Rotational machinery such as a combustion engine or an electric motor may become the source of considerable noise and vibrations when mounted for example in a vehicle. This is due to the phenomenon of resonance occurring at certain rotation frequencies.

The RIONOTE Multifunction Measurement System can simultaneously record rotational speed (rpm) data along with sound and vibration waveform data and perform automatic order tracking analysis based on these data. This analysis makes it possible to assess the sound or vibration state corresponding to the change in rotational speed, in order to determine the causes of resonance. Because the recorded waveform data are saved, it is also possible to change the frequency resolution or other parameters later and perform multiple analysis runs for comparative evaluation.
Display examples for vibration order tracking

Application examples

- Drive train noise and vibration analysis for automobiles and motorcycles
- Vibration analysis of large electric machinery
- Turbine blade vibration analysis
- Vibration and noise analysis of power transmission shafts and gears

Specifications

- Number of channels
  - SA-A1B4: 3 channels
  - SA-A1B2: 1 channel
  - Because one channel is required for tacho signal input
- Tacho signal: TTL level pulse, DC signal
- Max. rotational speed
  - 10,000 rpm (at 60 p/r) with analysis frequency 20 kHz
  - 600,000 rpm (at 1 p/r)
- Order setting
  - Settings up to one decimal point are supported
- Order width
  - Settable (depending on number of FFT sampling points)

Display

- Graph
  - Horizontal axis: rpm, Vertical axis: amplitude
- Simultaneous overlay display
  - Up to 4 orders (including overall)
- Data interpolation
  - Moving average, Weighted moving average
- Display data save formats
  - CSV, PNG

System configuration example

- Order Tracking Program: CAT-SAA1-ORDTRK
- Piezoelectric Accelerometer: PV-91C/PV-91CH/PV-971
- 1/2 inch Electret Condenser Microphone: UC-59
- Preamplifier: NH-22A
- BNC-BNC Coaxial Cable: EC-90
- BNC Adapter: VP-52A

RPM - Level (Simultaneous display of multiple orders)

RPM - Level (Enlarged view)

RPM - Level

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ISO 14001 RION CO., LTD.
ISO 9001 RION CO., LTD.

RION CO., LTD.
3-20-41, Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan
Tel: +81-42-359-7888 Fax: +81-42-359-7442

https://rion-sv.com/

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