



USER MANUAL



SV 279 PRO

MONITORING STATION

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Rev. 01.04

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This user manual presents the controller firmware revision SD270-PRO v5.01 and SD270A-PRO v2.02.

The succeeding software revisions (marked with the higher numbers) can change the view of some displays presented in the text of the manual.



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

- ✓ *Before installing the station at the measurement site, make sure that the protective caps on the four anti-bird spikes of the SA 279 outdoor microphone protection kit are removed. It is recommended to use the protective caps during transportation, storage and other operations with the instrument like, laboratory calibration, etc. to avoid personal injury.*
- ✓ *Only SVAN 979 and the controller can be disconnected and removed from the station case by the user. All other disassembling work should be performed strictly by an authorized service team.*
- ✓ *The producer does not recommend removing the controller without a sound reason. Double check that the controller has a good fixation in the connector after reconnecting.*
- ✓ *Do not remove the battery from the case! This operation must be done only by the authorised service.*
- ✓ *SVAN 979 is powered from the external source and doesn't use its internal batteries. Internal instrument's batteries must be removed for correct system operation and safety reasons.*
- ✓ *The correct connection of the accelerometer or microphone is not signalled by the controller therefore it is recommended to perform a test measurement each time the station is turned on.*
- ✓ *During station operation it is recommended to charge the internal and external batteries as often as possible; this will extend battery life. It is necessary to charge the battery after any total discharge.*
- ✓ *Monitoring station and/or SB 272 should not be stored for a long time with discharged batteries. Storing with batteries in discharged condition may damage them.*
- ✓ *If Monitoring station and/or SB 272 are planned to be stored for a long period of time, it is recommended to charge their batteries to 100% capacity. Batteries should be charged at least once per 6 months.*
- ✓ *If the storage period is longer than one year, a discharge/charge cycle must be performed. To do this, leave the device turned on until the battery is completely discharged. Then charge the battery to 100% capacity.*
- ✓ *Monitoring station and SB 272 have their own chargers, which are incompatible: SB 270 is a waterproof power supply for SV 279 PRO, whereas SB 273 is an indoor charger for SB 272.*
- ✓ *The windscreen influences the free-field characteristics of the SA 279 outdoor microphone protection kit, therefore it is important to check its condition regularly. In the case of visible degradation of the foam surface it must be replaced by the new one.*

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1 INTRODUCTION

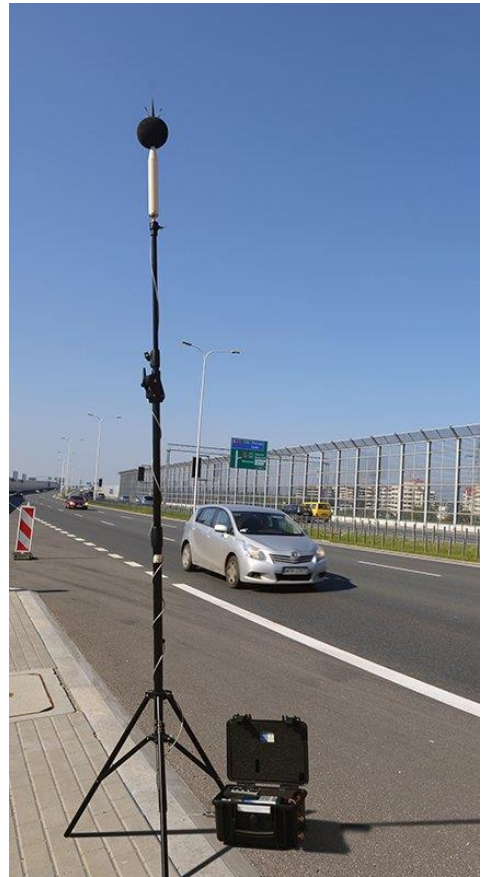
SV 279 PRO is an outdoor monitoring station based on the **SVAN 979** Class 1 sound level meter and **SA 279** outdoor microphone kit. The solution is recommended for short term and semi-permanent noise measurement in the environment.

The IP67 rated case contains a lead-acid battery the operating time of which can be easily extended by connecting an external battery or a solar panel. The intelligent charging unit enables the use of a solar panel without expensive controllers or heavy batteries. The case is fitted with very robust, waterproof connectors (military standard).

The station provides broad-band results such as **Leq**, **Max**, **Min** and **Peak** with all standard weighting filters together with an incredible time-history logging feature with two adjustable logging steps. The broad-band results can be recorded in three acoustic profiles which enable parallel measurements with 3 different filters (e.g. **A**, **C**, **Z**) as well as 3 different detector time constants (e.g. **Fast**, **Slow**, **Impulse**).

The SA 279 outdoor kit protects the SVAN 979 preamplifier and microphone from weather conditions. The SA 279 is made of lightweight materials and can be easily installed on a mast with standard mounting threads.

SVAN 979 can be easily removed from the station case and used as a hand-held sound level meter. The monitoring station uses a 3G modem for remote communication with the Internet. **SvanNET**, a relay server, supports the connection between PC and station. Thanks to SvanNET users may use a mobile phone or tablet to check the status of the monitoring station.



1.1 FEATURES

- SV 279 PRO is a portable monitoring station housed in an IP67 waterproof case dedicated for periodic outdoor measurements.
- The station is based on the SVAN 979 instrument which can be easily removed from the case and used as a hand-held sound level meter.
- **Class 1** noise measurements are performed over a very wide dynamic range over 110 dB from 3 Hz up to 20 kHz.
- The **Time history** of results such as **Leq**, **Max**, **Min** and **Peak** is saved on a micro SD-card.

- The station can perform real-time frequency analysis in **1/1** or **1/3-octave** bands and save it as time-history data. 1/3-octave real-time frequency analysis allows analysis of the noise frequency contents. The **statistical analysis** in 1/3-octave band is used for verification of noise sources in the environment.
- The time domain signal recording to **Wave** format works during measurement and is logged in parallel to a time history. Once downloaded to a PC it can be played back. Settings such as triggers or recording time are adjustable. In addition to audio play-back, Wave file can be post-processed in the **SvanPC++** software that provides the calculation of overall results such as Leq, Lmax, Lmin, Lpeak as well as 1/3 octave and **FFT** calculations or RT60.
- The **3G modem** provides fast data transfer over the Internet to a PC with a standard Internet connectivity.
- The remote communication settings are automatically adjusted to connect to **SvanNET**.
- The station can be powered from an internal battery, external battery or external DC power supply and is ready for direct connection to a solar panel. The powering is managed by the intelligent charging unit.
- The station uses a waterproof **charger** that is designed for outdoor use.
- Military standard **connectors** provide reliable, robust and waterproof cable connections.

1.2 ACCESSORIES INCLUDED

SVAN 979	Class 1 Sound & Vibration Analyser with 1/1 and 1/3 octave, FFT, Time Domain Signal Recording including: pre-polarised ½" condenser microphone with nominal sensitivity 50 mV/Pa (G.R.A.S. 40AE), voltage type (supports 200 V polarisation) microphone preamplifier (SV 17), foam windscreen (SA 22), USB 1.1 cable (SC 16)
SM 279 PRO	Outdoor monitoring station for SVAN 979 including: 17Ah battery, 3G modem (SP 270) and external power supply (SB 270)
SC 279	Preamplifier cable for SV 17, 6 meters
SA 270D	Desiccator for outdoor protection kits
SA 279	Outdoor protection kit for GRAS 40AE microphone (microphone, preamplifier, cable and desiccator not included)
SA 250	Carrying case for SA 279, SB 270, cables and accessories
SvanNET	Web interface and connectivity support

1.3 ACCESSORIES AVAILABLE

SV 36	Class 1 Sound Calibrator: 94/114 dB@1000 Hz
SB 272	External battery for SV 27x monitoring stations series (33 Ah) including indoor charger
SB 271	Solar panel for SV 27x monitoring stations (40 W)
SA 206	Mast with adjustable height from 1.5 meter to 4 meters (cover SA 21_45 included)
SP 275	Vaisala Weather Transmitter WXTxx type meteo module.
SP 272	WERMA, LED/Buzzer alarm lamp (12V DC).

