SVANTEK

SV 200
Noise Monitoring Station

SENSIDYNE®
Industrial Health & Safety Instrumentation

SV 200
Noise Monitoring Station

Typical applications:

- Environmental noise monitoring
- Industrial noise monitoring
- Construction site noise monitoring
- Noise monitoring during concert and sport events
- Noise mapping and verification

Features:

- 'All in one' design for portable, mobile and permanent noise monitoring installations
- Rugged housing protects the system against harsh environmental conditions (IP66)
- Integrated electrostatic actuator for full system verification
- IEC 61672 Class 1
- Internal high speed 3G or Wi-Fi modem
- Large windscreen for high wind speeds
- Live audio & data streaming capabilities
- Low power consumption & Li-Ion battery powered operation providing true flexibility for both short and long term measurements
- Web server for system configuration
- 16 GB data storage

SV 200 is a fully integrated solution for unattended noise monitoring applications. The system is specially designed for easy installation - the SV 200 is small, light-weight and easy to install by a single person.
The measurement capabilities of the SV 200 are optimized for noise monitoring applications. It measures and stores results suitable for automatic reports, advanced post-processing analysis and records audio events for noise source recognition.
With a any Internet enabled device the user has a full, remote access to all measurement data, settings and real-time results stored in SV 200 monitoring station.

SV 200 solutions:

Hardware design

The State-of-the-Art SV 200 hardware unveils outstanding measurement capabilities and superior technical specifications.

The weatherproof housing protects SV 200 noise monitoring station against extreme weather conditions while fulfilling Class 1 accuracy. Internal heating and a dual layer rugged housing with natural airflow cooling enables the SV 200 to operate from -30°C up to +50°C and humidity up to 100% RH.

Special attention was given to the highly efficient windscreen which reduces wind noise effects even at high wind speeds. To protect the microphone a special rain protection has been designed.

SV 200 can be used for 0° reference direction used for aircraft noise measurements and 90° typically used for environmental noise monitoring simultaneously.

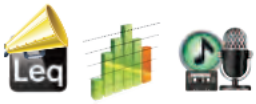
Power supply solutions

The SV 200 has two operating modes, the High Performance and the Energy Efficient mode. The High Performance mode is typically used when the system is connected to mains.
The Energy Efficient mode automatically shuts down power consuming processes to minimize energy consumption when running on batteries or solar panels. In this mode the modem is put into standby (sleep) and wakes up at a user-defined time schedule to send measurement files to data server (data push).
During this process the SV 200 also checks if the user has changed the measurement settings (configuration pull).
Data push / configuration pull process can be initiated at any time by sending an SMS to the station.

The SV 200 has an internal Li-Ion battery and interface for connecting solar panels. A waterproof mains adapter for charging the battery and powering the station is also included. Operating time when running on the internal Li-Ion batteries is more than 48 hours.

SV 200 capabilities:

Measurement capabilities



Measurement capabilities of SV 200 include multi-profile data logging, real time 1/1- and 1/3-octave logging, audio event recording and statistical analysis. All measurement results are securely stored on the built-in 16 GB microSD card.

Basic instrument's mode allows to calculate and record all necessary acoustic parameters including SPL, Leq, SEL, Lden, Ltm3, Ltm5, Statistics - Ln (L1-L99), LMax, LMin, LPeak. All these results are calculated with three different frequency and time weightings simultaneously (profiles).

SV 200 offers an incredible time history logging capability providing broad band results and spectra with adjustable double (long and short) logging steps.

Standard SV 200 instrument is equipped with 1/1 and 1/3 octave real-time analysis. These functions are applicable for majority of noise measurement applications where frequency domain is to be determined.

Time domain recording allows the system to make automatic recordings of the actual noise in order to identify noise sources or for post-processing analysis. Audio recording can be triggered on a threshold level, slope or external trigger. The trigger level and slope are independent to the logger trigger.
A pre- and post- trigger is used to extent the duration of a recording. This allows the user to optimize the triggering without losing valuable information. Because audio events consume large amount of memory, the maximum duration of a recording can be set as well. Recordings made by the SV 200 are 24 or 16 Bit uncompressed audio files with a selectable sample frequency of 48, 24 or 12 kHz.
This is important for post-processing like the tonality analysis. All audio events are automatically time synchronized to the measurement data and stored inside the measurement file on the built-in 16 GB microSD memory card.

