

Product and Measurement Solutions

for the Automotive Industry



Car body and vehicle related measurement solutions

P.4-5

Acceleration noise measurement

Acceleration Noise Measurement System

Measurement of sound absorption coefficient of road surface

Road Surface Sound Absorption Coefficient Measurement System

Experimental mode analysis of automobile body

Mode Analysis System (ME'Scope VES)

Automobile body sound source localization

Sound Source Localization System

Engine related measurement solutions

P.6-7

Analysis of noise and vibrations related to engine rotation

Order Tracking Analysis System

Inspection of transmission vibrations and noise

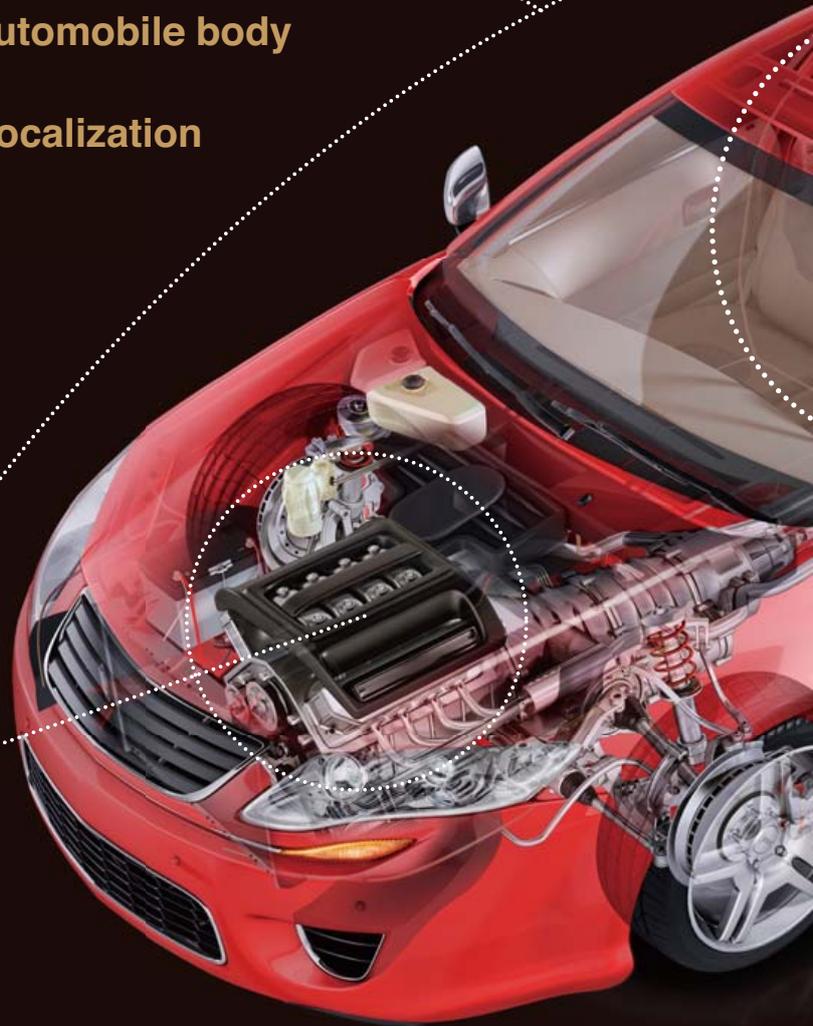
Gear Tester Evaluation System

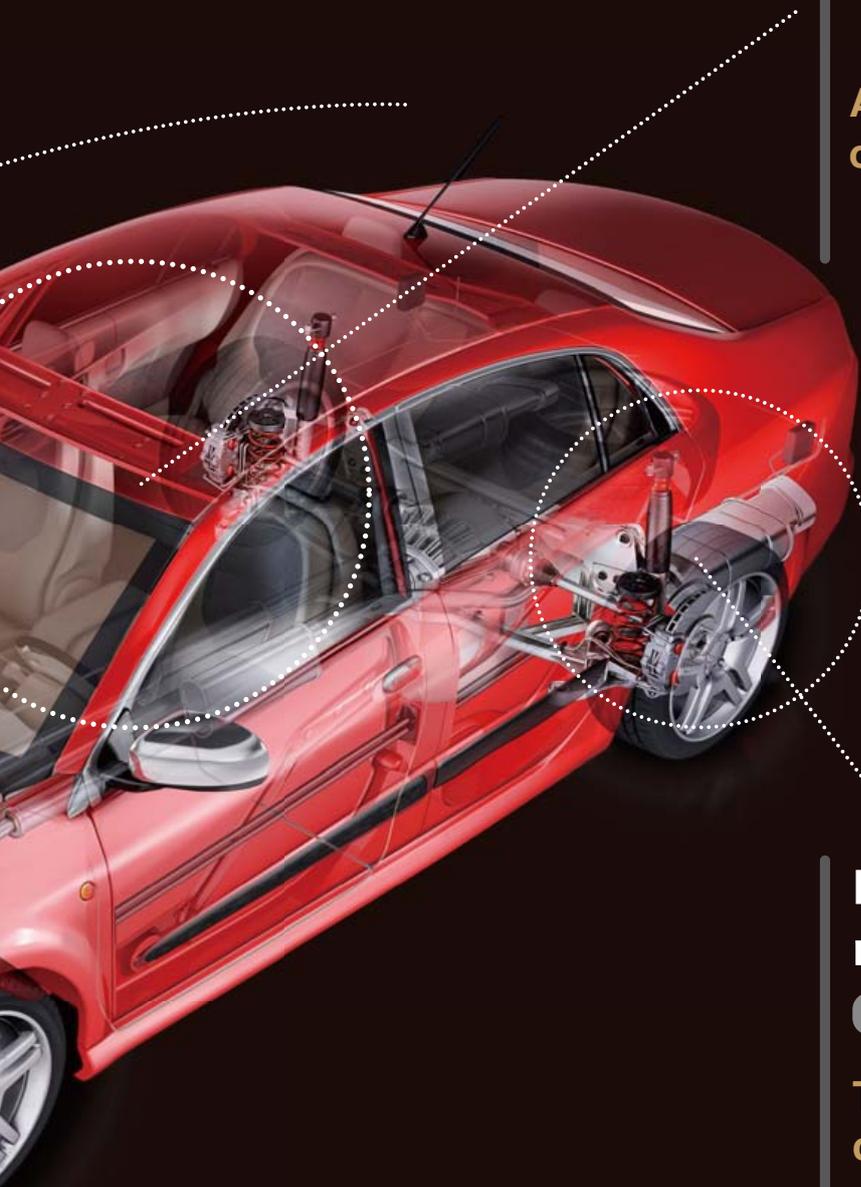
Cylinder head volume measurement

Acoustical Capacity Meter