2 MONITORING STATION SET

2.1 SV 279 PRO STANDARD SET AND OPTIONAL ELEMENTS

The SV 279 PRO station consists of two carrying cases. The main case is waterproof with an internal 17 Ah battery and internal charging unit supporting powering from an external DC or a solar panel. The SVAN 979 Class 1 sound level meter is installed inside but can be removed and used as a hand-held meter.

All accessories fit conveniently into a second carrying case.

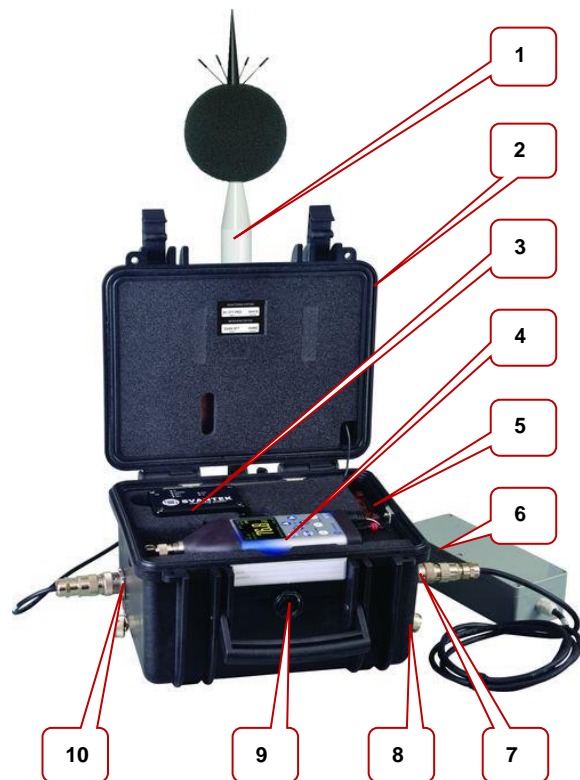
The SV 279 PRO station includes:

- outdoor microphone kit (1),
- waterproof case with battery, charging unit and connectors (2),
- controller (3),
- SVAN 979 – Class 1 Sound Level Meter and Analyser (4),
- 3G modem (5),
- power supply (6).

The waterproof case is equipped with:

- external power connector (7),
- SP274 meteo module connector (8),
- air pressure compensation valve (9)
- input signal connector (10).

The outdoor microphone kit (1) and outdoor charger (6) are packed inside the second transportation case together with microphone and charger cables and windscreen (11).



Additional accessories for SV 279 PRO system, not included in the standard set, but in many applications, essential for reliable system operation and task performance are:

1. Sound calibrator (**SV 36**), - see Chapter [2.2.1](#)
2. external battery 33 Ah including indoor charger (**SB 272**), - see Chapter [2.2.2](#)
3. solar panel 40 W (**SB 271**), - see Chapter [2.2.3](#)
4. meteo module (**SP 275**) - see Chapter [2.2.4](#)
5. light and buzz alarm lamp, 12V DC (**SP 272**) - see Chapter [2.2.5](#)
6. mast with adjustable height from 1.5 meter to 4 meters (**SA 206**), - type: Manfrotto 269BU



2.1.1 SM 279 PRO - Waterproof Case

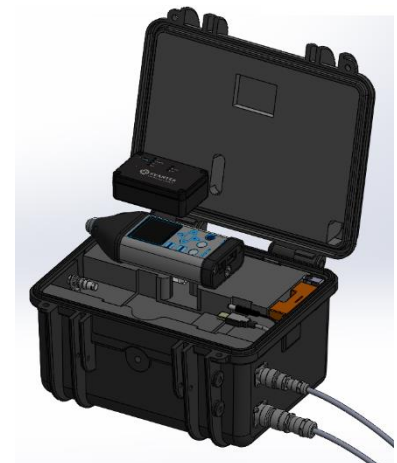
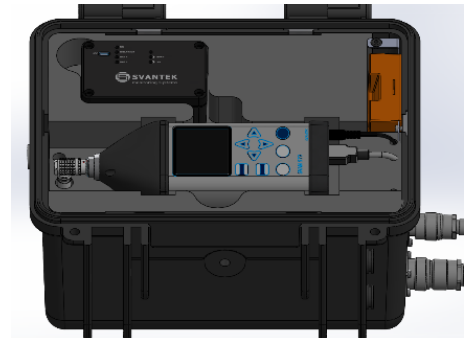
The IP 67 waterproof case houses and protects the main elements of the monitoring station:

- controller,
- 3G modem,
- SVAN 979 instrument,
- other internal elements such as: rechargeable battery, connectors, cables, circuit boards.

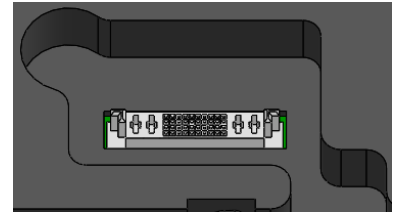
SVAN 979 can be removed from the case by the user and used as a hand-held sound meter.

To do this the user should;

1. switch off the instrument by pressing together **<Alt>** and **<Start/Stop>** keys,
2. unscrew the input connector and disconnect the input cable,
3. disconnect the USB and power cables.



The controller is fixed in the station case by a Signal Power Combo connector and can also be removed from the case. To do this the user should pull the controller up and remove it from the slot.



To put it back the user should put the controller in the slot and press on it to achieve a good fixation with the connector.



Note: Only SVAN 979 and the controller can be disconnected and removed from the station case by the user. All other disassembling work should be performed strictly by an authorized service team.



Note: The producer does not recommend removing the controller without a sound reason. Double check that the controller has a good fixation in the socket after reconnecting!

The monitoring station case is equipped with an air pressure compensation valve that enables the user to open the case easily if the internal pressure is lower than the atmospheric one.

Any remaining moisture after closing the lid will be absorbed by the silica gel bags (optional accessory).

The valve should be released if opening the top lid is problematic.



Note: The valve must be closed when the station is used outdoors, otherwise the case is not sealed against moisture.

The station case is equipped with three Souriau UTO type connectors for:

- input signals from the microphone (**INPUT**).
- powering station and charging the internal battery (**DC SUPPLY**).
- external interface for the SP 275 meteo module or the alarm lamp (**EXTERNAL INTERFACE**).



To connect a cable to a case socket, start by lining up the key on the plug and the socket, then lock the connector by turning the ring clockwise (only the ring close to the socket will rotate).



To disconnect a cable, push the connector towards the station and turn it counter-clockwise. New connectors require more force so using a closed hand is more effective than using only fingers.



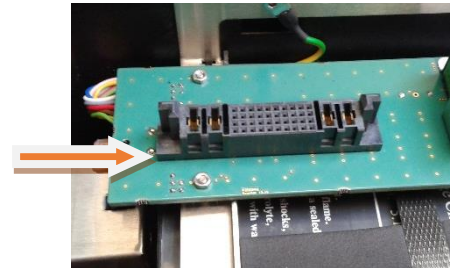
The station is equipped with the Lead-Acid rechargeable battery (17Ah, 12V), located in the bottom of the case.

The battery can be used in any chosen position without the risk of leakage. The battery has a pressure relief valves that allows safe dispersal of any excess pressure inside the cell (VRLA).



Battery capacity may vary depending on the ambient temperature.

The safety fuse is located on the left side of the connection plate.



Note: Do not remove the battery from the case! This operation must be done only by the authorised service.



Note: Battery is not restricted for air, surface and water transport. Classified as non-hazardous material (IATA/ICAO Special Provision A67, DOT-CFR Title 49 parts 171-189, IMDG amendment 27).



Note: During station operation it is recommended to charge the internal battery as often as possible; this will extend battery life. It is necessary to charge the battery after any total discharge.



Note: The station should not be stored for a long time with a discharged battery. Storing with batteries in discharged condition may damage them.



Note: If the station is planned to be stored for a long period of time, it is recommended to charge its battery to 100% capacity. The battery should be charged at least once per 6 months.