Meteorological Data

Weather conditions have a significant influence on noise measurements. The SV 200 is equipped with an interface for meteo sensors. With the optional SV 205 weather station, the noise monitoring station can measure wind speed, wind direction, temperature, humidity, ambient pressure and rain. Weather data is stored in parallel to the noise measurements.

With the post processing software SvanPC++_EM noise measurement results can be easily filtered based on weather conditions.

Time synchronization

Thanks to GPS and NTP time synchronization the internal clock is extremely accurate. This opens new possibilities for multi-point noise monitoring. Because all noise monitoring stations are automatically time synchronized, it's possible to correlate measurements for advanced data analysis.

Real time streaming

For real time monitoring applications like noise measurements at concerts, sport events, etc. continuous access to live data is needed. Using the internal web server or live data features of SvanPC++_RC server application real time measurement results can easily be monitored. Just browse to a web site using any mobile phone, tablet, laptop or PC to view live measurement results.

The optional audio streaming function makes it possible to remotely identify a sound source by listening to the microphone signal. SV 200 uses a standardized Internet audio streaming protocol to let you hear what the microphone is hearing. This is especially useful in situations when noise levels are exceeded and immediate source identification is necessary.

Remote communication

Communication is one of the most important features of unattended monitoring systems. The SV 200 is delivered with an integrated low-power 3G modem or WI-Fi access point. The implementation of advanced and highly reliable data communication protocol gives the user full control of the station, easy to use data transmission, real time data publication and live audio streaming.

Remote configuration and data management can be done with Web based tools or Server based tools. Both types of station management tools can be used at the same time allowing the SV 200 user to:

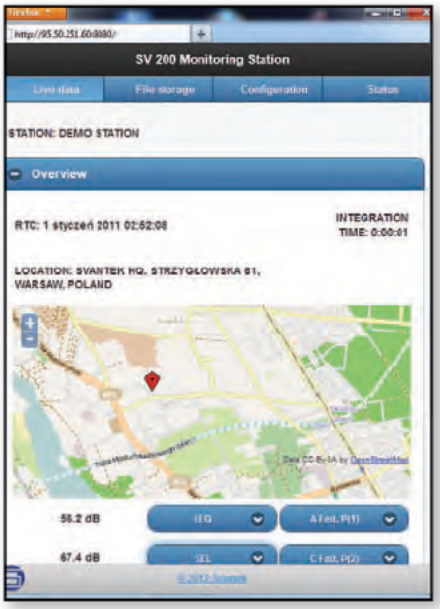
- use a mobile phone or tablet to watch real time measurement results, manually download files and reconfigure the station,
- manually download files and reconfigure the station using SvanPC++_RC module,
- use the SvanPC++_RC application based on MS Windows ® for automatic control of the noise monitoring stations, data archiving, automatic web publication, etc.

SV 200 remote communication:

Web based station management

Station configuration and data management is done by using a web browser or the SvanPC++_RC server application. Web based station management uses the SV200 internal web server and is typically used for single measurement point in short or medium term measurement duration.
Web based server management gives full control of the monitoring station using any web browsing device like a mobile phone, tablet or PC. It's easy to use and no additional software is needed. It's a perfect 'anyplace anywhere anytime' solution.

Measurement information



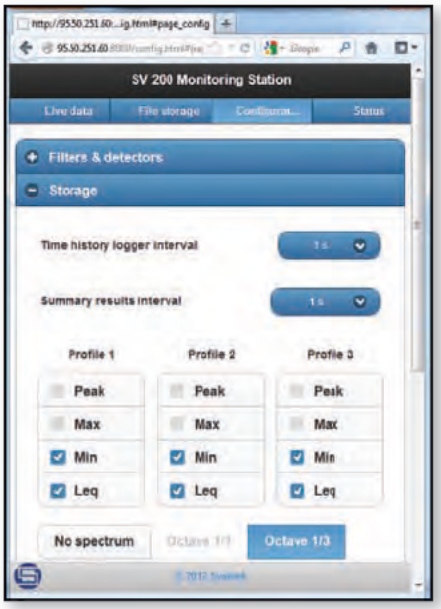
Functions:

