynamic shaker with testing transducer in back-to-back configuration



SCS 9001 COMPONENTS

ACOUSTIC

DS 360 synthesizer

Agilent or Keythley Multimeter

SCS 5013A Front-end

GRAS or BK Reference microphone

GRAS or BK Reference Pistonphone

GRAS electrostatic actuator (and/or)

BK acoustic coupler

GRAS insert voltage preamplifier

SCS 8200 software series

Standard PC with IEEE 488 interface

Accessories and 19" standard rack

VIBRATION (add on)

Reference accelerometer

MESA C14 low noise signal conditioner

200 N Electrodynamic shaker

SCS shaker fixture

SCS 8200 software series

World wide operations: EU, USA, ASIA

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