Note: If the storage period is longer than one year, a discharge/charge cycle must be performed. To do this, leave the device turned on until the battery is completely discharged. Then charge the battery to 100% capacity.

The case lid is equipped with an antenna for 3G modem.



2.1.2 SD 270(A) PRO - Controller

The SV 279 PRO monitoring station is equipped with the SD 270 PRO (and later modification SD 270A PRO) controller that integrates and controls all system modules and is responsible for the powering of all elements and communication between the following elements of the monitoring station:

- SVAN 979 instrument,
- 3G modem
- and optionally
- SP 275 meteo module, alarm lamp etc.



Very important task of the controller is power distribution - it provides appropriate DC power to every element of the system (managing external power sources such as a power supply SB 270 or optional solar panel or external battery).

The next key task of the controller is integration of the whole system – examining the communication, state and condition of every module of the system and the immediate indication of all problems on the control panel by means of several LEDs or remotely using 3G Internet connection.

The controller also analyses the temperature condition inside the monitoring station case. If the internal temperature is higher than 50°C, the controller will switch off internal battery charging. If the temperature further increases over 65°C, the controller will switch off the monitoring station. The station will be also switched off, if the internal temperature falls below -30°C.

The TEST key in the SD 270A PRO controller enables the controller resetting. To do this the user should press the TEST key for more than 20 seconds until the LED lights up. Release the key and the controller reset will be done.

A mini USB connector is positioned on the front panel of the controller and is designated to the controller firmware upgrade.



Note: The mini USB connector on the controller panel doesn't provide any measurement or setup data exchange with the PC. Such data exchange is carried out via the USB Device 1.1 interface of the SVAN 979 (**USB** socket).



Note: Communication of the controller or SVAN 979 with a PC requires installation of the USB drivers on your PC. USB driver for Svantek devices are available on <http://svantek.com/support-drivers-software.html>



Note: Before starting upgrading be sure that your SvanPC++ software is Off! If not, please Exit it before starting any upgrading.

To upgrade the firmware of the controller, go through the next steps:

1. Switch off SVAN 979 and wait until all LEDs are off.
2. Connect the controller to the PC with SC 56 cable.
3. Run the “file2usb.exe” file on the connected PC. The **BAT 1** LED will start flashing a green colour.
4. After “Success” is registered on the PC, disconnect the SC 56 cable.



Note: In case of any problems with the upgrade, switch off SVAN 979 and wait until all LEDs are off, then extract the controller from the case and repeat steps from 2 to 4.

2.1.3 SP 270 - 3G Modem

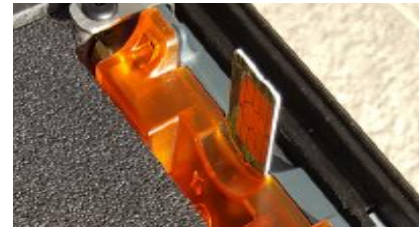
The 3G modem (**SP 270**) provides fast data transfer over the Internet to a PC with standard Internet connectivity. A 3G modem type “GeMalto® EHS6 Terminal” is used.

GeMalto® EHS6 Terminal uses mini-SIM cards 25mm x 15mm with Internet Access. The SIM slot accepts 1.8V and 3V SIM cards in accordance with GSM 11.12 Phase 2.

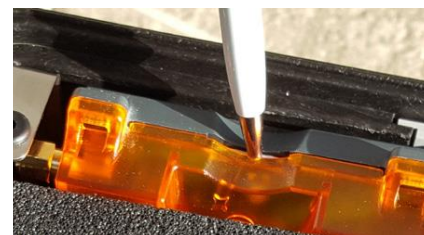


Note: See also GeMalto® EHS6 Terminal user manual.

The SIM-card should be inserted with the circuit-side facing left in the slot by pushing it until it snaps hold.



The SIM-card can be removed from the card slot by using a pen or other flat object. Press on the card until it snaps out. Use tweezers to remove the SIM-card from the slot.



If settings of SVAN 979 in the “Wireless Transfer” menu are correct, then once you insert a SIM card in the modem slot the remote communication settings of the modem are automatically adjusted to connect to the SvanNET server. In some cases, APN should be provided.



Note: Be sure that the PIN of the SIM card is off!

2.1.4 SVAN 979 - Sound and Vibration Analyser

SVAN 979 is a Class 1 Sound & Vibration level meter as well as a real time 1/1 or 1/3 octave analyser and is a core of the SV 279 PRO system. Its role is to make measurements and save results in files, as well as to control data transfer via modem to the SvanNET server or directly to the PC. The measurement results can be analysed later with the use of the SvanPC++ software.

SVAN 979 can be easily removed from the case and used as an independent hand-held sound or vibration level meter/analyser, not as an integral part of the SV 279 PRO system.

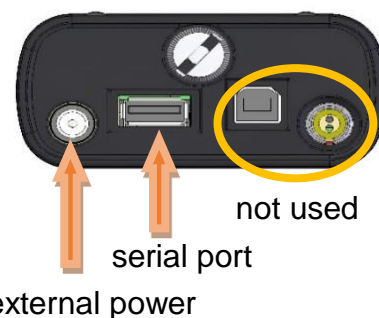
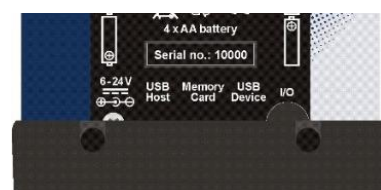
Main important features of SVAN 979 as a part of SV 279 PRO system:

- Three user configurable profiles allow parallel measurements with independently defined frequency filters and RMS detector time constants. Each profile provides a significant number of results (like **Spl**, **Leq**, **SEL**, **Lden**, **LEPd**, **Ltm3**, **Ltm5**, **Lnn**, **LR15**, **LR60**, **Ovl**, **Peak**, **Max** and **Min**).
- Advanced time history logging for each profile provides complete information about the measured signal using the SD-card fitted in the bottom of the meter and can be downloaded to any PC using SvanNET or SvanPC++ software.
- All required weighting filters: **A**, **B**, **C**, **Z**, **G** are available with this instrument.
- **SVAN 979** can, simultaneously to the meter mode, perform real time **1/1 Octave** or **1/3 Octave** and optionally **1/6 Octave** and **1/12 Octave** analysis including calculations of statistical levels.

SVAN 979, when it works with the monitoring station, is powered from an external power supply via the **6-24V** socket.

Data transfer to the modem is done via the **USB Host** socket, the serial interface.

Other instrument sockets are not used in the SV 279 PRO system.



Note: As a part of the SV 279 PRO station SVAN 979 is powered from the external source and doesn't use its internal batteries. Internal instrument's batteries must be removed for correct system operation and safety reasons!



Note: The station is delivered without internal batteries inside the instrument. But if you use SVAN 979 as a hand-held instrument, don't forget to remove batteries from the instrument every time you put it back into the station slot.

To extract the batteries, the user should switch off the instrument, unscrew the coin-operated screw, take off the black bottom cover of the instrument and slide the battery tubes out.



The user should then fix the bottom cover back on.

SVAN 979 is delivered with 16 GB micro SD-card.

The user may exchange it for a 128 GB card, but before insertion the card must be formatted as FAT32.

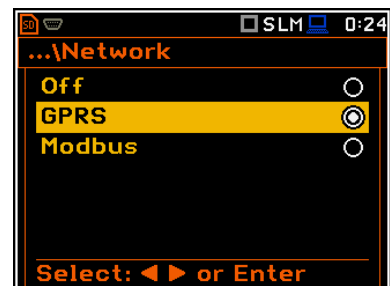
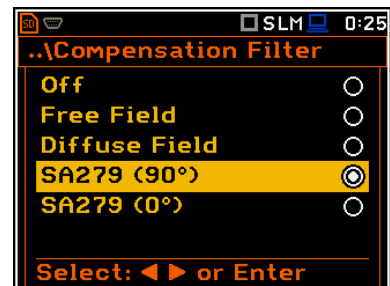
The micro-SD Memory Card is located in the slot under the bottom cover and can be accessed after removing the bottom cover.

