



SVANTEK

USER MANUAL



SV 804
WIRELESS
TRIAXIAL
VIBRATION
MONITOR

Warsaw, 2025-12-08

Rev. 1.00

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This user manual presents the SV 804 firmware revision 1.093.



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

GENERAL WARNINGS, SAFETY CLAUSES

- ✓ *If SV 804 is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.*
- ✓ *SV 804 cannot be submerged in water.*
- ✓ *Do not use SV 804 in the presence of flammable vapours or gases or in an explosive atmosphere.*
- ✓ *Safe operating ambient temperature range is -20 to +50°C.*
- ✓ *SV 804 can operate in the sun with an ambient temperature of up to +50°C. Above this temperature, the instrument should be protected from the sun.*
- ✓ *The instrument must be switched off for air transport.*
- ✓ *Only the battery can be removed from the SV 804 housing by the user. All other disassembly work should only be carried out strictly by an authorised service team.*
- ✓ *The ambient temperature range for charging the instrument battery is 0°C to 45°C.*
- ✓ *SV 804 should not be stored for long periods with the battery discharged. Storage with a discharged battery may damage the battery. In this case the warranty for the Li-ion battery is void.*
- ✓ *If SV 804 is to be stored for a long period, it is recommended that the battery is charged to 60% capacity. The battery should be charged at least once every 6 months.*
- ✓ *When not in use, WEIPU connectors must be capped.*

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)
Federal Communication Commission (FCC) and Industry Canada (IC) Certification	
FCC ID: QOQBGM12LMA	
FCC ID: RI7LE910CXWWX	
IC: 5123A-BGM12LMA	
IC: 5131A-LE910CXWWX	

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1 INTRODUCTION

The SV 804 is a Class 1 monitoring station designed for measuring structural vibrations in buildings and engineering structures. Thanks to its compact design, the entire device can be mounted directly onto a wall or structural surface using a single screw, ensuring quick and secure installation, even in hard-to-reach locations. It is ideal for rapid deployment in both vertical and horizontal orientations without the need to reposition geophones.

The SV 804 provides fully automated, remote vibration monitoring and sends real-time alerts via SMS and email. The system automatically detects vibration events based on peak particle velocity (PPV) thresholds and dominant frequency analysis, thereby reducing the need for manual intervention.

A built-in 4G modem ensures real-time data transfer and remote access via any web browser. In challenging environments such as tunnels or underground locations, the device also supports wired LAN and Bluetooth®, providing full control even without a mobile signal.

The SV 804 is a triaxial vibration meter that can be integrated with noise or weather monitoring systems. The instrument uses FFT analysis to determine the dominant frequency in accordance with BS and DIN standards. The RMS or PEAK velocity spectrum in 1/3 octave bands can also be used for comparison with user-defined curves. The SV 804 can measure vibration dose value (VDV) and record waveform signals as WAV files.

Measurement data is securely stored in the device and synchronised with the SvanNET cloud platform, where users can access detailed reports, event logs and diagnostic insights at any time and from any location.

The instrument can be fully controlled via the *SvanNET* web service using the 4G modem, via the *Assistant Pro* mobile application using Bluetooth®, or via the *SvanPC++* PC software using the USB connection. The control possibilities include data presentation, reporting, alarms, configuration of the measurement and settings of the instrument.

The SV 804 can operate autonomously for up to 60 days using its internal, field-swappable batteries. For extended or continuous use, the system offers maximum flexibility, supporting external DC power, solar panels and Power over Ethernet (PoE). This enables fully autonomous deployment in any environment.



1.1 KEY FEATURES

- **Class 1** measuring instrument in accordance with ISO 4866:2010 and IEC 61260:2014.
- **Peak Particle Velocity (PPV) and Dominant Frequency** are measured simultaneously in three axes according to DIN 45669-1:2020-06, 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).
- 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.
- Integration with the **Weather Station** and **Noise Monitoring Station** into one measurement system (option).

1.2 ACCESSORIES INCLUDED

SV 804	Outdoor monitoring station including built-in 4G modem, Bluetooth
SB 804	Exchangeable battery
SB 83	AC charger for SB 804 (USB-A, USB-C)
SC 816	Communication cable for SV 804 (1 m, WEIPU5 - USB-A)
ST 801	Vertical geophone (one pcs.)
ST 802	Horizontal geophone (two pcs.)
SA 82	Torque screwdriver
SA 83	32 GB memory card



Note: SV 804 is delivered in protective packaging. Please keep it for use when transporting your equipment.

1.3 ACCESSORIES AVAILABLE

SB 871	Solar panel for SV 804
SB 274L	Waterproof mains power supply for SV 804
SB 804	Exchangeable battery pack
SC 270	Mains power supply cable for SB 274L (5 m)
SC 804	DC cable for SB 274L and SV 804 (5 m, WEIPU2)
SC 816C	Communication cable for SV 804 (1 m, WEIPU5 - USB-C)
SC 833	Cable for solar panel and SV 804 (2 m, WEIPU2)
SC 834	Cable to power SV 804 from external battery
SP 79	Interface connecting SV 303 noise terminal to SV 804 (5 m)
SP 80	LAN interface with PoE for SV 804
SP 83	SubGHz transmitter for SV 804 (for use with SP 872W)
SP 872W	Wireless alarm lamp (for use with SP 83)
SP 872/5	Alarm lamp and buzzer with cable (5 m)
SA 804	Carrying case for SV 804 with accessories
SV 303	Noise Monitoring Terminal
SA 800/4	Levelling mounting base for SV 804

1.4 OPTIONAL FUNCTIONS

SF 804_FTP FTP/FTPS push/pull option (SFTP is not supported)

The FTP (File Transfer Protocol) option (**SF 804_FTP**) allows data to be transferred via an FTP server, enabling communication when both SV 804 and a PC have private IP addresses.



Note: The software optional functions listed above can be purchased at any time as they only require the entry of a special unlock code to activate using Assistant Pro (see Chapter [4.3.3](#)) or SvanPC++ (see Chapter [6.2](#)).

2 SV 804 DESCRIPTION

2.1 KEYPAD AND LEDs

The SV 804 has two buttons on the front panel to:

-  - wake up the 4G modem when it is operating in periodic mode
-  - turn on the status LED (short press) and, if the lid is opened, turn on Bluetooth (long press > 5 sec)

and three status LEDs that indicate:

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

Press both buttons simultaneously to turn on the instrument.



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

2.2 INSTRUMENT CONTROL

The SV 804 can be controlled via Bluetooth, 4G or USB connection. Each type of connection is supported by special software: *Assistant Pro* mobile device application (see Chapter 4) that supports the Bluetooth connection, *SvanNET* web-service that supports the 4G connection to the Internet (see Chapter 5) and *SvanPC++* software that supports either the USB or 4G connection (see Chapter 5).

2.3 WATERPROOF HOUSING

The SV 804 waterproof (IP 67) housing houses and protects the main elements of the monitoring station, including:

- Li-Ion battery pack,
- nano-SIM card and micro-SD memory card slots,
- analogue and digital processing parts,
- other internal elements such as connectors, cables, circuit boards.



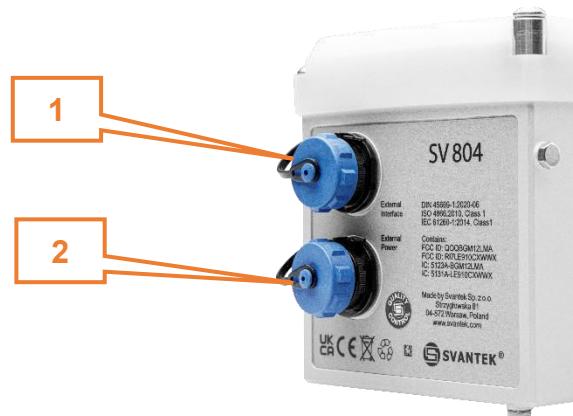
Note: SVANTEK does not provide a SIM card for the instrument. It is necessary to purchase the SIM card with the **data plan**. If the instrument is to be used for continuous monitoring, choose a service provider that guarantees good reception at the measurement point.



Note: Make sure the SIM card has the PIN code disabled before inserting it into the SV 804.

The station housing is equipped with two connectors:

1. **External Interface** (WEIPU5 type) for USB connection to PC and other devices, such as SV 303 Noise Monitoring Terminal, alarm lamp or LAN/WLAN adapter. This connector can also be used for any type of external power source equipped with the WEIPU2 plug.
2. **External Power** (WEIPU2 type) for any type of external power source equipped with the WEIPU2 plug.



To connect a cable to the WEIPU socket, first align the markings on the plug and socket, then turn the ring near the socket clockwise.

To disconnect a cable from the WEIPU socket, turn the ring near 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

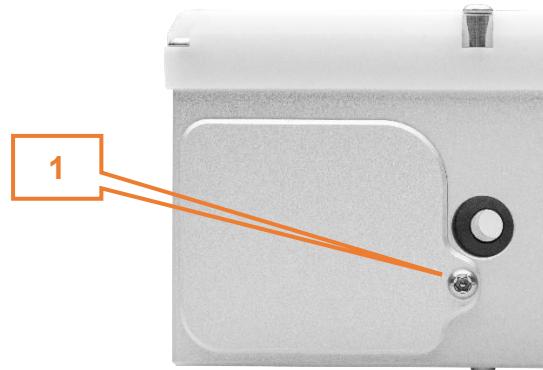
The battery must be removed from the instrument housing to be charged using the SV 83 mains charger.



Note: If the SV 804 is not powered via the WEIPU5 connector, it is necessary to turn off SV 804 before removing the battery.

To remove the battery, follow next steps:

1. Unscrew the cover screw with the torque screwdriver to have access to the battery pack.



2. Before removing the battery pack, check the LED inside (marked "BATTERY EXCHANGE"). When the LED turns off or goes green (when the WEIPU5 is powered), the battery can be safely removed.
3. Pull out the battery by the straps.



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

The battery is equipped with:

4. USB-C socket for charging the battery.



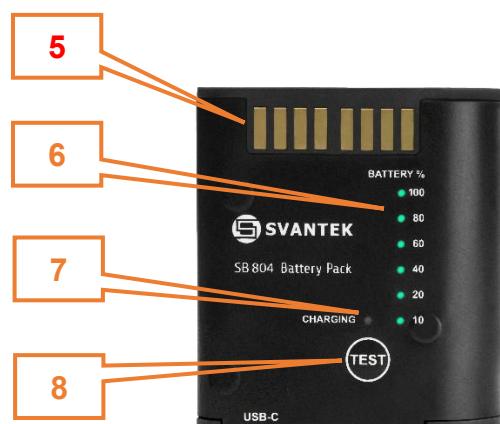
5. contacts for connecting the battery to the SV 804 circuit,
6. six green LEDs indicating the state of charge,
7. red LED to indicate battery charging,
8. TEST button for checking the state of charge of the battery.

Normally all the LEDs are off.

Pressing the TEST button causes the green LEDs to turn on from the 10% LED to the LED indicating the current charge.

When the battery is fully discharged, all LEDs will be off.

During charging a red LED and a series of green LEDs will light up.



2.5 OPTIONAL ACCESSORIES FOR SV 804

2.5.1 External power adapter

SB 274L is a 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



2.5.2 Solar panel

The **SB 871** solar panel (40 W, 17.5V DC) extends the working time of the monitoring terminal. 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 the cable with the WEIPU2 connector.



2.5.1 LAN PoE interface

The **SP 80** interface allows the SV 804 connection to the internet via the LAN PoE.



2.5.2 Alarm lamp

The SV 804 can be used with two types of alarm lamp:

- The **SP 872/5** alarm lamp, which connects to the SV 804's **External Interface** connector via a cable, and
- The **SP 872W** wireless alarm lamp, which connects to the SV 804 using the SP 83 SubGHz transmitter. The transmitter must be connected to the SV 804's **External Interface** connector.



2.5.3 Noise monitoring

You can expand the system by connecting the SV 303 Class 1 noise monitor to create a comprehensive 4-channel device. This allows the synchronised, real-time acquisition of both triaxial vibration and sound data to be managed via a *SvanNET* web service.

To integrate the SV 804 with SV 303 the Noise Monitoring Terminal, use the SP 79 Interface. The SP 79 must be connected to the **External Interface** connector of the SV 804 and to the USB-C connector of the SV 303.



3 OPERATING THE SV 804

3.1 POWERING

The SV 804 operates from internal rechargeable battery (SB 804).

When the battery is completely discharged, monitoring will be stopped, and the SV 804 will switch itself off.

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

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



Note: External power sources with WEIPU2 connectors can be connected to both WEIPU connectors on the instrument. The difference is that if it is the WEIPU5 connector, you can remove the battery without switching off the instrument, if it is the WEIPU2 connector, you cannot.



Note: The SV 804 should not be stored for long periods with the battery discharged. Storage with the discharged battery may damage the battery. In this case, the warranty for the Li-ion battery is void.



Note: If the SV 804 is to be stored for a long period, it is recommended that the battery is charged to 60% capacity. The battery should be charged at least once every 6 months.

3.2 POWER SAVE MODE

In terms of power consumption, the instrument operates in 2 power consumption modes:

1. Normal power consumption mode, when the **Modem** is set to *Off* or *Continuous* (see Chapter [4.6.6.1](#)). In this mode, each modem (Bluetooth, GPS, 4G) is switched on or off according to the settings.
2. Reduced power consumption mode, when the **Modem** is set to *Periodically active* (see Chapter [4.6.6.1](#)). In this mode, the instrument controls the switching on and off of the modems:
 - the 4G modem is put to sleep and woken up according to the rules described in Chapter [4.6.6.1](#),
 - the GPS modem is switched on 6 minutes before the 4G modem is to be woken up and is switched off when the 4G modem is in sleep mode,
 - Bluetooth is switched off and does not broadcast any data 10 minutes after switching on the instrument or after the last connection with the *Assistant Pro* application for mobile devices. As long as there is an active connection to the application, Bluetooth is not automatically switched off. Bluetooth turns off 10 minutes after the connection is lost.

Pressing the modem button wakes up the 4G modem and Bluetooth for 10 minutes.

Reduced power consumption mode gives a significant increase in operating time. In addition, in this mode, when all the modems are switched off at a given time, the instrument automatically reduces the processor clock, which allows a total of 3 months of operation.

There are several situations where the processor clock cannot be lowered:

- waveform **Recording** enabled with *2000 Hz* or *4000 Hz Sampling* (see Chapter [4.6.2.2](#)),
- **Human Vibration** enabled (see Chapter [4.6.1.2](#)),
- less than *10s Velocity Step* (see Chapter [4.6.2.1](#)).

3.3 LED INDICATORS

External LEDs

SV 804 has three external LEDs on the keyboard panel that indicate the status of:

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

When the instrument is turning on, three external LEDs flash orange in sequence; after a while they show the status and then go out.

A short press of the  button activates all three external LEDs for 15 seconds. During this time, the LEDs will show the current status and then turn off.

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

Internal LED

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

It is forbidden to remove the battery if the internal LED is:

- red and flashing – the instrument is switched on and there is no external power supply, or
- red – the instrument is switched on and there is an external power supply, or
- orange – the instrument is changing the mode or shutting down.

It is permissible to remove the battery if the internal LED is:

- green – the instrument is switched on and there is an external power supply on the WEIPU5 connector, or
- off – the instrument is switched off and there is no external power supply on the WEIPU5 connector.

During shutdown, the orange light will be on continuously and when it goes out, the instrument will switch off.

After closing the lid, the internal LED switches off automatically.

3.4 ESTABLISHING 4G CONNECTION



Note: To save the power of the instrument, the 4G modem works by default in periodic mode, connecting to SvanNET to download data files or to send alarm messages when an alarm occurs. To change the modem mode to continuous, use Assistant Pro or SvanNET.

It is strongly recommended that you configure remote communication before you go on site.

Open the cover of the SV 804 and insert a nano-SIM card into the slot. The instrument will automatically connect to SvanNET.

If you want to wake up the modem working in periodical mode and force the connection to SvanNET, press the  button on the SV 804 keypad.

The default APN setting is "internet". It is possible that your Internet provider uses a 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 [6.3.4](#)).



Note: If the connection to SvanNET fails, contact your local distributor or the SVANTEK support team.

3.5 MOUNTING THE INSTRUMENT

The SV 804 can be mounted on the floor or on a wall. It has special mounting holes in the housing (Fi 8 mm) and M6, M8 or $\frac{1}{4}$ " screws can be used to secure it in place.

To control the level, use the four studs on the sides that are in contact with the floor or wall.

The directions of the axes are shown below:



The SA 800/4 levelling mounting base can also be used for ground vibration measurements. In this case, fix the SV 804 to the SA 800/4 as shown in the picture.

Use four spikes and the spirit level to level the instrument.



3.6 TURNING THE INSTRUMENT ON/OFF

Turning On

The SV 804 switches on automatically when the external power supply is connected.

If the instrument was automatically switched off due to a discharged battery, it will switch on automatically when a charged battery is inserted.

In other cases, you should turn on SV 804 manually by pressing two buttons  and  at the same time (for appx. 2 seconds) until all the LEDs light up.

The SV 804 can also be turned on using the instrument's Timer or remotely from *SvanNET* or *Assistant Pro*.



While turning on, the system integration is checked and if successful, the firmware program is started. This program activates Bluetooth and the 4G modem and establishes a connection to the *SvanNET* web server (if the SIM card is inserted).

Turning Off

To turn the instrument off manually, press two buttons  and  at the same time and hold for approximately 5 seconds (all LEDs will turn orange) or

3.7 MEASUREMENT RUN AND DATA STORAGE

After turning on, the SV 804 starts the measurement process according to the current settings – factory settings or user settings.

3.7.1 Factory settings

The instrument is supplied with default/factory settings:

- Standard: BS-7385-2
- Building type: L2
- Events, Wave recording, and CSV recording functions are disabled.

By default, the instrument measures PPV, Peak, Max, RMS and DF and stores the results in a file named "Lxx" in steps of 30s.

If some configured events 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 restore the factory settings using the *Assistant Pro* application – see Chapter [4.3.9](#).

3.7.2 User settings

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

Measurement and instrument settings are described in Chapter [4.6](#) and [5.4](#).

3.7.3 Data Storage

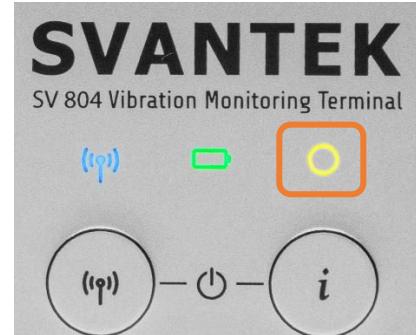
The SV 804 creates measurement files that are stored on the micro-SD memory card. These files can be downloaded manually using any of the Svantek software applications.

When the SV 804 uses the 4G connection to *SvanNET*, it can periodically transfer data files to the Cloud in automatic mode (and, if configured, delete transferred files). The programmable periodic connection mode is used to extend the battery life.

When the event occurs, the SV 804 also connects to *SvanNET* and sends alarm notifications to the recipients.

3.7.4 Overload indication

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



3.8 SYSTEM CHECK

The SV 804 has a special mechanism for testing the measurement chain, so called System Check, by triggering an electronic pulse and then evaluating the response of the sensor signal.

If the System Check finds an error, the warning about this is displayed in the *Assistant Pro* application and in the *SvanNET* web service.

System Check can be scheduled by the user (see Chapters [4.6.4](#) and [5.4](#)).

You can perform the system check manually using the *Assistant Pro* application (see Chapter [4.3.1](#)).

3.9 CALIBRATION

The instrument channels with the supplied geophones are factory calibrated for the reference environmental conditions (see Appendix C). If geophones other than those supplied are used, calibration of the channels should be carried out by the user. Periodic calibration of the instrument is also required.



Note: The SV 804 should be calibrated by the authorised laboratory that has the special vibration shaker table.



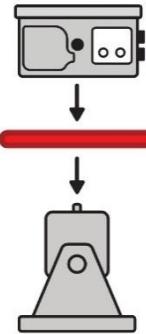
Note: The SV 804 is sensitive to shock. If it is dropped on a hard surface, it must be recalibrated.



Note: The recommended calibration interval is at least once every two years to ensure continued accuracy. Please contact your local Svantek representative for further details.

To calibrate the SV 804, proceed as follows:

- Mount the SV 804 on the shaker according to the calibrated axis (see Chapter [3.5](#)), using the mounting plate.
- Check the position of the SV 804 with the built-in spirit level.
- Set the required amplitude and frequency of the shaker.
- Switch on the shaker and the SV 804.
- In the *Assistant Pro* application, select the SV 804 calibration option and press the **Start** button. The SV 804 will automatically detect the geophone that is being calibrated.
- After the calibration measurement, apply a new calibration factor if it is within the acceptable range.



3.10 COMMUNICATION VIA THE 4G MODEM

The 4G modem enables wireless remote control of the instrument, downloading of measurement files, managing the configuration of the instrument, sending alarm emails, etc.

The 4G modem provides the user with a wide range of interface options through the main communication channel, *SvanNET* e-mail functionality and SMS alarm notifications as well as FTP Client service.

You can configure the remote communication via the 4G modem using the *Assistant Pro* mobile application or the *SvanPC++* PC software.



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



Note: Make sure that the SIM card has the PIN code deactivated before insertion it into SV 804.

3.10.1 Main communication channel

The main communication channel is a TCP/IP connection (a lossless data exchange protocol), which can be used to exchange commands according to Appendix A of the SV 804 User Manual. *SvanPC++_RC* ensures this connection and provides data download, configuration, performance validation and measurement start/stop.

The main communication channel of SV 804 can be established by one of two available methods: TCP/IP Client or TCP/IP Server. The SV 804 firmware does not support SSL (Secure Socket Layer) connections.

The **TCP Client** is a mode of the main communication channel in which SV 804 is configured to initiate a connection to a specified address (**remote host**). SV 804 will automatically attempt to establish a TCP/IP connection to a specified address on a specified port (**Data Port**). If the connection is successful, SV 804 can exchange commands with the remote server. If the connection attempt fails or is disconnected by the **remote host**, SV 804 will attempt to reconnect. In order to prevent the connections from becoming *idle* (a state where the TCP/IP connection appears to be active, but no data can be transferred), the station maintains the connection to the server by sending small packets of data at the keep alive period (which is one minute by default). If the transfer is not properly acknowledged by the other side, the connection is terminated.



Note: The **TCP Client** mode is used in the *SvanNET* web service. *SvanPC++_RC* supports all of TCP/IP connection modes.

SV 804 uses the **TCP Client** mode to connect to *SvanNET* (this is the default setting of the station) or another user defined server. The user also connects to *SvanNET* via web browser or *SvanPC++_RC*, and the service creates a "bridge" between the station and the user. In this case there are no restrictions on the SIM card tariff for mobile communication (no public IP address is required) and simple Internet access is sufficient. The essence of *SvanNET* is to simplify the procedures and requirements for connection.

TCP Server is a mode in which SV 804 is configured to act as a server for incoming connections. SV 804 waits for the first connection to be established on a designated port (called *Data Port*; default 8000). Such a connection can come from any application - a TCP/IP connection initiator (e.g., *SvanPC++*) called *remote peer*. For mobile communication, this mode requires a SIM card with a *public address* (called *public IP*).

3.10.1.1 SMS / E-mail alarming

The SMS/E-mail alarm functionality allows SV 804 to inform the user of various events, e.g. exceeded thresholds, low battery, etc., by SMS and/or e-mail notification. SV 804 can send an SMS to a defined number(s) and/or an email to a defined address(es) with the alarm and its details.

SV 804 has an advanced alarm mode. The advanced alarm configuration can be done via *SvanNET*. The e-mail alarm uses the *SvanNET* to send e-mails. The advantages of *SvanNET* e-mails are that the user does not need an e-mail client account on the SMTP server and that the e-mails are SSL encrypted. The content of the message is created automatically.



Note: *SvanNET* e-mail service uses SSL connection.

It should be noted that SMS alarms do not require an Internet connection, and therefore the SIM card does not require a data plan, as the SMS messages are sent entirely over the mobile network. E-mail still requires Internet access.

3.10.2 FTP Client option

The purpose of the FTP (File Transfer Protocol) option is to enable SV 804 to exchange data via an FTP server, allowing communication when both SV 804 and a PC have private IP addresses.

The **FTP Push** feature allows you to download a set of files from the instrument's memory to a user-specified server using FTP. This action is repeated periodically at a set interval so that the new files stored in the instrument's memory can be uploaded to the FTP server. The FTP Push operation is limited to the working folder and performs the file upload intelligently - it only uploads data that is new compared to the status after the previous FTP Push operation.

The **FTP Pull** feature allows you to upload a setup file from a specified location on an FTP server to the instrument and change the configuration based on the contents of that file. The name of the file is uniquely specified (complete with instrument type and number) and its content is a text string containing configuration parameters.

The FTP server can be accessed from *SvanPC++* using the *Remote Communication Center* (see *SvanPC++ User Manual*).



Note: *FTP works as stand-alone communication channel or in parallel with TCP communication channel.*

4 APPLICATION FOR MOBILE DEVICES – Assistant Pro

Assistant Pro is an application for mobile devices (smartphones, tablets and Macbooks with M processors) that allows you to control the SV 804. The application uses the Bluetooth® interface, which allows full control of the instrument, such as view current measurement results, start/stop measurements, change current settings, download files with measurement results, connect to the *SvanNET* web service and more.

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

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

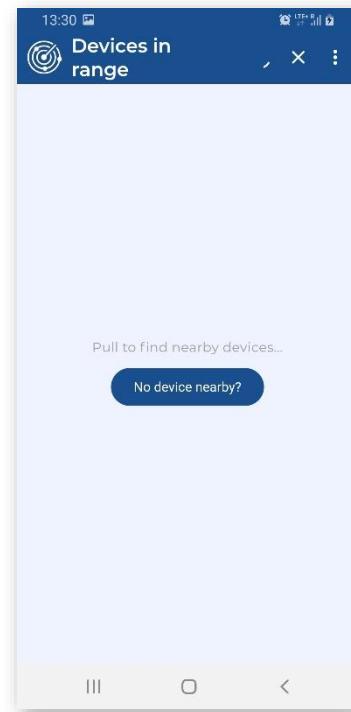
To install the SVANTEK applications on your mobile device, use the *Google Play Store* or *App Store* platforms

4.1 CONNECTING TO INSTRUMENTS

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

While scanning the instruments, the “scanning”  icon is displayed in the upper right corner. You can stop scanning by tapping . When scanning is complete, the “scanning” icon changes to . To restart scanning, tap .

The “No device nearby?” button opens a quick guide on how to prepare an instrument for use with the *Assistant* mobile application.



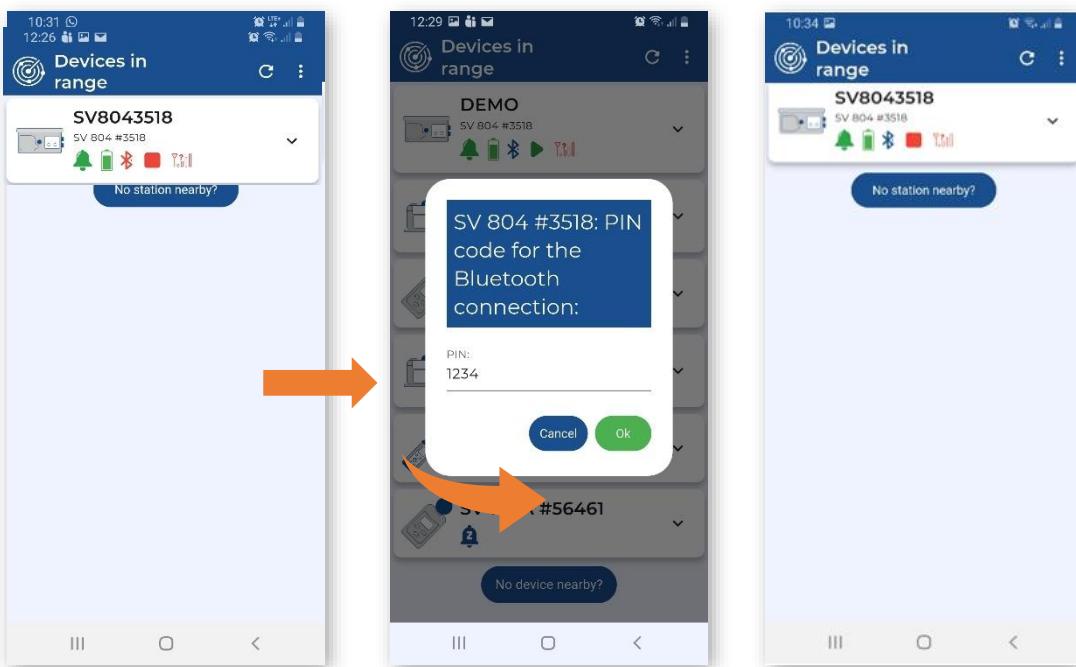
The visible instruments appear on the **Devices in range** screen as a panel with the status icons.

If there is no connection to the instrument, the Bluetooth icon on the instrument bar will be red. During the connection, it “emits waves”. If the connection is successful, the Bluetooth icon changes to blue.



Note: Svantek device can handle only one simultaneous connection.

The first time you pair an instrument, the application will try to use the default PIN code (1234). If it does not match, you will be prompted to enter the PIN.



After the connection is established, you can control this instrument and view measurement results.

4.2 DESCRIPTION OF THE STATUS ICONS

The instrument status icons have the following meanings:



Instrument type.



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



Battery status. When the battery is low, the icon changes colour to red.



Bluetooth connection: red – not paired, blue – paired, grey – connection being used by another mobile device.



The instrument is measuring.



The instrument is not measuring.



4G modem – no signal.



4G modem – connected to the Internet.



4G modem – connected to *SvanNET*.

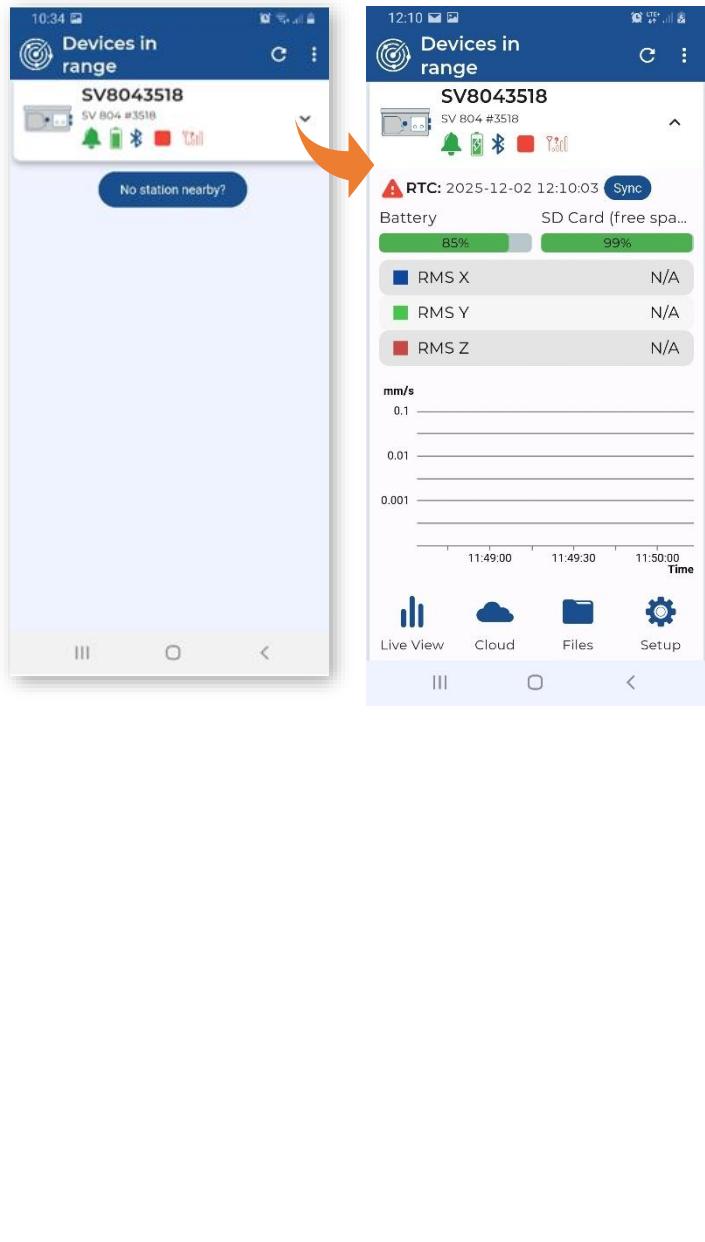
4.3 CONTROLLING THE INSTRUMENT

Devices in range appear as a bar that can be expanded by tapping it. Once expanded, the instrument panel displays the real-time clock (**RTC**), the status of the instrument's battery (**Battery**) and memory (**SD Card (free space)**) status as well as the values of some predefined readings.

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

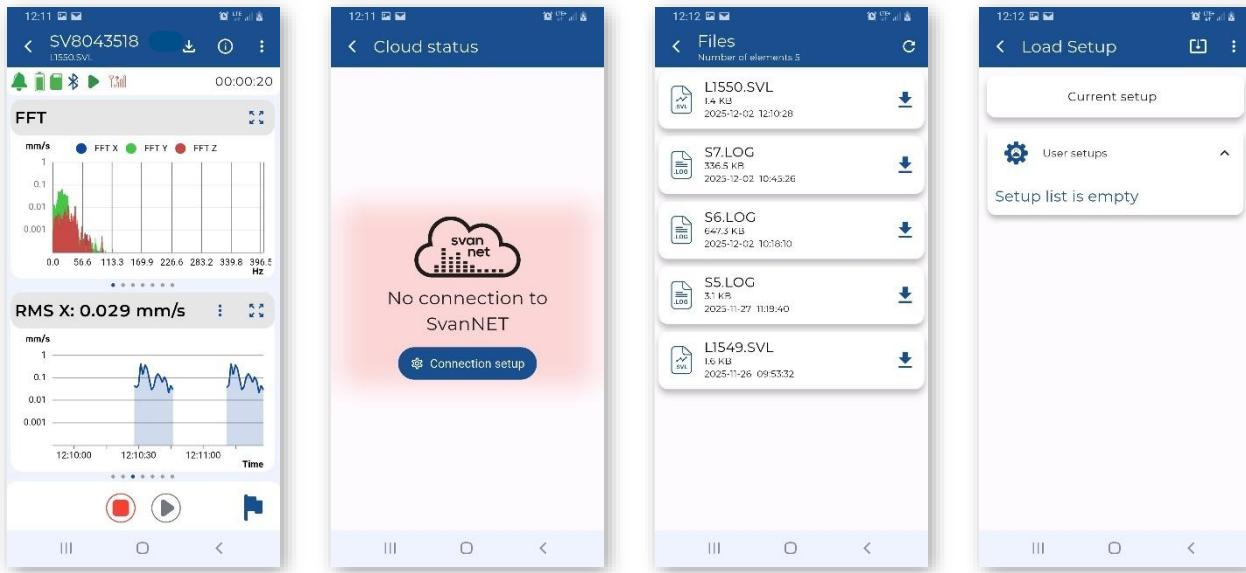
Four icons at the bottom of the panel give you quick access to some functions:

- **Live View** – viewing live results with the possibility to start/stop the measurement,
- **Cloud** – connecting to the *SvanNET* web service (see Chapter [4.3.6](#)),
- **Files** – downloading instrument files (the icon is hidden by default),
- **Setup** – configuring instrument settings.



Note: The **Files** icon is hidden by default. To make it visible and to be able to manage instrument files, you should activate it (see Chapter [4.4](#)).

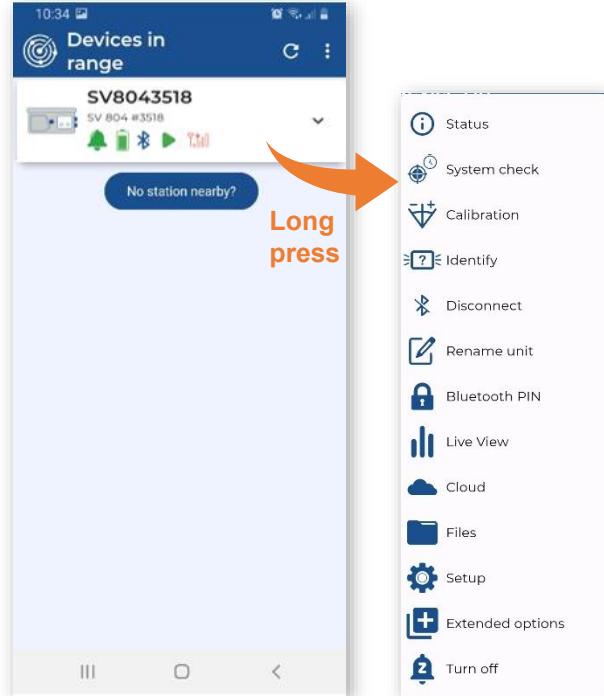
Below are screens after tapping function icons: **Live View**, **Cloud**, **Files** and **Setup**.



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

The pop-up menu allows you to:

- check the **Status** of the instrument,
- perform the **System check**,
- perform the **Calibration** of the channels,
- Identify the instrument connected,
- Connect or Disconnect the instrument,
- Rename unit for personalisation,
- enter the **Bluetooth PIN** during connection or change the PIN in the instrument after successful connection,
- view current measurement results - **Live View**,
- access the **Cloud** (SvanNET web service, see Chapter [4.3.6](#)),
- open the file list - **Files**; this icon can be hidden, see Chapter [4.4](#),
- configure instrument settings - **Setup**,
- unlock **Extended options**,
- Turn off the instrument.



4.3.1 System check

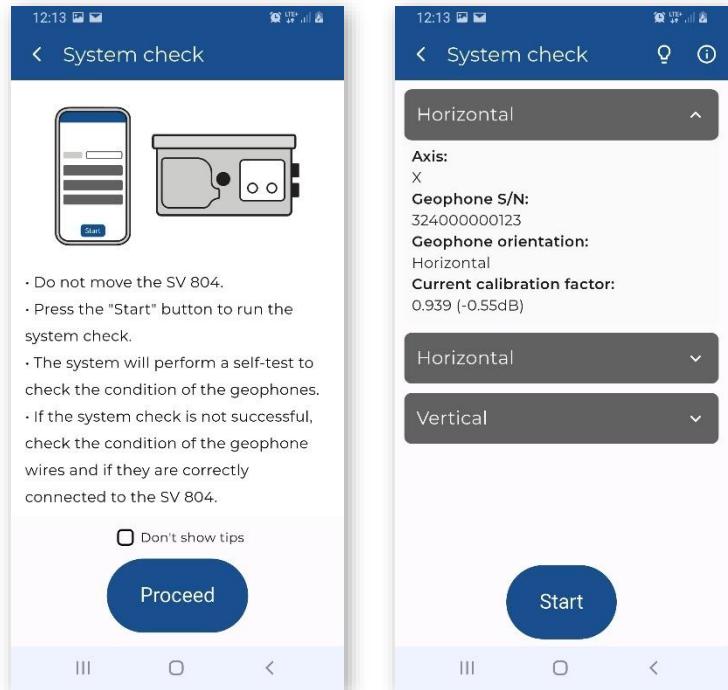
The system check function triggers an electronic pulse and evaluates the response of the sensor signal.

When you select the **System Check**, you will be taken to the Tips page to see how to perform the check.

You can skip the tips if you wish.

The system check should be performed with the closed lid.

Press the **Start** button to run the system check.

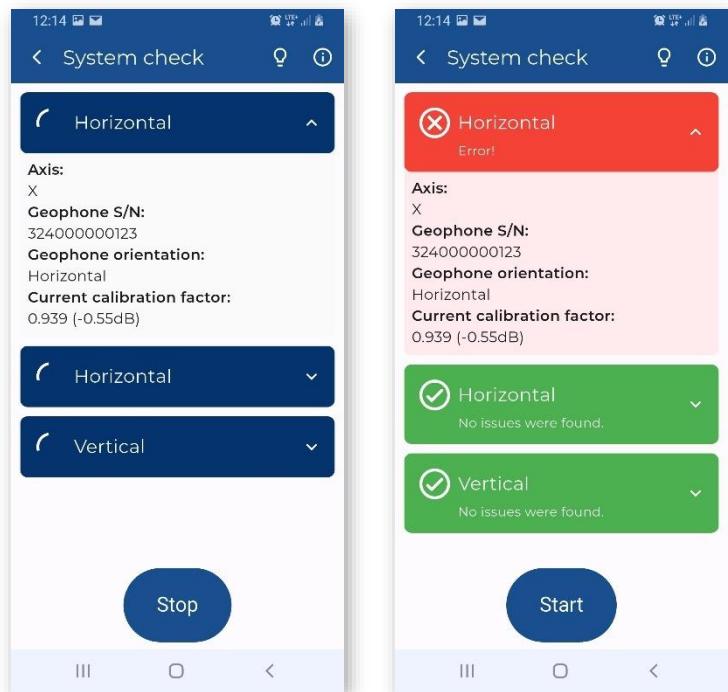


The system check performs a self-test and informs you about the condition of the geophones.

If the system check is not successful, this will be indicated by the geophone bar turning red.

In this case, check that the geophone cable is correctly connected and run the system check again.

If the system check is not successful, take the necessary action: calibrate or replace the geophone.



4.3.2 Calibration

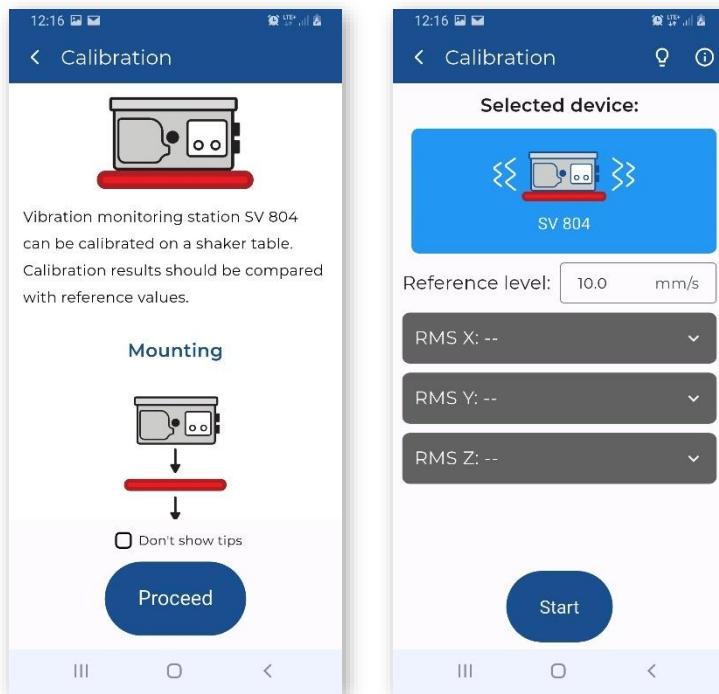
The calibration function allows you to calibrate the SV 804 or the geophones using the vibration shaker table.

When you select the **Calibration**, you will be taken to the Tips page to see how to perform the calibration.

You can skip the tips if you wish.

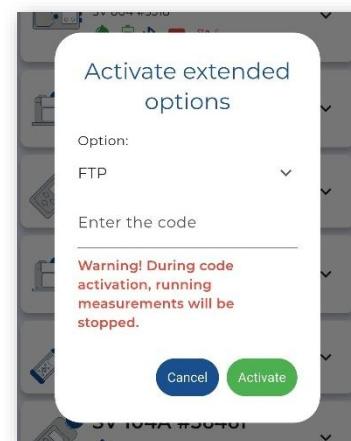
To perform the calibration, follow steps described in Chapter [3.9](#) and press the **Start** button.

After the calibration measurement apply a new calibration factor if it is within the acceptable range



4.3.3 Unlocking extended options

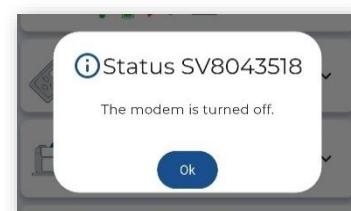
The FTP Client option can be enabled if you enter the special code that unlocks this option. Once unlocked, the option is permanently available.



4.3.4 Auxiliary commands

When you tap **Status**, the **Status** dialogue box will tell you if the measurement and communication configurations are correct. If not, the anomalies are listed.

When you tap **Identify**, the three LEDs on the front of the instrument will flash red four times to indicate which unit you are currently working with.



When you tap **Connect**, your mobile device begins to connect to this instrument via Bluetooth. When the connection is successful, this command changes to **Disconnect**. And vice versa.

When you tap **Rename Unit**, the **Device Name** dialogue box appears with the current instrument name, which you can edit.



When you tap **Bluetooth PIN**, the dialog appears where you can change the Bluetooth PIN code.

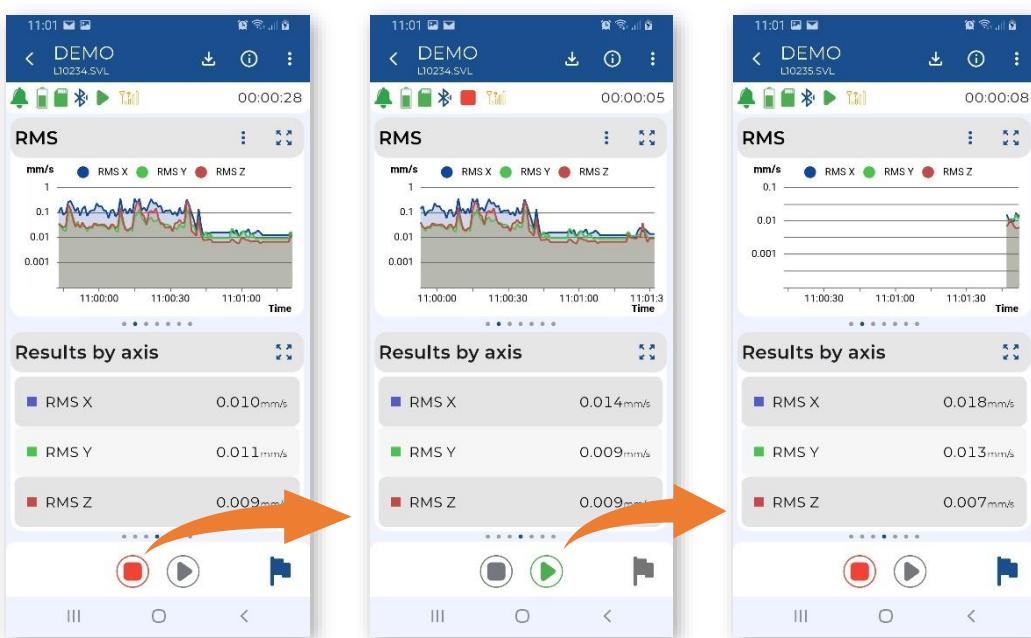


4.3.5 Live View

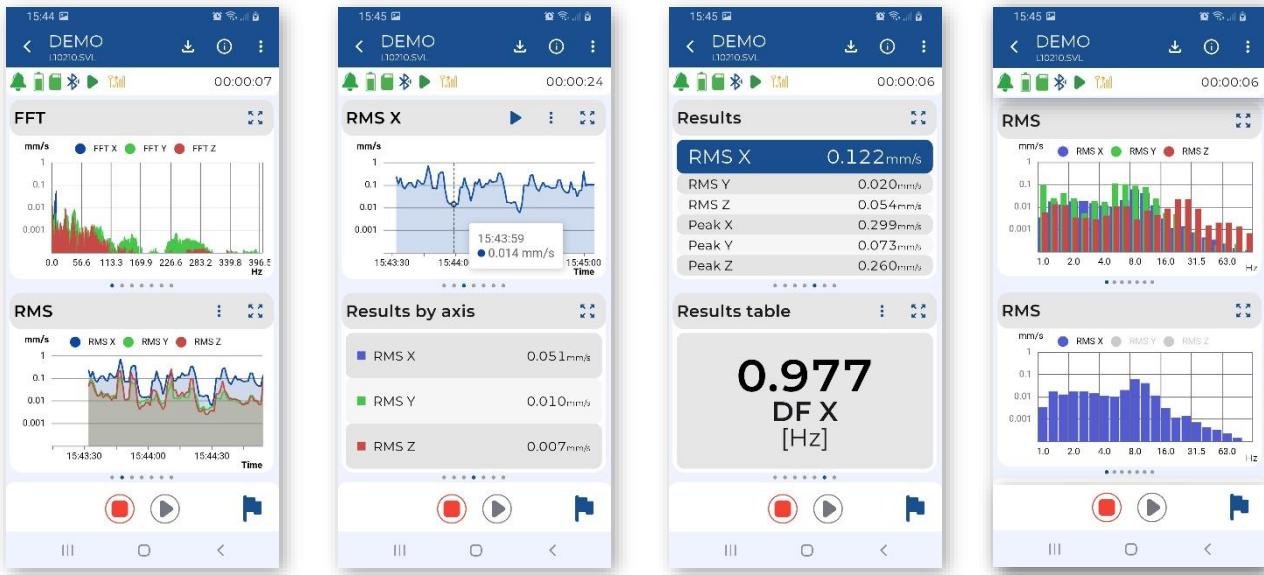
From the **Live View** screen, you can control the measurement process and set markers - notes about events that occur during the measurement.

The measurement results are displayed in sections (widgets) which you can adjust by scrolling through the presentation views.

The top line shows the battery, memory and measurement status, as well as the integration time.



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



Note: *Live view* shows the limited set of measurement results. The full set of measured results is stored in the instrument files and can be viewed using SvanPC++.



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

Tap on the round buttons (blue – X, green – Y or red – Z) to select axis on the time-history or spectrum graph to be displayed.

The time-history or spectrum graph can be expanded to the full screen.

You can zoom in and zoom out the selected time or frequency range using two fingers or the bar below the graph.

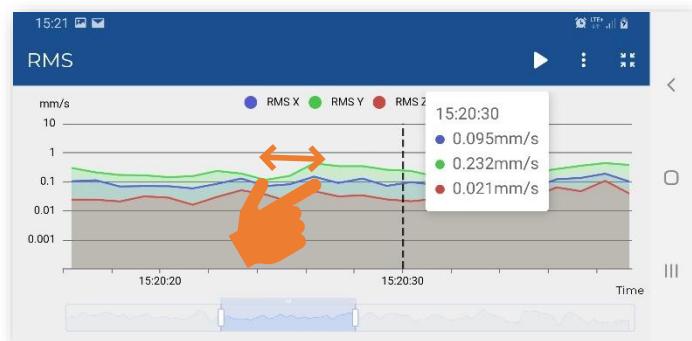
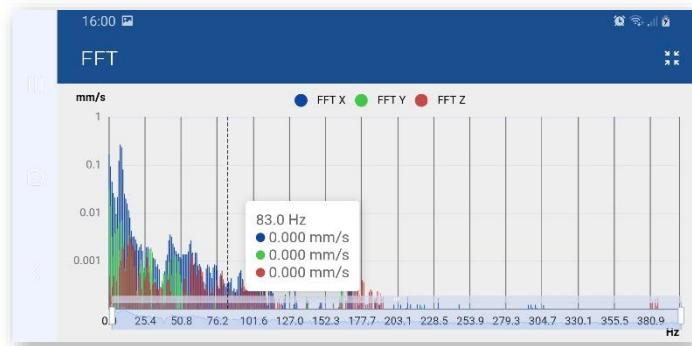


The horizontal screen enables you to view the graph at a higher resolution.

Tap on the graph area to activate the cursor with the readings.

