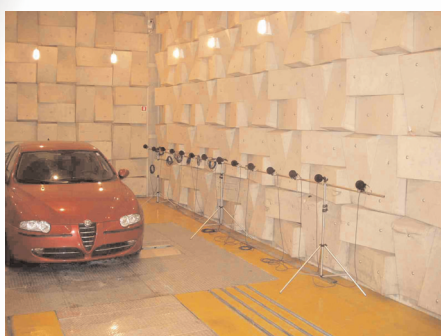


VEHICLES PASS-BY NOISE

- ISO STANDARD FOR OUTDOOR TESTING
- INDOOR TESTING PROCEDURES
- ON BOARD TESTING SYNCHRONIZATION
- RADAR OR GPS VEHICLE POSITION



Indoor pass-by noise testing



Outdoor pass-by noise testing

The SCS 9005 dedicated system is built around "market available" Real Time Analyzers with Audio recording features and it becomes possible to use all analysis power to further post-processing recorded data.

Outdoor Pass-by noise measurements ruled by noise standard, are approached experimentally by realizing Pass-by, Coast-by and in vehicle measurements (cabin noise) of the sound pressure level. In most cases car manufacturers do not only want to check that the vehicle conforms or not to the regulations, they also desire to be able to analyze measurement results within the framework of research and development studies.

The aim is to identify potential sources of noise: engine, power train, tire or airborne related and to reduce it. The simultaneous feature of pass-by and on-vehicle noise measurement would help a lot in performing those trouble shooting tasks.

The **SCS-9005 Version 6** system features a portable 4 to 16 channels Real Time Analyzer, a dedicated software and a full range of accessories to measure rpm, speed, position, centre line vehicle positioning, meteorological conditions, others.

The user interface is tailored to Engineers need for fast testing and exhaustive data analysis.).

Automatic measurement according to ISO 362 - 1998 (E) and ISO 13325 - 2002 (E)
Audio Signal recording and Playback

Automatic report of dBA Level and Spectra vs position or rpm

Signal editing and Post processing functions: dBA levels and spectra vs. position, rpm, speed, FFT, 1/n analysis, Order tracking, etc.

Unique Center line control feature with On-board display

Unique option for simultaneous pass-by, Cabin Noise measurement and analysis

Portable and self contained, Battery operation

Windows Outlook Explorer and MS Access data base

Real time WEB data transfer

Radar and/or GPS (evolution) position determination

On-board Noise & Vibration Sources (Cabin Noise) and Pass-by synchronization option

Performing a Pass-by test in combination with some kind of cabin noise measurements, helps for source identification and requires two separated Real Time Analyzers, on board and on ground.

Users can actually have 2 options: a single RTA which can be alternatively used for pass-by or for cabin noise, or 2 independent systems which can work simultaneously and synchronized using rpm or wheel speed information.

All the rest of the system "is exactly the same", i.e. same Front ends, same signals, same connectors and cables, etc.

RPM signals (or wheel) are analogically recorded as audio track and it becomes possible to perform order tracking as well as other available functions on post processing of microphones recorded audio signals.

Standard calculations are: overall, 1/n octaves, FFT, Order tracking, Articulation Index, etc. while a complete analysis package is also available.

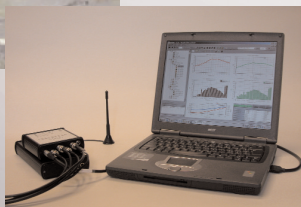
Data from Cabin noise are stored together with Pass-by data and can be viewed and compared in Post Processing.

Standardized reports are available: dBA, nth order, 1/n octaves, Articulation index vs rpm or speed or position, Overall levels (dBA) vs rpm or speed

Customizations are made for each individual customer needs.



Standard system full option



Reduced version for fast survey

Vehicle Pass-by Noise

SCS 9005

INDOOR Pass-by Noise Testing

Outdoor testing is always influenced by meteo conditions, background noise and other kind of disturbing situation, that is why it is suitable to possibly perform such test in some standard conditions steel meeting the ISO 362 requirements.

Pass-by noise measurements can actually being simulated indoor using a suitable hemi-anechoic chamber, a roller dynamometer bench and a microphones array. Noise data are acquired in synchronous with the rollers rotation while the vehicle is accelerating on them, like during the outdoor pass-by noise testing.