- GPS coordinates and location
- Current results view
- Time history data graphs and tables
- 1/1 and 1/3 octave spectra graphs and tables
- Access to data files downloading
- Audio data downloading

Typical applications:

- Instant data access via smartphone / tablet
- Random measurement checks
- Information browsing

Measurement settings



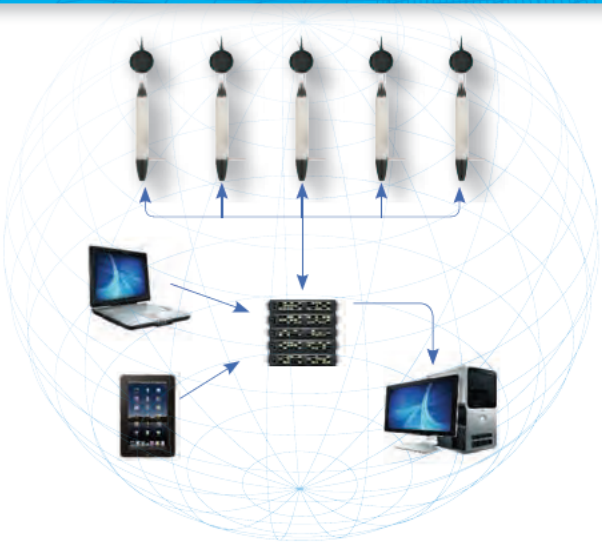
Functions:

- Profile settings selection
- Enabling time history recording
- Enabling 1/1 or 1/3 octave spectra recording
- Audio data recording settings
- Timer parameters settings

Typical applications:

- On-site measurement parameters settings
- Programming the measurement schedule

SV 200 remote communication:

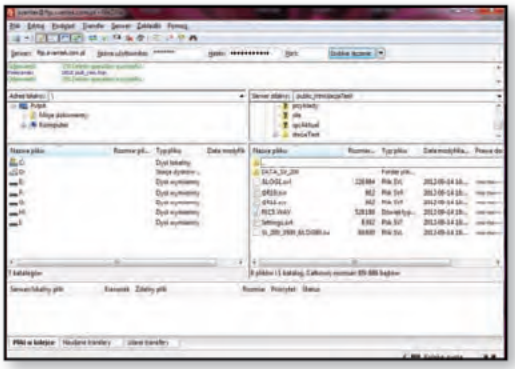


Server based station management

Server based system management is used to control multiple stations and manage large amounts of data for medium to long term applications. The server based system management is based on the data push / configuration pull principle that overcome many communication issues present in conventional systems. The system uses a secure communication protocol to periodically push measurement results to a data server and check for station configuration updates.

This process is completely autonomous, very easy to use and ideal for unattended control of multiple SV 200 monitoring terminals.

FTP data push & configuration pull



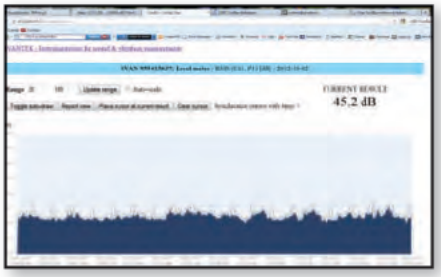
Features:

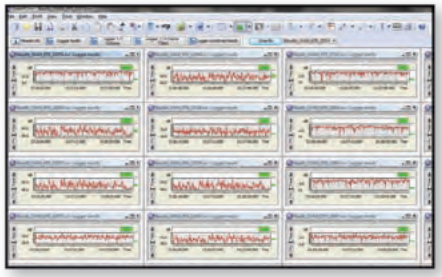
- No need for public IP
- Free of charge FTP client applications
- Easy access to FTP servers
- High reliability solution

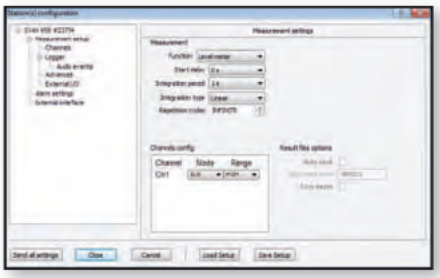
Typical applications:

- Permanent monitoring systems
- Multi-point monitoring
- Customised software solution
- Unattended monitoring