Combustion chamber volume measurement

Acoustical Capacity Meter





Car interior comfort related measurement solutions

P.8

Psychoacoustic evaluation

Sound Quality Assessment

Measurement System

Acoustic characteristics testing of interior materials

Vertical Incident Absorption Coefficient

Measurement System

Exhaust system related measurement solutions

P.9

Testing of muffler acoustic characteristics

Muffler Sound Reduction Index

Measurement System

Information about the RIONOTE Multifunction Measurement System and the Multi-Channel Signal Analyzer SA-02

P.10

Information about piezoelectric accelerometer and measurement microphone products

P.11

Other product information

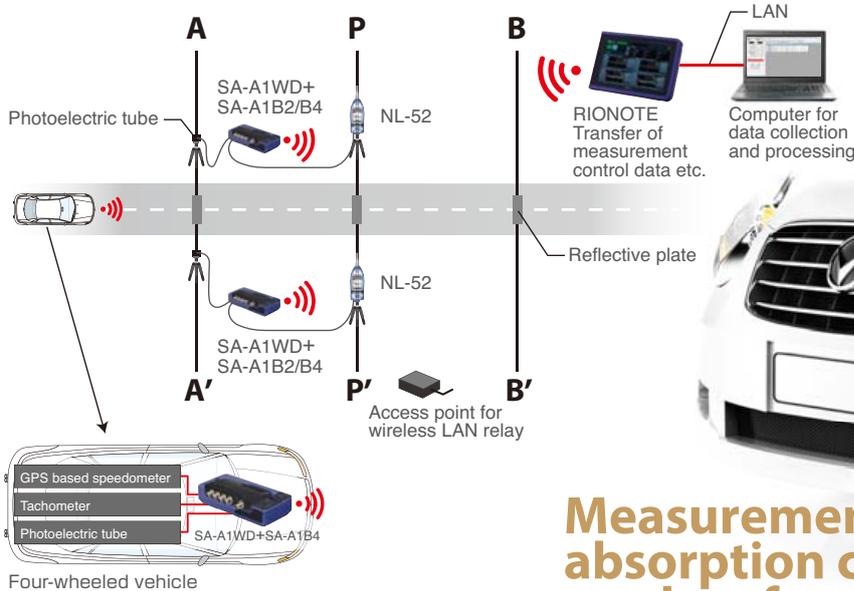
P.12

Car body and vehicle related measurement solutions

Acceleration noise measurement

[Acceleration Noise Measurement System]

