# SV1

## Seismic/ Human Response Vibration & Sound Analyzer

Registered
ISO 9001:2008 / ISO 14001:2004

SV

SV
CORPORATION

# Seismic / Human Response Vibration & Sound Analyser

## SV1

### Features
- Seismic/ Human Response Vibration & Noise Measurement
- Vibration Measurement by JIS C 1510(dBV)
- Vibration Measurement by DIN4150
- Simultaneously 3-Axis Vibration Level & Sound Level Display
- Simultaneously Multi-Processing & Display
- Vibration & Sound measurement by Trigger Level of Vibration Level
- Internet or LTE Communication with PC Software
- 7″ LCD Touch Screen
- Long term Data storage (4GB SD Memory card)
- Report and Post Processing & Analysis(Trace & FFT) Software on PC
- Check the Saved Result Data and Measurement Setup by SV1 on PC
- Measured data to convert to Trace, Octave, FFT graph on PC

### Applications
- Seismic Monitoring
- Mining Monitoring
- Ground Vibration Monitoring
- Blast Monitoring
- Pile Driving
- Construction Field
- Bridge Monitoring
- Power Plant Monitoring
- Building Vibration Monitoring

**SV1 is based on Smart phone technology with versatile application software to measure the Blast/Environment Vibration & Sound monitoring and analysis on the portable rugged system.**

## Main Specifications

| Operating system | WinCE5.0(Device), Windows7 and higher(32bit,64bit)(PC) | USB Interface | 1 Host, 1 Device |
|---|---|---|---|
| CPU | PXA320 (806MHz) | Power | 5V, 3A |
| LCD | 7" TFT-LCD +TSP | International protection | IP64 |
| Flash memory | NAND 128MB | Dimension | 350(W)x290(D)x150(H)mm |
| System memory | DDR SDRAM 128MB | Weight | 4.0Kg(without accessories) |
| External memory slot | SD/MMC Slot | Operating temperature | -20 ℃~50 ℃(-4 ℉~122 ℉) |
| Communication | Serial, Wireless(WiFi), Internet, LTE | Humidity | 5%~95%Non-condensing |

## Data Acquisition Unit Specifications

| | |
|---|---|
| A/D Converter | 24bit |
| Input Channel | 4channel(3ch for Vibration and 1ch for Sound) |
| Sensor Type | IEPE |
| Sampling Frequency | Vibration : 1024 Hz for each channel / Sound : 16384Hz |
| Input Range | ±5V(peak) |
| Measuring Range | Sound : 30~142 dB(50mV/Pa)<br><br>Vibration : 37~146 dB(±2g Full Scale), 46~156 dB(±6g Full Scale) |
| Frequency Range | Vibration : 0.5 ~ 500Hz(3dB) / Sound : 0.5 ~ 8000 Hz(3dB) |
| Accuracy | +/- 3% |
| Linear Accuracy | +/- 0.1 dB/30Hz |
| Trigger Range | 0.127 to 254 mm/s |
| Record Time | 1 to 10 Sec , up to 30 minutes, Wave Form, Combo & Manual mode |
| Signal to Noise Ratio | >= 120dB |

## Seismic Vibration & Sound Measurement

### [Vibration]
- Provide the influence evaluation data nearby Structure : 3axis peak and PVS(mm/sec)
- Vibration Measuring Range 255mm/sec
- Frequency Range : 0.5 ~ 100Hz for each channels (up to 500Hz)
- Vibration Accuracy : Less than 1%
- Vibration Resolution: 0.01 mm/sec
- Vibration Measuring Sample Rate: 1024 samples/sec
- Storage Sample Rate: 1024 samples/sec

### [Sound]
- Sound Measuring Range: 35 ~ 142 dBA
- Frequency Weighting Filter : A and L
- Frequency Range : 20 Hz ~ 8000 Hz
- Sound Accuracy : IEC 60651 Type2
- Sound Data : Simultaneously Lmax, Lmin, LeqLn, LeqAv