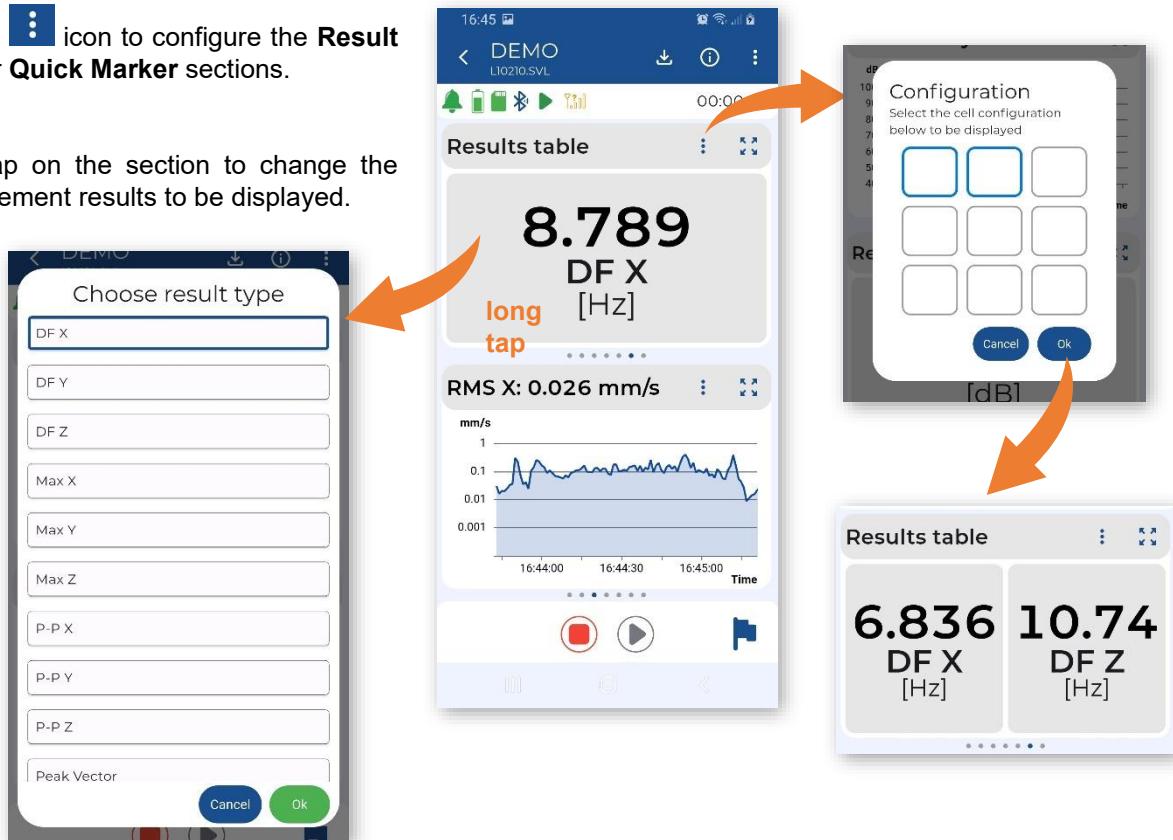
Tap outside the graph to deactivate the cursor.

Use the bar below the graph or two fingers to zoom in or out on the selected time or frequency range.



Tap the icon to configure the **Result table** or **Quick Marker** sections.

Long tap on the section to change the measurement results to be displayed.



Tap the flag button to create an extended marker to describe an event during a measurement. This will open the **Create Marker** dialogue box, which contains descriptive options.

On the given chart, select the area of the event. Enhance the data by attaching details in the form of a comment, photo, video, audio file or location information.

If the **Automatic Download** feature is enabled, any new marker will be automatically linked to the corresponding downloaded measurement file.

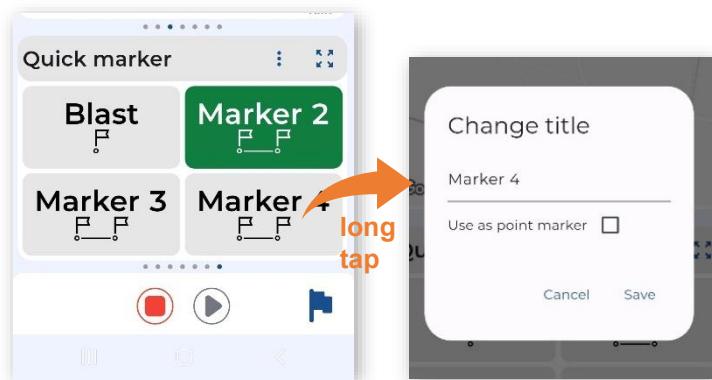
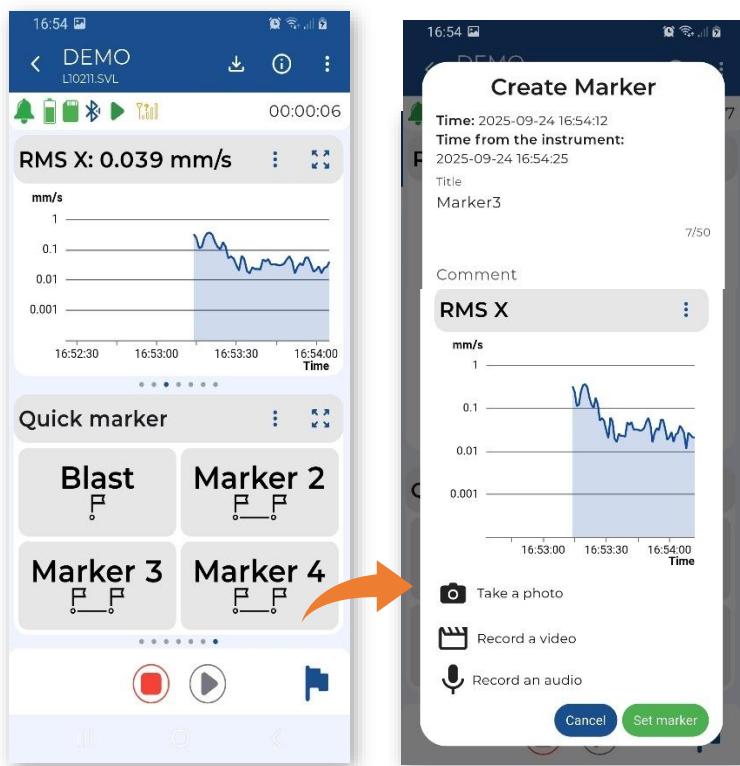
Once you have finished, tap **Set marker** to save it.

When a marker or measurement file is shared, they will be bundled together as a single package. The bundle can be opened using SvanPC++ software, which will display the markers directly on the time history plot.

Quick markers are used to label (or highlight) special events during the measurement, such as blasting works, and indicate the duration of the event in the logger results. Point markers have start and end at the same time.

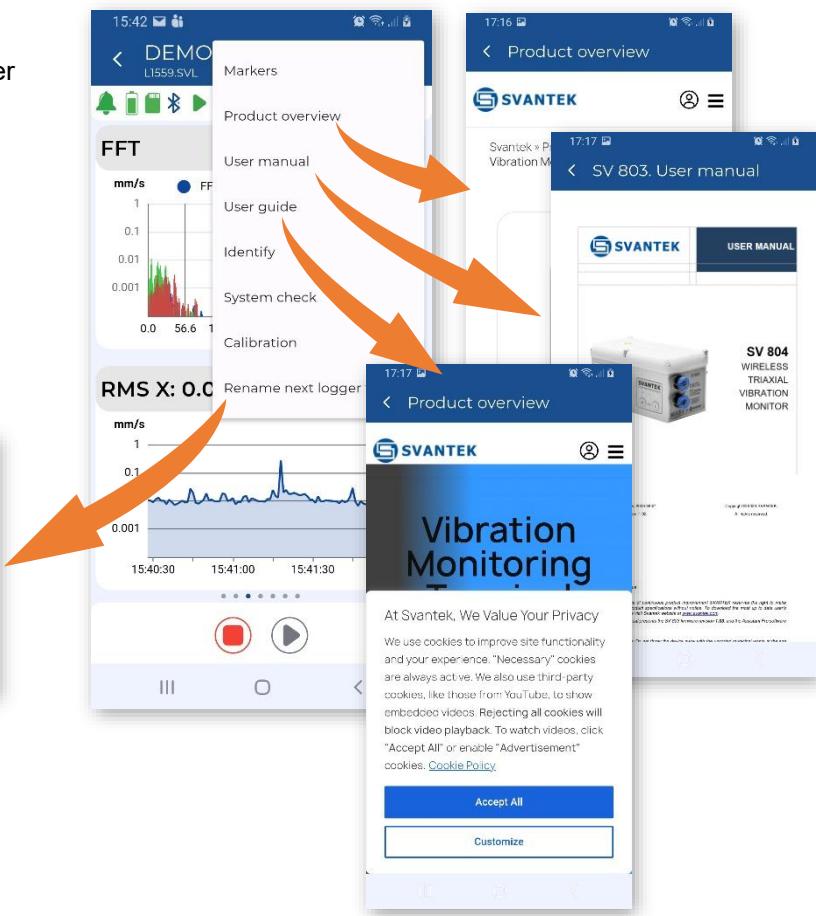
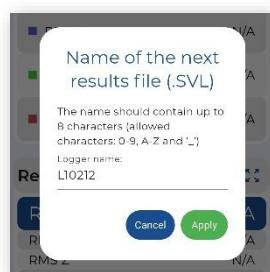
First tap on block marker activates it, the second one deactivates it.

To configure the marker, long tap on it.

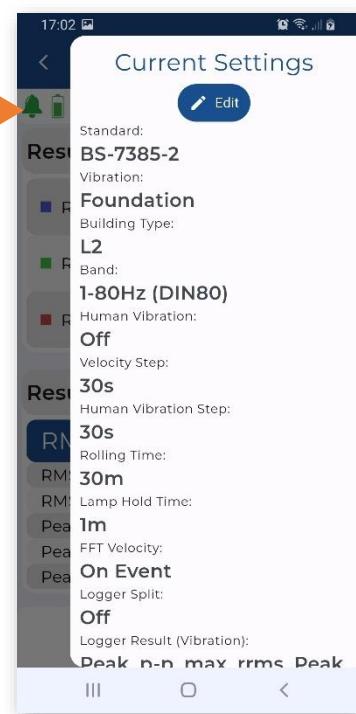
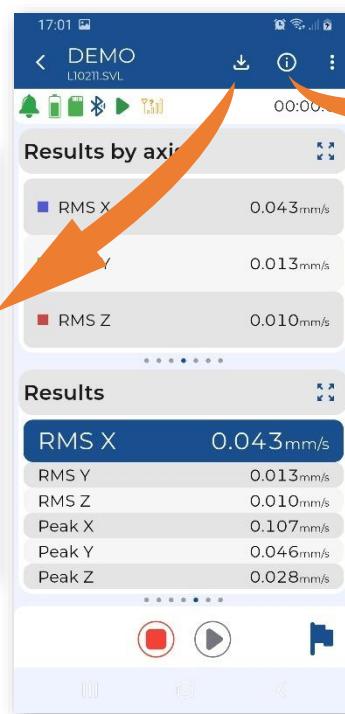
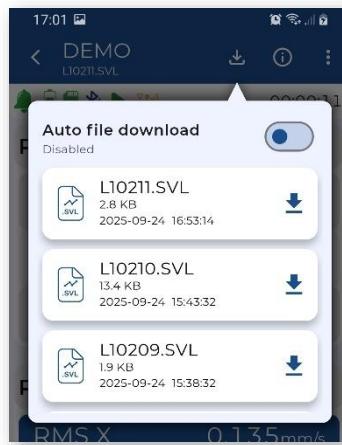


Tap the  icon to:

- access the list of the marker records,
- access the **Product overview**,
- access the **User manual**,
- access the **User guide**,
- Identify** the instrument (see Chapter 4.3.4),
- perform **System check** and **Calibration**.
- Rename next logger file**.



Tap the  icon to display and edit the current measurement settings.



Tap the  icon to open the automatic file downloads.

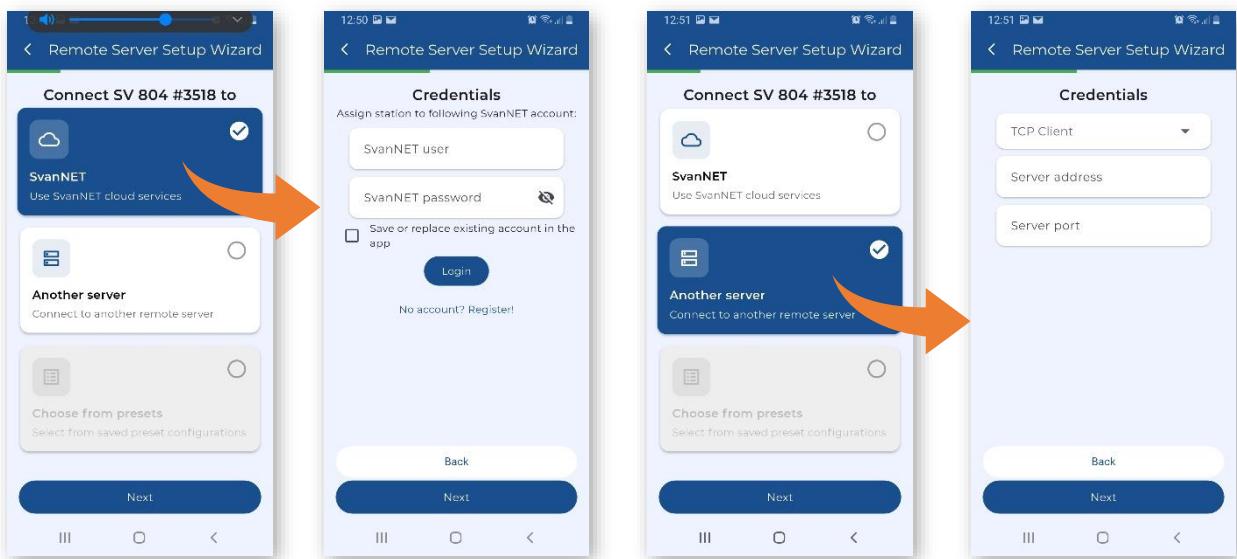
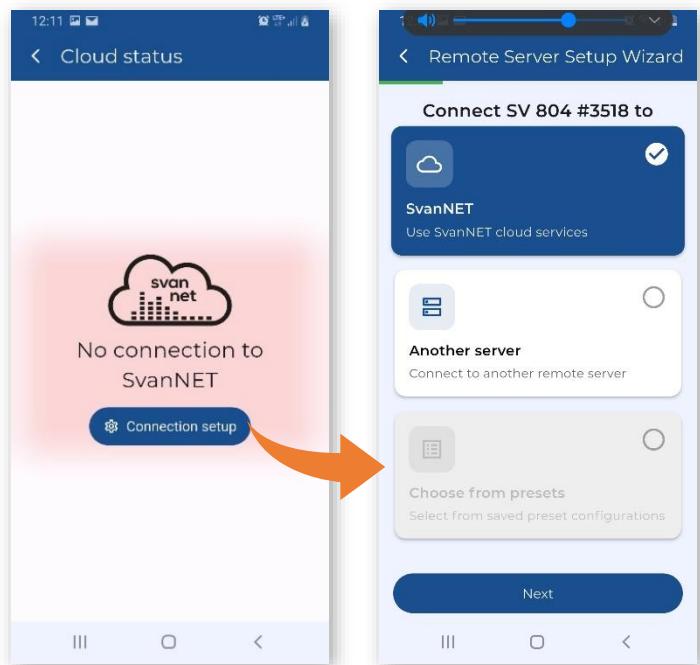
When this feature is enabled, the current file is automatically downloaded.

4.3.6 Cloud

When you tap **Cloud** in the expanded instrument panel, the **Cloud status** screen opens, showing the status of the connection to the *SvanNET* web service.

Tap on **Connection setup** to configure the settings for the remote connection.

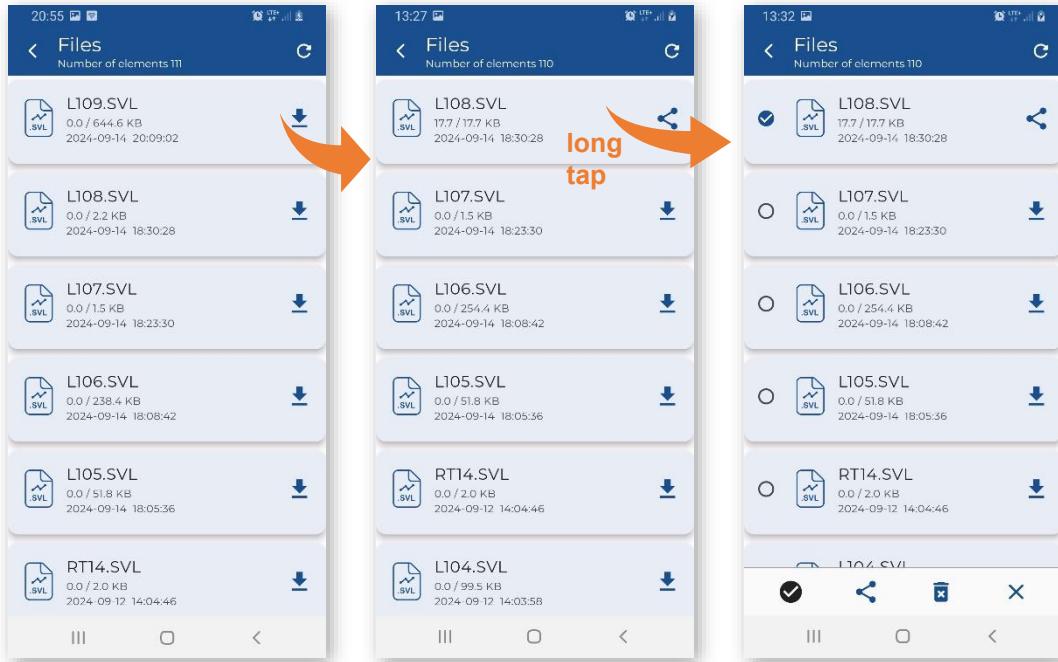
You can save presets to use them again later.



4.3.7 File list

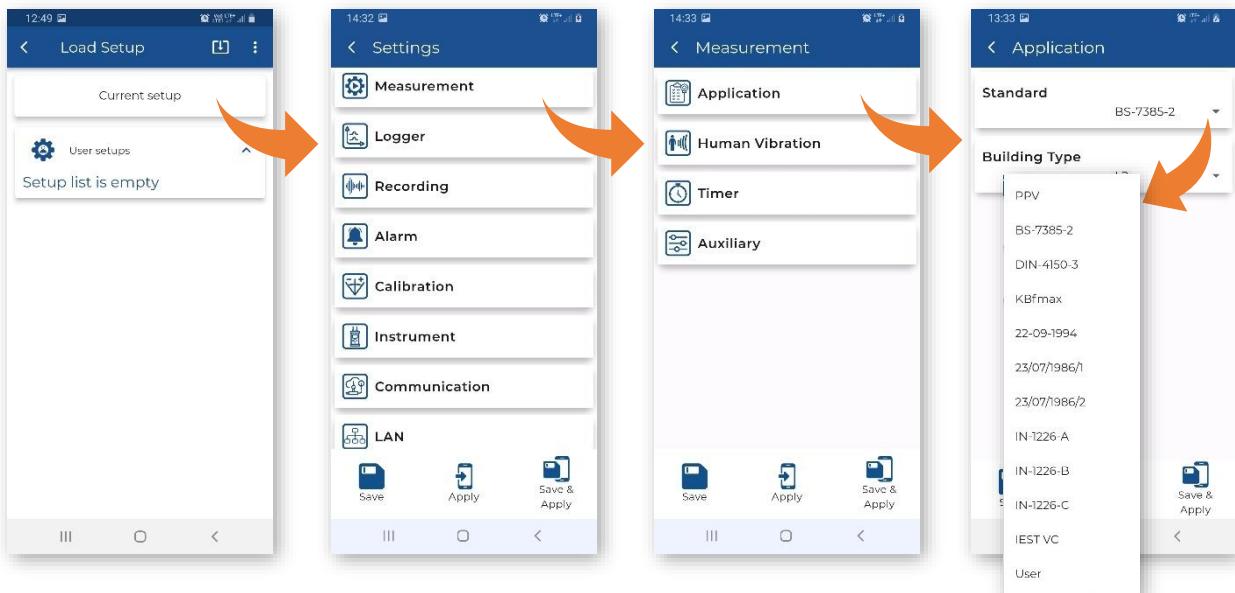
The **Files** section displays the list of files created by the instrument on the instrument's memory card.

You can tap on each file to download it to your mobile device (**Get**). Once the file has been downloaded, you can share it. To delete the file, swipe left on the file ribbon and tap the icon.



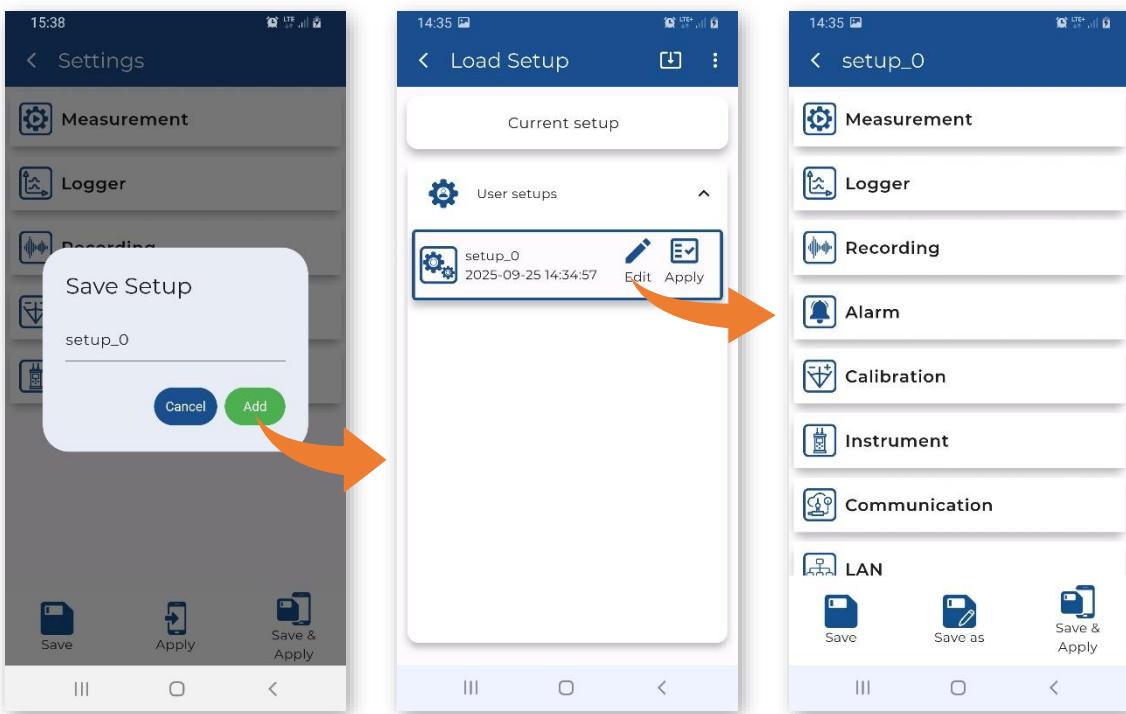
4.3.8 Instrument and measurement settings

The **Settings** section allows you to configure the measurement and specific instrument settings. The settings are grouped in sections such as **Measurement**, **Logger**, etc., which contain sub-sections, etc. The last item in such a hierarchy consists of parameters that you can set, e.g., **Standard: PPV, BS-7385-2**, etc.



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

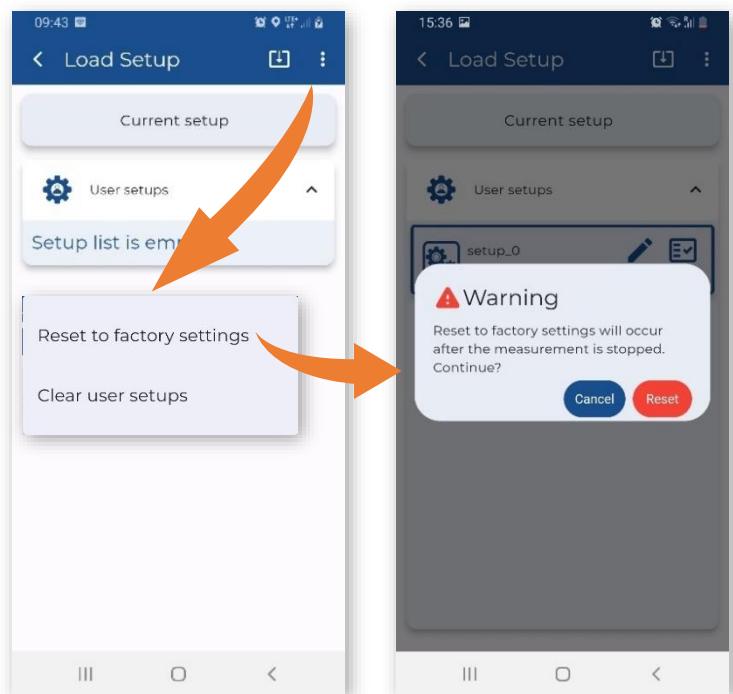
When you save settings, a new setup file is created in the dedicated application's directory on your mobile device, but the current instrument settings are not changed. You can load the settings saved in the file to the instrument. To do this, open the **User Setups** section, select the file with the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



4.3.9 Restoring factory settings

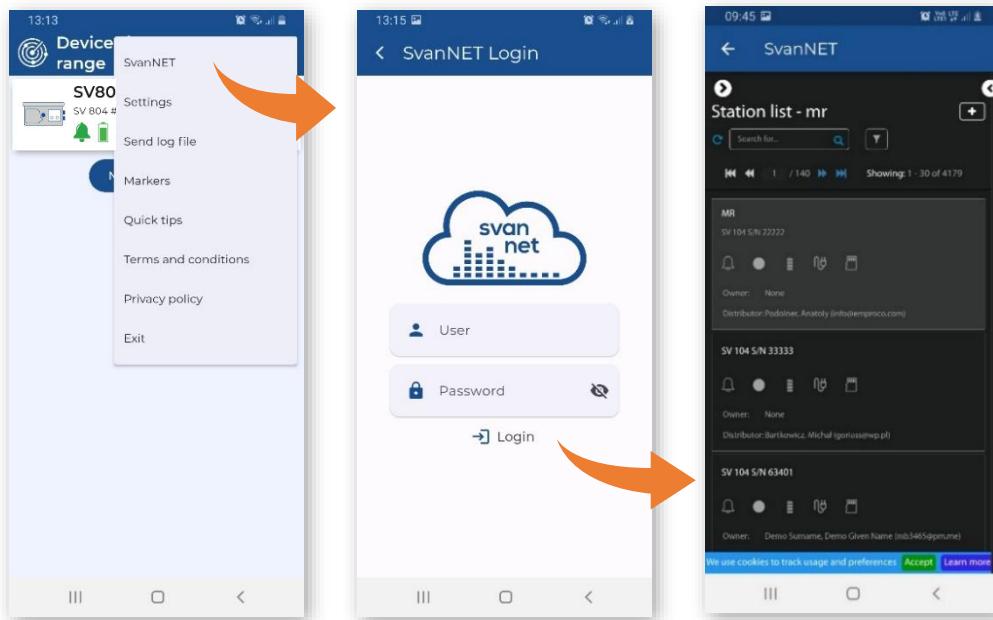
By tapping  in the **Load Setup** screen, you can:

- **Reset to factory settings** and
- **Clear user setups**.

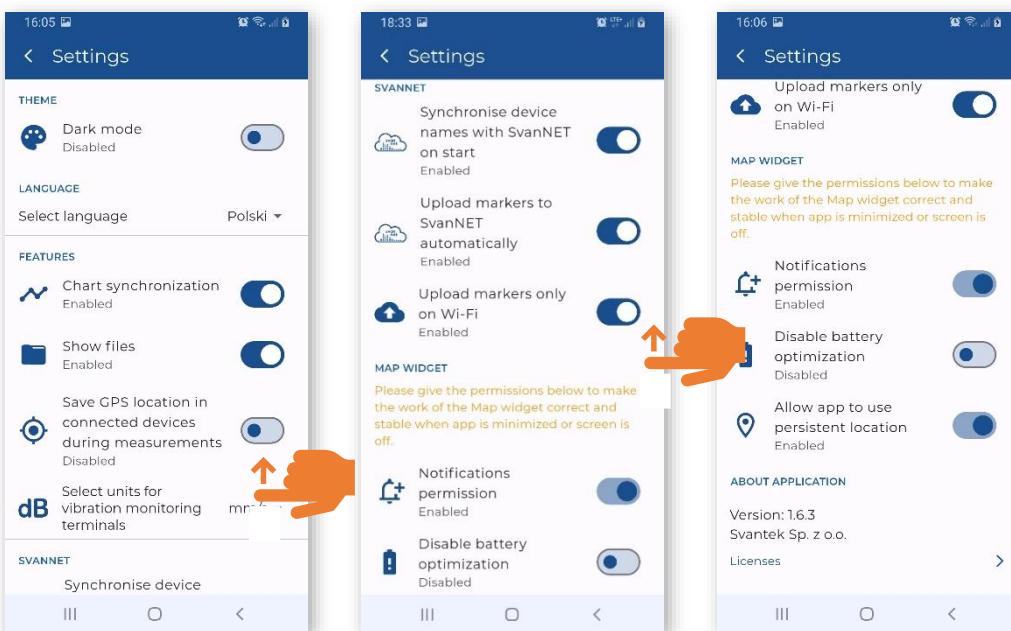


4.4 ASSISTANT PRO AUXILIARY FUNCTIONS AND SETTINGS

Tap the  icon in the **Devices in range** screen to open *SvanNET* in your mobile device, configure *Assistant Pro* settings, share the log file using Android applications and view, get access to the downloaded files and the created markers, get quick tips, get acquainted with terms and conditions and privacy policy, send the screen with the description to Svantek Support and exit the application.

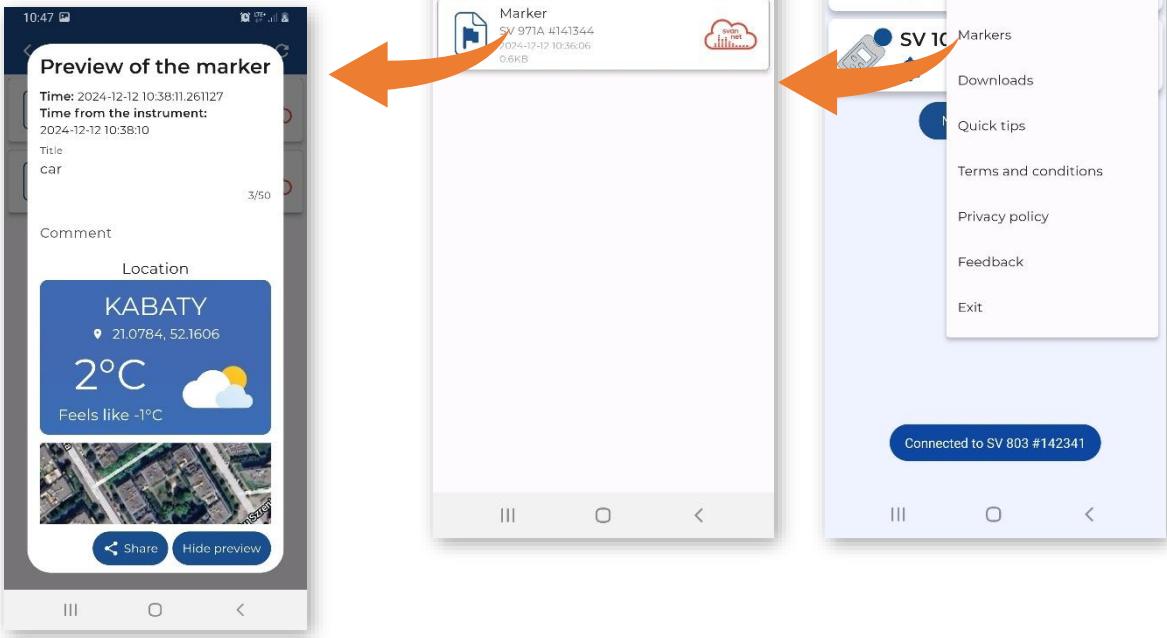


On the **Settings** screen, you can select the application **THEME** (enable **Dark Mode**), select the application **LANGUAGE** and enable some **FEATURES** (synchronise the cursors on different charts, make the **Files** item visible in the pop-up menu and in the instrument panel, select the units for displaying the vibration results and save the GPS location in the measurement files). You can also enable **SVANNET** options (synchronising the station name with SvanNET at startup, automatically uploading markers to SvanNET and only uploading markers on Wi-Fi). You can also give permissions regarding the **Map widget**, such as notifications, battery optimisation and persistent location, and get information about the application version and licences (**ABOUT APPLICATION**).



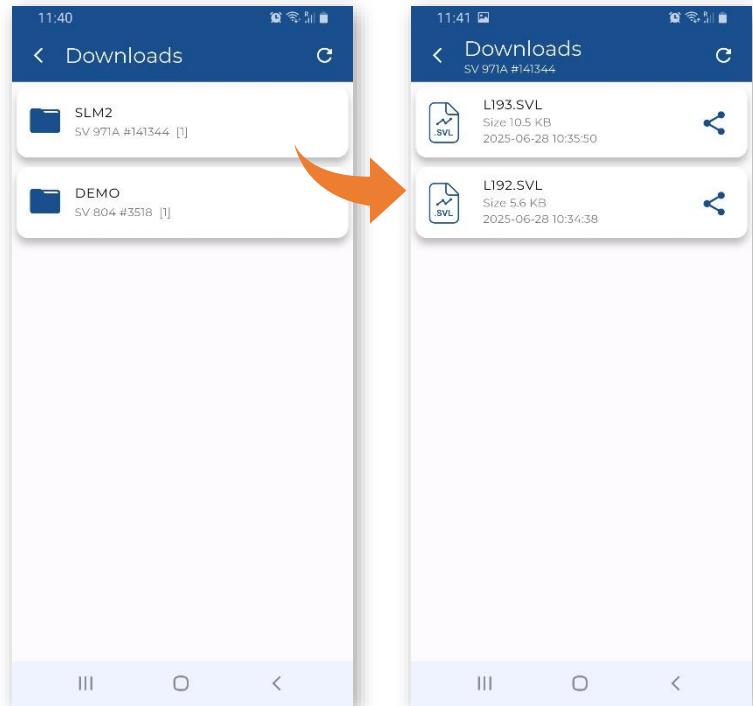
Tap the **Markers** item to get access to the created markers.

In the **Markers** screen you can open, share or delete the marker.

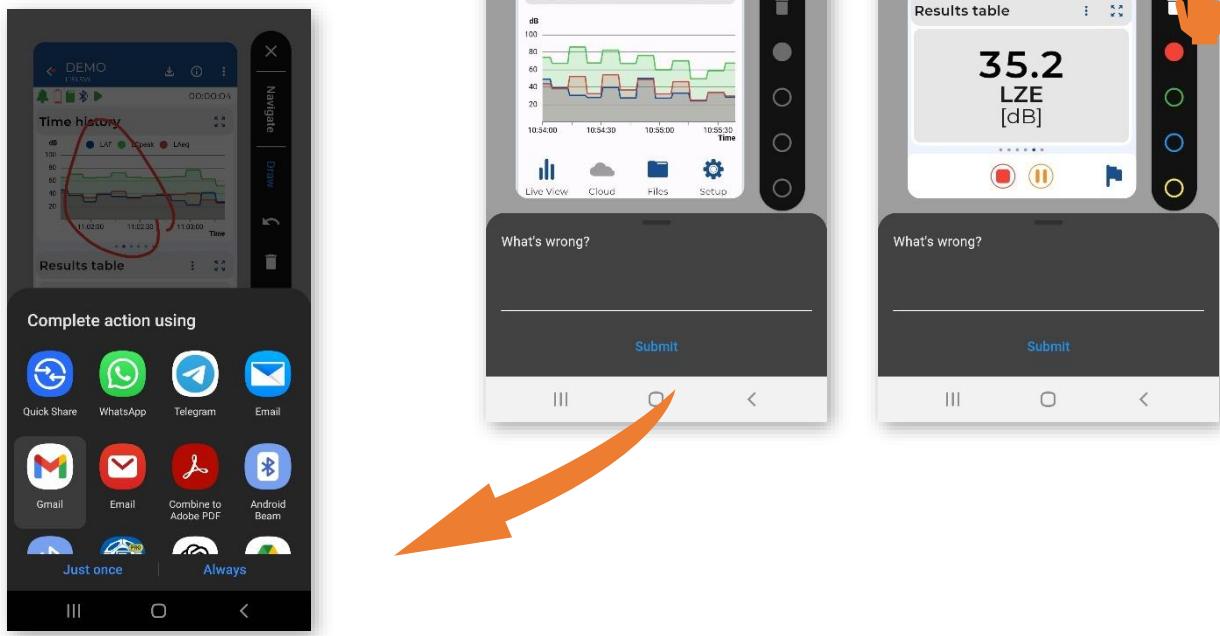


Tap the **Downloads** item to get access to the downloaded files.

In the **Downloads** screen you can open, share or delete the files.



In the **Feedback** screen, you can select the screen you want to share with, for example, the Svantek support team using the **Navigate** option, then draw any helpful drawing using the **Draw** option, write what is wrong and finally send it where you want using the **Submit** button and the sharing options available on your smartphone.



4.5 SHARING MEASUREMENT FILES AND MARKER RECORDS

Measurement files and their associated markers can be shared with other applications and sent to SvanPC++ software for further analysis. There are three ways to share files:

1. Sharing the downloaded file from the **Files** screen. If no markers were recorded during the measurement, the file will be shared as an SLV file. The file name will be extended with the date and time of the measurement (for example, a file named 'L4521.SLV' will be shared as '2025-07-10_12_04_28-L4521.SLV'). If markers were recorded during the measurement, the measurement file will be compressed together with the markers associated with it into a new archive and made available as a ZIP file with the original SLV file name (for example, 'L4521.zip').
2. Sharing multiple markers from the **Markers** screen. In this screen, you can select multiple markers by holding down the selected item and then tapping the share icon in the bottom menu. If there are measurement files associated with these markers, these files will be compressed with the markers into a new archive and shared as a ZIP file (for example, with the name 'Results.zip'). However, if no SLV file has been downloaded to the mobile device, the marker record will be shared in the ZIP archive without the SLV file (or with an incomplete file), which may result in an incorrect display in the PC++ results analysis programme.
3. Sharing single marker from the **Markers** or **Preview of markers** screens. Tapping the 'Share' icon allows us to share the open marker and the associated SLV file with external applications as a new archive whose name contains the marker name (for example, 'Marker1.zip').

4.6 INSTRUMENT SETTINGS

The configuration menu (**Settings**) contains the following sections:

- **Measurement** – to configure the measurement parameters,
- **Logger** – to configure data storage in a logger file,
- **Recording** – to configure signal recording to a WAV file,
- **Alarm** – to configure alarm conditions and notifications,
- **Calibration** – to view the last calibration data and set the system check schedule,
- **Instrument** – to configure parameters related to the instrument hardware,
- **Communication** – to configure remote control settings,
- **LAN** - to configure LAN settings.

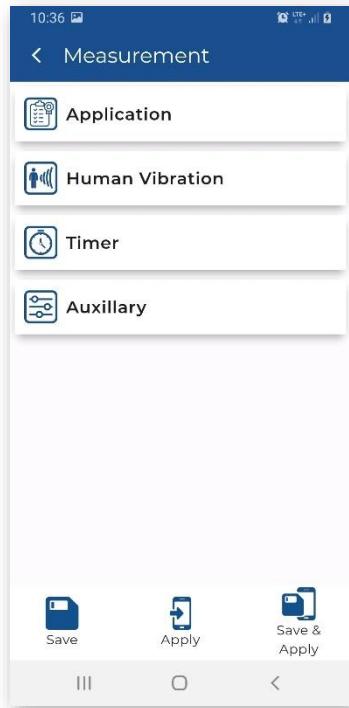
In the case of the *User* standard, three **Curve** sections appear in the main menu, allowing you to define/edit your own criterion curves.



4.6.1 Measurement settings – Measurement

The **Measurement** section allows you to configure measurement parameters and contains tree subsections:

- **Application** – to select the application standard and other associated parameters,
- **Human Vibration** – to define weighting filters for VDV measurements,
- **Timer** – to programme the instrument's internal timer to start measurements at the desired time,
- **Auxiliary** – to set some auxiliary settings, like start synchronisation and reference levels.

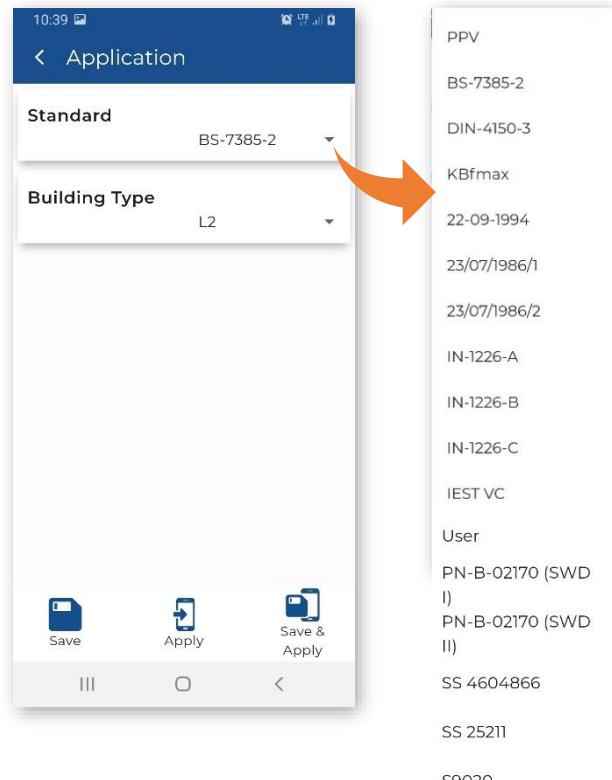


4.6.1.1 Standard settings – Application

In the **Standard** field, you can select 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*, *PN-B-02170 (SWD-I)*, *PN-B-02170 (SWD-II)*, *SS 4604866*, *SS 25211*, *S 9020*, *SBR-A* or *User*.

The content of the **Application** sub-section depends on the selected standard and may include the following settings:

- **Building Type** – for the *BS-7385-2*, *DIN-4150-3*, *22/09/1994*, *23/07/1986/1*, *23/07/1986/2*, *IN-1226-A*, *IN-1226-B*, *IN-1226-C* and *IEST VC* standards,
- **Vibration Type** – for the *DIN-4150-3* standard,
- **Band** – for the *PPV*, *DIN-4150-3*, *KBfmax* and *User* standards,
- **Spectrum** – for the *User* standard,
- **Curve x** – for the *PN-B-02170 (SWD-I)*, *PN-B-02170 (SWD-II)* standards.



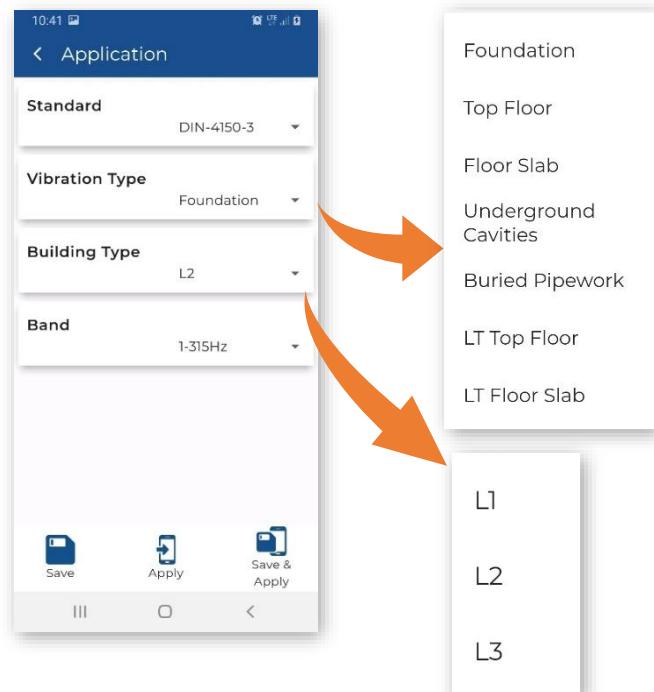
Building Type defines the criterion curve for most standards: **L1**, **L2**, etc.

Vibration Type defines the building element 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 the settings depends on the selected standard.

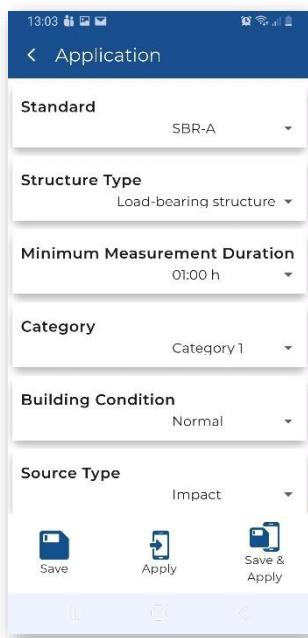
For example, the *IEST VC* method uses specific criterion curves for the special building types: *Workshop*, *Office*, *Residential*, *Theatre*, *VC-A*, *VC-B*, *VC-C*, *VC-D* and *VC-E*.

The **Band** item allows you to select a band: *1-80Hz* or *1-315Hz*.

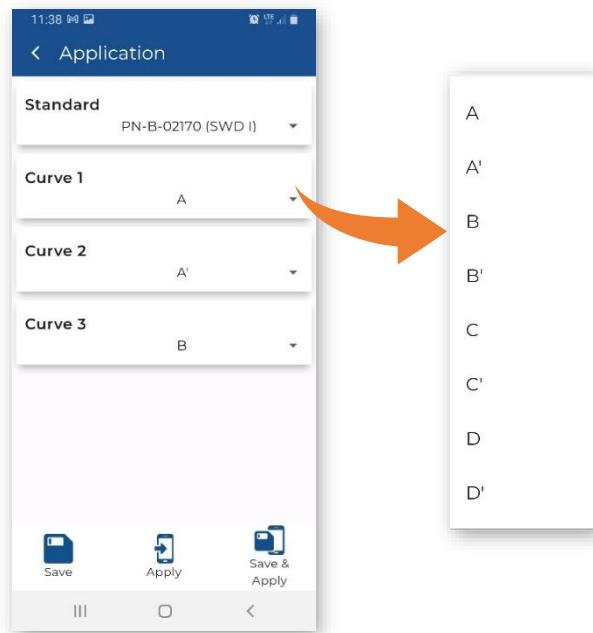


The **SBR-A** standard sets vibration limits to prevent structural damage, and these limits depend on:

- **Structure Type:** *Load-bearing structure on the ground floor, Top floor or Non-load-bearing elements* (such as facades or partition walls) or *Vibration-sensitive foundations*.
- **Minimum Measurement Duration:** $1 \text{ m} \div 336 \text{ h}$.
- **Building Category:** *Category 1* or *Category 2*.
- **Building Condition:** *Normal* or *Sensitive*.
- **Vibration Source Type:** *Impact, Periodic or Continuous*.
- **Measurement Type:** *Indicative, Limited or Extensive*.



The **Curve x** item allows you to select a type of a curve used in the *PN-B-02170 (SWD-I)* and *PN-B-02170 (SWD-II)* standards: *A, A', B, B', C, C', D or D'*.



The table below describes the application methods/standards used:

Standard / Method	Reference	Filtering	Method
PPV	DIN-4150-3 Part 3: Effects of vibration on structures	DIN 80 DIN 315 bandpass	Measurement of unweighted PPV without frequency analysis
BS-7385-2	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

DIN-4150-3	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
KBfmax	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
22/091994	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
23/07/1986/1	French regulation text of 23 rd of July 1986. «classified installations» FRENCH-A CONTINOUS	VEL 1 Unweighted	Measurement of unweighted PPV and its dominant frequency based on FFT analysis in the frequency band 4-100 Hz
23/07/1986/2	French regulation text of 23 rd 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
IN-1226-A	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
IN-1226-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
IN-1226-C	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
IEST VC	IEST American Vibration Criteria For Facilities With Sensitive Equipment	VEL 1 Unweighted	Measurement of unweighted velocity signal in 1/3 octave RMS spectra
User	User defined criteria	VEL 1 DIN 80 DIN 315	User defined method based on PPV and FFT or 1/3 octave velocity spectra
PN-B-02170 (SWD-I)	Polish standard PN-B-02170 "Ocena szkodliwości drgań przekazywanych na podłoże przez budynki, SWD-I"	1/3 octaves	Curves A, A', B, B', C, C', D, D' defined in SWD-I for small buildings
PN-B-02170 (SWD-II)	Polish standard PN-B-02170 "Ocena szkodliwości drgań przekazywanych na podłoże przez budynki, SWD-II"	1/3 octaves	Curves A, A', B, B', C, C', D, D' defined in SWD-I for big buildings
SS4604866: 2011	Swedish standard SS 4604866:2011	VEL 1	FFT based, no alarms for curves
SS25211	Swedish standard SS 25211	VEL 1	FFT based, no alarms for curves
S 9020	Austrian standard S 9020	DIN 315	FFT based, alarms for curves
SBR-A	Dutch standard SBR-A:2017	DIN 80	Measurement of unweighted PPV and its dominant frequency based on FFT analysis and curve

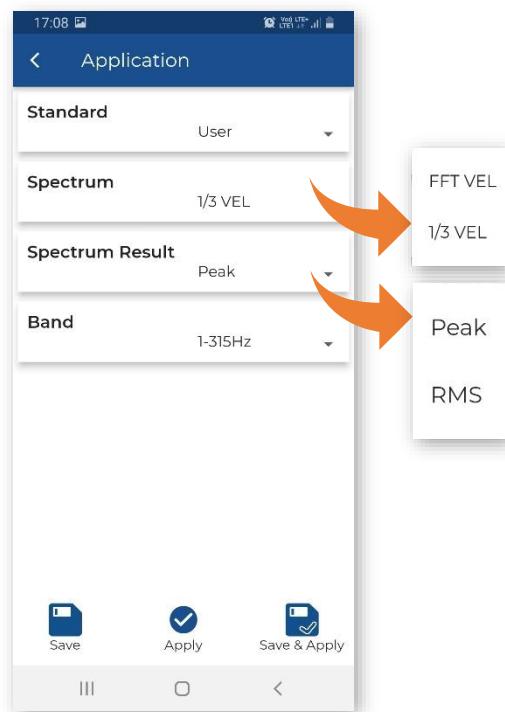


Note: The exponential RMS detector is used to calculate the Max value (125ms time constant) for all standards for the velocity vibration. The RMS values are calculated directly from the measured signal. For the KBfmax standard, the KBF result is calculated, which is the RMS based result with the exponential detector (125ms time constant). The measured values and the formulas for them are presented in Appendix D.

If you don't find the application method in the **Standard** list, you can customise 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.

To do this, select **User** in the **Standard** list and define **Spectrum: FFT VEL or 1/3 VEL**.

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

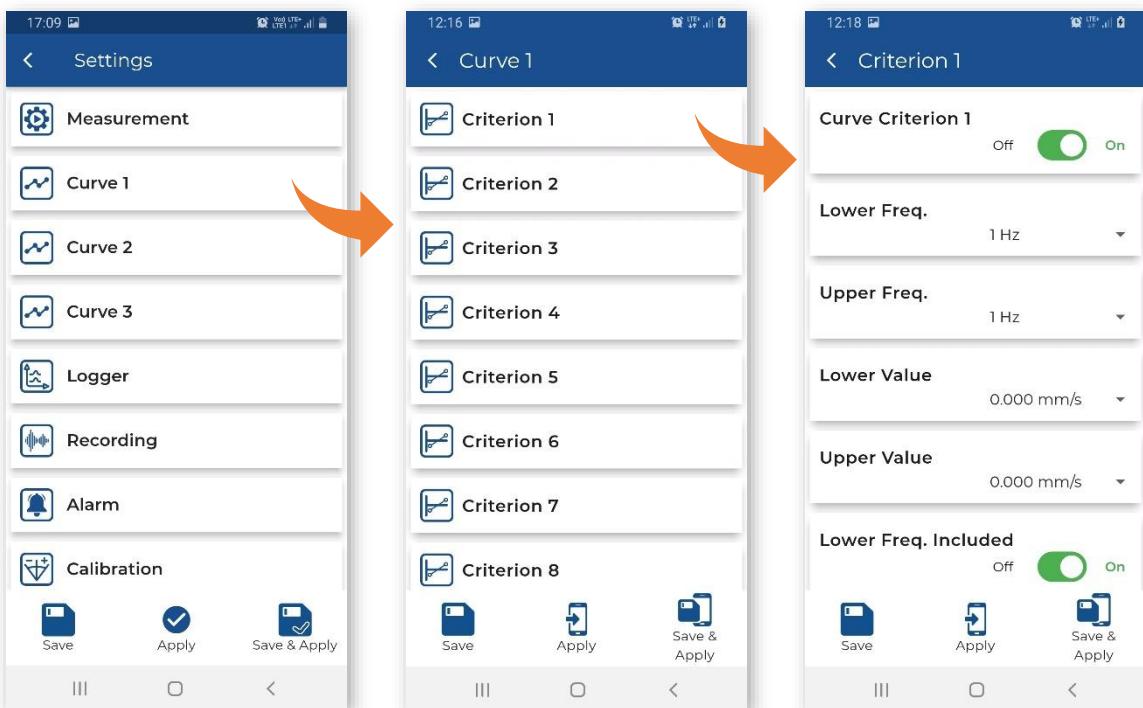


Note: The FFT spectrum parameters for all methods using FFT analysis are set by default as follows: power spectrum - 411 lines, time window – Hanning.