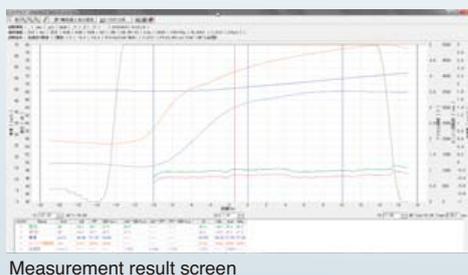
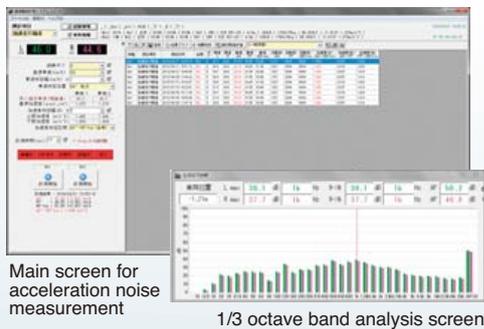
The Acceleration Noise Measurement System can perform measurement in compliance with the international standards ISO 362 and R51-03 which define accepted methods for assessing acceleration noise in four-wheeled vehicles.



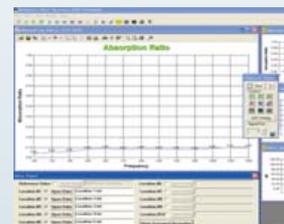
Measurement of sound absorption coefficient of road surface

[Road Surface Sound Absorption Coefficient Measurement System]

Measurement of noise emitted by road vehicles requires a standard test track as specified in ISO 10844 (JIS D 8301). The test method for in situ measurement of the sound absorption coefficient is specified by ISO 13472-2:2010. This measurement system complies with these requirements. By simply placing the acoustic duct on the track surface, the sound absorption coefficient can be measured quickly, making the system optimal for measurements during construction of a standard track, as well as for aging measurements.



Measurement system configuration

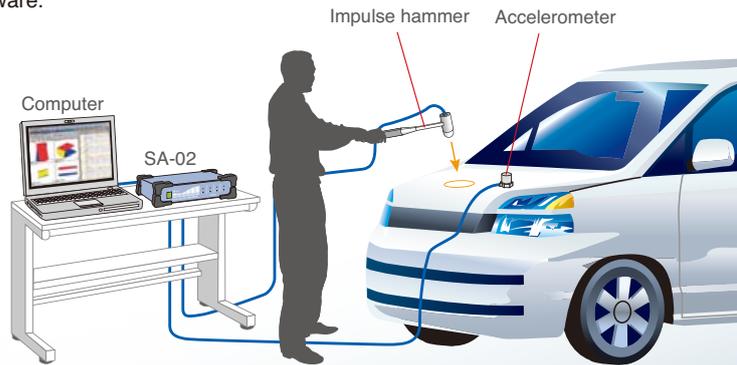
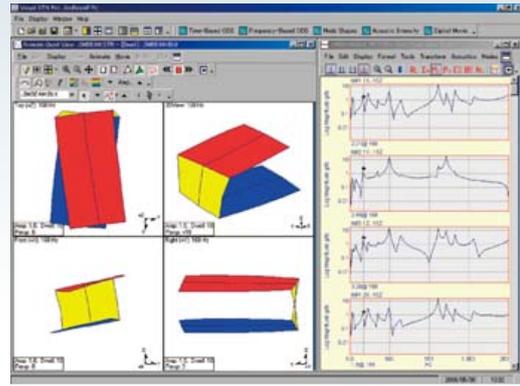


Sound absorption measurement result screen

Experimental mode analysis of automobile body

【Mode Analysis System (ME'Scope VES)】

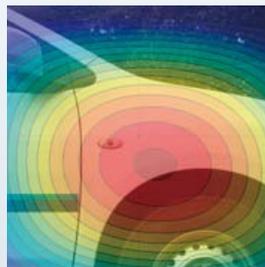
In order to control car body vibrations or to establish a fatigue life prognosis, knowing the natural frequency, vibration mode, and similar characteristics is a key requirement. This system makes it easy to perform continuous operation from measurement to analysis and animation by using the Multi-Channel Signal Analyzer SA-02, mode analysis software (ME'Scope VES), and mode analysis direct link software.



