



# USER MANUAL



## SV 803 VIBRATION MONITORING TERMINAL

Warsaw, 2023-04-06

Rev. 1.02

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This user manual presents the SV 803 firmware revision **1.03**. and the Assistant Pro software revision **1.0.4**.



**WEEE Notice:** Do not throw the device away with the unsorted municipal waste at the end of its life. Instead, hand it in at an official collection point for recycling. By doing this you will help to preserve the environment.

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## IMPORTANT NOTES BEFORE USE

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### GENERAL WARNINGS, SAFETY CLAUSES

- ✓ *If SV 803 is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.*
- ✓ *All measurements should always be made with the lid closed and tightened with a torque of 1.1 Nm.*
- ✓ *SV 803 cannot be submerged in water.*
- ✓ *Do not use SV 803 in the presence of flammable vapours or gases or in an explosive atmosphere.*
- ✓ *Safe operating ambient temperature range is -10 to +50°C (+14 to +122°F).*
- ✓ *SV 803 can operate in the sun at an ambient temperature of up to +50°C. Above this temperature, the device should be protected from the sun.*
- ✓ *For air-transport the instrument must be turned off!*
- ✓ *Only the battery and the geophones can be disconnected and removed from the SV 803 housing by the user. All other disassembling work should be performed strictly by an authorized service team.*
- ✓ *Instrument battery charging ambient temperature range is 0°C to 45°C.*
- ✓ *SV 803 should not be stored for a long time with discharged batteries. Storing with batteries in discharged condition may damage them. If so, warranty for Li-Ion battery is void.*
- ✓ *If SV 803 is planned to be stored for a long period of time, it is recommended to charge its battery to 60% capacity. The battery should be charged at least once per 6 months.*
- ✓ *WEIPU connectors must be capped when not in use.*

## SAFETY AND ENVIRONMENTAL PROTECTION MARKING OF THE UNIT



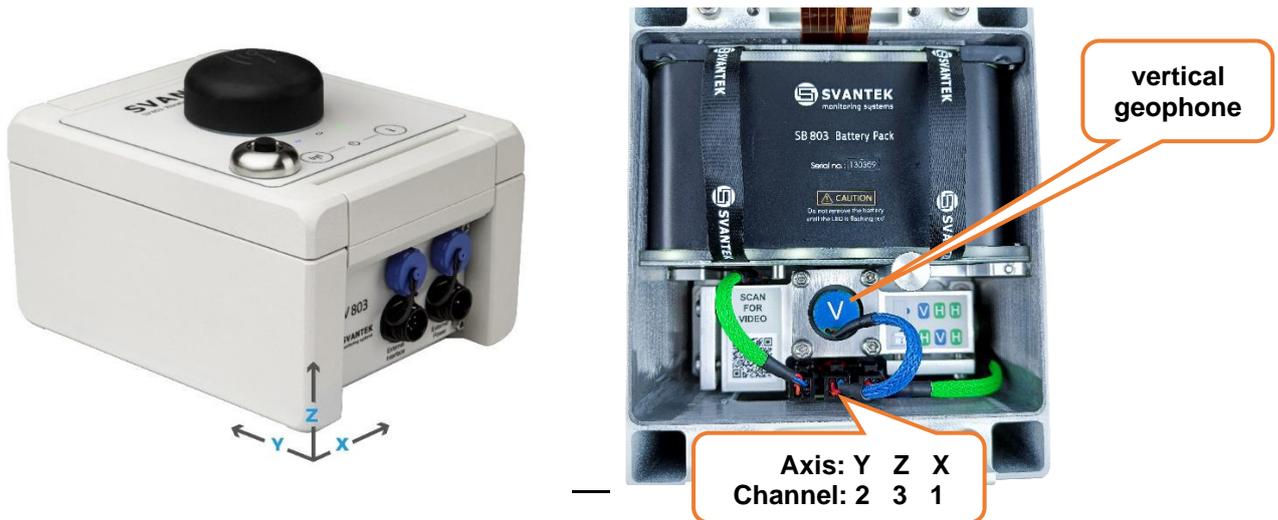
Marking on the Unit	Explanation
UK CA	This product meets UK consumer safety, health or environmental requirements
CE	This product meets EU consumer safety, health or environmental requirements
	Do not throw into standard municipal waste containers. The user is obliged to deliver used equipment to the manufacturer or to the recycling collection point
	This product can be recycled (sign is placed on the battery)

## INSTRUMENT ORIENTATION

The instrument can be mounted in the horizontal position (on the floor) or in the vertical position (on the wall). Each instrument position must correspond to a specific arrangement of geophones in the geophone pack. The arrangement of the geophones shows the scheme on the right section of the geophone pack.

Axes are assigned to the channels of SV 803: the X axis is assigned to Channel 1, Y axis – to Channel 2 and Z axis – to Channel 3.

- In the horizontal position, the central geophone must be of the vertical type \*).



- In the vertical position, the left geophone (with the QR code) must be of the vertical type.



\*) The geophone of the vertical type has the blue cable!

SV 803 is equipped with a gyroscope to identify its mounting position and assign the channels to the axes automatically. In case of inconsistency between the position of the instrument and the arrangement of geophones, the instrument will detect it and inform the user via the *Assistant Pro* mobile application and *SvanNET* web service.

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# 1 INTRODUCTION

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**SV 803** is an outdoor monitoring system dedicated for ground and building vibration applications such as construction site monitoring, tunnelling and blasting. It uses three geophones measuring vertical, longitudinal, and transverse vibration, that can be easily taken out for calibration.

The instrument can be fully controlled via the *SvanNET* web service and also using the *Assistant Pro* mobile application that connects a mobile device with the instrument via Bluetooth®. The control capability includes data presentation, reporting, alarms, configuration of measurement and instrument settings.

The instrument's enclosure has IP 67 rate and is fitted with very robust, waterproof connectors. It can be equipped with an IP 65 external power supply.

SV 803 measures vibration velocity in three directions and calculates both Peak Particle Velocity and Dominant Frequency value simultaneously. The device uses FFT for determining the dominant frequency according to BS and DIN standards. It also has the option to use RMS or PEAK velocity spectrum in 1/3 octave bands for comparison with user-defined curves. Additionally, SV 803 can measure Vibration Dose Value (VDV).

One of the biggest advantages of SV 803 is its power efficiency. It can run up to 180 days on batteries. The terminal can be powered from internal battery, or outdoor DC power supply, for example, solar panel.



## 1.1 KEY FEATURES

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- **Peak Particle Velocity (PPV) and Dominant Frequency** are measured simultaneously in three axes according to DIN 4150-3 and BS 7385-2.
- **Other** Building Vibration Standards and methods including customized criterion curves based on FFT or 1/3 octave (RMS or PEAK) can be used.
- **Human Vibration** in buildings measurements in accordance with DIN 4150-2 (**KB**) and BS 6472-1 (**VDV**).
- **Time history** logging of measurement results.
- **Time domain signal** recording that opens wide possibilities for post-processing analysis using SvanPC++ software.
- **Bluetooth®** enabling the remote control by the *Assistant Pro* smartphone application.
- **4G modem** enabling the remote control and fast data transfer over the Internet to a PC through the *SvanNET* web service.
- **GPS** module for localization of the instrument and time synchronization (option).
- Internal and external (optional) **4G antennas**.
- Powering from the removable **internal battery**, **external DC** source (option), and dedicated **solar panel** (option).
- Charging the instrument's battery using a standard **indoor USB-C wall adapter**.
- Charging and powering the instrument using the waterproof **outdoor power supply** (option).
- Waterproof **connectors** providing reliable external power supply and communication with external devices.
- **Weather Station** and **Dust Monitor** integration into the measurement system with the use of optional SD 310 monitoring system controller (future option).

## 1.2 ACCESSORIES INCLUDED

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<b>SV 803</b>	Outdoor monitoring station including built-in 4G modem, Bluetooth
<b>SB 803</b>	Exchangeable battery
<b>SB 83</b>	AC charger for SB 803 (USB-C)
<b>SA 800</b>	Levelling mounting base with four sleeves with bolts for mounting SV 803 on the SA 800, wall pin, three levelling studs and the Allen key 4mm for them to attach SV 800 on the wall
<b>SA 801</b>	Sharp short spikes for levelling mounting base on the floor
<b>SC 816</b>	Communication cable for SV 803 (1 m, WEIPU5 - USB-A)
<b>ST 801</b>	Vertical geophone (one pcs.)
<b>ST 802</b>	Horizontal geophone (two pcs.)
<b>SA 82</b>	Torque screwdriver
<b>SA 83</b>	32 GB memory card
<b>SA 85</b>	Key to unfasten geophone plugs



**Note:** SV 803 is shipped in protective packaging. Please keep it for use when transporting your equipment.

## 1.3 ACCESSORIES AVAILABLE

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<b>SV 110</b>	Hand-held vibration calibrator (80Hz & 160Hz) including carrying case
<b>SA 803</b>	Calibration adapter for geophones with cable
<b>SB 871</b>	Solar panel for SV 803
<b>SB 274</b>	Waterproof mains power supply for SV 803
<b>SC 270</b>	Mains cable for SB 274 (5 m)
<b>SC 803</b>	DC cable for SB 274 and SV 803 (5 m, WEIPU2)
<b>SC 833</b>	Solar panel power cable for SV 803 (2 m, WEIPU2)
<b>SA 802</b>	Ground spike 40 centimetres including impact protector
<b>SA 804</b>	External 4G antenna with cable (xx m)
<b>SA 805</b>	Carrying case for SV 803 and accessories

## 1.4 COMING OPTIONS

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Light and sound alarm, battery powered, Bluetooth® controlled  
 LAN (PoE)  
 RS232 cable  
 External Li-Ion battery  
 External digital triaxial geophone  
 External digital triaxial accelerometer  
 Light barrier – sensor for information about e.g., a passing train

## 1.5 SYSTEM EXTENSIONS

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SV 803 will be integrated in the measurement system with other devices:

<b>SP 276</b>	Weather Station
<b>SP 280</b>	Dust Monitoring

## 2 SV 803 DESCRIPTION

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### 2.1 KEYPAD AND LEDs

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SV 803 has on the front panel two keys for:

-  - waking up the 4G modem if the modem works in periodic mode
-  - switching on the status LED indication (short press) and, if the lid is opened, switching on Bluetooth (long press > 5 sec)

and three status LEDs:

-  (left) - indicating the 4G modem status,
-  (middle) - indicating the charging/powering status,
-  (right) - indicating the measurement status,

and the socket for the external antenna.

Simultaneous pressing of both buttons turns on the device.



**Note:** If the 4G modem is switched off, the  key will not switch it on. To switch the modem on, use *Assistant Pro* or *SvanNET*.



### 2.2 INSTRUMENT CONTROL

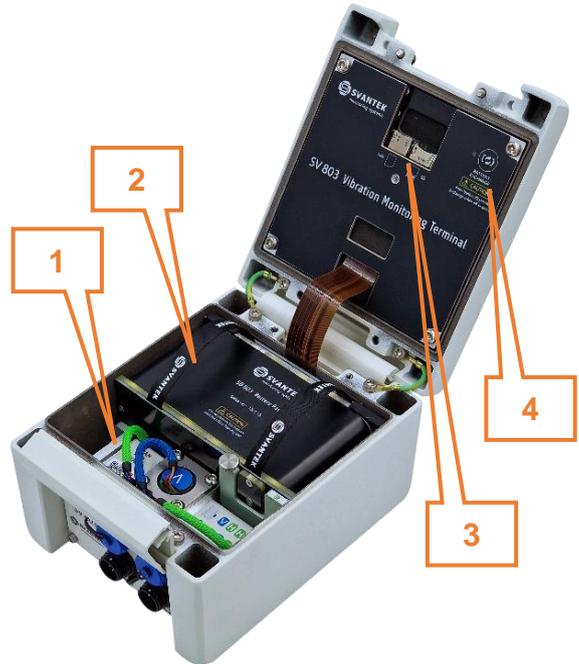
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SV 803 can be controlled via the Bluetooth connection, 4G connection or USB. Each type of connection is supported by the special software: *Assistant Pro* mobile device application (see Chapter [4](#)) that supports the Bluetooth connection, *SvanNET* web-service that supports the 4G connection with the Internet (see Chapter [5](#)) and *SvanPC++* software that supports either the USB or 4G connection (see Chapter [6](#)).

## 2.3 WATERPROOF HOUSING

The SV 803 waterproof housing (IP 67) houses and protects the main elements of the monitoring station:

- geophone pack (1),
- li-ion batteries pack (2),
- slots for the nano-SIM card and micro-SD memory card (3),
- button for notification of a safe battery replacement and the LED indicator of power state (4). The button turns on the instrument and also turns it off when there is no external power supply,
- analogue and digital processing parts,
- other internal elements such as: connectors, cables, circuit boards.



**Note:** SVANTEK does not provide a SIM card for the instrument. It is necessary to purchase the SIM card with the **data plan**. If the instrument is intended for constant monitoring, choose service provider that ensures good reception at the measurement point.



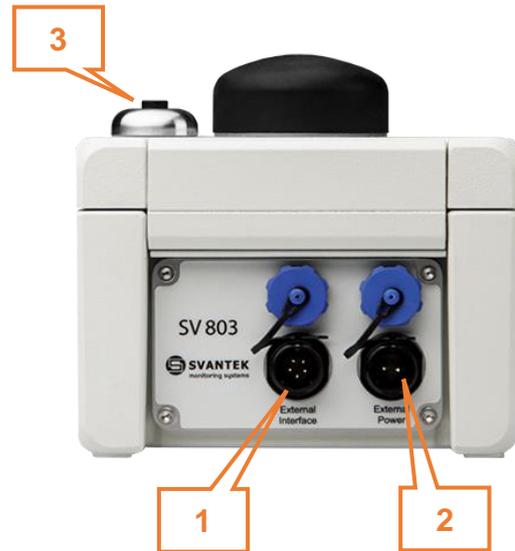
**Note:** Make sure the SIM card has deactivated PIN-code before insertion it into SV 803.

To open the housing, release the clamp and then unscrew two bolts under the clamp that ensure waterproofness of SV 803 using the torque screwdriver.



The station housing is equipped with two connectors:

1. **External Interface** (WEIPU5 type) for the USB connection with the PC, Weather or Dust monitors or SD 310 Monitoring System Controller, connection of the external geophones, alarm lamp or adapter for LAN. This connector may also be used for any type of external power sources equipped with the WEIPU2 plug.
2. **External Power** (WEIPU2 type) for any type of external power sources equipped with the WEIPU2 plug.
3. optional external antenna.



To connect a cable to the WEIPU socket, start by lining up the marker on the plug and socket, then screw the ring close to the socket clockwise.

To disconnect a cable from the WEIPU socket, turn the ring close to the socket counter-clockwise. New connectors require more force so using a closed hand is more effective than using only fingers.



**Note:** Use caps to protect connectors when not in use.

## 2.4 BATTERY REMOVAL AND CHARGING

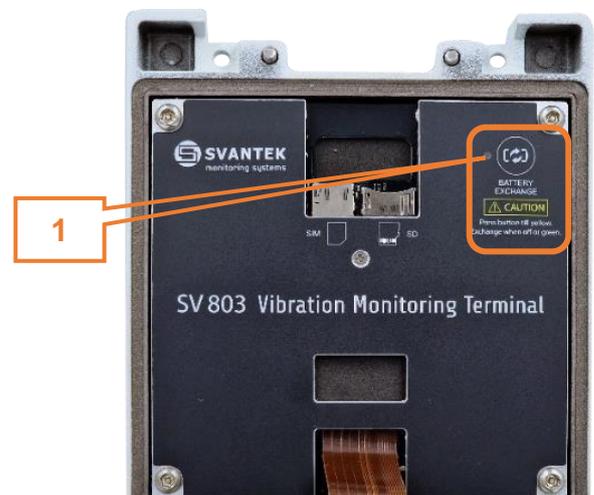
The battery must be removed from the instrument housing to be charged using the SV 83 mains charger.



**Note:** If SV 803 is not powering through the WEIPU5 connector, before removing the battery, it is necessary to turn off SV 803.

To remove the battery, follow next steps:

1. Open the lid and press the button on the lid and observe the LED (marked as BATTERY EXCHANGE); when the LED turns off, or it turns green (if there is the WEIPU5 power), you can remove the battery.

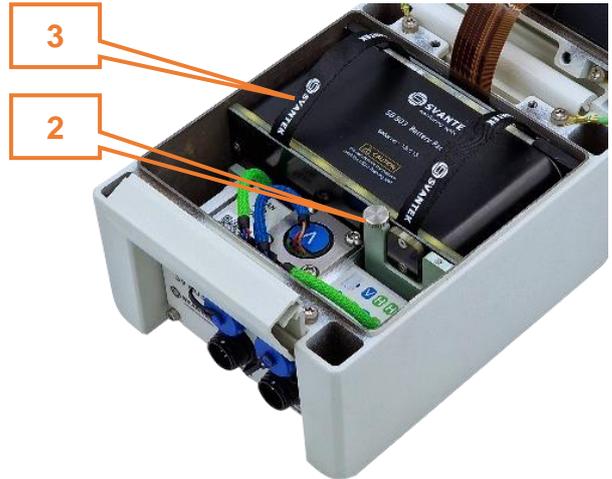




**Note:** Do not remove the battery if the LED is red (steady or flashing).

2. Unscrew the screw that secure the battery to the housing.
3. Pull out the battery by the straps.

After inserting the battery, tighten the screw (not too tight) to secure the battery in the housing.



The battery has:

4. contacts for connecting the battery with the SV 803 circuit,
5. six green LEDs showing the charged state,
6. TEST button for checking the battery charging state,
7. red LED for indication battery charging,
8. pin that does not allow you to insert the battery wrong,
9. USB-C socket for battery charging.



Normally all LEDs are off.

The TEST button initiates the green LEDs from the 10% LED to the LED showing the current charge level.

If the battery is fully discharged all LEDs will be off.

While charging, a red LED and a series of green LEDs light up.



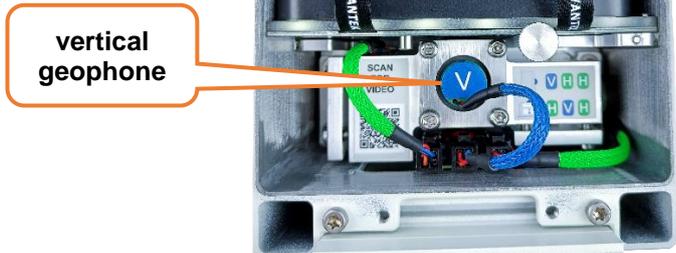
## 2.5 REPLACING GEOPHONES



**Note:** Before removing the geophones, it is necessary to turn off SV 803.

Geophones must be placed in the geophone block according to the SV 803 position.

If SV 803 is positioned horizontally (usually on the floor), the middle geophone must be of the vertical type.



If SV 803 is positioned vertically (usually on the wall), the left geophone must be of the vertical type.



**Note:** The geophone of the vertical has the blue cable.

To replace the geophones to fit the SV 803 position, you should first extract the geophone block from the case.

Before extracting the geophone block, disconnect all tree cables from the connector panel.

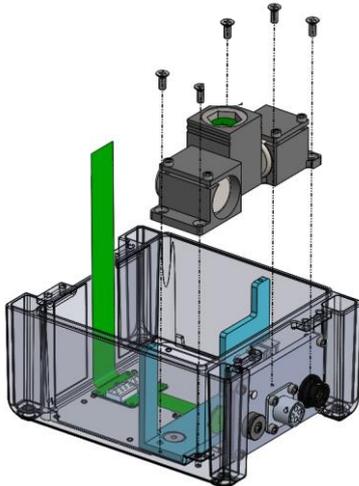
The geophone connectors have special locks, which should be pressed when you disconnect them. To make this process easier, use the special Key to unfasten geophone plugs as shown on the figure.



To disconnect the geophone cable, put the key on the connector and lean towards the battery.

To extract the geophone block:

- unscrew the four bolts that fix the basement of the geophone block to the housing (1) and
- unscrew the left-down long bolt on the central geophone (2).

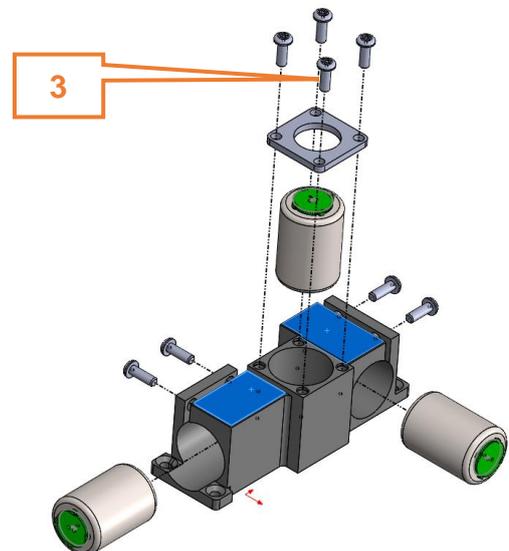
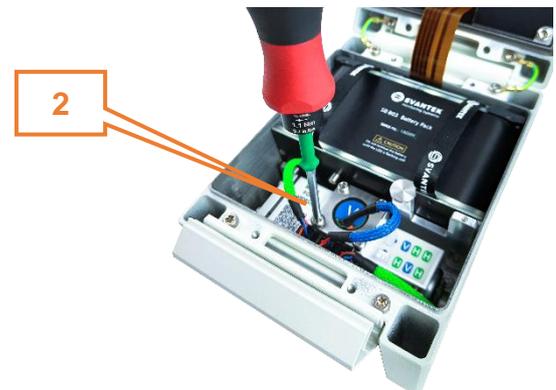
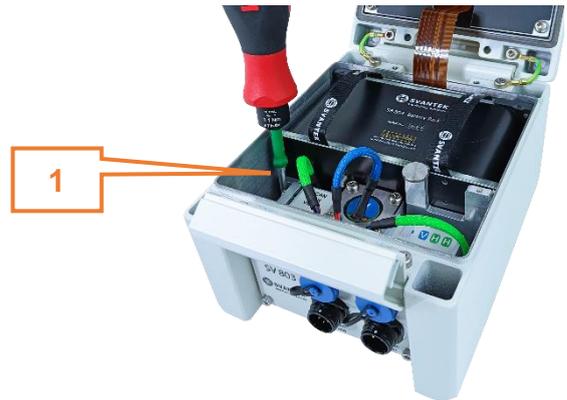


When the geophone block is extracted, unbolt the geophone cups using the torque screwdriver and extract the geophone from the box.

Place the geophones in the appropriate boxes and screw the bolts to fix them.

Then insert the geophone block to the instrument housing and screw four bolts to fix the geophone block to the housing.

In the end, tight the left-down long bolt on the central geophone (3).



## 2.6 OPTIONAL ACCESSORIES FOR SV 803

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### 2.6.1 External power adapter

**SB 274** is waterproof single output switching power supply which is characterised by:

- Universal AC input / Full range (90 ~ 305V AC)
- Rated power 40W
- Built-in active PFC function
- Class 2 power unit
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Fully encapsulated with IP 66 waterproof level



### 2.6.2 Solar panel

The **SB 871** solar panel (40 W, 17.5V DC) extends the working time of the monitoring station. The size and weight of the panel enables easy transportation in the dedicated carrying bag.

The SB 871 solar panel does not require additional batteries or external controllers.

SB 871 is equipped with a WEIPU2 connector cable for direct connection to the monitoring station.



## 3 OPERATING SV 803

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### 3.1 POWERING

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SV 803 is powered from the internal rechargeable battery (SB 803).

When the batteries are completely discharged, monitoring will stop, and SV 803 will turn off.

The battery can be charged outside or inside the instrument. In the last case one of the optional power sources equipped with the WEIPU2 type plug should be connected to the instrument:

- external power adapter (SB 274) or
- solar panel (SB 871).



**Note:** The external power sources with the WEIPU2 plugs can be connected to both WEIPU connectors of the instrument. The difference is, when it is the WEIPU5 connector, you can remove the battery without turning off the instrument, when it is WEIPU2, you cannot!



**Note:** SV 803 should not be stored for a long time with discharged batteries. Storing with batteries in discharged condition may damage them. If so, warranty for Li-Ion battery is void.



**Note:** If SV 803 is planned to be stored for a long period of time, it is recommended to charge its battery to 60% capacity. The battery should be charged at least once per 6 months.

### 3.2 LED INDICATORS

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#### External LEDs

SV 803 has three external LEDs on the keyboard panel, which indicate the state of:

-  4G modem status (left): red – when the modem is switched on, blue – when the modem is connected to *SvanNET*,
-  charging/powering status (middle): turned off – when the charger is not connected, red – when the battery is charging, green – when the charging is finished, flashes red - when the battery fault is detected,
-  measurement status (right): flashing green – when the measurement is running, flashing red for at least 30 seconds – when the measurement is running and the overload is detected, yellow – when the measurement is stopped.

When the instrument is turning on, three external LEDs are flashing orange in turn, after some time they show status and turn off.

Short pressing the  key activates all three external LEDs for 15 seconds. During this period LEDs show the present status and then turn off.

When the mobile device sends the command for identification from the *Assistant Pro* application, all three external LEDs are flashing alternately red and green for a certain time.

## Internal LED

The internal LED indicates whether the instrument is turned on or off and whether the battery can be removed or not. When it:

- flashing red – the instrument is turned on and there is no external power; removal of the battery is forbidden,
- red – the instrument is turned on and there is external power; removal of the battery is forbidden,
- orange – the instrument mode is changing or shutting down is in progress,
- green – the instrument is turned on and there is an external power on the WEIPU5 connector; removal of the battery is aloud,
- off – the instrument is turned off and there is no external power on the WEIPU5 connector; removal of the battery is aloud. When turning off, the orange light is on permanently and when it goes out, the device will turn off.

The internal LED is turning off automatically after closing the lid.

## 3.3 ESTABLISHING 4G CONNECTION



**Note:** To save the power of the instrument, the 4G modem is working by default in the periodical mode, connecting to the SvanNET to download data files, or when the alarm appears to send alarm notifications. To change the mode of the modem to the continuous, use Assistant Pro or SvanNET.

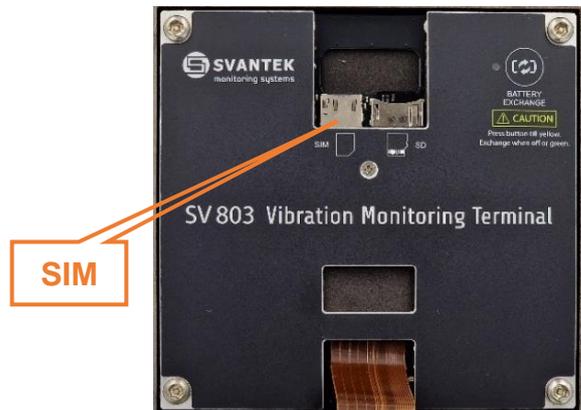
It is strongly advised to configure the remote communication before going on site.

Open the lid of SV 803 and insert a nano-SIM card into the slot located on the inner side of the lid. The instrument automatically connects to SvanNET.

The station is programmed to automatically establish a 4G connection with the SvanNET web service.

If you wish to wake up the modem which works in the periodical mode and force the connection to SvanNET, press the  key on the SV 803 keypad.

The default APN setting is "internet". It's possible that your Internet provider uses different APN. In this case the APN must be entered manually using the Assistant Pro application (see Chapter 4.6.6) or the SvanPC++ program (see Chapter 6.4).



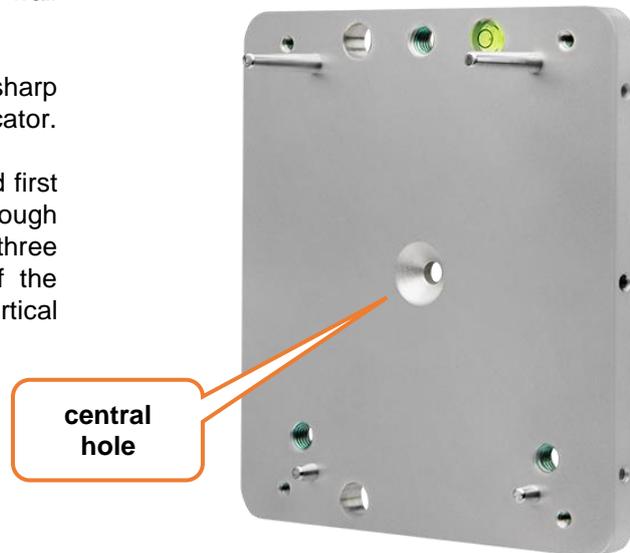
**Note:** In case the connection with SvanNET is failed, consult your local distributor or SVANTEK support group.

### 3.4 MOUNTING THE INSTRUMENT

SV 803 can be put on the floor or mounted on the wall with the use of the mounting plate.

If you wish to measure on the floor, attach four sharp spikes to the mounting base and check the level indicator.

If you wish to mount SV 803 on the wall, you should first attach the mounting base to the wall with the pin trough the central hole in the base. To control the level use three studs and the Allen key. The mounting angle of the instrument must not exceed 5° relative to the vertical plane.



After attaching the mounting base on the wall, fix SV 803 using four sleeves and the torque screwdriver.

While fixing SV 803 to the mounting plate, insert four sleeves with bolts to the holes in instrument housing and screw them with the torque screwdriver.



### 3.5 TURNING THE INSTRUMENT ON/OFF

#### Turning On

After connecting the external power supply SV 803 turns on automatically.

The instrument is turned on automatically after inserting the battery if it turns off automatically due to discharged battery.

In other cases, you should turn on SV 803 manually by pressing two keys  and  simultaneously until all the LEDs light up (for appx. 2 seconds).

SV 803 can be also turned on using the instrument's Timer or remotely.

While turning on, the system integration is checked and after successful result the firmware program starts. This program switches Bluetooth and the 4G modem and install connection with the SvanNET web server (if the SIM card is inserted).

### Turning Off

To turn the instrument off manually:

1. Hold down two buttons for about 5 seconds (all LEDs turn orange) or
2. If there is no power supply on the WEIPU5 connector, open the lid and press the key on the upper right corner on the lid marked as "BATTERY EXCHANGE" and hold it until the LED is orange.

## 3.6 MEASUREMENT RUN AND DATA STORAGE

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After turning on, SV 803 starts measurement process according to the current settings – factory settings or user settings.

### 3.6.1 Factory settings

The instrument is delivered with default Factory settings which are:

Standard: BS-7385-2

Building type: L2

Events, Wave recording, and CSV recording functions are disabled.

According to the Factory settings the instrument measures PPV, Peak, Max, RMS and DF, and saves measurement results in the file with the name "Lxx" with 30s step.

If some configured events are happened, the instrument analyses them and logs the spectrum to the logger file and records the domain signal to the wave recording file. At the same time, SMS and/or E-mail alarm notifications may be sent to the selected recipients.

You can return to the factory settings using the *Assistant Pro* application – see Chapter [4.4.6](#).

### 3.6.2 User settings

You may change the Factory settings using one of three software applications (*Assistant Pro*, *SvanNET* or *SvanPC++*) and restart the measurement.

The measurement configuration and the instrument hardware are described in chapters devoted to the applications.

### 3.6.3 Data Storage

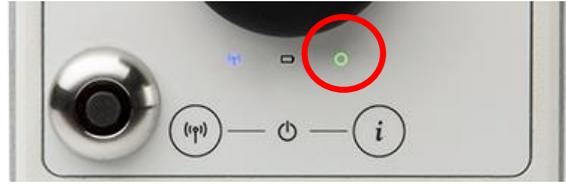
SV 803 creates measurement files that are stored on the micro-SD memory card. These files can be downloaded manually using any of the software application.

If SV 803 uses the 4G connection to *SvanNET* it can periodically transfers data files to the Cloud in the automatic mode (and, if configured, erases transferred files). The periodic way of connection, which is programmable, is used to prolong the battery life.

If the event happens, SV 803 also connects to *SvanNET* and sends alarm notification to the recipients.

### 3.6.4 Overload indication

If an overload occurs in one or more samples during the measurement, this interval period is marked with an overload flag. Overload is indicated by the measurement LED which starts blinking red for 30 seconds.



## 3.7 CALIBRATION

The instrument channels are factory calibrated with the supplied geophones for the reference environmental conditions (see Appendix C). In case of using other than supplied geophones calibration of the measurement channels should be performed by the user. Periodic calibration of the instrument is also required.

The calibration of SV 803 should be performed by the authorised laboratory.



**Note:** SV 803 is sensitive to shock. If dropped on a hard surface it must be recalibrated.



**Note:** The recommended factory calibration interval is 12 months for this instrument to be confident in its continuing accuracy and compliance with the international specifications. Please contact your local Svantek distributor for further details.

## 3.8 GEOPHONE IN SITU CHECK

The geophone check can be performed by the user with the use of SV 110 hand-held vibration calibrator.

For this, you should:

- extract the checked geophone from the geophone pack,
- prepare the SA 803 calibration adapter and the extension cable for connection the geophone with SV 803,
- attach the geophone to the SV 110 calibrator using the SA 803 calibration adapter,



- connect the geophone with SV 803 using the extension cable,
- set the SV 110 shaker amplitude and frequency (10 m/s<sup>2</sup> or 20 mm/s @ 79.58 Hz).



- switch on SV 803 and SV 110 and
- perform the geophone check using the *Assistant Pro* application.



**Note:** *Assistant Pro* has special wizard for calibration and geophone check that guides you through the process step by step.

### 3.9 SYSTEM CHECK

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SV 803 has special mechanism for testing the measurement chain, so called System Check, by initiating an electronic pulse and then evaluating the response of the sensor signal.

If System Check shows an error, it is displayed in the *Assistant Pro* application and the *SvanNET* web service.

System check can be scheduled by the user – see Chapters [4.6.4](#) and [5.2.5.1](#).

## 4 APPLICATION FOR MOBILE DEVICES – Assistant Pro

**Assistant Pro** is an application for mobile devices (smartphones and tablets) running on the Android platform that allows to control SV 803. The application uses the Bluetooth® interface enabling full control of the measuring device like view current measurement results, start/stop measurements, change current settings, download files with measurement results, connect to the *SvanNET* web service and other.

*Assistant Pro* also send alarms to the specified recipients when the certain events occur. The unique feature of the application is functionality of sending an email or SMS on pre-programmed alarm conditions.

The *Assistant Pro* application supports also other Svantek instruments that are equipped with Bluetooth® (e.g., SVAN 977/979 sound and vibration level meters, SV 100A vibration whole-body dosimeters, SV 104 sound exposure meters, SV 971A/973A/975 sound level meters etc.).

### 4.1 INSTALLING ASSISTANT PRO ON A MOBILE DEVICE

To install *Assistant Pro* on your mobile device:

1. Download the application installation file from the svantek.com website to your mobile device - smartphone / tablet with Android 5.0+ or iOS 9.0+ systems.
2. Go to the folder on your mobile device with the downloaded installation file *AssistantPro V x.x.x.apk*, tap it and follow installation procedure.

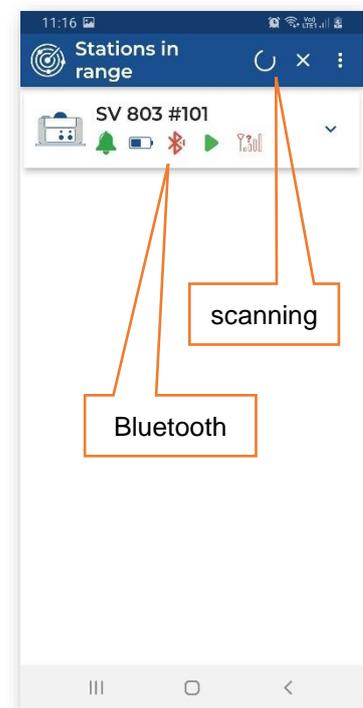
You can also download *Assistant Pro* from the *Play Store* application.