SvanPC++_RC solutions







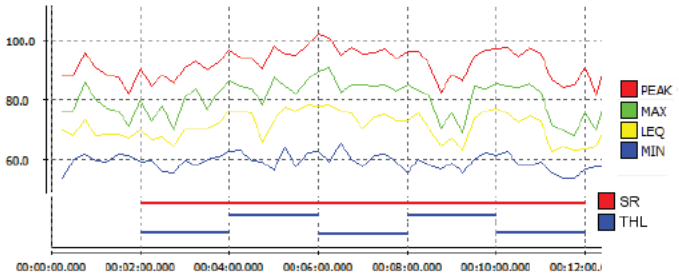
Functions:

- Remote system configuration
- Measurement status monitoring
- System check and alerting
- Timer parameters settings
- CSV and HTML data formatting
- Time history data plotting

SV 200 data management:

Data storage

SV 200 offers an incredible time history logging capability providing broad band results and spectra with adjustable double (long and short) logging steps. Three individual profiles allow simultaneous usage of three time constants (Fast, Slow, Impulse) and three weighting filters (A, C, Z).
All measurement results are securely stored on the built-in 16 GB memory.



Summary Results

Results recorded and integrated with logger step from 1s to 24h, such as Leq, Lmax, Lmin, Lpeak, SEL, Ln statistics are called summary results. Thanks to time synchronization the beginning of integration period can be adjusted to the full hour enabling an easy hourly / daily / weekly etc. data analysis.
Depending on settings, summary results may contain 1/1 or 1/3 octave spectra and meteo data.

Time History Logger

Selected results such as Leq, Lmin, Lmax, Lpeak can be stored as detailed time history with short logging step from 2ms to 1h. High speed logger may also contain 1/1 or 1/3 octave spectra and meteo data.

Both summary results and high speed logger data can be post-processed in SvanPC++ Environmental Module.

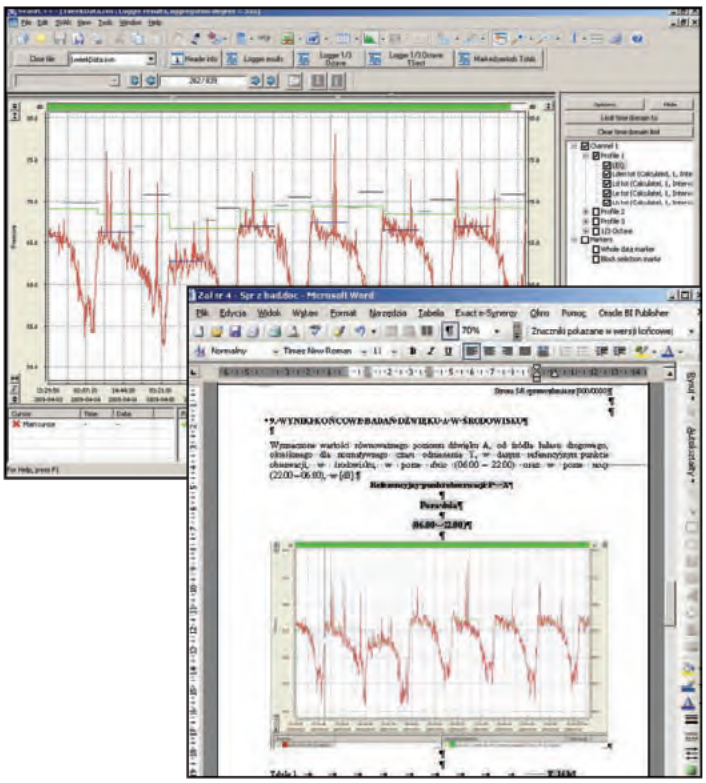
	SR	THR
Integration time	1s - 24h	2ms - 1h
Profiles	3	3
Frequency weighting	A,B,C,Z	A,B,C,Z
Time synchronized	Yes	No
Leq, LMax, LMin, LPeak	Yes	Yes
SEL, Lden, Ltm3, Ltm5	Yes	No
Full statistics	Yes	No
1/1 or 1/3 octave	Yes	No
1/1 or 1/3 octave statistics	Yes	No
Meteo: wind speed, wind direction, humidity, temperature, rain	Yes	Yes

Data post - processing

Optional Environmental Monitoring module for SvanPC++ software extends capabilities for data analysis and recalculations together with powerful project management.
The module is designed for processing data from long period unattended environmental monitoring.
Software provides all necessary functionalities such as :