To extract the card from the card-slot, the user should push on the card and then pull it out of the slot.



There are three important settings, which should be assured in the instrument when it is a part of the monitoring station:

1. The **Compensation Filter** should be set to **SA279 (90°)** or **SA279 (0°)** filter (*path: <Menu> / Measurement / Compensation Filter*). Both filters are dedicated for the permanent outdoor monitoring application. The characteristics of the outdoor filters depend on the application: environmental (sound signal is parallel to the microphone's grid) or airport (sound signal is perpendicular to the microphone's grid). The frequency characteristic of the designed filters is given in App. C to the SVAN 979 manual.
2. **Network** should be set to **GPRS** (*path: <Menu> / Instrument / Wireless Connection / Network*).
3. **RS232** should be switched on in the **Communication Ports** window (*path: <Menu> / Instrument / Communication Ports*).



Other settings depend on measurement and transmission type.

All measurement, instrument and transmission settings can be set up via SVAN 979 user interface, or remotely via the SvanNET web-server or SvanPC++ program.



Note: See also SVAN 979 user manual.

2.1.5 SA 279 - Outdoor Microphone Protection Kit

The **SA 279** outdoor kit protects the SVAN 979 preamplifier and microphone from weather conditions. The use of the outdoor kit requires an extension cable between the instrument and its preamplifier (**SC 279**). The SA 279 is made of lightweight materials and is easy to install on a tripod. This solution is recommended for short term and semi-permanent noise measurements in the environment.

The outdoor microphone kit has $\frac{3}{4}$ " screw on its bottom which enables using of standard tripods or other user specific mountings. Technical data such as direct and frequency characteristics associated with the microphone are included in the SVAN 979 user manual.

Optionally you may use desiccator - Silikogel. The desiccator absorbs moisture commonly contained in the air. The desiccator should be regenerated after some period of use, when it changes colour to red, by drying it for 3 hours in a temperature of 150°C. The colour of the silica gel is visible through the hole on the top of the desiccator.

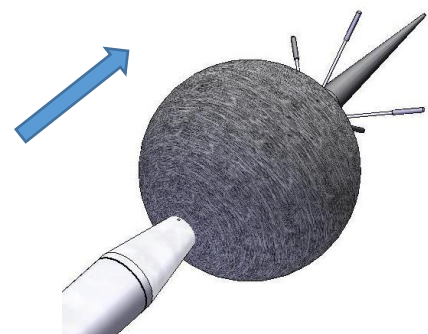
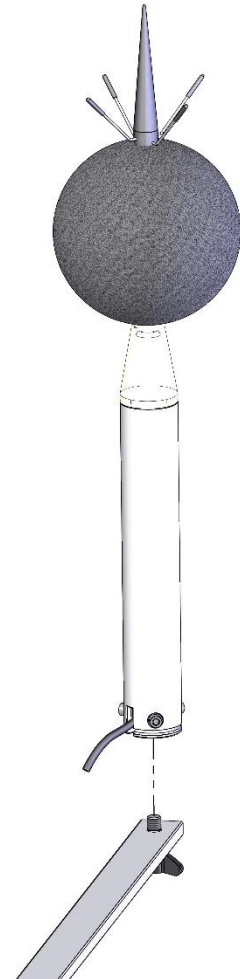


Note: See also SA 279 Assembly Guide to learn how to assemble and disassemble the microphone's outdoor protection.



Note: After assembling the SA 279 or after calibration check that the windscreen foam is properly installed. It should be shifted close to the anti-bird spikes. Otherwise the SA 279 free-field characteristics will be different from declared ones.

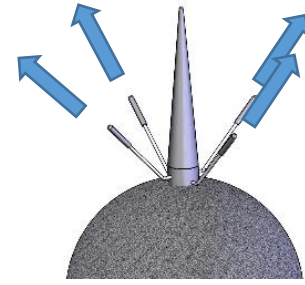
For absolute certainty, push the windscreen up to the stop.





Note: Before installing the station at the measurement site, make sure that the protective caps on the four antibird spikes are removed.

It is recommended to use the protective caps during transportation, storage and other operations with the instrument like, laboratory calibration, etc. to avoid personal injury.



Note: Correct connection of the microphone is not signalled by the controller therefore it is recommended to perform test measurements each time the station is turned on.

2.1.6 SB 270 - External Power Supply with AC/DC converter

SB 270 is waterproof Single Output Switching Power Supply which is characterised by:

- Universal AC input / Full range (90 ~ 264VAC)
- Protections: Short circuit / Over load / Over voltage
- Fully encapsulated with IP65 level
- Fully isolated plastic case



2.2 OPTIONAL ACCESSORIES FOR SV 277 PRO SYSTEM

2.2.1 SV 36 – Class 1 Sound Calibrator

For result verification purposes, most norms and standards impose the requirement to calibrate the measurement channel before and after each measurement or measurement session.

Sound calibrator is a device which produces sound pressure of defined level and frequency.

SV 36 Sound calibrator produces sound pressure of declared levels - 94 or 114 dB at a frequency of 1 kHz.



2.2.2 SB 272 - External Rechargeable Battery

SB 272 is an external source of DC power for the monitoring station. It includes a Lead-Acid rechargeable battery (33 Ah, 12 V) and is dedicated for outdoor use because of its waterproof case. The battery capacity enables up to three times longer operating time of the monitoring station in comparison to the station's internal 17 Ah battery.



The SB 272 set includes the SB 273 indoor charger and a cable for connection between SB 272 and the monitoring station.

SB 272 has the same connector for charging and for power supply and therefore cannot be used as a power supply for the monitoring station and at the same time be charged (as the internal station battery with solar panel or external power supply).



Note: *SB 272 cannot be charged by the monitoring station SB 270 power supply!*



Note: *SB 272 is not restricted for air, surface and water transport. Classified as non-hazardous material (IATA/ICAO Special Provision A67, DOT-CFR Title 49 parts 171-189, IMDG amendment 27).*



Note: *It is necessary to charge SB 272 after any total discharge, otherwise the battery may lose its capacity.*



Note: *SB 272 should not be stored for a long time with a discharged battery. Storing SB 272 with a discharged battery may damage it.*



Note: *If SB 272 is planned to be stored for a long period of time, it is recommended to charge its battery to 100% capacity. The battery should be charged at least once per 6 months.*



Note: *If the storage period is longer than one year, a discharge/charge cycle must be performed. To do this, completely discharge the battery and then charge it to 100% capacity.*

2.2.3 SB 271 - Solar Panel

The **SB 271** solar panel (40 Watt, 17.5 V) extends the working time of the monitoring station. The size and weight of the panel enables easy transportation in the dedicated carrying bag.

The SB 271 solar panel does not require additional batteries or external controllers.

The mounting system enables mounting of the SB 271 solar panel above the monitoring case which provides a natural shade that protects the station from overheating.

The SB 271 is equipped with a military standard connector cable for direct connection to the monitoring station.



2.2.4 SP 275 - Meteo Module

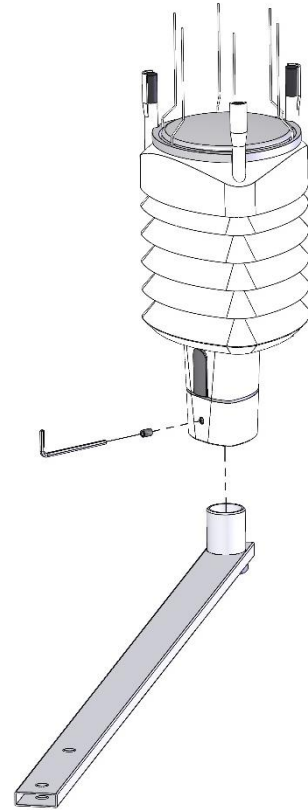
SP 275 is a Vaisala Weather Transmitter WXTxx type meteorological module used with the SV 279 PRO monitoring station.

It measures 6 most essential weather parameters (barometric pressure, humidity, precipitation, temperature, wind speed and direction) and also rain and hail intensity. It has low power consumption (working also with solar panels), is compact and light-weight, has no moving parts, has internal heating and can be easily installed with a one-bolt mounting method.