To start working with *Assistant Pro*, tap the  icon on your device.

The application may ask you to enable Bluetooth®, Localization services and allow access to files, photos, and media on your mobile device.

The application will detect visible instruments and if automatic connection function is enabled will try to connect with them.



**Note:** Geophones positions in the geophone pack should match the SV 803 mounting (on the floor or on the wall) – see Chapter 2.5. If the geophones do not match the SV 803 position, the instrument icon starts blinking red.

### 4.2 CONNECTING WITH INSTRUMENTS

*Assistant Pro* compatible instruments with enabled Bluetooth® will broadcast their basic status and some basic data will be visible on a mobile device running the application.

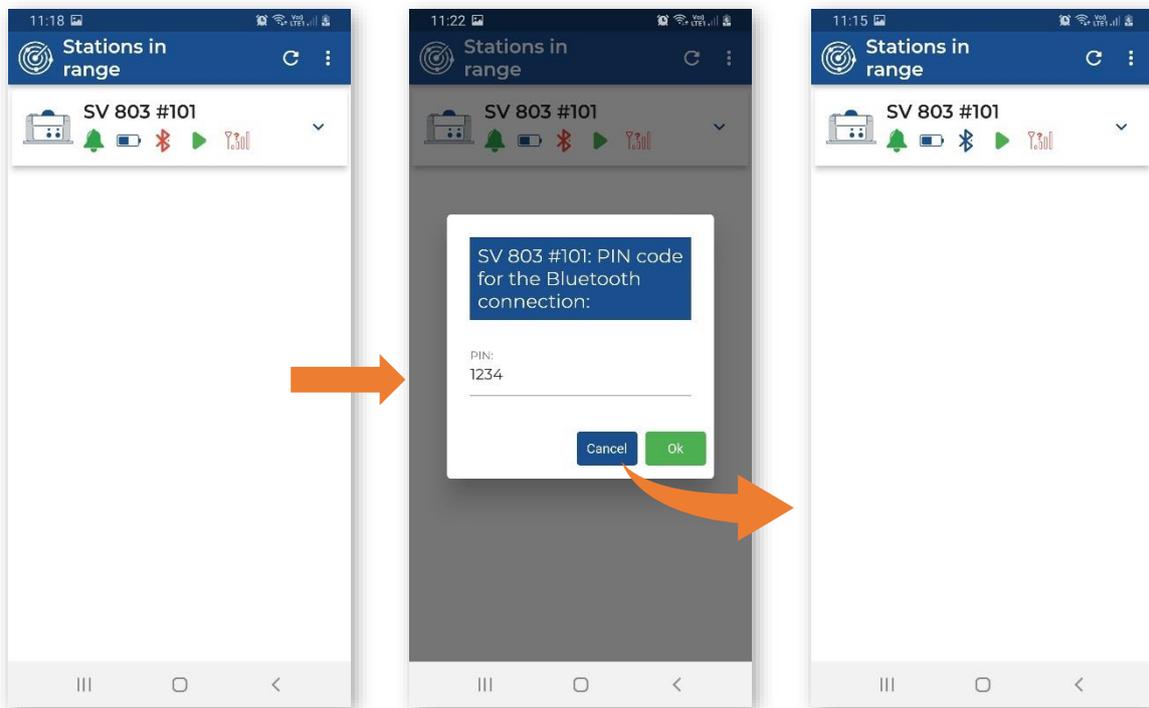
While screening the instruments, the “scanning”  icon appears in the right upper corner. You can stop scanning tapping on . When scanning is finished the “scanning” icon changes to . To start scanning, tap on .

If there is no connection with the instrument, the “Bluetooth” icon at the instrument bar is red. During connecting it “emits waves”. If connection is successful, the “Bluetooth” icon changes its colour to blue.



**Note:** You will not get access to the instruments that are under control of other users simultaneously running the Assistant Pro applications on another mobile devices.

If you pair the instrument for the first time, the application will try to use the default PIN code (1234). If it doesn't fit, you will be asked to enter the PIN code. Same effect is when you have changed the PIN code with another mobile device and then will try to connect with previous mobile device.



When the connection is established, you may control this instrument and watch measurement results.

### 4.3 DESCRIPTION OF ICONS

The instrument icons have next meanings:



Event alarms. If the icon is green there are no current event alarm, if it is red there is current event alarm.



Battery state. When the battery is empty the icon changes its colour to red.



Bluetooth – connection is used by another mobile device.



Bluetooth – not connected.



Bluetooth – while connecting.

	Bluetooth – connected.
	The instrument performs measurement.
	The instrument does not perform measurement.
	4G modem – not connected.
	4G modem – connected to the Internet.
	4G modem – connected to SvanNET.

#### 4.4 CONTROLLING THE INSTRUMENT

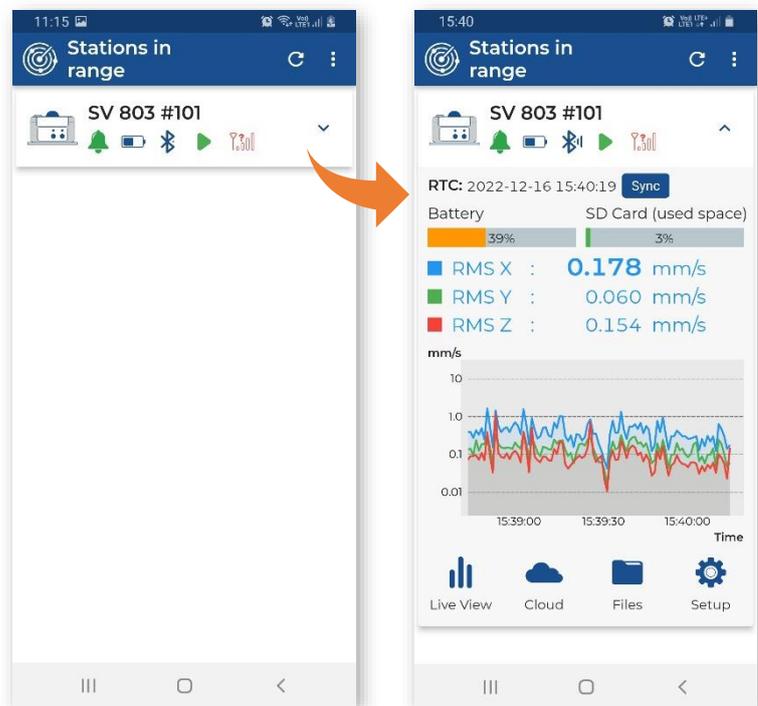
The visible instruments appear on the *Assistant Pro* screen as a bar which can be extended when you tap on it. After extension, the instrument field shows the state of the device's battery and memory and values of some predefined measurement results.

After extension, the instrument field shows the real-time (RTC), state of the device battery (**Battery**) and memory (**SD Card (used space)**) and values of some predefined measurement results.

To synchronize the real-time clock with the mobile device clock, tap the **Sync** button.

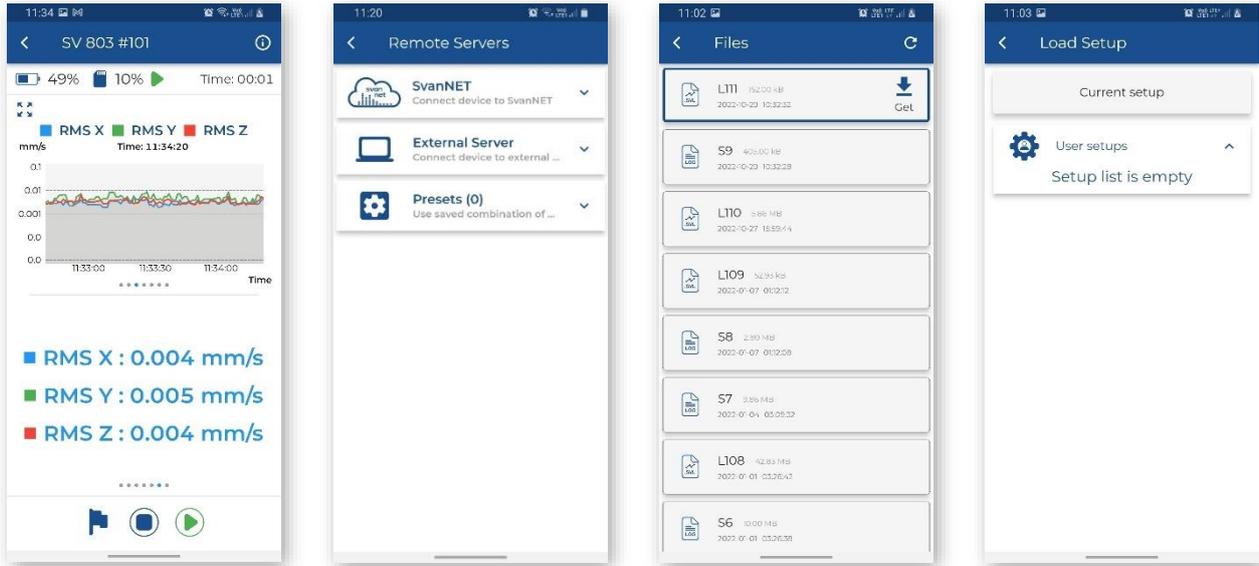
Three or four icons on the bottom give you quick access to some functions:

- **Live View** - viewing live results with the possibility to start/stop the measurement,
- **Cloud** - connecting to the SvanNET web service (direct connection to the instrument view),
- **Files** - managing instrument files,
- **Setup** - configuring instrument settings.



**Note:** By default, the **Files** icon is hidden. To have it visible and to be able to manage instrument files, you should activate it, see [Chapter 4.5](#).

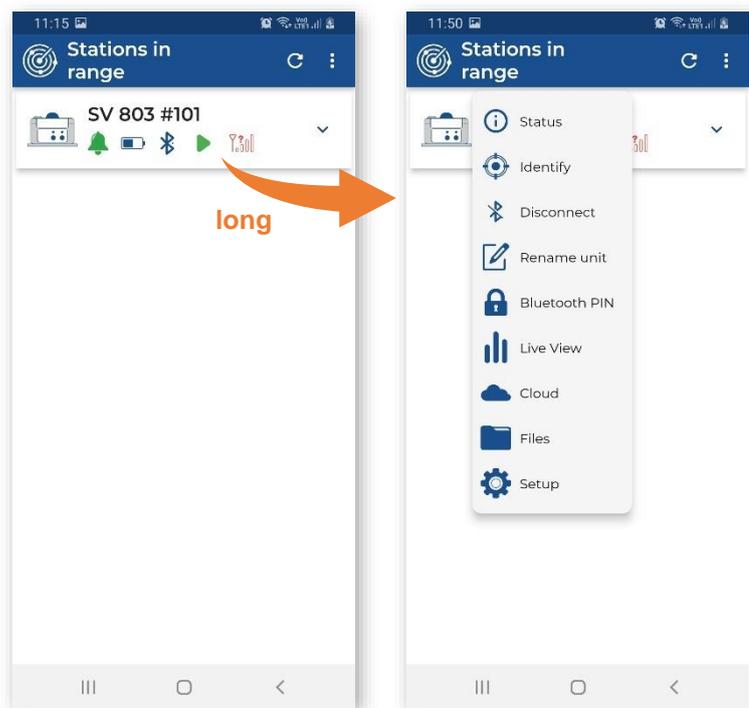
Below are screens after tapping function icons: **Live View**, **Cloud**, **Files** and **Setup**.



You may have access to these and other functions by long tapping on the instrument bar.

The pop-up menu allows you to:

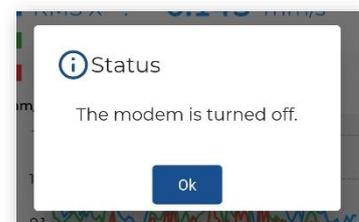
- check the instrument **Status**,
- **Identify** the connected instrument,
- **Connect** or **Disconnect** the instrument,
- **Rename unit** for personalization,
- enter **Bluetooth PIN** before connection or change PIN in the instrument after successful connection,
- view current measurement results - **Live View**,
- access the **Cloud** (SvanNET web service),
- open **Files** list (this icon can be hidden – see Chapter 4.5),
- configure instrument settings - **Setup**.



#### 4.4.1 Auxiliary commands

If you tap **Status**, the **Status** dialog box will inform you whether the measurement and communication configurations are correct. If not, the anomalies will be listed.

If you tap **Identify**, the three LEDs on the front panel of the instrument will flash red four times to give you a sign which unit you are currently working with.

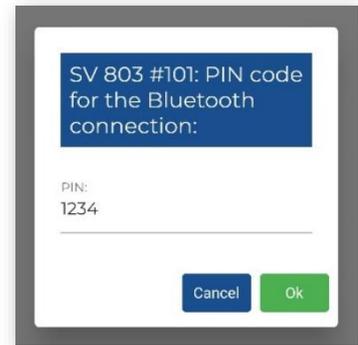


If you tap **Connect**, your mobile device will start connecting via Bluetooth with this instrument. After successful connection this command will change to **Disconnect**. And vice versa.

If you tap **Rename Unit**, the **Device Name** dialog box will be shown with the current instrument name which you can edit.

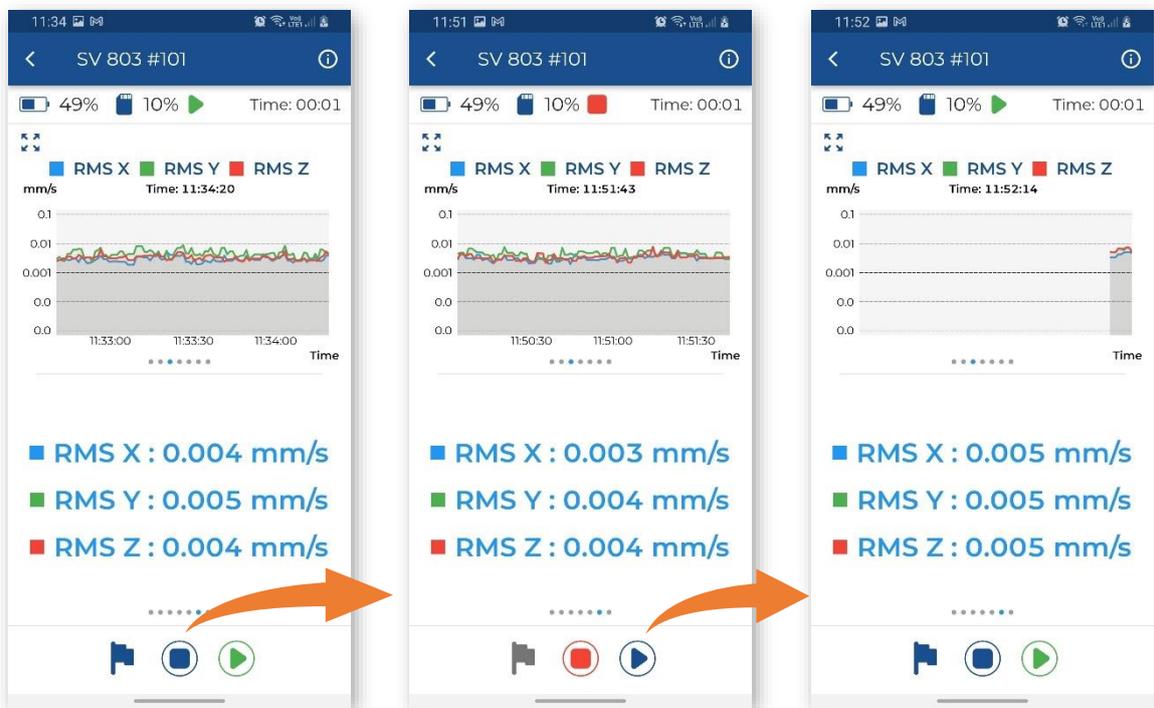


If you tap **Bluetooth PIN**, the dialog will be opened in which you can change the Bluetooth PIN code.



#### 4.4.2 Live View

In the **Live View** screen, you can start or stop the measurement and set a marker - a note during the measurement. The measured results are displayed in two sections which you may adjust by scrolling presentation views. The upper line presents the battery, memory and measurement status as well as the measurement time.



**Note:** **Live view** shows the limited set of measured results. The full set of measured results is saved in the instrument files and can be viewed with the use of SvanNET or SvanPC++.

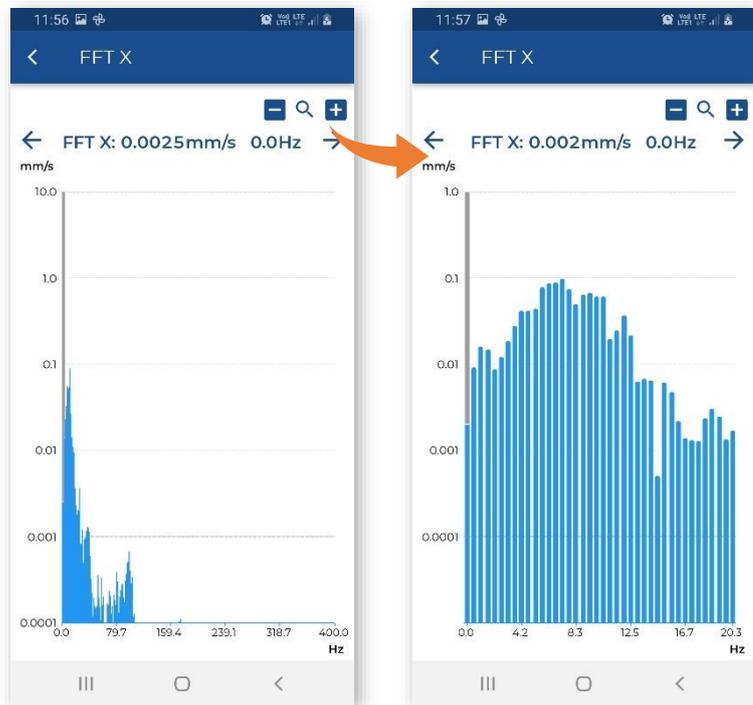
Below some view combinations are shown, among which are FFT or 1/3 octave spectra, time-histories of some results, current results values.



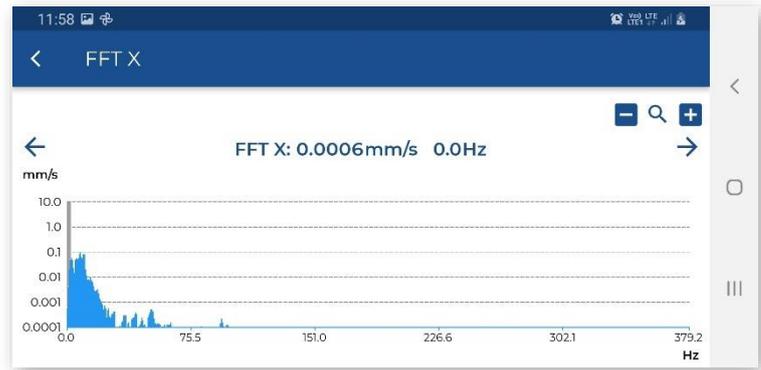
**Note:** FFT or 1/3 octave spectra views depend on the chosen standard – see Chapter 4.6.1.1. FFT spectra appear for most standards based on the PPV and its dominant frequency analysis. 1/3 octave spectra are shown for the User standard based on 1/3 octave analysis.

The FFT spectrum can be extended to the full screen.

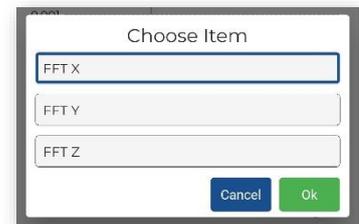
You can zoom the spectrum on or off.



You can also rotate the screen to watch the FFT spectrum in the better resolution.



To change the presented spectrum, long tap on the spectrum area and in the dialog box, choose the required spectrum.



If you tap the marker icon, the **Create Marker** dialog box will be opened enabling you to activate the marker to which you can assign the photo, video or audio record.

Tap **Title** to enter the marker name.

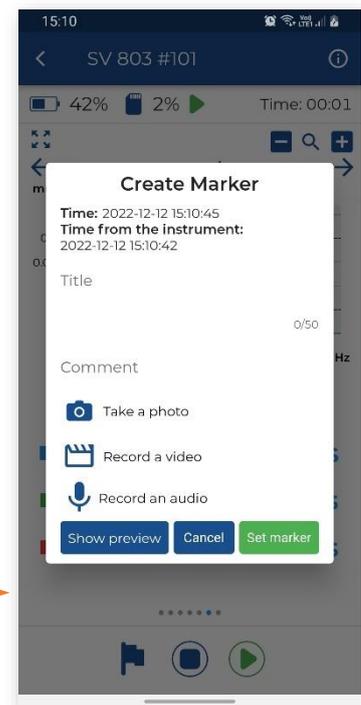
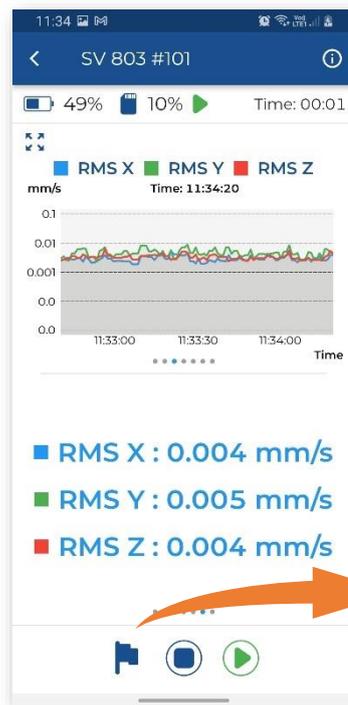
Tap **Comment** to enter the comment text.

Tap **Take a picture** to take a picture to this marker.

Tap **Record a video** to record a video to this marker.

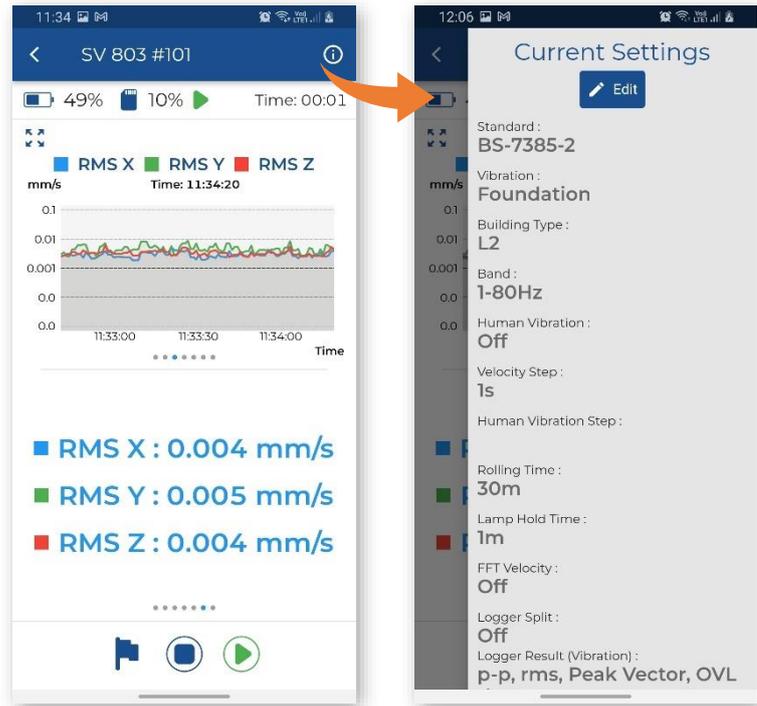
Tap **Record an audio** to record an audio to this marker.

To set a marker, tap **Set marker**.



If you tap the  icon, the instrument's current settings will be displayed.

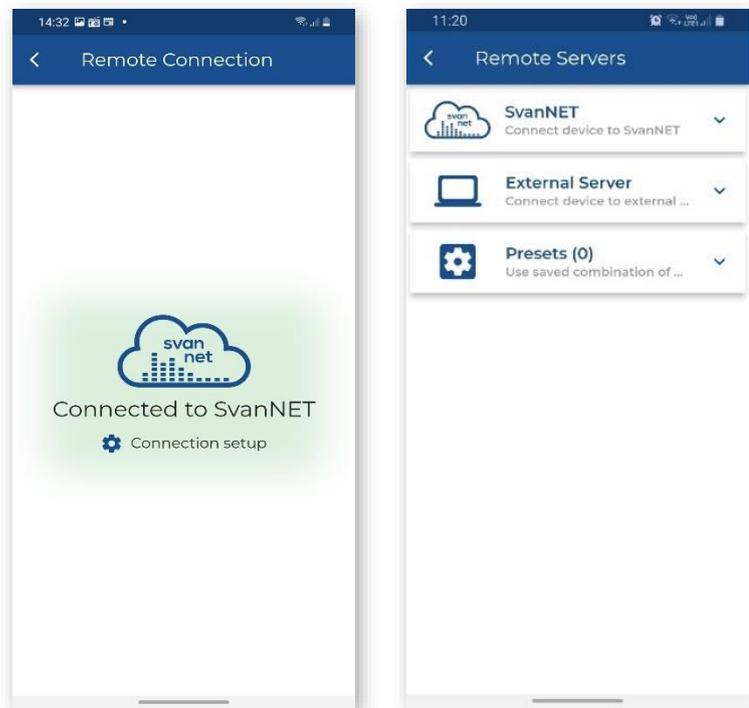
To edit them, tap **Edit**.

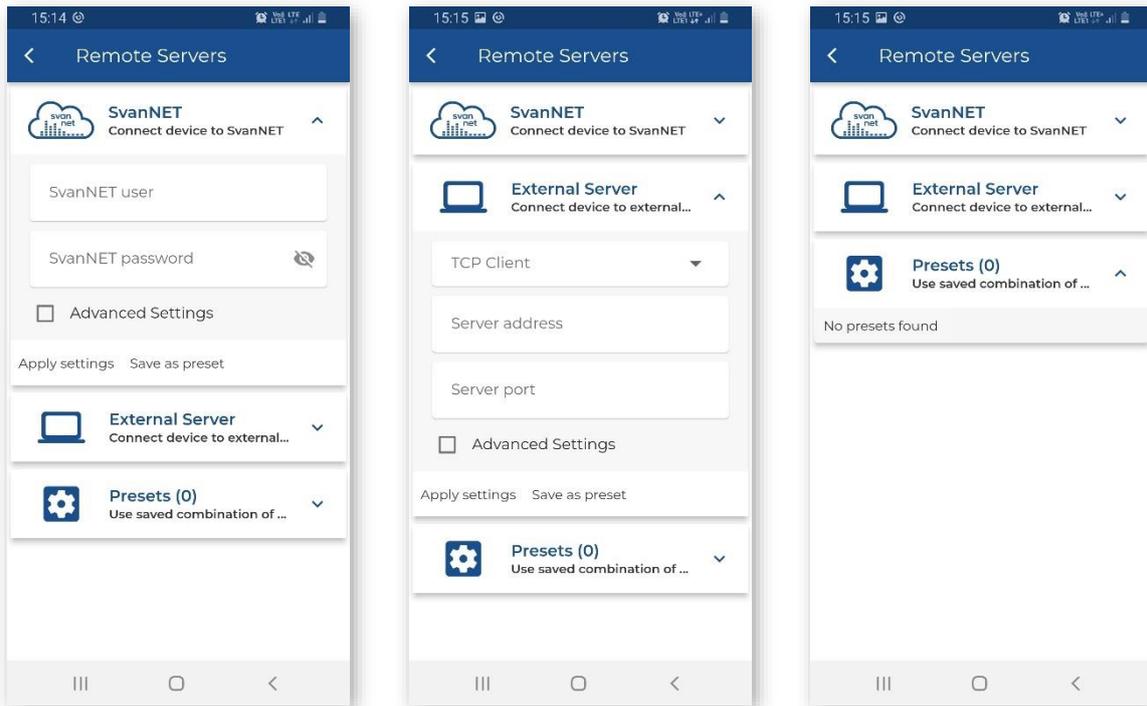


If you wish to come back to the scanning/status screen just tap the  icon.

#### 4.4.3 Cloud

Tapping **Cloud**, you will open the **Remote Connection** screen.

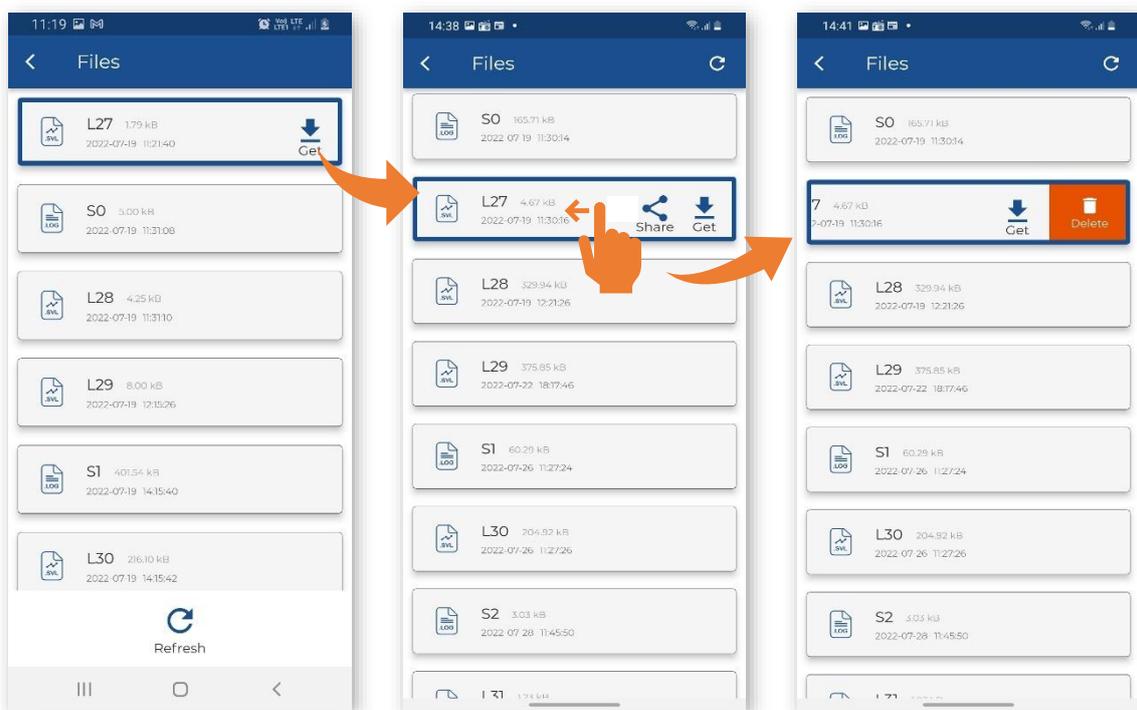




#### 4.4.4 Files list

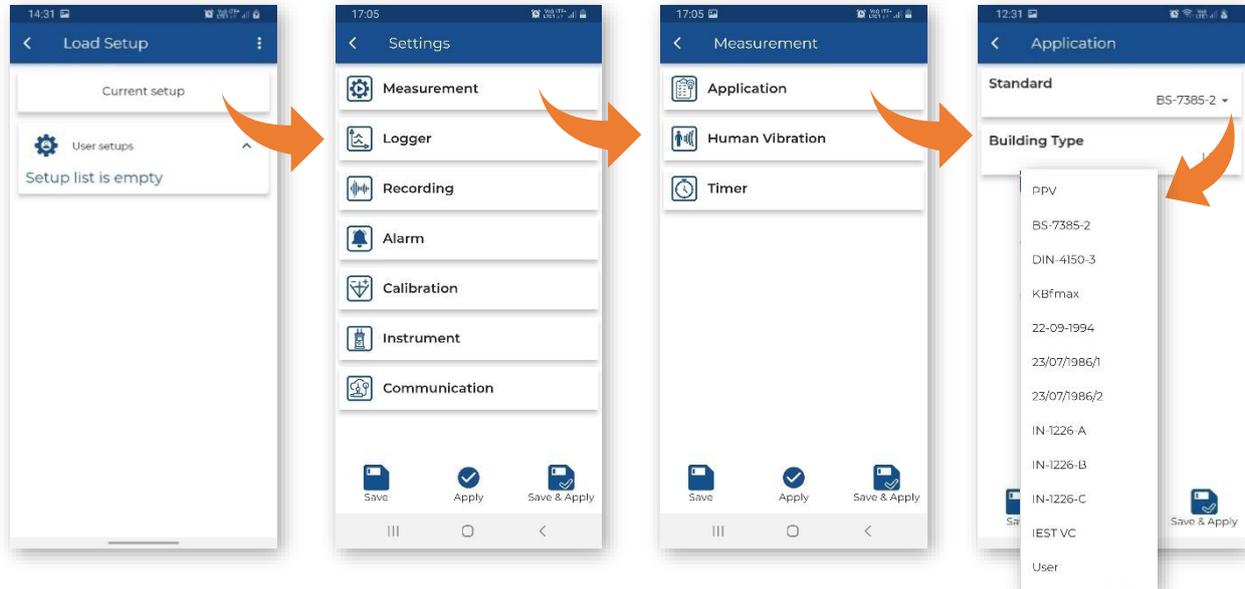
The **Files** section presents the list of files created by the instrument on the instrument's memory card.

You can tap on each file and then download it to your mobile device (**Get**). When the file is downloaded, you can share it. To delete the file, swipe left or right on the file ribbon and tap the  icon.



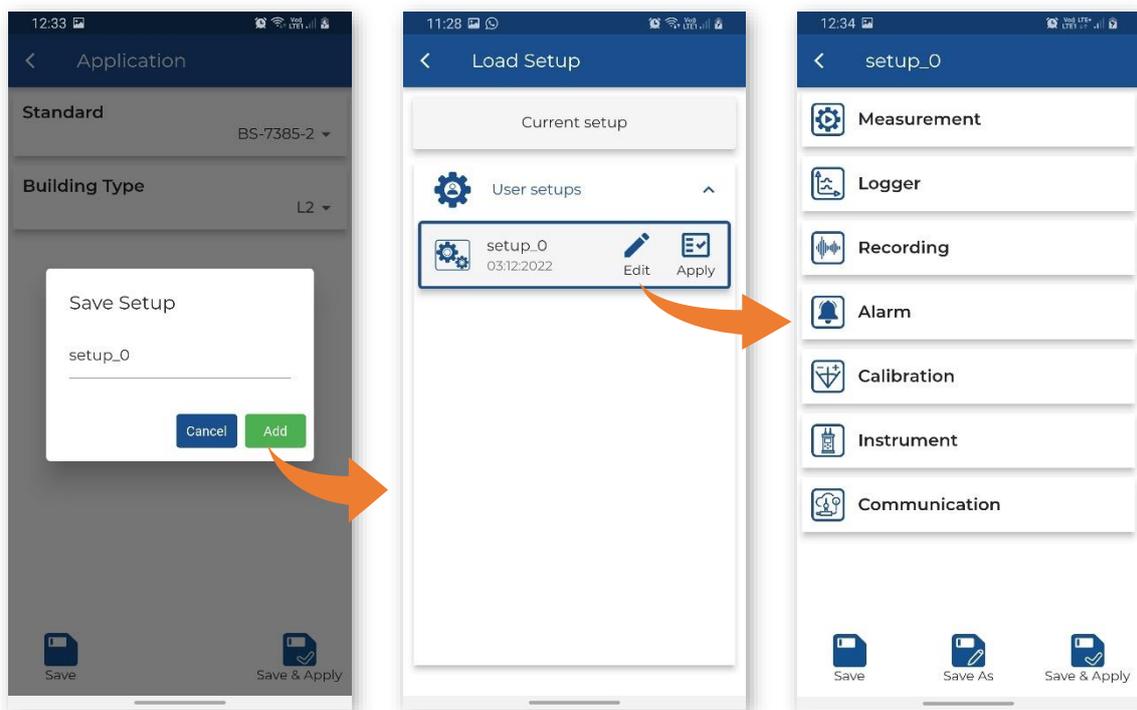
#### 4.4.5 Instrument settings

In the **Settings** section, you can configure the measurement and specific instrument settings. The settings are grouped in sections like **Measurement**, **Logger** etc., which includes sub-sections etc. The last item in such hierarchy consists of parameters that you can set, for example, **Standard**: *PPV*, *BS-7385-2* etc.