### [Common]
- Trigger Level : Set up from 0.1mm/sec with 0.1mm/sec step, 92dB
- Measuring Mode : Selectable Manual, Single, Continuous mode (Up to 250 Events)
- Selectable Measurement Time : 1sec, 2sec, 3sec, 5sec, 10sec, 1min, 5min, 30min, 1hr, 1day, User definable time
- Data Storage Capacity: SD Memory Card 4G (Continuously 60 days for the measurement data including Graph)
- Measurement cycle time: no dead time



**Blast Measurement BLS mode**

## Human Response Vibration & Sound Measurement

- Measurement Results : Instantaneous Sound Leq, Lmax, Lmin, Statistic Vibration Level L5, L10, L50, L90, L95
- Vibration Frequency Range : 0.5 ~ 80 Hz (up to 500Hz)
- Vibration Measuring Range : 37 ~ 156 dB
- Sound Measuring Range : 30 ~ 140 dBA
- Weighting Filter : A and L
- Sound Frequency Range : 20 Hz ~ 8000 Hz
- Dynamic Range : more than 120 dB
- Selectable Measuring Time :1sec, 2sec, 3sec, 5sec, 10sec, 1min, 5min, 30min, 1hr, 8hr, 1day, User definable set up



**Environmental Measurement EVS mode**

- Vibration Trigger Level : set up with 1 dB step from 45dB (to measure the wanted Vibration And Sound Level)
- Measuring Mode : Selectable Manual, Single, Continuous mode up to 250 events
- Data Storage Capacity : SD Memory Card 4GB (Continuously 60days for the measurement data including Graph)

## Remote Auto Measurement

- Communication Type : LTE or Internet
- Remote Data Transmit and Receiving time Control (To Control interval time with Hour, Min, Sec Unit)
- Remote Auto Control up to Max 100 measuring equipments
- Remote Control Trigger Level and Measurement time
- Possible to measure during receiving the measured data
- No need Reset the Equipment by the receiving error (Simultaneously the Measurement and Communication mode)