- Data management
- Projects (results, views, calculations, pictures and other files)
- Saving and restoring project status
- Unwanted time-history data removal
- Saving data views
- Time-history event finder & automatic block selection
- Templates based reports (Microsoft Word™ required)
- Data analysis and recalculations:
  - Leq, SEL, Min, Max, Lmin, Lmax, Max(Max), Max(Peak), Ltm3, Ltm5
  - Statistics (LN, histogram)
  - Day / evening / night noise level
  - Data comparison tools
  - Markers for events identification
  - Noise Criterion level & Noise Rating curve calculation
  - Spectrum averaging, Min, Max
  - Tonality analysis based on 1/3 octave result files

Additionally, the module provides a reporting tool which allows any combination of data to be placed on a report. Project functionality simplifies the management of data stored in various file types, gathered across given measurement activity, like measurement data, calculation results, views, photos, graphics, pictures and report templates.



SV 200 technical specification:

SOUND LEVEL METER

Standards	Class 1: IEC 61672-1:2002, Type 1: IEC 61260:2002
Weighting Filters	A, B, C, Z
Time constants:	Slow, Fast, Impulse
RMS Detector	Digital True RMS detector with Peak detection, resolution 0.1 dB
Microphone	Microtech Gefell MK 250, 50 mV/Pa, prepolarised 1/2" condenser microphone
Preamplifier	Integrated
Linear operating range	25 dBA RMS ÷ 133 dBA Peak (in accordance to IEC 61672)
Total dynamic measurement range	15 dBA RMS ÷ 133 dBA Peak (typical from noise floor to the maximum level)
Internal Noise Level	less than 15 dBA RMS
Dynamic Range	115 dB
Frequency Range	3.5 Hz ÷ 20 kHz
Meter Mode Results	SPL, Leq, SEL, Lden, Ltm3, Ltm5, LMax, LMin, LPeak Simultaneous measurement in three profiles with independent set of filters and detectors
Statistics	Ln (L1-L99), complete histogram in meter mode and 1/1 & 1/3 octave analysis Simultaneous measurement in three profiles with independent set of filters and detectors
1/1 Octave Analysis	Real-time analysis meeting type 1 requirements of IEC 61260 (3.15 Hz ÷ 20 kHz)
1/3 Octave Analysis	Real-time analysis meeting type 1 requirements of IEC 61260 (3.15 Hz ÷ 20 kHz)
Data Logger	Logging of summary results, spectra and weather data with logging step down to 1 second and time history of selected parameters with short logging step down to 2 millisecond
Audio Events Recording	Time domain recording to wav file format on demand with selectable bandwidth and duration
Audio Streaming (option)	On-line transmission of audio signal over Internet (under development)

GENERAL SPECIFICATION

Ingress Protection Rating	IP 66	
Inputs	Power supply LEMO 3-pin, extended I/O port LEMO 9-pin	
Remote Calibration	Built-in electrostatic actuator, triggered manually or in automatic mode	
Memory	Built-in 16 GB (non-removable)	
Display & Keyboard	External user interface with 1.1" OLED color display (option)	
Communication interfaces	USB / Serial port (RS 232 with optional cable)	
	3G modem (included in SV 200_3G)	
	WI-Fi / LAN module (included in SV 200_WiFi)	
	External trigger input 0-30V with pull-up 47kOhm at 3.3V	
Power Supply	Li-Ion rechargeable battery (non-removable)	operation time > 48 hours (14.4 V / 2.9 Ah)*
	Solar Panel (not included)	MPPT voltage 17.0 V ÷ 20.0 V
	AC power supply (included) – Input 100-240VAC, output +24VDC 2.5A, IP66 housing	
	External DC source (not included) – voltage range 10.5 V – 24 V, e.g. 12 V or 24 V accumulator	
Environmental Conditions	Temperature	from -10° C to 50° C without external powering**
	Humidity	up to 100 % RH
Physical Characteristics	Dimensions	810 mm length 70 mm diameter excluding windscreen (windscreen diameter 130 mm)
	Weight	Approx. 2.5 kg with batteries

* Meter mode, time history logging step 1 second, 3G modem transmission 10 % of the measurement time

** With external powering temperature range is from -30° C to 50° C

SVANTEK

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