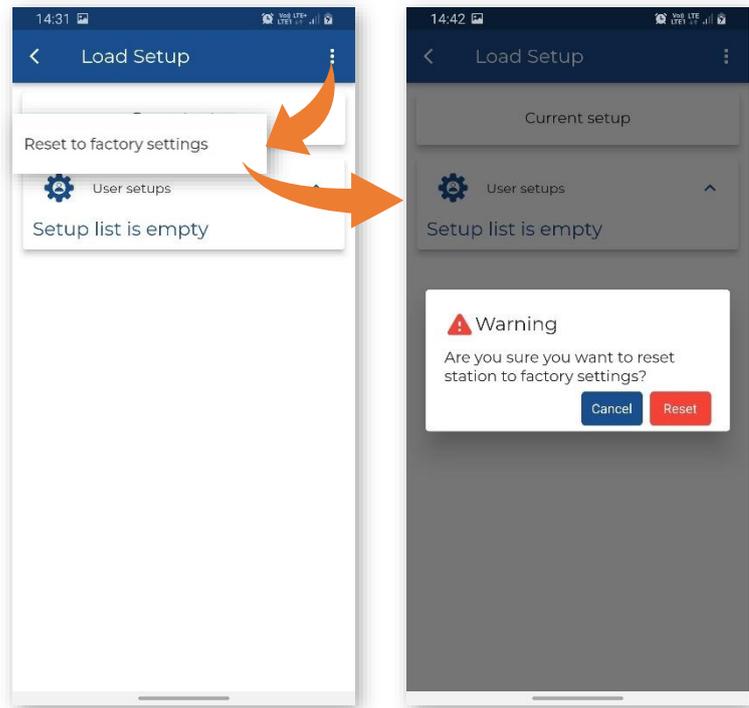
After configuring settings, you may save them in the mobile device catalogue (**Save**), load them to the instrument as current settings (**Apply**) or save and load them simultaneously (**Save & Apply**).

When you save settings, a new setup file is created in the dedicated application's directory on your mobile device, but current instrument settings will not be changed. You can load settings saved in the file to the instrument. For this, open the **User Setups** section, choose the file with desired settings, tap on it and select **Apply**. If necessary, you can **Edit** these settings.



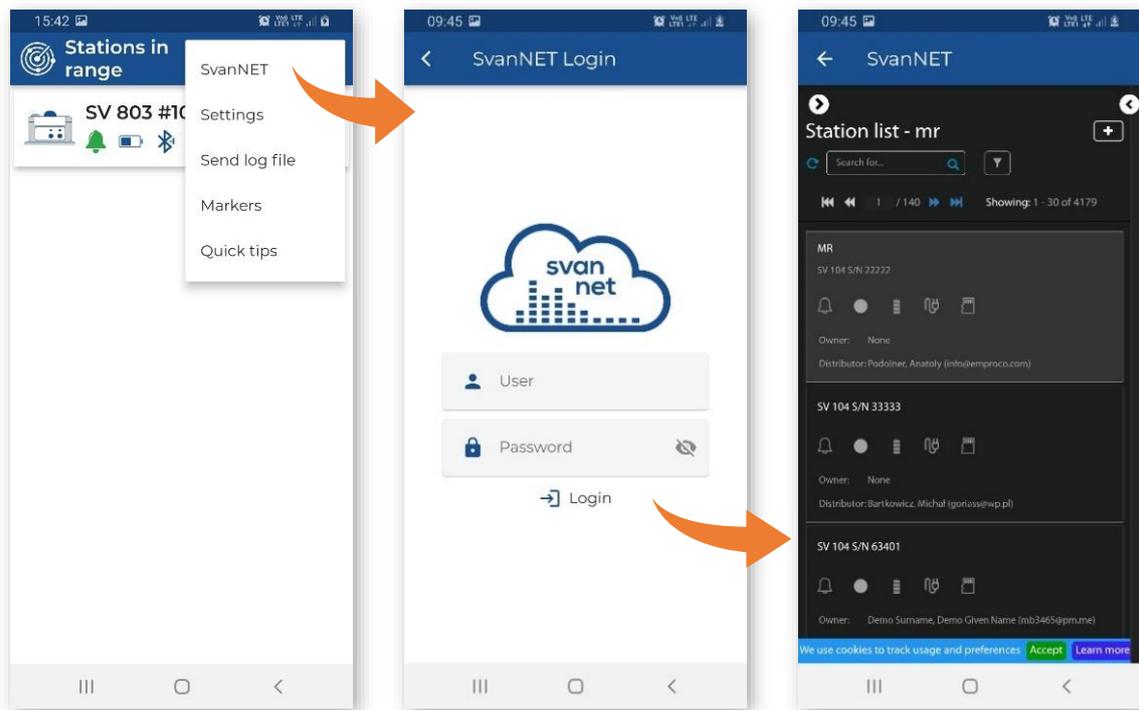
#### 4.4.6 Restoring factory settings

Factory settings can be restored if you tap , then tap **Reset to factory settings** and the *Reset* button in the Warning dialog box.

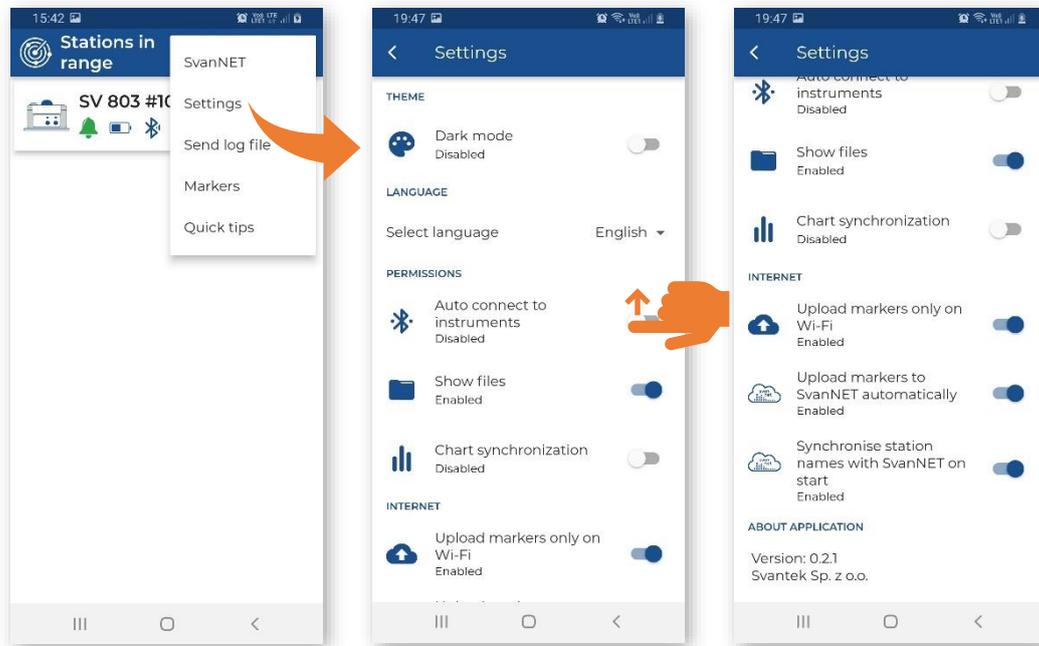


#### 4.5 ASSISTANT PRO AUXILIARY FUNCTIONS AND SETTINGS

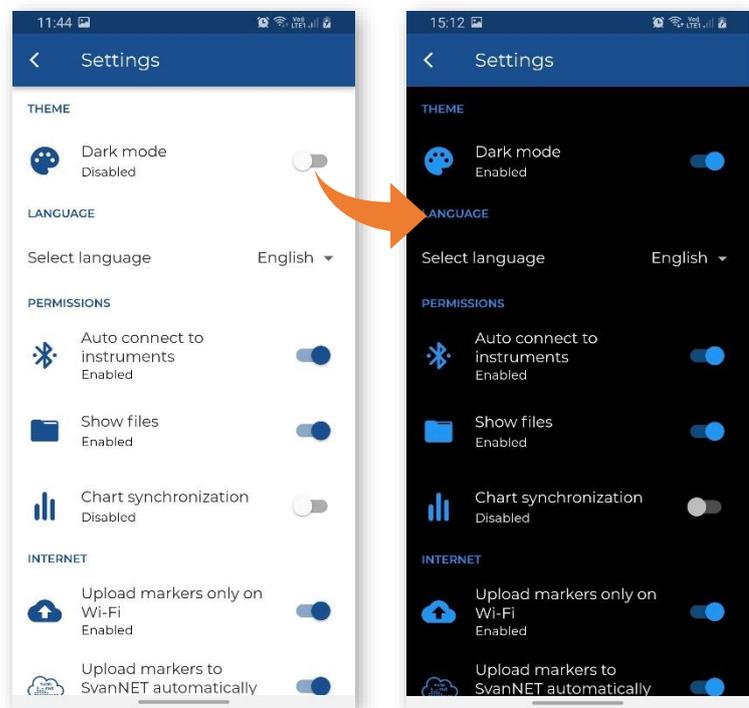
Tapping , you can open *SvanNET* in your mobile device, configure *Assistant Pro* settings, share the log file using Android applications and view, edit and share earlier created Markers, get quick tips, get acquainted with terms and conditions and privacy policy and exit the application.



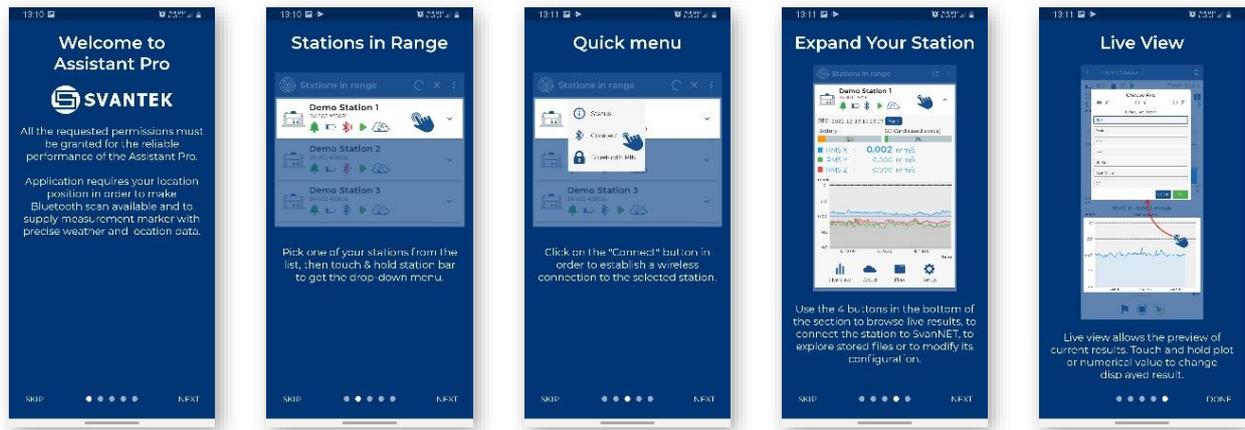
In the *Settings* screen, you can choose the application **THEME** (enable or disable the **Dark Mode**), choose the application **LANGUAGE**, enable or disable some **PERMISSIONS**: automatic connection with the visible instruments (**Auto connect to instruments**), add/delete the Files position in the pop-up menu (**Show files**), switch on/off synchronization of cursors on different charts (**Chart synchronization**), enable uploading markers (**Upload markers only on Wi-Fi**, **Upload markers to SvanNET automatically**), enable synchronization of the station name (**Synchronization station name with SvanNET on start**) and get information about the application version (**ABOUT APPLICATION**).



You can enable **Dark mode** to save your device power.



Quick tips give you a brief overview of the Assistant Pro.

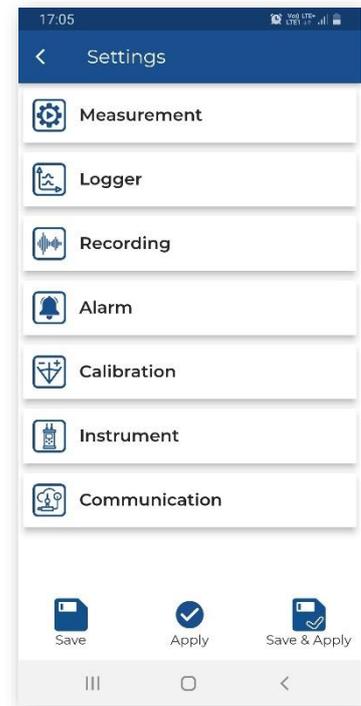


## 4.6 INSTRUMENT SETTINGS

The configuration menu (**Settings**) contains next sections:

- **Measurement** – allowing you to configure measurement parameters,
- **Logger** – allowing you to configure data storage in a logger file,
- **Recording** – allowing you to configure signal recording in a WAV file,
- **Alarm** – allowing you to configure alarm conditions and notifications,
- **Calibration** – allowing you to perform calibration of the instrument,
- **Instrument** – allowing you to configure parameters related to the instrument hardware,
- **Communication** – allowing you to configure remote control settings.

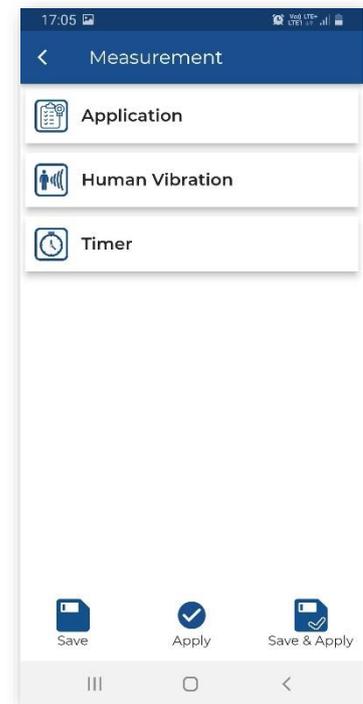
In case of the *User* standard, three **Curve** settings appear in the main menu allowing you to define/edit your own criterion curves.



### 4.6.1 Measurement settings – Measurement

The **Measurement** section allows you to configure measurement parameters and includes three sub-sections:

- **Application** – allowing you to choose application standard and other associated parameters,
- **Human Vibration** – allowing you to define weighting filters for VDV measurements,
- **Timer** – allowing you to programme the internal instrument's timer to start measurements on desired time.

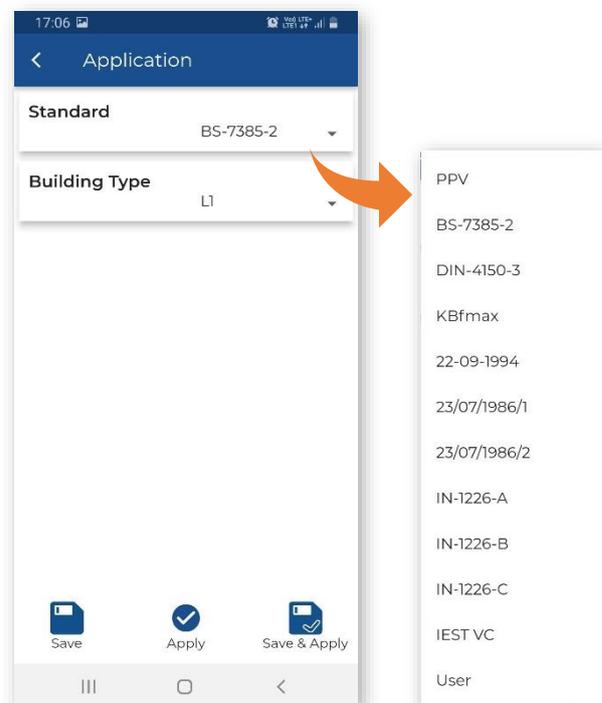


#### 4.6.1.1 Standard settings – Application

In the **Standard** field, you can choose the application method/standard: *PPV, BS-7385-2, DIN-4150-3, KBfmax, 22/09/1994, 23/07/1986/1, 23/07/1986/2, IN-1226-A, IN-1226-B, IN-1226-C, IEST VC or User.*

The content of the **Application** sub-section depends on the chosen **Standard** and may include next settings:

- **Building Type** for all methods except *PPV, KBfmax* and *User*,
- **Vibration Type** for the *DIN-4150-3* method,
- **Band** for the *PPV, DIN-4150-3, KBfmax* and *User* method,
- **Spectrum** for the *User* method.



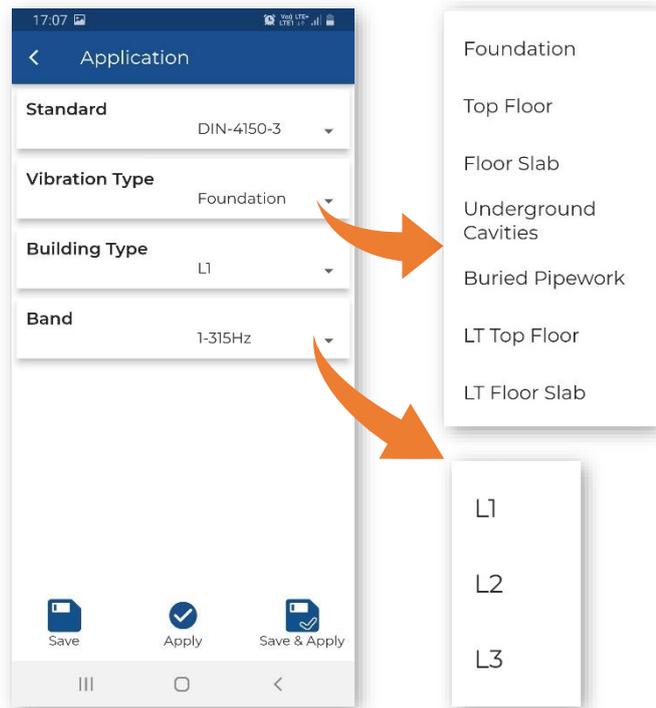
**Building Type** defines the criterion curve for most standards: **L1**, **L2**, etc.

**Vibration Type** defines the element of the building for the *DIN-4150-3* standard: *Foundation*, *Top Floor*, *Floor Slab*, *Underground Cavities*, *Buried Pipework*, *LT Top Floor* or *LT Floor Slab*.

The content of settings depends on the chosen method.

For example, the *IEST VC* method uses specific criterion curves for the special building types: *Workshop*, *Office*, *Residential*, *Theatre*, *VC-A*, *VC-B*, *VC-C*, *VC-D* and *VC-E*.

In the **Band** position, you can select two bands: *1-80Hz* and *1-315Hz*.



The table below presents description of used application methods/standards:

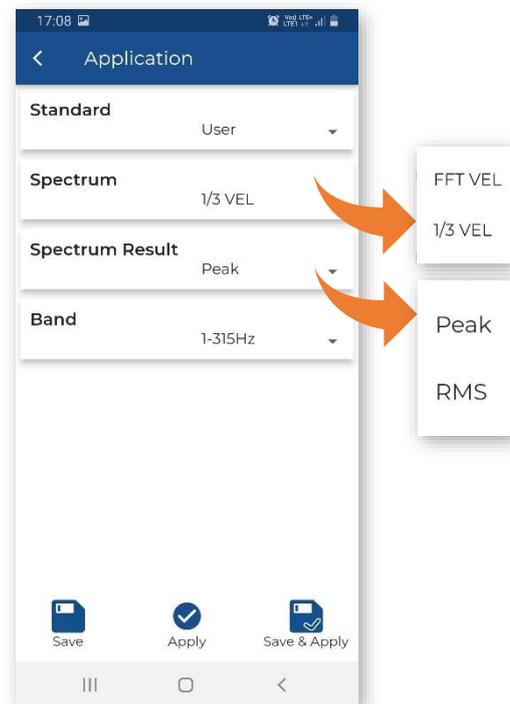
Standard / Method	Reference	Filtering	Method
<b>PPV</b>	DIN-4150-3 Part 3: Effects of vibration on structures	DIN 80 bandpass DIN 315 bandpass	Measurement of unweighted PPV without frequency analysis
<b>BS-7385-2</b>	BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration	VEL 1 Unweighted	Measurement of unweighted PPV and its dominant frequency based on FFT analysis in the frequency band 4 - 250 Hz
<b>DIN-4150-3</b>	DIN-4150-3 Part 3: Effects of vibration on structures	DIN 80 bandpass DIN 315 bandpass	Measurement of unweighted PPV and its dominant frequency based on FFT analysis in the frequency band 1 - 100 Hz
<b>KBfmax</b>	DIN 4150-2 Part 2: Human exposure to vibration in buildings	KB Weighting filter	Measurement of frequency weighted KBfti and KBfmax in the frequency band 1 - 80 Hz
<b>22/091994</b>	French regulations decree of 22/09/94 «Carrières»	VEL 1 Unweighted	Measurement of unweighted PPV and its dominant frequency based on FFT analysis in the frequency band 5 – 80 Hz
<b>23/07/1986/1</b>	French regulation text of 23 <sup>rd</sup> of July 1986. «classified installations» FRENCH-A CONTINUOUS	VEL 1 Unweighted	Measurement of unweighted PPV and its dominant frequency based on FFT analysis in the frequency band 4 – 100 Hz

<b>23/07/1986/2</b>	French regulation text of 23 <sup>rd</sup> of July 1986. «classified installations» FRENCH-B SHORT-TERM	VEL 1 Unweighted	Measurement of unweighted PPV and its dominant frequency based on FFT analysis in the frequency band 4 – 100 Hz
<b>IN-1226-A</b>	French Recommendation from National Railway company (SNCF) «Explosives»	VEL 1 Unweighted	Measurement of unweighted PPV and its dominant frequency based on FFT analysis in the frequency band 5 - 100 Hz
<b>IN-1226-B</b>	French Recommendation from National Railway company (SNCF) « French-A Continuous »	VEL 1 Unweighted	Measurement of unweighted PPV and its dominant frequency based on FFT analysis in the frequency band 5 – 100 Hz
<b>IN-1226-C</b>	French Recommendation from National Railway company (SNCF) « French-B Short-Term »	VEL 1 Unweighted	Measurement of unweighted PPV and its dominant frequency based on FFT analysis in the frequency band 5 – 100 Hz
<b>IEST VC</b>	IEST American Vibration Criteria For Facilities With Sensitive Equipment	VEL 1 Unweighted	Measurement of unweighted velocity signal in 1/3 octave RMS spectra
<b>User</b> Velocity or acceleration	User defined criteria	VEL 1 DIN 80 DIN 315	User defined method based on PPV and FFT or 1/3 octave velocity spectra or 1/3 octave acceleration

If you can't find the application method from the **Standard** list, you can customize your own parameters for a criterion curve based on the FFT or 1/3 octave velocity spectra (RMS and Peak) and create your own criterion curve.

In this case, select the **User** method in the **Standard** position and define the type of **Spectrum**: *FFT VEL* or *1/3 VEL*.

For the *1/3 VEL* spectrum you can also choose **Spectrum Result**: *Peak* or *RMS*.

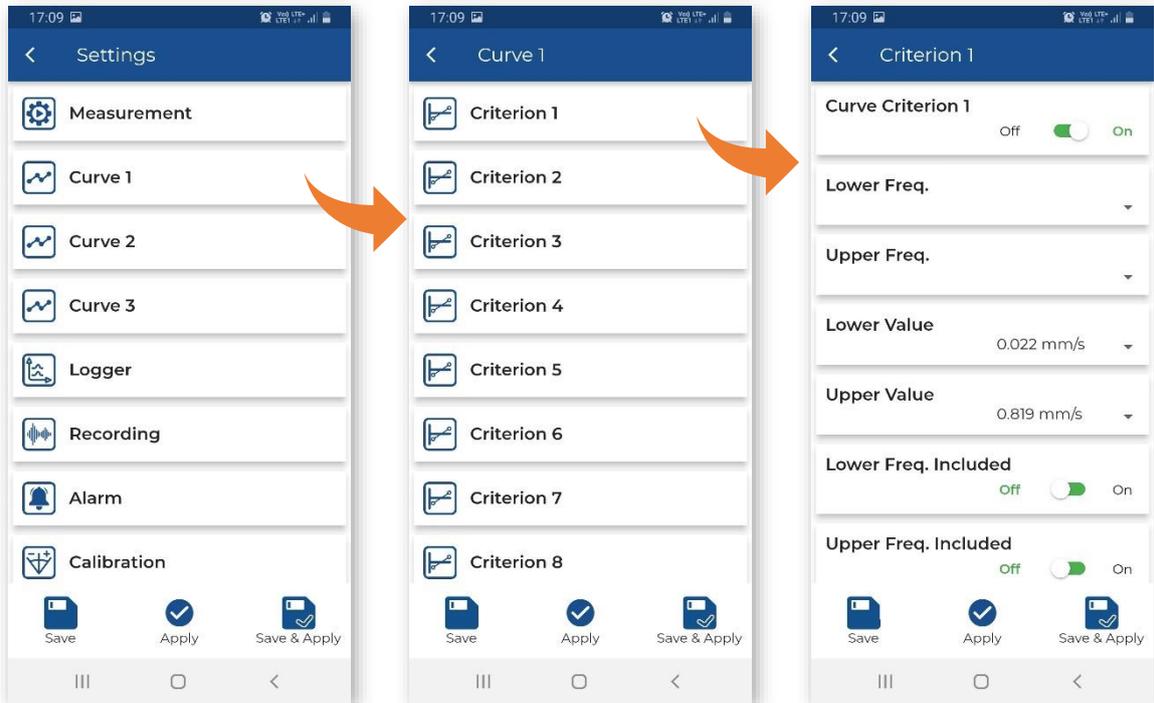


**Note:** The FFT spectra parameters for all methods that use the FFT analysis are set by default as follows: power spectrum - 411 lines, time window – Hanning.

In case of the *User* standard, three **Curve** settings appear in the main menu allowing you to define/edit your own criterion curves, segment by segment (**Criterion**).

To create new segment of the building type criterion curve for the *User* standard:

1. Activate it switching on **Curve Criterion**.
2. Select the lower and upper frequencies of the segment of the criterion curve, lower and upper values.
3. Include, if necessary, lower and/or upper parts of the segment.

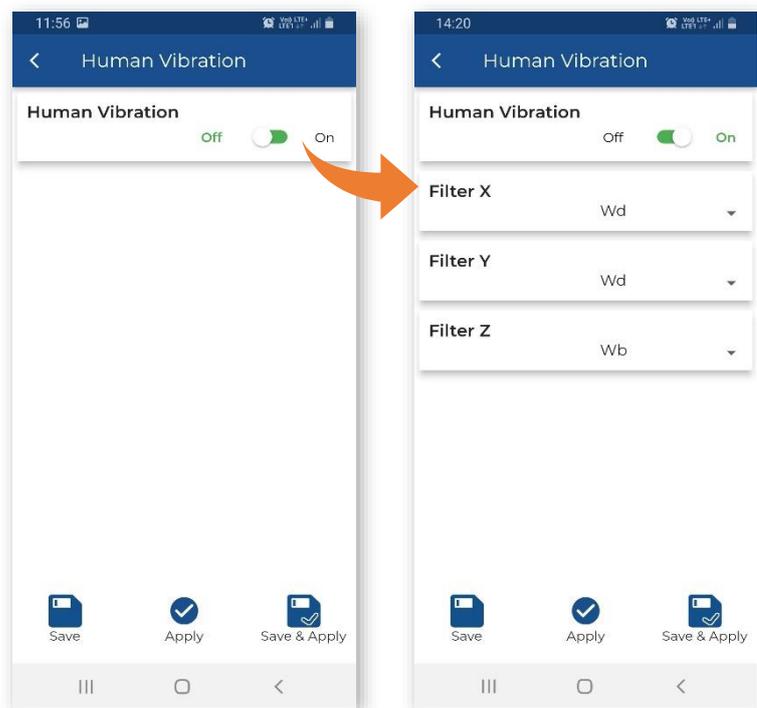


#### 4.6.1.2 Human vibration measurements – Human Vibration

The instrument can simultaneously measure vibration acceleration, allowing the measurement of VDV with a different recording step than PPV. The instrument has built-in weighing filters according to ISO 2631-1 and ISO 2631-2 as well as BS 6472-1.

In the **Human Vibration** section, you can switch *On/Off* the human vibration measurements. This option enables parallel measurement of acceleration vibration results.

When you switch on the human vibration measurements, the weighting filters for three axes X, Y and Z (*Wd*, *Wd* and *Wb* accordingly) will be shown. These filters are predefined and cannot be changed.



### 4.6.1.3 Programming instrument internal timer – Timer

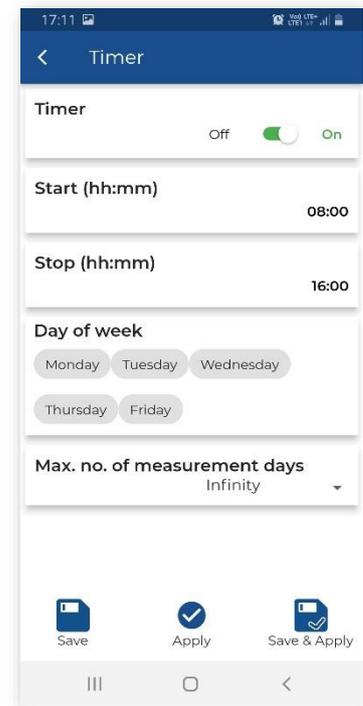
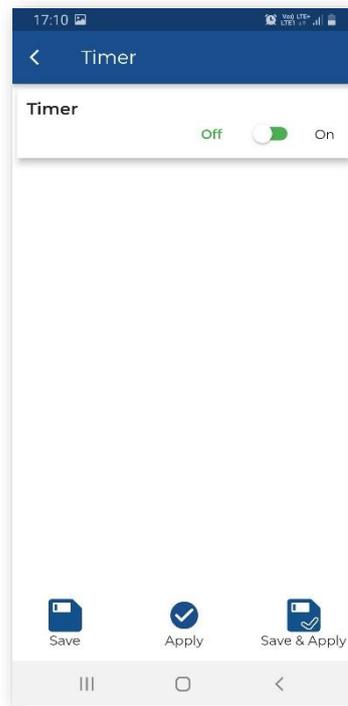
The **Timer** function is used to programme the automatic start and stop of the measurement. If the instrument is turned off, the timer will turn it on and then start the measurement and after the measurement stop will turn the instrument off.

The start and stop time are set by the **Start (hh:mm)** and **Stopt (hh:mm)** settings.

The timer will work in days of the week defined in the **Day of week** position.

You can limit the number of measurement days selecting other than *Infinity* number in the **Max. no. of measurement days** position.

Based on the example settings the instrument will start the measurement at 08:00 and will stop it at 16:00 during the workdays of each week without limitation.



### 4.6.2 Configuring data storage – Logger

The **Logger** section allows you to configure the way the measured results will be logged in files.

The instrument performs measurements of velocity vibration (according to the **Standard**) and acceleration vibration (**Human Vibration**) for measurement periods (so called, Steps) that can be set. Both velocity and acceleration results are saved in a "logger file". Velocity signals can be additionally recorded in a "wave file".

The logger file may contain three types of records:

1. velocity vibration results with **Velocity Step**,
2. FFT or 1/3 octave velocity spectra of signals with **Velocity Step**,
3. acceleration vibration results with **Human Vibration Step**.

The **Logger** section consists of two sections for configuring storage of the measurement results in a logger file (**Storage Setup**) and selecting results for storage (**Storage Results**).



### 4.6.2.1 Configuring measurement results storage – Storage Setup and Storage Results

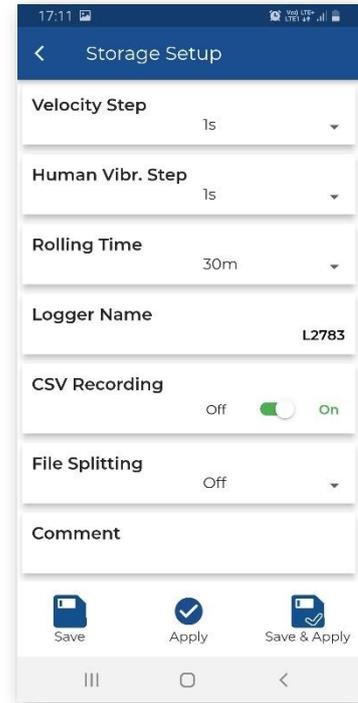
In the **Storage Setup** section, you can set:

- recording step for velocity vibration results including FFT or 1/3 octave velocity spectra (**Velocity Step**): *1s..59s, 1m..59m, 1h,*
- recording step for acceleration vibration results (**Human Vibration Step**): *1s, 30s..59s, 1m..59m, 1h,*
- time window for measuring the rolling RMS (**Rolling Time**): *1s..59s, 1m..59m, 1h,*
- name of the logger file (**Logger Name**),
- logger file splitting mode (**File Splitting**): *Off, Velocity Step, Sync. to full 15m, Sync. to full 30m, Sync. to full hour, Specified Time,*

and

- switch on **CSV Recording**,
- write **Comment** which will be visible in *SvanPC++*.

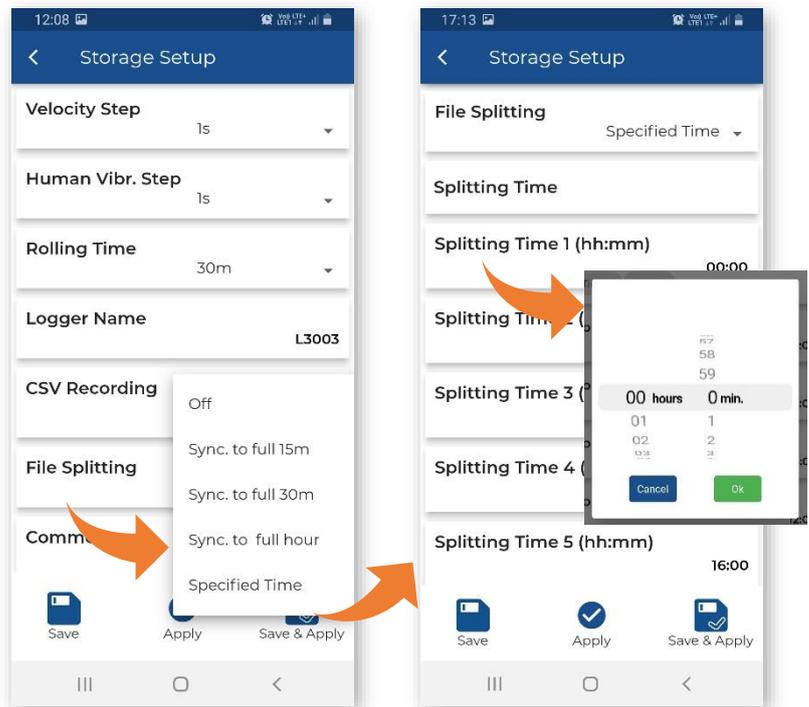
**File Splitting** enables splitting the logger data registration into separate files. If it is *Off* the registration of measurement results will be continuously made in one logger file with the name defined in the **Logger Name** position.