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

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

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

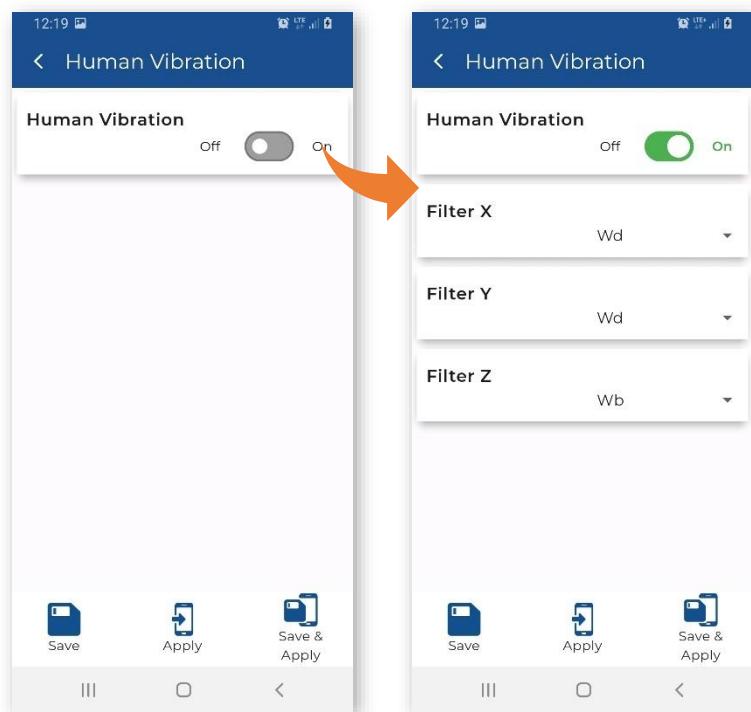


4.6.1.2 Human vibration measurements – Human Vibration

The instrument can measure acceleration vibration in parallel with the velocity vibration, allowing MAX, RMS and VDV results to be measured with different steps. The instrument has built-in weighting filters according to ISO 2631-1 and ISO 2631-2 and BS 6472-1.

The **Human Vibration** section allows you to enable/disable the human vibration measurements (acceleration vibration results).

When the **Human Vibration** option is enabled, you can set the weighting filters for the three channels: X (W_d or W_m), Y (W_d or W_m) and Z (W_b or W_m).



Note: The exponential RMS detector (1s time constant) is used to calculate the Max values for the acceleration vibration. The RMS values are calculated directly from the measured signal. The measured values and the formulas for them are presented in Appendix D.

4.6.1.3 Programming instrument internal timer – Timer

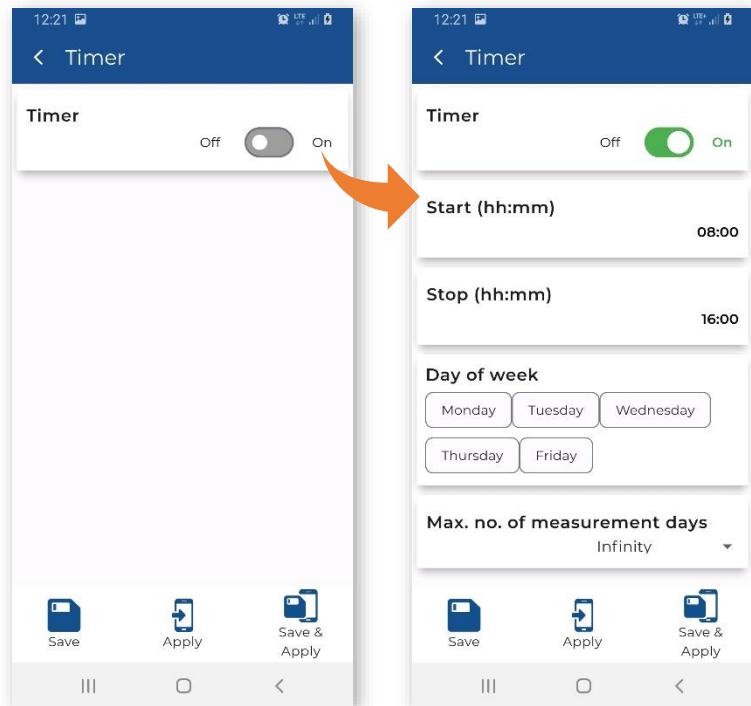
The **Timer** function is used to program the automatic start and stop of the measurement. When the instrument is switched off, the timer switches it on, then starts the measurement and switches it off when the measurement has finished.

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

The timer operates on the days of the week set in the **Day of week**.

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

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



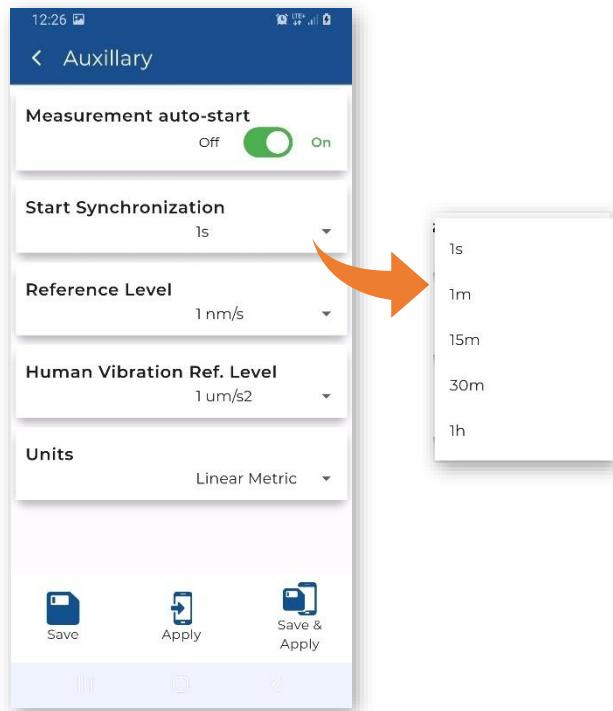
4.6.1.4 Auxiliary settings – Auxiliary

The **Auxiliary** section allows you to:

- Switch on the automatic measurement start after turning the instrument on,
- Define the points of synchronisation of the measurements with the RTC of the instrument. This parameter can be set to **1s, 1m, 15m, 30m** and **1h**.

For example, if **1h** is selected, the measurement will start from the beginning of the first second of the next hour after the Start command is sent and will be repeated from the first second of the next hour after the integration period has elapsed if the number of cycles is greater than one.

- Check the reference levels for the velocity and acceleration vibration.
- Select the vibration units: **Linear Metric** or **Linear Non-Metric**.



4.6.2 Configuring data storage – Logger

The **Logger** section allows you to configure the way in which the measurement results are stored in files.

The instrument performs measurements of velocity vibration (according to the selected standard) and acceleration vibration (if activated in the **Human Vibration**) for measurement periods (called Steps) that can be set. Both velocity and acceleration results are stored in a “logger file”. Velocity signals can also be additionally recorded in a “wave file”.

The logger file can 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 the storage of measurement results in a logger file (**Storage Setup**) and selecting the results to be stored (**Storage Results**).



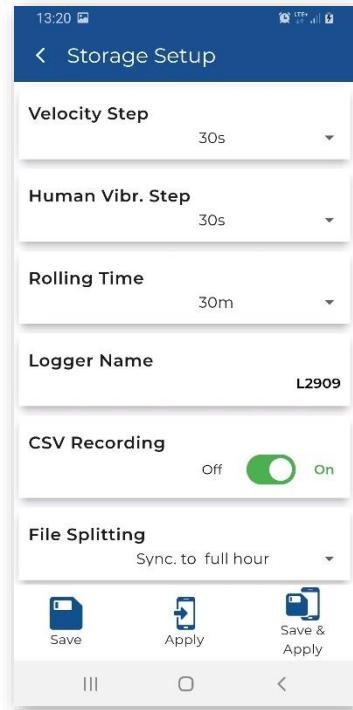
4.6.2.1 Configuring measurement results storage – Storage Setup and Storage Results

The **Storage Setup** section allows you to set:

- step for logging velocity vibration results including FFT or 1/3 octave velocity spectra (**Velocity Step**): **1s..59s, 1m..59m, 1h,**
- step for logging 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

- enable export of results logged to a logger file (except spectra) and alarms in CSV (Comma Separated Values) format (**CSV Recording**),
- write **Comment** that will be visible in *SvanPC++*.



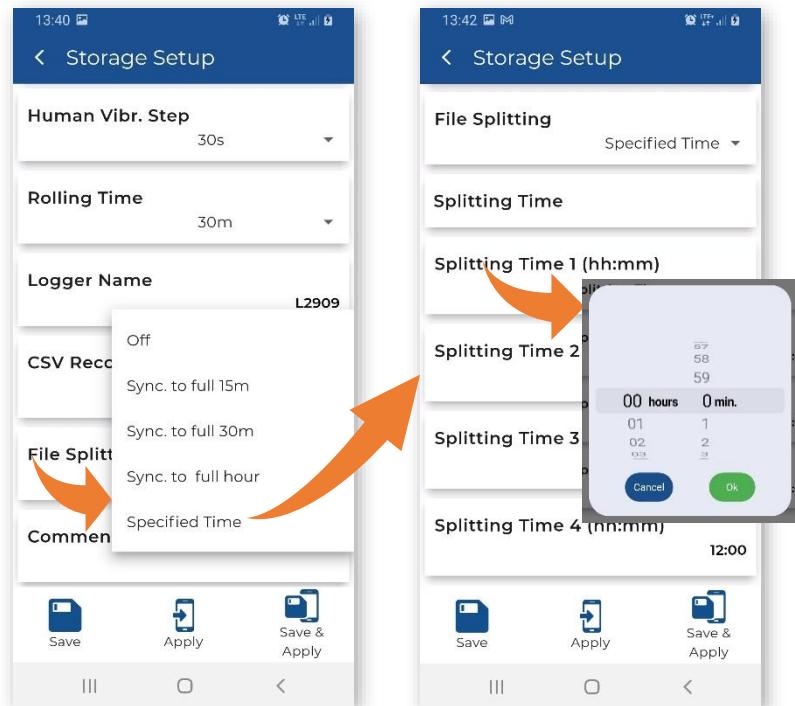
File Splitting allows splitting the logger data registration into separate files.

If it is **Off**, the measurement results are continuously recorded in one logger file with the name defined in the **Logger Name**.

In other cases, the logging is done in separate files and the logging in a new file is 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 the logging in a new file starts at the time specified by the user (**Specified Time**).

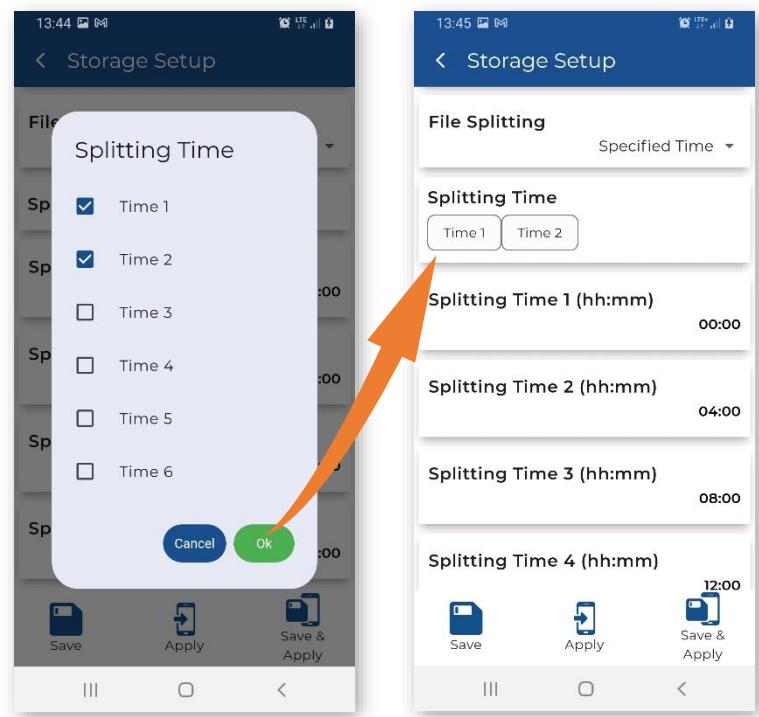
Whenever the split time is reached, the logger file is closed, and a new file is opened with a new number in the file name.

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



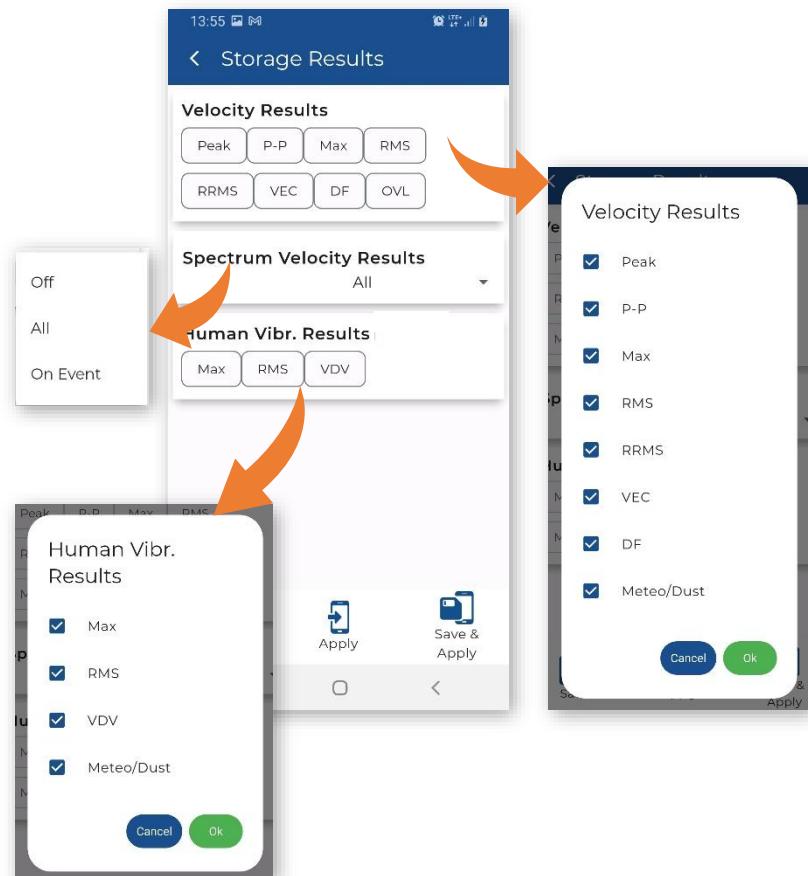
By tapping **Splitting Time**, you can check the splitting times to activate them.

After activating the splitting times and confirming with OK, the active splitting times are displayed in the **Splitting Time** bar.



The **Storage Results** section allows you to select the results for logging to the logger file:

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



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 start of the measurement (*Continuous*), or from the event trigger (*On Event*).

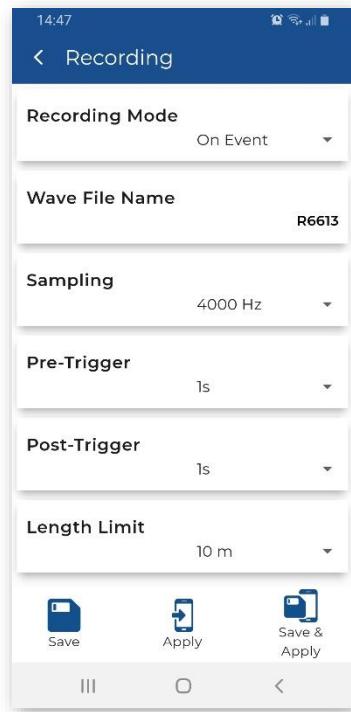
The instrument creates a WAV file in which the velocity vibration time-domain signals from three channels are recorded.

In the case of *On Event*, signals are recorded when an event occurs. The duration of such a recording is 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 by tapping on **Wave File Name**.

Wave recording settings include:

- **Sampling** frequency: 4000 Hz, 2000 Hz, 1000 Hz, 500 Hz or 250 Hz,
- pre-trigger recording (**Pre-Trigger**): Off, 1..60 (s), 1m,
- post-trigger recording (**Post-Trigger**): 0s..59s, 1m..59m, 1h..8h,
- wave file size limit (**Length Limit**): Off, 1m..59m, 1:00..8:00 h. When this limit is reached, the file is split.



4.6.3 Configuring alarms – Alarm

SV 804 can generate SMS and e-mail notifications as well as visual and audible alarms when a specific 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. The criterion curve can be moved up or down the scale so that the alarm is generated earlier or later. Event records are stored 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 and/or e-mail alarm notifications to different recipients.

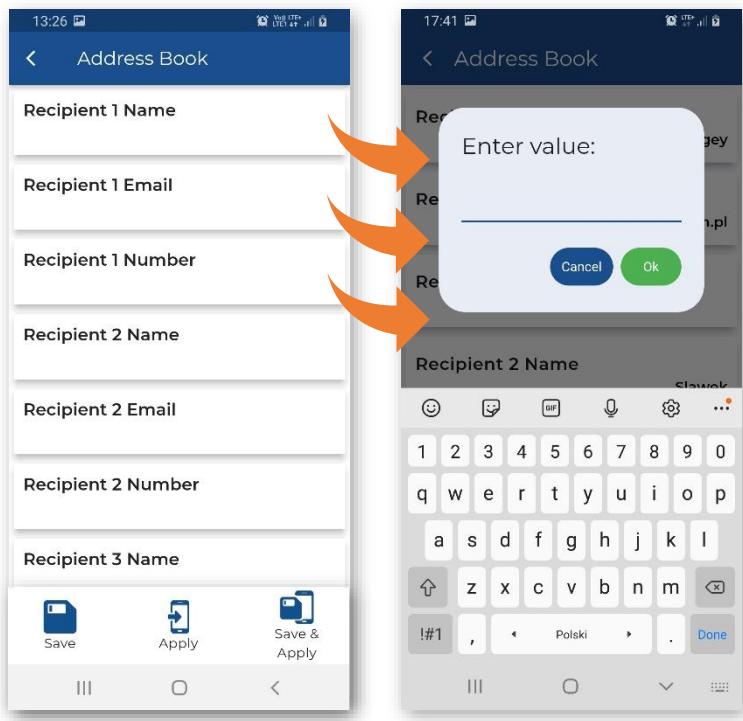
The duration of the event is configurable. When the event time has elapsed, the instrument starts analysing the data and defines the highest PPV value and, for some methods, the dominant frequency.



4.6.3.1 Alarms recipients – Address Book

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

In the **Address Book**, you can specify the recipient's name, email address and phone number.



4.6.3.2 Configuring events – Event

The **Event x** sub-section allows you to configure the event.

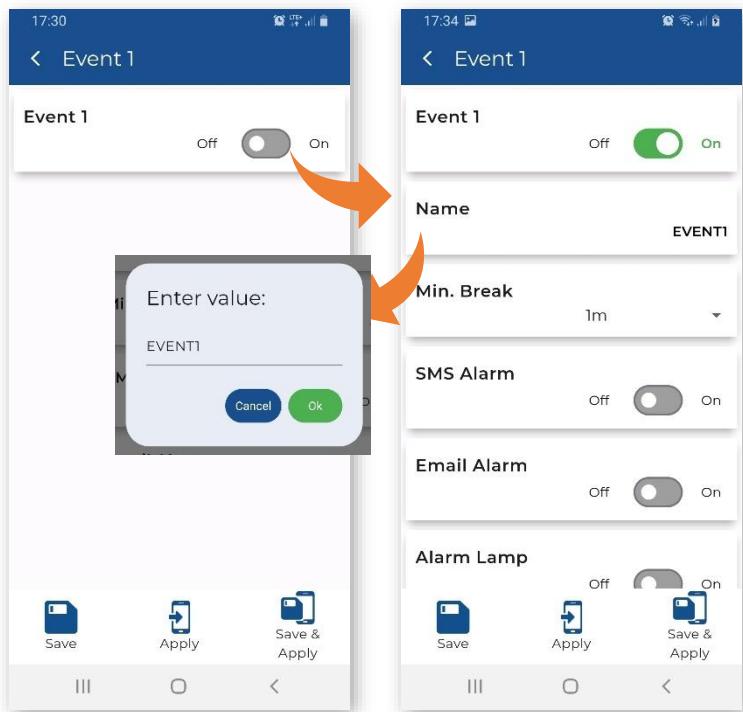
When the event is active (On), you can define its **Name**, enable specific alarms, set the trigger source, threshold level(s) and set time frames for alarms notifications.

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

Min. Break defines minimum time between SMS or email messages to limit the repetition of the same alarm messages.

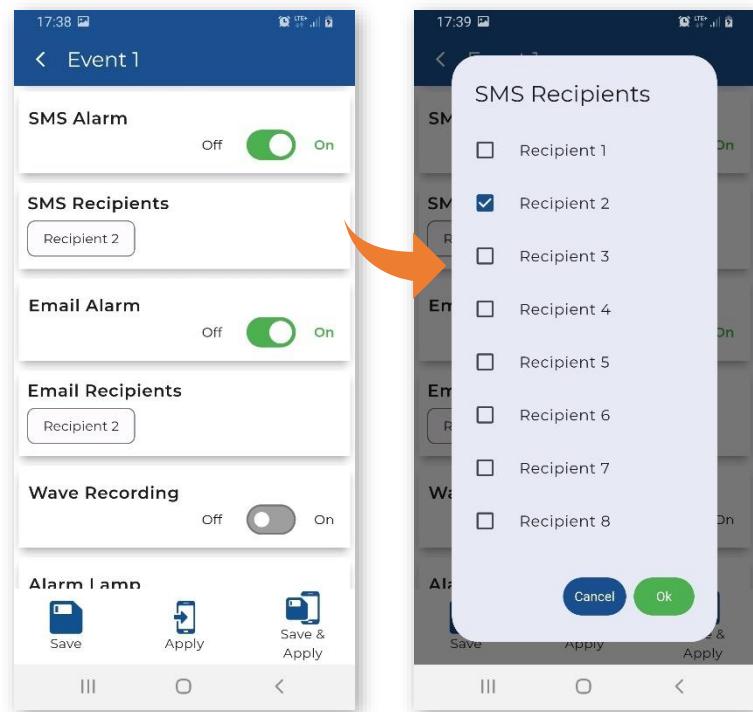
Four types of alarms can be enabled:

- **SMS Alarm** - SMS notification to the selected recipients,
- **Email Alarm** – email notification to the selected recipients,
- **Wave Recording** – recording of the input signal to the wave 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** item(s) appears allowing you to select recipients from the **Address Book**.

The duration of the lamp alarm can be extended beyond the duration of the event by setting an additional **Lamp Hold Time** in the **Auxiliary** section (see Chapter [4.6.5.1](#)).



The settings of some parameters depend on the selected standard/method.

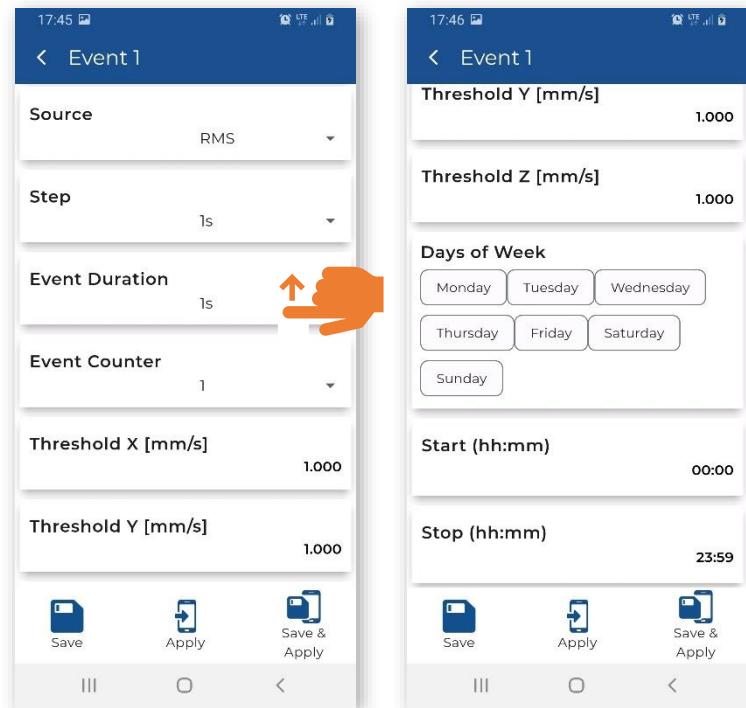
As the **Source** of the event trigger, you can select: *System*, *PPV*, *RMS*, *RRMS* (Rolling RMS), *Vector PPV* which will be compared with the threshold level(s) or select the building type criterion curve (*Curve*) to be checked for exceedance.

If *RMS* is selected as the source, the **Step** with which the RMS result is integrated can be selected (*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 building type is used as an event trigger, the PPV at its dominant frequency is compared with the curve multiplied by the **Reduction Factor** in the range: *0.001*, *0.01*, *0.1* ÷ *1.9*. The event is triggered when the PPV value exceeds the limit of the curve.



The **Event Duration** item allows you to set the duration of the Event from its start. For this period, the instrument defines the maximum PPV values and the dominant frequencies for the X, Y and Z axes.

In the **Event Counter** item, which appears for the specified **Source** (RMS, RRMS, PPV, Vector), you can select a number of conditions to be met before the event and alarms are triggered.

If **Event Counter >1**, the **Event Counter Mode** item appears, allowing you to select the way in which events are counted (*Consecutive* or *Periodical*):

- In the case of the *Consecutive* option, an event will occur when a trigger condition occurs **Event Counter** times in succession.
- In the case of the *Periodical* option, an event will occur when 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*.

Event Duration	5s	▼
Event Counter	2	▼
Event Counter Mode	Periodical	▼
Event Counter Period	Velocity Step	▼

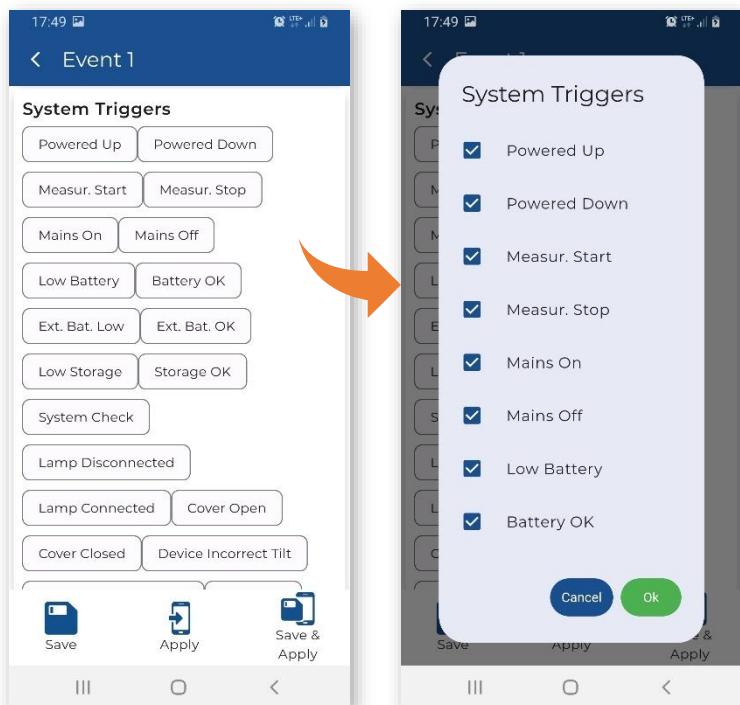
The **Days of Week** item allows you to select the days of the week, and the **Start (hh:mm)** and **Stop (hh:mm)** items allow you to define the time frame in which alarms are generated.

Days of Week	Monday	Tuesday	Wednesday
	Thursday	Friday	Saturday
	Sunday		
Start (hh:mm)	00:00		
Stop (hh:mm)	00:00		

If **System** is selected as the **Source**, the **System Triggers** bar will appear allowing you to select the system event that will trigger the alarm(s):

- **Powered Up** - instrument power up
- **Powered Down** – instrument power down (SMS or email will be sent just before power down)
- **Measur. Start** – start of the measurement
- **Measur. Stop** – stop of the measurement
- **Mains On** – detection of external power supply
- **Mains Off** – external power disconnect detection
- **Low Battery** – low battery condition; the alarm is generated when a low battery condition is detected and when the low battery condition disappears (when it is recharged).

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 power is disconnected; 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** – low memory (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 storage 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** – the alarm lamp is connected; the alarm is generated after the **Lamp Disconnected** alarm
- **Cover Open** – opening of the instrument lid; the alarm is generated when the lid is opened
- **Cover Closed** – closing of the instrument lid; the alarm is generated after the **Cover Open** alarm
- **Device Incorrect Tilt** – vertical position; the alarm is generated when the instrument is tilted more than a few degrees from vertical
- **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 error:
 - RTC error; the alarm is generated when the RTC reset is detected or when the GPS time differs from the instrument time by more than 1 minute
 - SD card error; the alarm is generated when there is an SD card error
 - battery error; the alarm is generated when the temperature of the battery pack is above 68°C or when there is no communication with the battery pack.
- **Location** – movement of the instrument detected (based on GPS data) by more than 1.5" (geographic seconds, about 30 metres in Poland)
- **FTP Push / FTP Pull** – Push or Pull error. An error and alarm is reported if multiple transmission attempts fail.

The table below summarises the event parameters displayed on the **Event** list when **Event** is On:

Parameter	Value	Presence	Description	Additional ¹ logging results for the event duration
Name		always	event name given by the user	
Min. Break		always	minimum time interval between consecutive E-mail / SMS alarms notifications	

¹ 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 time of Peak and optionally the 1/3 Octave spectra for the event/alarm period.

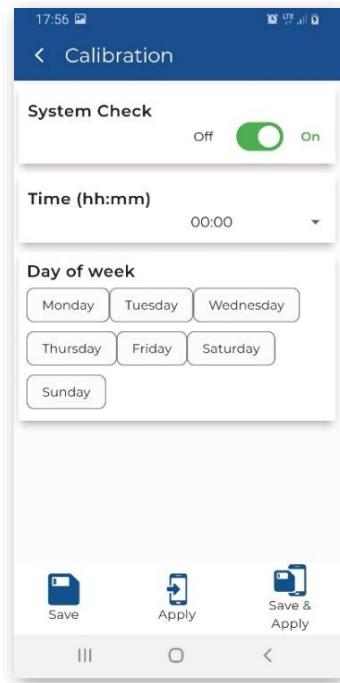
Source	Vector PPV	always	triggering after exceeding the threshold level by the 1s PPV vector	Vector PPV
	PPV	always	triggering when 1s PPV in any axis exceeds the threshold level	
	RMS	always	triggering when RMS exceeds the threshold level	RMS
	RRMS	always	triggering when RRMS exceeds the threshold level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

4.6.4 System checking – Calibration

SV 804 has a special mechanism for testing the measurement chain, called the system check, by triggering an electronic pulse and then evaluating the response of the sensor signal.

The **Calibration** section allows you to enable the system check and set the time and days of the week when the instrument will be performing the system check.

If the system check indicates an error, the information is displayed in the *SvanNET* web service.



4.6.5 Configuring instrument parameters – Instrument

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

4.6.5.1 Auxiliary settings – Auxiliary

The **Auxiliary** section allows you to:

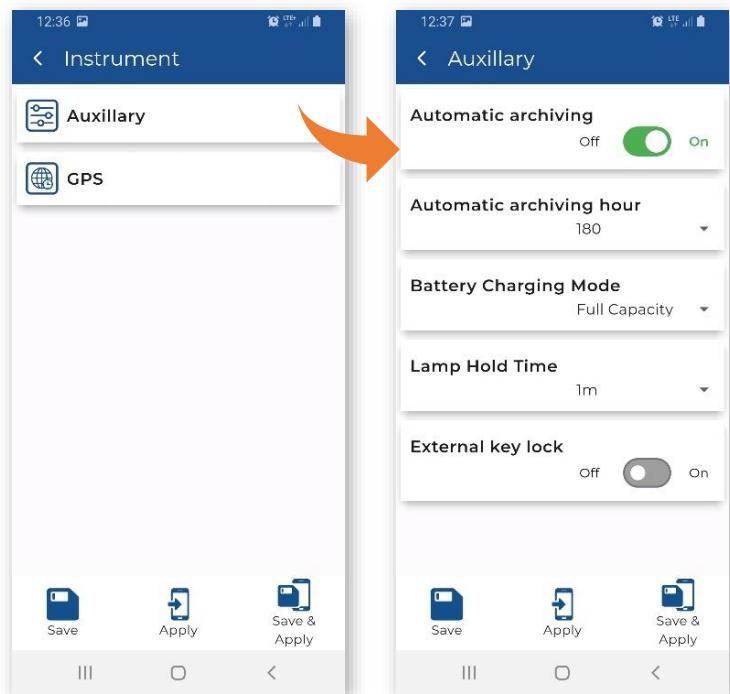
- Activate the **Automatic archiving** mode and set the **Automatic archiving hour**.

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

- Select 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.

- Select **Lamp Hold Time** – additional time for the lamp alarm after the event stop (see Chapter [4.6.3.2](#)).
- Switch on/off the **External key lock**.

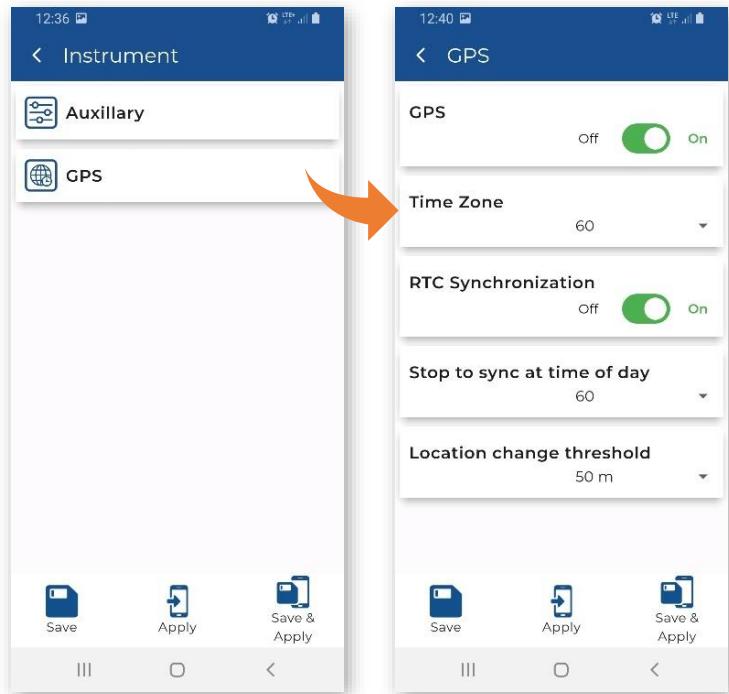


4.6.5.2 Configuring internal GPS – GPS

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

If **RTC Synchronization** is **On**, the **Stop to sync at time of day** item allowing you to program the time of the measurement stop before synchronisation,

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



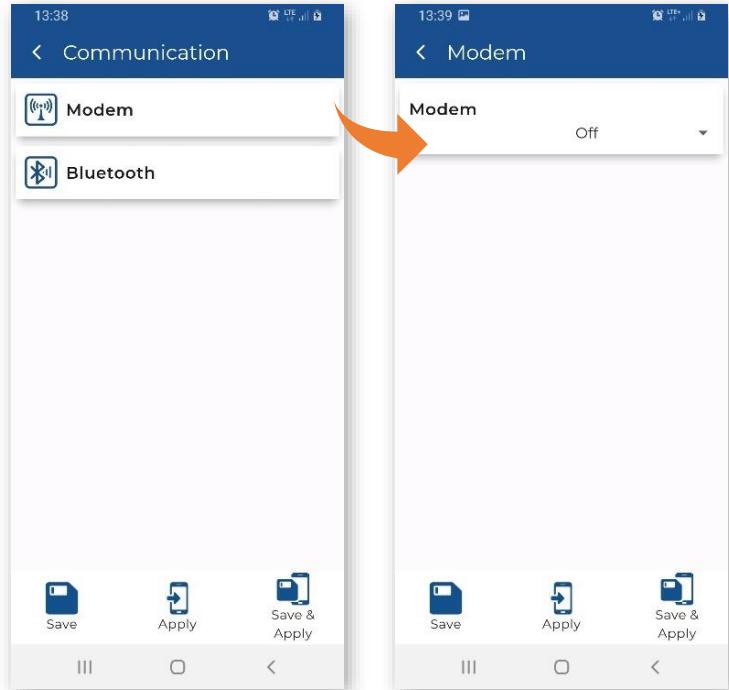
4.6.6 Configuring remote communication – Communication

The **Communication** section allows you to set communication via the 4G modem and Bluetooth.

4.6.6.1 Configuring 4G modem – Modem

In the **Modem** subsection, you can switch **Off** the 4G modem or select its mode (**Modem**): *Continuous* or *Periodically active*.

When the modem is switched on, you can set the **Connection Type** and **FTP** settings in additional subsections.

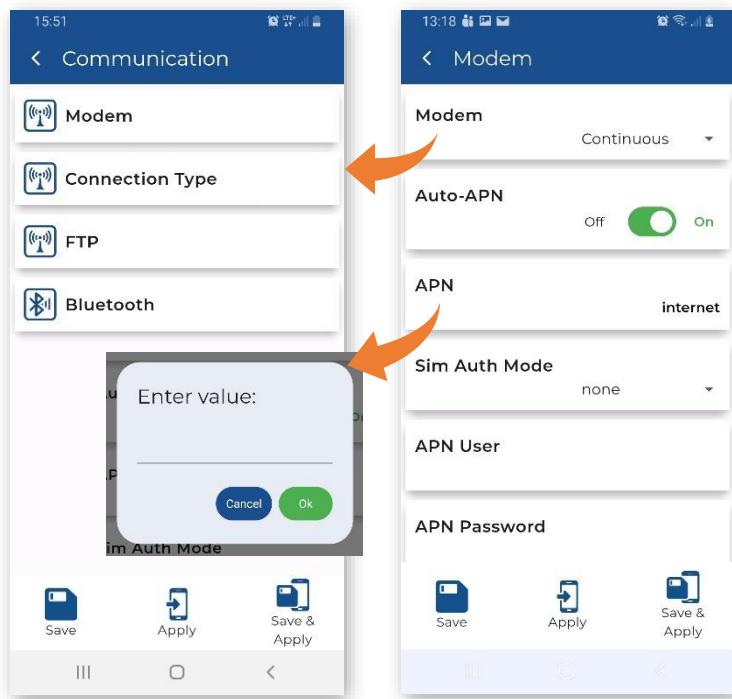


In **Continuous** mode, the modem is active all the time. However, this mode is energy-intensive and if the continuous data transfer is not required, it is recommended to use the **Periodically active** mode, which ensures low energy consumption.

In the **Periodically active** mode, you can set the **Connection Period** during which the 4G modem is in sleep mode.

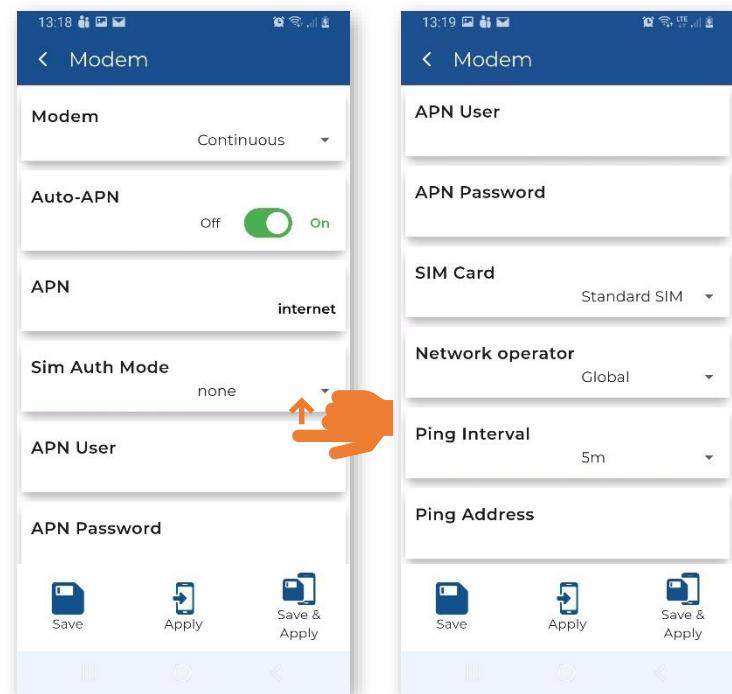
The modem will go into sleep mode immediately after the settings have been applied and will be woken up either when the period expires or when the event occurs.

When the modem wakes up, it automatically connects to *SvanNET* and *SvanNET* takes control of the device, downloads data and finally puts the modem into sleep mode. And so on.



In the **Modem** sub-section, you can:

- select the type of **Antenna (Build-in)**,
- switch on/off the automatic APN naming (**Auto-APN**),
- enter the **APN** name of the SIM card,
- select the method of user verification by the SIM card **Sim Auth Mode** (*none* or *PAP*),
- enter **APN User** login,
- enter **APN Password**,
- select the **SIM Card** type (*Standard SIM* or *Data only SIM*),
- select **Ping interval** (*Modem PING Off, 0, 1m, 2m, 3m, 4m*),
- enter **Ping address** (if Ping interval = *1m, 2m, 3m, 4m*),



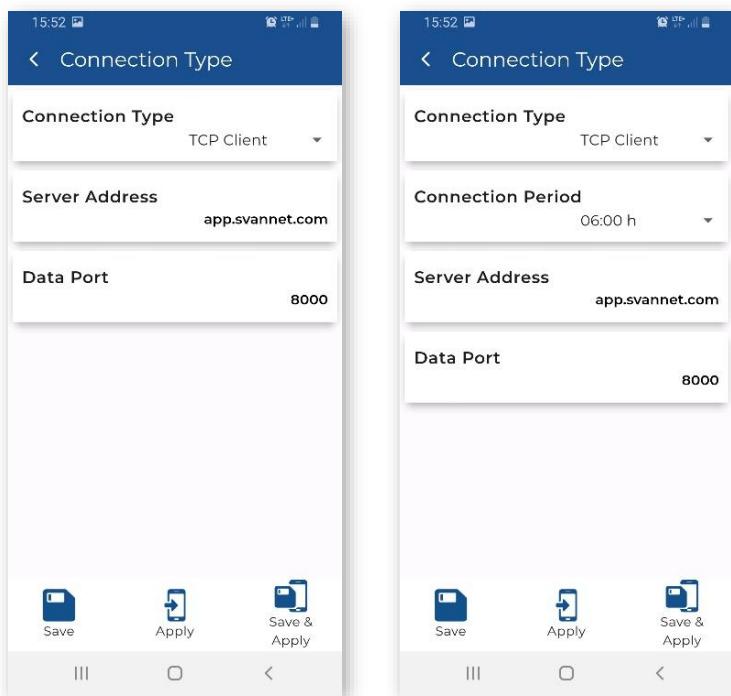
The **Ping interval** item allows you to set the length of time the system waits between ping packets. If **Ping interval** is set to *Off*, pinging will be disabled.

The **Ping address** item allows you to set the address of the ping server to be used first. If this address is not set, the instrument will use the default addresses.

In the **Connection Type** sub-section, you can:

- select the **Connection Type** (*Off*, *TCP Server*, *TCP Client* – see [Chapter 3.10.1](#)),
- enter **TCP/IP Server Address**, which is *app.svannet.com* by default.
- set the port number (**Data Port**) for data exchange between the remote host and the station.

If the *Periodically active* mode is selected in the **Modem** sub-section, you can set the **Connection Period** during which the 4G modem is in sleep mode.



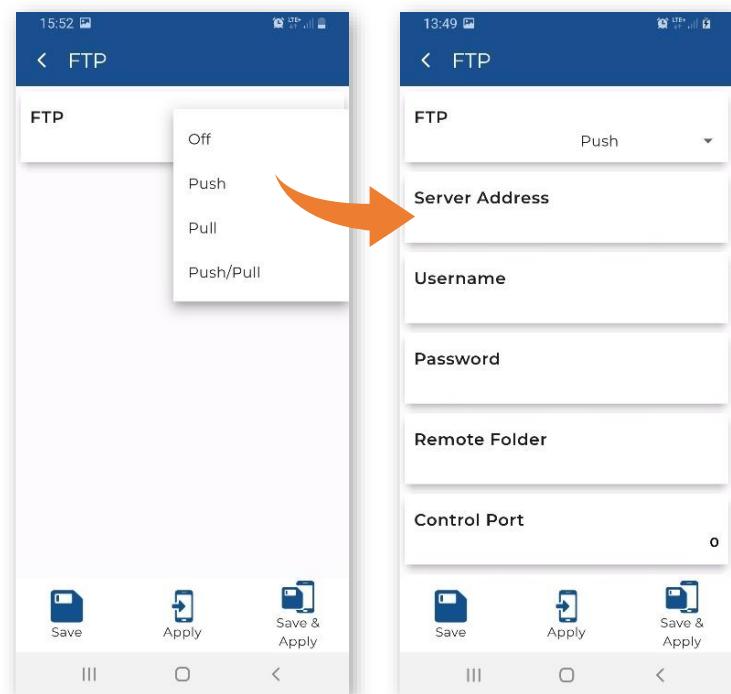
Note: The *FTP* function is optional and should be unlocked by entering the activation code (see [Chapter 4.3.3](#)).

In the **FTP** sub-section, you can:

- switch off (*Off*) or select the **FTP type** (*Push*, *Pull*, *Push/Pull*), see [Chapter 3.10.2](#).

If the **FTP type** is *Push*, you can:

- enter **FTP Server Address**,
- enter **Username**,
- enter **Password**,
- enter **Remote Folder**,
- enter **Control Port**,
- select the **Push Sectors** number (*Auto*, $0 \div 124$),
- select the **FTP Options** (*Privat IP ignoring*, *FTPS Security*, *FTP Extension*, *FTP passive mode connection*),
- select the **Push Interval** (*At the file size change*, *At logger split*, $1m \div 24h$),
- select **Push Files** (*SVL*, *CSV*, *WAVE*, *TXT*),
- select **FTP Timeout** ($10s \div 4m$).

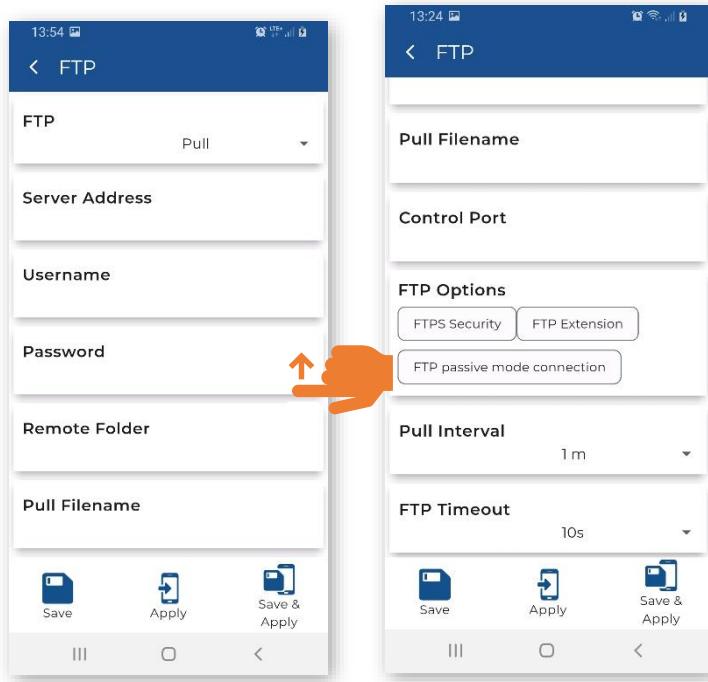


If the FTP type is *Pull*, you can:

- enter **FTP Server Address**,
- enter **Username**,
- enter **Password**,
- enter **Remote Folder**,
- enter **Pull Filename**,
- enter **Control Port**,
- switch on/off the **FTP Options** (*FTP passive mode connection, Privet IP ignoring, FTPS Security, FTP Extension*),
- select the **Pull Interval** (*After FTP push, 1m ÷ 24:00h*),
- select **FTP Timeout** (*10s ÷ 4m*).

If the FTP type is *Push/Pull*, you can set parameters for both Push and Pull.

Server Address means the location of the FTP server on the network to which you can connect to transfer files.

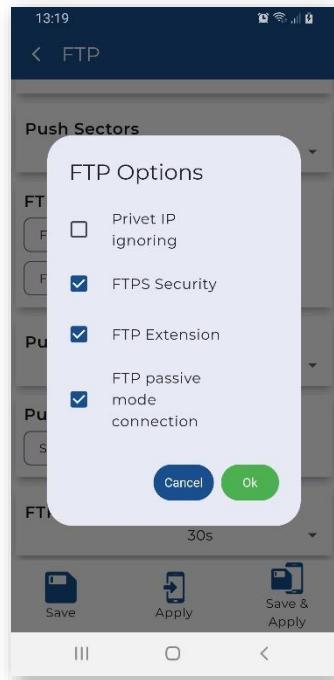


Push Interval means that files are downloaded to the server from the instrument with the interval from 1 second to 24 hours or when: the file changes its size or the logger file splits.

Pull Interval means that files are downloaded from the server to the instrument with the interval from 1 minute to 24 hours or after the FTP push is released.

FTP Options

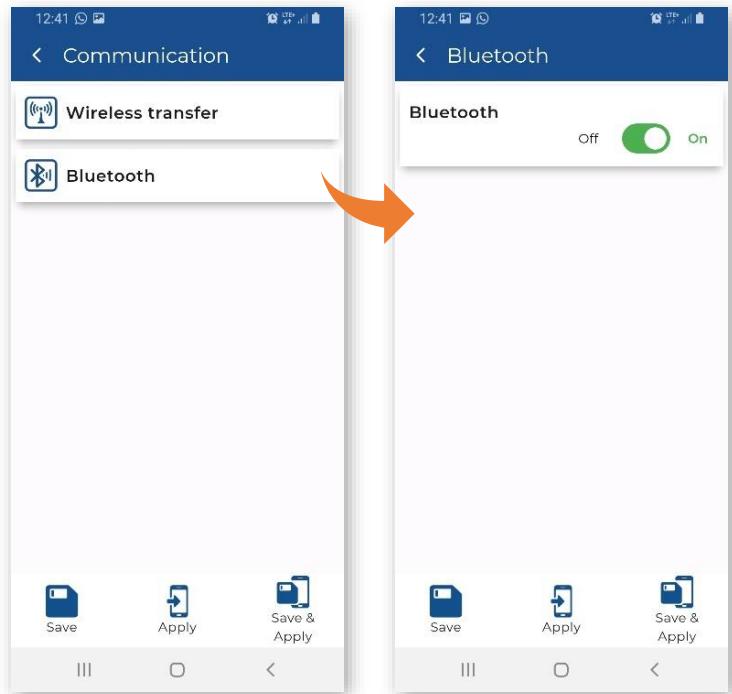
- **FTP passive mode connection**
 - If *Off*, the client establishes the command channel and the server establishes the data channel. Passive FTP provides no security for the FTP server.
 - If *On*, both the command channel and the data channel are established by the client. Active FTP provides security for the FTP server.
- **Private IP ignoring**
 - If *Off*, during a passive FTP mode, the client uses the IP address received from the server, even if it is a private IPV4 address.
 - If *On*, during a passive FTP mode, if the server sends a private IPV4 address, the client will ignore it and connect to the server using the IP address used to establish the FTP command channel.
- **FTPS Security**
 - If *Off*, all FTP commands will make plain FTP connections.
 - If *On*, the FTPS security is enabled.
- **FTP Extension**
 - If *Off*, the EPRT and EPSV commands are always used.
 - If *On*, both module and server IPV4 will use PORT and PASV commands option added to pass-through firewall that is unaware of the extended FTP commands for PUT, LIST, APP, GET.