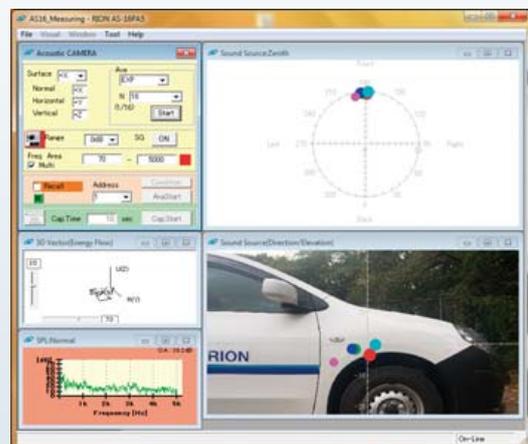
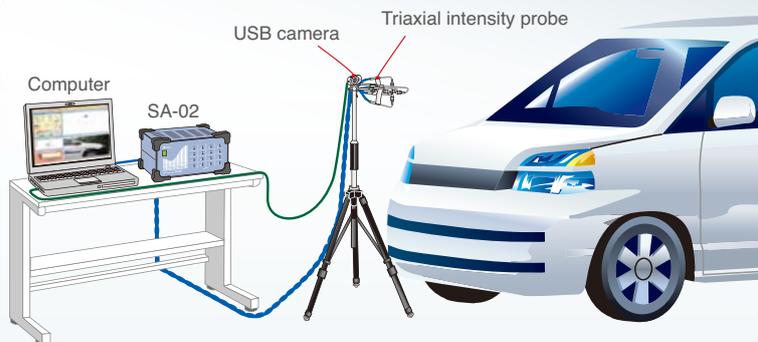
Automobile body sound source localization

【Sound Source Localization System】

This system allows displaying the incidence direction of a sound in real time. Using the triaxial acoustic intensity probe facilitates operation and enables the realization of sound source localization measurement at low cost. The frequency band (range) to analyze can be selected, and the optional video recording function also supports sound source identification.



Contour diagram (measured with AS-15PA5, a separate product)



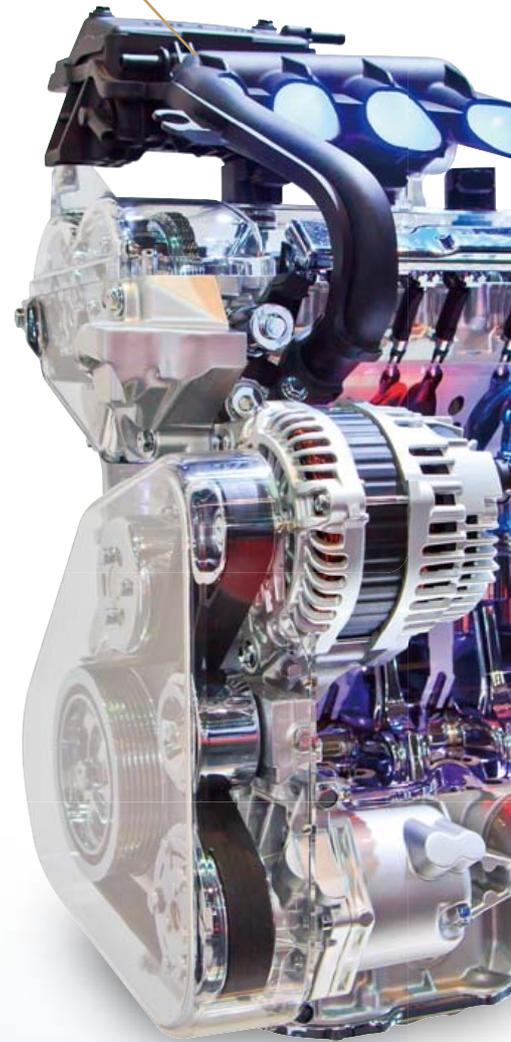
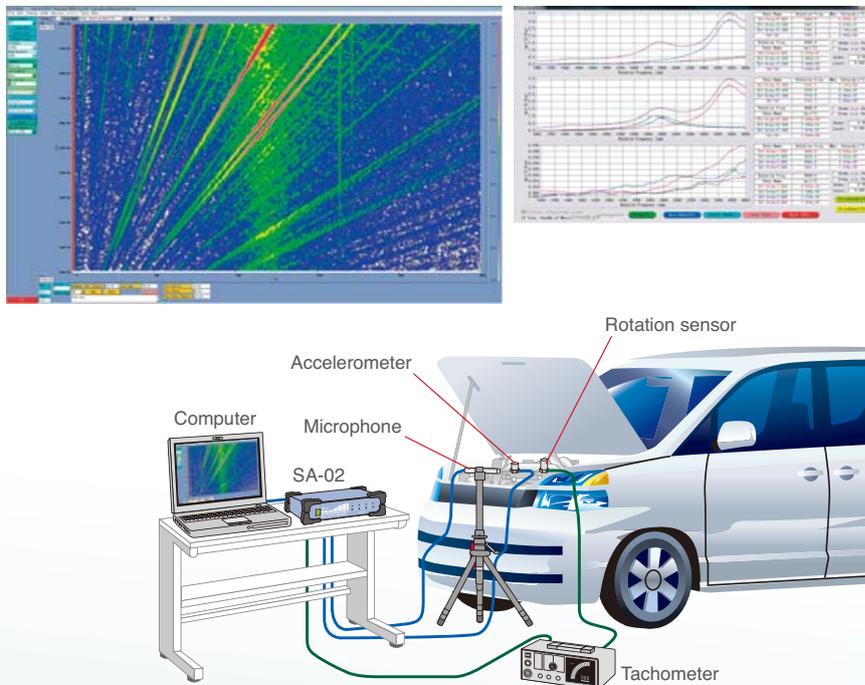
Sample display screen