In other cases, the registration will be made in separate files and the registration in a new file will be synchronised to every quarter of the RTC (*Sync. to full 15m*), or to every half an hour of the RTC (*Sync. to full 30m*), or to every hour of the RTC (*Sync. to full hour*), or registration in a new file will start at specified by the user times (*Specified Time*).

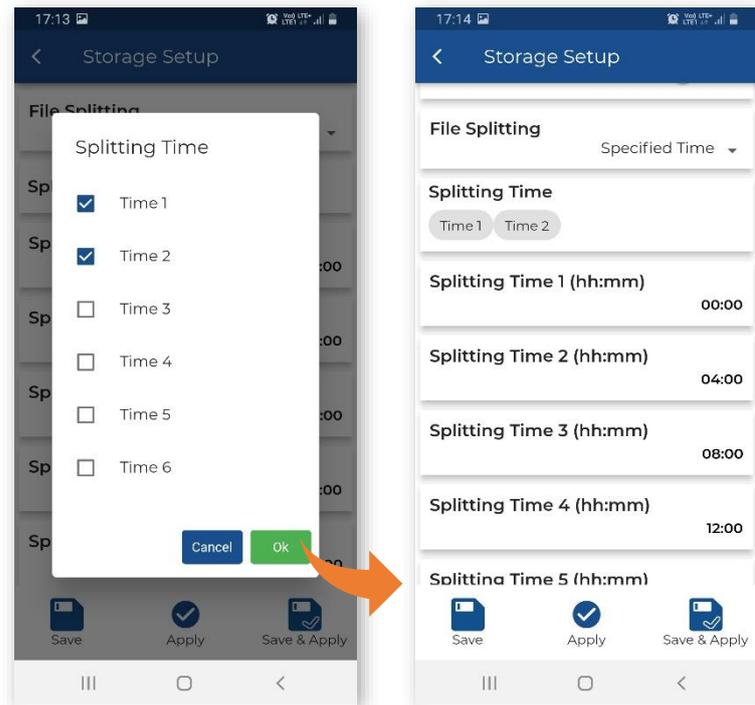
Whenever the split time is achieved the logger file is closed and the new file with the increased by one number in the name character string is opened for subsequent measurement data.

If *Specified Time* is selected, additional positions appear for setting up to six splitting times (**Splitting Time x**).



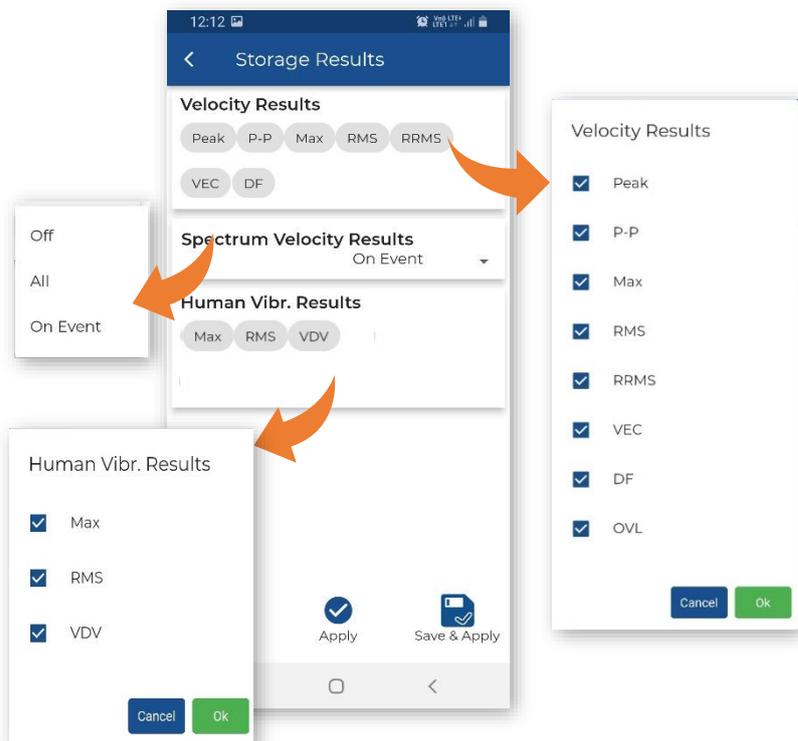
Tapping the **Splitting Time** position, you can check splitting times to activate them.

After activating the splitting times and confirming them with OK, the active splitting times will be shown on the **Splitting Time** bar.



In the **Storage Results** section, you can select results to be logged in the logger file:

- **Velocity Results:** *PPV*, *P-P* (Peak-to-Peak), *Max*, *RMS*, *RRMS* (Rolling RMS), *VEC* (Vector PPV), *DF*, *OVL* (Overload time),
- spectrum results (**Spectrum Velocity Results**): *Off* (switched off), *All* (continuous recording from measurement start to measurement stop) or *On Event* (if any Event occurs),
- acceleration results (**Human Vibr. Results**): *Max*, *RMS* and *VDV*.



### 4.6.2.2 Configuring signal recording – Recording

The velocity vibration signal in the form of WAV files for three vibration channels can be used for post-analysis of the frequency content in the SvanPC++ PC software.

In the **Recording Mode** position, you can disable the recording (*Off*) or select the way the signal will be recorded: continuously from the measurement start (*Continuous*), or from the event trigger (*On Event*).

The instrument will create the WAV file in which velocity vibration time-domain signals from three channels will be recorded.

In the case of *On Event*, signals will be recorded provided any Event occurs. The duration of such record will be calculated as follows: **Pre Trigger + Event Duration + Post Trigger**, where **Event Duration** is defined in the **Event** list (see Chapter 4.6.3.2). If a new event occurs while recording, recording will continue without interruption.

The WAV file name can be edited after tapping the **Wave File Name** position.

The wave recording settings include:

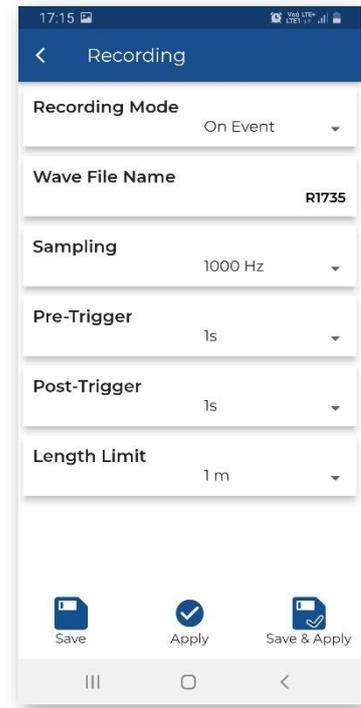
- **Sampling** frequency: 1000 Hz, 500 Hz or 250 Hz,
- Recording before trigger (**Pre-Trigger**): *Off*, 1..60 (s), 1m,
- Recording after trigger (**Post-Trigger**): *0s..59s*, *1m..59m*, *1h..8h*,
- size limits of the wave file (**Length Limit**): *Off*, *1..59m*, *1:00..8:00 h*. When this limit is achieved the file is split.

### 4.6.3 Configuring alarms – Alarm

SV 803 can generate SMS and e-mail notifications as well as visual and audible alarms when a certain Event occurs. You can configure alarms when either some PPV, RMS etc. values or some standard's criterion curves (e.g., DIN 4150-3) or user's criterion curves based on FFT, or 1/3 octaves are exceeded. You can shift the criterion curve up or down the scale so that the alarm is generated earlier or later. The Event records are saved in the logger file.

You can configure up to ten independent Events associated with alarm conditions that are checked simultaneously. Based on the Event alarms the instrument sends SMS or/and E-mail alarms notifications to different recipients.

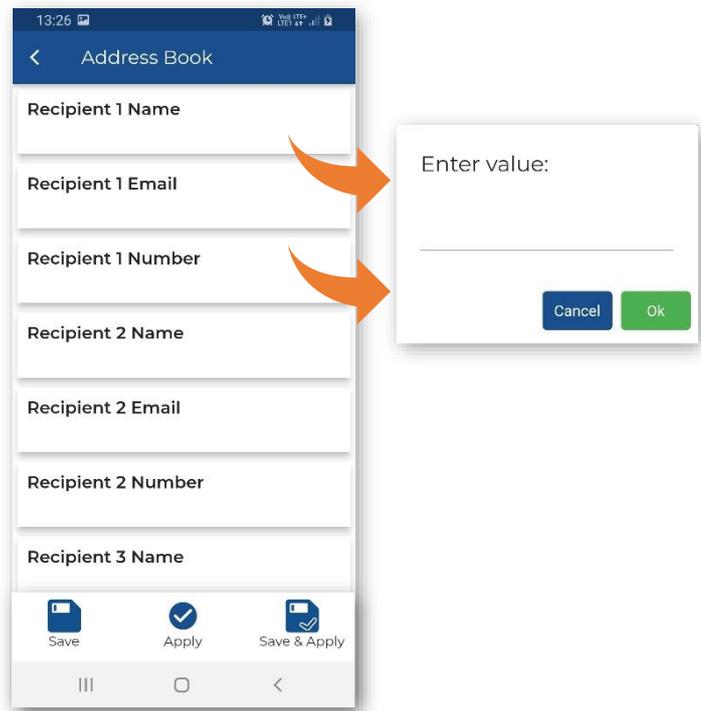
The duration of the Event is customizable. When the Event time has elapsed, the instrument starts analysing the data and indicates the highest PPV value and for some methods its dominant frequency.



#### 4.6.3.1 Alarms recipients – Address Book

You can send alarms up to the 15 recipients from the **Address Book**.

In the **Address Book**, you can define the recipient's name, e-mail address and phone number.



#### 4.6.3.2 Configuring events – Event

In the **Event x** sub-section, you can activate the Event, switching it *On*.

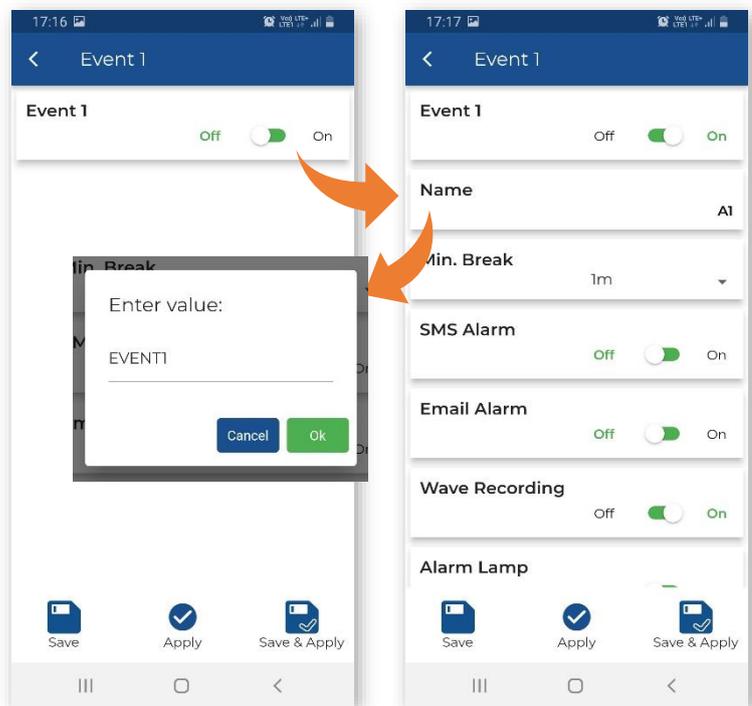
If the event is active, you can define its **Name**, enable specific alarms, set the trigger source, threshold level(s) and set the time frames for alarms notifications.

If the event occurs it triggers the enabled alarm(s) – SMS, Email or/and alarm lamp.

**Min. Break** defines minimum time between SMS or e-mail messages to limit the repetitions of the same alarm notifications.

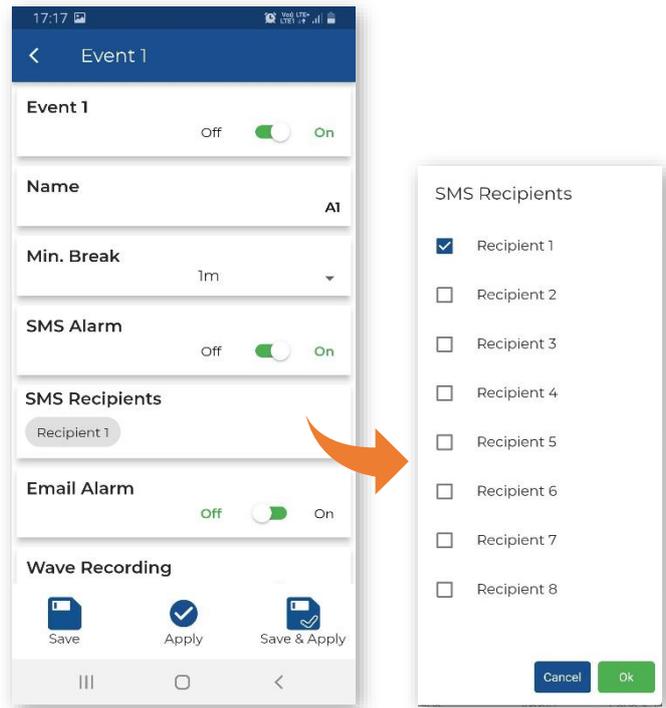
You can enable on four alarm types:

- **SMS Alarm** - SMS notification to the chosen recipients,
- **Email Alarm** – e-mail notification to the chosen recipients,
- **Wave Recording** – recording of the input signal in the wav file in the *On Event* recording mode.
- **Alarm Lamp** - alarm signal on the **EXTERNAL INTERFACE** instrument's socket to which the alarm lamp is connected,



If the **SMS Alarm** and/or **Email Alarm** is enabled, the **SMS/Email Recipients** position(s) appears allowing you to select recipients from the **Address Book**.

The duration of the lamp alarm can be extended over the event duration if you set additional **Lamp Hold Time** in the **Auxiliary** section (see Chapter [4.6.5.1](#)).



Settings of some parameters depend on the **Application** standard/method.

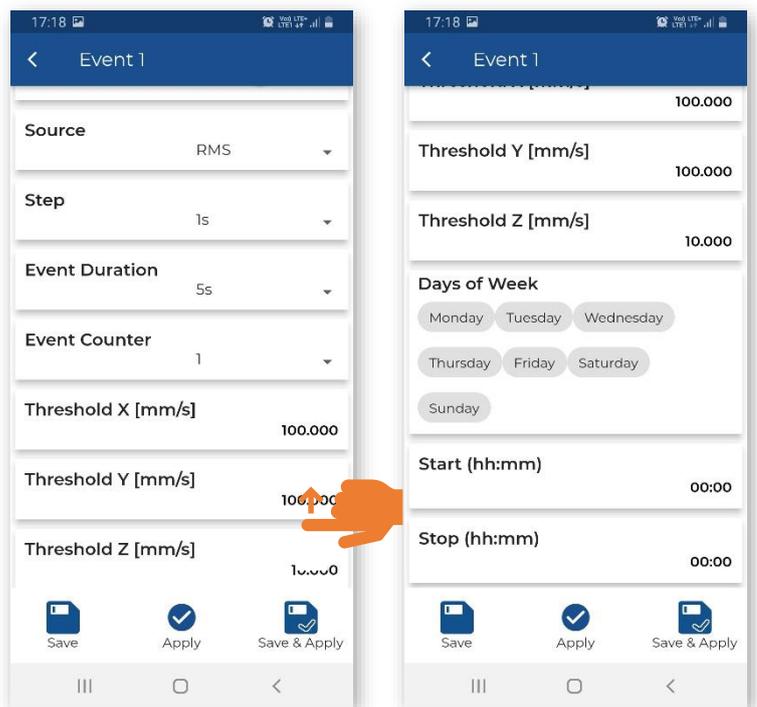
As an event trigger **Source**, you can select following results: *System*, *PPV*, *RMS*, *RRMS* (Rolling RMS), *Vector PPV* which will be compared with the threshold level(s) or select building type criterion curve (*Curve*) which will be checked for exceeding.

If *RMS* is set as a source, you can set the **Step** with which the RMS result will be integrated (*1s*, *Velocity Step* or *Human Vibr. Step*).

For the *PPV*, *RMS*, *RRMS* sources, you should set the **Threshold** levels for three axes.

For the *Vector PPV* source, you should set the **Threshold** level for the vector.

When the criterion curve for a given type of building is used as the event trigger, the PPV at its dominant frequency is compared against the curve multiplied by the **Reduction Factor** in the in the range: *0.001*, *0.01*, *0.1* ÷ *1.9*. The event will be triggered if the PPV value exceeds the curve limit.



In the **Event Duration** position, you can set the duration of the Event from its start. For this period the instrument defines the maximum PPV values and dominant frequencies for X, Y and Z axis.

In the **Event Counter** position, which appears for specified type of **Source** (RMS, RRMS, PPV, Vector), you can select a number of conditions that should appear before triggering the event and alarms.

If **Event Counter >1**, the **Event Counter Mode** position appears in which you can choose the way of counting events (*Consecutive* or *Periodical*):

- In case of the *Consecutive* option, an event will occur if a trigger condition occurs **Event Counter** times in succession.
- In case of the *Periodical* option, an event will occur if a trigger condition occurs **Event Counter** times in succession periodically with a period (**Event Counter Period**) equal to 1s, *Human Vibr. Step* or *Velocity Step*.

In the **Days of Week** position, you can select days of the week, and in the **Start (hh:mm)** and **Stop (hh:mm)** positions, you can define the timeframe when alarms will be generated.

If *System* is chosen as **Source**, the **System Triggers** bar appears enabling you to choose the system event to trigger the alarm(s):

- **Powered Up** - turning the instrument on
- **Powered Down** - switching the instrument off (SMS or email will be sent just before switching off)
- **Measur. Start** - running the measurement
- **Measur. Stop** - measurement stopped
- **Mains On** - detection of external power connection
- **Mains Off** - detection of external power disconnection
- **Low Battery** - low battery condition; the alarm is generated when the instrument detects a low battery condition and when the low battery condition disappears (when it is charged). The threshold is 25%



- **Battery OK** – restoration of the required battery level; the alarm is generated after the **Low Battery** alarm

- **Ext. Bat. Low** - low external battery condition; the alarm is generated when the low external battery condition is detected and the power from the external battery is cut off; the alarm is also generated when the low battery condition disappears
- **Ext. Bat. OK** – restoration of the required battery level; the alarm is generated after the **Ext. Bat. Low** alarm
- **Low Storage** – small space (less than 25%) of the instrument memory detected; the alarm is generated when the memory space drops below the threshold and when there will be more memory space
- **Storage OK** – restoration of the required memory level; the alarm is generated after the **Low Storage** alarm
- **System Check** - status after performing a system check
- **Lamp Disconnected** – disconnection of the alarm lamp; the alarm is generated after disconnection of the alarm lamp
- **Lamp Connected** – connection of the alarm lamp; the alarm is generated after the **Lamp Disconnected** alarm
- **Cover Open** – opening the instrument lid; the alarm is generated if the lid opens
- **Cover Closed** - closing the instrument lid; the alarm is generated after the **Cover Open** alarm
- **Device Incorrect Tilt** – vertical position; the alarm is generated when inclination of the instrument deviates from the vertical more than few degrees
- **Device Positioning Ok** - vertical position; the alarm is generated in case of restoration of the instrument vertical position; the alarm is generated after the **Device Tilt** alarm
- **Instr. Error** - instrument errors:
  - RTC error; the alarm is generated when the RTC reset is detected or when the GPS time deviates more than 1 minute to the time of the instrument
  - SD card error; the alarm is generated when there is an error of the SD card
  - battery error; the alarm is generated when the temperature of the battery pack is above 68°C or if there is no communication with the battery pack.
- **Location** - movement of the instrument detected (based on GPS data) by more than 1.5" (geographical seconds, about 30 meters in Poland).

The table below summarizes the event parameters presented on the **Event** list if **Event** is On:

Parameter	Value	Presence	Description	Additional <sup>1</sup> logging results for the event duration
<b>Name</b>		always	event name given by the user	
<b>Min. Break</b>		always	minimum time interval between consecutive E-mail / SMS alarms notifications	
<b>Source</b>	<b>Vector PPV</b>	always	triggering after exceeding the threshold level by the 1s PPV vector	Vector PPV

<sup>1</sup> For the FFT based methods, the instrument logs Peak, DF, Vector PPV and optionally FFT spectra for all channels at the moment of Peak.

For the 1/3 Octave based methods, the instrument logs Peak and Vector PPV for all channels at the moment of Peak and optionally the 1/3 Octave spectra for the event/alarm period.

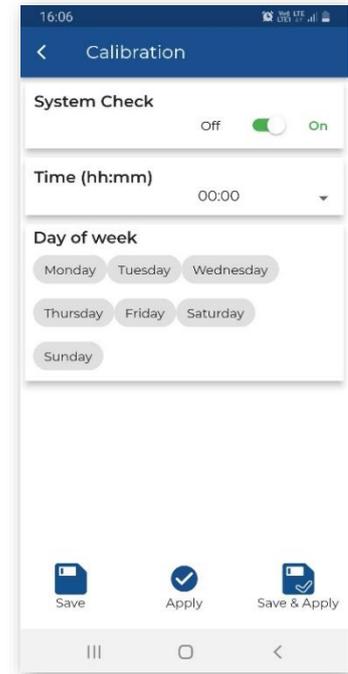
	<b>PPV</b>	always	triggering when 1s PPV in any axis exceeds the threshold level	
	<b>RMS</b>	always	triggering when RMS exceeds the threshold level	RMS
	<b>RRMS</b>	always	triggering when RRMS exceeds the threshold level	RRMS
	<b>Curve 1/2/3</b>	always	triggering when any spectrum line (depending on the <b>Standard</b> setting) exceeds the criterion curve considering the reduction factor	
<b>Threshold X/Y/Z</b>		for <b>RMS</b> or <b>RRMS</b> or <b>PPV</b> trigger	Event trigger level for each axis. For triggering, it is sufficient to exceed the value of one axis	
<b>Threshold</b>		for <b>Vector PPV</b> trigger	Event trigger level for <b>Vector PPV</b> (in m/s)	
<b>Step</b>		for <b>RMS</b> source	averaging period of the result which is compared with the threshold	
<b>Reduction Factor</b>		for <b>Curve 1/2/3</b> source	scaling factor of the criterion curve	
<b>Event Duration</b>		always	duration of the event from the moment the trigger condition is met	
<b>Event Counter</b>		for <b>RMS, PPV, RRMS, Vector PPV</b> source	counter of event occurrences necessary to generate an alarm and send notifications	
<b>Lamp Alarm</b>		always	Ext.I/O output signal according to the event state. If there is an event, there is the signal at the Ext.I/O	
<b>Sms Alarm</b>		always	enable / disable SMS notifications about alarms	
<b>Sms Recipient</b>		for <b>SMS Alarm</b>	notification recipient selection list	
<b>Email Alarm</b>		always	enable / disable E-mail notifications about alarms	
<b>Email Recipient</b>		for <b>Email Alarm</b>	notification recipient selection list	
<b>Days of Week</b>		always		
<b>Start (hh:mm)</b>		always		
<b>Stop (hh:mm)</b>		always		

#### 4.6.4 System checking – Calibration

The **Calibration** section allows you to switch on the checking of the geophones performance and set the time and days of the week when the instrument will be performing the system check.

SV 803 has special mechanism for testing the measurement chain, so called System Check, by initiating an electronic pulse and then evaluating the response of the sensor signal.

If the System Check indicates an error, the information about it is indicated in the *SvanNET* web service.



#### 4.6.5 Configuring instrument parameters – Instrument

The **Instrument** section consists of two positions: **Auxiliary** and **GPS**.

##### 4.6.5.1 Auxiliary settings – Auxiliary

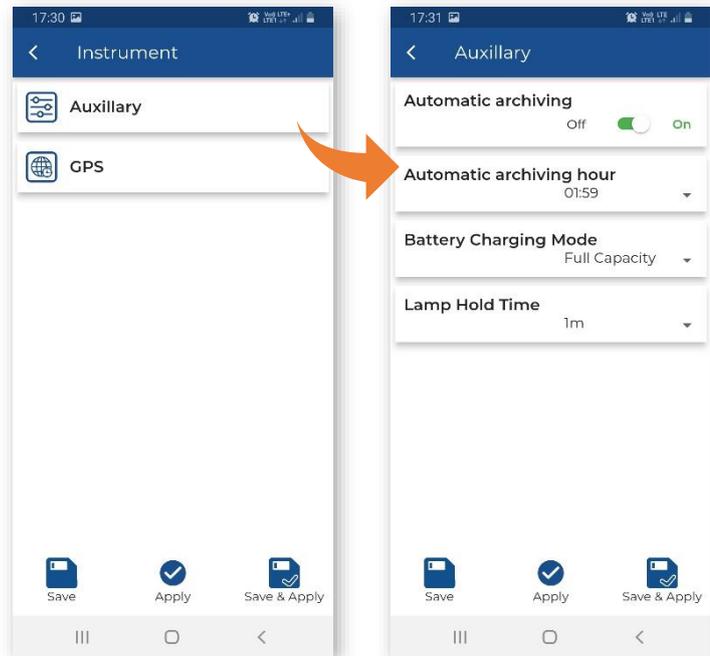
In the **Auxiliary** section, you can:

- Switch on the **Automatic archiving** mode and set the **Automatic archiving hour**.

If the automatic archiving is enabled, when the number of files in the working directory of the instrument reaches 5000, the measurement will be stopped and the entire working directory with the current date will be transferred to the ARCHIVE directory.

- Choose the **Battery Charging Mode**: *Full Capacity* or *Optimised*.

In the *Full Capacity* mode, the battery is charged to 100% of its capacity. In the *Optimised* mode, the battery is charged to about 85%. This option allows you to extend the life cycle of the battery.



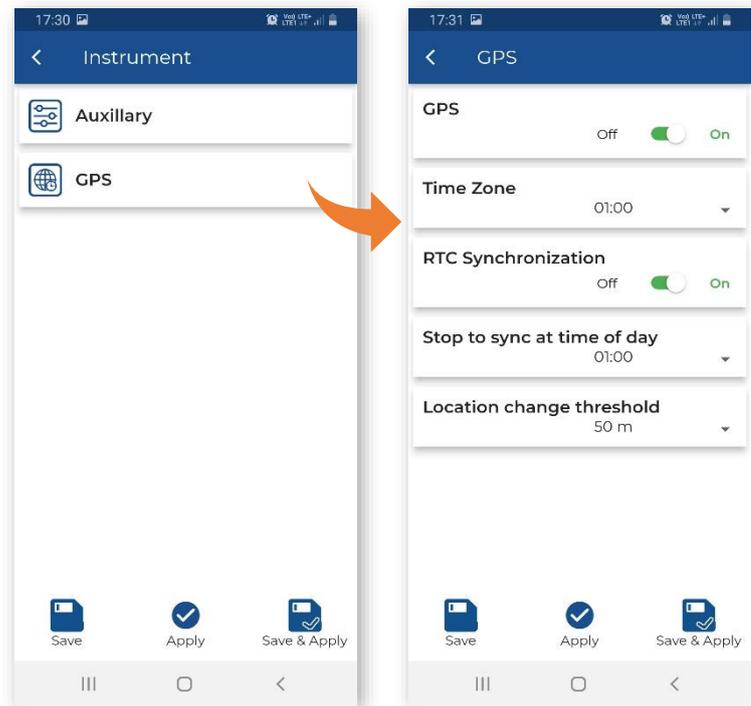
- Choose the **Lamp Hold Time** –additional time for the lamp alarm after the event stop (see Chapter [4.6.3.2](#)).

#### 4.6.5.2 Configuring internal GPS – GPS

The **GPS** position allows you to switch on/off GPS, select the **Time Zone**, switch on/off synchronization with the RTC and set the synchronization time.

If **RTC Synchronization** is *On*, the **Stop to sync at time of day** position appears enabling you to program the time of the measurement stop before synchronization,

The **Location change threshold** position allows you to set the threshold in meters above which the GPS reports a new position. This function excludes the display of GPS fluctuations.



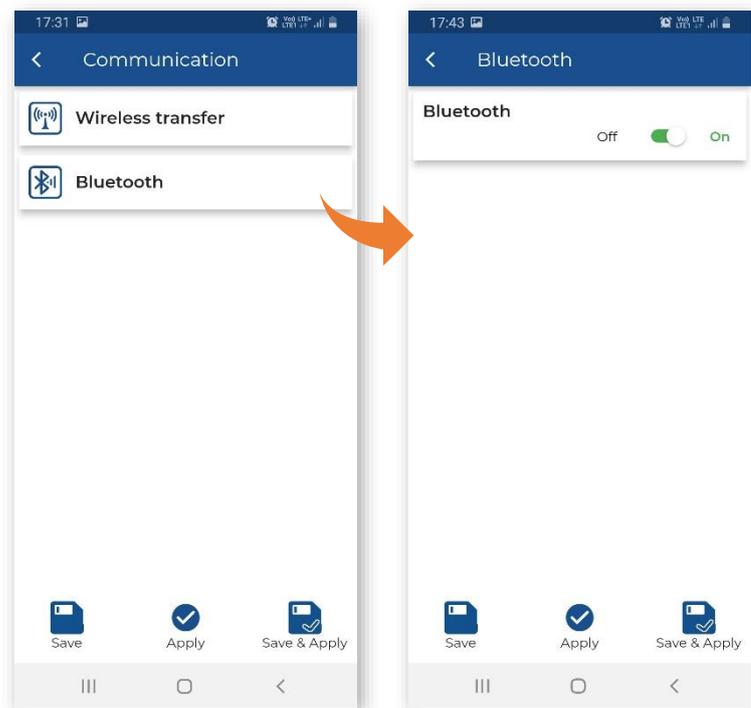
#### 4.6.6 Configuring remote communication – Communication

The Communication section allows you to set parameters of the communication via the 4G modem (**Wireless transfer**) and switch on **Bluetooth**.

##### 4.6.6.1 Switching on Bluetooth – Bluetooth

The low energy Bluetooth module is normally switched on, but if you are not going to use it, we recommend switching it off.

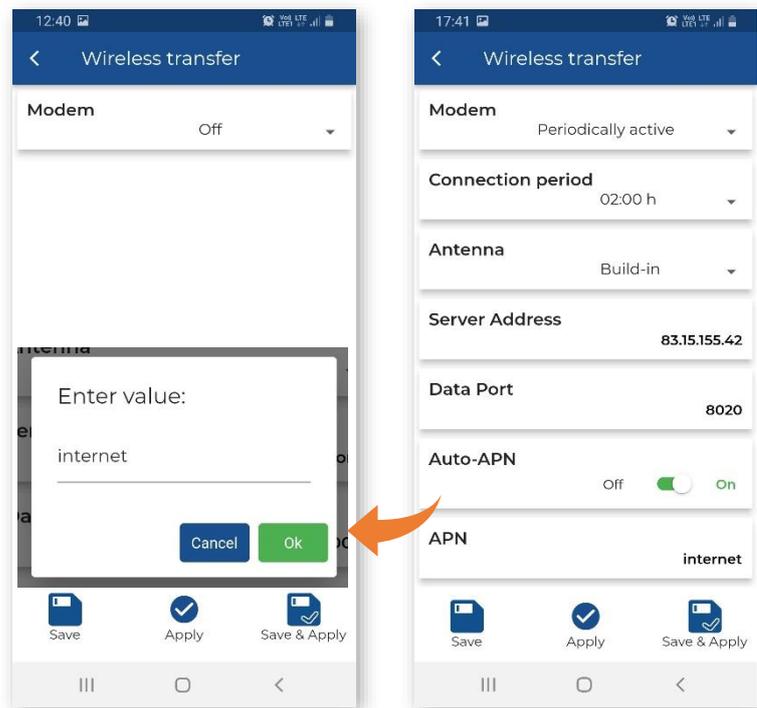
Bluetooth can be switched on by pressing the  key by 5 seconds.



#### 4.6.6.2 Configuring 4G modem – Wireless transfer

In the Wireless transfer sub-section, you can switch *Off* the 4G modem, or choose its mode (**Modem**): *Continuous* or *Periodically active*.

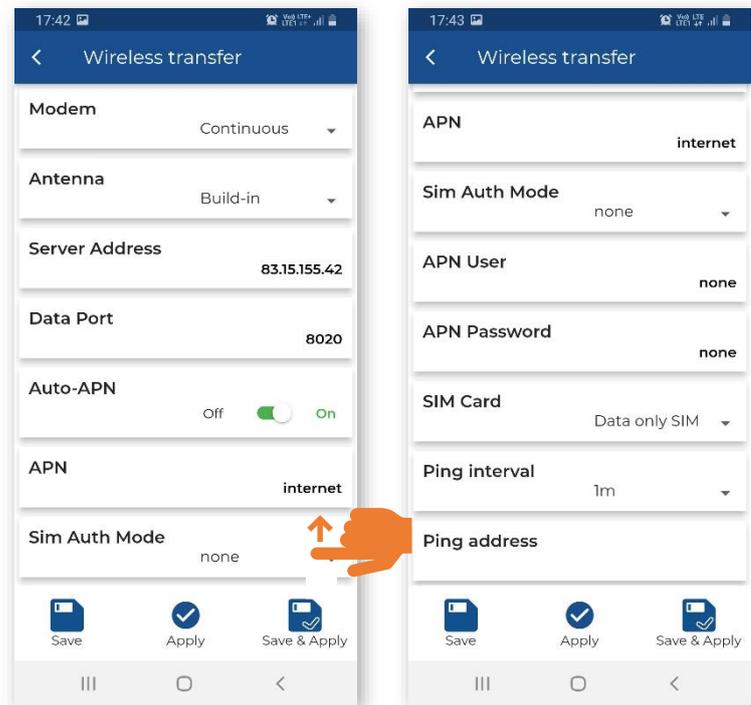
In the continuous mode, the modem is active all the time. However, this mode is energy-intensive and if the continuous data transfer is not necessary, it is recommended to use the *Periodically active* mode, which ensures low energy consumption.



In the *Periodically active* mode, the modem will be switching on and connect to *SvanNET* depending on the **Connection Period** setting.

In the **Wireless transfer** screen, you can also:

- choose the type of **Antenna** (*Build-In* or *External*),
- enter **Server Address**,
- enter **Data Port**,
- switch on **Auto-APN**,
- choose **Sim Auth Mode** (*none* or *PAP*),
- enter **APN User** login,
- enter **APN Password**,
- choose the **SIM Card** type (*Standard SIM* or *Data only SIM*),
- choose **Ping interval** (*Modem PING Off, 1m ÷ 5m*),
- enter **Ping address**.



## 5 INTERNET SERVICE PLATFORM – SvanNET

The SV 803 station is designed to be operated remotely via *SvanNET*, the Internet service platform (web service) provided by Svantek.

Internet connection is provided by the 4G modem of SV 803.