4.6.6.2 Turning on Bluetooth – Bluetooth

The low energy Bluetooth module is normally turned on, but if you are not using it, we recommend that you turn it off.

Bluetooth can be turned on by pressing and holding the  button for 5 seconds.

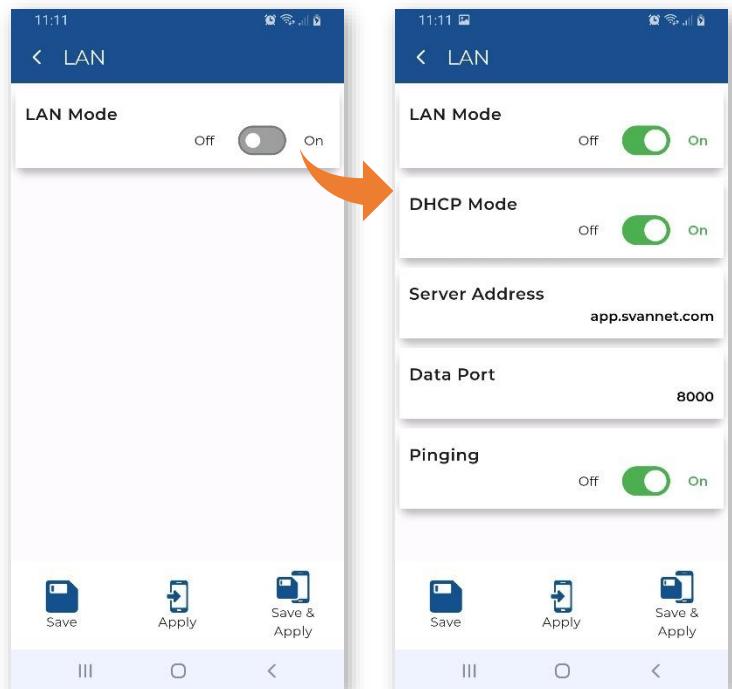


4.6.7 Configuring LAN settings – LAN

If you use the SP 80 LAN PoE interface (see Chapter [2.5.1](#)), you can configure the LAN settings.

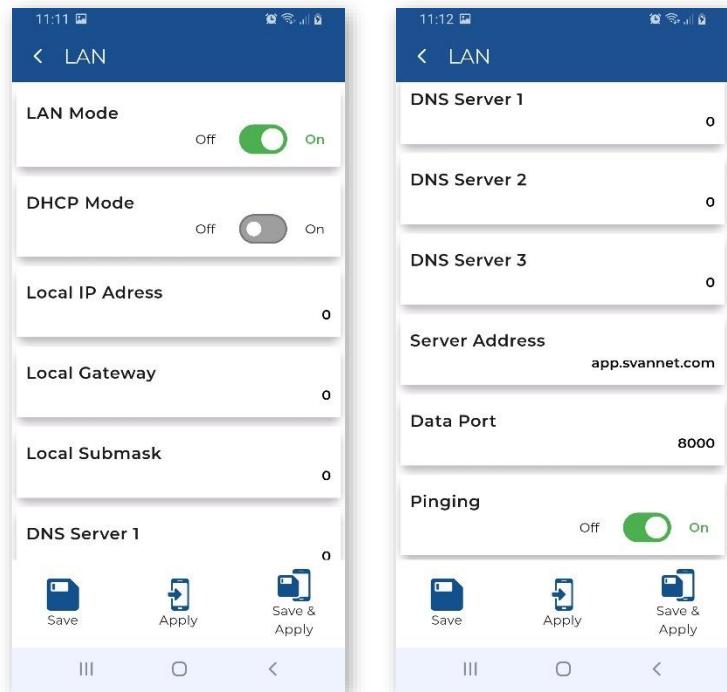
To do this, switch on **LAN Mode**.

Switch on **DHCP Mode** (Dynamic Host Configuration Protocol) to enable automatic assignment of configuration settings, primarily IP addresses.



Otherwise, set manually:

- **Local IP Address,**
- **Local Gateway,**
- **Local Submask,**
- **DNS Server 1,2,3,**
- **Server Address,**
- **Data Port.**



5 INTERNET SERVICE PLATFORM – SvanNET

The SV 804 station is designed for remote operation via *SvanNET*, the Internet service platform (web service) provided by Svantek.

The Internet connection is provided by the 4G modem of the SV 804.

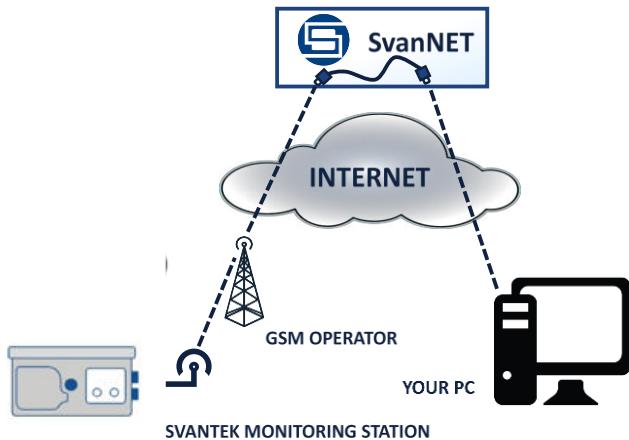
After successful configuration of the 4G modem and connection to the *SvanNET* web service, you can start working with the monitoring station remotely.

5.1 SVANNET WEB SERVICE

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

SvanNET allows the use of all types of SIM cards with the station's mobile modem regardless of whether they have a public or private IP.

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



Note: 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 804 is configured for the periodic connection to *SvanNET*. When the station is turned on, the 4G modem works for two hours and then goes into sleep mode. If you want to wake up the 4G modem, press the  button on the SV 804 keypad and after a while SV 804 will be connected to *SvanNET* again.



Note: If there is a Bluetooth connection, the station will not enter or exit sleep mode.

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

<https://www.svannet.com/>

Select your language before logging in.

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



SvanNET includes the standard function - *Remote Communication Services*, which is available to all SvanNET users, and the optional extension - *Automatic Monitoring Services*, which is offered via a licence.

Remote Communication Services maintain a remote connection to the monitoring stations and the service includes status alarms (e.g., battery, memory), remote access to station settings and measurement files, and provides a preview of current results and the latest time history graph.

Automatic Monitoring Services offers automatic control of measurement points, data sharing with other SvanNET users and 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 either be public or password protected.

You can switch between the two services using icons on the Main panel:

-  – *Automatic Monitoring Services (Project list)*
-  – *Remote Communication Services (Station list)*.

If you have the extended SvanNET package, you can use both tools. If you have the standard SvanNET package, only the Station list tool is available.



Note: For more information about all the functions of SvanNET, see *SvanNET User Manual*.

5.2 REMOTE COMMUNICATION SERVICE – STATION LIST

The **Station list** shows all the stations assigned to your account.

The station bar contains six icons indicating the status of the station:



Project status: this icon appears when this station is involved in the project. Clicking on this icon project displays the project name and a link to it.



Alert status: blue - everything is OK, red – an irregular event has happened.



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



Battery status. Clicking on this icon displays the battery status information.

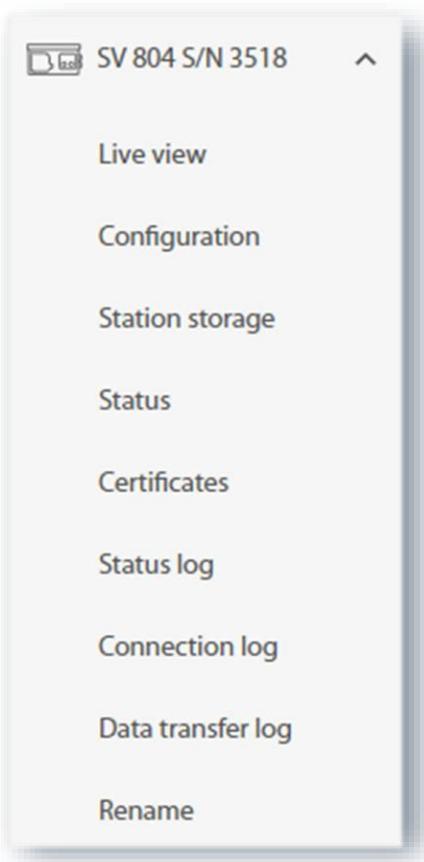


External power source status: blue – the instrument is powered by the external source, grey - there is no external power.



Memory status. Clicking this icon displays information about the available memory.

The Tool panel provides a number of functions for controlling the station. To change the function, place the cursor on the appropriate button (it will turn blue) and click.



The **Live view** button switches to the **Live data** view (see Chapter [5.3](#)), where you can view measurement results and start / stop measurements.

The **Configuration** button switches to the station **Configuration** view (see Chapter [5.4](#)), where you can configure measurement and instrument parameters.

The **Station storage** button switches to the **Station storage** view (see Chapter [5.5](#)), where you can download instrument files manually.

The **Status** button switches to the **Status** view (see Chapter [5.6](#)), where you can check the station status and configure status alarms.

The **Certificates** button opens the dialogue box that shows the available certificates for this station and allows you to add a new certificate (see Chapter [5.7](#)).

The **Status log** button switches to the **Status log** view (see Chapter [5.8](#)), where you can check the power source (type and charge level), free memory, mobile signal quality and the history of the system check.

The **Connection log** button switches to the **Connection log** view (see Chapter [5.8](#)), where you can check the history of station connections.

The **Data transfer log** button switches to the **Data transfer log** view (see Chapter [5.8](#)), where you can check the history of data transfers (uploads).

The **Rename** button allows you to set the new station name instead of the default (see Chapter [5.9](#)).

Icons in the Main panel tool allows you to:



manage user account



display alarms for all stations



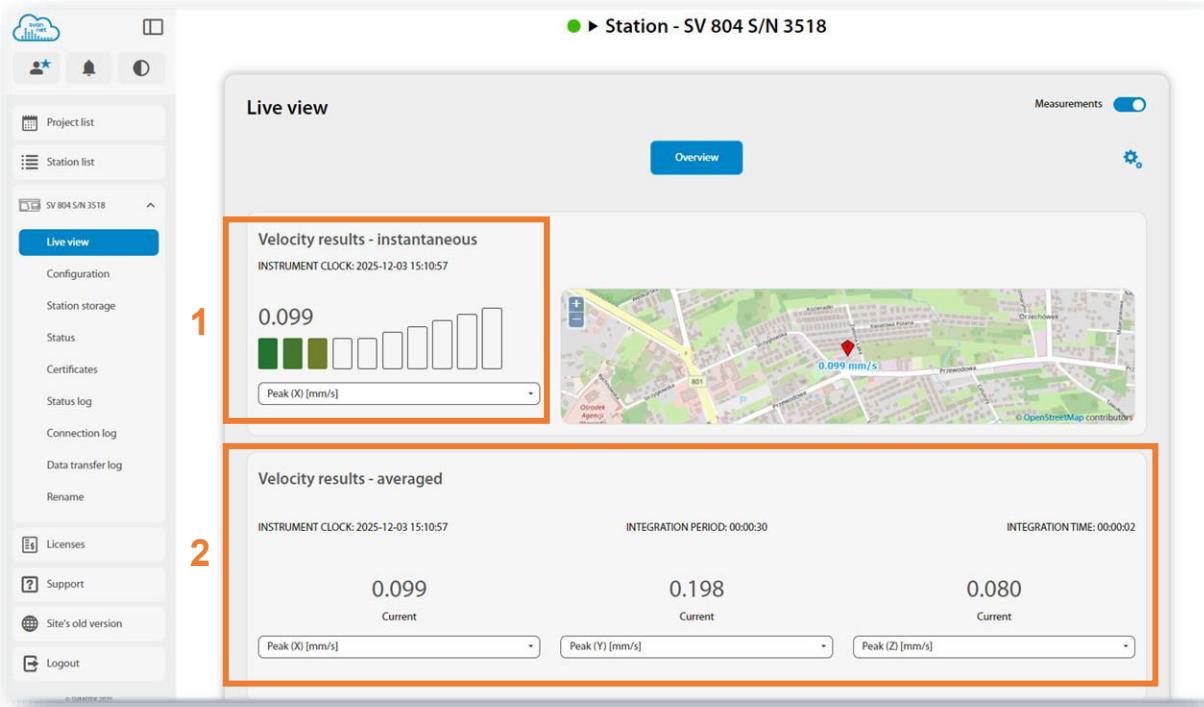
change the colour scheme of *SvanNET* from “dark” to “light”

-  activate licences
-  contact Svantek support team
-  Change to the old version of *SvanNET*.
-  Log out of *SvanNET*.

5.3 LIVE VIEW

Live view shows the map with the instrument location and the results measured in selected channels, updated every second:

1. **Velocity results - instantaneous** measured/averaged over a 1-second period; and
2. **Velocity results - averaged** measured over the **INTERGRATION TIME** in the range **[1s ÷ INTEGRATION PERIOD]**. After the INTEGRATION PERIOD has elapsed, the measurement starts again.



There are selectors for the results displayed. To change the result displayed, click the selector button for the desired channel and select the result.

5.4 CONFIGURATION VIEW

The **Configuration** view consists of several sections that allow you to configure measurement parameters (**Measurement setup**), data storage (**Storage**), measurement data export as CSV files (**CSV export**), event triggered alarms (**Event trigger**), signal recording in WAV format (**Wave recording**), automatic system check (**Calibration**), **FTP data transfer**, auxiliary parameters (**Auxiliary**) and perform **Firmware upgrade**.

To send the new configuration to the station, click the **✓ Apply settings** button.

5.4.1 Measurement setup

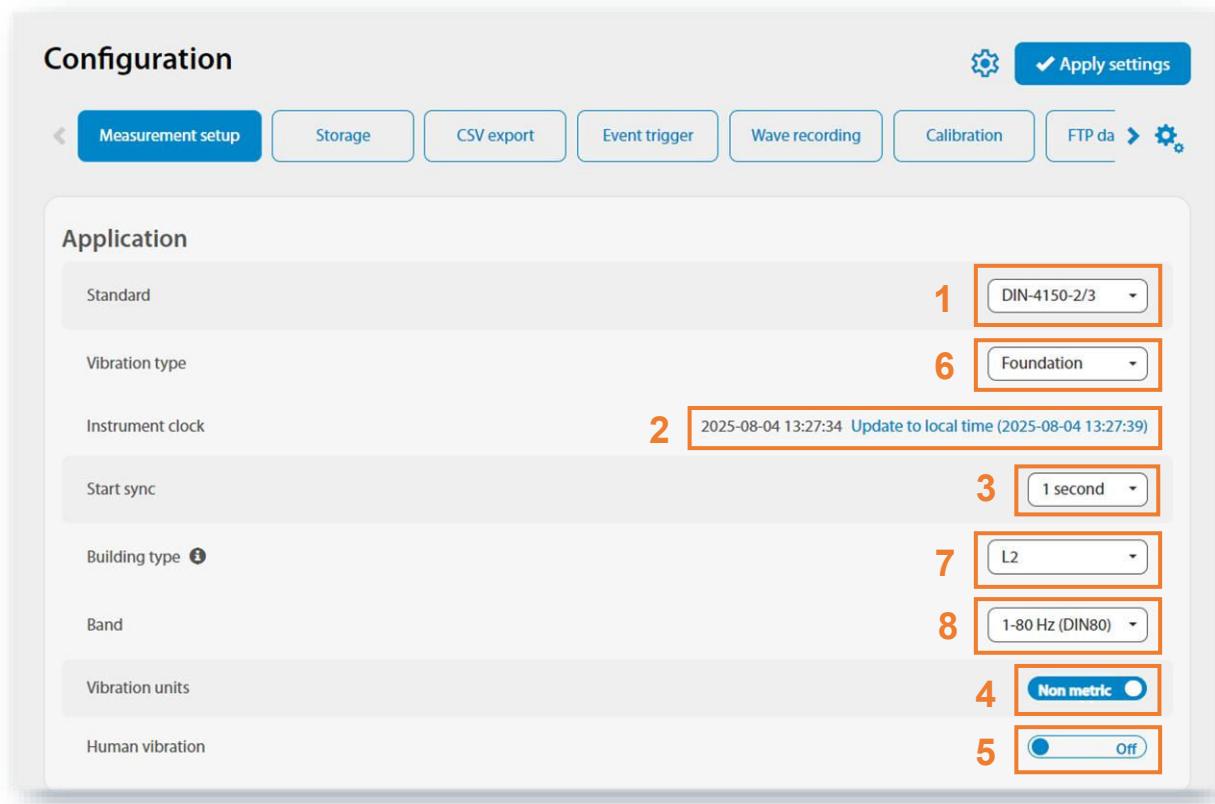
In the **Measurement setup** section, you can:

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, PN-B-02170 (SWD-I), PN-B-02170 (SWD-II), SS 4604866:2011, SS 25211, S 9020, SBR-A or User.*
2. Update the **Instrument clock**.
3. Set the synchronisation of the measurement start with the instrument's RTC to: *1 second, 1 minute, 15 minutes, 30 minutes or 1 hour.*
4. Select **Vibration units**: *Metric or Non metric.*
5. Switch on/off the **Human Vibration** measurements.

and depending on the standard:

6. Select the type of building element (**Vibration type**): *Foundation, Top floor, Floor slab, Underground cavities, Buried pipework, LT top floor, LT floor slab.*
7. Select the **Building type** criterion curve for some standards: *L1, L2 ... or Workshop, Office, Residential, Theatre, VC-A*
8. Select the measurement **Band**: *1-80 Hz or 1-315 Hz.*

For the *PN-B-02170 (SWD-I)* and *PN-B-02170 (SWD-II)* standards, you can select the type of **SWD Curve 1/2/3**: *A, A', B, B', C, C', D or D'.*



For the SBR-A standard, you can select:

- **Structure type**: *Load-bearing structure on the ground floor, Top floor or Non-load-bearing elements* (such as facades or partition walls) or *Vibration-sensitive foundations.*
- **Building Category**: *Category 1 or Category 2.*
- **Building condition**: *Normal or Sensitive.*
- **Vibration Source type**: *Impact, Periodic or Continuous.*
- **Measurement type**: *Indicative, Limited or Extensive.*
- **Minimum Measurement Duration**: *1 m ÷ 336 h.*

Application

Standard SBR-A

Instrument clock 2025-12-04 13:04:48 [Update to local time \(2025-12-04 13:04:49\)](#)

Start sync 1 second

Structure type Load-bearing structure on the ground floor

Category Category 1

Building condition Normal

Source type Impact

Measurement type Indicative

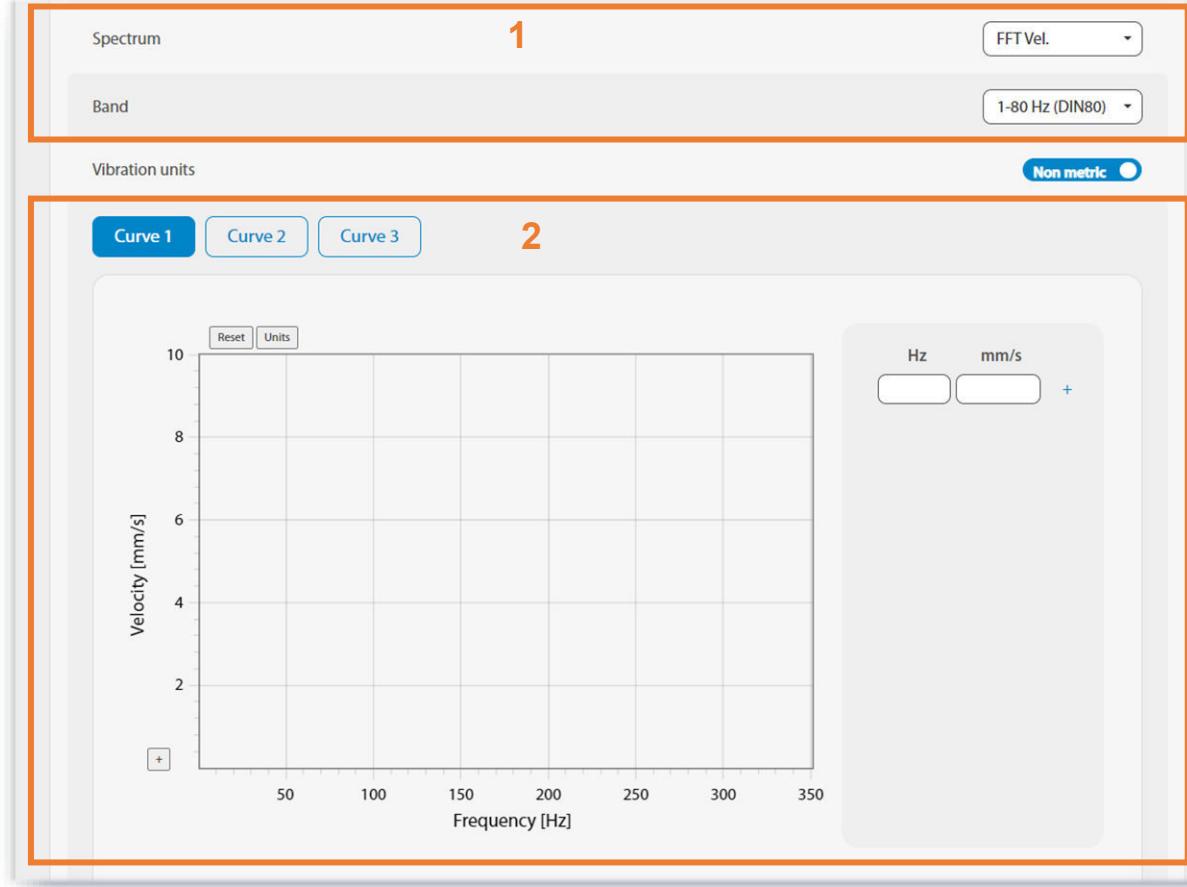
Minimum measurement duration 1 hour

Vibration units Metric

Human vibration Off

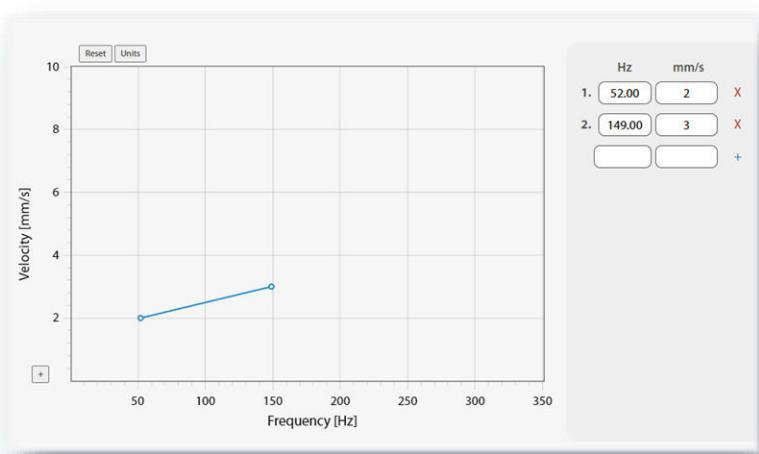
The *User* standard allows you to:

1. Use a 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.



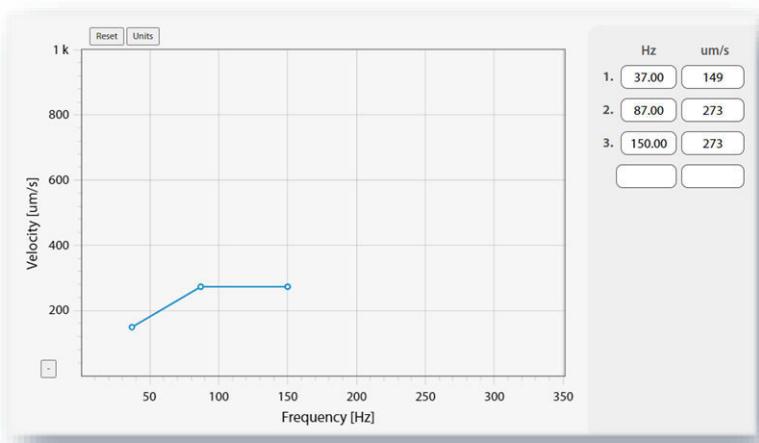
There are two ways to create a curve – using a table or a graph. Both ways complementary. First select the curve you wish to create or modify (**Curve 1, Curve 2 or Curve 3**).

If you want to use a table, enter the coordinates for the new point in the table - values in the **Hz** column and **mm/s** column. The new point will appear on the graph.



If you want to use a graph, place the cursor on the desired coordinate and click. The new point will appear on the graph and in the table.

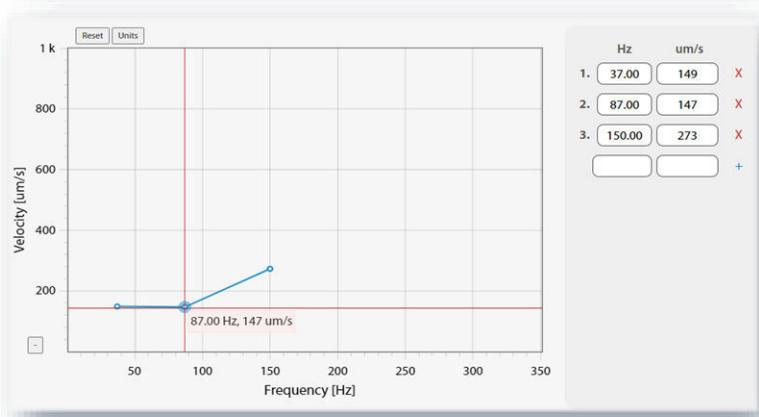
To change the Velocity scale, click on .



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

To change the **Velocity** units from **um/s** to **mm/s**, click on the **Units** button.

To reset the graph, click on the **Reset** button.



When the **Human Vibration** option is enabled, you can set the weighting filters for the three channels: X (*Wd* or *Wm*), Y (*Wd* or *Wm*) and Z (*Wb* or *Wm*).



The instrument performs two types of vibration measurement in three channels – velocity and acceleration vibration. The results of both types of measurements are stored in a logger file. Velocity signals can optionally be recorded in the WAV file.

The logger file may contain three types of records:

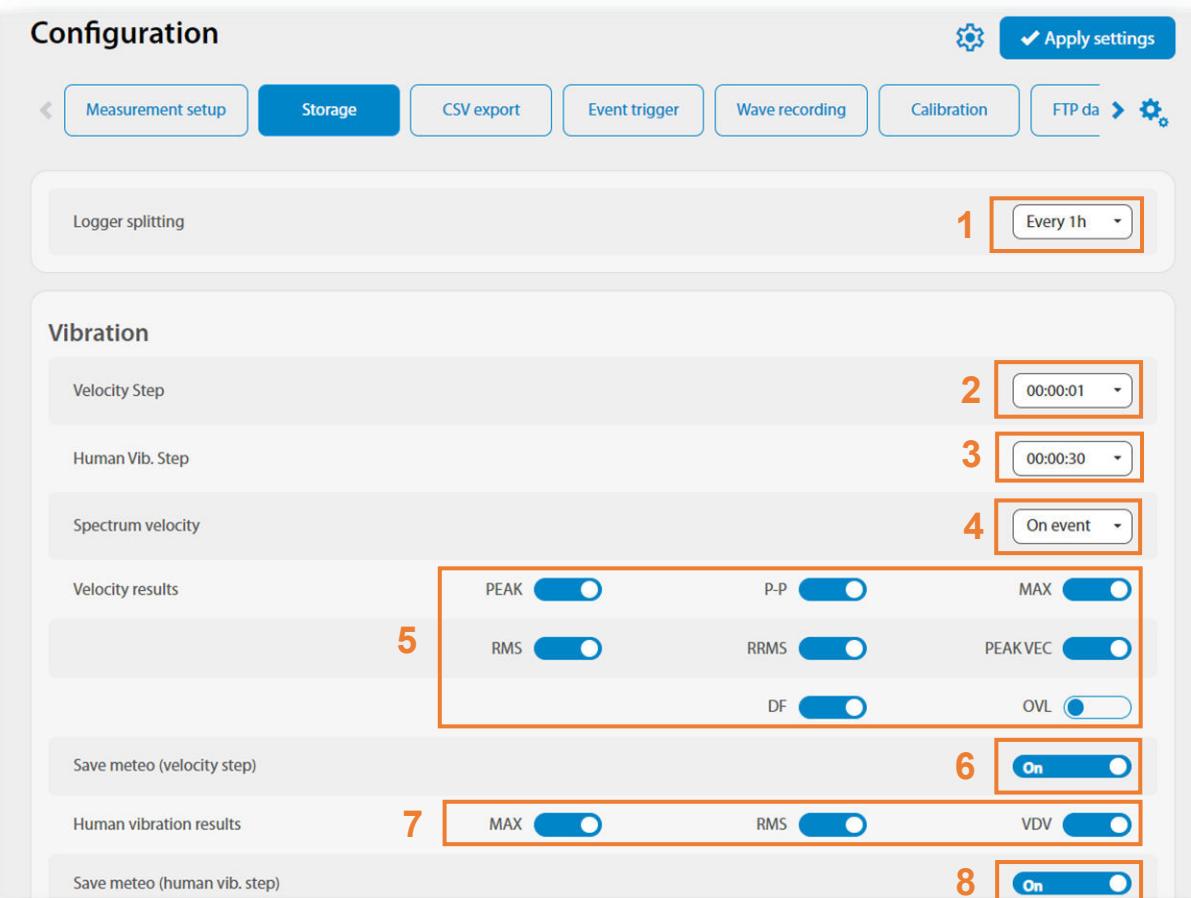
1. records of measurement results of velocity vibration for three channels made with **Velocity Step** (called Time History - TH),
2. records of measurement results of acceleration vibration for three channels made with **Human Vibration Step** (called Summary Results – SR), and
3. records of FFT velocity spectra for three channels made with **Velocity Step**.

The WAV file contains waveform signals for three channels.

5.4.2 Storage

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 registration of the Velocity results.
3. **Human Vib. step** for registration of the Acceleration results.
4. **Spectrum velocity** results recording: switched off (*Off*), continuous during the measurement (*Continuous*) or when the event is registered (*On event*).
5. **Velocity results** to be saved in a logger file with the **Velocity step**: *PEAK* (PPV), *P-P*, *MAX*, *RMS*, *RRMS* (Rolling RMS), *PEAK VEC* (PPV VEC), *DF* (Dominant Frequency) (for some standards), *OVL* (Overload).
6. Enable saving meteo results with Velocity step.
7. **Human vibration results** to be saved in a logger file with the **Human Vib. Step**: *MAX*, *RMS*, *VDV*.
8. Enable saving meteo results with Human vibration step.





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

5.4.3 CSV export

The **CSV export** section allows you to enable export of results (except spectra) and alarms that are logged to a logger file in the CSV (Comma Separated Values) format. You can select format for the date and time.

Configuration

CSV export

Enabled

Date & time formatting

Time: 12 hours

Date: ISO (YYYY-MM-DD)

5.4.4 Event trigger

The **Event trigger** section allows you to define event conditions for triggering wave recording and different alarms.

- Events are specified as a combination of superimposed **CONDITIONS** (logical AND), such as specific time intervals (**TIME CONDITION**) in which measurement thresholds are exceed or system events occur in a logical OR (**TRIGGER**), taking into account the minimum interval between SMS and email notifications (**TIME LIMITS**).
- Each event triggers specific actions (**Actions**), such as recording a block marker to the logger file (**MARKER**), recording the audio signal to the wave file (**AUDIO**), sending an SMS (**SMS ALARM**) or an email (**E-MAIL ALARM**) with the alarm notification.

Configuration

Event trigger

EVENT 1

CONDITIONS

TIME CONDITION: Whole week

TIME LIMITS: Event duration: 00:00:05, Min. SMS/E-mail break: 00:01:00

TRIGGER: RMS X >= 0.100 mm/s, Y >= 0.100 mm/s, Z >= 0.100 mm/s, Consecutive

ACTIONS

MARKER: Block

Add action

You can edit the book containing the addresses of SMS and email recipients by clicking on **Edit address book**.

When events are defined, the **Event trigger** section shows the list of events.

You can configure **CONDITIONS** and **ACTIONS** using the corresponding buttons. The settings are displayed in the row of this button.

For example, the EVENT configuration on the screen below means that the event will appear when the RMS value for one of the three axes exceeds the 0.100 mm/s threshold. The occurrence of such an event generates a block marker in the logger file.

Creating Events

To create a new event, click on **+Add event**. The new **Event** sector will appear where you can:

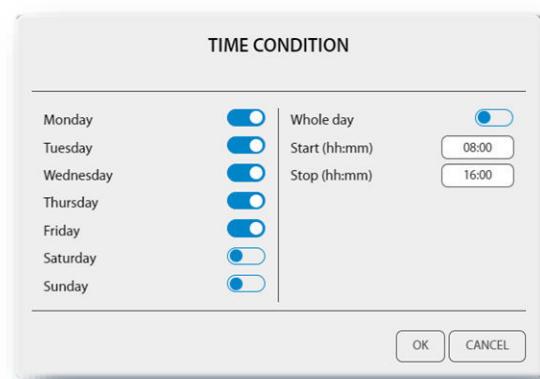
1. Rename, delete and hide the event settings.
2. Configure the **CONDITIONS** by clicking on the corresponding button (**TIME CONDITION**, **TIME LIMITS** and **TRIGGER**).
3. Add and configure the **ACTIONS**.

Configuring Conditions

Click the **TIME CONDITION** button to open the **TIME CONDITION** configuration box.

This box allows you to select days and time periods for event registration.

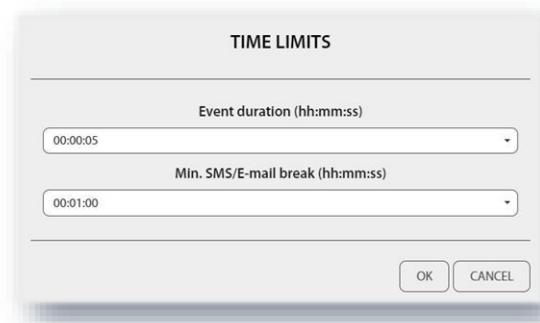
Press **OK** to confirm the settings.



Click the **TIME LIMITS** button to open the **TIME LIMITS** configuration box.

This box allows you to set the event (alarm) duration (only for the **Threshold** trigger!) and the minimum interval between consecutive SMS and/or E-mail notifications.

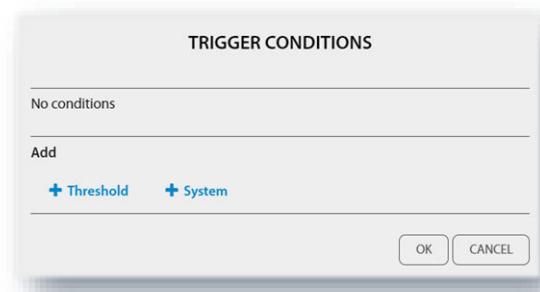
Setting **Min. SMS/E-mail break** period allows you to avoid a barrage of alarms for frequently recurring events.



Click the **TRIGGER** button to open the **TRIGGER CONDITIONS** configuration box.

This box allows you to add the type of condition: **Threshold** or **System**.

These conditions are mutually exclusive for the same event.



Threshold trigger condition

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

In the **Source** list, select the result to be compared with the threshold: *PPV*, *RMS*, *RRMS* (rolling RMS), *Vector* or *Curve*.

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

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

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

In the **Event counter** item, which appears for the specific **Source** (*RMS*, *RRMS*, *PPV* and *Vector*), you can select a number of conditions to be met before the event and alarms are triggered.

If **Event counter > 1**, the **Event counter mode** item appears, allowing you to select the way in which events are counted (*Consecutive* or *Periodical*):

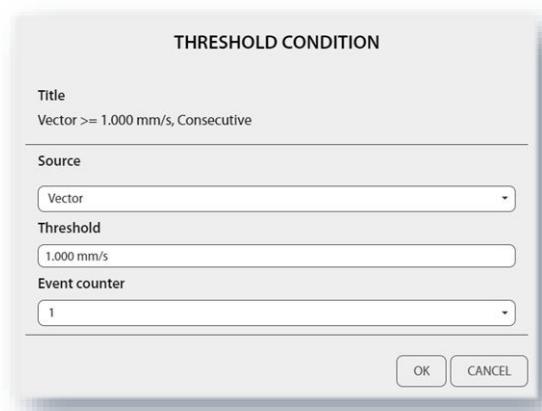
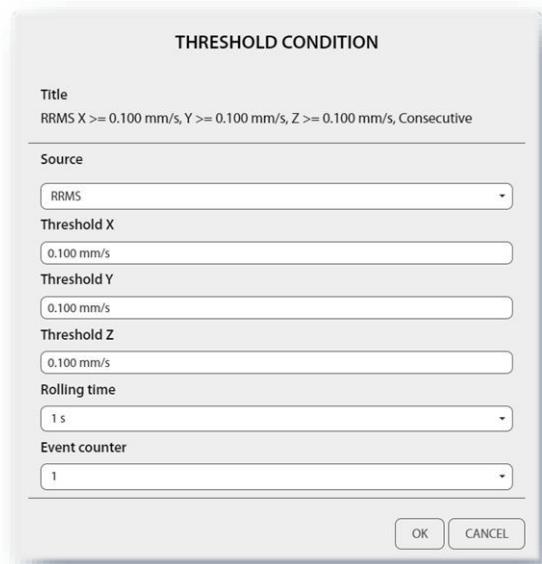
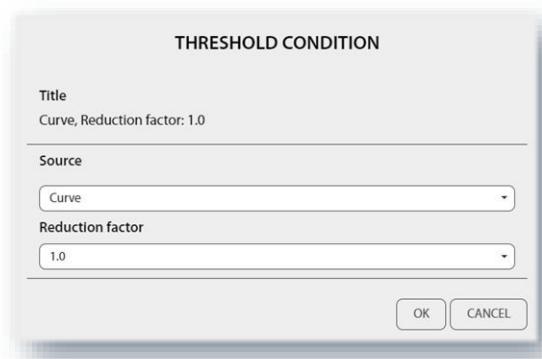
- In the case of *Consecutive*, an event occurs when a trigger condition occurs **Event counter** times in succession.
- In the case of *Periodical*, an event will occur when a trigger condition occurs **Event counter** times in succession periodically with a period (**Event counter period**) equal to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

The Event counter is not used for the *Curve* source.

In the case of *Vector*, the threshold should be defined in the range 1 $\mu\text{m/s}$ ÷ 10.0 m/s.

The threshold can be entered as a value with units or as a value only. If the value is outside the range, the program will adjust it to the nearest limit.

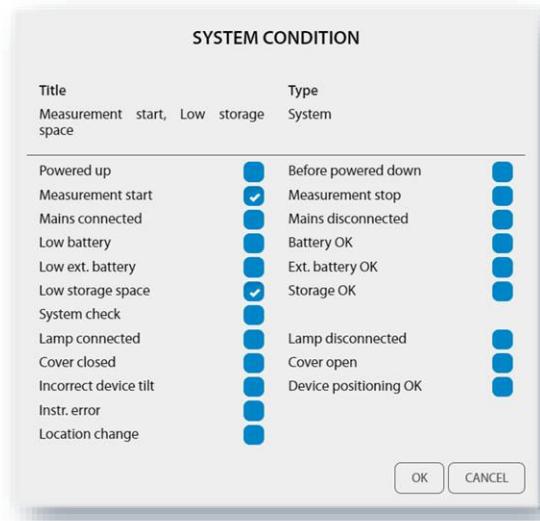
In the case of *PPV*, *RMS* and *RRMS*, it is necessary to define three thresholds for the X, Y and Z axes in the range 1 $\mu\text{m/s}$ ÷ 100 mm/s and to program the **Event counter** logic.



System trigger condition

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

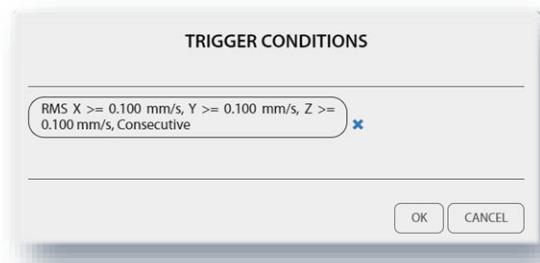
You can select some or all of the conditions presented in the **SYSTEM CONDITION** configuration box (see description in Chapter [4.6.3.2](#)).



The selected threshold condition is displayed in the **TRIGGER CONDITIONS** pop-up box.

You can delete this condition by clicking on **X** or confirm the selection by clicking on **OK**.

Once confirmed, the pop-up box closes, and the selection is displayed in the line of the **TRIGGER** button.



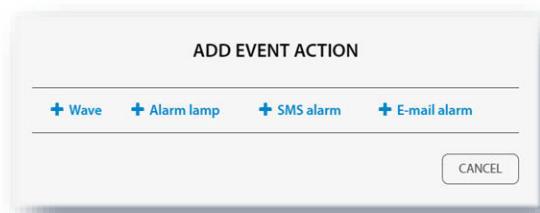
All condition settings are displayed in the lines of the corresponding buttons.

Defining actions

To create a new action, click on **+Add action** and in the **ADD EVENT ACTION** pop-up box, click on 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 registers a marker of the **Block** type in the logger file and is always active.

The **Wave** action triggers the signal recording.



The **Alarm lamp** action triggers an alarm signal on the **EXTERNAL INTERFACE** connector to which an alarm device can be connected (e.g., alarm lamp).

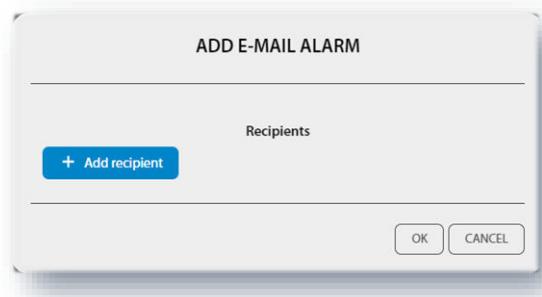
Hold time defines the duration of this alarm after the end of the event.



The **SMS alarm** action sends the SMS message to the phones of the recipients selected in the **ADDRESS BOOK**. To add a recipient, click on **+ Add recipient** and select the recipient from the address book list by clicking on **+** in the line of the recipient you want to add and click on **OK**.



The **E-mail** action sends the email message to the mailboxes of the recipients selected in the **ADDRESS BOOK**.



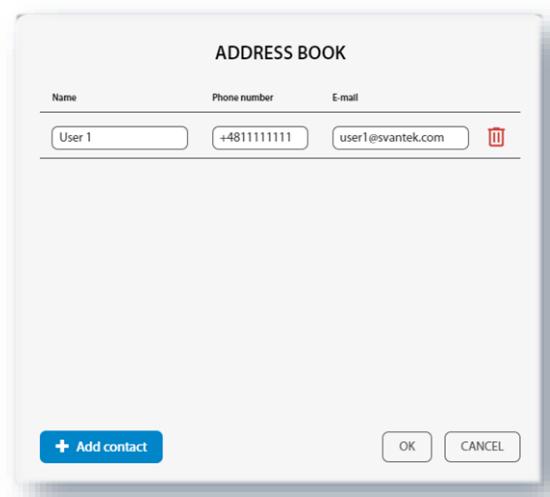
All **ACTIONS** settings are displayed in the rows of the corresponding buttons.



Address book

You can edit the address book by clicking **Edit address book** in the **Event trigger** section of the **Configuration** view.

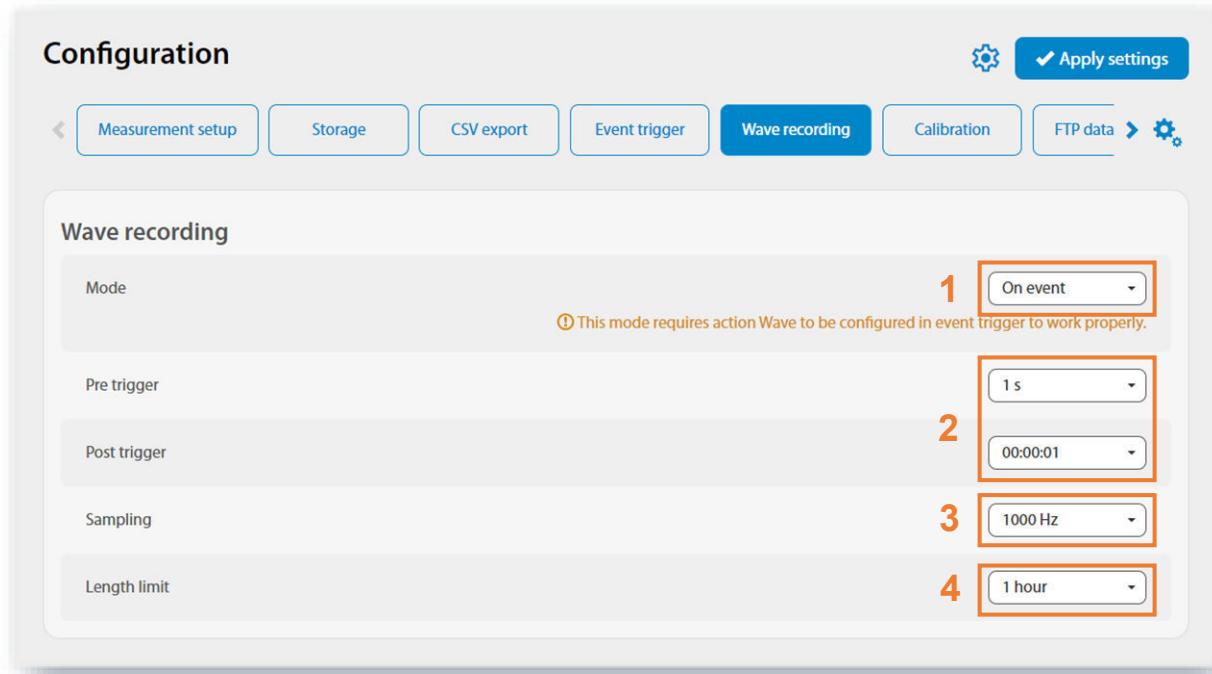
To add the address, click on **+Add contact**. To remove the address, click on the trash icon.



5.4.5 Wave recording

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

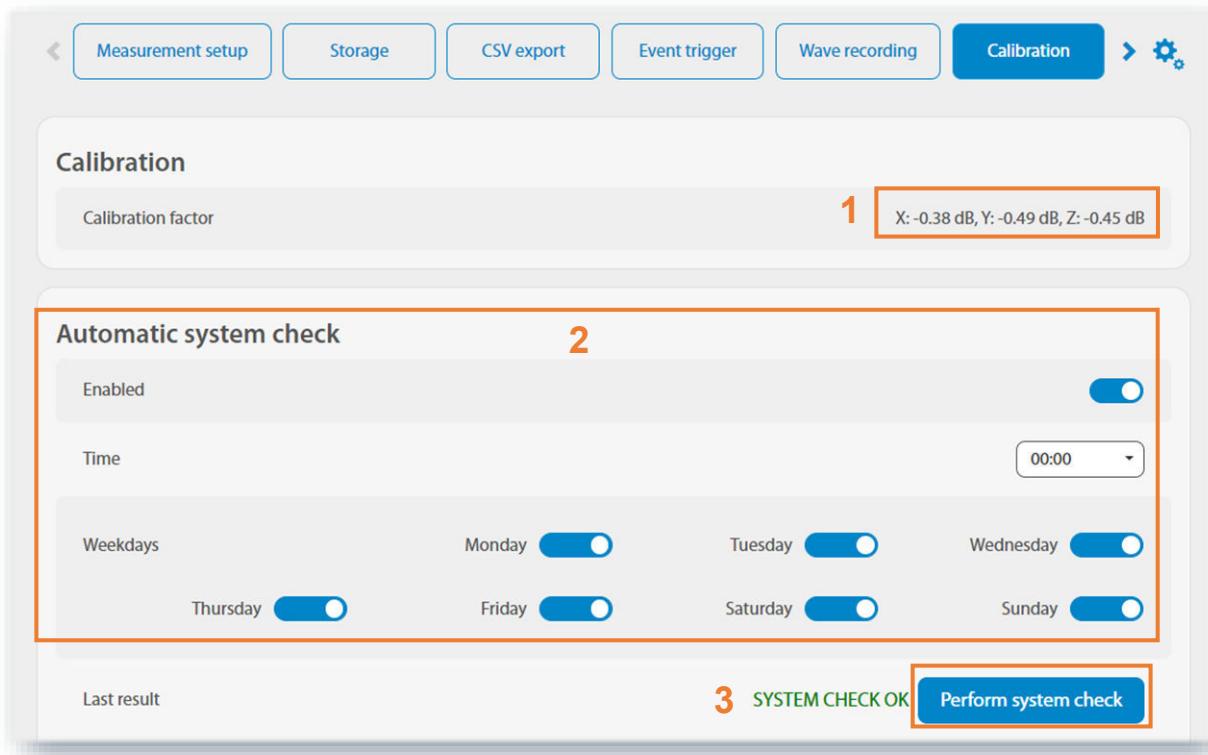
1. Set the recording **Mode**: *Disable*, *Continuous* (signals are recorded from the start of the measurement to the end of the measurement) or *On event* (signals are recorded during the event period).
2. In the case of *On event*, set the recording duration before the event (**Pre trigger**) and after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



5.4.6 Calibration

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

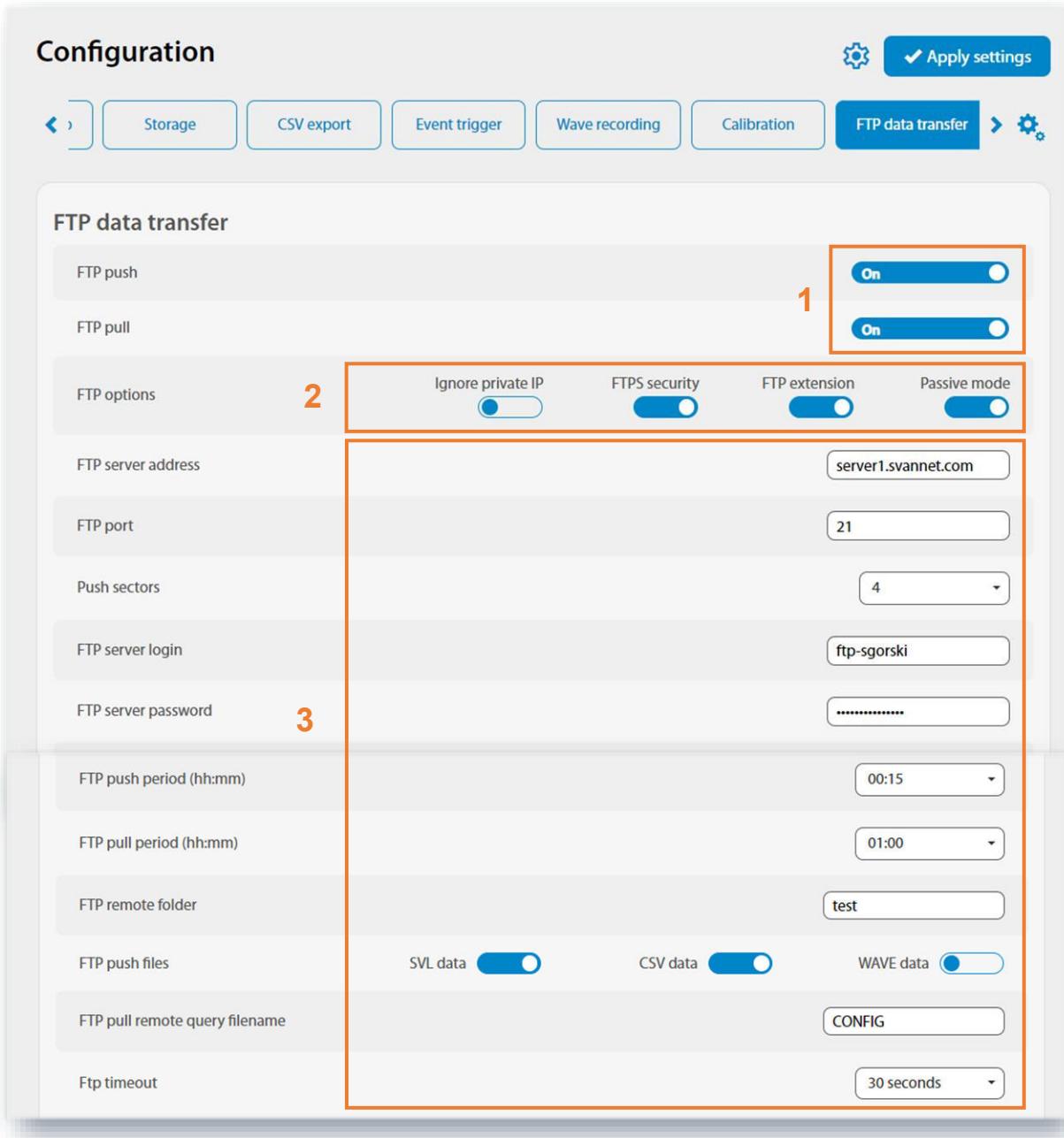
1. Check the calibration factor.
2. Program an automatic check of the system.
3. Perform the system check manually.



