Ground & Building Vibration Measurements

Practical solutions

Ground vibrations pose a potential threat to the structures of buildings as well as causing a nuisance for people living in such buildings. The effects of damage to building structures can be extremely expensive as well as dangerous to their surroundings. One can imagine the scope of the damage that would be caused by the collapse of a building or bridge. Vibrations in buildings can also have a detrimental effect on any people in the buildings both in terms of their well-being and productivity. Additional symptoms can be wide ranging from insomnia to shortness of breath.

INSTRUMENTATION FOR SOUND & VIBRATION MEASUREMENTS

SVANTEK

continuous innovation

SV 212 & SVAN 958A

Ground Vibration Mode in SVAN 958A

The ground vibration mode in the SVAN 958A has been developed for both short- and long-term monitoring applications. It measures triaxial velocity and acceleration in parallel and calculates Peak Particle Velocity and Vibration Dose value simultaneously.
In addition to logging overall values and frequency spectra, the time domain signal is stored for post processing purposes. An additional measurement channel is available for Class 1 noise measurements in parallel to triaxial vibration measurements. Measurements are performed according to BS and DIN standards. FFT is used for dominant frequency determination where the RMS velocity spectrum is recorded or 1/3 octave bands is used for comparison with the BS and DIN norm curves and the Peak Velocity spectrum is recorded.

Key Features

- Tri-axial vibration & noise measurement
- Root Mean Square (RMS) acceleration time history logger
- Peak Particle Velocity (PPV) assessment
- Vibration Dose Value (VDV) time history logger
- Two profiles per channel for simultaneous acceleration and velocity assessment
- Weighting filters comply to ISO 2631, BS 6472 and BS 7385
- KB filter according DIN 4150 and DIN 45669
- Simultaneous FTT analysis and WAV recording according to DIN 4150 -3 standard (option)
- Options for remote communication (GSM, LAN & WLAN)
- Advanced alarm triggers combined with SMS and e-mail alarms (option)

Applications

- Risk of structural damage
- Risk of vibration nuisance
- Simultaneous noise & vibration monitoring
- Continuous monitoring
- Simultaneous VDV and PPV measurements
- Blasting monitoring
- and more...

Noise & Ground Vibration Measurement System

Noise & Vibration Monitoring Kit

The SV 212 is an easy to install and cost effective system for noise and vibration monitoring. The portable and battery powered system can be used for a variety of monitoring applications including construction site monitoring, tunneling and blasting. This portable system works great in noise & vibration monitoring applications related to construction sites and road traffic. The SV 212 is protected from weather conditions by a waterproof case with locking capabilities. This solution makes the system portable allowing it to be moved from one place to another easily. An internal battery is able to power the whole system up to two weeks without recharging. Alternatively the SV 212 can be powered from an external DC power source or solar panels.

Options for Remote Communication

Remote control of the SV 212 is available either over GPRS or Local Internet connection (LAN, WLAN). Data transmission is fully supported by SvanPC++_RC Remote Communication software. Remote communication allows the user to set up the instrument and download data from monitoring systems placed in the field. Remote alarms that send messages via e-mails and text messages (SMS) are also implemented.

Technical Specification

Vibration Level Meter & Analyser

Meter Mode	RMS, VDV, MTVV or Max, Peak, Peak-Peak, Vector, A(8), Dose, ELV, EAV
Profiles Per Channel	2
Analyser (option)	1/1 octave real-time analysis 1/3 octave real-time analysis FFT analysis up to 1600 lines in a selectable frequency band FFT cross spectra measurements Time domain signal recording to WAV format
Filters In Profile 1	HP1, HP3, HP10, VEL1, VEL3, VEL10, VELMF, DIL1, DIL3, DIL10, KB, W_k, W_d, W_c, W_j, W_m, W_h, W_g, W_b, W_v
Filters In Profile 2	VEL1, VEL3, VEL10
RMS & RMQ Detectors	Digital true RMS & RMQ detectors with Peak detection, resolution 0.1 dB Time constants: from 100 ms to 10 s
Accelerometer (option)	SV 84 triaxial high sensitivity (1 V/g) SV 38 whole-body accelerometer (1 V/g MEMS type)
Measurement Range	Accelerometer dependent (with SV 84: 0.0005 ms^{-2} RMS ÷ 50 ms^{-2} PEAK)
Frequency Range	0.5 Hz ÷ 20 kHz; accelerometer dependent