SP 275 has an automatic control circuit that switches the heating on at low temperatures.

Five measurement weather parameters (barometric pressure, humidity, temperature, wind speed and direction) are transferred from SP 275 to the monitoring station every second.

Precipitation is measured and 3 values for rain and hail (intensity, accumulation and duration) are transferred, every 10 seconds, only when it is raining or hailing. These parameters are not averaged but integrated.

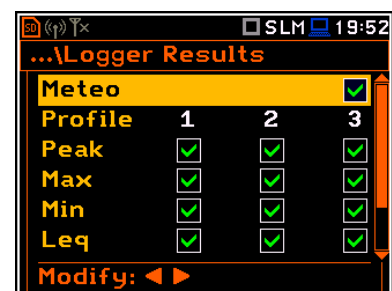


Note: Do not forget to align the transmitter so that the arrow on the bottom of the transmitter points North.

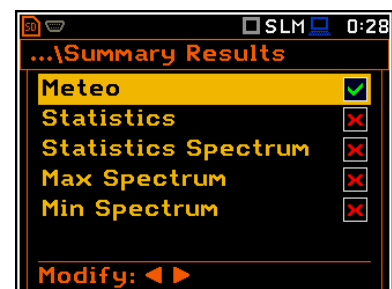


Note: See also *Vaisala WXT520 User Guide*.

The controller then transfers the weather parameters to SVAN 979, which saves them in a logger file as a history if the **Meteo** position is **On** in the **Logger Results** list (*path: <Menu> / Measurement / Logging / Logger Results*).



SVAN 979 also integrates weather parameters for the period, defined by the parameter **Integration Period** in SVAN 979 (*path: <Menu> / Measurement / General Settings*) and then saves them as **Summary Results** if the **Meteo** position is **On** in the **Summary Results** list (*path: <Menu> / Measurement / Logging / Summary Results*).



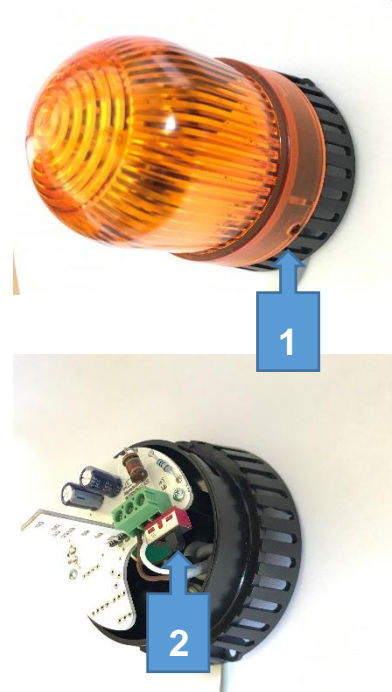
2.2.5 SP 272 - Alarm Lamp

The **SP 272** is a type WERMA, LED/Buzzer alarm lamp (12V DC).

The alarm lamp is connected to the **EXTERNAL INTERFACE** connector instead of the Meteo module.

In this lamp, the buzzer is disabled by default. To enable it you should:

1. open the case by pushing the black button and turning the plafond and
2. shift the switch to the left.



3 OPERATING THE STATION

3.1 POWERING

The SV 279 PRO monitoring station can be powered from:

- internal rechargeable battery,
- mains power source (SB 270);

and optionally from:

- external rechargeable battery (SB 272),
- solar panel (SB 271).

When the power supply is connected, it starts to power the station and load the internal battery in parallel (as a voltage source).

When the external rechargeable battery is connected to the station the station controller switches the powering from the internal battery to the external one. As soon as the external battery is discharged the controller switches powering back to the internal battery.

When the solar panel is connected to the station it starts to load the internal battery (as a current source). And all the time that the solar panel charges the internal battery, the station continues to be powered from the internal battery.

The status of powering is indicated at the controller's panel by a combination of **DC**, **CHARGING**, **BAT 1** or **BAT 2** LEDs (see Table below).



Note: *It is recommended that the batteries of SV 279 PRO and SB 272 are charged before going on site.*



Note: *Monitoring station and external battery have their own chargers, which are incompatible: SB 270 is a waterproof power supply for SV 279 PRO, whereas SB 273 is an indoor charger for SB 272.*



Note: *SVAN 979 is powered from the external source and doesn't use its internal batteries. Internal instrument's batteries must be removed for correct system operation and safety reasons!*

3.2 CONTROLLER INTERFACE

The controller interface consists of several LEDs, which indicate the state of the station elements or their connection with the controller:

- **DC** – external power supply connection state (AC/DC converter),
- **CHARGING** – charging state of the internal battery,
- **BAT 1** – internal battery state,
- **BAT 2** – additional external battery state,
- **SVAN** – SVAN 979 connection state,
- **3G** – 3G modem connection state,
- **EXT I/O** – Meteo module connection state.

Colour of LEDs can be red, orange or green. Colour of **SVAN**, **3G** and **EXT. I/O** LEDs reflect the communication state with the corresponding unit. Colour of **DC**, **CHARGING**, **BAT 1** or **BAT 2** LEDs depend on the state of the power supply and charging of the internal battery.

The table below shows combinations of LED colours in the specific supply states.

Power from	Internal battery	Power supply	External battery	Solar panel
DC	off	green	off	off
CHARGING	off	<ul style="list-style-type: none"> • red when charging; • green when charged 	off	<ul style="list-style-type: none"> • red when charging; • green when charged
BAT 1	<ul style="list-style-type: none"> • green if loaded > 50%; • orange if loaded 20-50%; • red if loaded <20%; • blinking red if loaded <8%; • off if 0% loaded or disconnected 	<ul style="list-style-type: none"> • when charging, colour is changed: red-orange-green; • green when charged 	off	<ul style="list-style-type: none"> • when charging, colour is changed: red-orange-green; • green when charged
BAT 2	off	off	<ul style="list-style-type: none"> • green if loaded > 50%; • orange if loaded 20-50%; • red if loaded <20%; • blinking red if loaded <8%; • off if 0% loaded or disconnected 	off

SVAN LED colour is green when there is a connection between the controller and the SVAN 979 instrument. If there is no connection the colour is red (for example, when the SVAN 979 instrument is switched off). When there is data transmission between controller and SVAN 979 the green LED will be blinking. During connection initialization or powering down phase it is blinking orange.

3G LED colour is green when there is a connection with a modem. When there is data transmission to or from the modem the green LED is blinking. During connection initialization or powering down phase it is blinking orange.

EXT. I/O LED is off if Meteo logging (*path: <Menu> / Measurement / Logging / Logger Results*) and Meteo saving with the Summary Results (*path: <Menu> / Measurement / Logging / Summary Results*) in the SVAN 979 settings are off (see Chapter [2.1.4](#)). If one of these parameters or both are on, but the Meteo module is not connected to the SV 279 PRO the **EXT. I/O** LED lights red colour. After connection of the Meteo module the LED changes colour to green. If Meteo logging is off and alarms are on in the SVAN 979 instrument, then **EXT I/O** LED reflects the status of an external alarm lamp.

3.3 MODES OF STATION OPERATION

3.3.1 Operational mode

In the operational mode, the SVAN 979, controller and 3G modem are switched on and communication between all modules is functioning correctly.

Data transmission is presented by the blinking lights of **SVAN** and **3G** LEDs on the controller panel.

In the operational mode, the following modules are powered continuously: SVAN 979 instrument, controller, 3G modem and outdoor microphone (optionally also the SP 275 meteo-module). The power supply for these modules can be switched off only by turning off the SVAN 979 instrument.

When the station case is open all LED diodes of the controller shine, informing about the station condition. The SVAN 979 display is switched on permanently regardless of the instrument's settings.

When the station case is closed all LED diodes of the controller are off and the SVAN 979 display is also off in order to save energy.