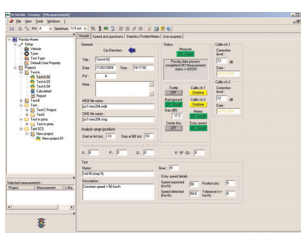
A specific data analysis procedure is applied to correct for the different test conditions and meet the ISO 362 requirements in simulation. The relevant portion of noise data recorded by each single microphone (time sequence) are streamed in a single audio trace simulating the vehicle moving along a line. Other correction required are also for doppler effects and for distance when the hemi-anechoic chamber does not allowed the 7.5m lateral distance between the microphones and the center line.

All features of the SCS 9005 pass-by noise and cabin noise measurement and analysis are kept for the *Indoor* simulation

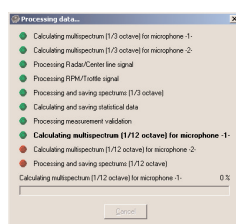


Reference microphones

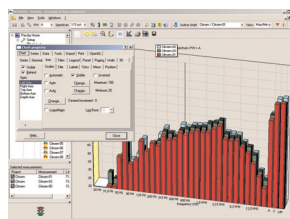
Software SCS 8500 (for System 9005)



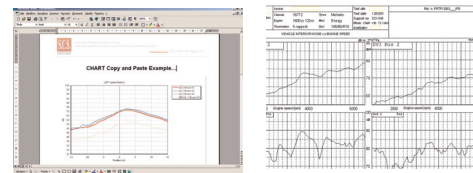
Test configuration and Explorer



Test running and Status



Data results



Automatic and standardized Reporting

Measurement set up and equipment (preferred)

SCS 5095

Pass-By Control Unit (Field)
Conditioning input & infrared photocells
Conditioning input for radar option
Digital TTL output
2 Analog output
FM telemetry Transceiver
Power supply and Battery charger
16 Status led's
Display for RPM and speed
Centre line conditioning input
Meteo station connector (SUB-D 9 pin)
UHF antenna



SCS 5098

Pass-By On-board unit
Display for RPM and Speed
6 status leds
Bar-Graph center line alignment indicator
Conditioning input (RPM, Wheel, Throttle)
Serial port for unit setup
Input connector for Center line Tracking sensor
Tracking sensor with double sucker handle
Telemetry transceiver with CAN bus port



All the information are sent either via cables or telemetry to the test system. Signals are pre-processed by the SCS-5098 (on board) and SCS-5095 Front End (on field) and fed to the 4 channel Real Time portable analyzer. All devices are battery powered which is essential when performing outdoor measurements.

HARDWARE:

Base unit: SCS 5095
On Board unit: SCS 5098
ANALYZER: Minimum 4 channels 18-24 bits EN 60651/60804 class 1 type, Audio Record, FFT & 1/n octave, MS-Access data-base, optional Order-analysis, Psychoacoustic.
MICROPHONES: 1/2" Condenser Electret, 1/2" Preamplifier Lemo 1B 7pin (ICP option), Windscreens, cables
NOTEBOOK PC PIII or better WIN 2000/XP-Pro, english version
VEHICLE POSITIONING SYSTEM: GPS or RADAR - Alternatively: WHEEL option - Rotational encoder
CENTER LINE ULTRASONIC sensor with mounting material, Adjustable Stand, Cable Drum (20m)
MEASUREMENT START/STOP Light barriers
ENGINE RPM sensor: Reflective Photocell or Cigarette lighter adaptor

SOFTWARE:

DEDICATED SOFTWARE PASS-BY 6, CABIN 1 Option for Cabin Noise measurement
User defined reports (Microsoft Word format)
User friendly chart. User can customize graph aspect (scale, titles, colors, fonts, labels, legend, cursor, ...)
Export chart to clipboard or file (bmp, jpg, ...)
Export data to/from wav, cmg, dat, hdf, avi, etc.
User defined property. The user can define new property and link it to projects or measurements.
CANBUS data are temporarily stored in the On Board Unit memory and than transmitted to the Main Unit (Field unit)
Automatic shift vehicles are tracked through the CanBus data
ICP microphones support and simple cabling system
Traffic light connected to the system for single operator use
Automatic control of acceleration/speed profiles in Run-up / Coast-down Trottle position recording.



euroAcoustic

World wide operations: EU, USA, ASIA

Italy Headquarter
10051 Avigliana (TO) 35011 Campodarsego PD)
Via Gandhi, 13 Via Antoniana, 278
Tel.: +39.011.9348705 Tel.: +39.049.9200975
Fax: +39.011.9348703 Fax: +39.049.9201239

Your Local Representative:

www.scs-controlsys.com info@scs-controlsys.com