Sound Level Meter & Analyser

Standards	Class 1: IEC 61672-1:2002
Profiles Per Channel	3
Meter Mode	SPL, L_{eq}, SEL, L_{den}, L_{tm3}, L_{tm5}, Statistics - L_n (L_1-L_{99}), L_{Max}, L_{Min}, L_{Peak}
Analyser (option)	1/1 octave real-time analysis, (Class 1, IEC 61260) 1/3 octave real-time analysis, (Class 1, IEC 61260) RT 60 reverberation time analysis in 1/3 octave bands FFT analysis up to 1600 lines in selectable frequency band FFT cross spectra measurements Sound Intensity measurements
Weighting Filters	A, C, Z, G
RMS Detector	Digital true RMS detector with Peak detection, resolution 0.1 dB Time constants: Slow, Fast, Impulse
Microphone (option)	MK 250, Class 1, 50 mV/Pa, prepolarised 1/2"
Preamplifier (option)	SV 12L detachable
Measurement Range	16 dBA RMS ÷ 140 dBA Peak (Total Dynamic Range)
Linearity Range	26 dBA RMS ÷ 140 dBA Peak (IEC 61672)
Frequency Range	0.5 Hz ÷ 20 kHz; microphone dependent, with MK 250 microphone: 3.5 Hz ÷ 20 kHz

SV 106
Six channel vibration meter

About

The SV 106 is a six-channel vibration meter and analyser suitable for making building vibration measurements. A unique capability of this instrument is its ability to take measurements with two triaxial accelerometers simultaneously which makes the SV 106 the most cost effective solution for building vibration assessment on the market. A typical application of the SV 106 is the measurement of vibration that causes a nuisance to the occupants of buildings

Features

- Two simultaneous tri-axial vibration measurements
- Root Mean Square (RMS) acceleration time history logger
- Peak Particle Velocity (PPV) assessment
- Vibration Dose Value (VDV) time history logger
- Two profiles per channel for simultaneous acceleration and velocity assessment
- Weighting filters comply to ISO 2631, BS 6472 and BS 7385
- KB filter according DIN 4150 and DIN 45669
- 1/1 or 1/3 octave real-time analysis (option)
- Time-domain signal recording to WAV format (option)

Technical Specification

Meter Mode	RMS, VDV, MTVV or Max, Peak, Peak-Peak, Vector, A(8), Dose, ELV, EAV
Profiles Per Channel	2
Filters In Profile 1	KB, W_h, W_k, W_d, W_c, W_j, W_m, W_g, W_b, W_f
Fiters In Profile 2	HP, VEL3 and Band Limiting filters corresponding to Profile 1
RMS & RMQ Detectors	Digital true RMS & RMQ detectors with Peak detection, resolution 0.1 dB
Time Constants	from 100 ms to 10 s
Measurement Range	Transducer dependent: 2.15 um/s RMS ÷ 0.6 ms Peak (with SV 84 and VEL3 filter) 0.01 ms^{-2} RMS ÷ 50 ms^{-2} Peak (with SV 38V and W_d filter)
Frequency Range	0.1 Hz ÷ 2 kHz (transducer dependent)
Data Logger	Time-history data including meter mode results and spectra to microSD card
Time-Domain Recording	Simultaneous 6-channel recording, sampling frequency 6 kHz (option)
Analyser	1/1 octave real-time analysis from 0.5 Hz to 2000 Hz (option) 1/3 octave real-time analysis from 0.4 Hz to 2500 Hz (option)
Accelerometer (option)	SV 84 tri-axial high sensitivity (1 V/g)

SVANTEK Sp. z o.o.
ul. Strzygłowska 81
04-872 WARSAW, POLAND
phone (+48) 22 51 88 300
fax (+48) 22 51 88 312
http://www.svantek.com
e-mail: office@svantek.com.pl

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