3.3.2 Battery charging mode

When the SVAN 979 is switched off but there is a power supply (voltage from SP 270 or current from solar panel) only **DC**, **CHARGING** and **BAT 1** LEDs of the controller will be active if the lid is open and these LEDs show:

- connection of AC/DC converter indicated by green **DC** LED,
- charging of the internal battery indicated by red **CHARGING** LED. When charging is complete **CHARGING** LED turns green and **BAT1** LED stops changing colours and also turns green,
- status of the internal battery charging indicated by green-orange-red **BAT 1** LED

If the lid is closed all LEDs will be off but charging will continue.

3.3.3 Bootstrap mode

The bootstrap allows upgrades of the internal firmware of the controller.

There are two ways to activate "bootstrap mode":

- by removing the controller from the monitoring station and connecting it to the PC through the USB or
- by connecting the controller to the PC via USB while SVAN 979 is off (all LEDs should be turned off).

Activation of bootstrap mode is indicated:

- in the case of SD 270, by the green **BAT 1** LED or
- in the case of SD 270A, by the LED above the **TEST** key.

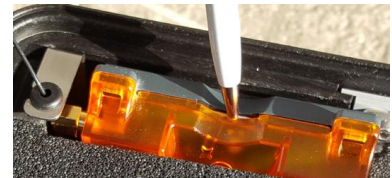


Note: USB connection between controller and PC can be established only if USB driver for SVANTEK instruments had been previously installed on the PC. USB driver can be downloaded from www.svantek.com

3.4 CONFIGURING THE STATION

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

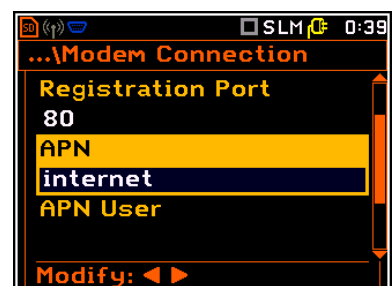
1. Start by opening the SV 279 PRO station and locating the 3G modem on the right-hand side of the case.
2. Insert a mini SIM card into the slot in the modem. The SIM card PIN protection must be disabled.
3. A click sound indicates that the SIM card is in the right orientation. If necessary, use a tool (e.g. pen) to push the SIM fully in.
4. Press **<Alt>+<Start>** on SVAN 979 to turn on the system.



The station is programmed to automatically establish a 3G connection with SvanNET. It takes up to 5 minutes to connect. The most important parameter of the connection is the **APN** (Access Point Name).

5. Check the Access Point Name (APN) setting in the SVAN 979.

The default setting for the APN is "**internet**". It's possible that your Internet provider is using a different APN. In this case the APN must be entered manually, either via the PC software or the SVAN 979 menu (*path: <Menu> / Instrument / Wireless Transfer / Modem Connection*).



3.5 ASSEMBLING THE STATION

1. The system consists of 2 carrying cases. Before use check the serial numbers on labels located on the side of both cases and ensure they are a matching set.



2. Open the case with accessories and take out the SA 279 microphone outdoor kit.



3. Mount the SA 279 on a tripod (not included) or other stable support.



4. Remove the protection cap from the input socket on the case by turning it counter-clockwise.



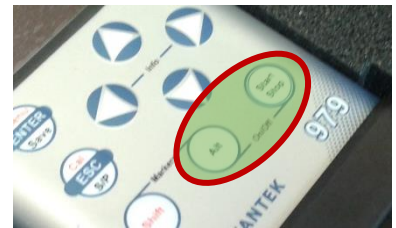
5. To connect the microphone extension cable, start by lining up the key on the plug and the INPUT socket, then lock the connector by turning the ring clockwise (only the ring close to the socket will rotate).



6. If you want to power the station from the Power supply connect the power supply cable to the DC Supply socket in the same way.



7. Press **<Alt>+<Start>** on SVAN 979 to turn on the system.



8. Remove the protection cap from the microphone and perform a calibration check.



9. Take out from the case with accessories the anti-bird spike with the foam from the accessories case, push the foam upwards and mount the tube on the thread. Then slide the foam down so it hides the metal parts of the kit.



Note: Make sure that the protective caps on the four antibird spikes are removed.

10. The station now is ready for use.



3.6 SWITCHING ON THE STATION

When the remote communication is installed, and the station is fully assembled:

- Turn on the SVAN 979 instrument. The controller will turn on automatically.

System integration is checked directly after turning on the controller. This procedure includes checking the connections with the instrument and 3G modem (optionally also the SP 275 meteo-module). Additionally, system power, internal temperature of the station and the battery state are checked.

During the test procedure, the controller's LEDs light up sequentially orange in the sequence from **DC** to **BAT2** and from **SVAN** to **EXT I/O**. In the case of the SD270A controller during the test (about 3-5s) the red LED next to the TEST button is still lit. All errors are indicated on the front panel by appropriate LED indicators. If all red indicators are off after above procedure, it means that the station is ready to use.

4 REMOTE CONTROL VIA 3G CONNECTION

The SV 279 PRO station is designed to work with a 3G modem.

Planning and deploying the remote-control system of the SV 279 PRO station doesn't require any extensive knowledge in the field of telecommunication. Once all steps described in Chapters [3.4](#) – [3.6](#) have been made, you can start working with the station via the remote-control system provided by SVANTEK.

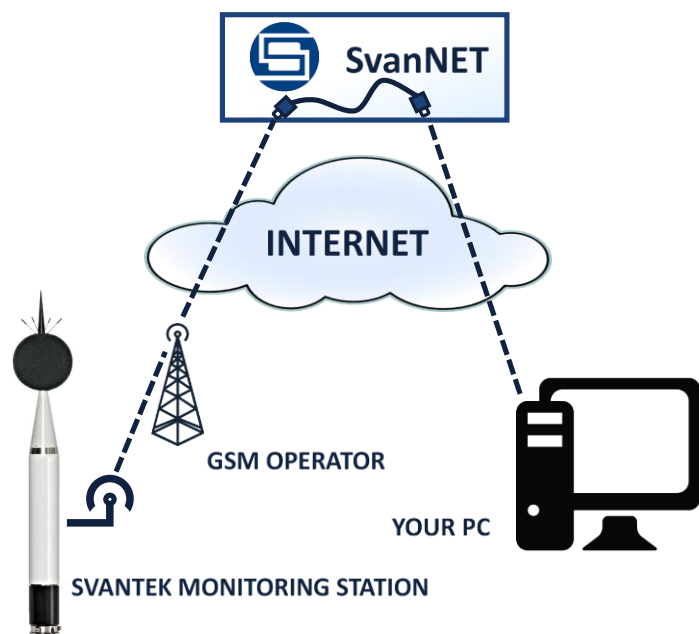
The easiest way to establish remote control is to create a user account for SvanNET service.

4.1 SVANNET WEB-SERVICE

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

SvanNET allows usage of all type of SIM cards with a 3G modem regardless of having a public or private IP. The connection over the SvanNET allows users to:

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



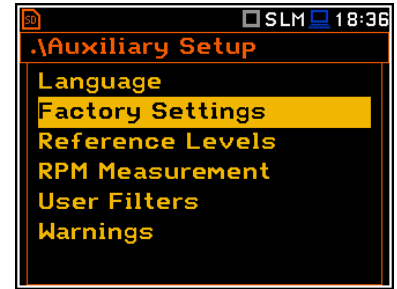
Note: Establishing 3G connection requires usage of a SIM card with no PIN protection with activated Internet access. Installation of the SIM card is described in Chapter [3.4](#).

SVAN 979 enables defining different types of connection via 3G. To configure connection via SvanNET please follow next steps:

1. Press **<Alt>+<Start>** on SVAN 979 to turn on the system.

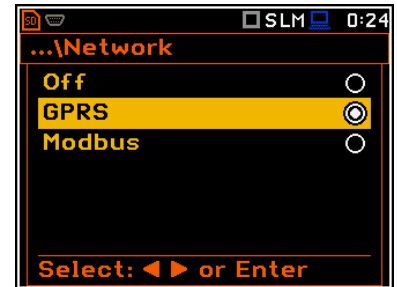


- Reset all settings in SVAN 979 using **Factory Settings** option (path: <Menu> / Auxiliary Setup).