5.4.7 FTP data transfer

In the **FTP data transfer** section, you can set the FTP option parameters (see Chapter [4.6.6.1](#)):

1. Switch on **FTP push / pull** data transfer.
2. Select **FTP options**: *Ignore private IP, FTPS security, FTP extension, Passive mode*.
3. Set other FTP parameters: server address, port, etc.



5.4.8 Auxiliary settings

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

1. Set the **Power saving** mode of the modem: **Modem activity** mode (*Continuous* or *Periodical*) and the **Connection period** from 15 min to 24 h. In continuous mode, the modem is active all the time. However, this mode is power hungry and if the continuous data transfer is not required, it is recommended to use *Periodical* mode, which ensures low power consumption.
2. Enter **Station descriptions**: **Station name**, **Project name** and **Location name**.
3. Enter the instrument's **Geolocalization**: **Latitude** and **Longitude**.
4. Enable GPS, synchronise internal instrument's RTC with the GPS time and set the time zone.
5. Select the Battery charging mode (*Optimised* or *Full capacity*). 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.

6. Set the Reference level for velocity results.
7. Set **Other** settings, like switching on **Measurement auto-start** option and **External key lock** option.

Configuration

⚙️ ✓ Apply settings

◀ Event trigger Wave recording Calibration FTP data transfer Auxiliary settings Firmware up! ➡️ ⚙️

1 Power saving ⚡

Modem activity Periodical

Connection period 15 minutes

2 Station descriptions

Station name

Project name

Location name

3 Geolocalization

Latitude 52.172740

Longitude 21.164470

4 GPS

Gps enabled On

Synchronize time to GPS On

Timezone (HH:MM) +00:00

5 Powering

Battery charging mode Full capacity

6 Reference levels

Velocity Results reference level [nm/s] 1

Human Vibration reference level [um/s²] 1

7 Other

Measurement auto-start Off

External key lock Off

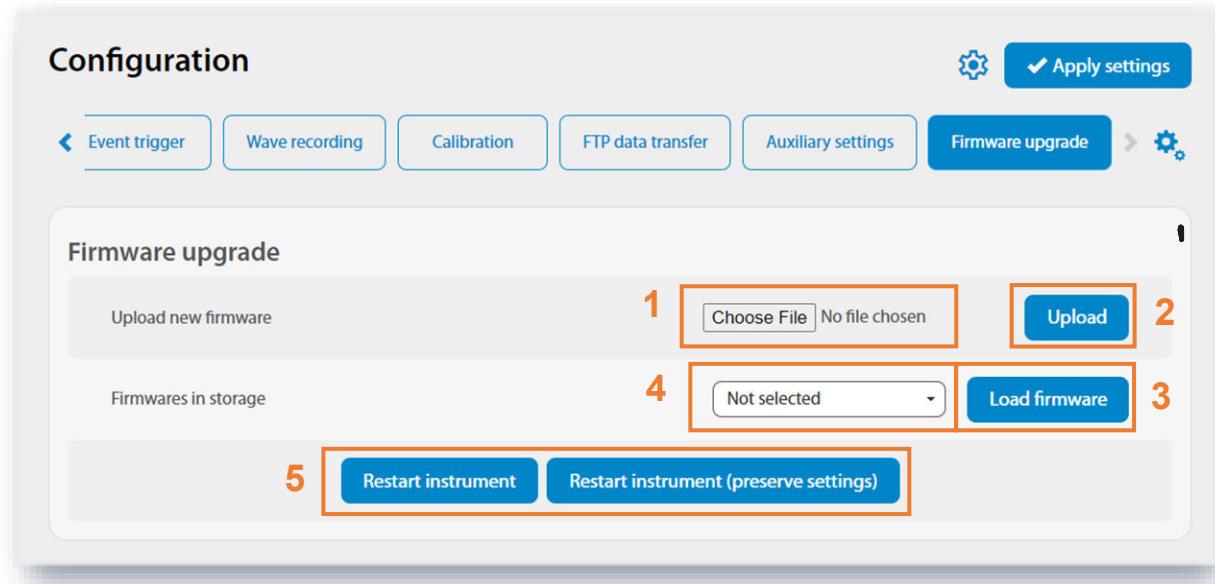
5.4.9 Firmware upgrade

In the **Firmware upgrade** section, you can upload new firmware to the instrument memory and perform the upgrade process.

Before upgrading, it is essential to download the correct firmware file from the SVANTEK website to your PC.

To upgrade the firmware:

1. Click **Choose file** and select the firmware *.bin file on your PC.
2. Upload the selected file by clicking the **Upload** button.
3. When the upload is complete, select the new firmware file in the firmware selector.
4. Click on **Load firmware**.
5. Click on **Restart instrument** or **Restart instrument (preserve settings)** to complete the process and wait 60 seconds for the connection to be reestablished. Measurements will start automatically.



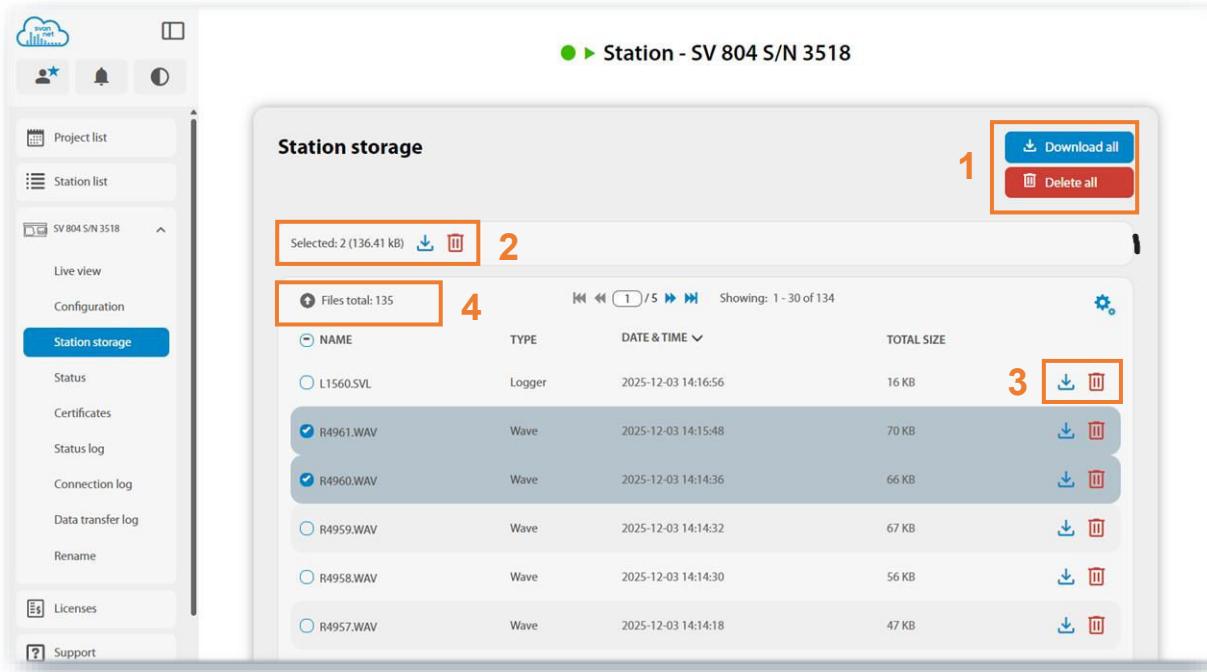
Note: After clicking on **Restart instrument (preserve settings)**, all previous instrument settings are retained. After clicking on **Restart instrument**, only the communication settings are retained, all other parameters are reset to default.

5.5 STATION STORAGE VIEW

The **Station storage** view presents a list of files stored in the station memory. The list contains only files from a single directory on the memory card and it initially displays the contents of the current working directory.

In the **Station storage** view, you can:

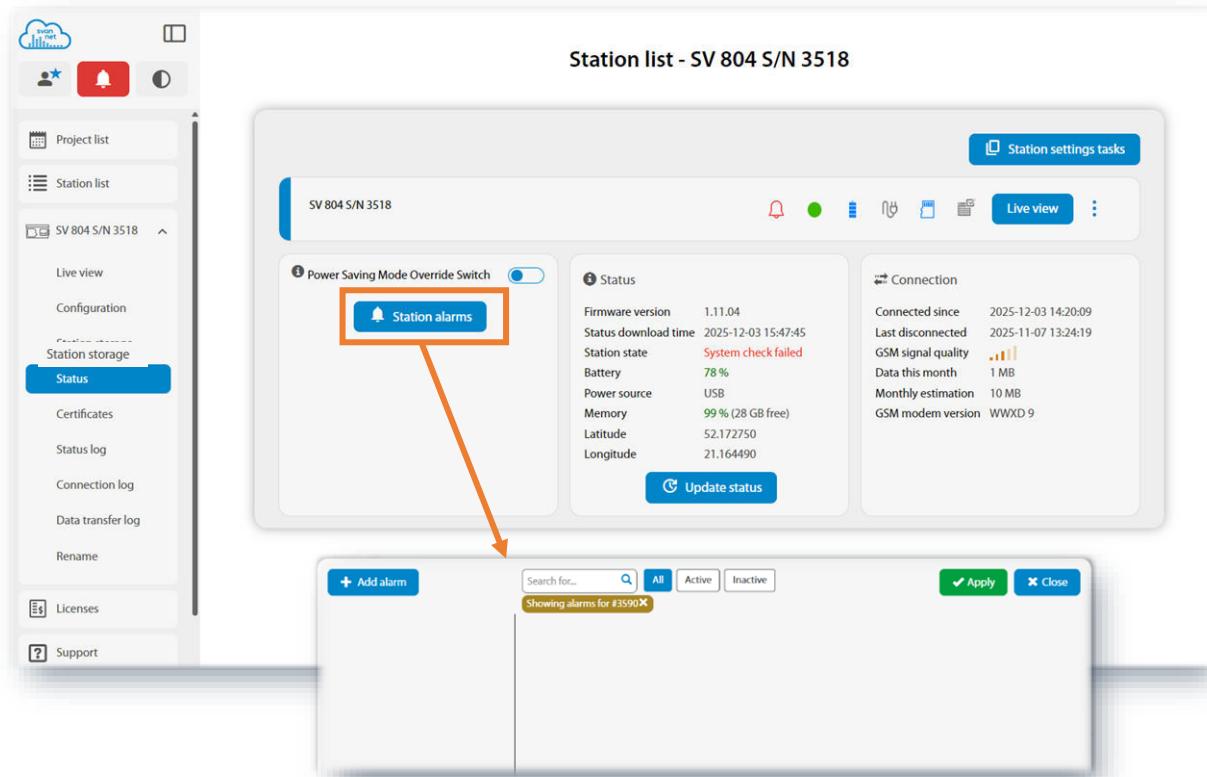
1. Download or delete all files.
2. Select multiple files and download or delete the selected files.
3. Download or delete individual files by clicking the right icons on the file row.
4. Navigate through the folder structure by clicking the “folder up” button.



5.6 STATUS VIEW

In the **Status** view you can:

- Check the status of the station (firmware version, battery charge, memory, connection, etc.).
- Configure alarms for the respective states that *SvanNET* will generate and send to the defined recipients in the form of an email (**Station alarms** button),
- Update the status of the station (**Update status** button).

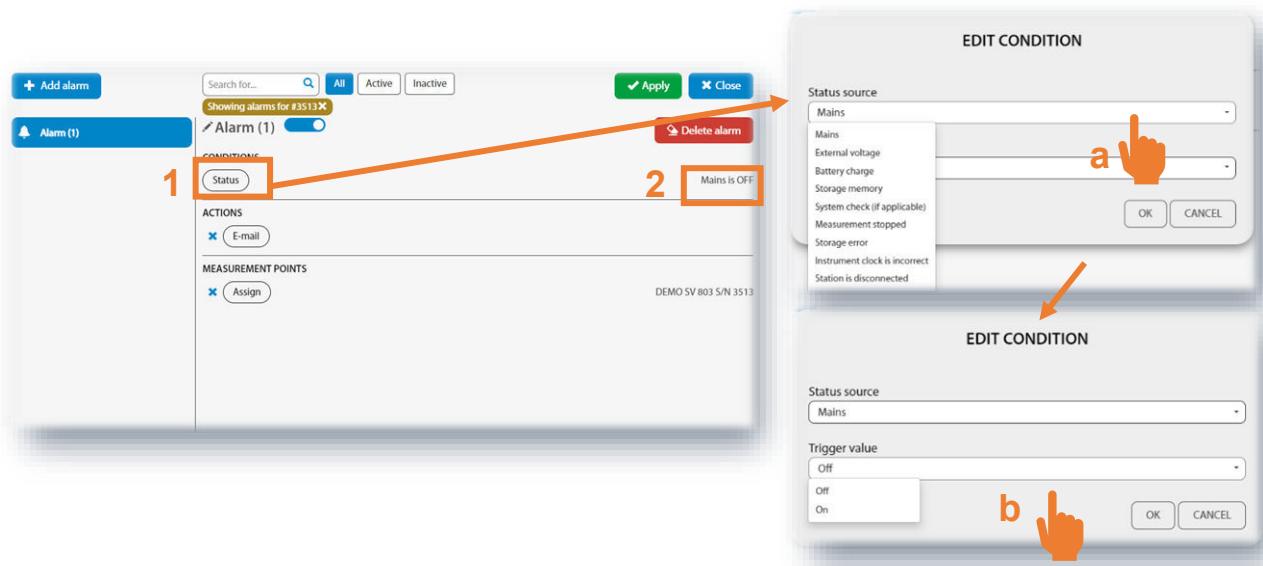




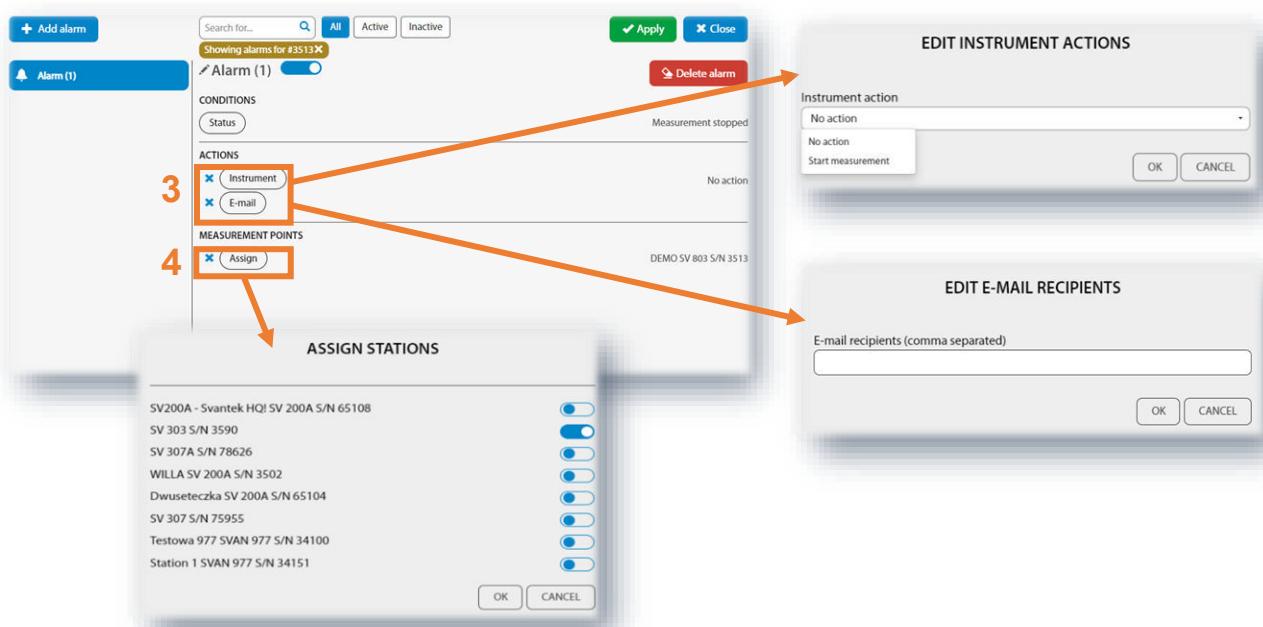
Note: In this view you can configure alarms generated by SvanNET based on data received from all stations assigned to your account.

After clicking the **Station alarms** button, click **+Add alarm** in the pop-up box and the new **Alarm(1)** will appear with CONDITIONS, ACTIONS and MEASUREMENT POINTS settings. Alarms are based on conditions and relate to selected measurement points. They generate actions – emails to the specified recipients. To configure an alarm:

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



2. Click **OK** and the new condition will appear in the CONDITIONS area.
3. Click on the **E-mail** button to enter/edit email recipients or additional options depending on the selected Status source (e.g. **Instrument** if the *Measurement Stopped* status source was selected).
4. Click on the **Assign** button to assign the alarm to the station(s).



The selections made are displayed in the ACTIONS and MEASUREMENT POINTS sections.

The *SvanNET* alarms have the following meanings:

- **Mains**
 - Trigger Value: Off – alarm is generated when the system detects a loss of power.
 - 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 that the external power supply has dropped below the set value. In this case, external power means the 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 free storage space below the selected threshold.
- **System check (if applicable)**
 - Alarm is generated when the system detects an error in the execution of the system check procedure (not live check).
- **Measurement stopped**
 - Alarm is generated when the system detects that a measurement has been stopped. Applies to stopped measurements only - condition such as start delay, waiting for synchronisation 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 running, and data is being recorded; the writing of the logger file is checked by changing of the free space on the card (which means that the instrument is writing data).
 - Instrument action: Restart the measurement.
- **Instrument clock is incorrect**
 - Trigger value: xx seconds / xx minutes – alarm is generated if the RTC indication of the instrument differs from 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.

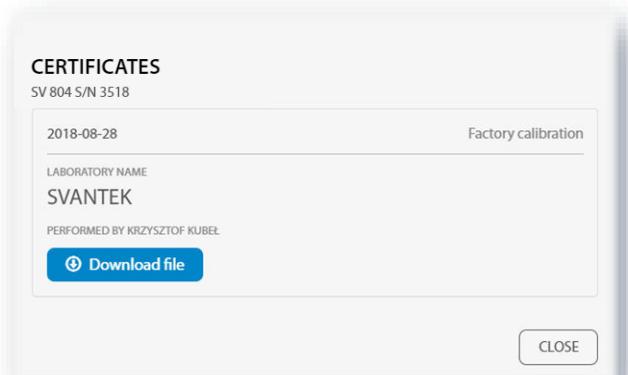
Alarms are reported once after the occurrence of an alarm condition. The occurrence of an alarm condition will generate selected actions (e.g., e-mail) at the moment the status changes compared to the previous check (i.e., if at 8:15 there is power supply, at 8:30 mains is off, at 8:45 mains is still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

5.7 CERTIFICATES VIEW

The **Certificates** button opens the CERTIFICATES dialogue box showing 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 as a PDF file by clicking **Download file**.



5.8 LOG VIEWS

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

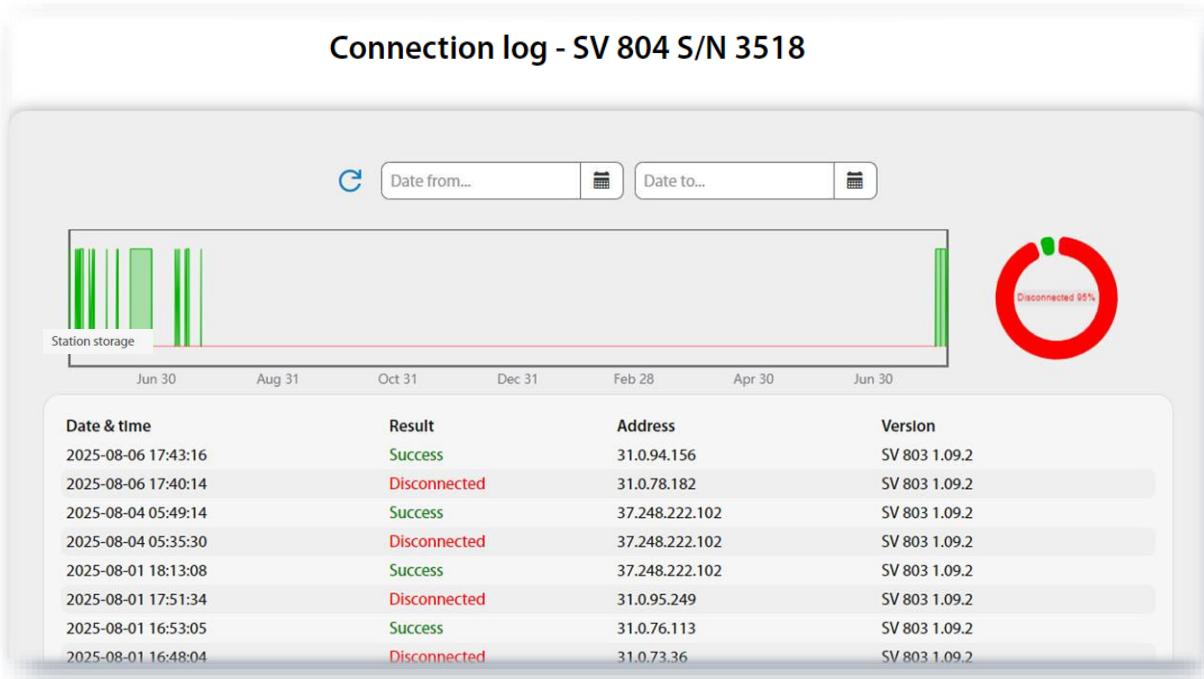
- **Status log** that registers the power source type and charge level, free memory space, GSM signal quality and GPS information.

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

Status log - SV 804 S/N 3518												
Date & time	Status	Battery	Power source	Charge / discharge time	Station battery voltage	Source voltage	Memory	Free space	GSM signal quality	Last system check	GPS Info	
2025-12-03 15:47:45	OK	78 %	USB	N/A	7.9 V	4.7 V	99 %	28 GB		System check failed X: Error Y: System check OK Z: System check OK	Lat: 52.172750, Lon: 21.164490	
2025-12-03 15:32:44	OK	78 %	USB	N/A	7.9 V	4.7 V	99 %	28 GB		System check failed X: Error Y: System check OK Z: System check OK	Lat: 52.172750, Lon: 21.164490	
2025-12-03 15:17:42	OK	77 %	Station battery	1 month(s), 5 day(s) to empty	7.8 V	0.2 V	99 %	28 GB		System check failed X: Error Y: System check OK Z: System check OK	Lat: 52.172750, Lon: 21.164490	
2025-12-03 15:02:41	OK	78 %	Station battery	1 month(s), 11 day(s) to empty	7.8 V	0.2 V	99 %	28 GB		System check failed X: Error Y: System check OK Z: System check OK	Lat: 52.172750, Lon: 21.164490	

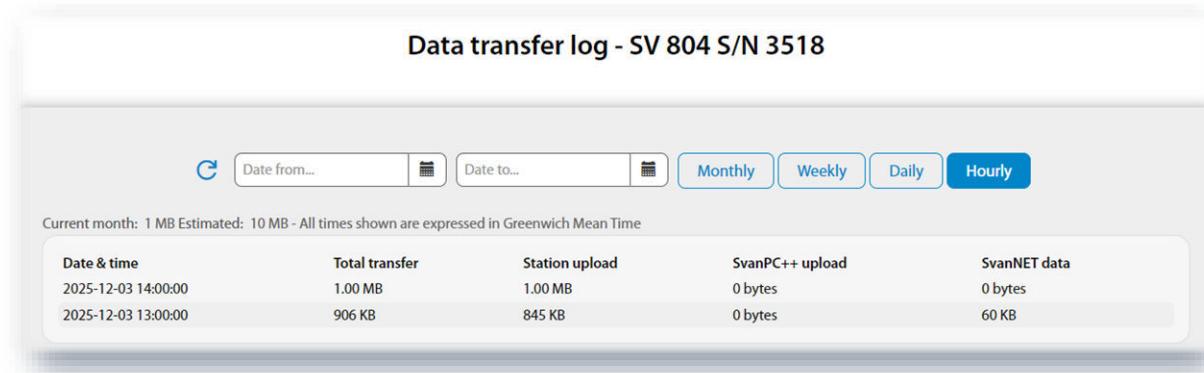
- **Connection log** that registers the history of station connections – result (successful or disconnected), IP address and firmware version.

In the upper line you can: refresh the log, select the desired period of records to be displayed and rewind records. Below is the time history of connections with *SvanNET*. The pie chart shows the total connection time as a percentage of the total working time.



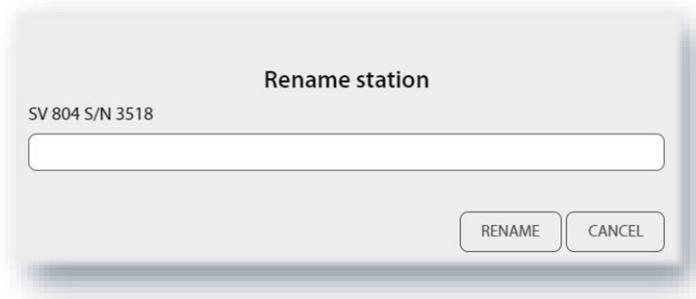
- **Data transfer log** that registers the history of data transfers (uploads).

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



5.9 RENAMING STATION

You can rename your station by pressing the **Rename** button.



5.10 AUTOMATIC MONITORING SERVICES – PROJECTS

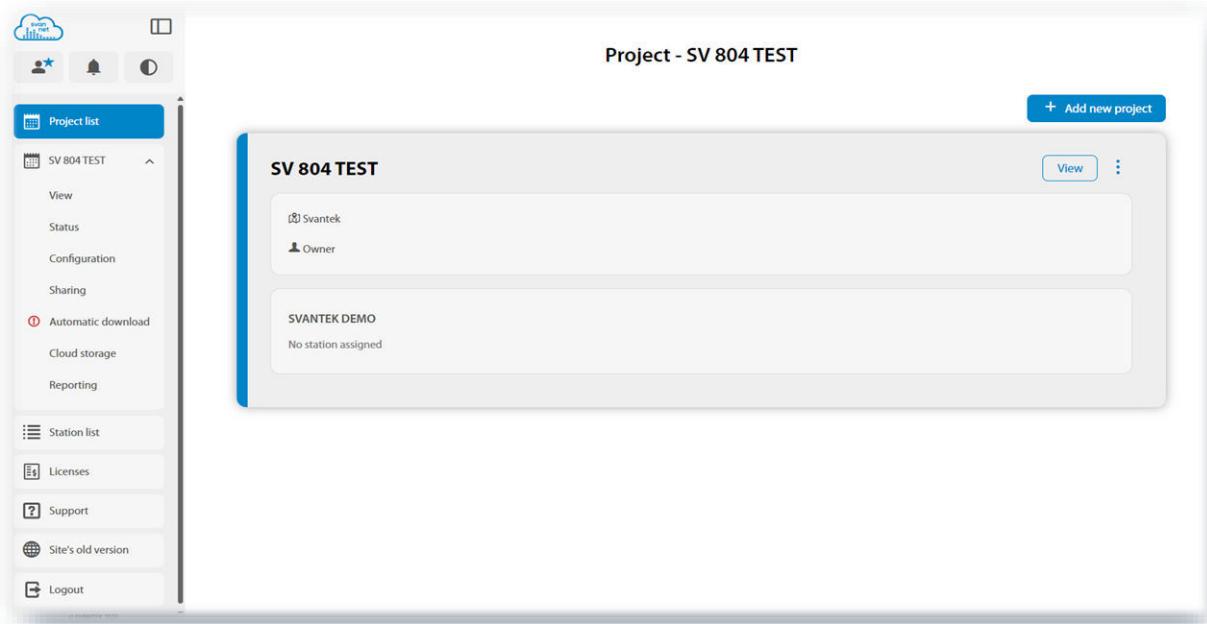
After clicking on the Project list icon, *SvanNET* opens the Project list view, where you can configure projects and view measurement results for all measurement points of the selected project.

A full description of the Project configuration is given in the *SvanNET* User Manual. This manual only gives a brief description of how to view measurement data in the Automatic Monitoring Services.

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

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

Configuring panels, formatting and creating reports is described in detail in the *SvanNET* User Manual. This manual only describes parts related to the operation of SV 804.

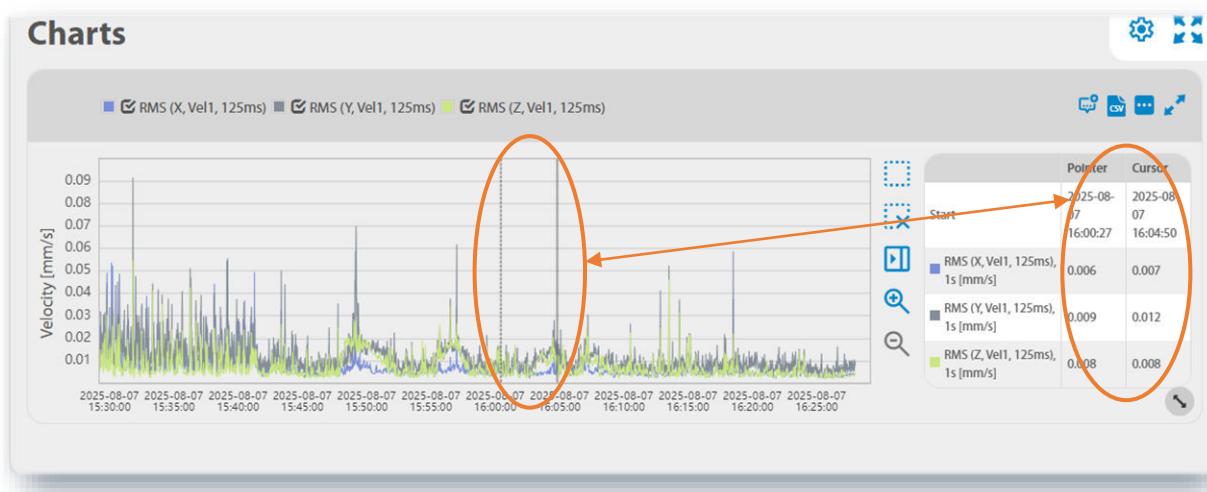
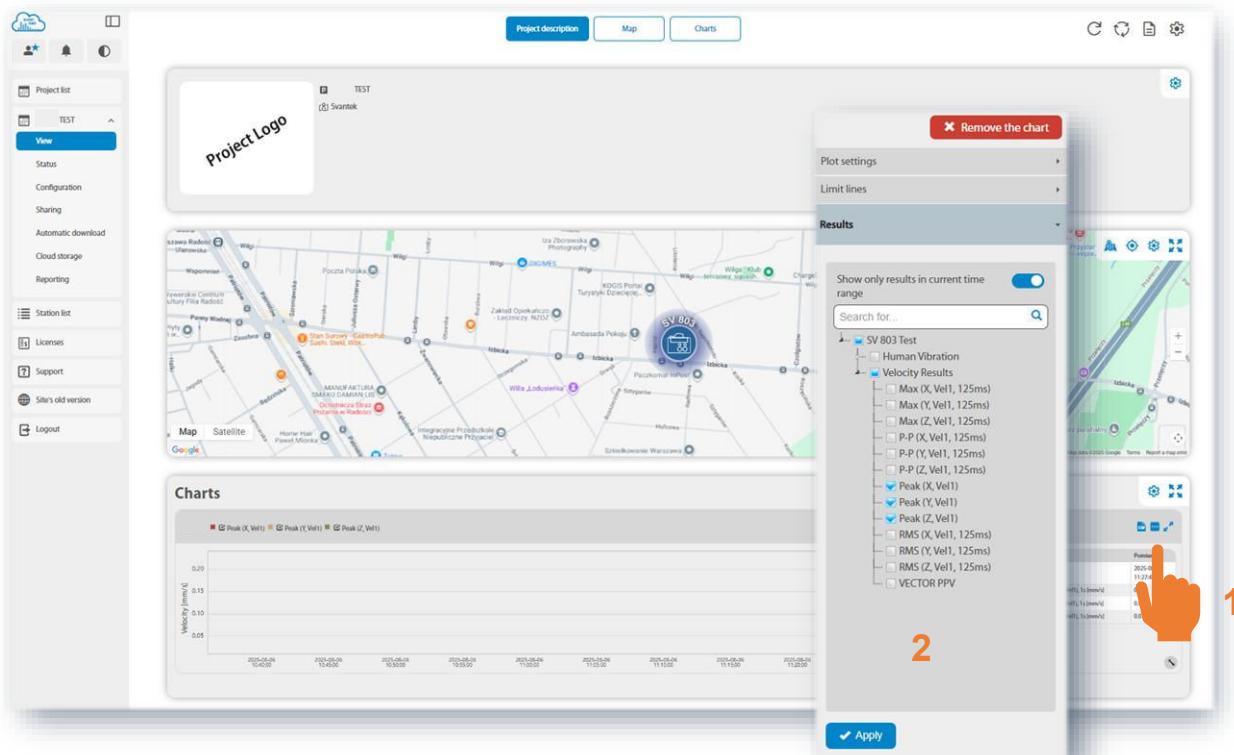


5.10.1 Viewing time-history of measured results – *Charts* panel

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

To view time-history(es):

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



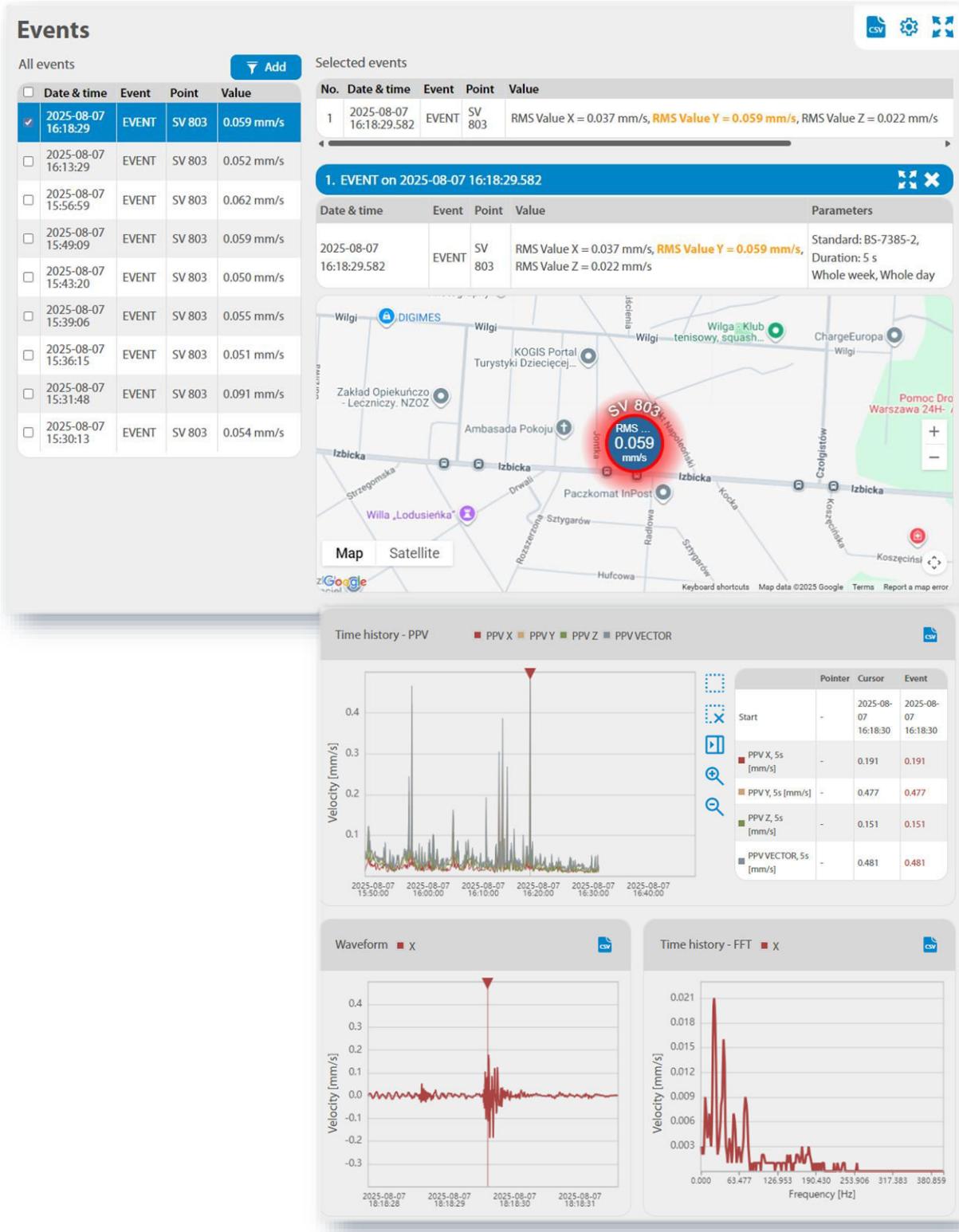
If you point the mouse at the plot, you can read the *Pointer* coordinates in the legend box. Click on the plot and read the *Cursor* coordinates in the legend box.

5.10.2 Viewing events – Events panel

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

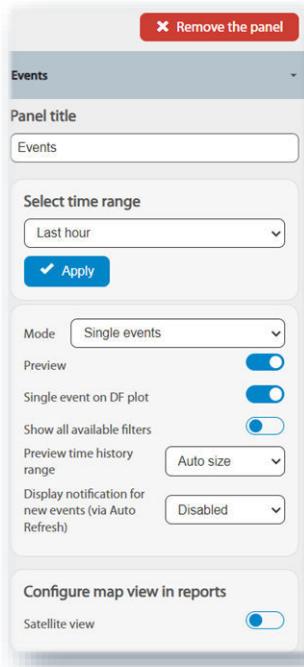
To view event details, highlight the event in the list.

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



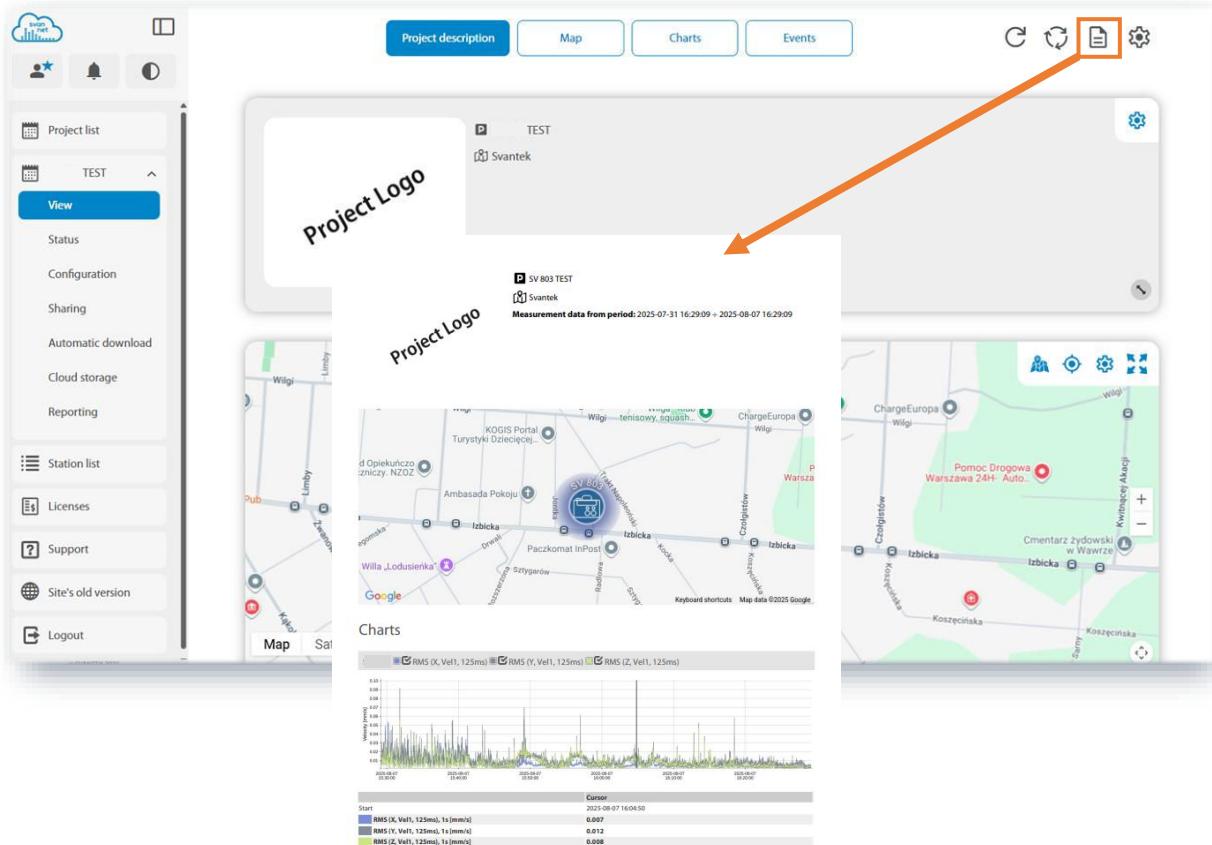
You can change the panel title and customise the panel details by clicking on the  icon. For example, for the *Events* panel, you can:

1. Select the time range for viewing 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 selecting of one of them.
2. Toggle between *Single events* and *Multi-point events*. Multi-point event is an event where at least two single-point events have been superimposed.
3. Toggle *Preview* of event details.
4. Toggle *Single event on DF plot* (Dominant frequency plot).
5. Toggle *Show all available filters*.
6. Select period for time-history plots (*Preview time history range*): *Auto*, *5m*, *30m*, *1h*, *2h*, *6h*, *12h*, *24h*.
7. Select the *Map type for reports*: *Satellite view* or *Road map*.



5.10.3 Printing reports

Once you have customised the 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). To do this, expand the right tool panel and click on DOC or PDF.



6 PC SOFTWARE – SvanPC++

The *SvanPC++* software for the PC enables configuration of the instrument settings and provides a wide range of data post-processing and reporting functions.

SV 804 must be connected to a computer running *SvanPC++* either by the USB cable or via the Internet. In the latter case, *SvanPC++* should be supplemented with the *Remote Communication* module.

Although SV 804 is designed for wireless remote control, it can also be easily configured and controlled via the USB interface. The USB interface mode can be used for initial configuration of wireless communication. The USB interface mode can also be used in an emergency, when the wireless connection has been interrupted or when wireless communication is not available for some reason, or in situations where the measurement process doesn't require wireless control of the instrument.



Note: This manual only describes the most useful and instrument specific functionalities available for the USB connection. All other functionalities, including those related to the Remote Communication module, are well described in *SvanPC++ User Manual*.

6.1 SVANPC++ SOFTWARE INSTALLATION AND ACTIVATION

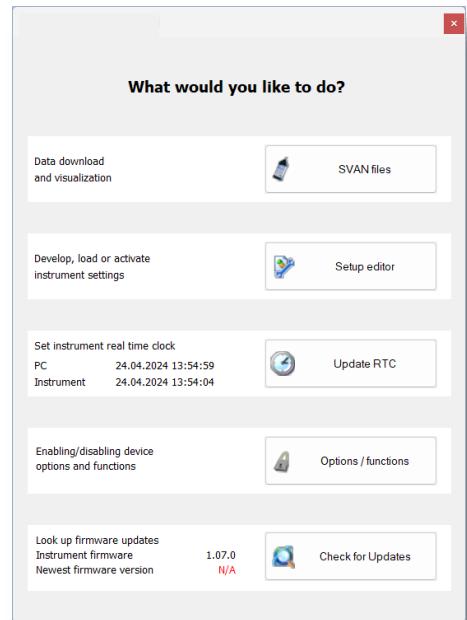
To download and install *SvanPC++* and Svantek *USB Drivers*, please visit the website: [SVANTEK Support and Service - Sound and Vibration](#).

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 VIZARD

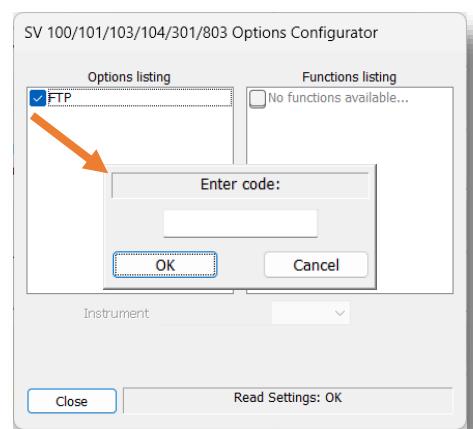
After connecting the instrument to the PC with *SvanPC++* running via the USB cable, the **SV 804 instrument wizard** dialogue box appears on the screen. It allows you to:

- download or upload files (**SVAN files** button),
- edit the instrument settings (**Setup editor** button),
- update the instrument's real time clock (**Update RTC** button),
- unlock the optional functions (**Options / functions**),
- check the firmware version of the instrument with the latest available version (**Check for Updates** button).



If you click functions **Options / functions**, the Options Configurator box will appear in which you can lock/unlock the extended option, e.g. FTP Client.

The FTP Client option can be enabled if you enter the special code that unlocks this option. Once unlocked, the option is permanently available.



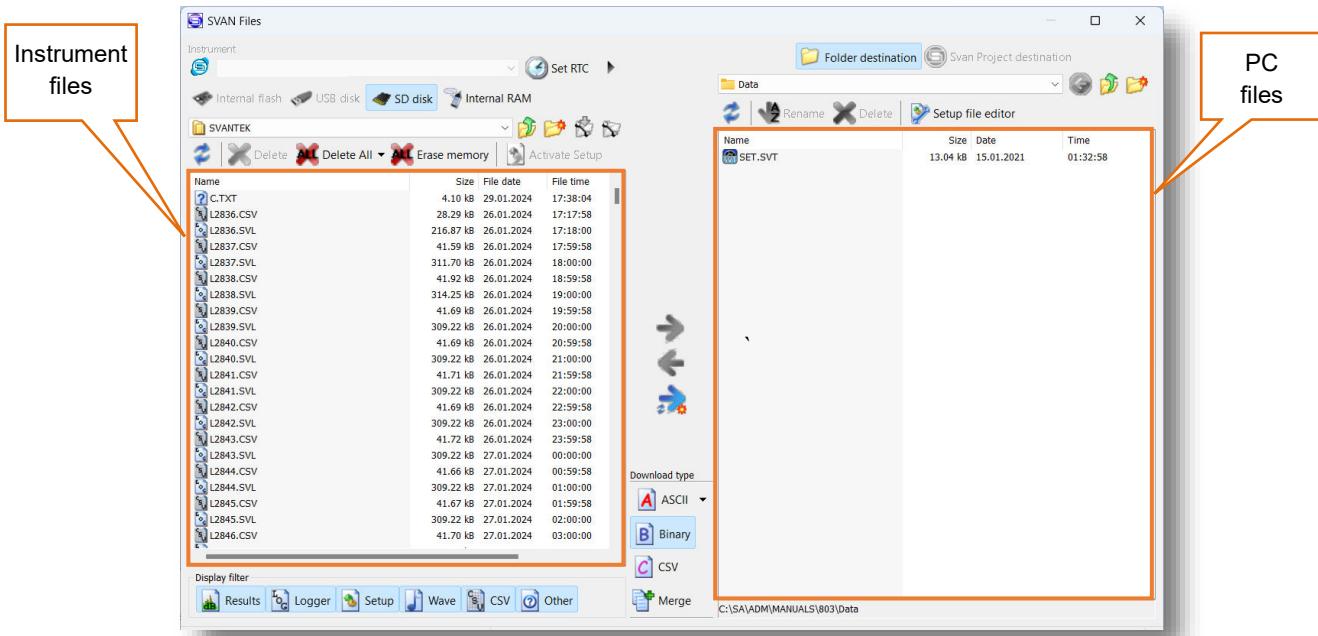
6.3 SVAN FILES

Instrument files are accessed from the **SVAN Files** dialogue box, which allows you to manage instrument files, open data files and configure setup files.

The **SVAN Files** dialogue box consists of two sections: instrument (left) and PC (right). Each section contains tools for managing files (selecting memory, directory and files, deleting files, creating directories, applying filters, etc.).

6.3.1 Downloading/uploading files

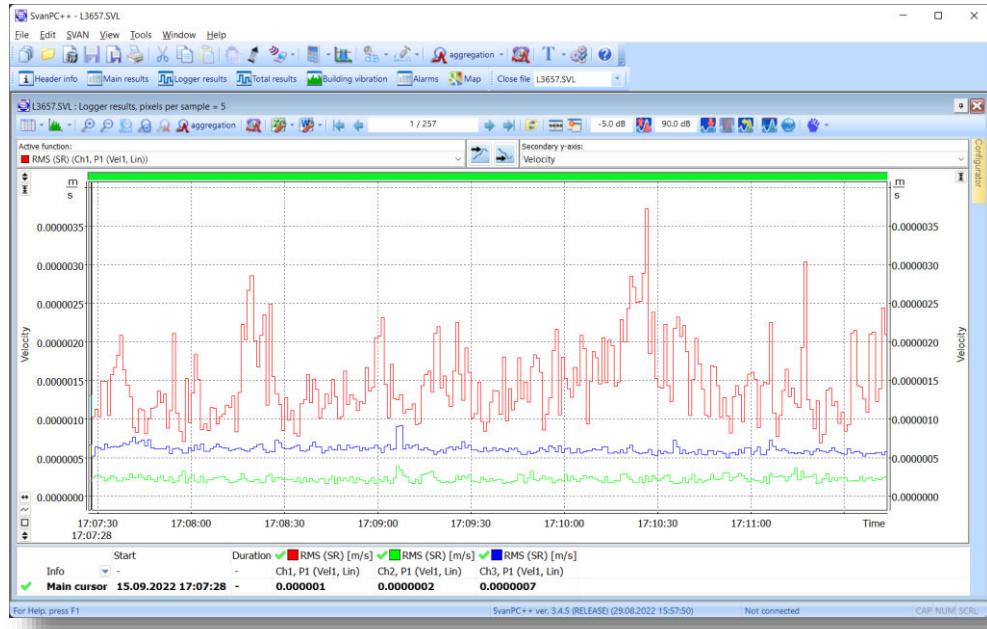
The arrows between the instrument and PC sections are used to download files from the instrument to the PC and upload files from the PC to the instrument.



To download files from the instrument to a PC, select the directory on a PC to download files (right section), select the instruments file to be download (left section) and press the right arrow button (centre section).