**Environmental Vibration mode by JIS C 1510**




**3-axis Environmental Vibration mode by JIS C 1510**

**Event Lists on PC**



**Time Data, Result data and DIN 4150**

## Analysis & Report Software
### -Powerful PC Software

- The user can store the measured data in SD card to do the post processing, analysis and report PC.
- The user can get the report by JIS C1510 and DIN 4150 with this post processing software.
- Software along with manual for use in window system and analysis.
- Time history graph of displacement, acceleration & particle velocity.
- Frequency Vs Energy graph and also in numerical form of above waveform.
- Peak value of displacement, acceleration and particle velocity, frequency and energy release with corresponding time and release.
- F.F.T analysis. The software should have the provision for giving raw data in ASCII and/or standard data base format for use in the third party software.
- Optional Post-processing software (DatsliteNVE) (attached) : PSD(Auto Power Spectral Density), FFT, Trends(Acceleration, Velocity, Displacement), Digital filtering and so on
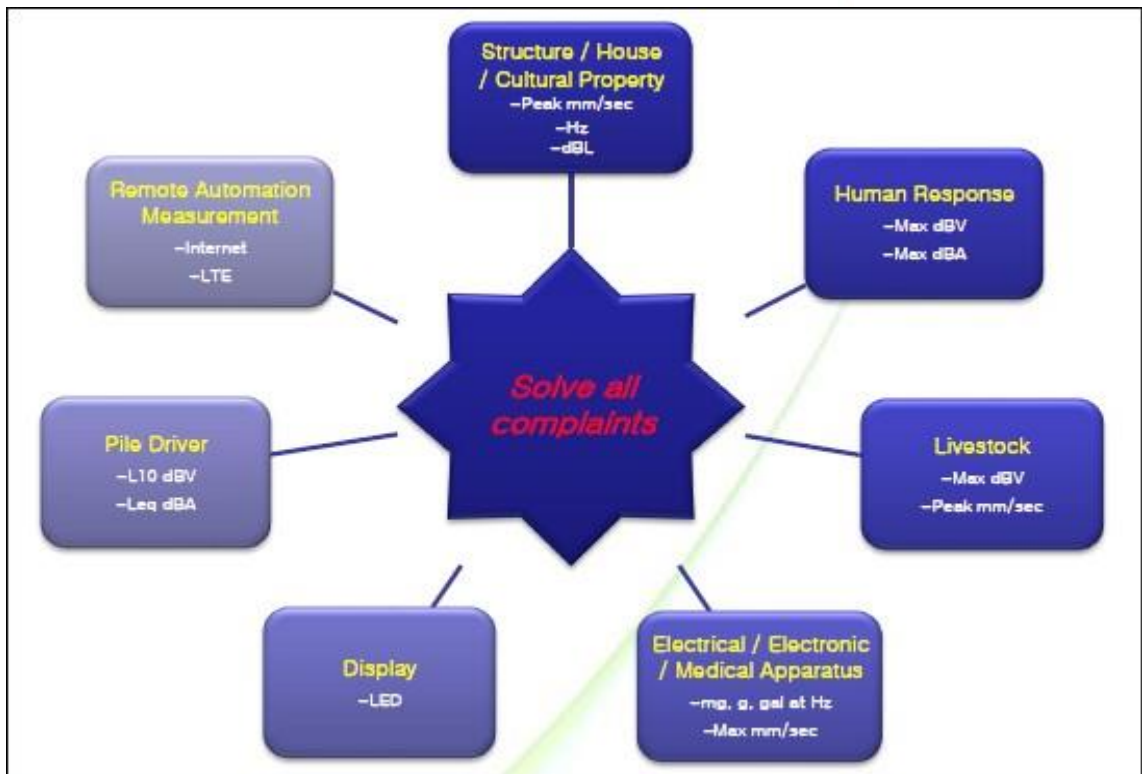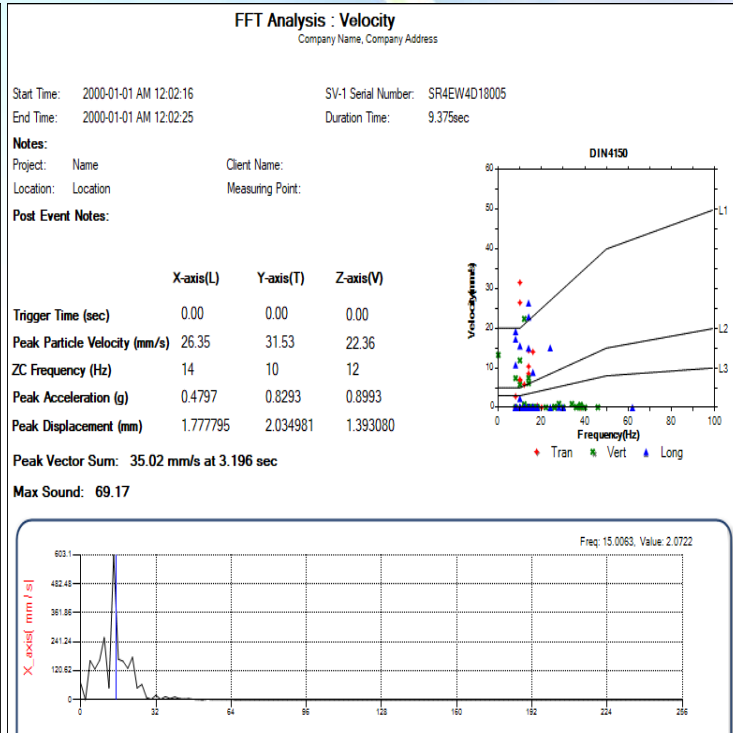
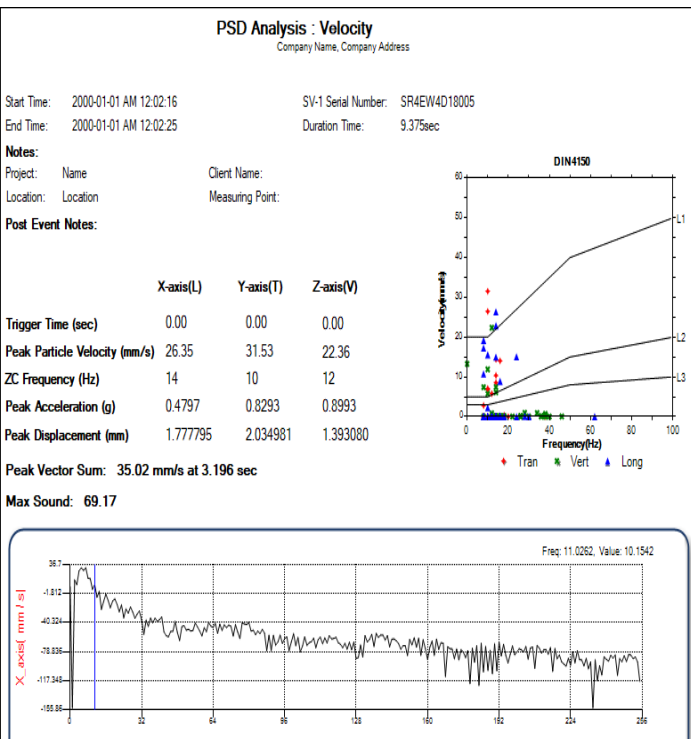# Seismic / Human Response Vibration & Sound Analyser
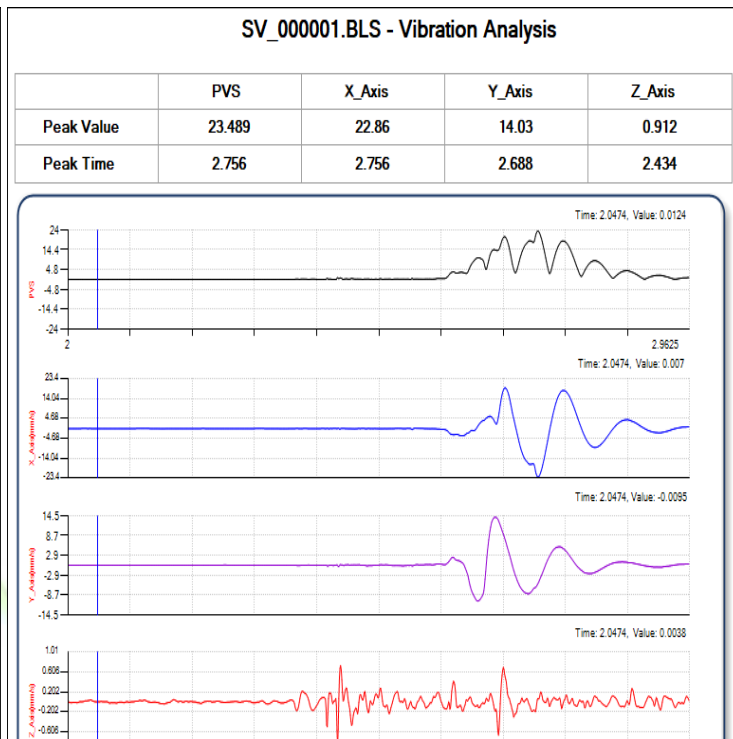
## BLS PC Software
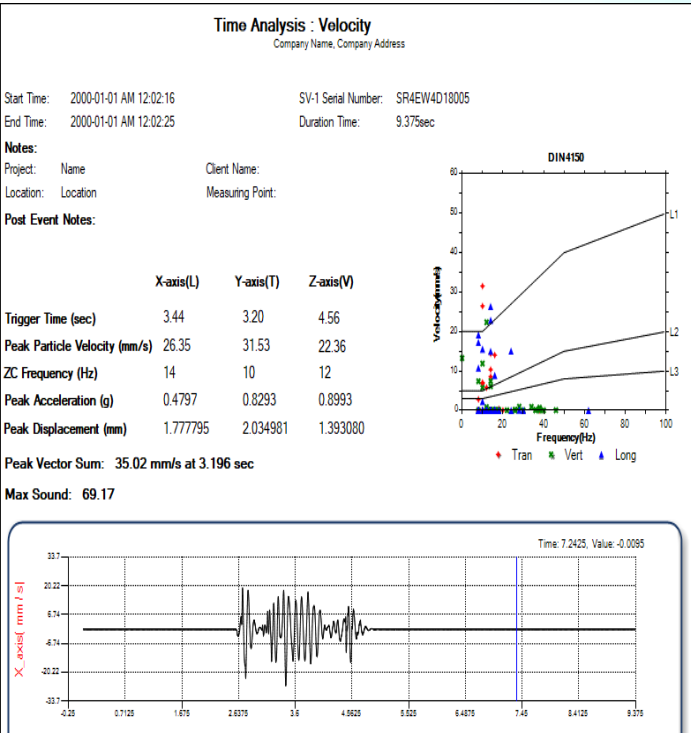