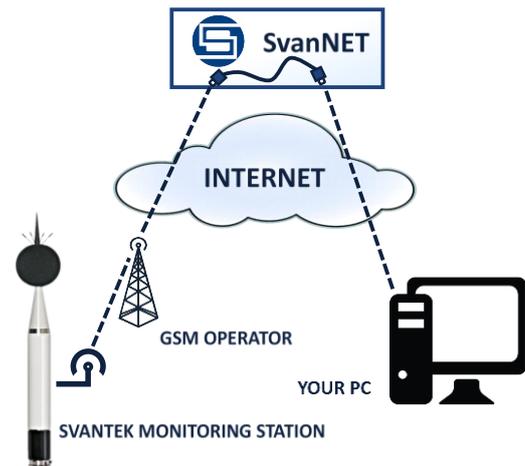
After successful configuration of the 4G modem and connection with the *SvanNET* web service, you can start working with the monitoring station remotely.

### 5.1 SVANNET WEB SERVICE

*SvanNET* is an Internet service that simplifies the remote connection between a PC and Svantek monitoring stations.

*SvanNET* allows usage of all type of SIM cards with the station mobile modem regardless of having a public or private IP.

The connection over the *SvanNET* allows users to watch real time measurement results, control monitoring stations and measurements, download files (manually or automatically), configure monitoring stations using any available Internet browser.



**Note:** Establishing the mobile connection requires the use of a SIM card without PIN code protection and with activated Internet access. Installation of the SIM card is described in Chapter [2.3](#).



**Note:** To have access to the *SvanNET* web service the local SVANTEK distributor should create the user's account and assign monitoring stations to it.

By default, SV 803 is configured for the periodical connection with *SvanNET*. After station is turned on, the 4G modem will work for two hours and then will go into the sleep mode. If you wish to wake the 4G modem up, press the  key on the SV 803 keypad and after a while SV 803 will be connected to *SvanNET* again.



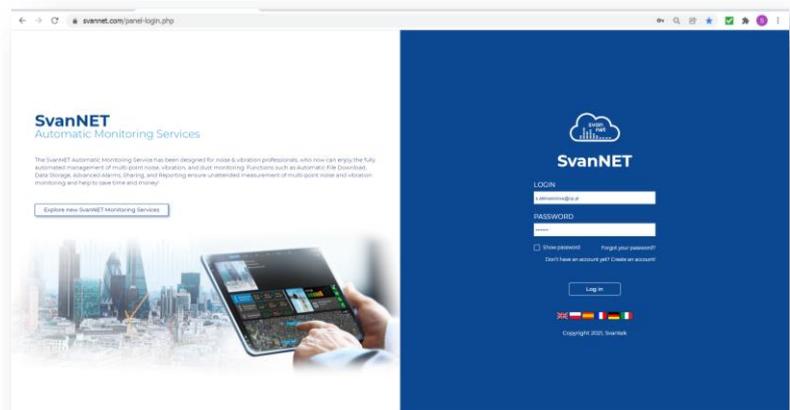
**Note:** If there is a Bluetooth connection, the station will not go into the sleep mode or will wake up from it.

To access *SvanNET*, log in to your account at:

<https://www.svannet.com/panel-login.php>

Before logging, select your language.

Once logged in you can use the web interface to work remotely with the monitoring station.



*SvanNET* includes the standard function - *Remote Communication Services* available for all the *SvanNET* users and the optional extension - *Automatic Monitoring Services* offered via a license.

*Remote Communication Services* maintain remote connection with the monitoring devices and service includes status alarms (e.g., battery, memory), remote access to device settings and measurement files stored in the device and preview of the current results and recent time-history graph.

*Automatic Monitoring Services* offers automatic control of many measurement points, data sharing with other *SvanNET* users as well as data preview in the form of a customised website with either public or restricted access. The preview website can be customised with a logo and individual project name. Access to the preview can be either open to the public or protected by a password.

You can switch both services using icons on the Main panel:



– *Remote Communication Services* (**Station list**).



– *Automatic Monitoring Services* (**Project list**)



**Note:** To get more information about all functions of *SvanNET* follow *SvanNET* User Manual.

## 5.2 REMOTE COMMUNICATION SERVICE – STATIONS

**Station list** displays all stations assigned to your account – turned on and off. When you click the station, it becomes active and the tools at the right panel will be dedicated to this particular station.

The screenshot displays the 'Station list - S/N 1234' interface. The main list shows several stations, with 'SV 803 S/N 1234' highlighted. A right-hand panel provides a menu for the selected station, including options like 'WEB INTERFACE', 'STATUS', 'CERTIFICATES', 'STATUS LOG', 'CONNECTION LOG', and 'DATA TRANSFER LOG'. Below the station list, a detailed view for 'SV 803 S/N 1234' is shown, featuring six status icons: 'Station in project', 'Alerts', 'Station status', 'Battery state', 'Power source', and 'Memory'. Each icon has a corresponding tooltip with details such as project name, alert time, status, battery percentage, power source, and memory usage.

The station bar except station name with serial number includes six icons that indicate the station state. When a station is disconnected from *SvanNET* all icons are of grey colour.

If you click the station name, station information will be displayed. If you click the icon, this icon status information will be displayed:



Project status: this icon appears when this station is involved in the project. When you click this icon, the project name and link to it will be displayed.



Alert status: blue - everything is OK, red – unregular event is happening.



Station connection status: green – online; grey – offline; yellow - the station doesn't respond to the command for a long time.



When the station is in the Sleep mode - blinking blue, otherwise it is changing to the Station connection status icon.



Battery state. When you click this icon, the information about battery state will be displayed.



External power source status: blue – the instrument is powered by the external source, grey - there is no external power.



Memory status. When you click this icon, the information about available memory will be displayed.

Icons in the Main panel tool allows you to:



display alarms for all stations



manage user account



activate licences



contact Svantek Support team

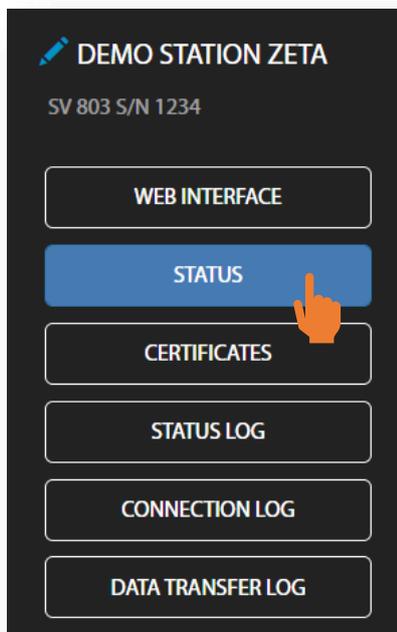


change the colour scheme of *SvanNET* from “dark” to “light”



logout from *SvanNET*.

The Tool panel provides some functions for station control. To switch the function, point a cursor on the appropriate button (it will change its colour to blue) and click it.



The **WEB INTERFACE** button switches you to the Live data view (see Chapter [5.2.4](#)) in which you can view measurement results and use additional tools to configure station parameters, download data files, start/stop measurements and perform station checking. This button is available for the stations connected to *SvanNET*.

The **STATUS** button switches you to the Station status view (see Chapter [5.2.1](#)) in which you can check the station status and configure status alarms.

The **CERTIFICATES** button activates the dialog box which shows available certificates for this instrument and allows you to add new certificate (see Chapter [5.2.2](#)).

The **STATUS LOG** button switches you to the Status log view (see Chapter [5.2.3](#)) in which you can check the power source (type and charge level), memory free space and signal quality.

The **CONNECTION LOG** button switches you to the Connection log view (see Chapter [5.2.3](#)) in which you can check the history of station connections.

The **DATA TRANSFER LOG** button switches you to the Data transfer log view (see Chapter [5.2.3](#)) in which you can check the history of data transfers (uploads).

Clicking  you can set the new station name instead of the default.

### 5.2.1 STATUS view

In the **STATUS** view you can check the station status and:  
configure status alarms.

- switch the modem mode (**Power Saving Mode Override Switch**),
- enable e-mail notification that the station is connection with *SvanNET* (**Notify when station comes online**),
- update instrument's status (**UPDATE STATUS**),
- configure status alarms Conditions and related Actions for the measurement points (**STATIONS ALARMS**).

The screenshot displays the 'Station - Demo Station SV 803 S/N 3509' interface. It includes a sidebar with navigation icons, a main content area with status and connection information, and a right-hand menu with options like 'WEB INTERFACE', 'STATUS', 'CERTIFICATES', 'STATUS LOG', 'CONNECTION LOG', and 'DATA TRANSFER LOG'. A 'STATION ALARMS' button is highlighted with an orange box, and a blue-bordered pop-up window titled '+ADD ALARM' is shown below it, containing a search bar, filters for 'All', 'Active', and 'Inactive', and 'APPLY' and 'CLOSE' buttons.

Power Saving Mode Override Switch can be activated to stop the station from going into the configured Power Save Mode. The next time the station connects to *SvanNET* (Either due to scheduled connection cycle or due to an event being triggered) the station will remain online with its modem running if the switch is activated.

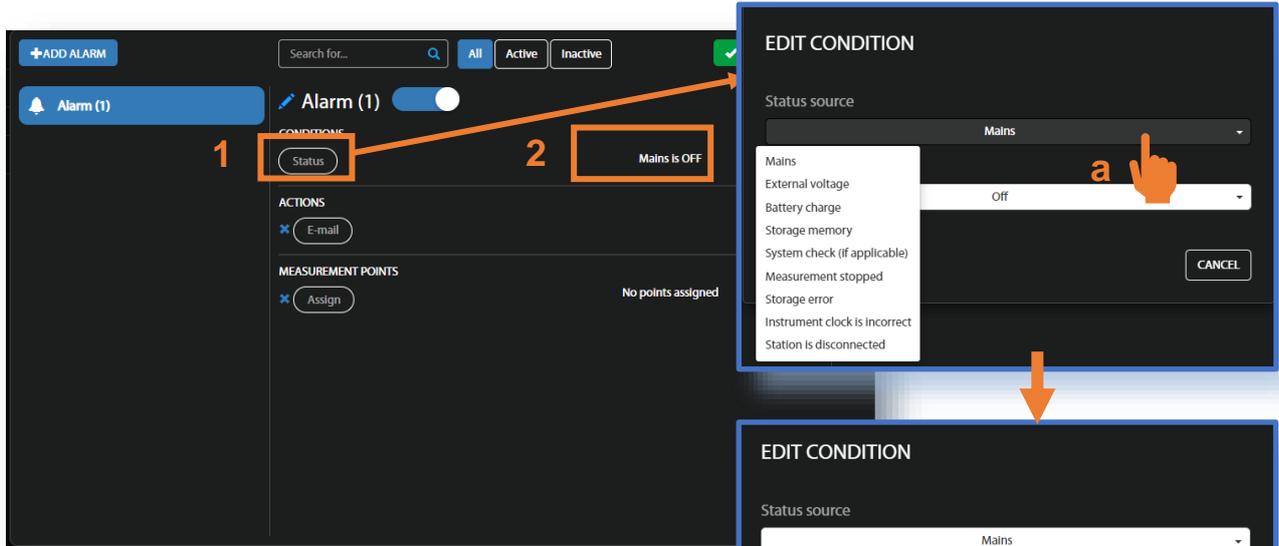


**Note:** Leaving this option ON will disallow the station to shut off the modem. This will significantly reduce the expected operating time of the battery.

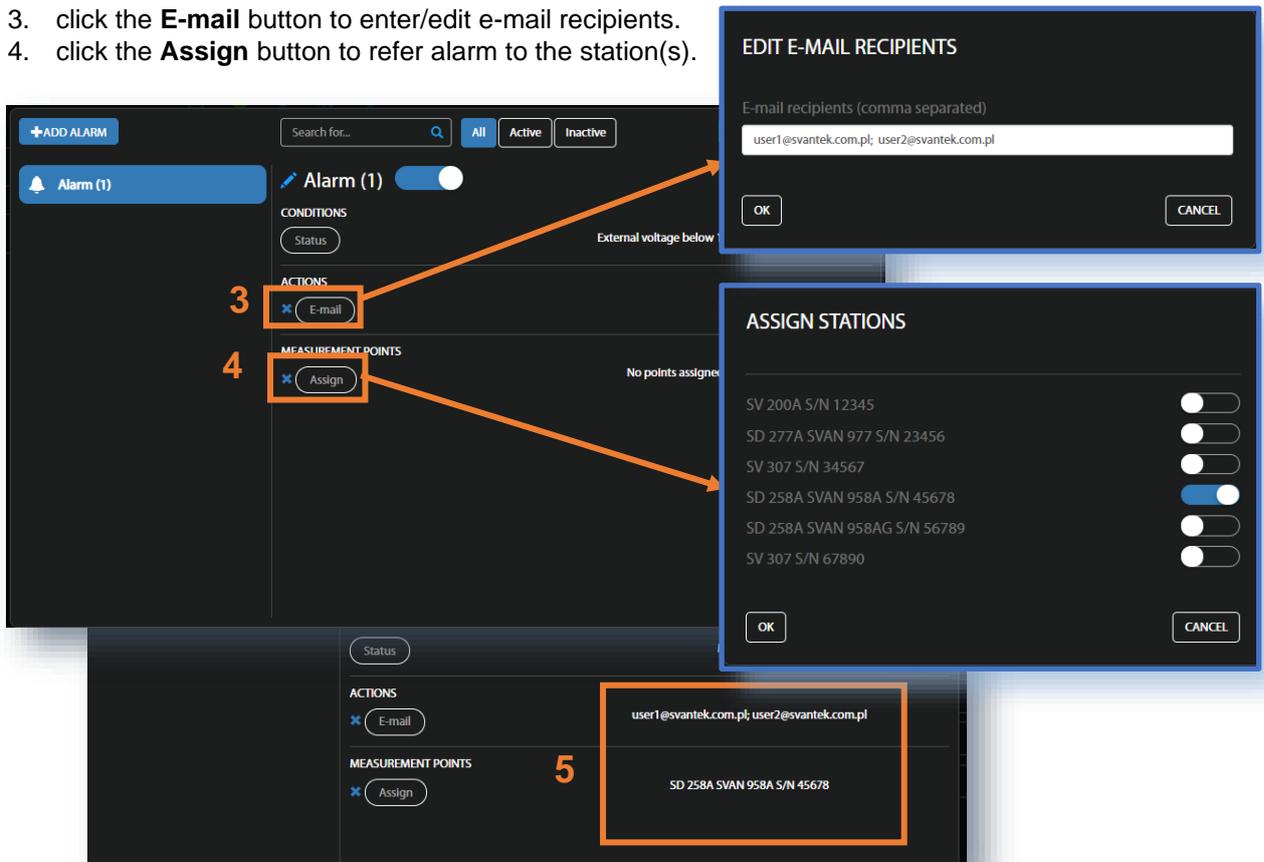
Sends an e-mail to station owner when the station connects to *SvanNET* because of exiting Power Saving Mode

After clicking **STATION ALARMS**, click **+ADD ALARM** in the pop-up box and a new **Alarm(1)** with **CONDITIONS**, **ACTIONS** and **MEASUREMENT POINTS** settings will appear. Alarms are based on Conditions and relate to Actions, that are default e-mails to the specified recipients, and refer to Measurement points. To configure Alarm:

1. Click the **Status** button and in the **EDIT CONDITIONS** configuration box:
  - a. select **Status source**: **Mains**, **External voltage**, **Battery charge**, **Storage memory**, **System check** ect.,
  - b. click the **Trigger value** selector and choose the required value of the selected **Status source**.



2. click **OK** and new condition will be displayed in the CONDITIONS area.
3. click the **E-mail** button to enter/edit e-mail recipients.
4. click the **Assign** button to refer alarm to the station(s).



5. Made selections are displayed in the ACTIONS and MEASUREMENT POINTS areas.

The Status sources have next meanings:

- **Mains**
  - Trigger Value: Off – alarm is generated when the system detects loss of power supply
  - Trigger Value: On – alarm is generated when the system detects appearance of power supply
- **External voltage**
  - Trigger Value: xx.xx V – alarm is generated when the system detects an external power drop below the selected value. In this case, external power means power supply and all various battery packs
- **Battery charge**
  - Trigger Value: xx % - alarm is generated when the system detects a decrease in the percentage of battery charge below the selected threshold.
- **Storage memory**
  - Trigger Value: xx MB/GB - alarm is generated when the system detects a decrease in the free storage memory below the selected threshold.
- **System check (if applicable)**
  - Alarm is generated when the system detects failure in execution of the system check procedure (not live check).
- **Measurement stopped**
  - Alarm is generated when the system detects lack of measurement. Applies only to stopped measurements - states such as start delay, waiting for synchronization and pause are treated as a running measurement
  - Instrument action: Start measurement
- **Storage error**
  - Alarm is generated when the system detects an SD-card error. The check assumes that a measurement is in progress and data are recorded; the writing of the logger file is checked by changing of the free space on the card (which means that the device is writing data).
  - Instrument action: Restart measurement
- **Instrument clock is incorrect**
  - Trigger value: xx seconds / xx minutes – alarm is generated if the RTC indication of the device is inconsistent with the current system time (based on owner's time zone) by  $\pm$  of the selected value
  - Instrument action: Set instrument clock to server time (based on owner's time zone) – measurement is stopped, instrument clock is set (based on owner's time zone), measurement is resumed
- **Station is disconnected**
  - Trigger value: xx minutes / xx hours – alarm is generated when the station remains disconnected from SvanNET for a time equal to the selected value.

Alarms are reported once after the occurrence of an alarm condition. The occurrence of an alarm condition will generate selected actions (e.g. e-mail) at the moment of changing the status compared to the previous check (i.e. if at 8:15 there is power supply, at 8:30 mains is off, at 8:45 mains is still off, the system will generate an alarm at 8:30 and will be still until mains is on and off again).

## 5.2.2 CERTIFICATES dialog box

The **CERTIFICATES** button opens the CERTIFICATES dialog box which shows a list of available certificates for this station.

The certificate is attached to each instrument and contains a calibration card and instrument specifications.

You can download the certificate pdf file clicking **Download file**.

Station list - SV 803 S/N 3509

Owner: Bukala, Michal (pomiar@svantek.com.pl)  
Distributor: None

SD 258A PRO SVAN 958AG S/N 97952

[ CLICK TO SET NAME ]  
SD 258A PRO  
SVAN 958AG S/N 97952

WEB INTERFACE  
STATUS  
**CERTIFICATES**  
STATUS LOG  
CONNECTION LOG  
DATA TRANSFER LOG

**CERTIFICATES**  
SV 803 S/N 3509

2018-09-03 Factory calibration  
LABORATORY NAME  
SVANTEK  
PERFORMED BY KRZYSZTOF KUBEL

Download file

© 2022

SVANTEK ISO9001 certified

FACTORY CALIBRATION DATA OF THE SV

### 5.2.3 LOG views

There are three station logs, that register system events, connections and data transfer:

- **Status log** which registers power source type and charge level, memory free space, GSM signal quality, system check history and GPS information.

In the upper line you can: refresh the log, select the period of records to be displayed and rewind records.

Status log - SV 803 S/N 3509

Date from... Date to... 30

1 / 130

Date & time	Status	Battery	Power source	Charge / discharge time	Station battery voltage	Source voltage	Memory	Free space	GSM signal quality	GPS info
2022-10-25 19:28:58	OK	Unavailable	Mains	N/A	8.0V	14.5V	98%	26 GB	Very good (-75 dBm)	Lat: 52.172730, Lon: 21.163890 Default location: no GPS signal
2022-10-25 19:13:56	OK	Unavailable	Mains	N/A	7.9V	14.5V	98%	26 GB	Very good (-79 dBm)	Lat: 52.172730, Lon: 21.163890 Default location: no GPS signal
2022-10-25 18:58:54	OK	Unavailable	Mains	N/A	7.9V	14.7V	98%	26 GB	Very good (-79 dBm)	Lat: 52.172730, Lon: 21.163890 Default location: no GPS signal
2022-10-25 18:43:53	OK	Unavailable	Mains	N/A	7.9V	14.6V	98%	26 GB	Very good (-77 dBm)	Lat: 52.172730, Lon: 21.163890 Default location: no GPS signal
2022-10-25 18:28:52	OK	Unavailable	Mains	N/A	7.9V	14.5V	98%	26 GB	Very good (-77 dBm)	Lat: 52.172730, Lon: 21.163890 Default location: no GPS signal
2022-10-25 18:13:51	OK	Unavailable	Mains	N/A	7.8V	14.5V	98%	26 GB	Very good (-79 dBm)	Lat: 52.172730, Lon: 21.163890 Default location: no GPS signal
2022-10-25 17:58:50	OK	Unavailable	Mains	N/A	7.8V	14.5V	98%	26 GB	Very good (-77 dBm)	Lat: 52.172730, Lon: 21.163890 Default location: no GPS signal

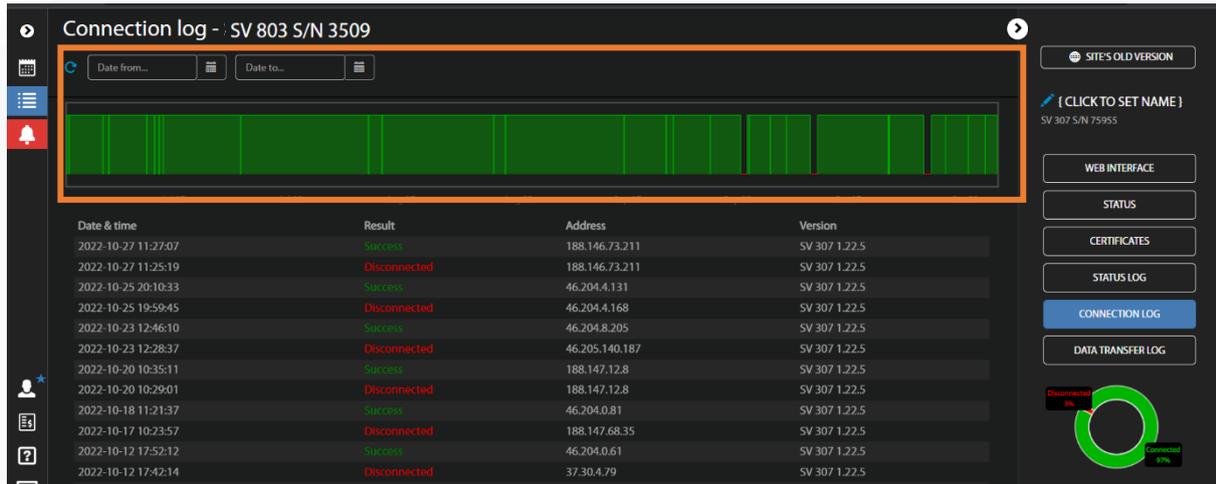
SITE'S OLD VERSION

[ CLICK TO SET NAME ]  
SV 803 S/N 3509

WEB INTERFACE  
STATUS  
CERTIFICATES  
**STATUS LOG**  
CONNECTION LOG  
DATA TRANSFER LOG

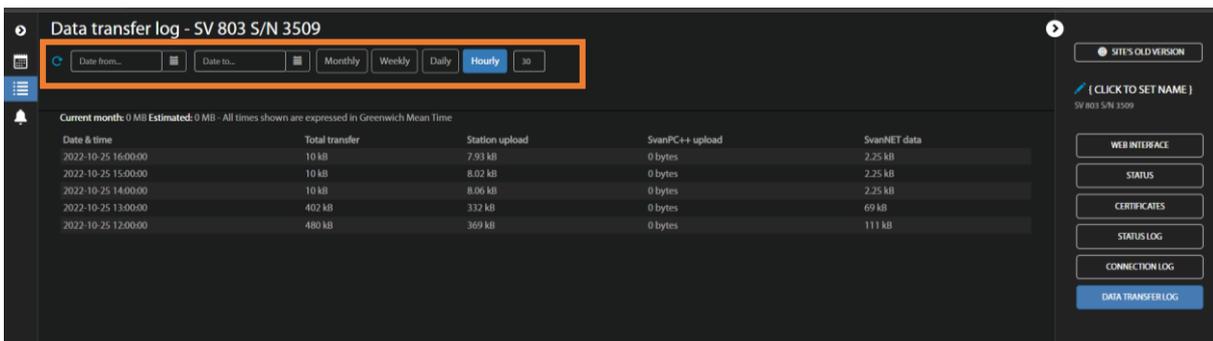
- **Connection log** which registers history of station connections – result (success or disconnected), IP address, firmware version and reason of the disconnection.

In the upper line you can: refresh the log, select the required period of records to be displayed and rewind records, below is the time-history of connections with the SvanNET and the pie chart shows the total connection time in percentage to the whole working time.



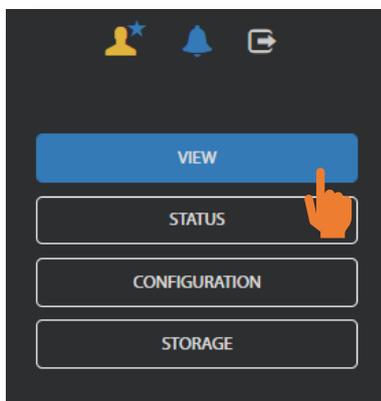
- **Data transfer log** which registers history of data transfers (uploads).

In the upper line, you can: refresh the log, select the required period of records to be displayed and select the period for data transfer presentation: Monthly, Weekly, Daily or Hourly.



## 5.2.4 WEB INTERFACE view

The **WEB INTERFACE** view is available for the stations connected to SvanNET and enables viewing measurement results, configuring station parameters, downloading files and measurements start/stop.



The **VIEW** button switches you to the **Live data** view (see Chapter [5.2.4.1](#)) in which you can view broadband results, time-history results and event presentation.

The **STATUS** button switches you to the station status view (see Chapter [0](#)) in which you can check the station status and start/stop measurements.

The **CONFIGURATION** button switches you to the station **Configuration** view (see Chapter [5.2.5.1](#)) in which you can configure measurement and instrument parameters.

The **STORAGE** button switches you to the **Storage** view (see Chapter [5.2.6](#)) in which you can download files manually.

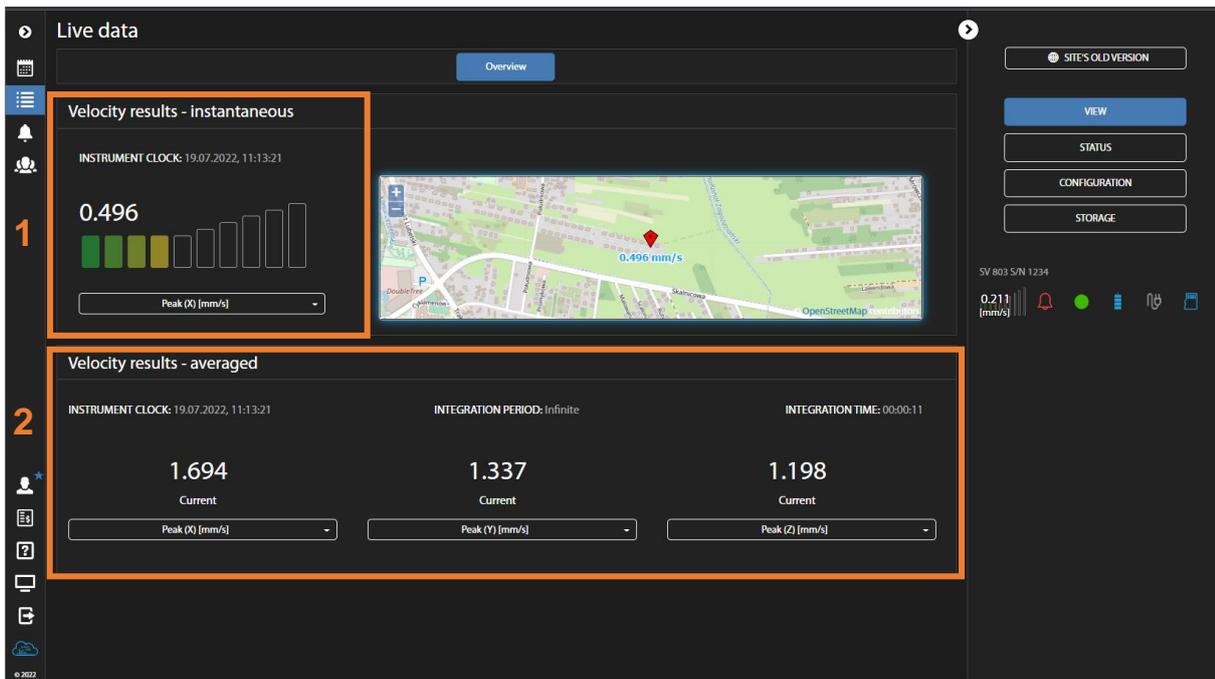


**Note:** Content of the **Configuration** tabs depends on the selected parameters. The objective of this manual is not to present all possible combinations of parameters, but to indicate the principles of working with SvanNET.

### 5.2.4.1 Live data view

The **Live data** view displays the map with the device location and results measured in three channels which are refreshed every second:

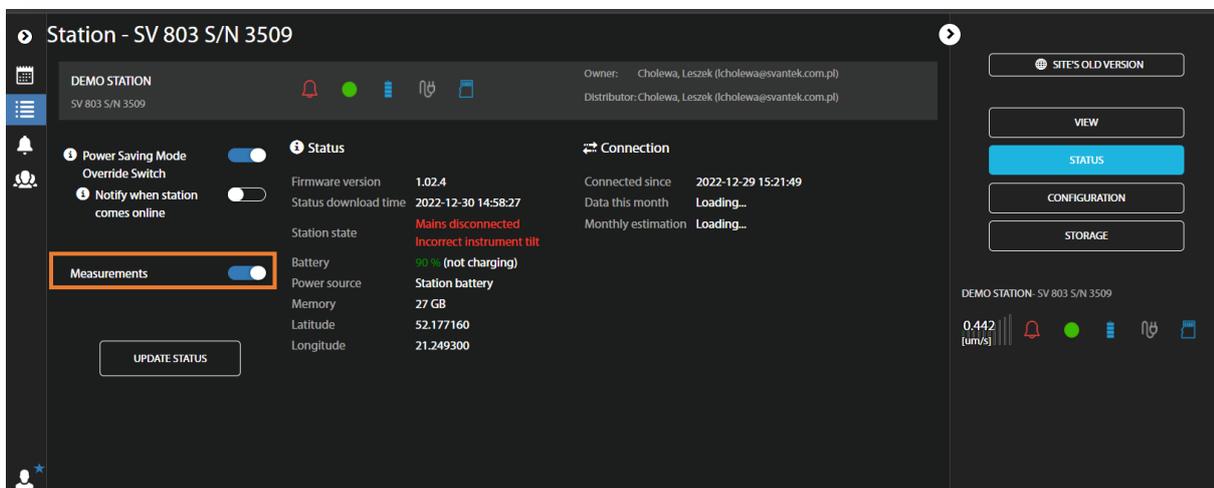
1. **Instantaneous** velocity results measured/averaged by 1-second period and
2. **Current averaged** velocity results in the three channels for the INTERGRATION TIME in the range [1s ÷ **Velocity step**]. After expiring the **Velocity step** time, the averaging starts from the beginning. (INTEGRATION PERIOD).



There are selector buttons for displayed results. To change the displayed result, click the selector button for the required Channel and choose the result.

### 5.2.5 STATUS view

The **STATUS** view is similar to that described in Chapter [5.2.1](#). The difference is that instead of configuring STATUS ALARMS, in this view, you can start/stop measurements.



### 5.2.5.1 Configuration views

The **Configuration** view consists of several sections that enable configuring of measurement parameters (**Measurement setup**), measurement results saving (**Storage**), files exporting in the CSV format (**CSV export**), recording of the measured signal in the WAV format (**Wave recording**), station alarms based on events (**Event trigger**), periodical system check (**Calibration**), auxiliary parameters (**Auxiliary**) and upgrade the firmware (**Firmware upgrade**).

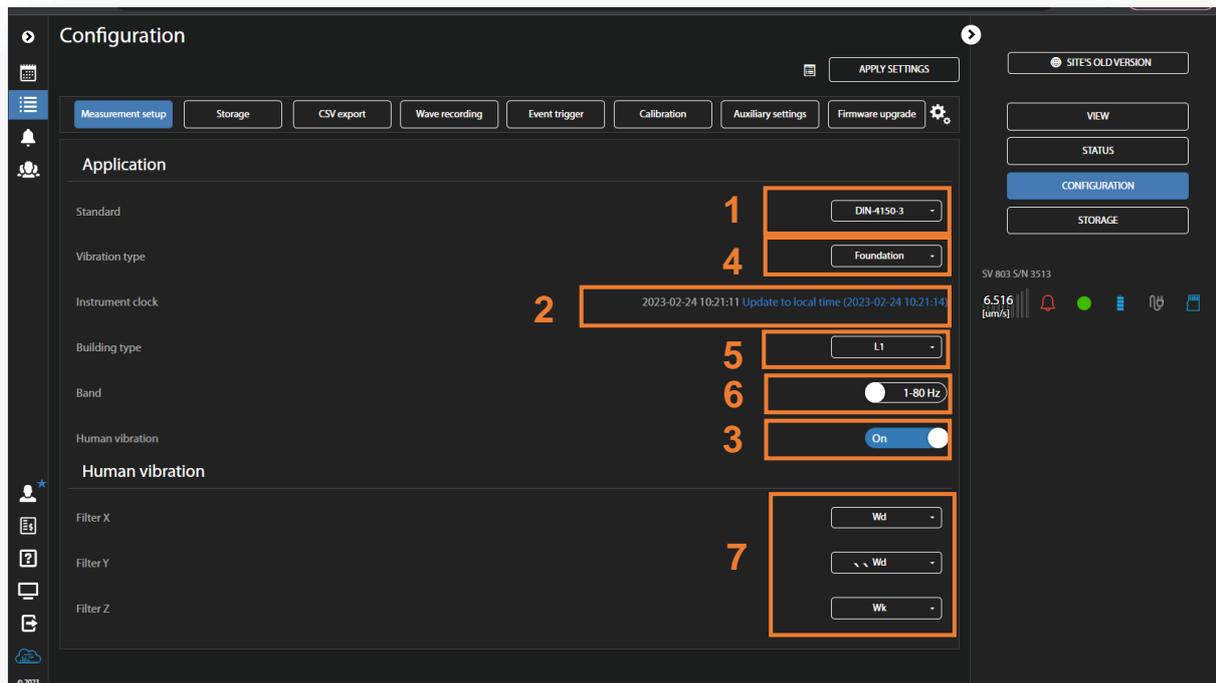
To send new configuration to the station, click the  button.

In the **Measurement setup** section, you can:

1. select the **Standard**: *PPV, BS-7385-2, DIN-4150-3, Kbfmax, 22/09/1994, 23/07/1986/1, 23/07/1986/2, IN-1226-A, IN-1226-B, IN-1226-C, IEST VC* or *User*,
2. update the **Instrument clock**,
3. switch on/off the **Human Vibration** measurements  
and depending on the standard:
4. select the type of building element (**Vibration type**): *Foundation, Top floor, Floor slab, Underground cavities, Buried pipework, LT top floor, LT floor slab*,
5. select the **Building type** criterion curve for some standards: *L1, L2 ...* or *Workshop, Office, Residential, Theatre, VC-A ...*,
6. select the measurement **Band**: *1-80 Hz* or *1-315 Hz*.

If the **Human Vibration** measurements are switched on, you can:

7. set weighting filters for Human Vibration measurements in the channels for three axes X, Y and Z.