6.3.2 Opening files

Double click on the file name to open the **Viewer** module, which provides various tools for viewing the data. This module is described in detail in the SvanPC++ User Manual.

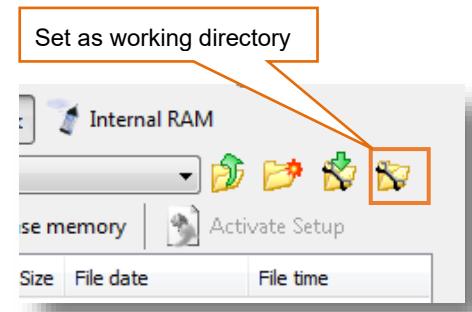


6.3.3 Changing working directory

The working directory is a folder in the instrument's memory where all the measurement files are stored. To change the working directory:

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

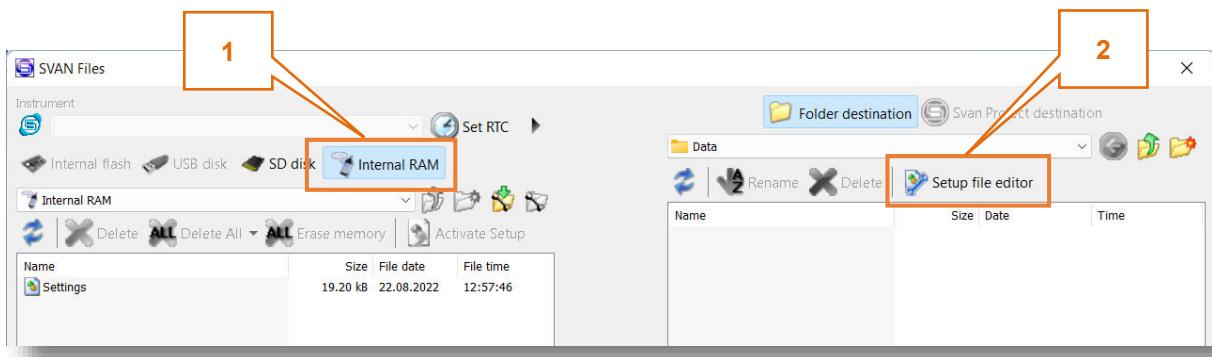
From this point on, all results files will be stored in the selected director.



6.3.4 Configuring instrument settings

The instrument settings can be configured with the use of *Setup file editor*, which can be also opened from the **SVAN Files** dialog box. To do this:

1. press the **Internal RAM** button, select the *Settings* file and double click it, or
2. 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* are the same as those available in the *Assistant Pro* application.

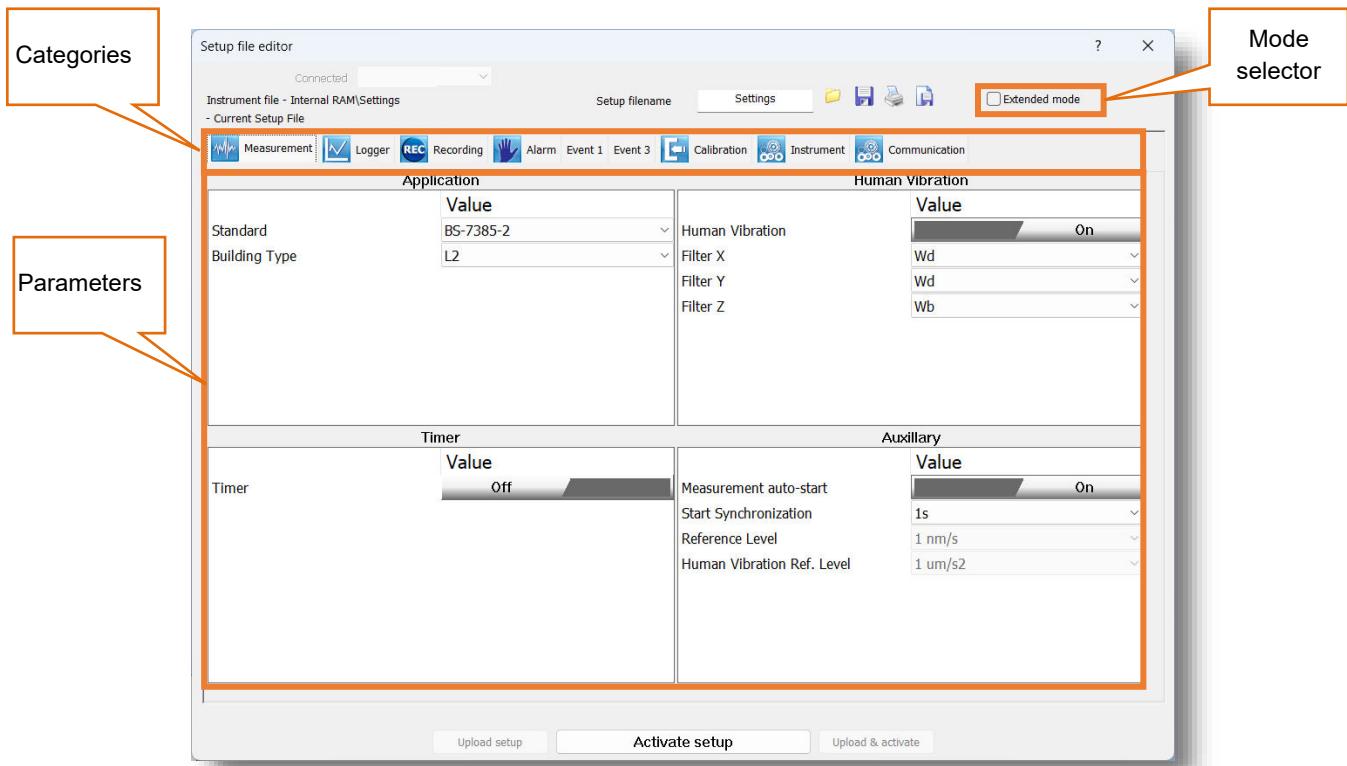
In *Standard* mode the *Setup file editor* allows you to view and edit the settings most likely to be modified, presented in a simple and intuitive way. Note that not all of the settings available in the connected instrument may be available in *Standard* mode.

The settings are divided into a number of categories, which can be selected using the tabs at the top of the *Setup file editor* window.

Settings can be easily edited using the following elements:

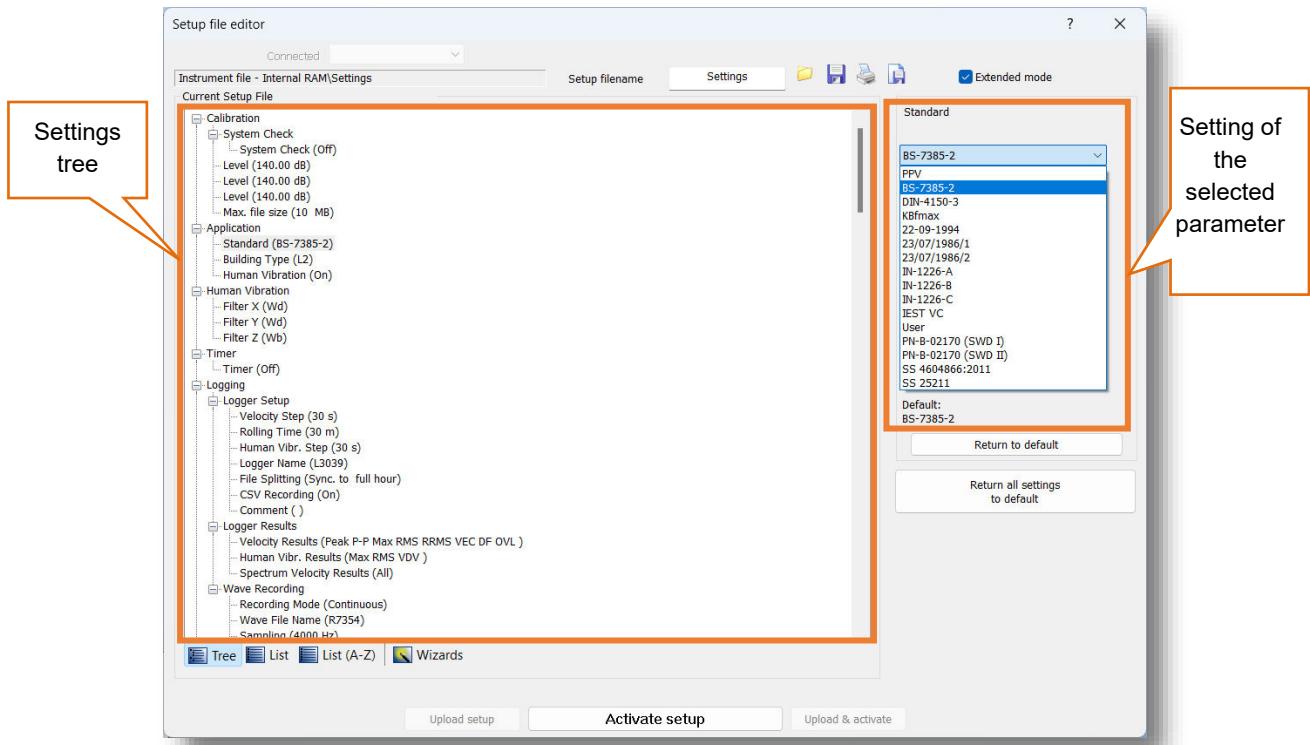
- check boxes – allowing to select some out of several possibilities,
- list boxes – allowing to select one out of several possibilities,
- text fields – allowing to type in a value using keyboard,
- binary buttons – allowing to enable or disable an option.

Standard mode:



In *Extended* mode, all instrument settings are visible and available for editing. The list of settings, located on the left side of the window, can be displayed in a tree view or a list view. You can change the view using the buttons at bottom of the window.

Extended mode:



To change settings in the *Extended* mode, use the controls that appear in the panel at the top right of the window after selecting parameter from the list.

The default, *Tree View*, offers the settings arranged in the form of a tree, similar to the structure of the instrument menu. The nodes represent menu sections, while the leafs represent parameter settings that can be edited in the top right corner of the window. The settings are sorted according to the menu structure accessible via the instrument's display panels.

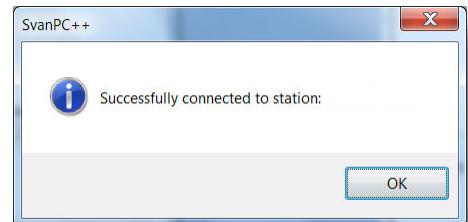
Some of the settings are linked to each other, which means that one of them will only be available for editing if the other one is set to a certain value.

When you have finished configuring the settings, press the **Activate setup** button.

At the top of the *Setup file editor* window, next to the Setup filename field, there are several file management buttons that open a setup file stored on the PC, save the currently edited setup file to the PC, print the currently edited setup file, or save the contents of the currently edited setup file in a simple text format.

In *Extended* mode, you can restore the factory (default) settings by pressing the **Return all settings to default** button.

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



6.4 BUILDING VIBRATION VIEW

SV 804 uses special methods based on Peak Particle Velocity and Dominant Frequency, which comply with many local standards and also allow measurement of human vibration in buildings. SV 804 generates alarms based on special events which are registered in the data files.

SV 804 uses two approaches to assess the dominant frequency based on 1/3 octaves or FFT and the vibration results associated with that frequency. Different local standards use one or the other approach.

SV 804 generates files (group of files) that *SvanPC++* recognises and presents the data in the special *Building vibration* view.

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

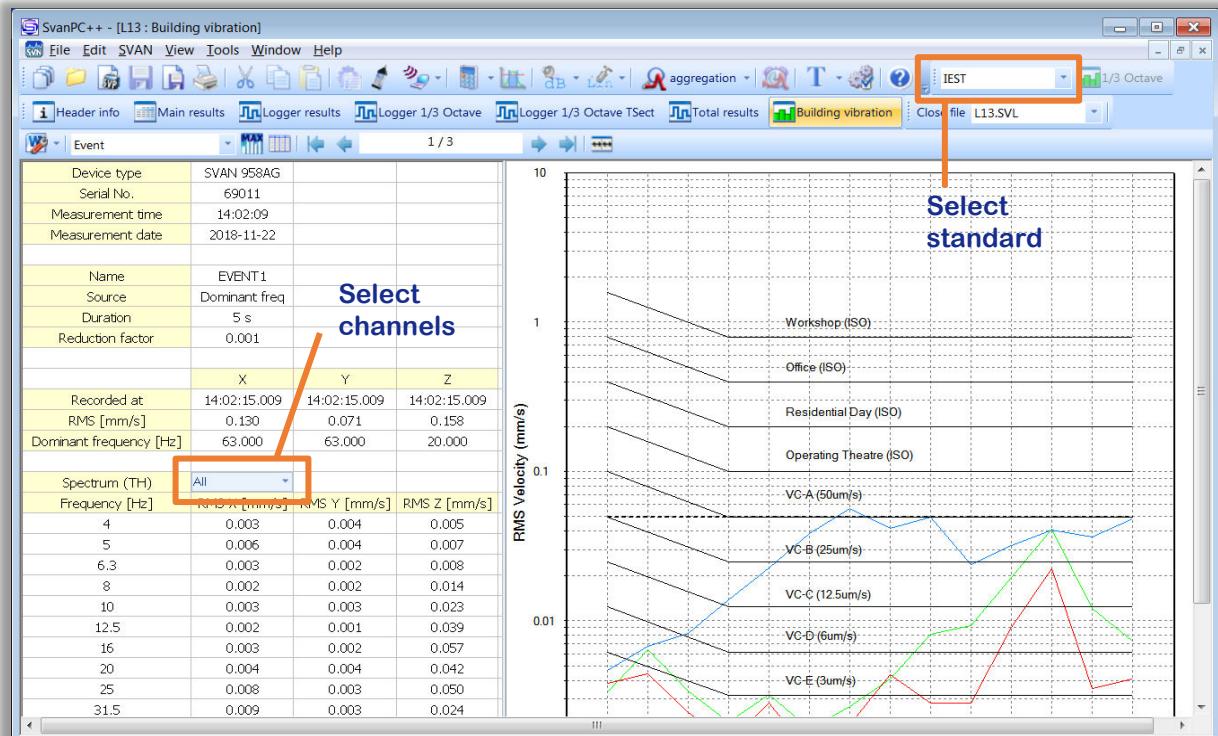
In the case of the FFT approach, the instrument creates **Lxx** files and also wave files that are associated with the logger files, named **Rxx**, where **xx** is a number, with the extension **WAV**. An **Rxx** file contains the waveform signal recorded for a detected event during the period set in SV 804 as *PreTrigger + Duration + Post Trigger*.



Note: When retrieving data from SV 804, remember to retrieve all files created during a measurement.

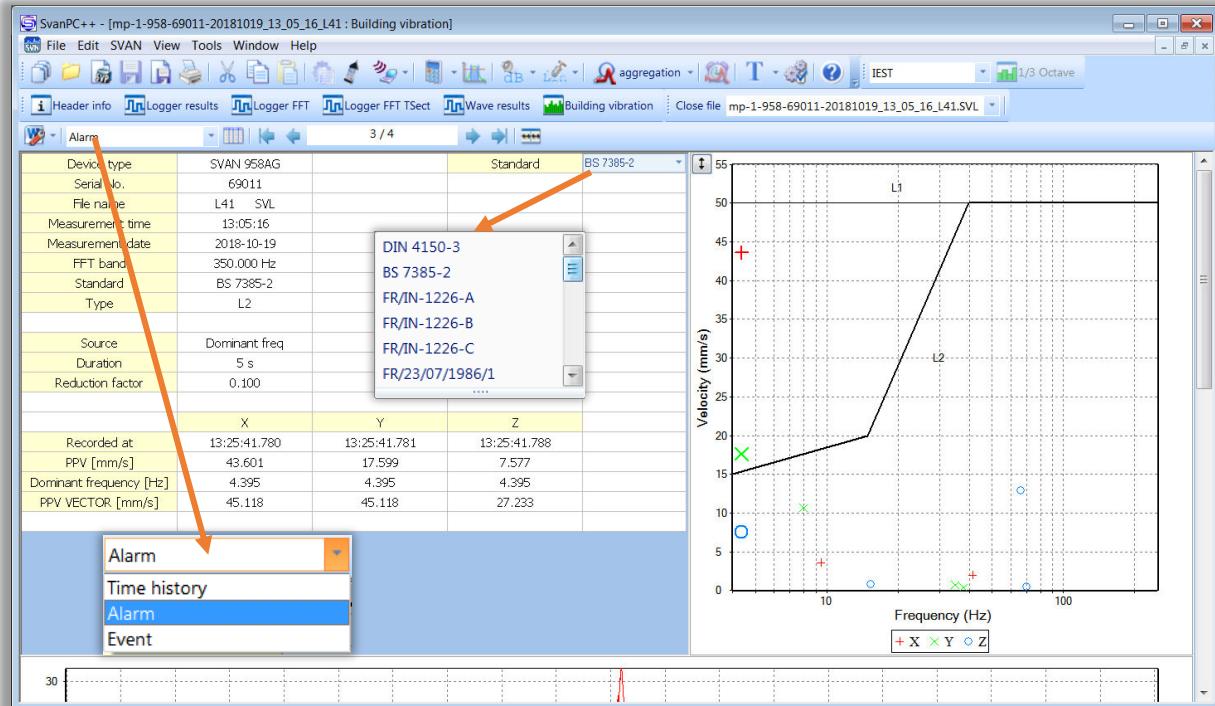
6.4.1 1/3 octave approach

In the case of the 1/3 octave approach, the *Building vibration* view presents a table with SV 804 settings and data for the time history, events or alarms and Criterion curves with measurement results for three axes (X, Y, Z) in the form of 1/3 octave spectra.



6.4.2 FFT approach

In the case of the FFT approach, the *Building vibration* view presents a table with SV 804 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.



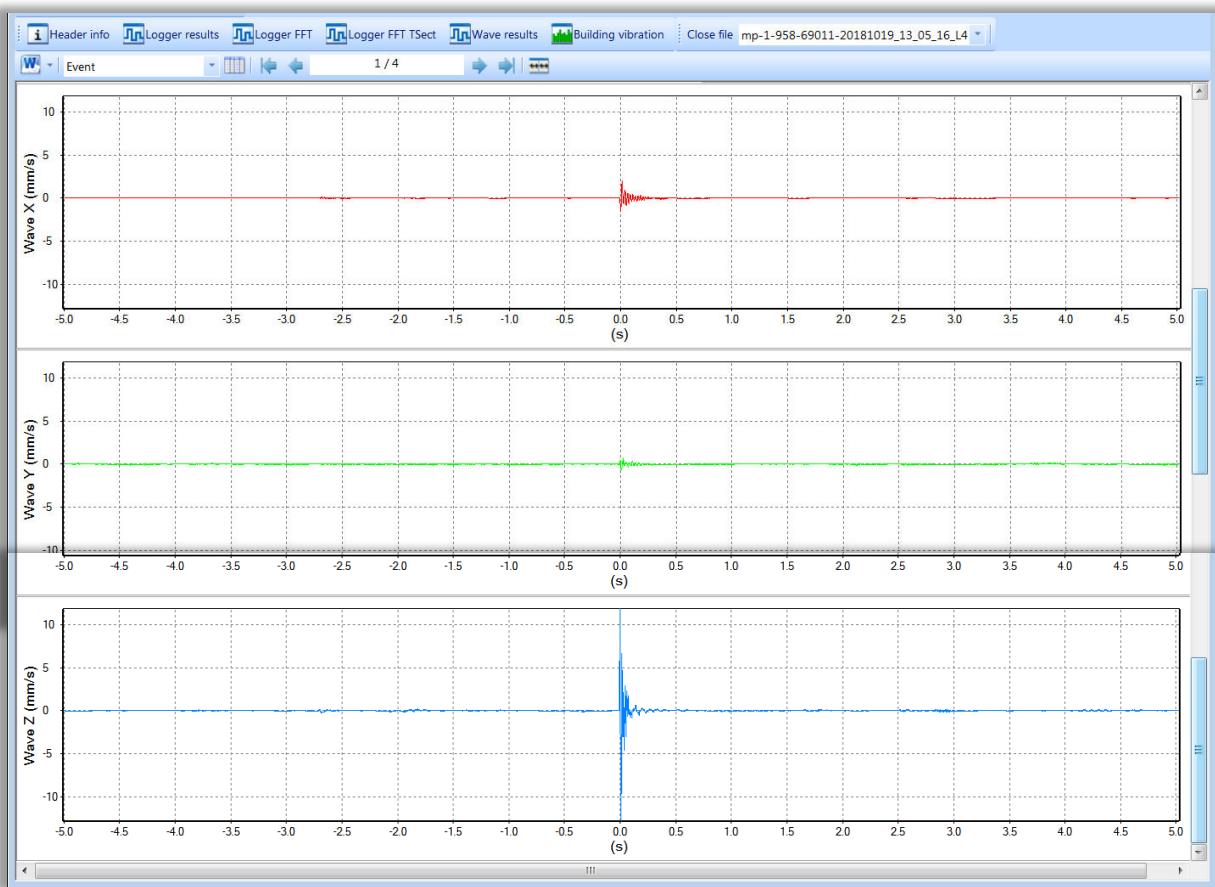
The content of the table and the data presented on the right plot depend on the selections made in the second position of the View toolbar (*Time history*, *Alarm* or *Event*). When you select *Time history*, you can view PPV and Dominant frequency for all measurements performed with the Logger step.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



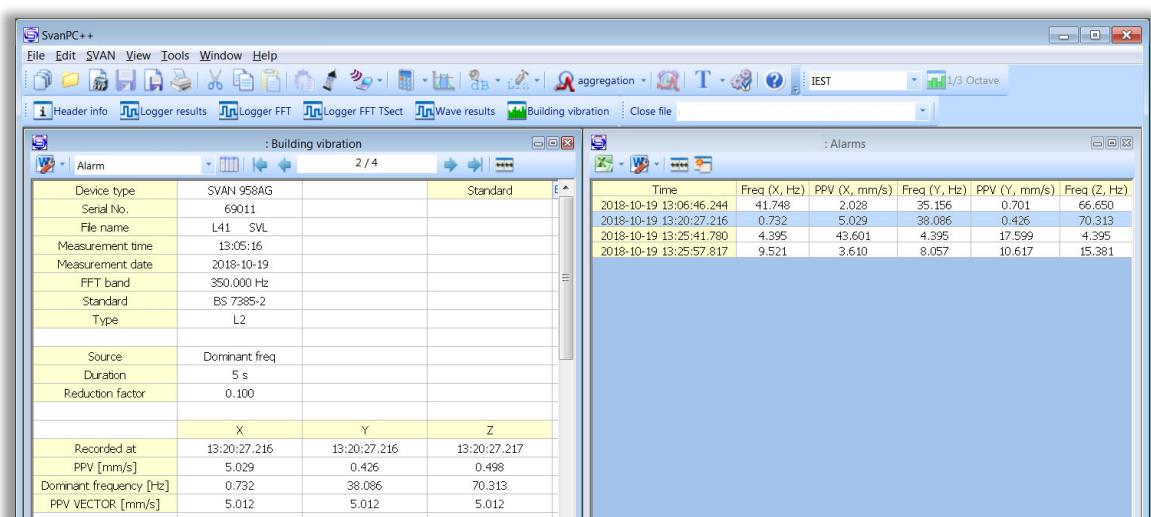
Note: SV 804 calculates PPVs, dominant frequencies, events and alarms based on the selected standard, which is displayed together with other settings in the second column of the table. Selection of the standard in the upper right cell only places another criterion curves, but all measurement results will not be changed.

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

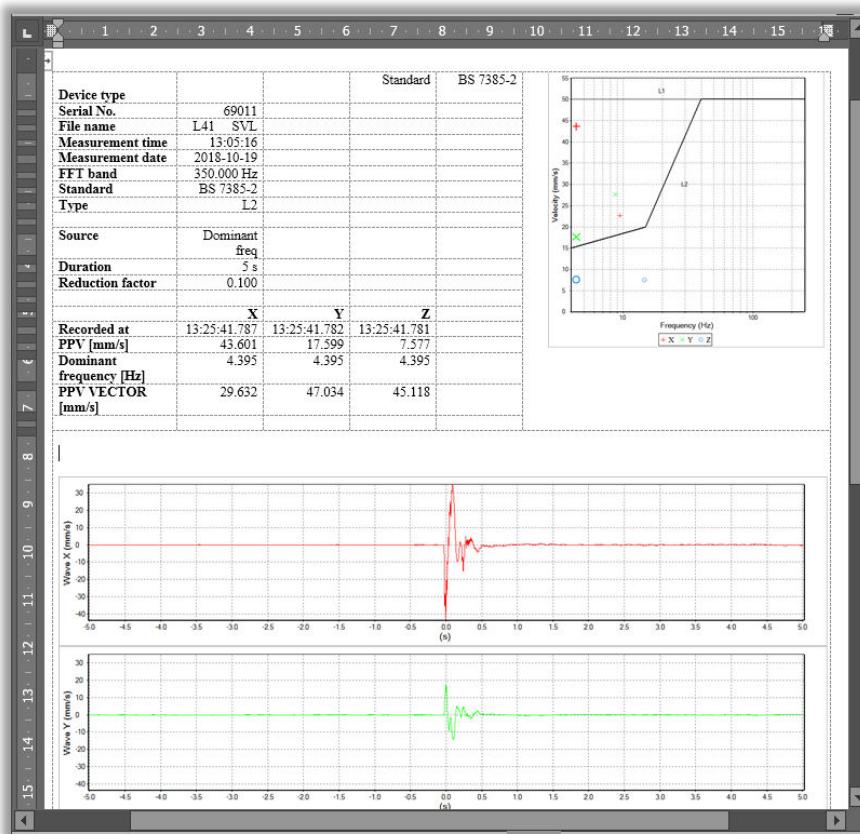


If you press the *Events list* button  located next to the Alarm/Event/Time history selector, the new *Alarms* view will appear. This view presents the table with all events detected.

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.



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



7 MAINTENANCE

7.1 EXCHANGING THE MEMORY CARD

The SV 804 is delivered with the 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.

7.2 RESETTING THE INSTRUMENT

- **HARDWARE RESET:** internal hardware reset; no user data (settings and memory content) is changed.
Open the cover of the SV 804 and then hold down the  button for 20 seconds and then release it. The same effect is achieved if you remove and then insert the battery again after 3 minutes.



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.

7.3 FIRMWARE UPGRADE

You can upgrade the firmware either via *SvanNET* (see Chapter [5.4](#)) or via the USB connection to a PC.

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

1. Turn off the instrument.
2. Enter Bootstrap mode. Press and hold both buttons on the keyboard and wait for the left LED to turn red. Then release the left button within two seconds. All the LEDs will then turn green within the next two seconds, at which point you can release the second button.
3. Connect the SV 804 to a PC using SC 816 USB cable.
4. Run the **go-usb.bat** file from the upgrade package on your PC. During loading the new firmware, the internal LED will flash red. A
5. After the firmware has loaded, the instrument will start automatically.

7.4 PRESERVATION OF THE INTERNAL BATTERY

- To preserve the life of the internal battery, 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 804 should not be stored for a long time with discharged battery. Storing with the battery in discharged condition may damage it.



Note: If SV 804 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.

7.5 TRANSPORTATION AND STORAGE

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



Note: For air-transport turn off the instrument.

7.6 CLEANING

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.

7.7 TROUBLESHOOTING

- In the case your instrument does not respond, proceed with hardware reset of the instrument (see Chapter [7.2](#)).
- 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.

Internet: www.svantek.com

Address: [SVANTEK Sp. z o.o.
Strzygowska 81
04-872 Warszawa,
Poland](http://SVANTEK Sp. z o.o. Strzygowska 81 04-872 Warszawa, Poland)

APPENDIX A. REMOTE CONTROL CODES

USB 2.0 interface (full speed only) is a serial interface working with 12 MHz clock which enables one to control remotely the device. Its speed is relatively high, and it ensures the common usage of USB in all produced nowadays Personal Computers.

Alternatively, all commands described in this appendix are valid for any other kinds of interfaces (if present) like **mobile (3G/4G)** communication, **bluetooth** or **RS232**. Mobile use TCP/IP or UDP communication protocols to exchange data with the instrument. Some of the instruments can also be controlled via SMS.

Functions, which are developed in order to control data flow in the serial interfaces, ensure:

- Bi-directional data transmission,
- Remote control of the instrument.

In order to program the serial interface, the user has to:

1. send a "function code",
2. get a response to the "function code"
3. send/receive a data file (optionally)

A.1 INPUT / OUTPUT TRANSMISSION TYPES

The following basic input / output transmission types (called functions) are available:

FUNCTION #1 – GENERAL CONTROL FUNCTIONS

FUNCTION #2 – MEASUREMENT RESULTS READ-OUT IN THE VLM MODE

FUNCTION #3 – MEASUREMENT RESULTS READ-OUT IN FFT AND 1/3-OCTAVE

FUNCTION #4 – SETUP FILE READ-OUT

FUNCTION #7 – SPECIAL CONTROL FUNCTIONS

FUNCTION #9 – SETUP FILE WRITE-IN

FUNCTION #D – DATA FILES ACCESS

FUNCTION #S – DIRECT SETUP ACCESS

No table of contents entries found.

A.2 FUNCTION #1 – GENERAL CONTROL FUNCTIONS

#1 function enables the user to send the control setting codes to the instrument and read out a file containing the current control state. A list of the control setting codes is given in A.10 **Control setting codes**. The format of #1 function is defined as follows:

#1,Xccc,Xccc,...,Xccc; (1)

or

#1,Xccc,X?,Xccc,...,X?,Xccc; (2)

or

#1,X?,X?,...,X?; (3)

where:

X - group code, **ccc** – new code value,

X? - request to send the current X code setting.

In the first case (1) the instrument does not respond to a command, even if an error occurs.

In the second and third cases (2), (3) the instrument outputs control settings for all requests X? in the following format:

#1,Xccc,Xccc,...,Xccc;



Note: All bytes of that transmission are ASCII characters.



Note: Changing settings using #1 functions during measurements running state (#1,S1;) is blocked. Stop the measurements (#1,S0;) before changing the settings.

In order to read out all current control settings the user should send to the device the following sequence of characters:

#1;

In this case the instrument outputs all control settings given in A.10 **Control setting codes** in the format:

#1,Xccc,Xccc,...,Xccc;

Example: The instrument sends the following sequence of characters as an answer for the mentioned above request:

#1,U804,N1234,W1.01.1,Q0.01:1,Q0.10:2,Q0.30:3,M18,I17:1,I17:2,I16:3,B16,b16,d1s,D1s,K1,L1,Y1,y1,X
A0,XD-1:1,XD-1:2,XD-1:3,XD-1:4,XD-1:5,XD-
1:6,Xlapp.svannet.com,XJ8000,XNinternet,XOnone,XUnone,
XV0.0.0.0,XV0.0.0.0,XV0.0.0.0,XXI1,XXu11,XXz10,XXq60,XXr1800,XXw10,Xk0,Xw0,XF0,XG0,Xo1000,S1,
T1,p1,u1,h1,E1;

means that:

- SV 804 is investigated (**U804**); see #7,US; command for unit subtype information;
- its serial number is 1234 (**N1234**);
- software version number is 1.22.1 (**W1.01.1**);
- calibration factor is equal to 0.01 dB in X axis, 0.10 dB in Y axis and 0.30 in Z axis (**Q0.01:1,Q0.10:2,Q0.30:3**);
- **GROUND VIBRATION** is selected as the measurement function (**M18**);
- ... and so on.

See A.10 **Control setting codes** for more details.



Note: Control settings presented in the instrument's response and not described in A.10 **Control setting codes** considered as reserved. Do not change these settings!

A.3 FUNCTION #2 – MEASUREMENT RESULTS READ-OUT IN THE VLM MODE

#2 function enables one to read out the current measurement velocity results from the selected axis.

#2 function has the format defined as follows:

#2 [<aver>[<flags>]] [<profile>] [[[,X?] ,X?] ,(...)];

where:

<aver> – type of results:

- i – instantaneous results, i.e. results from the current cycle (default),
- a – averaged results, i.e. results from the previous cycle,

c – 1 second results, i.e. results integrated for the last 1 second,

<flags> – flags:

s – measurements flags, i.e. measurements running,

<profile> – profile number:

1, 2 or 3 – one of the axes/profiles, i.e. only results from the given axis/profile will be sent;

1 – profile1, X axis,

2 – profile1, Y axis,

3 – profile1, Z axis

X – code of the specified result (see below); if no codes are specified all results will be sent;

In the case of **<profile> = 1, 2 or 3** the instrument sends results in the format defined as follows:

#2 [,<aver>[<flags>f]],<profile>,Xccc,(...);

where **f** is a flags value, e.g. 1 – measurements are running; **ccc** is the value of the result **X** or question mark (?) if result **X** is not available;

If no results are available, the instrument returns:

#2,?;

The **X** codes of the results from the **SLM** mode are defined as follows:

- v** under-range flag (ccc equals to 0 when the overload did not occur, 2 when the under-range took place during the last measurement period but did not occur in the last second of the measurement and 3 when the under-range took place during the last measurement period and it lasted in the last second of the measurement);
- V** overload flag (ccc equals to 0 or 1);
- T** time of the measurement (ccc – value in seconds);
- x** start date of the measurement in format **dd/mm/yyyy** (**dd** – day, **mm** – month, **yyyy** – year)
- t** start time of the measurement in format **hh/mm/ss** (**hh** – hour, **mm** – minute, **ss** – second)
- P** **Peak** value (ccc – the value in dB);
- Q** **P-P** value (ccc – the value in dB);
- M** **Max** value (ccc – the value in dB);
- R** **RMS** result (ccc – the value in dB).
- g** **RRMS** result (ccc – the value in dB);
- F** **CRF** result (ccc – the value in dB);
- O** **Peak Vector** result (ccc – the value in dB);
- d** **DF** result (ccc – the value in Hz);

The exemplary results of the instrument's response after sending to it the following sequence of characters: **#2,1;** coming from the first profile are given below:

#2,1,x06/06/2022,t11:11:05,v0,V0,T45,P61.10,Q54.24,M52.76,R48.43,g?,F12.67,O52.21,d7.15;



Note: The presented above order of the measurement results sent out by the instrument does not depend about the characters sent to the unit.

Example: After sending to the instrument the string:

#2,1,T?,R?,V?,P?;

the unit sends out the results of measurement coming from the first profile in predefined, described above, order:

#2,1,V0,T34,P60.18,R47.56;



Note: All bytes of that transmission are ASCII characters.

A.4 FUNCTION #3 – MEASUREMENT RESULTS READ-OUT IN FFT AND 1/3-OCTAVE

#3 function enables one to read out the current measurement results **FFT** or **1/3 OCTAVE**, depends on ground vibration standard selected.

#3 function format is defined as follows:

- #3[x][,T]; - instantaneous spectrum (in the FFT mode, the spectrum from the last full second)
- #3[x] [,T],A; - averaged spectrum
- #3[x] [,T],I; - instantaneous spectrum (in the FFT mode, the spectrum from the last full second)
- #3[x] [,T],M; - max spectrum
- #3[x] [,T],N; - min spectrum
- #3[x] [,T],P; - peak spectrum
- #3[x] [,T],S; - spectrum for the last full Velocity Step Period

T - include additional parameter in text header data in the instrument's response

x – send result only for selected channel: 1, 2 or 3

The device responds, sending the last measured spectrum (when the instrument is in STOP state) or currently measured spectrum (when the instrument is in RUN state) in the following format:

#3[<channel>][,x<date>][,t<time>][,r<resolution>][,T<int_time>][,f<first_frq>];<Status Byte> <LSB of the transmission counter> <MSB of the transmission counter> <data byte> (...) <data byte>

<channel> is the channel number 1, 2 or 3

<date> is the measurement date given in format DD:MM:RRRR

- DD – day
- MM – month
- RRRR – year

<time> is the measurement time given in format HH:MM:SS.mmm

- HH – hour
- MM – minute
- SS – second
- mmm – millisecond

<resolution> is the FFT resolution time given in Hz (only in FFT)

<int_time> integration time in seconds (only in 1/3 octave)

<first_frq> first 1/3 octave frequency (only in 1/3 octave)

e.g.

#3,1,x02/08/2022,t14:25:54.701,r0.52083,2,x02/08/2022,t14:25:52.512,r0.52083,3,x02/08/2022,t14:25:45.422,r0.52083;

The optional text header parameters

[<channel>][,x<date>][,t<time>][,r<resolution>][,T<int_time>][,f<first_frq>] are sent only if "T" option is selected.

<Status Byte> gives the information about the current state of the instrument.

D7	D6	D5	D4	D3	D2	D1	D0
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where:

D7 = 0 means that "overload does not happen in channel 3 (Z)",
 = 1 means that "overload appeared in channel 3 (Z)",

D6 = 0 means that "overload does not happen in channel 2 (Y)",
 = 1 means that "overload appeared in channel 2 (Y)",

D5 = 0 means that "overload does not happen in channel 2 (X)",
 = 1 means that "overload appeared in channel 1 (X)",

D4 = 0 the instantaneous current result (RUN State),
 = 1 the final result (STOP State),

D3 = 0 **1/3 OCTAVE** results,
 = 1 **FFT** results,

D2, D1, D0 type of spectrum:

000 - averaged spectrum

001 - instantaneous spectrum (in the FFT mode, the spectrum from the last full second)

010 - max spectrum

011 - min spectrum

100 - peak spectrum

101 - spectrum for the last full Velocity Step Period



Note: ASCII part of the response ends with semicolon ":". Status byte, transmission counter and data bytes are coded in binary form.



Note: The measurement result is coded in binary form as dB•100 (e.g. 34.5 dB is sent as binary number 3450).

A.5 FUNCTION #4 – SETUP FILE READ-OUT

#4 function enables the user to read-out a file from the internal Flash-disk or RAM memory. The data file formats are given in Appendix B.

#4 function formats are defined as follows:

#4,0,\; file containing the catalogue,

#4,0,?; count of the files,

#4,0,index,count; part of the file containing the catalogue,

where:

index - first record,

count - number of records in the catalogue.

The catalogue of the files is a set of the records containing 16 words (16 bits each). Each record describes one file saved in the instrument's Flash-disk or RAM. The record structure is as follows:

words 0 - 3 8 characters of the file name,

word 4 type (binary number),

word 5 reserved,

word 6 least significant word of the file size,

word 7 most significant word of the file size,

words 8 - 15 reserved.

#4,4; current setup file,

#4,4,?; size of the current setup file,

#4,4,offset,length; part of current setup file,

where:

offset - offset from the beginning of the current setup file,

length - number of bytes to read,



Note: The "\ character is treated as the file name of the catalogue and must be sent to the instrument.

All data words are sent <LSB> (least significant byte) first.

When an error is detected in the file specification or data, the instrument respond with:

#4,?;



Note: Current setup file placed in RAM is serviced by this command in the SV 804 only. For data files access see A.8 Function #D – data files access.

A.6 FUNCTION #7 – SPECIAL CONTROL FUNCTIONS

#7 function enables the user to perform special control functions. **Some of them should be used with the extreme care.**

#7 function format is defined as follows.

To read settings a query should be send to the device:

#7,<code>;

where <code> is a two ASCII letter code.

The device responds with a control settings:

#7,<code>,set1[,set2[,set3[,...[setN]]]];

where <code> is the same code sent in the query and **set1, set2,... setN** are settings.

To write settings to the device follow the opposite procedure. Send to the device:

#7,<code>,set1[,set2[,set3[,...[setN]]]];

In case of success the device responds with:

#7,<code>;

In case of an unknown function or error the device returns:

#7,?;

Codes and settings for #7 function are described in the A.10 **Control setting codes**.



Note: #7 function protocol consist of ASCII characters only.



Note: Some of the #7 functions are blocked during measurements running state (#1,S1;). Stop the measurements (#1,S0;) before changing these settings.

A.7 FUNCTION #9 – SETUP FILE WRITE-IN

#9 function enables the user to write a configuration file into the instrument's storage or non-volatile memory. The data file formats are given in Appendix B.

#9 function formats are defined as follows:

#9,<FILE_TYPE>,<FILE_LENGTH>,<DATA>

where:

<FILE_TYPE>	type of the file
	2 - setup file (file is saved on SD card; does not change current setup),
	4 - current setup file,
<FILE_LENGTH>	length of the file in bytes,
<DATA>	binary content of the file.



Note: #9 function is blocked during measurements running state (#1,S1;). Stop the measurements (#1,S0;) before using the function.

A.8 FUNCTION #D – DATA FILES ACCESS

#D functions are used to access data files in the instrument's storage like microSD card or USB Flash Disc with FAT file system. A basic knowledge of FAT file system is necessary to use these functions.

#D functions take the following parameters:

<disk>	logical disk number:
	0 – SD-card,
	1 – USB Disk (not implemented),
	2 – Internal Memory (not implemented)
<address>	directory address (cluster number),
<offsetB>	offset of the first byte to read (an even number),
<nB>	number of bytes to read (an even number),
<data>	binary data,
<count>	directory size in bytes,
<name>	filename in the format XXXXXXXX.YYY (XXXXXXX – filename, YYY- filename extension),
<dirName>	directory name,
<nBwr>	number of bytes to write.

1) **#D,c,?;** this function returns a list of available disks in format:

#D,c,<disk1>[,<disk2>[,<disk3>]];

2) **#D,d,?;** this function returns parameters of the working directory in format:

#D,d,<disk>,<address>,<count>;

3) **#D,d,<disk>,<address>;** this function enables to change the working directory.

Response:

#D,d; - command was executed

#D,d,?; - command cannot be executed

4) **#D,r,<disk>,<address>,<offsetB>,<nB>;** the function enables to read a file from the working directory.

Response:

#D,r,<disk>,<address>,<offsetB>,<nB>[<data>]

5) **#D,w,<name>,<nBwr>,<data>** the function enables to write a file to the working directory.

Response:

#D,w; - command was executed
#D,w,?; - command cannot be executed

6) **#D,e,<name>;** function enables to delete a file in working directory.

Response:

#D,e; - command was executed
#D,e,?; - command cannot be executed

7) **#D,e;** function enables to delete all files in the working directory.

Response:

#D,e; - command was executed
#D,e,?; - command cannot be executed

8) **#D,m,<address>,<dirName>;** function enables to create a subdirectory in the directory defined by <address>.

Response:

#D,m; - command was executed
#D,m,?; - command cannot be executed

9) **#D,f,<address>;** function enables to delete directory and its contents (files and subdirectories).

Response:

#D,f; - command was executed
#D,f,?; - command cannot be executed

10) **#D,j,?;** this function returns parameters of the archive directory in format:

#D,j,<disk>,<address>;

11) **#D,s,?;** this function returns parameters of the setup directory in format:

#D,s,<disk>,<address>;



Note: Only read functions are available during measurements running state (#1,S1;). Stop the measurements (#1,S0;) to unlock all the functions.

A.9 FUNCTION #S – DIRECT SETUP ACCESS

#S function enables to read/write instrument's settings in a direct manner. Any settings changed by this command affect current setup, are written into non-volatile memory and are available on the next power up.

#S function format is defined as follows.

To read settings a query should be send to the device:

#S[,<code1>[,<code2>[,<code3>[,...]]]];

where **<codeN>** is a two to four ASCII letter setting code.

The device responds with a control settings:

#S[,<code1>:<set1>[,<code2>:<set2>[,<code3>:<set3>[,...]]]];

where **<codeN>** is the same settings code sent in the query and **<setN>** is a settings value.

To return all settings available send:

#S;

To write settings to the device follow the opposite procedure. Send to the device:

#S,<code1>:<set1>[,<code2>:<set2>[,<code3>:<set3>[,...]]]];

In case of success the device responds with the same ASCII string:

#S,<code1>:<set1>[,<code2>:<set2>[,<code3>:<set3>[,...]]]];

In case of an error (e.g. settings code does not exist or parameter value is out of range) the device respond with “?” instead of **<setN>** value:

#S,<codeN>:?;

For example if three parameters are set and **<set2>** is out of range the device response is:

#S,<code1>:<set1>,<code2>:?,<code3>:<set3>;

Codes and settings for #S function are described in the A.10 **Control setting codes**.



Note: #S function protocol consist of ASCII characters only.



Note: Some of the #S functions are blocked during measurements running state (#1,S1;). Stop the measurements (#1,S0;) before changing these settings.

A.10 CONTROL SETTING CODES

The control setting codes used in the SV 307 instrument are given in the below tables.

Table A.1 Unit information

Table A.2 Measurements settings and control

Table A.3 Calibration and geophone settings

Table A.4 Channel/profile settings

Table A.5 Spectrum settings

Table A.6 Wave settings

Table A.7 Logger settings

Table A.8 CSV export settings

Table A.9 System check settings

Table A.10 Setup settings

Table A.11 Alarms settings

Table A.12 General settings

Table A.13 Power settings

Table A.14 System log settings

Table A.15 Position and time settings

Table A.16 Mobile network settings and status

Notes:

- function codes marked in green are **read only!**
- function codes marked in red are **locked during measurements run state!** Stop measurements before changing these settings.
- values in square brackets are **[optional]!**
- values are written in the form of numbers or in the form of a bit number (prefix 'b') or hexadecimal (prefix '0x') e.g. the b5 is equal to the number 32 = 2^5 or hexadecimal 0x20.



Table A.1 Unit information

Group name	#1 code	#7 code	#S code	Code description
Unit type	U			804
Unit subtype		US		Returns unit subtype. 1 – SV 804
Serial number	N			xxxxxx
Software version	W			a.bb.c – firmware version a.bb.0c – beta firmware version
			AA	abbc – firmware version in hex format
Files system version		FS		a.bb – file system version
PIC version		PI		x.xx – version of auxiliary microcontroller
Hardboot version		VH		x.xx – version of hardboot program
Bootstrap version		VB		x.xx – version of bootstrap program

Table A.2 Measurements settings and control

Group name	#1 code	#7 code	#S code	Code description
Measurement function	M		BB	18 - GROUND VIBRATION
Measurement state	S			0 - STOP 1 - START 2 - PAUSE 3 - System Check (read only) 4 - Delay before START (read only)

Group name	#1 code	#7 code	#S code	Code description
Detector type in the LEQ function	L		BG	0 - LINEAR 1 - EXPONENTIAL
Rolling time	XXr		BT	nn- nn time in seconds $\in (1 \div 60)$ nn- nn time in minutes multiplied by 60 $\in (60 \div 3600)$
Auto-Run		AS		#7,AS,<e>,<HH>,<MM>,<hh>,<mm>,<dW>,<mR>; where: <e> - On (e=1), Off (e=0), <HH> - hour of the measurement start, <MM> - minutes of the measurement start, <hh> - hour of the measurement stop, <mm> - minutes of the measurement stop, <dW> - day of week in which the measurement will be done defined as a sum of flags: b0 - Monday b1 - Tuesday b2 - Wednesday b3 - Thursday b4 - Friday b5 - Saturday b6 - Sunday <mR> - maximum number of the measurement days,
				MR <e> - On (e=1), Off (e=0)
				MJ <HH> - hour of the measurement start
				MK <MM> - minutes of the measurement start
				ML <hh> - hour of the measurement stop
				MM <mm> - minutes of the measurement stop
				MN <dW> - day of week
				MO <mR> - maximum number of the measurement days

Table A.3 Calibration and geophone settings

Group name	#1 code	#7 code	#S code	Code description
Calibration factor	Q			Qxx.xx:n - calibration factor [dB] represented as real number $\in (-10.00 \div 10.00)$ in axis n (1 – X, 2 – Y, 3 – Z)
			AJn	xxxx - calibration factor [dB] multiplied by 100 $\in (-1000 \div 1000)$. in axis n, (0 – X, 1 – Y, 2 – Z)
Last calibration type			AFn	Previously performed calibration type

Group name	#1 code	#7 code	#S code	Code description
				0 - none 1 - BY MEASUREMENT (manual) 2 - REMOTE 3 - FACTORY CALIBRATION 4 - AUTOCAL CALIBRATION n: axis (0 – X axis, 1 – Y axis, 2 – Z axis)
Last calibration date and time		CT		Function returns calibration date and time for all axes in order X, Y, Z, in the format: #7,CT,DD-MM-YYYY,hh:mm:ss, DD-MM-YYYY,hh:mm:ss, DD-MM-YYYY,hh:mm:ss ; where hh:mm:ss denotes the time and DD/MM/YYYY gives the date
			AGn	Last calibration date d - coded data $\in (0 \div 65535)$ Date decoding in C language: day = (d & 0x1F); month = ((d>>5) & 0x0F); year = ((d>>9) & 0x7F) + 2000; n: axis (0 – X axis, 1 – Y axis, 2 – Z axis)
			AHn	Last calibration time t - t coded time $\in (0 \div 65535)$ Time decoding in C language: sec = (t%30); min = ((t/30)%60); hour = (t/1800); <i>Note: time resolution is 2 seconds!</i> n: axis (0 – X axis, 1 – Y axis, 2 – Z axis)
Last calibration ref. level			AIn	xxxx - calibration reference level [dB] multiplied by 100 n: axis (0 – X axis, 1 – Y axis, 2 – Z axis)
Calibration history file version			AT	v - version of calibration history file " C.TXT "
Calibration history file split size	XXw		AW	s - a size limit of the calibration history " C.TXT " file [MB] $\in (0 \div 255)$ <i>Note: A new file is created after the size limit is reached.</i>
Geophone TEDs type		TT		Returns type of geophone saved in TEDS memory for all axes in order X, Y, Z Where -1 - unknown, 83V - geophone (vertical type) 83H - geophone (horizontal type) 183 - electrical input adapter
Geophone TEDs serial number		TS		Returns serial number of geophone saved in TEDS memory for all axes in order X, Y, Z.

Group name	#1 code	#7 code	#S code	Code description
Geophone TEDs calibration		TC		Returns calibration factor of geophone saved in TEDS memory for all axes in order X, Y, Z.
Geophone TEDs factory calibration		TF		Returns factory calibration factor of geophone saved in TEDS memory for all axes in order X, Y, Z.