Engine related measurement solutions

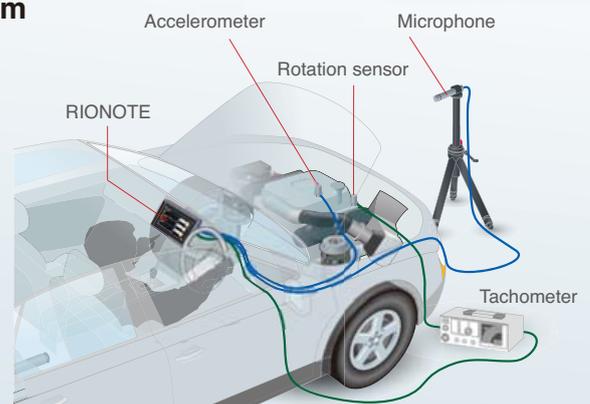
Analysis of noise and vibrations related to engine rotation [Order Tracking Analysis System]

Examining the rotational frequency or order can be useful in determining conditions related to rotation speed such as the natural frequency of structural parts and components. This system uses the Multi-Channel Signal Analyzer SA-02 or the RIONOTE Multifunction Measurement System to obtain revolution data and noise and vibration waveform data simultaneously and perform rotation order ratio analysis.

Tracking analysis system using Multi-Channel Signal Analyzer SA-02



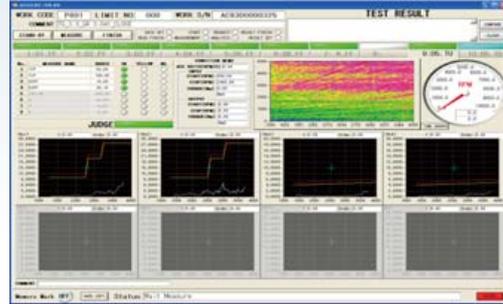
Tracking analysis system using RIONOTE Multifunction Measurement System