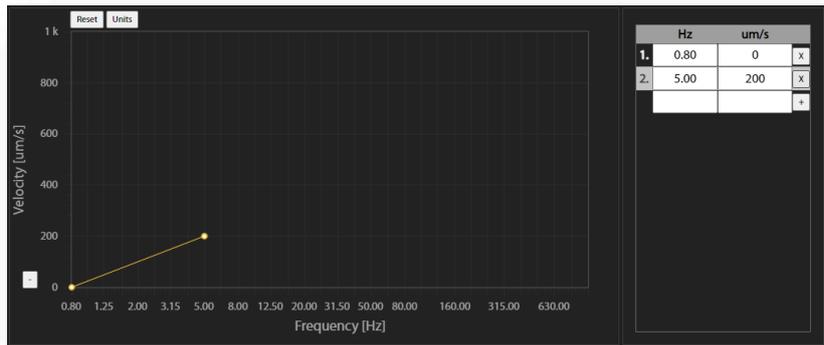
The **User** standard allows you to:

1. Use specific type of **Spectrum**: *FFT Vel. or Octave 1/3 Vel.* and **Spectrum result** of 1/3 octave band: *Peak, Max, Min* or *RMS*.
2. Create your own criterion curves.

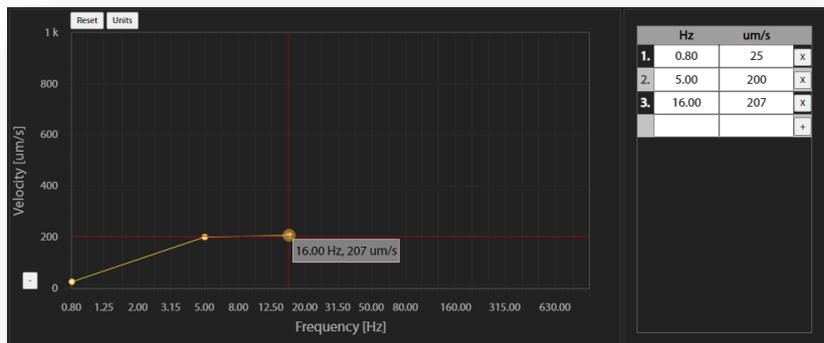


There are two ways to create a curve – using a table or a graph. Both ways complement each other. First, choose the curve you wish to create or modify (**Curve 1**, **Curve 2** or **Curve 3**).

If you wish to use a table, tap the coordinates for the new point on the graph - values in the column **Hz** and column **µm/s**. The new point will be shown on the graph.



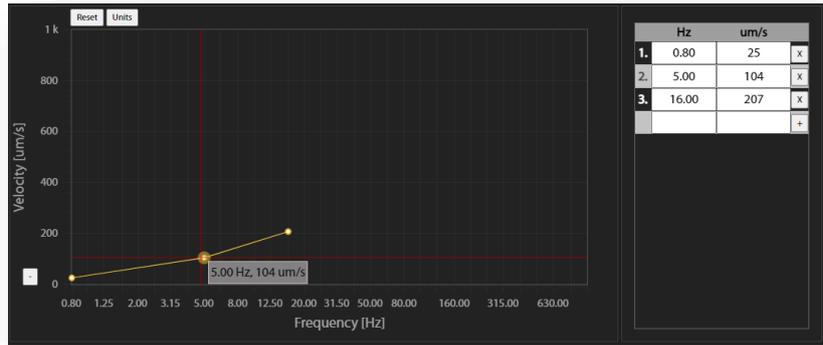
If you wish to use a graph, point the cursor on the coordinate and click it. The new point will be shown on the graph and in the table.



If you wish to change the position of the previously created point, you can change its coordinate either using the table or the graph.

You can change the **Velocity** units from  $\mu\text{m/s}$  to  $\text{mm/s}$  clicking the **Units** button.

To can reset the curve clicking on the **Reset** button.



The instrument performs two types of vibration measurements in three channels – Velocity and Acceleration. Measurement results of both types are saved in the logger file. Velocity signals can be optionally recorded in the wave file.

The logger file may contain three types of records:

1. records contained measurement results of velocity vibration from three channels made with **Velocity Step** (so-called time-history - TH),
2. records contained measurements of acceleration vibration from three channels made with **Human Vibration Step** (so-called Summary Results – SR) and
3. records of FFT velocity spectra from three channels with the **Velocity Step**.

The wave file contains waveform signals for three channels.

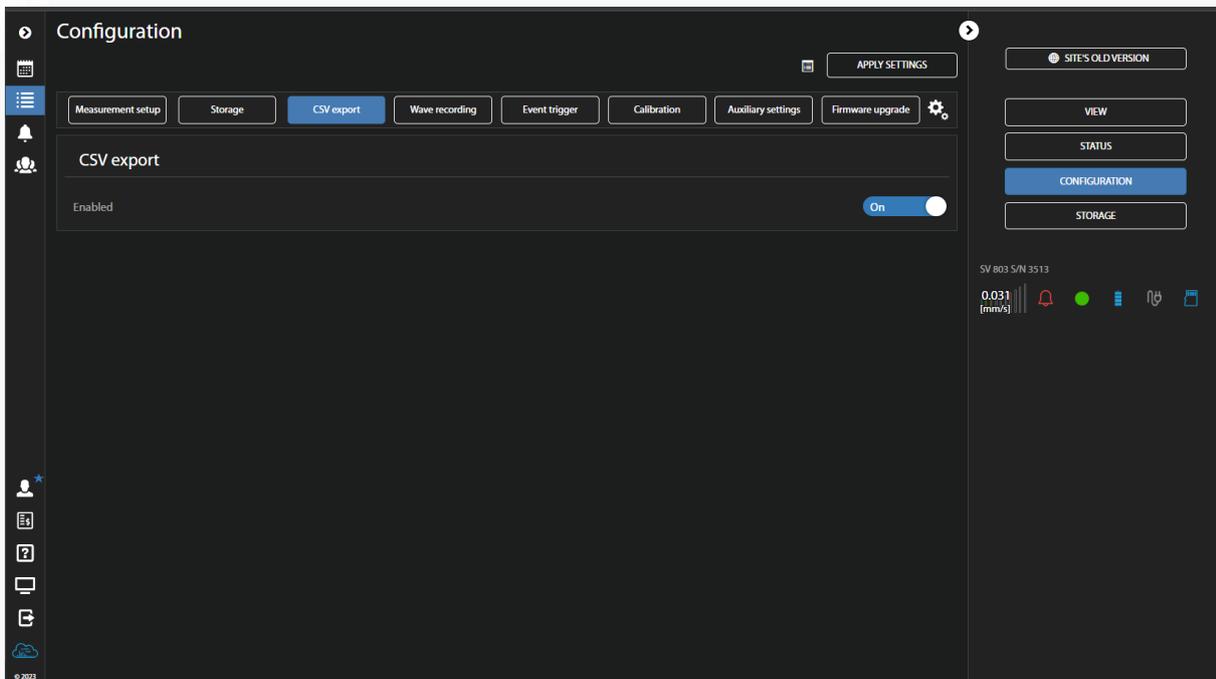
In the **Storage** section, you can set:

1. **Logger splitting** period: *Disabled, Every 15 m, Every 30 m, Every 1h or Every day,*
2. **Velocity step** for the **Velocity results** registration,
3. **Human vibration step** for the Acceleration results registration,
4. **Spectrum velocity** results recording: switched off (*Off*), continuously during the measurement (*Continuous*) or when the event is registered (*On event*),
5. **Velocity results** to be saved in a file with the **Velocity step**: *PEAK (PPV), P-P, MAX, RMS, RRMS (Rolling RMS), PEAK VEC (PPV VEC), DF (Dominant Frequency), OVL (Overload).*



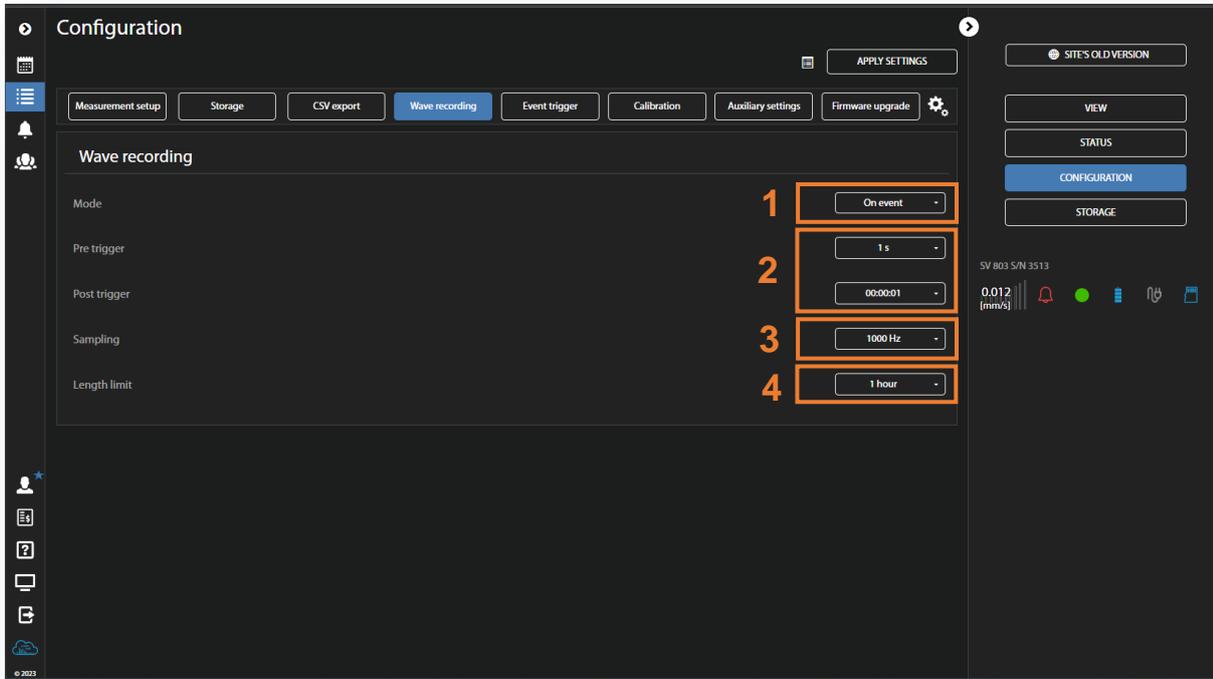
**Note:** All measurement results and waveform are saved in the files with automatically defined names. You can define both file names manually through the Assistant Pro or SvanPC++ interface (see Chapters [4.6.2.1](#), [4.6.2.2](#) and [6.3.4](#)).

In the **CSV export** section, you can enable the export of results in the CSV (Comma Separated Values) format.



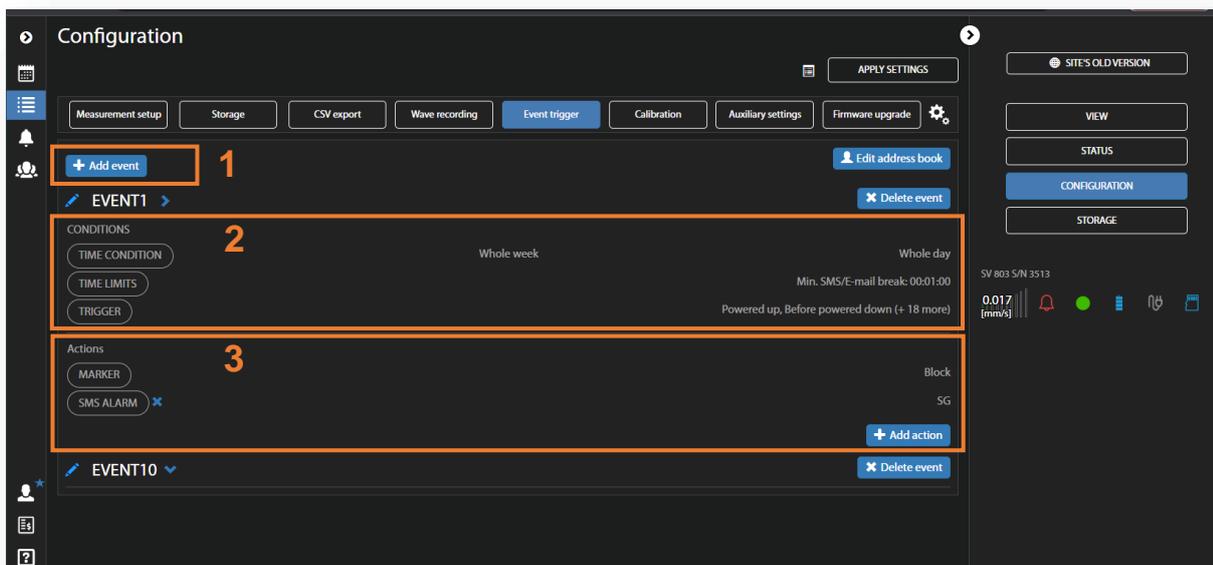
In the **Wave recording** section, you can:

1. set the **Mode** of the recording: *Disable*, *Continuous* (signals are recorded from the measurement start till the measurement end) or *On event* (signals are recorded during the event period),
2. in the case of *On event*, set the recording duration before the event (*Pre trigger*) and after the event (*Post trigger*),
3. set the sampling frequency of the signal recording: *250 Hz*, *500 Hz*, *1000 Hz*,
4. set the time of signal recording after triggering.



In the **Event trigger** section, you can:

1. add new event,
2. configure **CONDITIONS** and
3. define **Actions**.

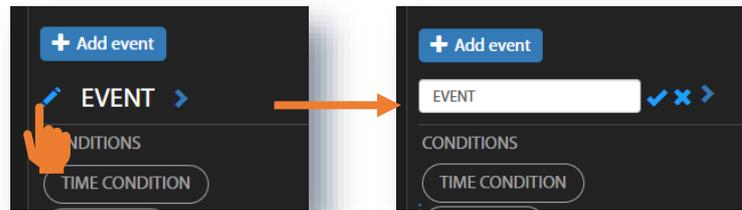


To add new event, click **+ Add event**. The new **Event** section with the **CONDITIONS** and **Actions** fields will appear.

To edit the event name, click .

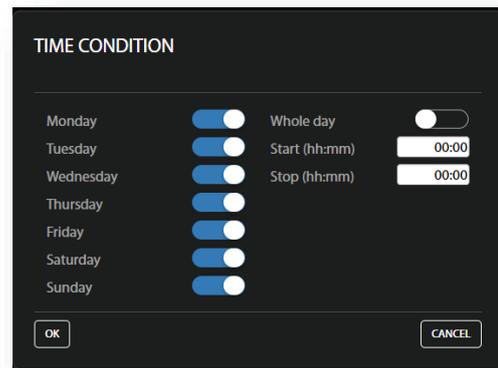
After editing the event name confirm it clicking  or reject it clicking .

To hide the event, click .



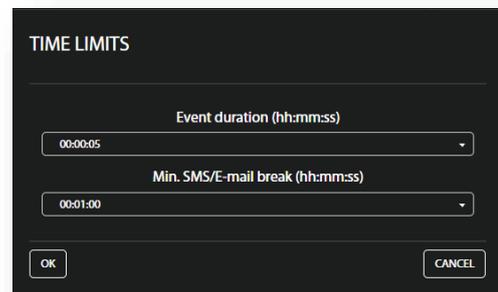
### Configuring conditions

Click the **TIME CONDITION** button to select days and periods for events registration in the TIME CONDITION configuration box.

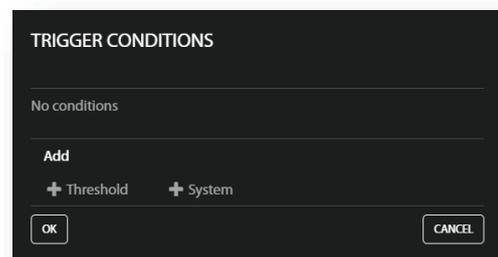


Click the **TIME LIMITS** button to set the event (alarm) duration and minimum period of break between SMS and E-mail notifications in the TIME LIMITS configuration box.

Setting **Min. SMS/E-mail break** period allows you to avoid hail of alarms in case of frequently recurring events.



If you click the **TRIGGER** button, the TRIGGER CONDITIONS configuration box will pop-up. In this box, you can add the condition type: **Threshold** or **System**. These conditions are mutually exclusive for the same event.



### Threshold trigger condition

The **Threshold** type trigger activates the event when the measured value (**Source**) crosses above the threshold level.

Select in the **Source** list the result which will be compared with the threshold level: *PPV*, *RMS*, *RRMS* (rolling RMS), *Vector* or *Curve*.

Selected result defines the threshold type – next parameter in this box.

In case of *Curve*, the **Reduction factor** should be defined from the set: 0.001, 0.01, 0.1 ÷ 1.9.

In case of *Vector*, the threshold level should be defined in the range 1 µm/s ÷ 10.0 m/s.

You can enter the threshold as value with the units or just value. If the value will be out of the range, the program will adjust it to the nearest limit.

In case of *PPV*, *RMS* and *RRMS*, three **Threshold** levels should be defined for the X, Y and Z axis in the range 1 µm/s ÷ 100 mm/s and the **Event counter** logic should be programmed.

For *RRMS*, also the **Rolling time** should be defined.

In the **Event counter** position, which appears for specified type of **Source** (*RMS*, *RRMS*, *PPV* and *Vector*), you can choose a number of conditions that should appear before triggering the event and alarms.

If **Event counter** > 1, the **Event counter mode** position appears in which you can choose the way of counting events (*Consecutive* or *Periodical*):

- In case of the *Consecutive* option, an event will occur if a trigger condition occurs **Event counter** times in succession.
- In case of the *Periodical* option, an event will occur if a trigger condition occurs **Event counter** times in succession periodically with a period (**Event counter period**) equal to *Human Vib. Step* or *Velocity Step*.

The Event counter is not used for the Curve source.

THRESHOLD CONDITION

Title  
Curve, Reduction factor: 1.0

Source  
Curve

Reduction factor  
1.0

OK CANCEL

THRESHOLD CONDITION

Title  
Vector >= 1.000 mm/s, Consecutive

Source  
Vector

Threshold  
1.000 mm/s

Event counter  
1

OK CANCEL

THRESHOLD CONDITION

Title  
RRMS X >= 5.012 mm/s, Y >= 5.012 mm/s, Z >= 5.012 mm/s, Over Human Vib. Period, Count: 2

Source  
RRMS

Threshold X  
5.012 mm/s

Threshold Y  
5.012 mm/s

Threshold Z  
5.012 mm/s

Rolling time  
30 m

Event counter  
2

Event counter mode  
Periodical

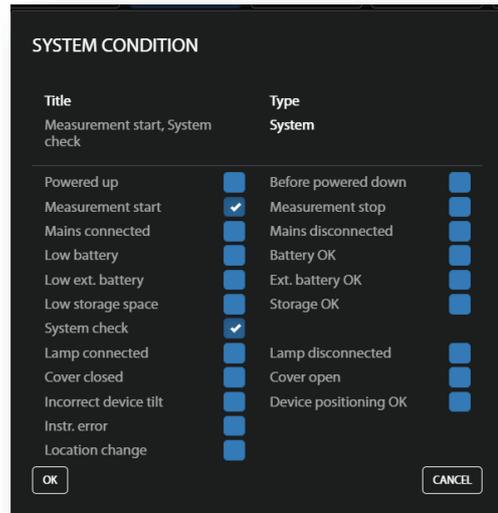
Event counter period  
Human Vib. Step

OK CANCEL

**System trigger condition**

The **System** type trigger activates the event when some of the system conditions appear.

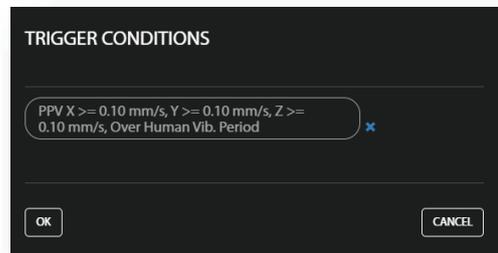
You can select several or all conditions presented in the SYSTEM CONDITION configuration box (see description in Chapter 4.6.3.2).



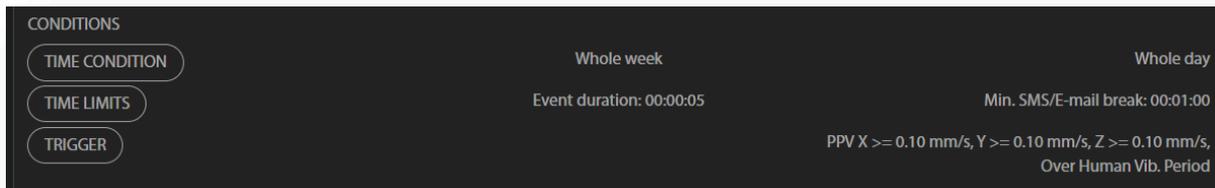
The selected threshold condition will be presented in the TRIGGER CONDITIONS pop-up box.

In this box you can delete this condition clicking the  icon or confirm the selection clicking **OK**.

After confirmation the pop-up box closes, and the selection will be presented in the line of the **TRIGGER** button.



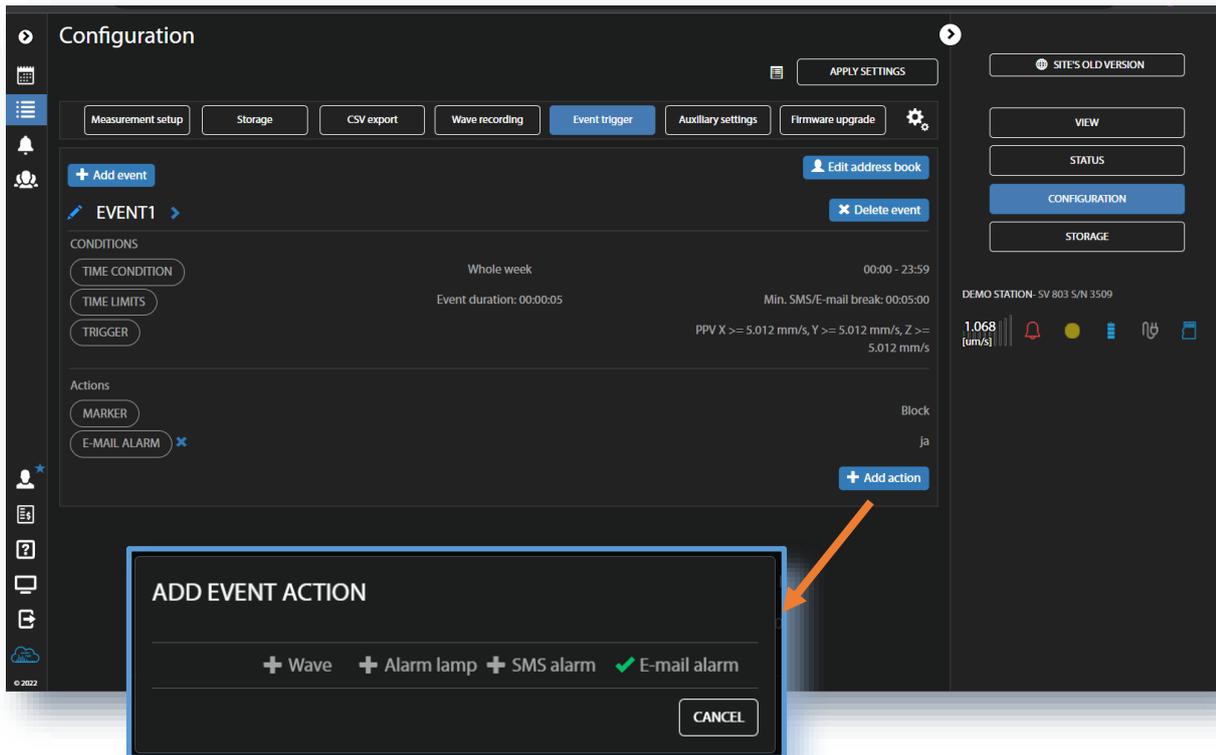
All **CONDITIONS** settings will be presented in the lines of appropriate buttons.



**Defining actions**

To create new action, click the  field and in the ADD EVENT ACTION pop-up box, click the action you wish to add and to configure: **Wave**, **Alarm lamp** (both only for the **Threshold** trigger!), **SMS alarm** or **E-mail alarm**.

The **MARKER** action that adds the special block marker of the event duration to the data file is always enabled.



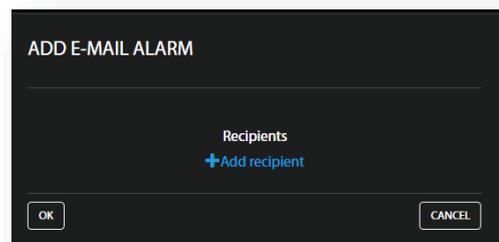
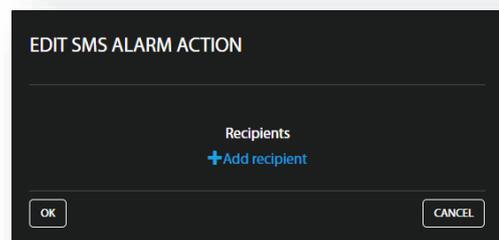
After occurrence of the event, actions will be performed during the time the event is active, at its beginning or at the end depending on the action type.

The **Alarm lamp** action starts an alarm signal at the **EXTERNAL INTERFACE** connector to which some alarm device can be connected (for example, alarm lamp).

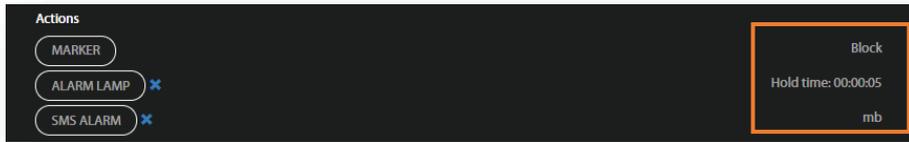
**Hold time** defines the duration of this alarm after the end of the event.

The **SMS Alarm** action sends the SMS note to the defined recipient's phones, which can be selected from the **ADDRESS BOOK** after clicking **+Add recipients**.

The **E-mail Alarm** action sends the E-mail note to the defined recipient's addresses, which can be selected in the **ADDRESS BOOK** after clicking **+Add recipients**.



After confirmation (**OK**) the pop-up windows close, and the selections will be presented in the lines of the appropriate **Actions** buttons.

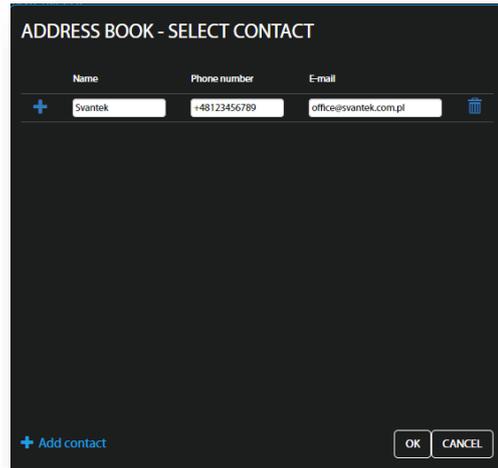


**Address book**

The ADDRESS BOOK pop-up window appears in the SMS and E-mail alarm actions pop-up windows after clicking the **+Add recipients**. In this case you should select the required address (+) and click **OK**.

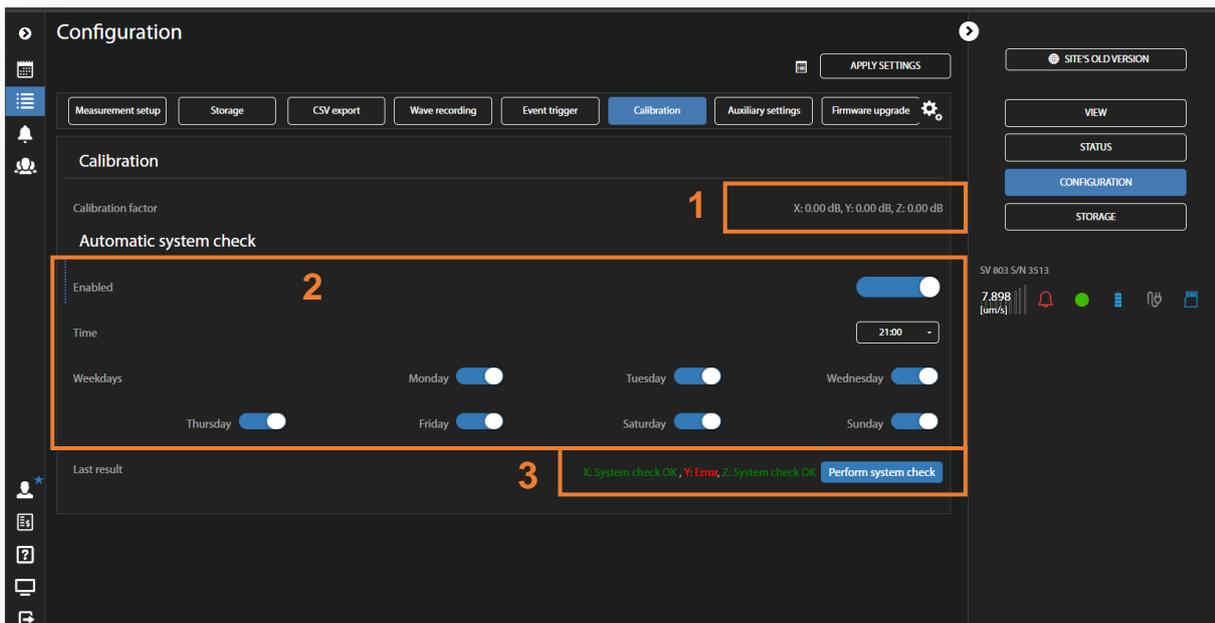
You can add the contact by clicking **+Add contact**.

You can edit the ADDRESS BOOK also from the **Configuration** view if you click **Edit address book**.



In the **Calibration** section, you can:

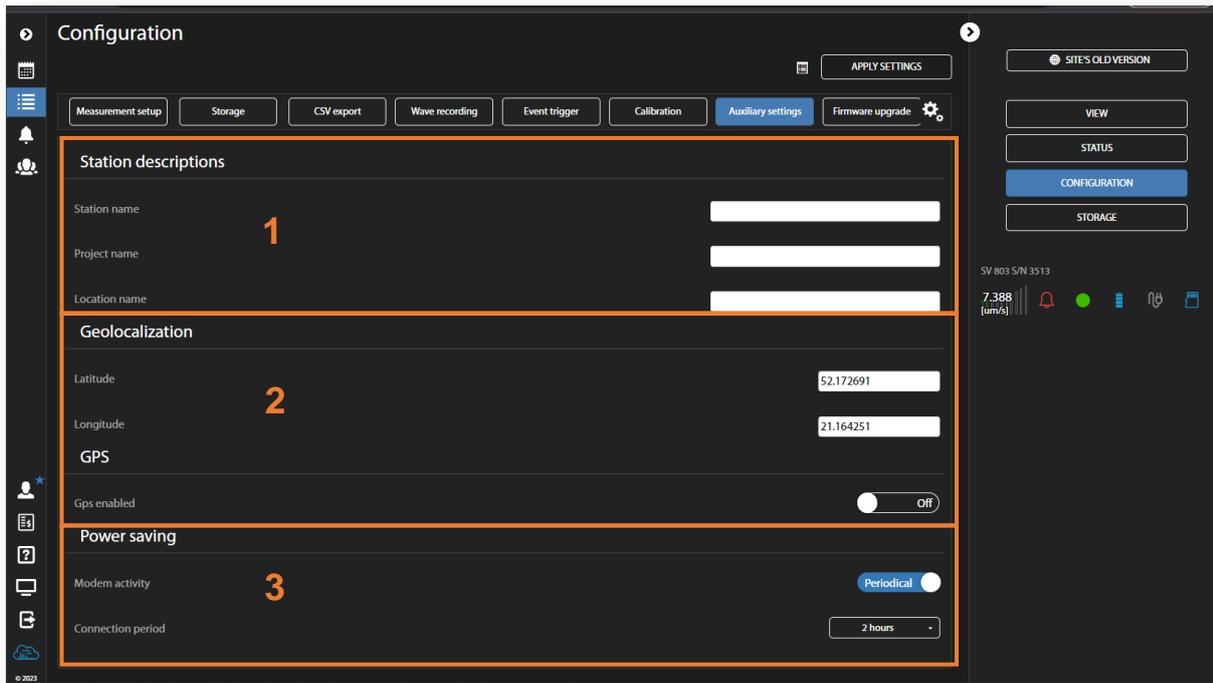
1. Check the calibration factor,
2. Enable and program automatic system check and
3. Perform the system check manually.



In the **Auxiliary settings** section, you can:

1. Enter **Station descriptions: Station name, Project name** and **Location name**.
2. Enter the instrument's **Geolocalization: Latitude** and **Longitude**. If the instrument's GPS is enabled Latitude and Longitude will be automatically read out from GPS.
3. Set the **Power saving** mode of the modem - choose **Modem activity** mode (*Continuous* or *Periodical*) and set the **Connection period** from 15 min to 24 h.

In the continuous mode, the modem is active all the time. However, this mode is energy-intensive and if the continuous data transfer is not necessary, it is recommended to use the *Periodical* mode, which ensures low energy consumption.

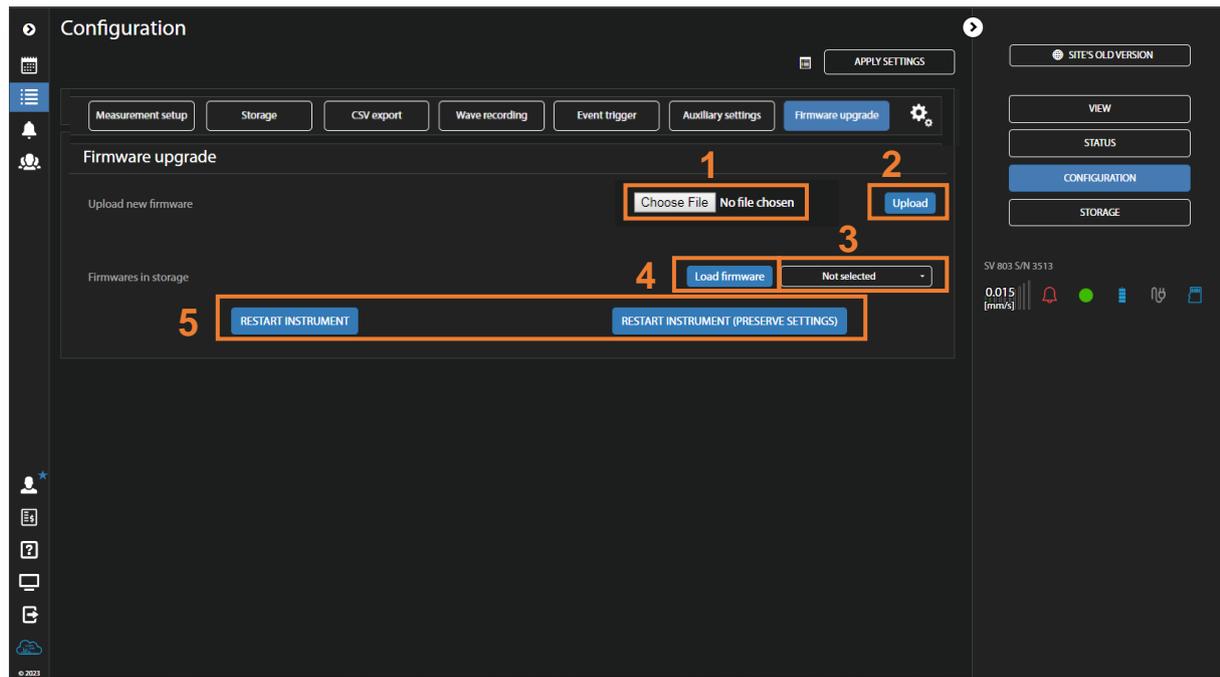


In the **Firmware upgrade** section, you can upload new firmware on the instrument's SD-card and perform upgrade process remotely.