Table A.4 Channel/profile settings

Group name	#1 code	#7 code	#S code	Code description
Human Vibration Filter type in axis n	I			Ik:n - k filter in axis n k: 16 – Wk, 17 – Wd, 18 – Wc, 20 – Wm, 23 – Wb 7.7.1.1 <i>n – axis number: 1-X, 2-Y, 3-Z</i>
			BIn	k - k filter in axis n, n – axis number: 3-X, 4-Y, 5-Z

Table A.5 Spectrum settings

Group name	#1 code	#7 code	#S code	Code description

Table A.6 Ground Vibration settings

Group name	#1 code	#7 code	#S code	Code description
Ground Vibration Standard			CA	Standard for Ground Vibration function 0 - Off 1 - PPV 2 - BS-7385-2 3 - DIN-4150-3 4 - KBfmax 5 - FR/22/09/1994 6 - FR/23/07/1986/1 7 - FR/23/07/1986/2 8 - FR/IN-1226-A 9 - FR/IN-1226-B

Group name	#1 code	#7 code	#S code	Code description
				10 - FR/IN-1226-C 11 - IEST 12 - User
Ground Vibration Type			CB	In case of DIN-4150-3 standard 0 - Foundation 1 - Top Floor 2 - Floor Slab 3 - Underground Cavities 4 - Buried Pipework 5 - LT Top Floor 6 - LT Floor Slab
Ground Vibration Spectrum			CC	In case of User standard 1 - FFT VEL 3 - 1/3 VEL
Ground Vibration Spectrum Results			CD	In case of User standard 0 - Peak 1 - Max 2 - Min 3 - RMS
Ground Vibration Building Type			CE	Building Type 0 - L1 1 - L2 2 - L3 3 - L4 4 - Workshop, 5 - Office, 6 - Residential, 7 - Theatre, 8 - VC-A, 9 - VC-B, 10 - VC-C, 11 - VC-D, 12 - VC-E
Ground Vibration Band			CF	Frequency Band 0 - (1Hz - 80Hz) 1 - (1Hz - 315Hz)
Human Vibration			CG	0 - Off

Group name	#1 code	#7 code	#S code	Code description
				1 - On
Criterion y th for curve x th x ∈ (0 ÷ 2), y ∈ (0 ÷ 9)			FAxy	In case of User standard Criterion's Criterion: 0 - Off 1 - On
FFT Lower frequency Criterion y th for curve x th x ∈ (0 ÷ 2), y ∈ (0 ÷ 9)			FDxy	In case of User standard FFT Lower frequency in Hz ∈ (1 ÷ 512)
1/3 Octave Lower frequency Criterion y th for curve x th x ∈ (0 ÷ 2), y ∈ (0 ÷ 9)			FExy	In case of User standard 1/3 Octave Lower frequency: 0 - 0.8 Hz 1 - 1.0 Hz 2 - 1.25 Hz 3 - 1.6 Hz 4 - 2.0 Hz 5 - 2.5 Hz 6 - 3.15 Hz 7 - 4.0 Hz 8 - 5.0 Hz 9 - 6.3 Hz 10 - 8.0 Hz 11 - 10.0 Hz 12 - 12.5 Hz 13 - 16.0 Hz 14 - 20.0 Hz 15 - 25.0 Hz 16 - 31.5 Hz 17 - 40.0 Hz 18 - 50.0 Hz 19 - 63.0 Hz 20 - 80.0 Hz 21 - 100 Hz 22 - 125 Hz 23 - 160 Hz 24 - 200 Hz 25 - 250 Hz 26 - 315 Hz

Group name	#1 code	#7 code	#S code	Code description
				27 - 400 Hz 28 - 500 Hz 29 - 630 Hz 30 - 800Hz 31 - 1000Hz
FFT Upper frequency Criterion y^{th} for curve x^{th} $x \in (0 \div 2)$, $y \in (0 \div 9)$			FHxy	In case of User standard FFT Upper frequency in Hz $\in (1 \div 512)$
1/3 Octave Upper frequency Criterion y^{th} for curve x^{th} $x \in (0 \div 2)$, $y \in (0 \div 9)$			Flxy	In case of User standard 1/3 Octave Upper frequency: 0 - 0.8 Hz 1 - 1.0 Hz 2 - 1.25 Hz 3 - 1.6 Hz 4 - 2.0 Hz 5 - 2.5 Hz 6 - 3.15 Hz 7 - 4.0 Hz 8 - 5.0 Hz 9 - 6.3 Hz 10 - 8.0Hz 11 - 10.0 Hz 12 - 12.5 Hz 13 - 16.0 Hz 14 - 20.0 Hz 15 - 25.0 Hz 16 - 31.5 Hz 17 - 40.0 Hz 18 - 50.0 Hz 19 - 63.0 Hz 20 - 80.0Hz 21 - 100 Hz 22 - 125 Hz 23 - 160 Hz 24 - 200 Hz 25 - 250 Hz 26 - 315 Hz

Group name	#1 code	#7 code	#S code	Code description
				27 - 400 Hz 28 - 500 Hz 29 - 630 Hz 30 - 800Hz 31 - 1000Hz
Lower value Criterion y th for curve x th $x \in (0 \div 2)$, $y \in (0 \div 9)$			FGxy	In case of User standard Lower value, $\in (0 \div 1000)$
Upper value Criterion y th for curve x th $x \in (0 \div 2)$, $y \in (0 \div 9)$			FKxy	In case of User standard Upper value, $\in (0 \div 1000)$
Value Unit Criterion y th for curve x th $x \in (0 \div 2)$, $y \in (0 \div 9)$			FCxy	In case of User standard Value unit: 0 - $\mu\text{m/s}$ 1 - mm/s
Lower frequency included Criterion y th for curve x th $x \in (0 \div 2)$, $y \in (0 \div 9)$			FFxy	In case of User standard Lower frequency included: 0 - Off 1 - On
Upper frequency included Criterion y th for curve x th $x \in (0 \div 2)$, $y \in (0 \div 9)$			FJxy	In case of User standard Upper frequency included: 0 - Off 1 - On

Table A.6 Wave settings

Group name	#1 code	#7 code	#S code	Code description
Wave file name			IB	xxxxxxxx - up to 8 characters (permitted characters: 0:9, A:Z, and '_'). Default name "R1"
Last wave file name		LW		a name of a previous wave file
Wave recording mode	XXu		IA	0 - Off 1 - continuous 11 - alarm
Sampling	XXI		IE	1 - 1024 Hz 2 - 512 Hz 3 - 256 Hz
Pre trigger	XXz		IL	x - x pre trigger time [s] (default 10s) $\in (0 \div 60)$

Group name	#1 code	#7 code	#S code	Code description	
Post trigger	XXy		IN	x -	x recording time [s]; $\in (1 \div 59)$, $(60 \div 3600)$ with 60s steps and $(3600 \div 28800)$ with 3600s steps
Length Limit	XXq		IP	0 - x -	file size limit 4GB file size limit in minutes; $\in (1 \div 480)$

Table A.7 Logger settings

Group name	#1 code	#7 code	#S code	Code description	
Logger file name			DC	xxxxxxxx – up to 8 characters (permitted characters: 0:9, A:Z, and '_'). Default name "L1"	
Last logger file name		LB		a name of a previous logger file	
Velocity Step (Integration period)	D			0 -	infinity (measurement finished by pressing the Stop or remotely - by sending S0 control code)
			BE	nns - nnm - nnh -	nn number in seconds nn number in minutes nn number in hours
Human Vibration Step (Logger step)	d		DB	0 - nn -	infinity (measurement finished by pressing the Stop or remotely - by sending S0 control code) nn number of seconds $\in (30 \div 3600)$
Human Vibration results			DR	x - b0 - b1 - b2 - b3 - b4 - b5 -	x – sum of the following flags: Peak values P-P values Max values RMS values VDV values RRMS values
Velocity FFT results			DS	0 - 1 - 2 -	Off Continuous On Event
Velocity results			DP	x - b0 - b1 - b2 - b3 - b5 - b6 - b7 - b9 -	x – sum of the following flags: Peak values P-P values Max values RMS values RRMS values Peak Vector values DF values OVL time values

Group name	#1 code	#7 code	#S code	Code description
Logger File Splitting Mode	XA		DH	<p>0 - switched off (OFF)</p> <p>-1 - file is created for each measurement cycle.</p> <p>15 - file is created every 15 min, synchronized to RTC.</p> <p>30 - file is created every 30 min, synchronized to RTC.</p> <p>60 - file is created every 1 hour, synchronized to RTC.</p> <p>1440 - file is created on the specified times, see next parameter</p> <p><i>Note: for “-1” – integration period must be at least 60s</i></p>
Specified Time for Logger File Splitting	XD			<p>XDx:n – x = -1 (switched off)</p> <p>x = 0 ÷ 1439 (time in minutes)</p> <p>n = 1 ÷ 6 (specified time number)</p> <p><i>Note: valid only if Split Mode is equal to 1440</i></p>
		DI		<p>Active split time number</p> <p>x - x – sum of the following flags</p> <p>b0 - split on time number 1</p> <p>b1 - split on time number 2</p> <p>b2 - split on time number 3</p> <p>b3 - split on time number 4</p> <p>b4 - split on time number 5</p> <p>b5 - split on time number 6</p>
		DJn		Split hour (0 ÷ 23) for time number n-1, n ∈(0 ÷ 5)
		DKn		Split minute (0 ÷ 59) for time number n-1, n ∈(0 ÷ 5)
User text			UB	text – up to 128 characters of user text added to each data file. Default text “ ”. Permitted characters: 0-9, a-z, A-Z, space and the following characters !#\$%&')(*-./:<=>?@[{} ^~
Time results	TL			<p>#7,TL,m,d;</p> <p>Get Time velocity results.</p> <p>m – the mask of selected results:</p> <p>b0 - PEAK, channel X,</p> <p>b3 - RMS, channel X,</p> <p>b5 - PEAK, channel Y,</p> <p>b8 - RMS, channel Y,</p> <p>b10 - PEAK, channel Z,</p> <p>b13 - RMS, channel Z,</p> <p>d – fifo buffer pointer:</p>

Group name	#1 code	#7 code	#S code	Code description
				<p>d = 0 - set the fifo pointer to the beginning before sending d = 1 - auto-incrementing of the fifo pointer d = 2 - set the fifo pointer to the last measured result before sending d < 0 - reset the fifo pointer by abs(d) results before to the last measured result</p> <p>Response format:</p> <p>#7,TL,r,mmmm,s,rn,rl,date,time,res1..resN;</p> <p>r – state of the instrument: r0 - RUN state, r1 - STOP state,</p> <p>m – the mask of selected results: b0 - PEAK, channel X, b3 - RMS, channel X, b5 - PEAK, channel Y, b8 - RMS, channel Y, b10 - PEAK, channel Z, b13 - RMS, channel Z,</p> <p>s – integration period in seconds,</p> <p>rn – the number of transmitted records,</p> <p>rl – the number of records in the fifo,</p> <p>date – the date of the first of the transferred records in format DD/MM/YYYY,</p> <p>time – the time of the first of the transferred records in format HH/MM/SS,</p> <p>res1..resN - the results in accordance with the mask (N records). The results of each record contains as many results as there are set bits in the mask</p>

Table A.8 CSV export settings

Group name	#1 code	#7 code	#S code	Code description
CSV file		CV		<p>Reading (response from the instrument): #7,CV,<on>,<err>;</p> <p>Writing: #7,CV,<on>;</p> <p>where</p> <p><err> - CSV file error; 0 – no error</p> <p><on> - Writing into CSV:</p>

Group name	#1 code	#7 code	#S code	Code description
				0 - Off , 1 - On
			EA	Writing into CSV: 0 - Off , 1 - On

Table A.9 System check settings

Group name	#1 code	#7 code	#S code	Code description
System check settings			RC	<p>To read/write settings send #7,RC[,<sel>]; where <sel> is settings selector:</p> <p>0 (or empty) - read system check status 1 - read/write system check settings</p> <p>2 - start system check 3 - read live check status 4 - read live check status and write to calibration history file</p> <p>Reading status (response from the instrument): #7,RC,0,<active>,<result>,<hh>,<mm>,<ss>,<sm>; where</p> <p><active> - status of the system check 0 - inactive 1 - active</p> <p><result> - result of the last system check 0 - OK 1 - Failed 2 - Not performed 3 - Speaker failed 4 - Geophone disconnected 5 - Geophone connected 6 - Geophone damaged</p> <p><hh> - hours left to the next system check <mm> - minutes left to the next system check <ss> - seconds left to the next system check <sm> - geophone service mode 0 - inactive 1 - active</p> <p>Reading/writing settings: #7,RC,1,<mode>[,<time>[,<wday>]]; where</p> <p><mode> - automatic system check function enable 0 - Off 1 - On</p> <p><time> - time of a day [min] when system check should be performed</p>

Group name	#1 code	#7 code	#S code	Code description
				<p>0 - Off 1...1439 –minutes since midnight <wday> - weekday mask; sum of the following flags representing week days</p> <p>b0 - Monday b1 - Tuesday b2 - Wednesday b3 - Thursday b4 - Friday b5 - Saturday b6 - Sunday</p> <p><i>Notes: the mask value is given in hexadecimal. For example, 1F means working days of a week Monday-Friday.</i></p> <p>Response from the #7,RC,3; and #7,RC,4; #7,RC,<x>,<result>,<sm>;</p> <p><x> - 3 or 4 <result> - result of the live check <sm> - geophone service mode</p>
			AX	<mode> - automatic system check function enable
			AY	<time> - time of a day [min] when system check should be performed
			AZ	<p><wday> - weekday mask</p> <p><i>Notes: the mask value is given in decimal. For example 31 value means working days of a week Monday-Friday.</i></p>
Last system check date			Aa	<p>d - coded data $\in (0 \div 65535)$ Date decoding in C language: day = (d & 0x1F); month = ((d>>5) & 0x0F); year = ((d>>9) & 0x7F) + 2000;</p>
Last system check time			Ab	<p>t - t coded time $\in (0 \div 65535)$ Time decoding in C language: sec = (t%30); min = ((t/30)%60); hour = (t/1800); <i>Note: time resolution is 2 seconds!</i></p>
Last system check result			Ac	<result> - result of the last system check

Table A.10 Setup settings

Group name	#1 code	#7 code	#S code	Code description
Load setup		LS		name - a name of a setup file to be loaded (activated)

Group name	#1 code	#7 code	#S code	Code description
				<p><i>Notes:</i></p> <ul style="list-style-type: none"> - name is given without "svt" extension - a setup file must be placed into the SETUP directory of the instrument's SD card prior using this command; see A.7 or A.8 on file upload
Save setup		SS		<p>name - a current instrument setup will be saved as a "name.svt" file in the SETUP directory of the instrument's SD card; 8 characters is a maximum name length</p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> - name is given without "svt" extension
Clear setup		CS		<p>This command restores factory defaults of the instrument.</p> <p>To execute command send #7,CS[,<sel>]; where <sel> is settings selector:</p> <ul style="list-style-type: none"> 0 (or empty) - clear measurements setup (preserve communication settings) 1 - clear all settings 2 - clear all settings and calibration history <p><i>Notes: it is not advised to use this function remotely via Internet with <sel>=1 or <sel>=2 since communication with the instrument may be lost!</i></p>
Delete setup		DS		<p>name - a name of a setup file to be deleted from the SETUP directory of the instrument's SD card</p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> - name is given without "svt" extension

Table A.11 Alarms settings

Group name	#1 code	#7 code	#S code	Code description
n th address book name ; nn ∈ (01 ÷ 16)			QAnn	<p><i>Notes:</i></p> <ul style="list-style-type: none"> - name has a maximum length of 16 characters
n th address book email ; nn ∈ (1 ÷ 16)			QBnn	<p><i>Notes:</i></p> <ul style="list-style-type: none"> - email has a maximum length of 48 characters
n th address book phone ; nn ∈ (1 ÷ 16)			QCnn	<p><i>Notes:</i></p> <ul style="list-style-type: none"> - phone has a maximum length of 15 characters
n th event active ; nn ∈ (1 ÷ 10)			WAnn	<ul style="list-style-type: none"> 0 - Off 1 - On
n th event name ; nn ∈ (1 ÷ 10)			WBnn	<p><i>Notes:</i></p> <ul style="list-style-type: none"> - name has a maximum length of 16 characters
n th event source ; n ∈ (1 ÷ 10)			WCnn	<ul style="list-style-type: none"> 0 - System 1 - PPV 2 - RMS

Group name	#1 code	#7 code	#S code	Code description
				3 - RRMS 4 - Curve 5 - Curve 1 6 - Curve 2 7 - Curve 3 8 - Vector PPV
n^{th} event integration ; $nn \in (1 \div 10)$			WDnn	0 - 1s 1 - SR (Velocity step) 2 - TH (Human Vibration step) Valid only with event source RMS
n^{th} event X threshold ; $nn \in (1 \div 10)$			WEnn	x - X axis threshold level in dB $\in (60 \div 160)$
n^{th} event Y threshold ; $nn \in (1 \div 10)$			WZnn	x - Y axis threshold level in dB $\in (60 \div 160)$
n^{th} event Z threshold ; $nn \in (1 \div 10)$			WXnn	x - Z axis threshold level in dB $\in (60 \div 160)$
n^{th} event Vec threshold ; $nn \in (1 \div 10)$			WFnn	x - Vector PPV threshold level in dB $\in (60 \div 160)$
n^{th} event reduction factor ; $nn \in (1 \div 10)$			WGnn	x - reduction factor in 0.001
n^{th} event days of week ; $nn \in (1 \div 10)$			WHnn	x - sum of the following flags flags: b0 - Monday b1 - Tuesday b2 - Wednesday b3 - Thursday b4 - Friday b5 - Saturday b6 - Sunday
n^{th} event start hour ; $nn \in (1 \div 10)$			WI nn	x - hour $\in (0 \div 23)$
n^{th} event start minutes ; $nn \in (1 \div 10)$			WJnn	x - minute $\in (0 \div 59)$
n^{th} event stop hour ; $nn \in (1 \div 10)$			WKnn	x - hour $\in (0 \div 23)$
n^{th} event stop minutes ; $nn \in (1 \div 10)$			WLnn	x - minute $\in (0 \div 59)$
n^{th} event duration ; $nn \in (1 \div 10)$			WMnn	x - duration in s $\in (1 \div 3600)$
n^{th} event counter ; $nn \in (1 \div 10)$			WWnn	x - counter $\in (1 \div 100)$
n^{th} event counter mode ; $nn \in (1 \div 10)$			WVnn	counter mode: 0 - Consecutive 1 - Periodical Valid only with Counter > 1

Group name	#1 code	#7 code	#S code	Code description
n th event counter period ; nn ∈ (1 ÷ 10)			TAnn	counter period: 1 - Velocity step 2 - Human vibration step Valid only with Event Counter > 1 and Counter Mode = Periodical
n th event min. break ; nn ∈ (1 ÷ 10)			WNnn	x - min. break in s ∈ (0 ÷ 3600)
n th event SMS active ; nn ∈ (1 ÷ 10)			WOnn	0 - Off 1 - On
n th event SMS number mask ; nn ∈ (1 ÷ 10)			WPnn	x - sum of the following flags b0 - user number 1 b1 - user number 2 ... B15 - user number 16
n th event email active ; nn ∈ (1 ÷ 10)			WQnn	0 - Off 1 - On
n th event email recipient mask ; nn ∈ (1 ÷ 10)			WRnn	x - sum of the following flags b0 - user number 1 b1 - user number 2 ... B15 - user number 16
n th event wave recording active ; n ∈ (1 ÷ 10)			WSnn	0 - Off 1 - On
n th event alarm lamp active ; nn ∈ (1 ÷ 10)			WTnn	0 - Off 1 - On
n th event system mask ; nn ∈ (1 ÷ 10)			WUnn	b0 - Powered Up b1 - Powered Down b2 - Measurement Start b3 - Measurement Stop b4 - Mains On b5 - Mains Off b6 - Low Battery b7 - Battery OK b8 - Low External Battery b9 - External Battery OK b10 - Low Storage b11 - Storage OK b12 - System Check b13 - Lamp Disconnected b14 - Lamp Connected b15 - Cover Open b16 - Cover Closed b17 - Device Tilt b18 - Device Vertical b19 - Instrument Error b20 - Location

Table A.12 General settings

Group name	#1 code	#7 code	#S code	Code description
UART interface mode	Xy		VL	0 - none 1 - monitoring station SP 276 2 – External Device 3 – dust monitoring station ES-642
Lamp hold time			UH	x - x lamp hold time [s]; ∈ (1 ÷ 59), (60 ÷ 900) with 60s steps
Unit Name		UN		Up to 12 characters (permitted characters: 0:9, a:z, A:Z, space, and '_').
Instrument description		AX		To read settings send #7,AX;. Response: #7,AX,<station>,<res1>,<res2>; <station> - station name <res1>, <res2> - reserved values To write settings send #7,AX,<sel>,<text>; where <sel> - value selector 0 - station name <text> - user text up to 128 characters in UNICODE format. Permitted characters: 0- 9, a-f, A-F
			LI	<text> - user text for station name
SD card: erase disk	ED			Erase all files from SD card.
SD card: version of Fat file system	FT			-1 - SD disk not ready 2 – FAT32
SD card: number of sectors	NS			n - number of sectors. <i>Sector is 512 bytes in size</i>
SD card: number of free sectors	NF			n - number of free sectors. <i>Sector is 512 bytes in size</i>
Measurement files number	BN			n - number of “*.syl” files in the instrument’s working directory
Firmware upgrade	FU			To read status of firmware upgrade send #7,FU;. Response: #7,FU,<stat>; To start firmware upgrade send: #7,FU,<name>.<ext>; where <name> - a name of a firmware binary to be used for upgrade; file must reside in the FIRMWARE directory of the instrument’s SD card. <ext> - three characters extension of the firmware file; usually it is “BIN” <stat> - status of upgrade; negative value is an error 0 - not upgrading or upgrade finished successfully (if started with #7,FU,<name>.bin;) 1 - start of upgrade 2- checking a firmware image

Group name	#1 code	#7 code	#S code	Code description
				<p>3 - erasing Flash 4 - writing Flash 5 - checking a firmware after write 6 - finishing After 6 the state always comes to 0.</p>
Firmware list		FL		<p>Returns firmware file list in the FIRMWARE directory of the instrument's SD card. Response: <code>#7,FL,<name1>,<len1>[,<name2>,<len2>[...]]</code>; where <code><namex></code> - name of the firmware file with extension, e.g. "firmware.bin"; <code>max</code> 8 characters for name and 3 characters for extension <code><lenx></code> - length of the firmware file [B]</p>
RMS on stop		LL		<p>Reading (response from the instrument): <code>#7,LL,<L1>,<L2>,<L3>;</code> where <code><L1></code> - RMS value from X axis in [dB] <code><L2></code> - RMS value from Y axis in [dB] <code><L3></code> - RMS value from Z axis in [dB] <i>Notes: function is not available during measurements.</i></p>
Instrument orientation		OR		<p>Returns orientation of the device in the format: <code>#7,OR,x<a.aa>,y<b.bb>,z<c.cc>;</code> where <code>a.aa</code> - gravitational acceleration in [g] for axis x <code>b.bb</code> - gravitational acceleration in [g] for axis y <code>c.cc</code> - gravitational acceleration in [g] for axis z</p>
Station status		II		<p>This function provides cumulative station status. Reading (response from the instrument): <code>#7,II,[<rms1>],[<rms2>],[<rms3>],Fx<flags>,B<b at>,D<disk>,ex<err>,wx<war>,Rx<rst>,fx<add>,O<dd:hh:mm:ss>;</code> where <code><L1></code> - L value from X axis in [dB] (on STOP only) <code><L2></code> - L value from Y axis in [dB] (on STOP only) <code><L3></code> - L value from Z axis in [dB] (on STOP only) <code><flags></code> - station status flags defined in hexadecimal format as a sum of the following flags: <code>b0</code> - measurements are running, <code>b1</code> - pause is active, <code>b2</code> - reserved, <code>b3</code> - battery is charging, <code>b4</code> - reserved, <code>b5</code> - external power supply is present,</p>

Group name	#1 code	#7 code	#S code	Code description
				<p>b6 - time is synchronized with GPS, b7 - reserved, b8 - reserved, b9 - key pressed, b10 - reserved, b11 - reserved, b12 - reserved, b13 - reserved, b14 - solar panel is connected, b15 - battery charging is finished, b16 - reserved, b17 - battery heater is on, b18 - timer mode is active,</p> <p><bat> - battery relative state of charge [%] <disk> - SD card occupation [%] <err> - error flags defined in hexadecimal format as a sum of the following flags:</p> <p>b0 - battery pack error, b1 - SD card is not ready, b2 - logger file error, b3 - reserved, b4 - reserved, b5 - reserved, b6 - reserved, b7 - meteo module error, b8 - reserved, b9 - reserved, b10 - reserved, b11 - instrument is not standing correctly, b12 - geophone disconnected, b13 - external battery is low, b14 - logger file name error, b15 - geophone damaged, b16 - communication with battery pack, b17 - battery pack temperatures greater than 60°C, b18 - SIM not detected for more than an hour,</p> <p><war> - warning flags defined in hexadecimal format as a sum of the following flags:</p> <p>b0 - logging off, b1 - battery pack temperatures greater than 43°C, b2 - battery pack temperatures greater than 55°C, b3 - SIM not detected for more than 5 minutes,</p> <p><rst> - last instrument power on/off and reset cause</p> <p>b0 - hardware reset, b1 - watchdog reset, b2 - remote reset,</p>

Group name	#1 code	#7 code	#S code	Code description
				<p>b3 - reserved, b4 - reserved, b5 - reserved, b6 - reserved, b7 - reserved, b8 - system was on because of keyboard, b9 - system was on because of external power supply had been connected b10 - system was on because of RTC alarm, b11 - reserved, b12 - system was on because EXT I/O line had triggered,</p> <p><dd:hh:mm:ss> - system <i>on</i> time since last power-up where <dd> - days <hh> - hours <mm> - minutes <ss> - seconds</p>

Table A.13 Power settings

Group name	#1 code	#7 code	#S code	Code description
Battery Charge mode		SB	JY	0 - Full capacity 1 - Optimized
External Battery mode		EB	JU	0 - Off 1 - On
Power status		BS		<p>To read settings send #7,BS;.. Response: #7,BS,<bat>,<src>,<time>,<chrg>; where</p> <p><bat> - battery state of charge [%]; -1 when state of charge cannot be read</p> <p><src> - power source</p> <p>0 - internal battery -1 - external power supply, e.g. SB274 -2 - solar panel (battery is charging) -3 - solar panel (battery is not charging)</p> <p><time> - battery time [h]; either "time to full" if battery is charging or "time to empty" if battery is discharging</p> <p><chrg> - charging indication</p> <p>0 - not charging 1 - charging is finished 2 - charging is in progress</p>
Battery voltage		BV		volt - battery voltage [mV] multiplied by 10;
External power voltage		EV		volt - external power supply voltage [mV] multiplied by 10;
Power off		PO		Power off the instrument.

Group name	#1 code	#7 code	#S code	Code description
				<i>Notes: take care using this command remotely via Internet</i>
Reset		XR		Hardware reset of the instrument (power off and on). Send #7,XR[,<n>]; n - delay [s] before reset
Battery pack information		BM		To read settings send #7,BM;. Response: #7,BM,<err>,<manuf>,<date>,<sn>,<dev>,<chem>,<chemId>,<designV>,<designC>; where <err> - error reading battery pack 0 - no error, the settings are valid (<manuf>,<date>, etc.) not 0 - error, the settings are not valid; repeat read command <manuf> - manufacture name, "Svantek sp. o.o." <date> - manufacture date, "dd.mm.yyyy" <sn> - serial number of packet (production code) <dev> - device name <chem> - chemistry of the battery, "LION" <chemId> - internal chemistry ID <designV> - design voltage [mV] <designC> - design capacity [mAh]
Battery status		BT		To read settings send #7,BT;. Response: #7,BT,<err>,<temp>,<volt>,<curr>,<Merr>,<soc>,<fcc>,<cell1>,<cell2>,<tte>,<ttf>; where <err> - error reading battery pack 0 - no error, the settings are valid (<temp>,<volt>, etc.) not 0 - error, the settings are not valid; repeat read command <temp> - temperature of the battery pack [°C] <volt> - voltage of the battery pack [mV] <curr> - actual current of the battery pack [mA]; negative value means discharging <Merr> - maximum error [%] of the gauging algorithm <soc> - state of charge [%] <fcc> - actual full charge capacity of the battery pack [mAh] <cellx> - voltage of battery pack cellx [mV]; cell1 is most close to ground <tte> - "time to empty" [min]; value of 65353 means, that battery pack is not discharging <ttf> - "time to full" [min]; value of 65353 means, that battery pack is not charging

Table A.14 System log settings

Group name	#1 code	#7 code	#S code	Code description
System log file			LG	<p>To read settings send #7,LG;. Response: #7,LG,<mask>,<time>,<size>,<totSize>,<err>;</p> <p>To write settings send: #7,LG,<mask>,<time>,<size>,<totSize>; where</p> <p><mask> - events written to a system log file (S.LOG) defined in hex format as a sum of the following flags:</p> <p>0x0 - Off (logs are not saved), 0x0001 – log system events, 0x0002 – log modem communication events, 0x0004 – log modem configuration, 0x0008 – log periodic modem status, 0x0010 – log periodic battery status, 0x0020 – log periodic instrument status, 0x0040 – reserved, 0x0080 – log modem debug (off by default), 0x0100 – log periodic GPS status, 0x0200 – reserved, 0x0400 – log remote commands events, 0x0800 – log advanced alarms events, 0x1000 – reserved, 0x2000 – reserved, 0x4000 – reserved, 0x8000 – reserved</p> <p><time> - interval [s] for periodic logs,</p> <p><size> - maximum size [MB] of a single S.LOG file,</p> <p><sizeTot> - maximum size [MB] of all S.LOG files in the current working directory,</p> <p><err> - S.LOG file error; 0 – no error.</p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> - <i>it is not advised to switch off the log file! This file is useful in case of support.</i> - <i>do not set reserved flags!</i>
			JL	<mask> - events written to a system log file “Sx.LOG”; see above
			JT	<time> - interval [s] for periodic logs
			JR	<size> - maximum size [MB] of a single “Sx.LOG” file
			JS	<sizeTot> - maximum size [MB] of all “Sx.LOG” files in the current working directory

Table A.15 Position and time settings

Group name	#1 code	#7 code	#S code	Code description
GPS		GH	JN	0 - Off 1 - On

Group name	#1 code	#7 code	#S code	Code description
Position settings	GL	LA	LB	To read settings send #7,GL[,<sel>];. Response: #7,GL,<Latitude>,<Longitude>; To write settings send: #7,GL,<Latitude>,<Longitude>; where <sel> - 0 – automatic read mode. Coordinates are read from GPS if it is active and position is fixed or from the memory otherwise. 1 – coordinates are read from the memory <Latitude> - Latitude in degrees; value has ‘-‘ sign for South hemisphere, <Longitude> - Longitude in degrees; value has ‘-‘ sign west of Greenwich,
				<LatDeg> - Latitude degrees; value has ‘-‘ sign for South hemisphere,
				<LatMin> - Latitude minutes,
				<LatSec> - Latitude seconds,
				<LatmSec> - Latitude milliseconds,
				<LongDeg> - Longitude degrees; value has ‘-‘ sign west of Greenwich,
				<LongMin> - Longitude minutes,
				<LongSec> - Longitude seconds,
				<LongmSec> - Longitude milliseconds,
GPS last data	GP	GS	JO	Reading (response from the instrument): #7,GP,<qq>,<YY>,<MM>,<DD>,<hh>,<mm>,<ss>,<LaD>,<LaM>,<LaS>,<LaS10>,<Ladir>,<LoD>,<LoM>,<LoS>,<LoS10>,<Lodir>; Where: <qq> - Fix (qq>0), Not fix (qq=0), <YY> - Year, <MM> - month, <DD> - day, <hh> - hour, <mm> - minute, <ss> - seconds, <LaD> - Latitude degree, <LaM> - Latitude minutes, <LaS> - Latitude seconds, <LaS10> - Latitude fraction of seconds, <Ladir> - Latitude direction (N- north, S- south), <LoD> - Longitude degree, <LoM> - Longitude minutes, <LoS> - Longitude seconds, <LoS10> - Longitude fraction of seconds, <Lodir> - Longitude direction (E- east, W- west)
				0 - Off
				1 - On
				0 - Off
				1 - On
				0 - Off
				1 - On
				0 - Off
				1 - On
				0 - Off
				1 - On

Group name	#1 code	#7 code	#S code	Code description
Stop measurement to synchronize RTC with GPS			JZ	0 - Off 1 - On
Synchronization time			JV	time of a day [min] when synchronization should be performed
Synchronization threshold			JX	Minimum time difference between RTC and GPS in seconds to perform synchronization Default: 10s
Real Time Clock (RTC)		RT		Current instrument's date/time settings. Reading (response from the instrument): #7,RT,<hour>,<min>,<sec>,<day>,<month>,<year>; Writing: #7,RT,<hour>,<min>,<sec>,<day>,<month>,<year>; where <hour> - hour $\in (0 \div 23)$ <min> - min $\in (0 \div 59)$ <sec> - sec $\in (0 \div 59)$ <day> - day $\in (1 \div 31)$ <month> - hour $\in (1 \div 12)$ <year> - hour $\in (2000 \div 2099)$
Time zone		TZ		x - time zone [min] $\in (-720 \div 840)$ in 15 minutes step
			JM	x - time zone [min] $\in (-720 \div 840)$ in 15 minutes step
On time		RO		Time elapsed since last power up. Reading (response from the instrument): #7,RO,<dd>,<hh>,<mm>,<ss>; where <dd> - days <hh> - hours <mm> - minutes <ss> - seconds

Table A.16 Mobile network settings and status

Group name	#1 code	#7 code	#S code	Code description
Communication Module (3G or LTE) On/Off	Xk		KA	0 - Off 1 - Continuous On 2 - Periodically On
Communication Period			KP	nn - period in minutes $\in (15 \div 60)$ with 15min step and $\in (60 \div 1440)$ with 60 min step; default is 120 min
External antenna			KX	Antenna 0 - Internal 1 - External

Group name	#1 code	#7 code	#S code	Code description
Access Point Name	XN		KE	Access Point Name is a gateway to the operator's Internet; default "internet" or empty ""; (permitted characters: 0:9, a:z, '.', '-' and '_').
Authentication mode	XF		KB	Authentication mode to be used during Internet connection 0 - Off 1 - PAP
Username	XO		KG	Username to be used during Internet connection
Password	XU		KH	Password to be used during Internet connection
Domain Name Server	XV			Domain Name Server (DNS) address Ipv4 in dot notation
			KI	Domain Name Server (DNS) address written as single number x=<aa>*2 ²⁴ +<bb>*2 ¹⁶ +<cc>*2 ⁸ +<dd> Where: x - DNS written as single number <aa>.<bb>.<cc>.<dd> - DNS in dot notation (e.g. 192.168.1.1 written as 3232235777 = 192*2 ²⁴ +168*2 ¹⁶ +1*2 ⁸ +1)
Connection type	XB		KL	Connection type 0 - TCP server (listener) mode 1 - TCP client mode (default)
Remote address	XI		KD	Remote address of TCP/UDP connection; default "app.svannet.com" <i>Note: the setting can be a name to be resolved by DNS or Ipv4 address in dot notation, e.g. "192.168.1.1"</i>
Remote port	XJ		KC	Remote port of TCP/UDP connection ∈ (0 ÷ 65535); default 8000 <i>Note: it is not advised to use ports < 1024!</i>
SIM mode	Xw		KJ	0 - data + SMS mode 1 - data only mode
Default settings for LTE			KU	0 - user defined settings for LTE 1 - use modem's default settings for LTE
Ping Interval			KO	Time interval [s] between consecutive PING commands: 0 - PINGing disabled x - time interval [s]
Ping address			KN	The name of the server for PING, e.g: google.com
Modem firmware			KT	Some LTE modems has selectable firmware for different operators LE910Cx-NF modem supports firmwares: 0 - AT&T Config 1 - Verizon Config 2 - T-Mobile Config LE910Cx-AP modem supports firmwares:

Group name	#1 code	#7 code	#S code	Code description
				<p>10 - NTT Docomo Config 11 - Telstra Config 12 - KDDI Config 13 - Softbank Config LE910Cx-CN modem supports 20 - China Mobile Config 21 - China Unicom Config 22 - China Telecom Config</p>
Mobile information	GI			<p>To read settings send #7,GI,<sel>; where <sel> is a settings selector: 0 - mobile equipment information 1 - mobile network information 2 - mobile connection information Reading mobile equipment information: #7,GI,0,<manuf>,<model>,<rev>,<id>; where <manuf> - modem's manufacture name <model> - model of the modem <rev> - modem's firmware revision <id> - modem's IMEI number Reading mobile network information: #7,GI,1,0x<flags>,<oper>,<simId>,<reg1>,<reg2>,<rssI>,<ber>,<act>; where <flags> - modem state in hex format defined as a sum of flags: 0x00000001 - modem is powered on, 0x00000002 - mode m is initialized, 0x00000004 - modem is connected to the operator's network, 0x00000008 - modem is connected to the Internet, 0x00000010 - modem has established a TCP/IP connection, 0x00000020 - modem is connected to SvanNET, 0x02000000 - modem is requesting a SIM PUK, 0x04000000 - modem is requesting a SIM PIN, 0x08000000 - SIM error, e.g. SIM not inserted, Notes: <i>all other flags are reserved!</i> <oper> - ID of the network operator defined as Mobile Country Code (MCC – 3 digits) and Mobile Network Code (MNC – 2 or 3 digits) <simId> - MCC + MNC read from a SIM card <reg1> - GSM network registration 0 – not registered, 1 – registered</p>

Group name	#1 code	#7 code	#S code	Code description	
				<p><reg2> - GPRS/UMTS/LTE network registration indicator; 0 – not registered, 1 – registered</p> <p><rssi> - Received Signal Strength 0 – (-113) dBm or less 1 – (-111) dBm 2..30 – (-109)dBm..(-53)dBm / 2 dBm per step 31 – (-51)dBm or greater 99 – not known or not detectable</p> <p><ber> - Bit Rate Error [%] (2G) 0 – less than 0.2% 1 – 0.2% to 0.4% 2 – 0.4% to 0.8% 3 – 0.8% to 1.6% 4 – 1.6% to 3.2% 5 – 3.2% to 6.4% 6 – 6.4% to 12.8% 7 – more than 12.8% 99 – not known or not detectable</p> <p>Signal Quality [dBm] (4G) 0: (-4) to (-3) 1: (-6) to (-5) 2: (-8) to (-7) 3: (-10) to (-9) 4: (-13) to (-11) 5: (-15) to (-14) 6: (-17) to (-16) 7: (-19) to (-18) 99 – not known or not detectable</p> <p><act> - Access Technology 0, 3 – 2G (GSM) 2, 4, 5, 6 – 3G (UMTS) 7, 8, 9 – 4G (LTE)</p> <p>Reading mobile connection information: #7,GI,2,0x<flags>,<serviceIP>,<trafficUp>,<trafficDown>,<dataUp>,<dataDown>; where <flags> - modem state in hex format, see <u><flags></u> for definition. <serviceIP> - IP address of the remote side in dot notation, e.g. 192.168.0.1 <trafficUp> - amount of raw data [kB] sent out from the instrument to the Internet</p>	

Group name	#1 code	#7 code	#S code	Code description
				<p><trafficDown> - amount of raw data [kB] received by the instrument from the Internet</p> <p><dataUp> - amount of user data [kB] sent out from the instrument to the Internet</p> <p><dataDown> - amount of user data [kB] received by the instrument from the Internet</p> <p>Notes:</p> <ul style="list-style-type: none"> - “user data” means any commands sent to the instrument and any responses received from the instrument, e.g. #7,GI,2; – command sent to the instrument is 8 bytes of <dataDown> #7,GI,2,0x3F,100.101.102.1,229373,26494,1188 5,1254; - response received from the instrument is 51 bytes of <dataUp> - raw data means user data + protocols overhead
Modem reset		RM		<p>Force modem reset.</p> <p>0 (or empty) - software reset</p> <p>1 - hardware reset (power off and on)</p>
Signal quality		SQ		Modem signal quality, see <rss>

Table A.20 Bluetooth settings

Group name	#1 code	#7 code	#S code	Code description
Bluetooth		bt	UC	Bluetooth 0 - Off 1 - On
Bluetooth PIN		BP	UD	Bluetooth PIN 0 - Off 1...9999 – PIN
Bluetooth software version		br		To read settings send #7,br;. Response: #7,br,<a>,,<c>,<d>,<e>; <a>, - software version <c>,<d>,<e> - bootstrap version
Bluetooth status		bm		To read settings send #7,bm;. Response: #7,bm,<a>,,<c>,<d>,<e>; <a> - module active - connection active <c> - internal software version <d> - connection interval in ms <e> - package size in bytes

APPENDIX B. DATA FILE STRUCTURES

B.1 GENERAL STRUCTURE OF THE SV 803 / SV 804 FILES

Each file containing data from the **SV 803 / SV 804** (internal file system rev. **1.11**) instrument consists of several groups of words. There are two different types of files containing:

- measuring results data (cf. App. B.2);
- setup data (cf. App. B.3).

Each file has the following elements:

- o SvanPC file header (cf. Tab. B.1.1)
- o file header (cf. Tab. B.1.2);
- o unit and internal software specification (cf. Tab. B.1.3);
- o calibration settings (cf. Tab. B.1.4)
- o user's text (a header) stored together with the measurement data (cf. Tab. B.1.5);
- o Unit text info (cf. Tab. B.1.6);
- o parameters and global settings, common for all profiles (cf. Tab. B.1.7);
- o parameters for Wave recording (cf. Tab. B.1.10);
- o special settings for profiles (cf. Tab. B.1.12);
- o header of the logger file (cf. Tab. B.1.15)
- o contents of the logger file (cf. Tab. B.1.16)

Other elements of the file structure are not obligatory for each file type stated above. These elements are as follows:

- 1) Header of the Summary Results Record (saved in Summary Results Record) (cf. Table B.1.17)
- 2) main results (saved in Summary Results Record) (cf. Tab. B.1.18_SLM)
- 3) FFT analysis results (saved in Summary Results Record) (cf. Tab. B.1.20)
- 4) 1/3 OCTAVE analysis results (saved in Summary Results Record) (cf. Tab. B.1.21)
- 5) settings of the instrument saved in the setup file (cf. Tab. B.1.24);
- 6) file-end-marker (cf. Tab. B.1.25);

Below, all file structure groups are described separately in Tab. B.1.1 – Tab. B.1.25. The format used in the columns, named **Comment** with the square parenthesis ([xx, yy]), means the contents of the word with; **xx** is the most significant byte (MSB) and **yy** the lowest significant byte (LSB) of the word. The format 0xnnnn means that the nnnn is four-digit number in hexadecimal form.

Table B.1.1. SvanPC file header

Word number	Name	Comment
0..2	“SvanPC”	reserved
3	26	reserved
4	32	reserved
5	71	reserved
6..15	Reserved	reserved
...

Table B.1.2. File header

Word number	Name	Comment
0	0xnn01	[01, nn=header's length]
1..4	FileName	name of the file (8 characters)
5	Reserved	Reserved
6	CurrentDate	file creation date (cf. App. B.4)
7	CurrentTime	file creation time (cf. App. B.4)
8..13	Reserved	Reserved
...		...

Table B.1.3. Unit and software specification

Word number	Name	Comment
0	0xnn02	[02, nn=specification's length]
1	UnitNumberL	unit number (LSB word)
2	UnitType	type of the unit: 803 – SV 803 804 – SV 804
3	SoftwareVersion	software version: 106
4	SoftwareIssueDate	software issue date
5	DeviceMode	mode of the instrument
6	UnitSubtype	subtype of the unit: 2 – SV 803 1 – SV 804
7	FileSysVersion	file system version: 111
8	reserved	Reserved
9	SoftwareSubversion	software subversion: 01
10	UnitNumberH	unit number (MSB word)
11	GeoSN_X_L	geophone number (LSB word), X axis
12	GeoSN_X_H	geophone number (MSB word), X axis
13	GeoSN_Y_L	geophone number (LSB word), Y axis
14	GeoSN_Y_H	geophone number (MSB word), Y axis
15	GeoSN_Z_L	geophone number (LSB word), Z axis
16	GeoSN_Z_H	geophone number (MSB word), Z axis
...		...

Table B.1.4. Calibration settings

Word number	Name	Comment
0	0xnn47	[47, nn=header's length]
1	CalibrType X	X axis, type of calibration performed: 0 - none 1 - BY MEASUREMENT (manual) 2 - REMOTE 3 - FACTORY CALIBRATION 4 - AUTOCALIBRATION
2	CalibrDate	X axis, date of calibration performed (cf. App. B.4)
3	CalibrTime	X axis, time of calibration performed (cf. App. B.4)
4	CalibrFactor	X axis, factor (*100 dB) of calibration performed
5	CalibrType X	Y axis, type of calibration performed: 0 - none 1 - BY MEASUREMENT (manual) 2 - REMOTE 3 - FACTORY CALIBRATION 4 - AUTOCALIBRATION
6	CalibrDate	Y axis, date of calibration performed (cf. App. B.4)
7	CalibrTime	Y axis, time of calibration performed (cf. App. B.4)
8	CalibrFactor	Y axis, factor (*100 dB) of calibration performed
9	CalibrType X	Z axis, type of calibration performed: 0 - none 1 - BY MEASUREMENT (manual) 2 - REMOTE 3 - FACTORY CALIBRATION 4 - AUTOCALIBRATION
10	CalibrDate	Z axis, date of calibration performed (cf. App. B.4)
11	CalibrTime	Z axis, time of calibration performed (cf. App. B.4)
12	CalibrFactor	Z axis, factor (*100 dB) of calibration performed
...

Table B.1.5. USER's text

Word number	Name	Comment
0	0xnn03	[03, nn=specification's length]
1...	title text	the user's text (two characters in a word) finished with one or two null bytes

Table B.1.6. Unit text info

Word number	Name	Comment
0	0xnn58	[58, nn=block's length]
1	“UN”	Unit name header
2..8	UnitName	Unit name
.....

Table B.1.7. Parameters and global settings

Word number	Name	Comment
0	0xnn04	[04, nn=block's length]
1	MeasureStartDate	measure start date (cf. App. B.4)
2..3	MeasureStartTimeMS	measure start time in ms (cf. App. B.4)
4	DeviceFunction	device function: 18 – Ground Vibration
5	Range	measurement range: 1 - Default (0.003 ÷ 100 mm/s RMS) 2 - High (0.012 ÷ 400 mm/s RMS)
6	UnitFlags	calibration flags: b0 - if set to 1: X axis, calibration coefficient is used b1 - if set to 1: Y axis, calibration coefficient is used b2 - if set to 1: Z axis, calibration coefficient is used b3 - if set to 1: X axis, overload occurred b4 - if set to 1: Y axis, overload occurred b5 - if set to 1: Z axis, overload occurred b9 - if set to 1: measurement start synchronized with GPS b11 - if set to 1: X axis, underrange occurred b12 - if set to 1: Y axis, underrange occurred b13 - if set to 1: Z axis, underrange occurred
7	RepCycle	repetition cycle: 0 - infinity nnnn - number of repetitions $\in (1 \div 1000)$
8	NofChannel	number of channels (3)
8	NofProf	number of profiles (2) First profile: Velocity Second profile: Human Vibration
10	StartDelay	start delay time
11..12	VelocityStepSec	velocity step in seconds
13	RmsInt	detector's type in the Rms function: 0 - LINEAR,

		1 - EXPONENT.
14	FilterSpec	Reserved
15	DetSpec	Reserved
16	RollRms1	rolling time (1) in seconds
17	RefLev_A	reference level for acceleration (human vibration profile) given in 0.01dB referenced to 1 um/s ²
18	GvStandard	<p>Standard for Ground Vibration function</p> <p>0 - Off</p> <p>1 - PPV</p> <p>2 - BS-7385-2</p> <p>3 - DIN-4150-3</p> <p>4 - KBfmax</p> <p>5 - FR/22/09/1994</p> <p>6 - FR/23/07/1986/1</p> <p>7 - FR/23/07/1986/2</p> <p>8 - FR/IN-1226-A</p> <p>9 - FR/IN-1226-B</p> <p>10 - FR/IN-1226-C</p> <p>11 - IEST VC</p> <p>12 - User</p> <p>13 - PN-B-02170 (SWD I)</p> <p>14 - PN-B-02170 (SWD II)</p> <p>15 - SS 4604866:2011</p> <p>16 - SS 25211</p> <p>17 - SS 4604861</p> <p>18 - S 9020</p>
19	GvVibrType	<p>In case of DIN-4150-3 standard</p> <p>0 - Foundation</p> <p>1 - Top Floor</p> <p>2 - Floor Slab</p> <p>3 - Underground Cavities</p> <p>4 - Buried Pipework</p> <p>5 - LT Top Floor</p> <p>6 - LT Floor Slab</p>
20	GvSpectrum	<p>1 - FFT VEL</p> <p>3 - 1/3 VEL</p>
21	GvSpectrumResult	<p>In case of 1/3 VEL GvSpectrum</p> <p>0 - Peak</p> <p>1 - Max</p> <p>2 - Min</p> <p>3 - RMS</p>

		In the case of BS-7385-2 , DIN-4150-3 , FR/22/09/1994 , FR/23/07/1986/1 , FR/23/07/1986/2 , FR/IN-1226-A , FR/IN-1226-B , FR/IN-1226-C or IEST VC standard 0 - L1 1 - L2 2 - L3 3 - L4 4 - Workshop , 5 - Office , 6 - Residential , 7 - Theatre , 8 - VC-A , 9 - VC-B , 10 - VC-C , 11 - VC-D , 12 - VC-E
22	GvBuildingType	
23	GvBand	Band in Hz
24	HumanVibration	Human vibration profile 0 - Off 1 - On
25	GvSampling	Sampling in Hz
26	RefLev_V	reference level for velocity given in 0.01dB referenced to 1 nm/s
27	VelResults	Velocity results in the 1 st profile, all axes saved in the file. Contents defined as a sum of flags: b0 - Peak value (*100 dB) b1 – Peak-Peak value (*100 dB) b2 - maximal value (Max) (*100 dB) b3 – RMS value (*100 dB) b4 – reserved b5 – Rolling RMS (RRMS) value (*100 dB) b6 – Peak Vector value (*100 dB) b7 – Dominant frequency (*1000 Hz) b8 – Meteo / Dust data b9 – OVL time (sec) b10 – Peak sample number b11 – Peak Vector sample number
28	HumanVibrResults	Reserved
29	Spectrum_VelocityResults	Spectrum velocity results in the 1 st profile, all axes saved in the file. 0 - Off 1 – All. 2 – On Event
30	StartSync	Synchronization the start of measurement with RTC 0 - switched off. -1 - synchronization to 1 sec. 1 - synchronization to 1 min. 15 - synchronization to 15 min. 30 - synchronization to 30 min. 60 - synchronization to 1 hour.
31	GpsTimeZone	GPS Time Zone in 15 min.
32	GpsLastSyncTime	The time between clock synchronization from GPS module and the start of measurement in seconds. 0xffff - no synchronization

33	SplitMode	Logger files splitting mode: 0 - off. -1 - The file is created for each measurement cycle. 15 - The file is created every 15 min synchronized to RTC. 30 - The file is created every 30 min synchronized to RTC. 60 - The file is created every 1 hour synchronized to RTC. 1440 - The file is created on the specified times.
34	SplitTime[1]	Logger files splitting time: -1 - off. 0:1439 - Time in minutes. Valid only if SplitMode is 1440.
35	SplitTime[2]	Logger files splitting time: -1 - off. 0:1439 - Time in minutes. Valid only if SplitMode is 1440.
36	SplitTime[3]	Logger files splitting time: -1 - off. 0:1439 - Time in minutes. Valid only if SplitMode is 1440.
37	SplitTime[4]	Logger files splitting time: -1 - off. 0:1439 - Time in minutes. Valid only if SplitMode is 1440.
38	SplitTime[5]	Logger files splitting time: -1 - off. 0:1439 - Time in minutes. Valid only if SplitMode is 1440.
39	SplitTime[6]	Logger files splitting time: -1 - off. 0:1439 - Time in minutes. Valid only if SplitMode is 1440.
40	AxisOrientation	0 – vertical 1 – horizontal 2 – vertical
41	GeoComp	Geophone compensation 0 - Off 1 - On
42	SWD Curve 1	In case of SWD I or SWD II standard Curve 1 type: 0 – A 1 – A' 2 – B 3 – B' 4 – C 5 – C' 6 – D 7 – D'
43	SWD Curve 2	In case of SWD I or SWD II standard Curve 2 type
44	SWD Curve 3	In case of SWD I or SWD II standard Curve 3 type

45	SensClass	In case of S 9020 standard Building sensitivity class $\in (0 \div 4)$
46	Occurance	In case of S 9020 standard Occurance: 0 – Rare 1 – Repeated 2 – Often
...		

Table B.1.10. Wave-file recording parameters

Word number	Name	Comment
0	0xnn2D	[2D, nn=block's length] trigger mode: 0 - OFF , 1 - recording whole measurement 11 - recording on trigger ALARM
1	TriggerMode	
2	TriggerPre	pretrigger time given in seconds
3	TriggerPost	posttrigger time given in seconds
4	TriggerSampling	sampling frequency given in Hz
5	TriggerStep	trigger period given in 0.1 ms. If zero Step is equal to logger time-step (cf. Tab. B.1.15) filter type: 4 – VEL1 , 15 – KB , 16 – Wk , 17 – Wd , 18 – Wc , 20 – Wm , 23 – Wb , 152 – DIN80 , 153 – DIN315 ,
6	TriggerFilter	
7	BitsPerSample	bits/sample: 32
8	RangeX	Full scale signal range in 0.01dB, X axis
9	RangeY	Full scale signal range in 0.01dB, Y axis
10	RangeZ	Full scale signal range in 0.01dB, Z axis
11	Gain	Signal gain in dB. Valid only for bits/sample: 16
12	LengthLimit	Wave file length limit in minutes
...		