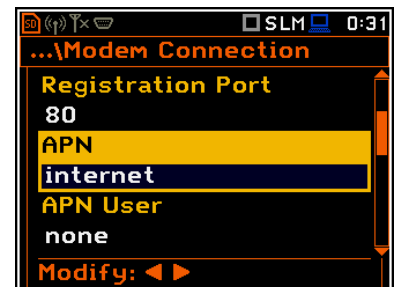
Note: Newly purchased stations have factory settings as standard.

- Set **Network** to **GPRS** (path: <Menu> / Instrument / Wireless Connection / Network).



- Check the Access Point Name (APN).

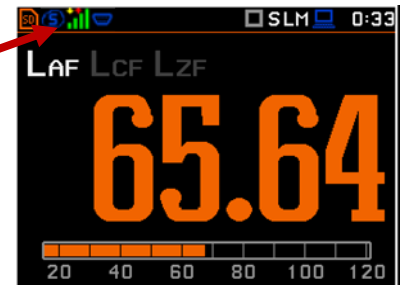
The default setting for the APN is "internet". It is possible that your Internet provider is using a different APN. In this case the APN must be entered manually, either via the PC software or the SVAN 979 menu (path: <Menu> / Instrument / Wireless Transfer / Modem Connection).



- Successful connection to SvanNET is indicated by an icon on a SVAN 979 display.



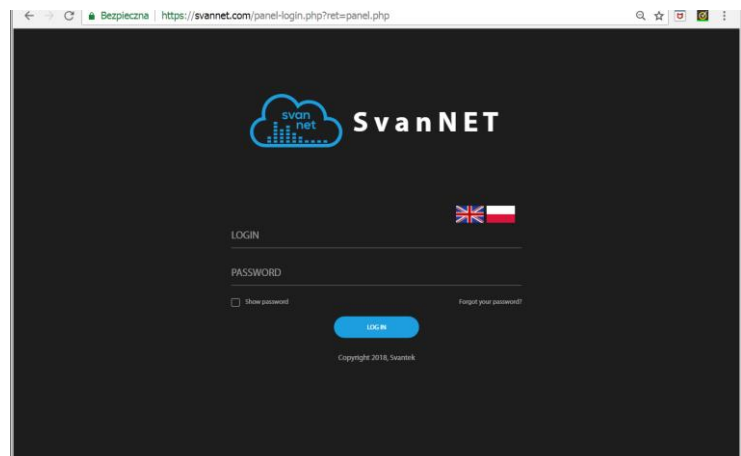
"S" means that connection with SvanNET is established. Bars and arrows inform about signal quality and data transmission – in and out.



- To access SvanNET, log in to your account at: <https://www.svanet.com/panel-login.php>

Before logging, select your language.

Once logged in you can use the web interface to manage the monitoring station.



Note: Ask your local SVANTEK distributor to create the SvanNET account for you and assign your new station to your SvanNET account.

The SvanNET interface depends on the package of tools assigned to your account and access level and includes:



– projects tools (**Project list**)



– individual stations tools (**Station list**).

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



Note: This manual describes only the **Station list** tools. To get more information about **Project list** see SvanNET User Manual.

4.2 STATION LIST VIEW

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

The screenshot displays the SvanNET interface for a specific station. The main area shows a list of stations with a selected station highlighted. Below the list are several status panels: Alerts (no alerts), Station status (status - online), Battery state (more than 50%), Power source (mains), and Connection state (connected to svannet, signal quality: good). The right sidebar contains a 'STATION LIST' button and a list of navigation options: WEB INTERFACE, STATUS, STATUS LOG, CONNECTION LOG, and DATA TRANSFER LOG.

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

If you click the station name, station information will be displayed.

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



Warning about emergency situations: blue - everything is OK, red – unregular event is happening.



Information about the communication with the station: green - correct, in progress; yellow - the station doesn't respond to the command for a long time; red – the station is not connected to SvanNET.



Battery status. When you click this icon, information about charging level will be displayed.



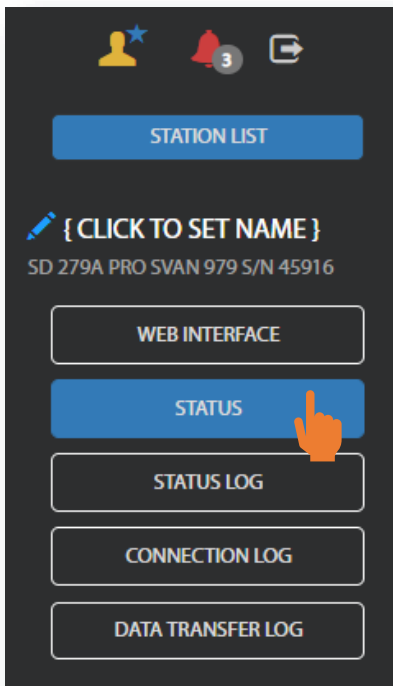
External power source status: blue – the instrument is powered by the external source, grey - there is no external power. When you click this icon, information about external source will be displayed.




Connection status. When you click this icon, information about connection status and signal strength will be displayed.

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

The blue **STATION LIST** button just informs you that you are in the Station view.



You can set new station name instead of the default clicking .

The **WEB INTERFACE** button switches you to the Live data view (see Chapter [4.3](#)) in which you can view measurement results and use additional tools to configure station parameters, download data files and start/stop measurements. This button is available for the stations connected to SvanNET.

The **STATUS** button switches you to the Station status view (see Chapter [4.2.1](#)) in which you can check the station status and configure status alarms.

The **STATUS LOG** button switches you to the **Status log** view (see Chapter [4.2.2](#)) in which you can check the power source (type and charge level), memory free space and GSM signal quality.

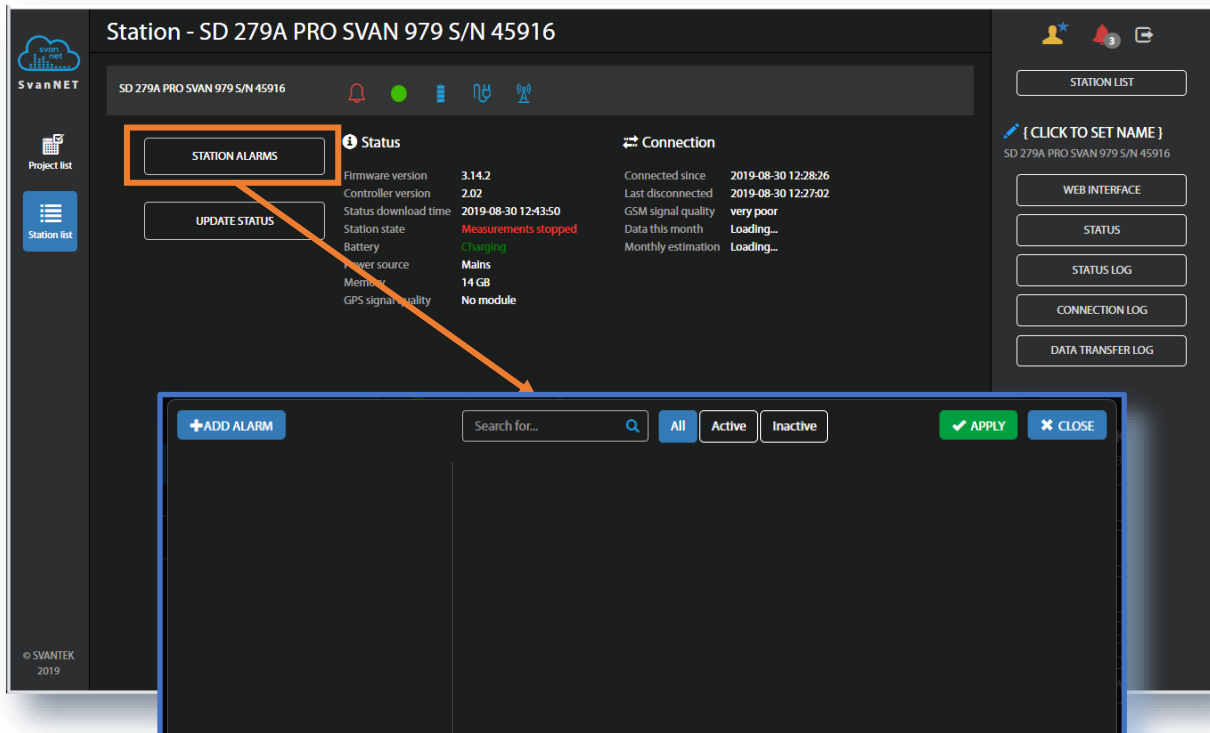
The **CONNECTION LOG** button switches you to the **Connection log** view (see Chapter [4.2.2](#)) in which you can check the history of station connections.