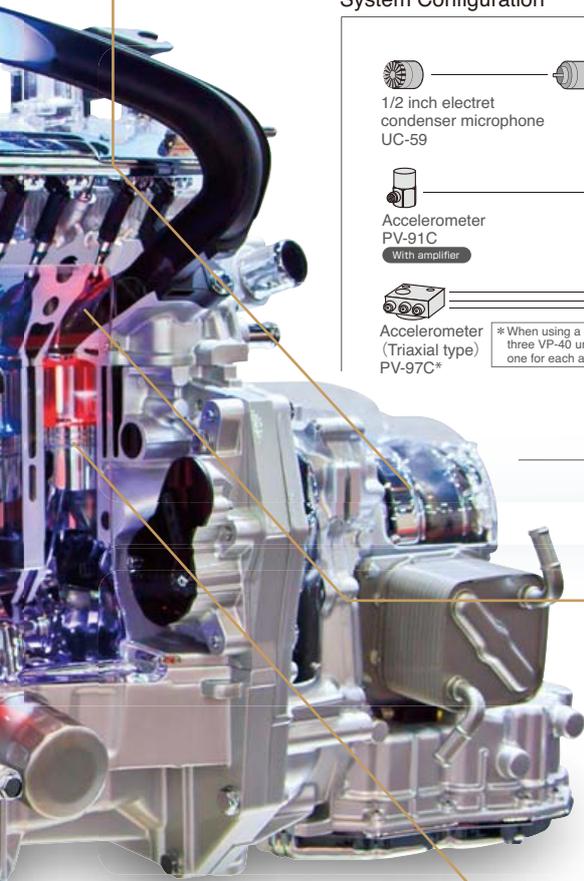
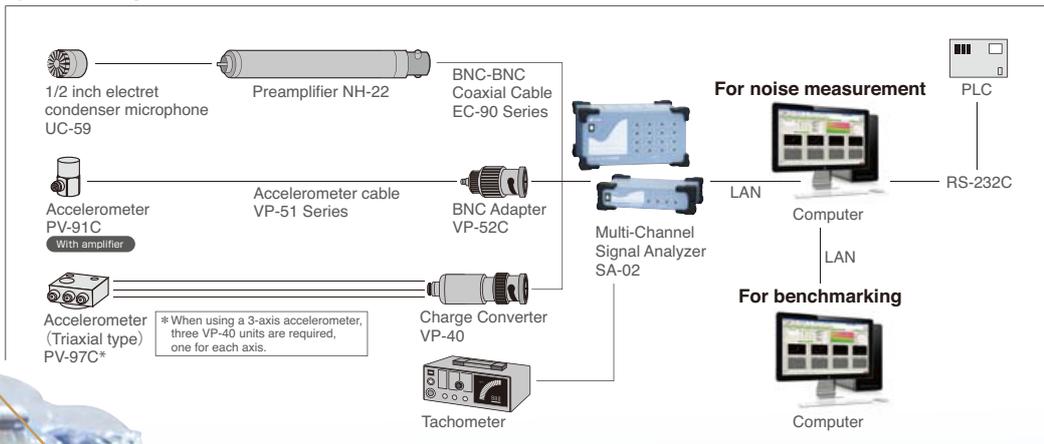
Inspection of transmission vibrations and noise

[Gear Tester Evaluation System]

This system acquires noise, vibration, and revolution number data for power transfer in automobiles or general-purpose motors, to check for vibration and noise. The Multi-Channel Signal Analyzer SA-02 enables the configuration of a transfer control system and communication link to perform pass/fail evaluation.



System Configuration



Cylinder head volume measurement

[Acoustical Capacity Meter]

Simply by placing the volume meter on the combustion chamber cavity of the cylinder head, the combustion chamber volume can be measured regardless of its shape.



Combustion chamber volume measurement

[Acoustical Capacity Meter]

On the assembled engine, the volumetric capacity of the combustion chamber can be measured in a short time (about 2 seconds) by joining the volumeter to the spark plug hole with a dedicated adapter.

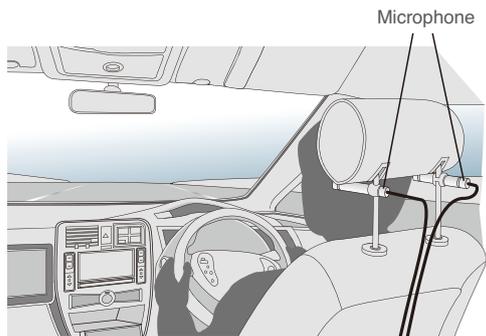


Car interior comfort related measurement solutions

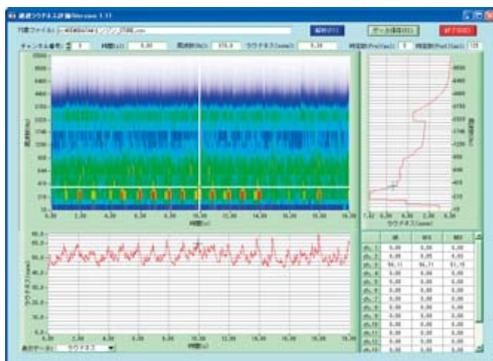
Psychoacoustic evaluation

[Sound Quality Assessment Measurement System]

There are considerable individual differences in whether sounds generated inside a car are perceived as pleasant or unpleasant. Psychoacoustic evaluation is therefore necessary to quantify how a person perceives a sound. The Sound Quality Assessment Measurement System makes this possible by displaying psychoacoustic evaluation results in numeric form.