Time Analysis : Velocity


FFT Analysis : Velocity


PSD Analysis : Velocity


Velocity Data Zoom Analysis

# Seismic / Human Response Vibration & Sound Analyser

## Time Analysis : Acceleration
Company Name, Company Address

| | | X-axis(L) | Y-axis(T) | Z-axis(V) |
|---|---|---|---|---|
| Start Time: | 2000-01-01 AM 12:02:16 | | SV-1 Serial Number: | SR4EW4D18005 |
| End Time: | 2000-01-01 AM 12:02:25 | | Duration Time: | 9.375sec |

Notes:
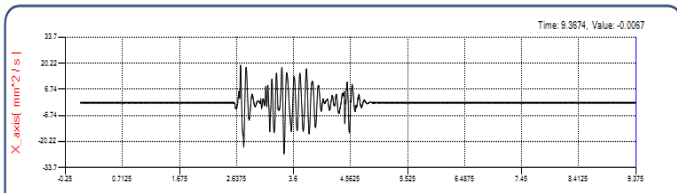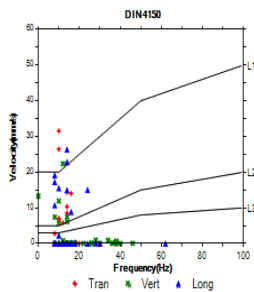Project: Name    Client Name:
Location: Location    Measuring Point:
Post Event Notes:

| | X-axis(L) | Y-axis(T) | Z-axis(V) |
|---|---|---|---|
| Trigger Time (sec) | 3.44 | 3.20 | 4.56 |
| Peak Particle Velocity (mm/s) | 26.35 | 31.53 | 22.36 |
| ZC Frequency (Hz) | 14 | 10 | 12 |
| Peak Acceleration (g) | 0.4797 | 0.8293 | 0.8993 |
| Peak Displacement (mm) | 1.777795 | 2.034981 | 1.393080 |

Peak Vector Sum: 35.02 mm/s at 3.196 sec

Max Sound: 69.17

DIN4150

Time: 9.3674, Value: -0.0067

Time Analysis: Acceleration

## PSD Analysis : Acceleration
Company Name, Company Address

| | | | | |
|---|---|---|---|---|
| Start Time: | 2000-01-01 AM 12:02:16 | | SV-1 Serial Number: | SR4EW4D18005 |
| End Time: | 2000-01-01 AM 12:02:25 | | Duration Time: | 9.375sec |

Notes:
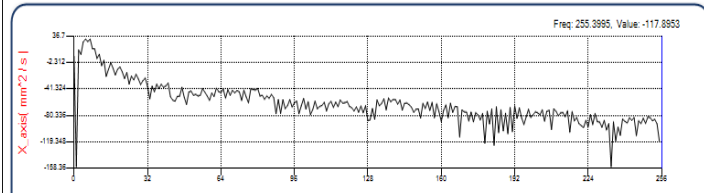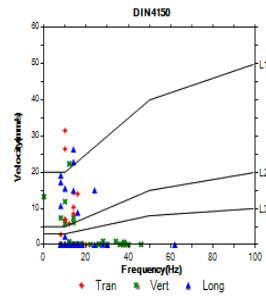Project: Name    Client Name:
Location: Location    Measuring Point:
Post Event Notes:

| | X-axis(L) | Y-axis(T) | Z-axis(V) |
|---|---|---|---|
| Trigger Time (sec) | 0.00 | 0.00 | 0.00 |
| Peak Particle Velocity (mm/s) | 26.35 | 31.53 | 22.36 |
| ZC Frequency (Hz) | 14 | 10 | 12 |
| Peak Acceleration (g) | 0.4797 | 0.8293 | 0.8993 |
| Peak Displacement (mm) | 1.777795 | 2.034981 | 1.393080 |