Before upgrading it is essential that the proper firmware file is downloaded from SVANTEK website to your PC.

To upgrade the firmware:

1. Click **Choose file** and locate the firmware \*.bin file on the PC.
2. Upload the selected file by clicking the **Upload** button.
3. After the upload is finished select new firmware package in the firmware selector.
4. Click the **Load firmware** button.
5. Click the **RESTART INSTRUMENT** or **RESTART INSTRUMENT (PRESERVE SETTINGS)** button to finalize the process and wait 60 seconds for the connection to renew. The measurements will start automatically.

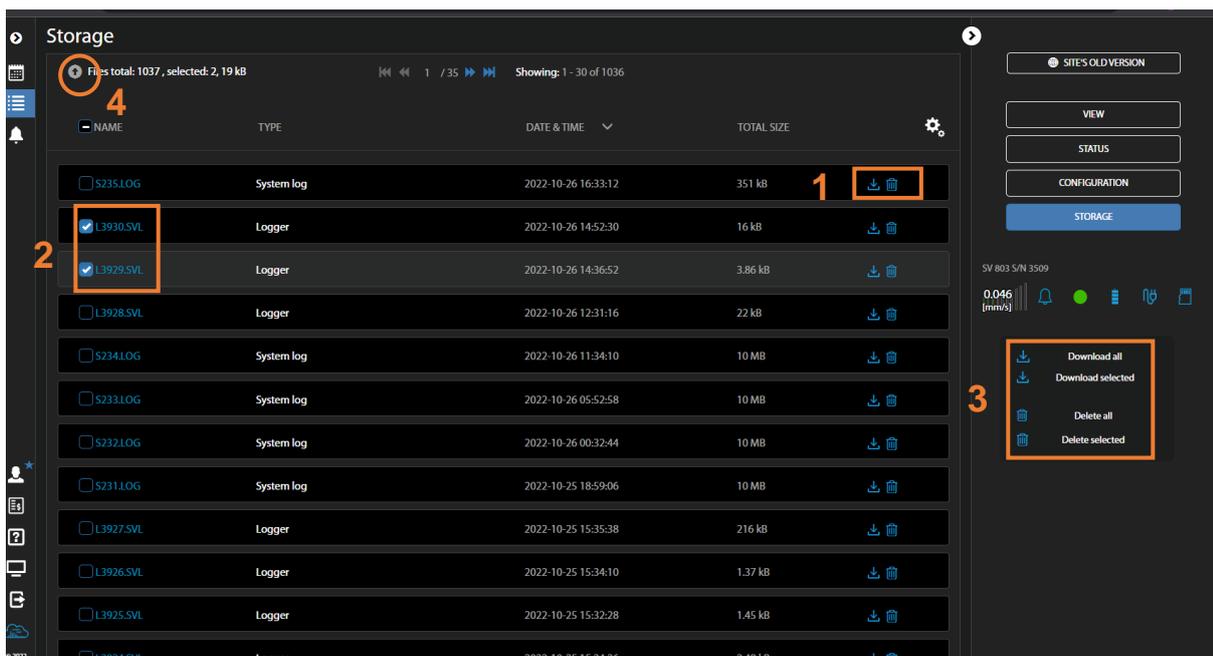


## 5.2.6 STORAGE view

The file storage window presents a list of files saved in the instrument's SD-card memory. The list includes only files from a single directory on the memory card and it initially shows the content of the current working directory.

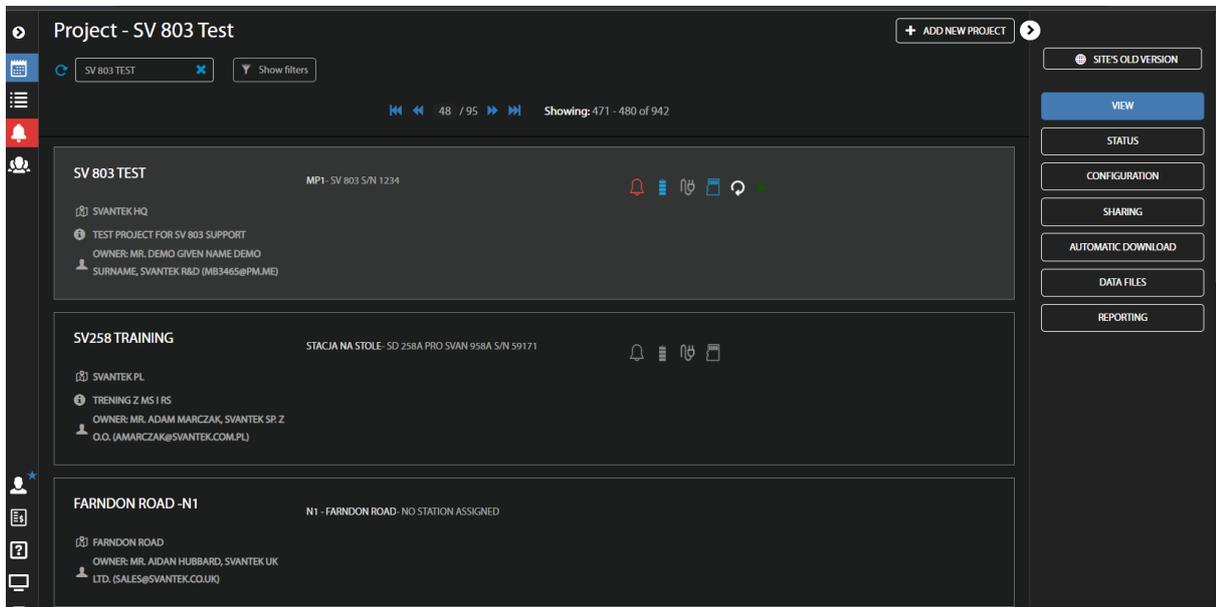
In the **Storage** view, you can:

1. Download or delete individual files by clicking the righthand icons on the file line.
2. Select several files and download or delete selected files.
3. Download or delete all files.
4. Navigate through the folder structure by clicking the "folder up" button.



## 5.3 AUTOMATIC MONITORING SERVICES – PROJECTS

After clicking the Project list icon, SvanNET opens the Project list view which enables configuring projects and viewing of all measurement results for all measurement points of the selected project.



Full description of the Project configuration is done SvanNET User Manual. This manual gives just brief description of how measurement data can be viewed in the Automatic Monitoring Services.

To view the project data, click the **VIEW** button.

You can view project data in several panels: *Project description*, *Configuration Info*, *Live data*, *Map*, *Charts*, *Tables*, *Events*, *Heatmaps*, *Weather/Dust* and *Text*. All panels are customizable so you can create a report based on these customized views using functionality of WYSIWYG (What You See Is What You Get).

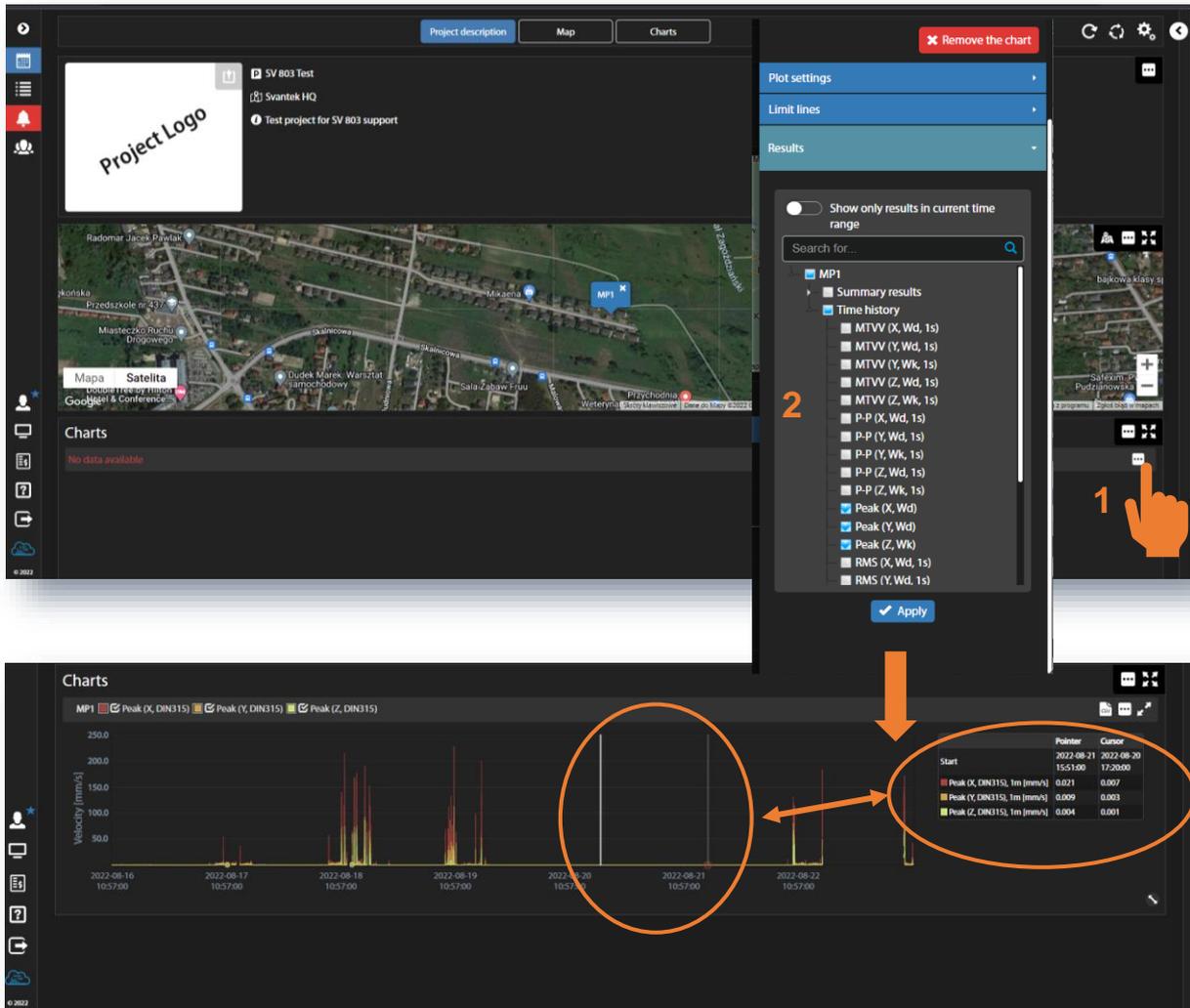
Configuring panels, formatting, and preparing reports is described in detail in SvanNET User Manual. This manual describes only parts related to the SV 803 operation.

### 5.3.1 Viewing time-history of measured results – *Charts* panel

The *Charts* panel presents time-histories of some results.

To view time-history(es):

1. click the  icon on the *Charts* panel and
2. in the pop-up box, choose results.



Point the mouse on the plot you can read the *Pointer* coordinates in the legend box. Clicking on the plot you can put the cursor and read the *Cursor* coordinates in the legend box.

### 5.3.2 Viewing events – Events panel

The *Events* panel presents the list of events (left section) and details of selected events (right section).

To view event details, mark the event in the list.

Event details include measurement point map, PPV time-history curves for three axes with marked events and cursor legend, waveforms and FFT spectra for three axes.

Events
🔄 ⚙️ 🔍

**Events**

All events Add

Date & time	Event	Point	Value
2022-08-13 00:10:42	EVENT1	MP1	0.010 mm/s
2022-08-12 00:05:27	EVENT1	MP1	0.014 mm/s
2022-08-12 23:54:59	EVENT1	MP1	0.011 mm/s
2022-08-12 23:52:58	EVENT1	MP1	0.012 mm/s
2022-08-12 23:46:23	EVENT1	MP1	0.027 mm/s
2022-08-12 23:43:19	EVENT1	MP1	0.011 mm/s
2022-08-12 23:37:20	EVENT1	MP1	0.010 mm/s
2022-08-12 23:31:03	EVENT1	MP1	0.012 mm/s
2022-08-12 23:25:28	EVENT1	MP1	0.010 mm/s
2022-08-12 23:21:25	EVENT1	MP1	0.010 mm/s
2022-08-12 23:15:00	EVENT1	MP1	0.012 mm/s
2022-08-12 23:07:04	EVENT1	MP1	0.129 mm/s
2022-08-12 23:06:40	EVENT1	MP1	0.013 mm/s
2022-08-12 22:59:37	EVENT1	MP1	0.010 mm/s

**Selected events**

No.	Date & time	Event	Point	Value	Parameters
1	2022-08-12 23:07:04	EVENT1	MP1	RMS Value X = 0.081 mm/s, <b>RMS Value Y = 0.129 mm/s</b> , RMS Value Z = 0.084 mm/s	Standard: User, Duration: 300 s Whole week, 00:05 - 23:59

1. EVENT1 on 2022-08-12 23:07:04

Date & time	Event	Point	Value	Parameters
2022-08-12 23:07:04	EVENT1	MP1	RMS Value X = 0.081 mm/s, <b>RMS Value Y = 0.129 mm/s</b> , RMS Value Z = 0.084 mm/s	Standard: User, Duration: 300 s Whole week, 00:05 - 23:59

**Time history - PPV** MP1 PPV X PPV Y PPV Z

Pointer	Cursor	Event
Start	2022-08-12 22:37:30	2022-08-12 23:07:05
Pointer	0.142	0.142
Cursor	0.142	0.207
Start	2022-08-12 22:37:30	2022-08-12 23:07:05
Pointer	0.142	0.142
Cursor	0.142	0.207
Start	2022-08-12 22:37:30	2022-08-12 23:07:05
Pointer	0.108	0.108
Cursor	0.108	0.169
Start	2022-08-12 22:37:30	2022-08-12 23:07:05
Pointer	0.029	0.029
Cursor	0.029	0.023

**Waveform** No data available

**Time history - FFT** X

**Waveform** No data available

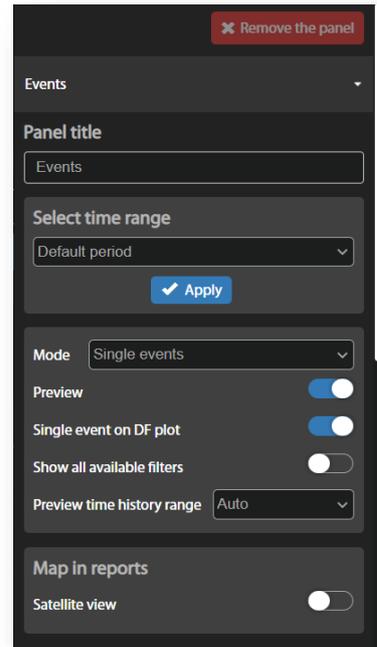
**Time history - FFT** Y

**Waveform** No data available

**Time history - FFT** Z

Clicking the  icon on the *Events* panel, you can change the *Panel title* and adjust presentation of events details:

1. Select the time range for observation of events (*Select time range*): *Default period (Default time range)*, *Last hour*, *Last day*, *Last month*, *Last year*, *Last x period*, *Fixed period*. Periods for the last two options are defined after selection of one of them.
2. Switch between *Single events* and *Multi-point events*. Multi-point event means the event when at least two single-point events were superimposed.
3. Switch *Preview* of events details.
4. Switch *Single event on DF plot* (Dominant frequency plot).
5. Switch *Show all available filters*.
6. Select period for time-history plots (*Preview time history range*): *Auto*, *5m*, *30m*, *1h*, *2h*, *6h*, *12h*, *24h*.
7. Choose the type of *Map in reports*: *Satellite view* or *Road map*.



### 5.3.3 Printing reports

After customizing panels with the results, you can easily generate a report based on this view using functionality of WYSIWYG (What You See Is What You Get). For this, extend the right tool panel and click the DOC or PDF icon.

The report preview window displays the following information:

**Project description**  
 Demo project 2  
 Manhattan, New York, United States of America  
 Building vibration demo project

**Measurement data from period:** 2022-10-17 15:39:54 - 2022-10-24 15:39:54

**Charts**  
 MP 1 VECTOR PPV (HP) Peak (Ch1, Vel1) Peak (Ch2, Vel1) Peak (Ch3, Vel1)

**Events**

No.	Date / time	Event	Point	Value	Parameters
1.	2022-10-23 13:15:12	CURVE 1	MP 1	PPV X = 0.90 mm/s, DF (X) = 38.818 Hz, PPV Y = 0.40 mm/s, DF (Y) = 33.691 Hz, <b>PPV Z = 9.00 mm/s, DF (Z) = 15.381 Hz</b>	Standard: DIN4150, Duration: 10 s, Whole week, Whole day

## 6 DATA POST-PROCESSING – SvanPC++

The *SvanPC++* software for the PC enables configuring instrument settings and provides also wide spectrum of data post-processing and reporting functionalities.

SV 803 needs to be connected to the computer running *SvanPC++* either by the USB cable or the internet. In the last case *SvanPC++* should be supplemented with the *Remote Communication* module.

Although SV 803 is dedicated to wireless remote control it can be also easily configured and controlled via the USB interface. The USB interface mode can be used for the first configuration of the wireless communication. The USB interface can also be used in emergency when the wireless connection was broken or when for some reason wireless communication is not available or in situations when the measurement process doesn't require wireless control of the instrument.



**Note:** The current manual describes only most useful and instrument specific functionalities that are available for the USB connection. All other functionalities including functionalities connected with *Remote Communication* module are well described in *SvanPC++ User Manual*.

### 6.1 SVANPC++ SOFTWARE INSTALLATION AND ACTIVATION

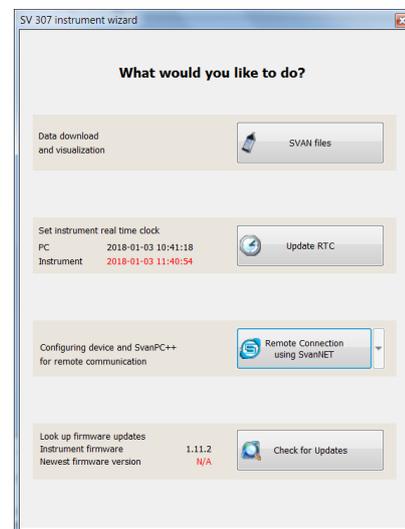
To download and install *SvanPC++* software and Svantek *USB Drivers* go the website: [SVANTEK Support and Service - Sound and Vibration](#).

*SvanPC++* requires Windows operating system and minimum system parameters of the PC: 1GHz CPU, 1 GB RAM (2GB RAM for x64 system), 20 GB HDD, 1024x768 display.

### 6.2 INSTRUMENT WIZARD

After connecting the instrument to the computer running *SvanPC++* by the USB cable the **SV 803 instrument wizard** dialog box appears on the screen. It enables you to:

- download or upload files (**SVAN files** button),
- adjust the instrument real-time clock (**Update RTC** button),
- configure the connection with SvanNET (**Remote Connection using SvanNET** button). Once the connection is configured, the **Remote Communication Center** button will be displayed instead,
- check the firmware version of the instrument with the latest available version (**Check for Updates** button).



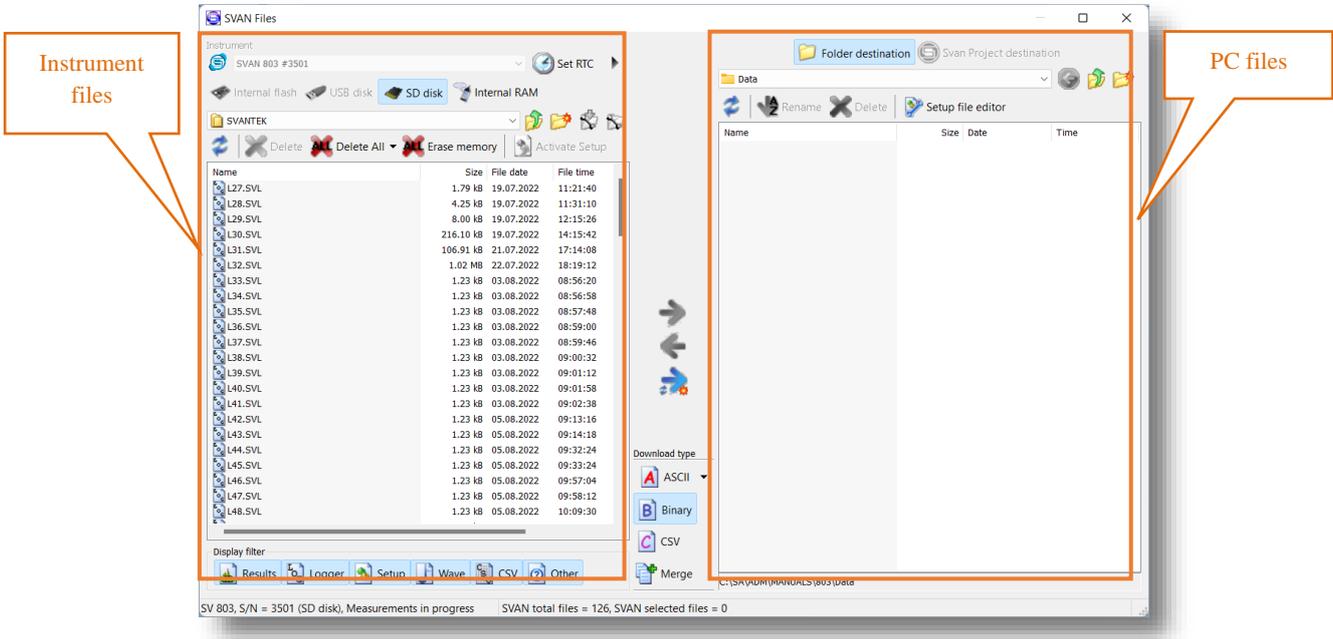
### 6.3 SVAN FILES

Access to the instrument's files is carried out from the **SVAN Files** dialog box. This dialog box enables managing instrument files, opening data files and configuring settings files.

The **SVAN Files** dialog box consists of two parts: instrument (left) and PC (right). Each part includes tools for files managing (selecting memory, directory and files, deleting files, creating directory, applying filters etc.).

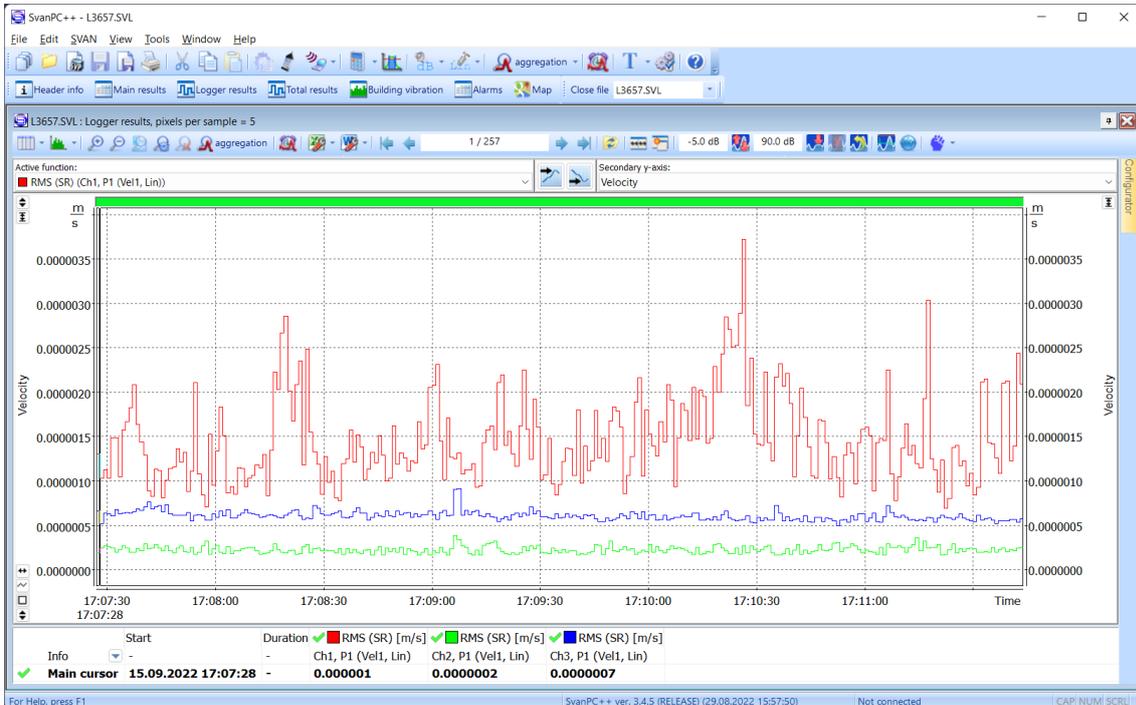
### 6.3.1 Downloading/uploading files

Arrows in between are used to download files from the instrument to the PC and upload files from the PC to the instrument.



### 6.3.2 Opening files

Double click the file name to open the **Viewer** module that enables different tools for data viewing. This module is described in detail in the SvanPC++ User Manual.



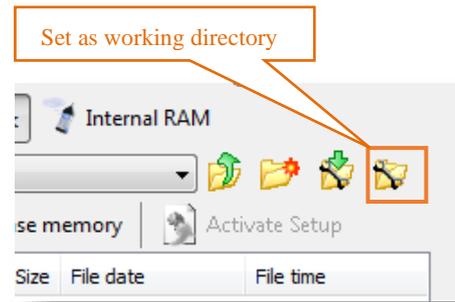
### 6.3.3 Changing working directory

Working directory is a folder on the SD disc in which all the measurement files are stored. Changing the working directory can be done in the **SVAN Files** dialog box.

For this:

1. Select the desired working directory in the left panel of the **SVAN Files** dialog box.
2. Click the **Set as working directory** button.

From this moment all result files will be stored in the selected directory.

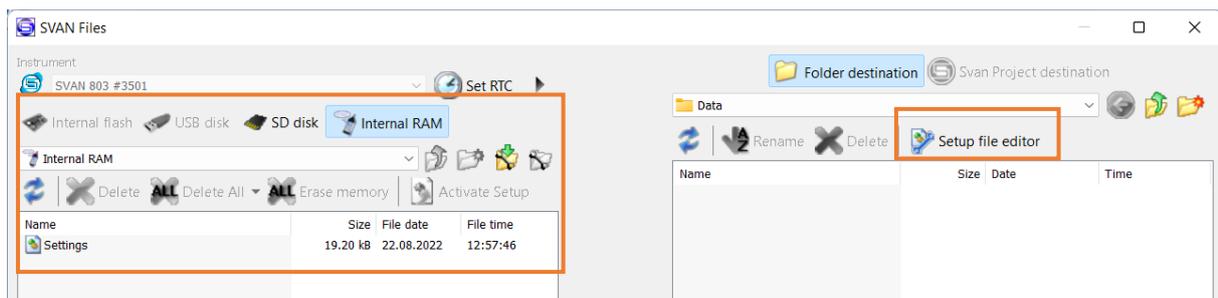


### 6.3.4 Configuring instrument settings

The instrument settings can be configured with the use of *Setup file editor* opened from the **SVAN Files** dialog box.

In order to edit a setup file (.svt), you should either:

- press the **Internal RAM** button, select the *Settings* file and double click it or
- press the **Setup file editor** button, located in the top right corner of the window.



The *Setup file editor* is available in two modes: *Standard* and *Extended*. The settings available in the *Setup file editor* correspond to those available via the SV 803 instrument's interface.

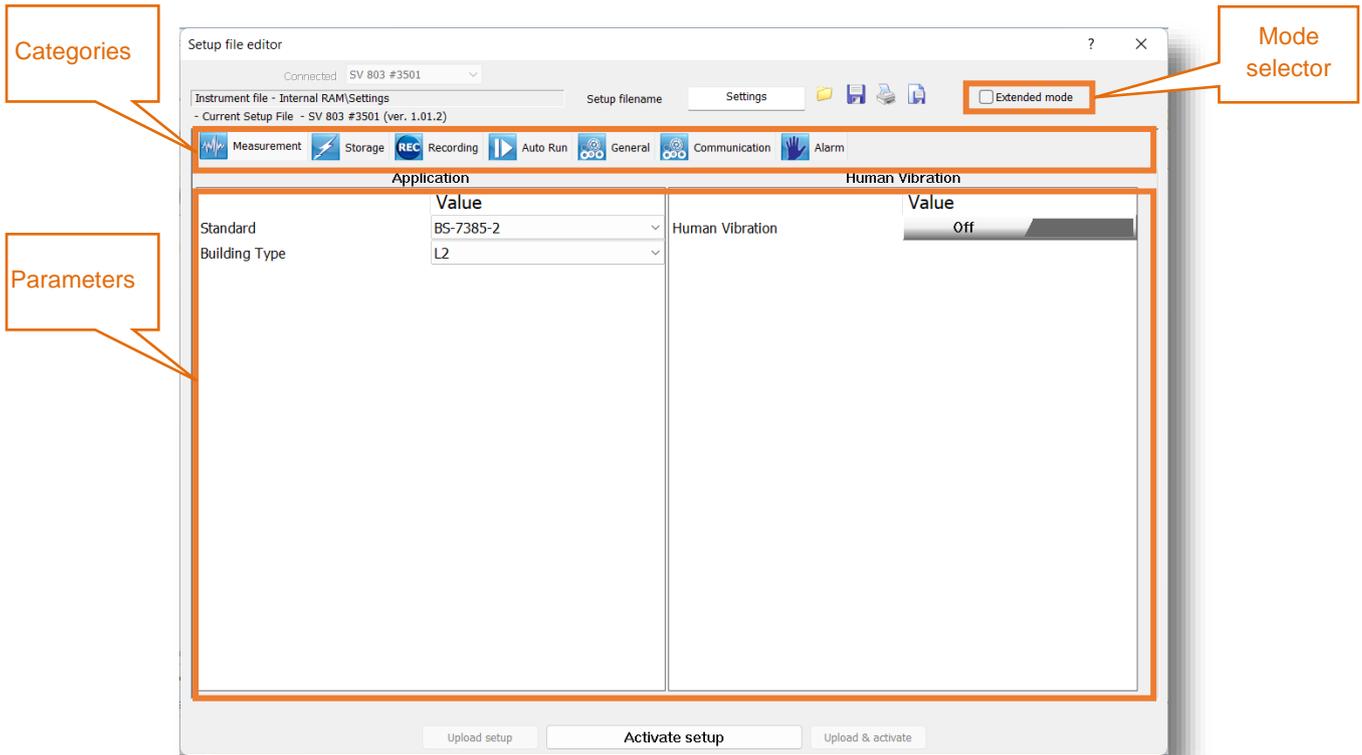
*Setup file editor* in the *Standard* mode allows for viewing the settings that are most likely to be modified, presented in a simple and intuitive way. Note that not all of the settings available in the connected instrument may be available in the *Standard* mode.

The settings are divided into several categories. You can select a category using the tabs located in the upper part of the *Setup file editor* window.

Settings can be easily edited using the following elements:

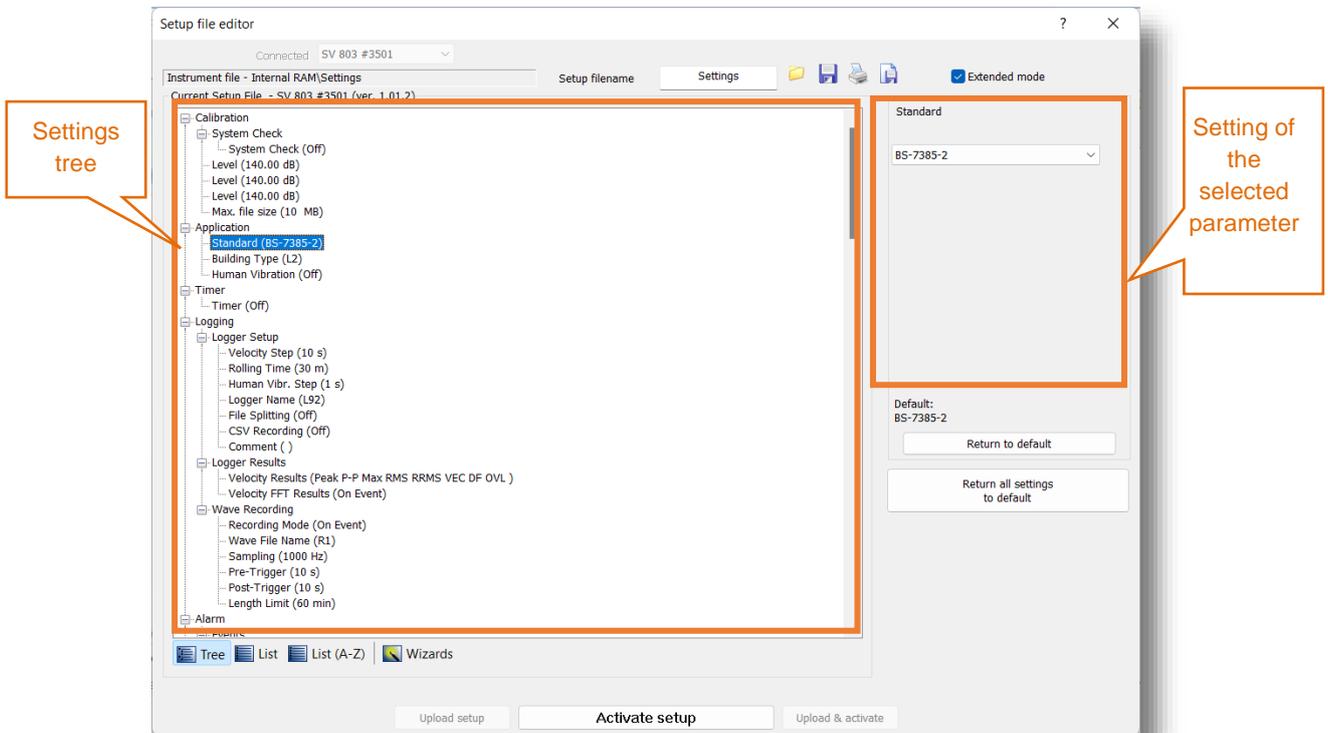
- check boxes – allowing to select some out of several possibilities,
- list boxes – allowing to select one out of several possibilities,
- text fields – allowing to type in a value using keyboard,
- binary buttons – allowing to enable or disable an option.

**Standard mode:**



In the *Extended* mode, all the settings of SV 803 are visible and available for editing. The list of settings, located at the left-hand side of the window, can be displayed in a tree view or a list view. You can switch the view using the buttons located in the lower part of the window.

**Extended mode:**



In order to change some particular settings in the *Extended* mode, use the controls that appear in the panel at the top-right corner of the window after selecting parameter from the list.

The default, *Tree View*, offers the settings arranged in a form of a tree, resembling structure of settings in SV 803. The nodes denote menu sections, while the leafs – parameter's settings which can be edited at the top-right corner of the window. The settings are sorted in accordance with menu structure accessible through display panels of the instrument.

Some settings are related to each other. It means that one of them is available for editing only when the other is set to a certain value.