Sound Quality Evaluation Software
CAT-SA02-SQ

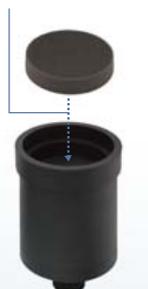


Acoustic characteristics testing of interior materials

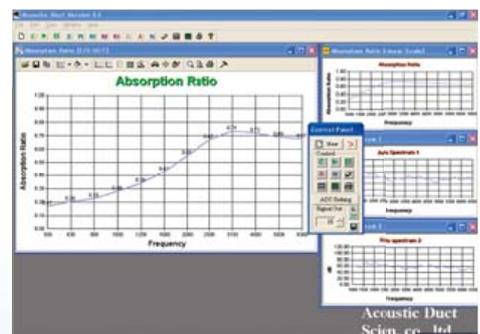
[Vertical Incident Absorption Coefficient Measurement System]

This measurement setup determines the vertical incident sound absorption coefficient by using the dual microphone method in conjunction with an acoustic duct. The system facilitates evaluation of the physical properties of sound absorbing material in compliance with JIS A 1405-2 and ISO 10534-2.

A piece of material cut to fit the duct diameter is inserted into the duct



Low frequency duct for measurement



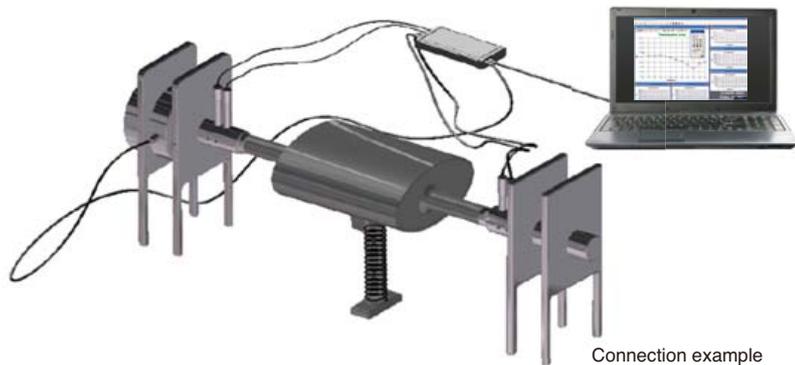
Measurement screen

Exhaust system related measurement solutions

Testing of muffler acoustic characteristics

[Muffler Sound Reduction Index Measurement System]

Assessing the sound absorption performance of a muffler as part of a car's exhaust system is an essential requirement. The vertical incident sound absorption coefficient/sound reduction measurement system makes it possible to directly determine the sound reduction index.



Connection example



Information about the RIONOTE Multifunction Measurement System and the Multi-Channel Signal Analyzer SA-02

Portable Multi-function Measuring System RIONOTE

The RIONOTE Multifunction Measurement System makes it possible to realize optimal analysis functions for a wide range of application fields. The capability for wireless measurement allows quick and simple setup even in locations where cabling would be difficult. A wide range of analysis programs are available, and customization is also supported.

- Color LCD touch screen allows intuitive operation.
- B5 size ideal for measurements in the field.
Light weight: only 1.2 kg including amplifier and battery.
- Support for wireless measurements
- Use of Wireless Dock SA-A1WD provides support for up to 16 measurement channels



Portable Multi-function Measuring System
RIONOTE



Wireless Dock SA-A1WD



Platform (main unit) and amplifier

Multi-Channel Signal Analyzer SA-02

Multi-Channel Signal Analyzer SA-02 Combines FFT Analysis and 1/1, 1/3, 1/12 Octave Band Analysis Capability

Multi-Channel Signal Analyzer SA-02M (4ch~16ch)



4-Channel Signal Analyzer SA-02A4



- Up to 32 channels supported (using two SA-02M units)
- Allows high frequency analysis in multiple channels
- Various analysis software available
- Customizing of analysis software also possible

By linking two SA-02M units, up to 32 channels are supported



Information about piezoelectric accelerometer and measurement microphone products

Broad and versatile lineup makes it possible to choose the optimum product for any given application.