Table B.1.12. Special settings for profiles

Word number	Name	Comment
0	0xnn05	[05, nn=block's length]
1	0x0607	[used_profile, profile's mask]
2	0xmm06	[06, mm=sub-block's length]
3	DetectorP[1][1]	detector type in the 1 st profile (velocity), X axis: 0 - 100ms 1 - 125ms 2 - 200ms 3 - 500ms 4 - 1s 5 - 2s 6 - 5s 7 - 10s
4	FilterP[1][1]	filter type in the 1 st profile (velocity), X axis: 4 – VEL1 , 15 – KB , 16 – Wk , 17 – Wd , 18 – Wc , 20 – Wm , 23 – Wb , 152 – DIN80 , 153 – DIN315 ,
5	BufferP[1][1]	logger contents in the 1 st profile, Y axis, defined as a sum of: 0 - none, 1 – Peak , 2 – P-P , 4 – Max , 8 – RMS , 16 – VDV , 32 – RRMS ,
6	Reserved	Reserved
7	Reserved	Reserved
8	0xmm06	[06, mm=sub-block's length]
9	DetectorP[1][2]	detector type in the 1 st profile (velocity), Y axis:
10	FilterP[1][2]	filter type in the 1 st profile (velocity), Y axis:
11	BufferP[1][2]	logger contents in the 1 st profile, Y axis, defined as a sum of:
12	reserved	Reserved
13	reserved	Reserved
14	0xmm06	[06, mm=sub-block's length]
15	DetectorP[1][3]	detector type in the 1 st profile (velocity), Z axis:
16	FilterP[1][3]	filter type in the 1 st profile (velocity), Z axis:
17	BufferP[1][3]	logger contents in the 1 st profile, Z axis, defined as a sum of:
18	reserved	Reserved
19	reserved	Reserved
20	0xmm06	[06, mm=sub-block's length]

21	DetectorP[2][1]	detector type in the 2 nd profile (human vibration), X axis:
22	FilterP[2][1]	filter type in the 2 nd profile (human vibration), X axis:
23	BufferP[2][1]	logger contents in the 2 nd profile, X axis, defined as a sum of:
24	reserved	Reserved
25	reserved	Reserved
26	0xmm06	[06, mm=sub-block's length]
27	DetectorP[2][2]	detector type in the 2 nd profile (human vibration), Y axis:
28	FilterP[2][2]	filter type in the 2 nd profile (human vibration), Y axis:
29	BufferP[2][2]	logger contents in the 2 nd profile, Y axis, defined as a sum of:
30	Reserved	Reserved
31	Reserved	Reserved
32	0xmm06	[06, mm=sub-block's length]
33	DetectorP[2][3]	detector type in the 2 nd profile (human vibration), Z axis:
34	FilterP[2][3]	filter type in the 2 nd profile (human vibration), Z axis:
35	BufferP[2][3]	logger contents in the 2 nd profile, Z axis, defined as a sum of:
36	reserved	Reserved
37	reserved	Reserved
...		

Table B.1.13. FFT spectral analysis settings

Word number	Name	Comment
0	0x0051	[51, 00=block's length in the second word]
1	BlockLength	length of the block
2	0x0307	[used_channel, channel's mask]
3..6	reserved	reserved
7..8	M	frequency resolution: integer mantissa
9	E	frequency resolution: binary exponent. Formula to calculate resolution in Hz: $\Delta F = M \cdot 2^E$
10	N	number of FFT spectrum lines
11	T	number of TOTAL values
12	reserved	reserved
13	Window	window function: 0 – Hanning , 1 – Rectangle , 2 – Flat Top , 3 – Kaiser-Bessel ,
14	WindowFactor	window correction factor in 0.01dB
15	reserved	reserved
16	reserved	reserved
17	Filter	filter type: 4 – VEL1 ,
18	reserved	reserved
...		

Table B.1.14. User curve definition

Word number	Name	Comment
0	0x0075	[75, 00=block's length in the second word]
1	BlockLength	length of the block
2	n_interval	Number of intervals
+[0]	0xnndd	[dd=curveID(1..3), nn=block length]
+[1]	type	type of: 0 - Acceleration, 1 - Velocity, 2 - Displacement,
+[2]	lowerFreq	lower border of the interval: in the case of 1/3 OCTAVE for GvSpectrum: nn – number of 1/3 OCTAVE filter $\in (0 \div N_{Ter}-1)$ in the case of FFT for GvSpectrum nn – freq in Hz
+[3]	lowerIncluded	1 if lowerFreq is included in the interval, 0 - otherwise
+[4..5]	lowerValue	value of the lower border of the interval in um/s
+[6]	upperFreq	upper border of the interval: in the case of 1/3 OCTAVE for GvSpectrum: nn – number of 1/3 OCTAVE filter $\in (0 \div N_{Ter}-1)$ in the case of FFT for GvSpectrum nn – freq in Hz
+[7]	upperIncluded	1 if upperFreq is included in the interval, 0 - otherwise
+[8..9]	upperValue	value of the upper border of the interval in um/s
...		

Table B.1.15. Header of the file from the logger

Word number	Name	Comment
0	0xnn0F	[0F, nn=header's length]
1	BuffTSec	logger time step - full seconds part
2	BuffTMilisec	logger time step - milliseconds part
3	LowestFreq	the lowest 1/3 OCTAVE frequency (*100 Hz)
4	NOctTer	number of 1/3 OCTAVE results
5	NOctTerTot	number of TOTAL values
6..7	BuffLength	logger length (bytes) Until the file is closed, the value is 0xFFFFFFFF
8..9	RecsInBuff	number of records in the logger Until the file is closed, the value is 0xFFFFFFFF
10..11	RecsInObserv	number of records in the observation period equal to: number of records in the logger + number of records not saved Until the file is closed, the value is 0xFFFFFFFF
12..13	Reserved	Reserved

14..15	DustMeteoUnitNumber	serial number of the monitoring station (if the parameter value is equal to 0xFFFFFFFF this parameter is irrelevant)
16	DustMeteoUnitType	type of the monitoring station: - 276 (SP 276) - 642 (ES-642 Dust Monitor) (if the parameter value is equal to 0xFFFF this parameter is irrelevant)
17..18	DustMeteoSoftwareVersion	firmware version number of the monitoring stations (if the parameter value is equal to 0xFFFFFFFF this parameter is irrelevant) Format of version in case of SP276: A.BB.CC where CC = version %100 (two characters) BB = (version / 100)%100 (two characters) A = version / 10000 e.g. 0x00004E2E mean 2.00.14
...



Note: The current logger time step in seconds can be obtained from the formulae:

$$T = \text{BuffTSec} + \text{BuffTMillisec} / 1000$$

Table B.1.16. Contents of the file from the logger

Word number	Name	Comment
0..(BuffLength/2-1)		result#1, result#2, ... result#(BuffLength/2-1)

Table B.1.17. Header of the Summary Results Record (saved in Summary Results Record)

Word number	Name	Comment
0	0xnn59	[59, nn=header's length]
1..2	RecNumber	Summary Results Record number: 1..
3..4	MeasureTime	Time of the measurement
5	Flags	Measurement flags. Contents defined as a sum of flags: b0 - if set to 1: X axis, calibration coefficient is used b1 - if set to 1: Y axis, calibration coefficient is used b2 - if set to 1: Z axis, calibration coefficient is used b3 - if set to 1: X axis, overload occurred b4 - if set to 1: Y axis, overload occurred b5 - if set to 1: Z axis, overload occurred b9 - if set to 1: measurement start synchronized with GPS b11 - if set to 1: X axis, underrange occurred b12 - if set to 1: Y axis, underrange occurred b13 - if set to 1: Z axis, underrange occurred

6	MeasureStartDate	measure start date (cf. App. B.4)
7..8	MeasureStartTimeMS	measure start time in ms (cf. App. B.4)
...

Table B.1.18_VEL. Main velocity results (saved in Summary Results Record),

Word number	Name	Comment
0	0xnn66	[66, nn=block's length]
1 st profile results. Axes X. Presence depending on the value of "VelResults" (cf. Tab. B.1.7)		
	Result[1][1]	Peak value in the X axis (*100 dB)
	Result[1][2]	P-P value in the X axis (*100 dB)
	Result[1][3]	Max value in the X axis (*100 dB)
	Result[1][4]	RMS value in the X axis (*100 dB)
	Result[1][5]	RRMS value in the X axis (*100 dB)
	Result[1][6]	DF value in the X axis (*1000 Hz) (results written in 2 words)
	Result[1][7]	Overload time in the X axis (results written in 2 words)
	Result[1][8]	Peak sample number in the X axis (results written in 2 words). Counted relative to the start time of the record. Sampling defined in table B.1.7 (GvSampling).
1 st profile results. Axes Y. Presence depending on the value of "VelResults" (cf. Tab. B.1.7)		
	Result[2][1]	Peak value in the Y axis (*100 dB)
	Result[2][2]	P-P value in the Y axis (*100 dB)
	Result[2][3]	Max value in the Y axis (*100 dB)
	Result[2][4]	RMS value in the Y axis (*100 dB)
	Result[2][5]	RRMS value in the Y axis (*100 dB)
	Result[2][6]	DF value in the Y axis (*1000 Hz) (results written in 2 words)
	Result[2][7]	Overload time in the Y axis (results written in 2 words)
	Result[2][8]	Peak sample number in the Y axis (results written in 2 words). Counted relative to the start time of the record. Sampling defined in table B.1.7 (GvSampling).
1 st profile results. Axes Z. Presence depending on the value of "VelResults" (cf. Tab. B.1.7)		
	Result[3][1]	Peak value in the Z axis (*100 dB)
	Result[3][2]	P-P value in the Z axis (*100 dB)
	Result[3][3]	Max value in the Z axis (*100 dB)
	Result[3][4]	RMS value in the Z axis (*100 dB)
	Result[3][5]	RRMS value in the Z axis (*100 dB)
	Result[3][6]	DF value in the Z axis (*1000 Hz) (results written in 2 words)
	Result[3][7]	Overload time in the Z axis (results written in 2 words)
	Result[3][8]	Peak sample number in the Z axis (results written in 2 words). Counted relative to the start time of the record. Sampling defined in table B.1.7 (GvSampling).
Common results. Presence depending on the value of "VelResults" (cf. Tab. B.1.7)		
	ResultCommon[1]	Peak Vector value (*100 dB)
	ResultCommon[2]	Peak Vector sample number (results written in 2 words). Counted relative to the start time of the record. Sampling defined in table B.1.7 (GvSampling)
For the S 9020 standard, the Dominant Frequency results are calculated at the moment of calculating the Peak Vector result and for the remaining standards independently for each axis at the moment of calculating the Peak result.		

Table B.1.20. FFT analysis results (saved in Summary Results Record)

Word number	Name	Comment
0	0x0055	[51, 00=block's length in the second word]
1	BlockLength	length of the block
2		[used_channel, channel's mask]
3..6	reserved	reserved
4	NTerTot	number of TOTAL values: 0
7	Result[1]	First FFT result (*100 dB);
...	Result[n]	n FFT result (*100 dB);
...	Result[N+T]	Last FFT result (*100 dB);
...

Table B.1.21. 1/3 OCTAVE analysis results (saved in Summary Results Record)

Word number	Name	Comment
0	0xnn10, 0xnn28, 0xnn29, 0xnn32	[block_id, nn=block_length] 0xnn10 - averaged spectrum results, 0xnn28 - min. spectrum results, 0xnn29 - max. spectrum results 0xnn32 - peak spectrum results
1	0x0303	[used_axis, axis's mask]
2	LowestFreq	the lowest 1/3 OCTAVE frequency (*100 Hz)
3	NTer	number of 1/3 OCTAVE values
4	NTerTot	number of TOTAL values: 0
	Tercje[0][i]	1/3 octave[i] value (*100 dB); i=1..NTer+NTerTot (1..10) in X axis
	Tercje[1][i]	1/3 octave[i] value (*100 dB); i=1..NTer+NTerTot (1..10) in Y axis
	Tercje[2][i]	1/3 octave[i] value (*100 dB); i=1..NTer+NTerTot (1..10) in Z axis
...

Table B.1.23. Meteo Data (saved in Summary Results Record)

Word number	Name	Comment
0	0x002A	[2A = id, 00 = block's length in the second word]
1	BlockLength	block length in words
2..3	UnitNumber	serial number of the monitoring station (if the parameter value is equal to 0xFFFFFFFF this parameter is irrelevant)
4	UnitType	type of the monitoring station: - 276 (SP 276) (if the parameter value is equal to 0xFFFF this parameter is irrelevant)
5..6	SoftwareVersion	firmware version number of the monitoring stations (if the parameter value is equal to 0xFFFFFFFF this parameter is irrelevant)

		Format of version in case of SP276: A.BB.CC where CC = version %100 (two characters) BB = (version / 100)%100 (two characters) A = version / 10000 e.g. 0x00004E2E mean 2.00.14
7..8	IntTimeSec	meteorological results averaging time used in the monitoring station
9	Temperature	temperature measurement result in format 0,1°C
10	Pressure	atmospheric pressure measurement result in hectopascals
11	Humidity	relative humidity measurement result in format 0,1%
12	AvgWindSpeed	average wind speed measurement result in the format 0,1 m/s
13	WindDirection	wind direction in degrees for maximum wind speed (if the parameter value is equal to 0xFFFFh the direction is undefined)
14	MaxWindSpeed	maximum wind speed measurement result in the format 0,1 m/s
15..16	WindDirTotalPuffs	number of wind measurement samples
17	N	number of directions of wind direction distribution
18..	WindDir[N]	wind direction distribution table - values in the format 0.1%
18+N	M	number of directions of measurement of maximum wind speed
...	WindMax[M]	table of maximum wind speeds - values in 0.1 m / s format
18+N+M	V	number of directions for measuring average wind speeds
...	WindAvg[V]	table of average wind speeds - values in the format 0,1 m/s
16+N+M+V	RainDetection	flag of precipitation: Note: if the flag is zero, the next 5 words of precipitation parameters are not present in this block
+[0]	[RainIntensity]	rainfall intensity in 0.1 mm / h format (It is the sum of the last sixty lots of 1 minute accumulated Rain data. A new sum measurement is generated every minute.)

Table B.1.24. SETUP file

Word number	Name	Comment
0	0x0020	[20, 00=block's length in the second word]
1	BlockLength	length of the block
2..BlockLength-1	SetupTextData	saved setup values

Table B.1.25. File-end-marker

Word number	Name	Comment
0	0xFFFF	file end marker

Table B.1.28. Alarm parameters settings

Word number	Name	Comment
0	0x0060	[60 = id, 00 = block's length in the second word]
1	BlockLength	block length in words
2	EventCount	
+[0]	0xmm67	[67, mm=sub-block's length]
+[1]	EventId[i]	
+[2]	Active[i]	event active: 0 - switched off, 1 - switched on
+[3..10]	Name[i]	
+[11]	Source[i]	event source: 0 – System 1 – PPV 2 – RMS 3 – RRMS 4 – Curve 5 – Curve 1 6 – Curve 2 7 – Curve 3 8 – Vector PPV 9 – reserved 10 – ISO 2631-1 Curve 11 – Moderate Annoyance Curve 12 – Likely Annoyance Curve 13 – S 9020 Impuls 14 – S 9020 Short 15 – S 9020 Continous
+[12]	Step[i]	event step 0 – 1s, 1 – Velocity step, 2 – Human Vibration step, Valid only with event source RMS
+[13..15]	Threshold1[i] Threshold2[i] Threshold3[i]	in case of System event source: Threshold1[i], Threshold2[i] system event mask defined as a sum of: b0 - Powered Up b1 - Powered Down b2 - Measurement Start b3 - Measurement Stop b4 - Mains On b5 - Mains Off b6 - Low Battery b7 - Battery OK b8 - Low External Battery b9 - External Battery OK b10 - Low Storage

		<p>b11 - Storage OK b12 - System Check b13 - Lamp Disconnected b14 - Lamp Connected b15 - Cover Open b16 - Cover Closed b17 - Device Tilt b18 - Device Vertical b19 - Instrument Error b20 - Location Threshold3[i] – reserved</p> <p>in case of PPV, RMS, RRMS source:</p> <p>Threshold1[i] – X axis threshold value in dB Threshold2[i] – Y axis threshold value in dB Threshold3[i] – Z axis threshold value in dB</p> <p>in case of Curve, Curve 1, Curve 2, Curve 3, ISO 2631-1 Curve, Moderate Annoyance Curve, Likely Annoyance Curve source:</p> <p>Threshold1[i] – reduction factor in 0.001 Threshold2[i] – reserved Threshold3[i] – reserved</p> <p>in case of Vector PPV source:</p> <p>Threshold1[i] – threshold value in dB Threshold2[i] – reserved Threshold3[i] – reserved</p>
+[16]	StartHour[i]	
+[17]	StartMinute[i]	
+[18]	StopHour[i]	
+[19]	StopMinute[i]	
+[20]	Weekday	<p>weekday mask defined as a sum of:</p> <p>b0 – Mo, b1 – Tu, b2 – We, b3 – Th, b4 – Fr, b5 – Sa, b6 – Su,</p>
+[21]	EventDuration[i]	Event duration in seconds
+[22]	EventCounter[i]	Event counter value
+[23]	EventCounterMode[i]	<p>Event counter mode:</p> <p>0 – Consecutive, 1 – Periodical, Valid only with EventCounter > 1</p>
+[24]	EventCounterPeriod[i]	<p>Event counter period</p> <p>0 - 1s 1 - Velocity step 2 - Human vibration step</p> <p>Valid only with EventCounter > 1 and EventCounterMode = Periodical</p>

+[25]	MinBreak[i]	min. break between successive events in seconds
+[26]	SMSActive[i]	sms active: 0 - switched off, 1 - switched on
+[27]	SMSRecipMask[i]	
+[28]	Email Active[i]	email active: 0 - switched off, 1 - switched on
+[29]	EmailRecipMask[i]	
+[30]	WaveActive[i]	wave recording active: 0 - switched off, 1 - switched on
+[31]	LampActive[i]	Alarm Lamp active: 0 - switched off, 1 - switched on
...

B.2 STRUCTURE OF THE FILE CONTAINING RESULTS FROM LOGGER'S FILE

SvanPC file header - cf. Tab. B.1.1.

File header - cf. Tab. B.1.2.

Unit and software specification - cf. Tab. B.1.3.

Calibration settings - cf. Tab. B.1.4.

USER'S text - cf. Tab. B.1.5.

Unit text info - cf. Tab. B.1.6.

Parameters and global settings - cf. Tab. B.1.7.

Wave-file recording parameters - cf. Tab. B.1.10.

Special settings for profiles - cf. Tab. B.1.12.

FFT spectral analysis settings – cf. Tab.B.1.13

Header of the statistical analysis - cf. Tab. B.1.14.

Header of the logger file - cf. Tab. B.1.15.

Contents of the logger file - cf. Tab. B.1.16. and the description in B.2.1.

B.2.1. The contents of the files in the logger

The records with the results and the records with the state of the markers as well as the records with the breaks in the results registration are saved in the files in the logger. All results are written in dB*100.

B.2.1.1. Record with the results

The contents of the record with the results depends on the selected measurement function and the value set in the **LOGGER** position of the **PROFILE x** and **SPECTRUM** sub-lists. The following elements can be present (in the given sequence):

(1) flag record (written only if any results is saved)

< flags > :

- b0: X axis, 1- the overload detected, 0 - the overload not detected
- b1: Y axis, 1- the overload detected, 0 - the overload not detected
- b2: Z axis, 1- the overload detected, 0 - the overload not detected

(2) results of the measurement from the first profile (velocity), X axis if the corresponding **LOGGER** position was active (cf. Tab. B.1.12); up to seven words are written:

<result1> - **Peak** result, depending on the value of BufferP[1][1] (cf. Tab. B.1.12)
 <result2> - **P-P** result, depending on the value of BufferP[1][1] (cf. Tab. B.1.12)
 <result3> - **Max** result, depending on the value of BufferP[1][1] (cf. Tab. B.1.12)
 <result4> - **RMS** result, depending on the value of BufferP[1][1] (cf. Tab. B.1.12)
 <result5> - **VDV** result, depending on the value of BufferP[1][1] (cf. Tab. B.1.12)
 <result5> - **RRMS** result, depending on the value of BufferP[1][1] (cf. Tab. B.1.12)
 <result6> - **DF** result, depending on the value of BufferP[1][1] (cf. Tab. B.1.12)

(3) results of the measurement from the first profile (velocity), Y axis if the corresponding **LOGGER** position was active (cf. Tab. B.1.12); up to seven words are written:

<result1> - **Peak** result, depending on the value of BufferP[1][2] (cf. Tab. B.1.12)
 <result2> - **P-P** result, depending on the value of BufferP[1][2] (cf. Tab. B.1.12)
 <result3> - **Max** result, depending on the value of BufferP[1][2] (cf. Tab. B.1.12)
 <result4> - **RMS** result, depending on the value of BufferP[1][2] (cf. Tab. B.1.12)
 <result5> - **VDV** result, depending on the value of BufferP[1][2] (cf. Tab. B.1.12)
 <result5> - **RRMS** result, depending on the value of BufferP[1][2] (cf. Tab. B.1.12)
 <result6> - **DF** result, depending on the value of BufferP[1][2] (cf. Tab. B.1.12)

(4) results of the measurement from the first profile (velocity), Z axis if the corresponding **LOGGER** position was active (cf. Tab. B.1.12); up to seven words are written:

<result1> - **Peak** result, depending on the value of BufferP[1][3] (cf. Tab. B.1.12)
 <result2> - **P-P** result, depending on the value of BufferP[1][3] (cf. Tab. B.1.12)
 <result3> - **Max** result, depending on the value of BufferP[1][3] (cf. Tab. B.1.12)
 <result4> - **RMS** result, depending on the value of BufferP[1][3] (cf. Tab. B.1.12)
 <result5> - **VDV** result, depending on the value of BufferP[1][3] (cf. Tab. B.1.12)
 <result5> - **RRMS** result, depending on the value of BufferP[1][3] (cf. Tab. B.1.12)
 <result6> - **DF** result, depending on the value of BufferP[1][3] (cf. Tab. B.1.12)

(5) results of the measurement from the first profile (human vibration), X axis if the corresponding **LOGGER** position was active (cf. Tab. B.1.12); up to seven words are written:

<result1> - **Peak** result, depending on the value of BufferP[2][1] (cf. Tab. B.1.12)
 <result2> - **P-P** result, depending on the value of BufferP[2][1] (cf. Tab. B.1.12)
 <result3> - **Max** result, depending on the value of BufferP[2][1] (cf. Tab. B.1.12)
 <result4> - **RMS** result, depending on the value of BufferP[2][1] (cf. Tab. B.1.12)
 <result5> - **VDV** result, depending on the value of BufferP[2][1] (cf. Tab. B.1.12)
 <result5> - **RRMS** result, depending on the value of BufferP[2][1] (cf. Tab. B.1.12)
 <result6> - **DF** result, depending on the value of BufferP[2][1] (cf. Tab. B.1.12)

(6) results of the measurement from the first profile (human vibration), Y axis if the corresponding **LOGGER** position was active (cf. Tab. B.1.12); up to seven words are written:

<result1> - **Peak** result, depending on the value of BufferP[2][2] (cf. Tab. B.1.12)
 <result2> - **P-P** result, depending on the value of BufferP[2][2] (cf. Tab. B.1.12)
 <result3> - **Max** result, depending on the value of BufferP[2][2] (cf. Tab. B.1.12)
 <result4> - **RMS** result, depending on the value of BufferP[2][2] (cf. Tab. B.1.12)
 <result5> - **VDV** result, depending on the value of BufferP[2][2] (cf. Tab. B.1.12)
 <result5> - **RRMS** result, depending on the value of BufferP[2][2] (cf. Tab. B.1.12)
 <result6> - **DF** result, depending on the value of BufferP[2][2] (cf. Tab. B.1.12)

(7) results of the measurement from the first profile (human vibration), Z axis if the corresponding **LOGGER** position was active (cf. Tab. B.1.12); up to seven words are written:

<result1> - **Peak** result, depending on the value of BufferP[2][3] (cf. Tab. B.1.12)
 <result2> - **P-P** result, depending on the value of BufferP[2][3] (cf. Tab. B.1.12)
 <result3> - **Max** result, depending on the value of BufferP[2][3] (cf. Tab. B.1.12)
 <result4> - **RMS** result, depending on the value of BufferP[2][3] (cf. Tab. B.1.12)
 <result5> - **VDV** result, depending on the value of BufferP[2][3] (cf. Tab. B.1.12)
 <result5> - **RRMS** result, depending on the value of BufferP[2][3] (cf. Tab. B.1.12)
 <result6> - **DF** result, depending on the value of BufferP[2][3] (cf. Tab. B.1.12)

B.2.1.2. Record with the state of the markers

The record with the state of the markers consists of one word:

<0x8nnn>

in which 12 bits nnn denote the state of the markers:

b11 = state of #12 marker
 b10 = state of #11 marker
 ...
 b1 = state of #2 marker
 b0 = state of #1 marker

B.2.1.3. Record with the breaks in the results registration

The record with the breaks in the results registration consists of four words:

<0xB0ii> <0xB1jj> <0xB2kk> <0xB3nn>

in which ii, jj, kk, nn bytes denote 4-bytes counter of left or skipped records: nnkkjjii (ii is the least significant byte, nn – the most significant byte).

B.2.1.4. Record with the breaks account PAUSE in the results registration

The record with the breaks in the results registration consists of four words:

<0xA0ii> <0xA1jj> <0xA2kk> <0xA3nn>

in which ii, jj, kk, nn bytes denote 4-bytes counter duration of PAUSE in milliseconds: nnkkjjii (ii is the least significant byte, nn - the most significant byte).

B.2.1.5. Record with the wave file name

The record with the wave file name consists of six words:

<0xC2aa>
<0xccbb>
<0xeeed>
<0xggff>
<0xiihh>
<0xCAaa>

in which:

aa - size of records,

bb cc dd ee ff gg hh ii - 8-bytes name of wave file name

B.2.1.6. Record with Summary Results

The format of the data frame is as follows:

HS	L (optional)	D	L (optional)	HE
----	--------------	---	--------------	----

where:

HS starting header (1 word)

L length of the block (field is optional and occurs only when b7..b0 in header are set to zero)

D Summary Data:

- Main results (cf. Tab. B.1.17_VEL)
- FFT analysis results (optional, cf. Tab. B.1.19)
- 1/3 OCTAVE analysis results (optional, cf. Tab. B.1.20)

HE ending header (1 word), which differs from the HS only on b11 bit (thanks to it, it is possible to analyse the recorded file starting from its end)

The HEADER format is as follows:

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
-----	-----	-----	-----	-----	-----	----	----	----	----	----	----	----	----	----	----

where:

b15 - 1

b14 - 1

b13 - 0

b12 - 0,

b11 - header type:

0 - HS

1 - HE

b10 - 0

b9 - 1

b8 - 1

b15÷b8 – HS (0xC3), HE (0xCB)

b7÷b0 – length of the block (if zero length of the block is saved in additional word L)

B.2.1.7. Record with the comment file name

The format of the data frame is as follows:

HS	D	HE
----	---	----

where:

HS starting header (1 word)

D The full name of the comment file (e.g. "REC62.WAV").

HE ending header (1 word), which differs from the HS only on b11 bit (thanks to it, it is possible to analyse the recorded file starting from its end)

The HEADER format is as follows:

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
-----	-----	-----	-----	-----	-----	----	----	----	----	----	----	----	----	----	----

where:

b15 - 1

b14 - 1

b13 - 0

b12 - 0,

b11 - header type:

0 - HS

1 - HE

b10 - 1

b9 - 0

b8 - 0

b15÷b8 – HS (0xC4), HE (0xCC)

b7÷b0 – length of the block

B.2.1.8. Record with GPS data

The value equal to -12288 (0xd000) denotes the undefined value.

Word number	Name	Comment
0	0xC703	record ID (start)
1	Length	length of the block together with IDs, [words]
2	Quality	Signal quality: 0 - GPS_NOT_FIX (no signal) 1 - GPS_FIX 2 - GPS_FIX_DIF
3	Time.Sec	Seconds part of time
4	Time.Min	Minutes part of time
5	Time.Hour	Hours part of time
6	Date.Day	Day
7	Date.Month	Month
8	Date.Year	Year
9	Latitude.Deg	Degree part of latitude
10	Latitude.Min	Minutes part of latitude
11	Latitude.Sec	Seconds part of latitude
12	Latitude.MiliSec	Milliseconds part of latitude

13	Latitude.Dir	Latitude direction: N, S
14	Longitude.Deg	Degree part of longitude
15	Longitude.Min	Minutes part of longitude
16	Longitude.Sec	Seconds part of longitude
17	Longitude.MiliSec	Milliseconds part of longitude
18	Longitude.Dir	Longitude direction: E, W
19	Altitude	Altitude (meters)
20	Altitude.10	Decimal part of altitude
21	Speed	Speed * 100 (km/h)
22	Length	length of the block together with IDs, [words]
23	0xCF03	record ID (end)
...

B.2.1.9. Block of marker for meteorological data block calculated with the human vibration step

Word number	Name	Comment
0	0xC704	0xC704 = block start identifier,
1	0xnnnn	block length in words
2	N_1s	number of averaged 1 second results
3	Temperature	temperature measurement result in format 0,1°C
4	Pressure	atmospheric pressure measurement result in hectopascals
5	Humidity	relative humidity measurement result in format 0,1%
6	WindDirTotalPuffs	number of non-zero wind sample
7	AvgWindSpeed	average wind speed measurement result in the format 0,1 m/s
8	WindDirection	wind direction in degrees for maximum wind speed (if the parameter value is equal to 0FFFFh the direction is undefined)
9	MaxWindSpeed	maximum wind speed measurement result in the format 0,1 m/s
...		Reserved
...	0xnnnn	block length in words
...	0xCF04	0xCF04 = block end identifier,

B.2.1.10. Block of marker for meteorological rainfall calculated with the human vibration step

Word number	Name	Comment
0	0xC705	0C705h= block start identifier,
1	0xnnnn	block length in words
2	RainIntensity	rainfall intensity in 0.1 mm / h format (It is the sum of the last sixty lots of 1 minute accumulated Rain data. A new sum measurement is generated every minute.)
3..4	RainAccumulation	sum of rainfall in 0.01 mm format
5..6	RainDuration	duration of precipitation in seconds
...		Reserved
...	0xnnnn	block length in words
...	0xCF05	0xCF05 = block end identifier

B.2.1.12. Block of marker for alarm and events

Word number	Name	Comment
0	0xC708	0xC708 = block start identifier
1	0xnnnn	block length in words
2	Flags	Alarm/Event flags: b0 - if set to 1: Alarm block b1 - if set to 1: Event Block b2 - if set to 1: Alarm/Event triggered SMS/Email message, lamp, wave recording. b3 - if set to 1: FFT data b4 - if set to 1: 1/3 octave data b5..b15 - reserved
3	Marker	number of marker defined in Tab. B.1.28
4	AlarmDate	Alarm date (cf. App. B.4)
5..6	AlarmTime	Alarm time in ms
7 ...	Value[1...]	in case of "System" source (cf. Tab. B.1.28): Value[1] - LSW of system event defined in SysEventMask Value[2] - MSW of system event defined in SysEventMask Value[3] - Instrument Error (valid only with Instrument Error flag) x - sum of the following flags flags: b0 - RTC error b1 - SD card error b3 - Battery error b4 - Battery temperature too high Value[4] - X axis System Check Value[5] - Y axis System Check Value[6] - Z axis System Check (valid only with System Check flag) 0 - OK 1 - Failed 2 - Not performed 3 - Geophone disconnected 4 - Geophone connected
7 ...	Value[1...]	in case of source different then "System" and GvSpectrum set to FFT VEL Value[1] - X axis, Peak value in 0.01dB Value[2] - Peak Vector value in 0.01dB (calculated at X axis Peak time) Value[3..4] - X axis, DF value in 0.001Hz Value[5..6] - X axis, Peak sample number Value[7] - Y axis, Peak value in 0.01dB Value[8] - Peak Vector value in 0.01dB (calculated at Y axis Peak time) Value[9..10] - Y axis, DF value in 0.001Hz Value[11..12] - Y axis, Peak sample number Value[13] - Z axis, Peak value in 0.01dB Value[14] - Peak Vector value in 0.01dB (calculated at Z axis Peak time) Value[15..16] - Z axis, DF value in 0.001Hz

		Value[17..18] - Z axis, Peak sample number
		Additional in case of RMS, RRMS source
		Value[19] - X axis, RMS triggering value in 0.01dB
		Value[20] - Y axis, RMS triggering value in 0.01dB
		Value[21] - Z axis, RMS triggering value in 0.01dB
		Additional in case of Peak Vector source
		Value[19] - Peak Vector triggering value in 0.01dB
		Value[20..21] - Peak Vector triggering sample number
		Value[22] - X axis Peak component of Vector value in 0.01dB
		Value[23] - Y axis Peak component of Vector value in 0.01dB
		Value[24] - Z axis Peak component of Vector value in 0.01dB
...	FFT Value[1...]	FFT data in case of source different then "System" and GvSpectrum set to FFT VEL (optional)
		FFT data blocks for 3 channel in format:
		Value[1] - FFT block ID (0x0055)
		Value[2] - block length
		Value[3] - channel info in format 0xAABB AA - number of channel (number of FFT blocks), BB - channel flag (binary)
		Value[4] - reserved
		Value[5] - reserved (data)
		Value[6..7] - reserved (time in ms)
		Value[8...] - FFT values in 0.01 dB
7 ...	Value[1...]	in case of source different then "System" and GvSpectrum set to FFT VEL
		Value[1] - X axis, Peak value in 0.01dB
		Value[2] - Peak Vector value in 0.01dB (calculated at X axis Peak time)
		Value[3] - X axis, max value of 1/3 octave band in 0.01dB
		Value[4] - X axis, 1/3 octave band index with max value (0..)
		Value[5..6] - X axis, Peak sample number
		Value[7] - Y axis, Peak value in 0.01dB
		Value[8] - Peak Vector value in 0.01dB (calculated at Y axis Peak time)
		Value[9] - Y axis, max value of 1/3 octave band in 0.01dB
		Value[10] - Y axis, 1/3 octave band index with max value (0..)
		Value[11..12] - Y axis, Peak sample number
		Value[13] - Z axis, Peak value in 0.01dB
		Value[14] - Peak Vector value in 0.01dB (calculated at Z axis Peak time)
		Value[15] - Z axis, max value of 1/3 octave band in 0.01dB
		Value[16] - Z axis, 1/3 octave band index with max value (0..)
		Value[17..18] - Z axis, Peak sample number
		Additional in case of RMS, RRMS source
		Value[19] - X axis, RMS triggering value in 0.01dB
		Value[20] - Y axis, RMS triggering value in 0.01dB
		Value[21] - Z axis, RMS triggering value in 0.01dB
		Additional in case of Peak Vector source
		Value[19] - Peak Vector triggering value in 0.01dB
		Value[20..21] - Peak Vector triggering sample number
		Value[22] - X axis Peak component of Vector value in 0.01dB

		Value[23] - Y axis Peak component of Vector value in 0.01dB Value[24] - Z axis Peak component of Vector value in 0.01dB
		Additional in case of S 9020 source Value[19] - Peak Vector triggering value in 0.01dB Value[20..21] - Peak Vector triggering sample number Value[22] - X axis Peak component of Vector value in 0.01dB Value[23] - Y axis Peak component of Vector value in 0.01dB Value[24] - Z axis Peak component of Vector value in 0.01dB Value[25] - Event duration in seconds
		Sample number counted relative to the start time of the alarm. Sampling defined in table B.1.7 (GvSampling)
		For the S 9020 standard, the Dominant Frequency results are calculated at the moment of calculating the Peak Vector result and for the remaining standards independently for each axis at the moment of calculating the Peak result.
...	FFT Value[1...]	FFT data in case of source different then "System" and GvSpectrum set to FFT VEL (optional) FFT data blocks for 3 channel in format: Value[1] - FFT block ID (0x0055) Value[2] - block length Value[3] - channel info in format 0xAABB AA - number of channel (number of FFT blocks), BB - channel flag (binary) Value[4] - reserved Value[5] - reserved (data) Value[6..7] - reserved (time in ms) Value[8...] - FFT values in 0.01 dB
...	1/3 octave Value[1...]	1/3 spectrum data in case of source different then "System" and GvSpectrum set to 1/3 VEL (optional) 1/3 spectrum data blocks for 3 channel in format consistent with Table B.1.21
.. nn-2 nn-1	0xnnnn 0xCF08	block length in words 0xCF08 = block end identifier

B.3 STRUCTURE OF THE SETUP FILE

SvanPC file header - cf. Tab. B.1.1.

File header - cf. Tab. B.1.2.

Unit and software specification - cf. Tab. B.1.3.

SETUP DATA - cf. Tab. B.1.23.

File-end-marker - cf. Tab. B.1.24.

B.4 DATE AND TIME

Following function written in C explain how the date and time are coded:

```
void ExtractDateTime(int date, unsigned int time, int dt[])
{
    dt[0] = time % 30;                      /* sec */
    dt[1] = (time/30) % 60;                  /* min */
    dt[2] = time/1800;                      /* hour */

    dt[3] = date & 0x001F;                  /* day */
    dt[4] = (date>>5) & 0x000F;            /* month */
    dt[5] = ((date>>9) & 0x007F) + 2000; /* year */

}

void ExtractTimeMs(long timeMs, int dt[])
{
    long time = timeMs/1000L;

    dt[0] = time % 60L;                      /* sec */
    dt[1] = (time/60L) % 60L;                /* min */
    dt[2] = time/3600L;                      /* hour */
    dt[3] = timeMs % 1000L;                 /* ms */
}
```

B.5 STRUCTURE OF THE CSV FILE

B.5.2. Structure of the CSV file

Section	File contents
File header	// **** // CSV file version, 1.20 // Created, 12/02/2021, 11:20:00 // Unit, 307, SN, 70825, MicSN, 78322 // Firmware, 1.21.0, 08/02/2021 // Corresponding logger file name, L34098.SVL // Device function, SLM // Integration time, 00:01:00 // Leq integration, Linear // Profile 1, A, Impulse // Profile 2, C, Fast // Profile 3, Z, Slow // CSV save mask, 7FFF, 7FFF, 7FFF, 15 // ****
Record header	Record, Date, Record End Time, SLM results profile 1, TIME, Lpeak, Lmax, Lmin, L, Leq, LE, Lden, LEPd, Ltm3, LTeq, L(01), L(10), L(20), L(30), L(40), L(50), L(60), L(70), L(80), L(90), LR30m, LR60m, OVL, SLM results profile 2, TIME, Lpeak, Lmax, Lmin, L, Leq, LE, Lden, LEPd, Ltm3, LTeq, L(01), L(10), L(20), L(30), L(40), L(50), L(60), L(70), L(80), L(90), LR30m, LR60m, OVL, SLM results profile 3, TIME, Lpeak, Lmax, Lmin, L, Leq, LE, Lden, LEPd, Ltm3, LTeq, L(01), L(10), L(20), L(30), L(40), L(50), L(60), L(70), L(80), L(90), LR30m, LR60m, OVL
Record data	1, 12/02/2021, 11:21:00, P1, 60, 80.4, 62.5, 41.3, 44.5, 47.1, 64.9, 47.1, 47.1, 53.9, 55.3, 54.8, 50.6, 47.4, 45.8, 44.7, 44.1, 43.6, 43.0, 42.3, 41.5, 46.1, , 0, P2, 60, 80.4, 73.1, 55.6, 57.1, 63.7, 81.4, 63.7, 63.7, 66.7, 67.2, 72.5, 67.6, 64.6, 62.6, 61.5, 60.6, 59.8, 59.0, 58.3, 57.3, 63.9, , 0, P3, 60, 82.5, 72.6, 61.4, 61.5, 66.3, 84.1, 66.3, 66.3, 67.8, 68.0, 74.0, 69.4, 67.6, 66.1, 65.2, 64.4, 63.7, 63.0, 62.1, 61.1, 66.5, , 0
...	

APPENDIX C. SV 804 TECHNICAL DATA¹

Nr	Parameter	Value/ Description
1. Measurement characteristics		
1.1.	Standards	DIN 45669-1:2020-06; ISO 4866:2010, Class 1; IEC 61260:2014, Class 1; DIN 4150-3:2017-12
1.2.	Meter Mode	PPV (Vmax), DF, RMS, RRMS, KBf, KBfmax, VDV, MAX, Peak, Peak-Peak, PPV Vector, aw, awv, OVL
1.3.	Analyser	1/3 octave real-time analysis or FFT analysis, Time domain signal recording to WAV format
1.4.	Filters	DIN 80, DIN 315, VEL 1, KB, HP
1.5.	RMS Detector	Digital true RMS with Peak detection, resolution 0.01 dB
1.6.	Detector Time Constants	Fast 125 ms in accordance with DIN 4150-2
1.7.	Vibration Sensor	Tri-axial geophone
1.8.	Dynamic Range	1 µm/s ÷ 100 mm/s RMS (141 mm/s Peak) 4 µm/s ÷ 400 mm/s RMS (565 mm/s Peak)
1.9.	Measurement Range	3 µm/s ÷ 100 mm/s RMS (141 mm/s Peak) 12 µm/s ÷ 400 mm/s RMS (565 mm/s Peak)
1.10.	Frequency Range	0.8 Hz ÷ 500 Hz (-3 dB)
1.11.	Number of Channels	3
1.12.	Directions of measurement	3 - vertical (Z) and horizontal (X, Y)
2. Physical data		
2.1.	Dimensions	171 x 85 x 83 mm (without accessories)
2.2.	Weight	1.7 kg including battery

¹ 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

Nr	Parameter	Value/ Description
2.3.	Leakproof classification	IP 67 according to EN 60529 (1997) + A1 (2000)
2.4.	Working ambient temperature range	Temperature -20 °C ÷ +50 °C
2.5.	Storage ambient temperature range	-20°C to +60°C
2.6.	Working relative humidity range	0 – 100% RH
3. Power Supply		
3.1.	SB 804 internal battery pack	Li-ion, 7.2 V, 10.2 Ah, 73.4 Wh (removable)
3.2.	SV 804 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
3.3.	Operating time when powered from the internal battery pack, (20°C, fully charged)	Up to 10 days with continuous modem transmission Up to 60 days in power saving mode *UNLIMITED with SB 804 and solar panel in power saving mode
3.4.	SV 804 power consumption including charging	up to 20 W
3.5.	External DC input	voltage: 5 V to 28 V
3.6.	External DC power supply SB 274L	15 V (waterproof)
3.7.	Solar panel (option)	OCV voltage up to 28 V Note: Size and power of the panel depend on the climate of the area where the station operates.
4. 4G modem		
4.1.	modem type and features	The LE910C1-WWX(D) is an LTE Cat-1 module based on ThreadX intended for global use across EMEA/North America/APAC/LATAM. Some of the module features are: <ul style="list-style-type: none"> • GSM bands: B2, B3, B5, B8 (850/900/1800/ 1900 MHz)

Nr	Parameter	Value/ Description
		<ul style="list-style-type: none"> UMTS/HSPA bands: B1, B2, B4, B5, B6, B8, B19 (800/850/900/1700/ 1900/2100 MHz) LTE FDD bands: B1, B2, B3, B4, B5, B7, B8, B9, B12, B13, B14, B18, B19, B20, B25, B26, B28 (700/800/850/900/1700/1800/1900/ 2100/2600 MHz) Output power: Class 3 (0.2W, 23dBm), LTE-FDD
4.2.	modem approvals	<p>Approvals of the module:</p> <ul style="list-style-type: none"> EMEA: RED (CE) / UKCA (UK) / TRA (UAE) / ICASA (ZA) APAC: RCM (AU) / KCC (KR) / IMDA (SG) / NCC (TW) America: ANATEL (BR) / ISED (CA) / FCC (USA) RoHS
5. Bluetooth modem		
5.1.	modem type and features	<p>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.</p> <ul style="list-style-type: none"> TX power: up to 8 dBm Receiver sensitivity: -90 dBm Range: typically, ≤50m line-of-sight and depending on local RF conditions.
5.2.	modem approvals	<p>Copies of the modules regional approvals certificates may be obtained from Svantek or Silicon Laboratories.</p> <ul style="list-style-type: none"> Declaration ID: D033250, Controller Subsystem Qualified Design ID: 88831
6. GPS module		
6.1.	type and features	<p>SAM-M10Q produced by U-blox Holding AG:</p> <ul style="list-style-type: none"> Position Accuracy (horizontal): < 1.5 m CEP Tracking Sensitivity: up to -165dBm Time accuracy: < 1µs (directly depends in position deviation) 4 concurrent GNSS reception GPS / QZSS, GLONASS, Galileo, BeiDou Acquisition Cold / Hot start typ. 23s / 1s Signal integrity reporting RF interference and jamming detection and

<i>Nr</i>	<i>Parameter</i>	<i>Value/ Description</i>
		<ul style="list-style-type: none">• Protection level <p>Real-time position accuracy estimate with 95% confidence</p>

APPENDIX D. DEFINITIONS AND FORMULAE OF MEASURED VALUES

D.1 Basic terms and definitions

T current time period of the measurement in seconds.

T₀ reference duration of 28 800 seconds (8 hours)

τ 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_{Wτ}(t) instantaneous frequency and time-weighted velocity signal with the weighting filter **W** and time constant **τ** calculated from the equation:

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

where: ξ – integration variable.

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

a(t) instantaneous unweighted acceleration signal

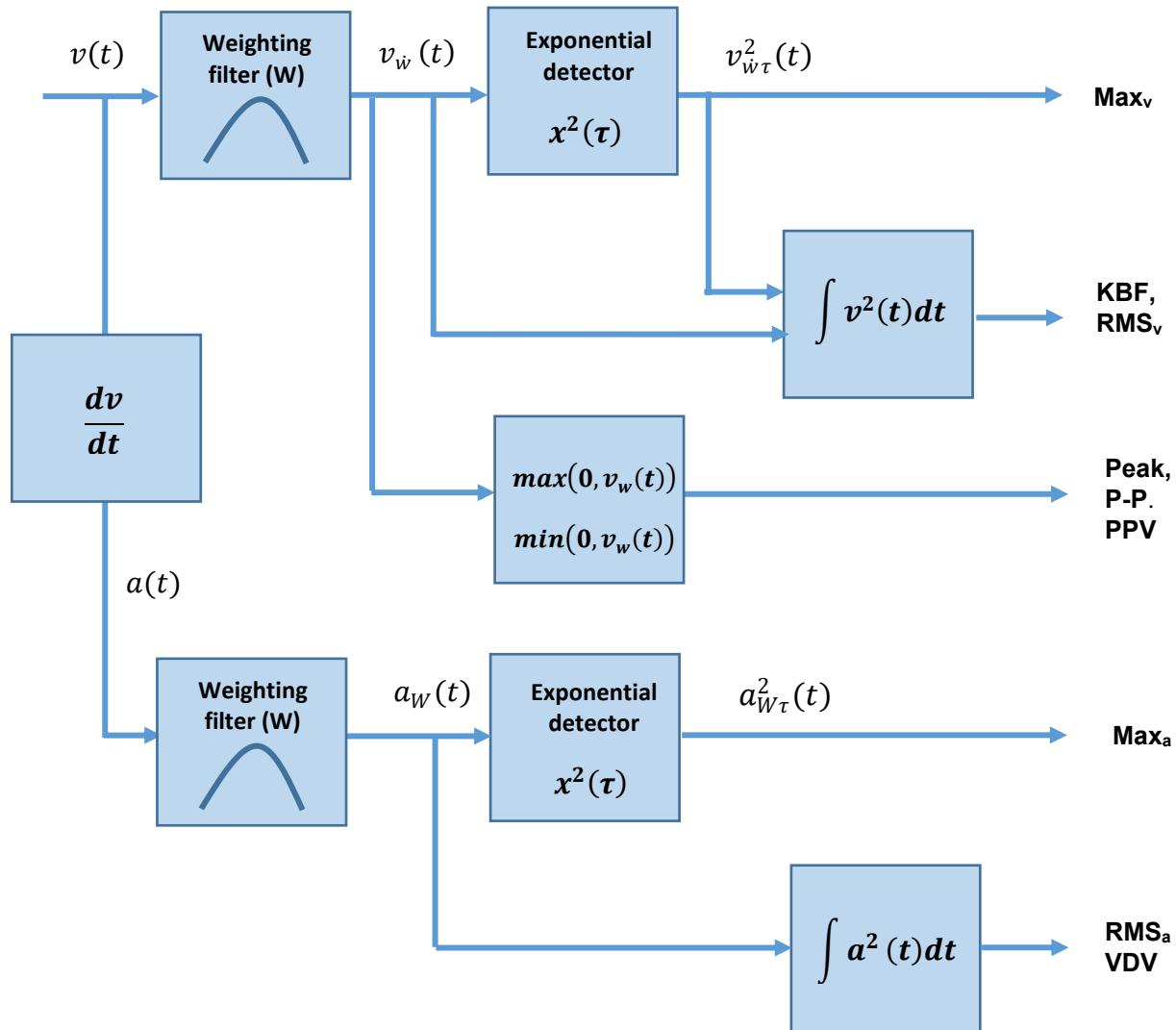
a_{Wτ}(t) instantaneous frequency and time-weighted acceleration signal with the weighting filter **W** and time constant **τ** calculated from the equation:

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

where: ξ – 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:

**Peak**

Maximum absolute value of the velocity signal for the axis: X, Y or Z that is frequency-weighted within a stated time interval \mathbf{T} .

$$\text{Peak} = \max_T(0, v_w(t))$$

P-P

Peak-to-peak (**P-P**) result is the difference between highest and lowest value of the velocity signal for the axis X, Y or Z within a stated time interval \mathbf{T} .

$$P - P = \max_T(0, v_w(t)) - \min_T(0, v_w(t))$$

Max_v

Maximal value of the velocity signal for the axis: X, Y or Z that is frequency- and time-weighted within a stated time interval \mathbf{T} .

$$\text{Max} = \max_T(v_{w\tau}(t))$$

RMS_v

Root mean square result of the velocity signal for the axis X, Y or Z that is frequency-weighted and averaged for a stated time interval \mathbf{T} .

$$RMS = \left(\frac{1}{T} \int_0^T v_w^2(t) dt \right)^{1/2}$$

Roll. RMS	Rolling RMS measured for the axis X, Y or Z in the time window for the last T_R seconds of the measurement time T .	$Roll. RMS = \sqrt{\frac{1}{T_R} \int_{T-T_R}^T v_W^2(t) dt}$
PPV	Peak Particle Velocity - maximum absolute value of the unweighted velocity signal for the axis X, Y or Z within a stated time interval T .	$PPV = \max_T(0, v_W(t))$
Vector	Vector of the PPV values taken from three axis.	$PPV_V = \max_T \sqrt{v_{Wx}(t)^2 + v_{Wy}(t)^2 + v_{Wz}(t)^2}$
KBF	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: ξ – integration variable.
KBFTi	Energy-averaged KBf during the time averaging period T_i .	$KBFTi = \sqrt{\frac{1}{T_i} \int_0^{T_i} KBf^2(t) dt},$
KBFTm	Root-mean-square value of the KB _{FTi} 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 KB _{FTi} values less than or equal to 0,1 (KB _{FTi} ≤ 0,1) are taken to be zero though these cycles contribute to the total number of cycles N	$KBFTm = \sqrt{\frac{1}{N} \sum_{i=1}^N KBFT_i^2},$
RMS_a	Root mean square result of the acceleration signal for the axis X, Y or Z that is frequency-weighted and averaged for a stated time interval T .	$RMS = \left(\frac{1}{T} \int_0^T a_W^2(t) dt \right)^{1/2}$
Max_a	Maximal value of the acceleration signal for the axis: X, Y or Z that is frequency- and time-weighted within a stated time interval T .	$Max = \max_T(a_{W\tau}(t))$
VDV	Vibration Dose Value – result of the acceleration signal for the axis X, Y or Z that is frequency-weighted averaged for the time T .	$VDV = \left(\int_0^T a_{W\tau}^4(t) dt \right)^{1/4}$