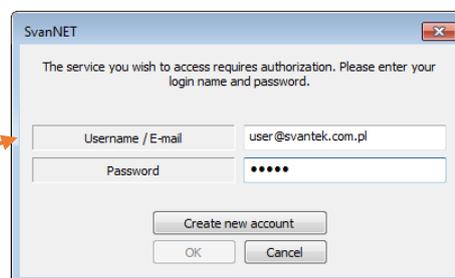
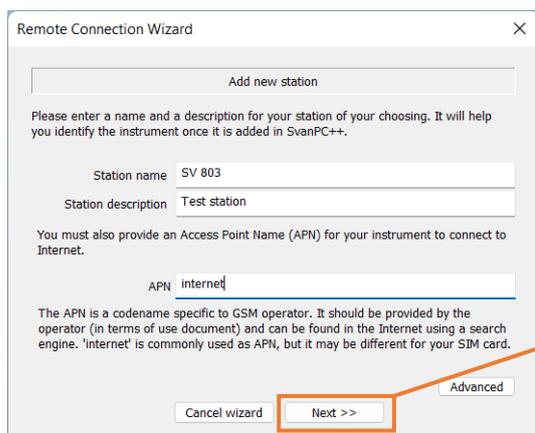
After finishing configuration of settings, press the **Activate setup** button.

At the top of the *Setup file editor* window, next to the Setup filename field, there are several buttons responsible for the file management: opening a setup file stored on the PC, saving the currently edited setup file on the PC, printing currently edited setup file or saving the contents of the currently edited setup file in a simple text format.

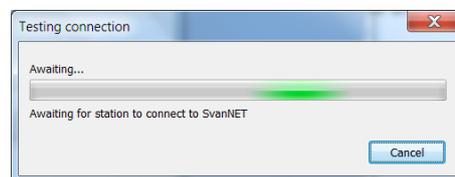
## 6.4 CONFIGURING WIRELESS CONNECTION

The internet connection can be configured via **SV 803 instrument wizard**. For this:

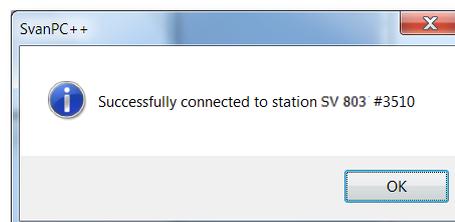
1. In the **SV 803 instrument wizard** dialog box, click the **Remote Connection using SvanNET** button.
2. In the **Remote Connection Wizard** dialog box, type the **Station name**, **Station description** and **APN** of the mobile operator. If necessary, use the **Advanced** button to provide additional parameters required by the mobile operator.
3. After filling in the required fields in the **Remote Connection Wizard**, press the **Next>>** button and enter the login and the password of your registered account.



4. Press **OK** button and SvanPC++ will run connection settings.
5. After entering all the required information SvanPC++ will check connection settings. Wait until process is finished. It may take a few minutes.



6. After successful connection the **Remote Connection using SvanNET** button will change its name to **Remote Communication Center**.



## 6.5 BUILDING VIBRATION VIEW

SV 803 uses special methods based on Peak Particle Velocity and Dominant Frequency conforming many local standards and also allows measurements of human vibration in buildings. SV 803 generates alarms based on special events which are registered in the data files.

SV 803 uses two approaches for assessment of dominant frequency based on 1/3 octaves or FFT and vibration results associated with that frequency. Different local standards use one or another approach.

SV 803 generates files (group of files) which *SvanPC++* recognizes and presents data in the special *Building vibration* view.

In case of the 1/3-octave approach, the instrument creates the series of logger files with the name **Lxx**, where **xx** is a number, and extension **SVL**.

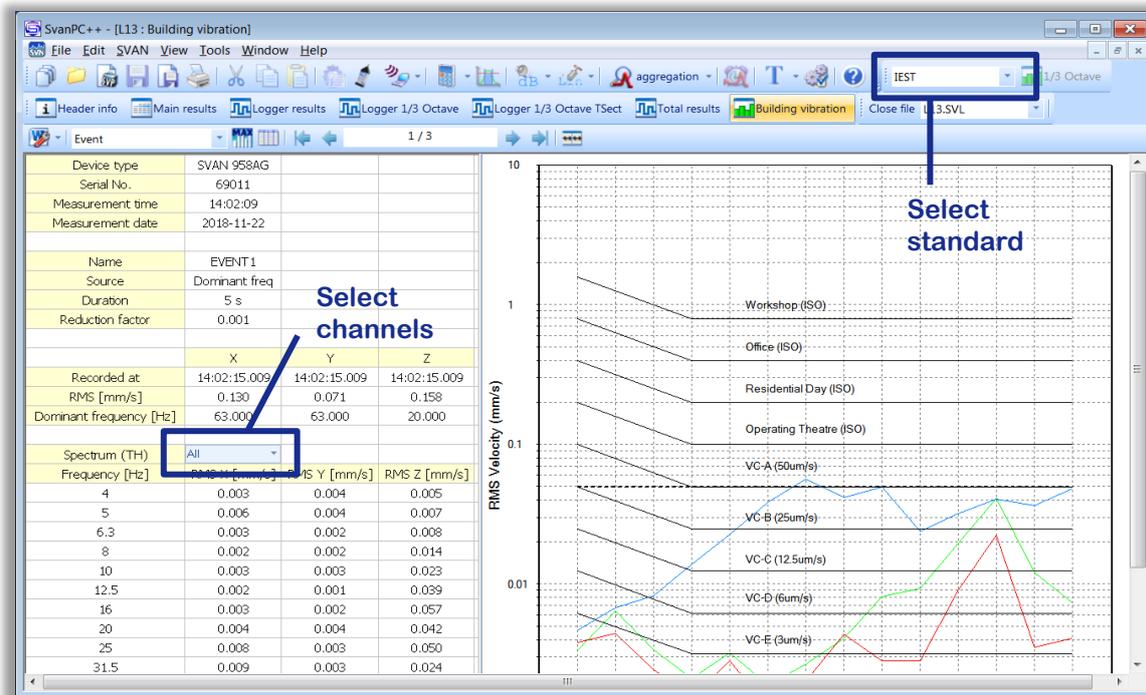
In case of the FFT approach, the instrument creates **Lxx** files and also wave files that are associated with the logger files with names **Rxx**, where **xx** is a number, and extension **WAV**. One **Rxx** file includes waveform signal recorded for one detected event during the period set in SV 803 as a *PreTrigger + Duration + Post Trigger*.



**Note:** While retrieving data from SV 803 remember to retrieve all files created during a measurement.

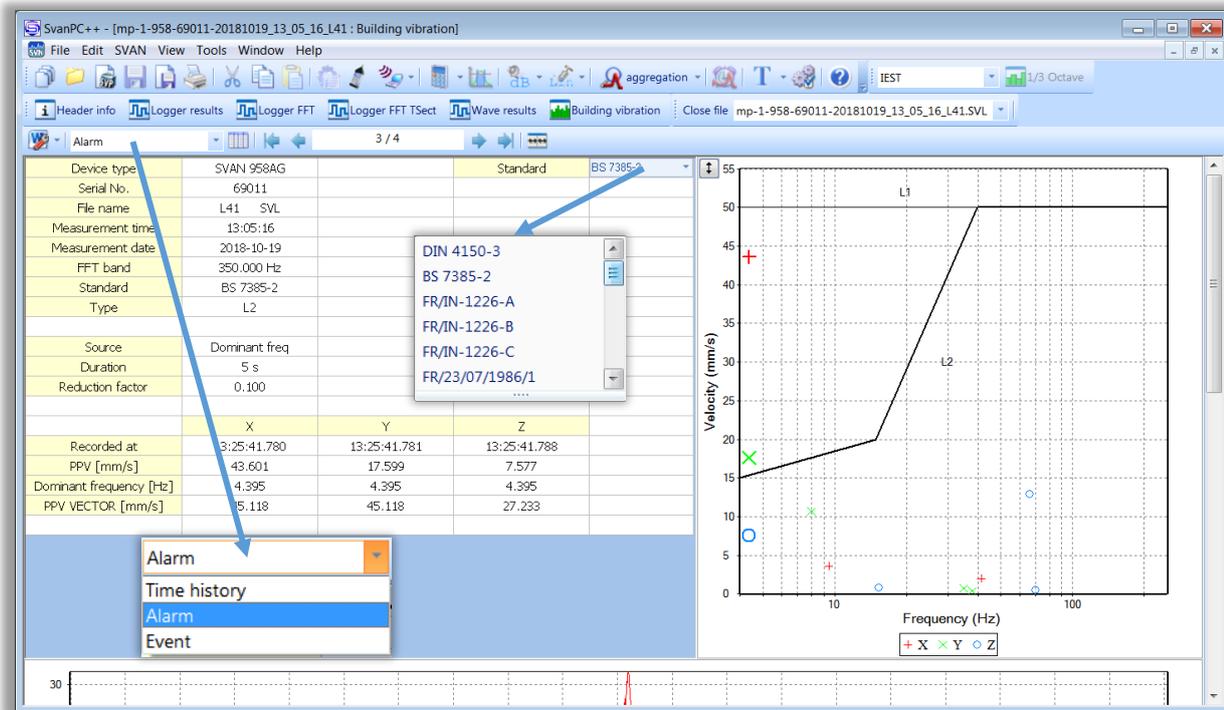
### 6.5.1 1/3 octave approach

In case of the 1/3 octave approach, the *Building vibration* view presents a table with SV 803 settings and data for the time history, events or alarms and Criterion curves with measurement results for three axes (X, Y, Z) in the way of 1/3-octave spectra.



## 6.5.2 FFT approach

In case of the FFT approach, the *Building vibration* view presents a table with SV 803 settings and data for the time history, events or alarms and Criterion curves with measurement results for three axes (X, Y, Z) as a points.



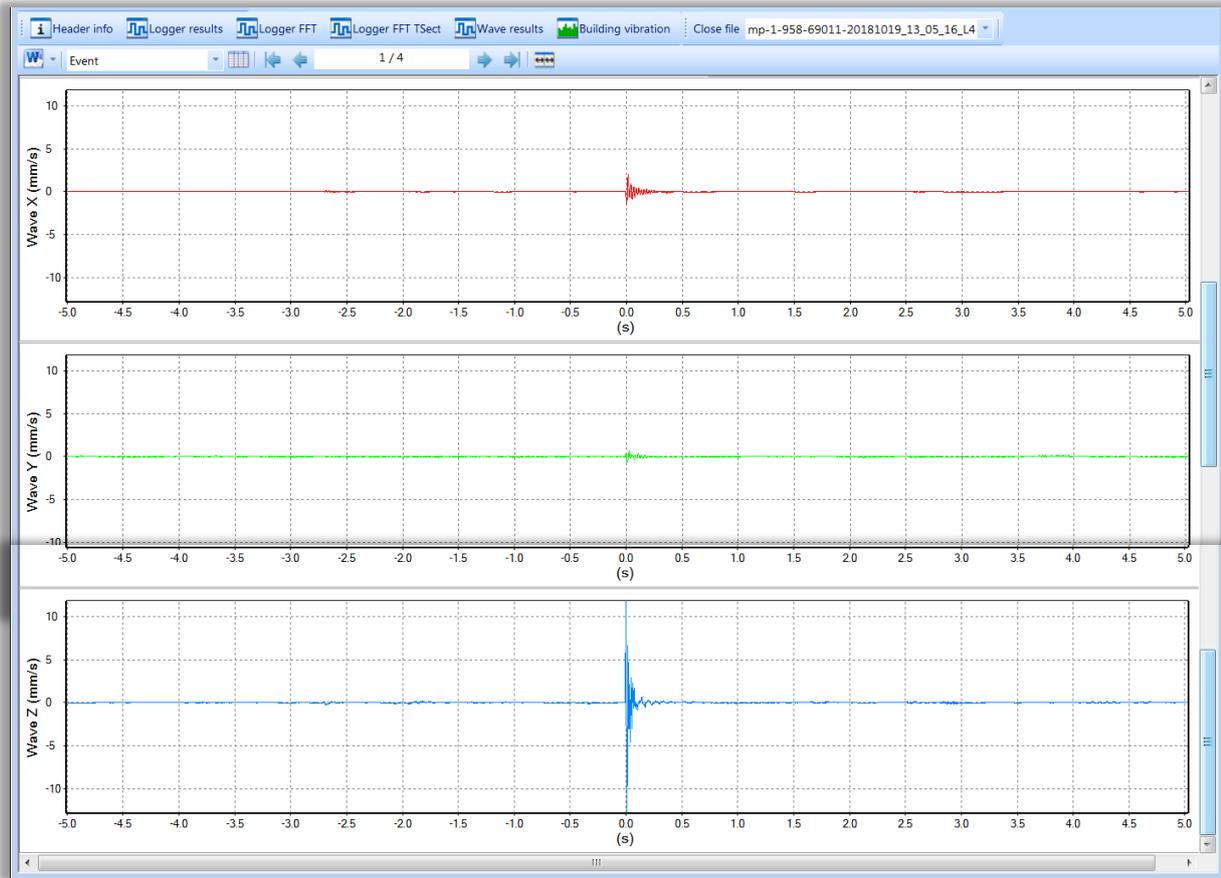
The table content and data presented on the right plot depend on the selections made in the second position of the View toolbar (*Time history*, *Alarm* or *Event*). When you select *Time history*, you can view PPV and Dominant frequency for all measurements performed with the Logger step. When you select *Event* or *Alarm*, you can view PPV and Dominant frequency for events or alarms only. You can scroll through the records with the arrows located on the View toolbar.

Criterion curves depend on the standard selected in the upper right cell of the table (DIN 4150-3, BS 7385-2, FR/IN-1226-A, FR/IN-1226-B, FR/IN-1226-C, FR/23/07/1986/1, FR/23/07/1986/2, FR/22/09/1994, SBR-A).



**Note:** SV 803 calculates PPVs, dominant frequencies, events and alarms based on the selected standard, which is displayed together with other settings in the second column of the table. Selection of the standard in the upper right cell only places another criterion curves, but all measurement results will not be changed.

Scrolling the view down you can examine waveform signals associated with the selected event or alarm registered for three axes.



If you press the *Events list* button  located next to the Alarm/Event/Time history selector, the new *Alarms* view will appear. This view presents the table with all events detected.

You can display two tables, *Building vibration* and *Alarms* side by side. If you change the row in the *Alarms* table in the right panel, the alarm record will be changed automatically in the left panel and vice versa.

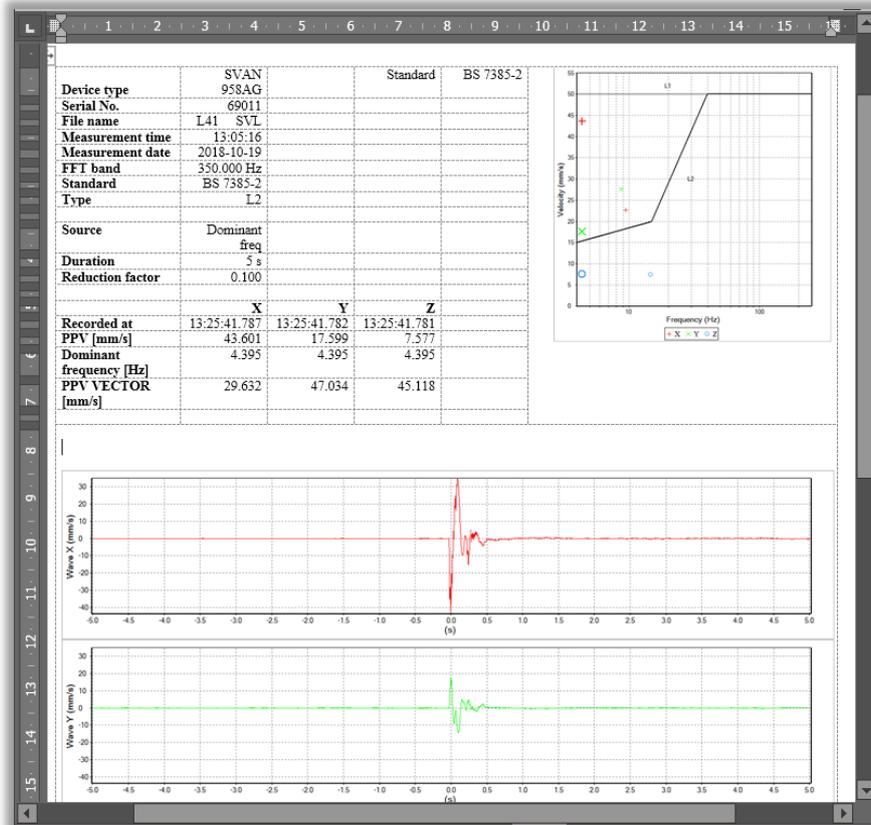
The screenshot shows the software interface with two panels side-by-side. The left panel is titled 'Building vibration' and contains a table with the following data:

Device type	SVAN 958AG	Standard	
Serial No.	69011		
File name	L41_SVL		
Measurement time	13:05:16		
Measurement date	2018-10-19		
FFT band	350.000 Hz		
Standard	BS 7385-2		
Type	L2		
Source	Dominant freq		
Duration	5 s		
Reduction factor	0.100		
	X	Y	Z
Recorded at	13:20:27.216	13:20:27.216	13:20:27.217
PPV [mm/s]	5.029	0.426	0.498
Dominant frequency [Hz]	0.732	38.086	70.313
PPV VECTOR [mm/s]	5.012	5.012	5.012

The right panel is titled 'Alarms' and contains a table with the following data:

Time	Freq (X, Hz)	PPV (X, mm/s)	Freq (Y, Hz)	PPV (Y, mm/s)	Freq (Z, Hz)
2018-10-19 13:06:46.244	41.748	2.028	35.156	0.701	66.650
2018-10-19 13:20:27.216	0.732	5.029	38.086	0.426	70.313
2018-10-19 13:25:41.780	4.395	43.601	4.395	17.599	4.395
2018-10-19 13:25:57.817	9.521	3.610	8.057	10.617	15.381

To create a report, press the *Send to MS Word* button at the left side of the view Toolbar



## 7 MAINTENANCE

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### 7.1 KEEPING DRY INSIDE

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Keep SV 803 dry inside. If suspicion of any moisture inside the housing, find the cause, dry it out. If sent to repair after damage from moisture, please remove the battery to minimize damage.

### 7.2 EXCHANGING MEMORY AND SIM CARDS

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SV 803 is delivered with 32 GB micro-SD card - Kingston MicroSD HC Class 4 or equivalent.



**Note:** The originally supplied Kingston MicroSD HC Class 4 memory card has been tested by SVANTEK and is strongly recommended for use when it is replaced.

You may exchange it with the higher capacity card (up to 128 GB), but before insertion the card must be formatted as FAT32.



**Note:** If you would like to use the card with higher capacity, consult this with the local distributor.

To exchange the memory or SIM card, follow next steps:

1. Open the lid.
2. Turn off the instrument by long press the button on the inner side of the lid.
3. Extract the memory or SIM card by sliding it from the slot.
4. Insert the new card.
5. Turn on the instrument by long press the button on the inner side of the lid.
6. Close the lid.

### 7.3 RESETTING THE INSTRUMENT

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- **HARDWARE RESET:** internal hardware reset; no user data is changed. Hold down the button on the inside panel of the housing lid (BATTERY EXCHANGE) for 20 seconds, and then release it.



**Note:** Hardware reset is only to be used in extreme situations such as an instrument hang-up. Be aware, that a hardware reset will stop any pre-programmed auto-run modes.

### 7.4 FIRMWARE UPGRADE

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You can upgrade the firmware either via SvanNET (see Chapter [5.2.5.1](#)) or via the USB connection to the PC.

To upgrade the firmware via the USB connection, follow next steps.

1. Turn off the instrument if it is on.
2. Enter the bootstrap mode by pressing any external and then internal key. Keep both keys pressed until the LED inside lights up orange. In the bootstrap mode all LEDs are orange.
3. Connect SV 803 to the PC using SC 816 USB cable.
4. Run the **start.bat** file from the upgrade package on your PC. During loading the new firmware, the internal LED will flash red. A
5. After loading the program, the instrument will start automatically.

## 7.5 PRESERVATION OF INTERNAL BATTERIES

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- To preserve the life of the internal batteries, it is recommended that the instrument is turned off when it is stored.
- When the instrument is turned off, it still draws a small amount of battery power. Therefore, it is recommended to charge the cell every few months if it is not going to be used regularly.



**Note:** *SV 803 should not be stored for a long time with discharged battery. Storing with the battery in discharged condition may damage it.*



**Note:** *If SV 803 is planned to be stored for a long period of time, it is recommended to charge its battery to 60% capacity. The battery should be charged at least once per 6 months.*

## 7.6 TRANSPORTATION AND STORAGE

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For transportation or storage purpose, we recommend using the packaging provided by the manufacturer.



**Note:** *For air-transport turn off the instrument.*

## 7.7 CLEANING

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Clean the surface of the instrument with damp soft cloth.

The instrument sockets should be cleaned with the use of compressed air.



**Note:** *In cases of larger dirt, such as oil or grease, contact your Local Authorized Distributor or Svantek Service Office.*

## 7.8 TROUBLESHOOTING

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- In the case your instrument does not respond, proceed with hardware reset of the instrument (see Chapter [7.3](#)).
- In the case the reset does not help, call your Local Authorized Distributor or Svantek Service Office.

Should your SVANTEK professional measurement equipment need to be returned for repair or for calibration, please contact the service office at the following number or contact via the SVANTEK website.

Service Office: +48 (22) 51-88-320 or +48 (22) 51-88-322.

Office hours are 9:00 a.m. to 5:00 p.m. Central European Time.

E-mail: [support@svantek.com.pl](mailto:support@svantek.com.pl)  
[office@svantek.com.pl](mailto:office@svantek.com.pl)

Internet: [www.svantek.com](http://www.svantek.com)

Address: [SVANTEK Sp. z o.o.](#)  
[Strzygłowska 81](#)  
[04-872 Warszawa,](#)  
[Poland](#)

## 8 SV 803 TECHNICAL DATA<sup>1</sup>

<b>Nr</b>	<b>Parameter</b>	<b>Value/ Description</b>
<b>Physical data</b>		
<b>1</b>	Dimensions	163 x 128 x 115 mm (without accessories)
<b>2</b>	Weight	Approx. 3 kg including battery Approx. 3 kg including battery and mounting plate
<b>4</b>	Leakproof classification	IP 67 according to EN 60529 (1997) + A1 (2000)
<b>5</b>	Working ambient temperature range	-10°C do +50°C (Ambient air temperature, without direct sunlight). <i>Note: Outside this range the station will automatically switch itself off.</i> <i>Note: In charging mode the range of working temperature is from 0°C to +45°C</i>
<b>6</b>	Storage ambient temperature range	-20°C to +60°C
<b>7</b>	Working relative humidity range	0 – 100 %RH
<b>Power Supply</b>		
<b>1</b>	SB 803 internal battery pack	Li-Ion, 7.2 V, 30.15 Ah, 217 Wh (removable)
<b>2</b>	SV 803 power consumption without charging	Modem and GPS is switched off: ca. 40 mW Mean infrequent short transmissions: ca. 50 mW Continuous transmission: ca. 1.0 W
<b>3</b>	Operating time when powered from the internal battery pack, (20°C, fully charged)	Up to 30 days with continuous modem transmission Up to 180 days in power saving mode *UNLIMITED with SB 803 and solar panel in power saving mode
<b>4</b>	SV 803 power consumption including charging	up to 20 W

<sup>1</sup> Our Company's policy is based upon continuous product development and innovation. Therefore, we reserve the right to change the specifications without any prior notice whatsoever

5	External DC input	voltage: 5 V to 28 V
6	External DC power supply SB 274	15 V (waterproof)
7	Solar panel (option)	OCV voltage up to 28 V <b>Note:</b> Size and power of the panel depend on the climate of the area where the station operates.
<b>4G modem</b>		
1	modem type and features	The LE910C1-EU is a 4G European module that features Long-Term Evolution LTE connectivity, high-speed HSUPA/HSDPA connectivity while still leveraging backwards compatibility with GSM/GPRS and EDGE networks.  Some of the module features are: <ul style="list-style-type: none"> <li>• GSM bands: B3, B8 (1800/900 MHz)</li> <li>• UMTS/HSPA bands: B1, B3, B8 (2100/1800/900 MHz)</li> <li>• LTE FDD bands: B1, B3, B7, B8, B20, B28A (2100/1800/2600/900/800/700 MHz)</li> <li>• Output power: Class 3 (0.2W, 23dBm), LTE-FDD</li> </ul>
2	modem approvals	Approvals of the module: <ul style="list-style-type: none"> <li>• RED (CE)</li> <li>• RoHS</li> </ul>
<b>Bluetooth modem</b>		
1	modem type and features	The instrument contains a wireless transmission module, BGM121 from Silicon Laboratories and supports wireless connection via Bluetooth® 5.2 (Low energy). This connectivity is compatible with mobile and PC devices that support Bluetooth® 5.2. <ul style="list-style-type: none"> <li>• TX power: up to 8 dBm</li> <li>• Receiver sensitivity: -90 dBm</li> <li>• Range: typically, ≤50m line-of-sight and depending on local RF conditions.</li> </ul>
2	modem approvals	Copies of the modules regional approvals certificates may be obtained from Svantek or Silicon Laboratories. <ul style="list-style-type: none"> <li>• Declaration ID: D033250, Controller Subsystem Qualified Design ID: 88831</li> </ul>
<b>GPS module</b>		
1	type and features	The instrument has a built-in GPS module A2235-H produced by Maestro Wireless Solutions Ltd. intended for logging position and time definition.  GPS is an antenna module with SiRF Star IV ROM based chip and an on-board integrated antenna.

		<ul style="list-style-type: none"> <li>• Position Accuracy (horizontal): &lt; 2.5 m CEP (autonomous),</li> <li>• Tracking Sensitivity: -163dBm</li> <li>• Time accuracy: &lt;1<math>\mu</math>s (directly depends on position deviation)</li> </ul>
<b>Measurement characteristics</b>		
<b>1</b>	Standards	DIN 45699-1:2020-06; ISO 4866:2010, Class 1; IEC 61260:2014, Class 1
<b>2</b>	Meter Mode	PPV, DF, RMS, RRMS, VDV, MAX, Peak, Peak-Peak, PPV Vector, aw, OVL
<b>3</b>	Analyser	1/3 octave real-time analysis or FFT analysis, Time domain signal recording to WAV format
<b>4</b>	Filters	DIN 80, DIN 315, VEL 1, KB
<b>5</b>	RMS Detector	Digital true RMS with Peak detection, resolution 0.1 dB
<b>6</b>	Detector Time Constants	Fast 125 ms in accordance with DIN 4150-2
<b>7</b>	Vibration Sensor	Triaxial geophone pack
<b>8</b>	Dynamic Range	1 $\mu$ m/s RMS $\div$ 141 mm/s PEAK
<b>9</b>	Measurement Range	3 $\mu$ m/s $\div$ 100 mm/s RMS (141 mm/s PEAK)
<b>10</b>	Frequency Range	0.8 Hz $\div$ 400 Hz (-3 dB)
<b>11</b>	Number of Channels	3
<b>12</b>	Directions of measurement	3 - vertical (Z) and horizontal (X, Y)

## APPENDIX D. DEFINITIONS AND FORMULAE OF MEASURED VALUES

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### D.1 Basic terms and definitions

$T$  current time period of the measurement in seconds.

$T_0$  reference duration of 28 800 seconds (8 hours)

$\tau$  exponential time constant in seconds with the time-weighting **125 ms**.

$v(t)$  instantaneous unweighted velocity signal.

$v_W(t)$  instantaneous frequency-weighted velocity signal with the weighting filter **W**: **Vel1**, **Din80**, **Din315**.

$v_{W\tau}(t)$  instantaneous frequency and time-weighted velocity signal with the weighting filter **W** and time constant  $\tau$  calculated from the equation:

$$v_{W\tau}(t) = \sqrt{\frac{1}{\tau} \int_{-\infty}^t v_W^2(\xi) e^{-\frac{(t-\xi)}{\tau}} d\xi},$$

where:  $\xi$ - integration variable.

$KB(t)$  instantaneous frequency-weighted velocity signal normalized to 1 mm/s

$a(t)$  instantaneous unweighted acceleration signal

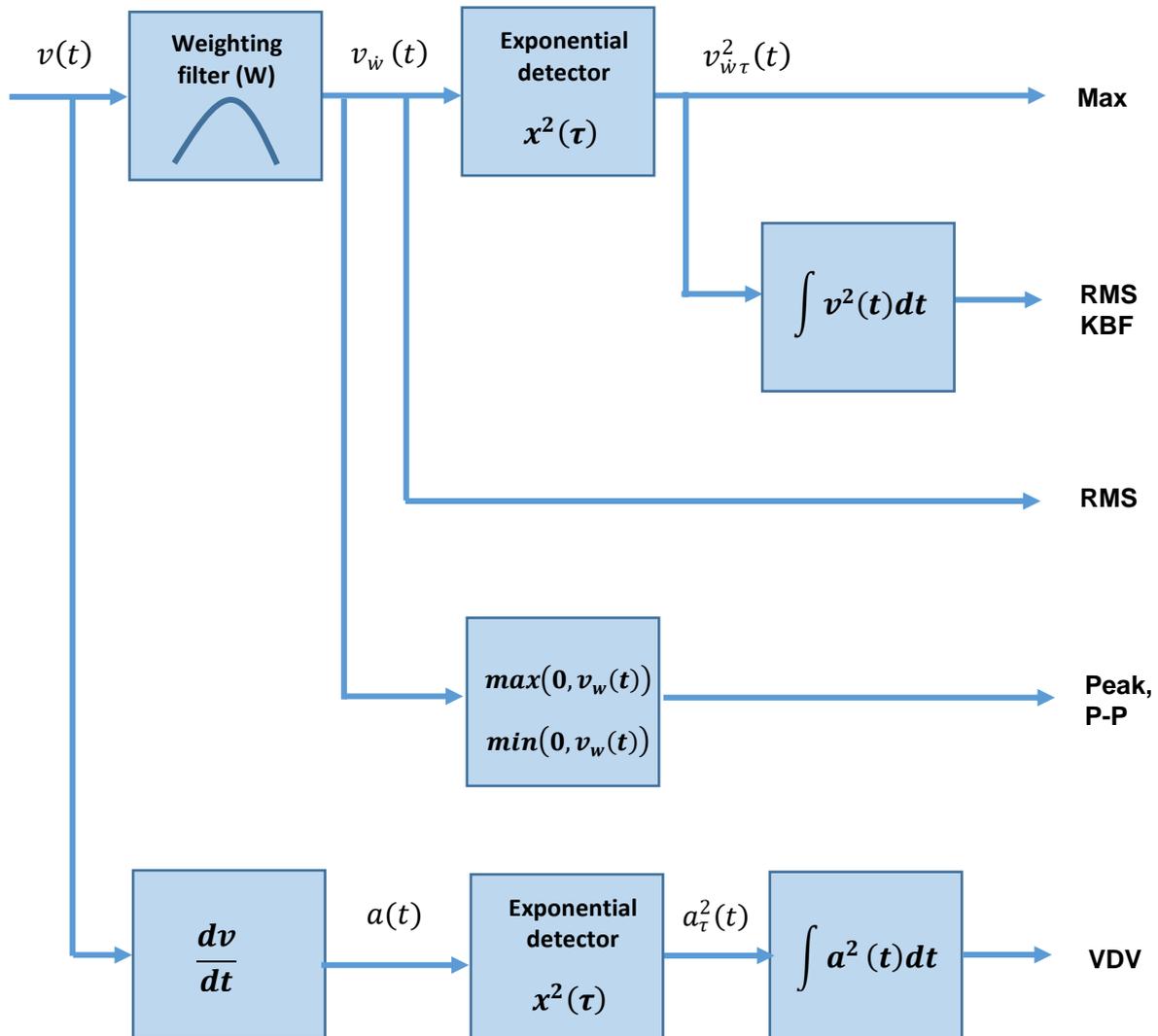
$a_{W\tau}(t)$  instantaneous frequency and time-weighted acceleration signal with the weighting filter **W** and time constant  $\tau$  calculated from the equation:

$$a_{W\tau}(t) = \sqrt{\frac{1}{\tau} \int_{-\infty}^t a_W^2(\xi) e^{-\frac{(t-\xi)}{\tau}} d\xi},$$

where:  $\xi$ - integration variable.

## D.2 Definitions and formulas of measuring results

The instrument calculates the vibration measurement results for two profiles, one for the velocity vibration and another for the acceleration vibration. The calculation flow diagram for one profile is presented below:



<b>Peak</b>	Maximum absolute value of the acceleration signal for the axis: X, Y or Z that is frequency-weighted within a stated time interval <b>T</b> .	$Peak = \max_T(0, v_w(t))$
<b>P-P</b>	Peak-to-peak ( <b>P-P</b> ) result is the difference between highest and lowest value of the acceleration signal for the axis X, Y or Z within a stated time interval <b>T</b> .	$P - P = \max_T(0, v_w(t)) - \min_T(0, v_w(t))$
<b>Max</b>	Maximal value of the acceleration signal for the axis: X, Y or Z that is frequency- and time-weighted within a stated time interval <b>T</b> .	$Max = \max_T(v_{w\tau}(t))$

<b>RMS</b>	Root mean square result of the acceleration signal for the axis X, Y or Z that is frequency- and time-weighted and averaged for a stated time interval <b>T</b> .	$RMS = \left( \frac{1}{T} \int_0^T v_{W\tau}^2(t) dt \right)^{1/2}$
<b>Roll. RMS</b>	Rolling RMS measured for the axis X, Y or Z in the time window for the last <b>T<sub>R</sub></b> seconds of the measurement time <b>T</b> .	$Roll. RMS = \sqrt{\frac{1}{T_R} \int_{T-T_R}^T v_{W\tau}^2(t) dt}$
<b>PPV</b>	Peak Particle Velocity - maximum absolute value of the unweighted velocity signal for the axis X, Y or Z within a stated time interval <b>T</b> .	$PPV = \max_T(0, v_W(t))$
<b>Vector</b>	Vector of the PPV values taken from three axis.	$PPV_V = \max_T \sqrt{v_{Wx}(t)^2 + v_{Wy}(t)^2 + v_{Wz}(t)^2}$
<b>KBF</b>	Weighted vibration severity - running RMS time average of the $KB(t)$ signal obtained by averaging the time-weighted values of $KB(t)$ for the time $\tau = 0.125$ s.	$KBF = \sqrt{\frac{1}{\tau} \int_0^\tau KB^2(\xi) e^{-(\tau-\xi)/\tau} d\xi}$
		where: $\xi$ - integration variable.
<b>KBFTi</b>	Energy-averaged KBf during the time averaging period <b>T<sub>i</sub></b> .	$KBFTi = \sqrt{\frac{1}{T_i} \int_0^{T_i} KBf^2(t) dt}$
<b>KBFTm</b>	Root-mean-square value of the $KBFT_i$ values recorded during the time averaging period $T_m = N \cdot T_i$ where $N$ is the number of cycles each of duration $T_i$ , calculated using the following equation, in which $KBFT_i$ values less than or equal to 0,1 ( $KBFT_i \leq 0,1$ ) are taken to be zero though these cycles contribute to the total number of cycles $N$	$KBFTm = \sqrt{\frac{1}{N} \sum_{i=1}^N KBFT_i^2}$
<b>VDV</b>	Vibration Dose Value – result of the acceleration signal for the axis X, Y or Z that is frequency- and time-weighted averaged for the time <b>T</b> .	$VDV = \left( \int_0^T a_{W\tau}^4(t) dt \right)^{1/4}$