Peak Vector Sum: 35.02 mm/s at 3.196 sec

Max Sound: 69.17

DIN4150

Freq: 255.3995, Value: -117.8953

PSD Analysis: Acceleration

## Time Analysis : Displacement
Company Name, Company Address

| | | | | |
|---|---|---|---|---|
| Start Time: | 2000-01-01 AM 12:02:16 | | SV-1 Serial Number: | SR4EW4D18005 |
| End Time: | 2000-01-01 AM 12:02:25 | | Duration Time: | 9.375sec |

Notes:
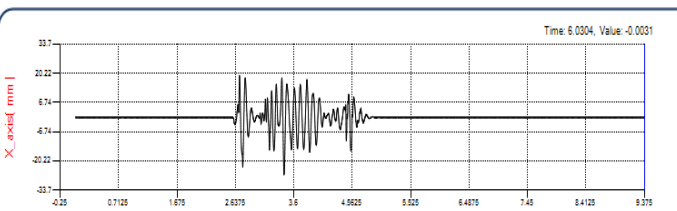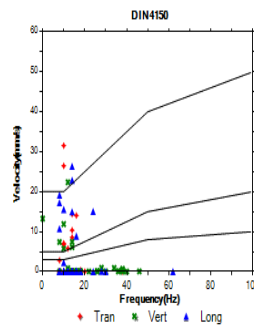Project: Name    Client Name:
Location: Location    Measuring Point:
Post Event Notes:

| | X-axis(L) | Y-axis(T) | Z-axis(V) |
|---|---|---|---|
| Trigger Time (sec) | 3.44 | 3.20 | 4.56 |
| Peak Particle Velocity (mm/s) | 26.35 | 31.53 | 22.36 |
| ZC Frequency (Hz) | 14 | 10 | 12 |
| Peak Acceleration (g) | 0.4797 | 0.8293 | 0.8993 |
| Peak Displacement (mm) | 1.777795 | 2.034981 | 1.393080 |

Peak Vector Sum: 35.02 mm/s at 3.196 sec

Max Sound: 69.17

DIN4150

Time: 6.0304, Value: -0.0031

Time Analysis: Displacement

## FFT Analysis : Displacement
Company Name, Company Address

| | | | | |
|---|---|---|---|---|
| Start Time: | 2000-01-01 AM 12:02:16 | | SV-1 Serial Number: | SR4EW4D18005 |
| End Time: | 2000-01-01 AM 12:02:25 | | Duration Time: | 9.375sec |

Notes:
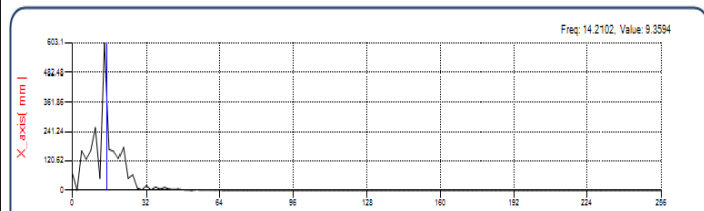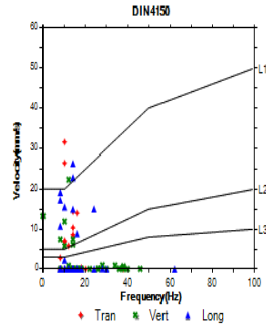Project: Name    Client Name:
Location: Location    Measuring Point:
Post Event Notes:

| | X-axis(L) | Y-axis(T) | Z-axis(V) |
|---|---|---|---|
| Trigger Time (sec) | 0.00 | 0.00 | 0.00 |
| Peak Particle Velocity (mm/s) | 26.35 | 31.53 | 22.36 |
| ZC Frequency (Hz) | 14 | 10 | 12 |
| Peak Acceleration (g) | 0.4797 | 0.8293 | 0.8993 |
| Peak Displacement (mm) | 1.777795 | 2.034981 | 1.393080 |

Peak Vector Sum: 35.02 mm/s at 3.196 sec

Max Sound: 69.17

DIN4150

Freq: 14.2102, Value: 9.3594

FFT Analysis: Displacement