Piezoelectric Accelerometers

	With built-in amplifier	Triaxial	High-temperature	Compact	
Photo					
Model	PV-91C	PV-90T	PV-97	PV-90H	PV-08A
Outline /purpose	Compact, lightweight, High temperature	Compact, TEDS compliant	Triaxial, 200 °C	Compact, lightweight, High temperature	Compact, Lightweight
Mass g	1.8	2	10	2	0.7
Charge sensitivity pC/ (m/s ²) ^{*1}	—	—	0.29	0.29	0.102
Voltage sensitivity mV/ (m/s ²) ^{*1}	1	0.5	—	—	—
Vibration frequency range (±1 dB) Hz ^{*2}	1 to 20 000 (10 %) (1 to 2 Hz (±15 %) at 150 to 170 degrees.)	1 to 12 000 (10 %)	1 to 10 000 1 to 5 000 (X·Y) (±10 %)	1 to 20 000 (10 %)	1 to 25 000
Temperature range for use / °C	-50 to +170	-20 to +100 (TEDS: -20 to +85)	-50 to +200	-50 to +250	-50 to +160
Dimensions mm	7 (Hex) × 12.5 (H)	7 (Hex) × 11.4 (H)	13 (H) × 13 (W) × 13 (D)	7 (Hex) × 11 (H)	5.5 (φ) × 7.8 (H)

*1 Representative value; actual value is noted on calibration sheet supplied with accelerometer.
*2 Representative value when mounted on flat surface according to standard mounting method.

Charge converters with CCLD support

Charge Converter VP-42

(Compact relay type)



Charge Converter VP-40

(For direct connection to BNC input)



Specifications

Model	VP-40	VP-42
Gain	1 mV/pC ±2.5 % (80 Hz)	1 mV/pC ±2.5 % (80 Hz)
Frequency range	1 Hz to 30 kHz (±5 %)	1 Hz to 30 kHz (±5 %)
Drive current	2 mA to 4 mA	2 mA to 4 mA
Dimensions (mm)	φ14.5 × 45	φ7 × 27.7

Measurement Microphone

Condenser Microphones UC Series



Model	UC-35P	UC-59	UC-54
Outline /purpose	Quiet measurement	General purpose	Ultrasound
Nominal diameter	1 inch	1/2 inch	1/4 inch
Measurement frequency range (Hz)	10 to 12 500	10 to 20 000	20 to 100 000 ^{*2}
Sensitivity level (dB re 1 V/Pa) ^{*1}	0	-27	-48
Capacitance (pF)	—	13	4
Maximum input sound pressure level (dB) (Linearity tolerance ± 0.3 dB)	96	148	164
A-weighted inherent noise level (dB)	4	18	45
Dimensions (mm)	φ23.8 × 132.7	φ13.2 × 14.3	φ7.0 × 10.0

*1 Representative value for 1 kHz *2 frequency range refers to microphone without grid.

Microphone With Preamp (TEDS compliant)



Model	UC-59T
Purpose	Multi-point
Microphones	UC-59
Preamp	NH-22AT
Measurement frequency range (Hz)	10 to 20 000
Drive current	2 mA to 4 mA
A-weighted inherent noise level (dB)	16.6
Dimensions (mm)	φ13.2 × 99.4

Other product information

Other Products

For applications ranging from environmental measurements to R & D

Sound Level Meter (class 2)
NL-42

Sound Level Meter (class 1)
NL-52



For wide-band measurements from 1 Hz to 20 kHz

Sound Level Meter (class 1)
NL-62
(With low-frequency sound measurement function)



For facility diagnosis and on-site measurement

Vibration Analyzer
VA-12
(With FFT analysis function)



For multi-channel vibration measurements

2-Channel Charge Amplifier
UV-16



For multi-channel sound and vibration measurements

Sound Level Meter Unit / Vibration Meter Unit
UN-14 / UV-15



For data recording in automotive environments or on-site

4 channel Data Recorder
DA-21



Anechoic Box / Anechoic Room

The ideal "silent space" for performing stable and optimized acoustic measurements



Anechoic Box (Compact Type)



Anechoic Room



Sound Proof Chamber



JCSS
JCSS 0197

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