The **DATA TRANSFER LOG** button switches you to the **Data transfer log** view (see Chapter [4.2.2](#)) in which you can check the history of data transfers (uploads).

4.2.1 STATUS view

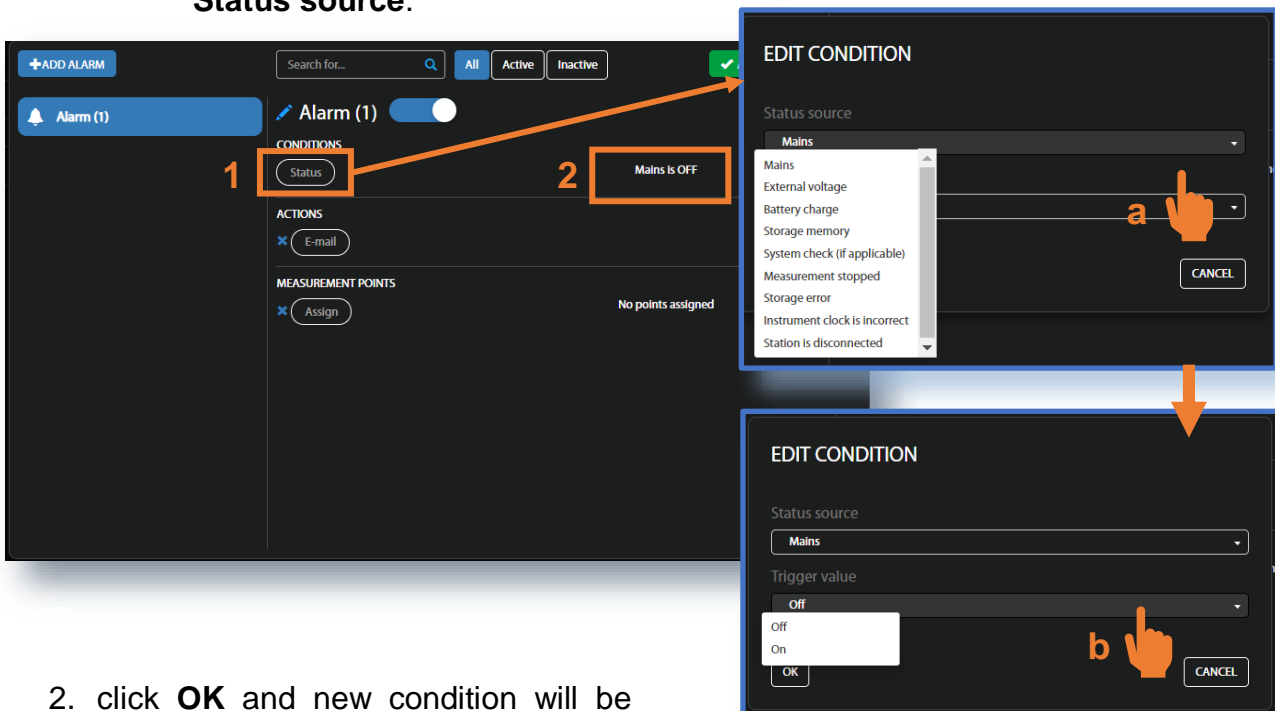
In the **STATUS** view, you can check the station status and configure status alarms.

- To update instrument's status, click the **UPDATE STATUS** button.
- To configure status alarms Conditions and related Actions for the measurement points, click the **STATIONS ALARMS** button.



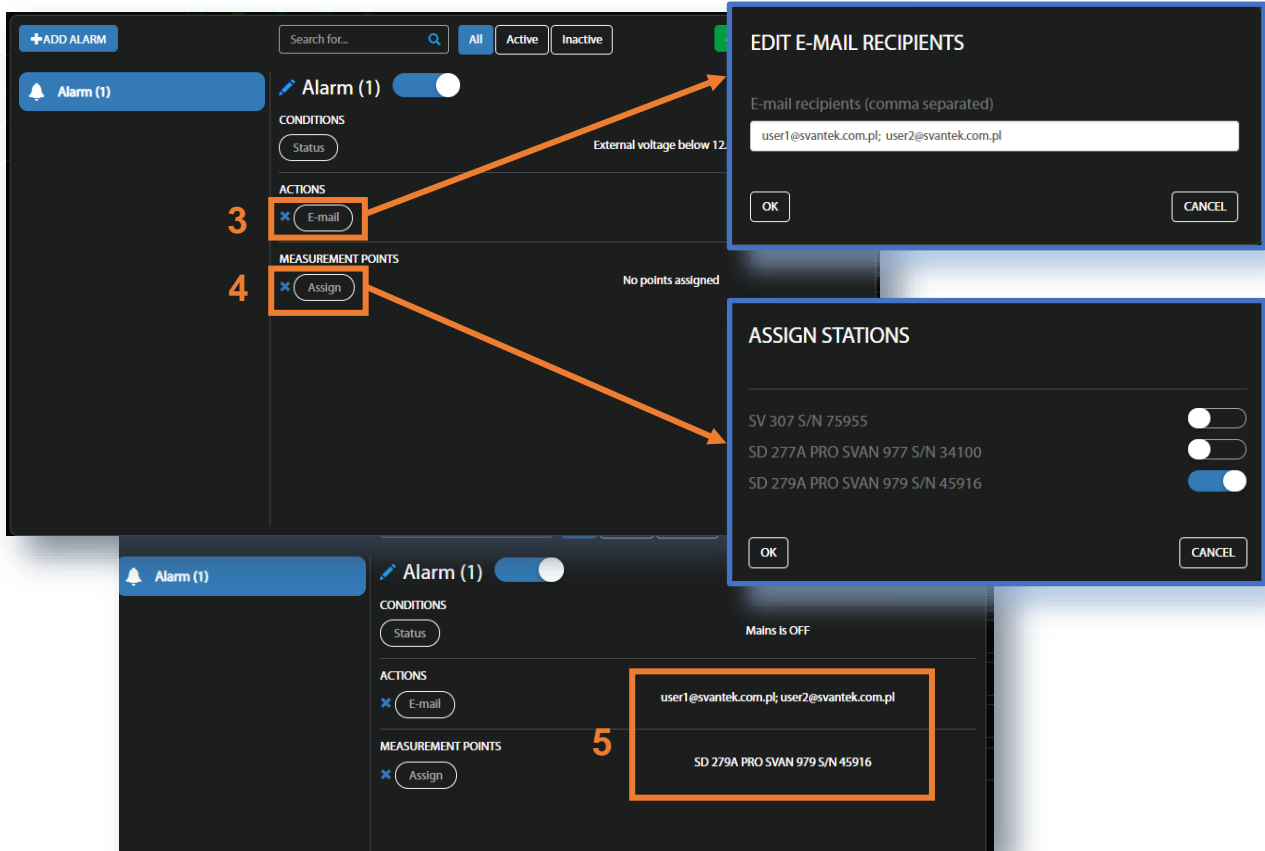
Click **+ADD ALARM** in the pop-up box and a new **Alarm(1)** with **CONDITIONS**, **ACTIONS** and **MEASUREMENT POINTS** areas will appear. Alarms are based on Conditions and relate to Actions, that are default e-mails to the specified recipients, and refer to Measurement points. To configure Alarm:

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



2. click **OK** and new condition will be displayed in the **CONDITIONS** area.

3. click the **E-mail** button to edit e-mail recipients.
4. click the **Assign** button to refer alarm to the station(s).



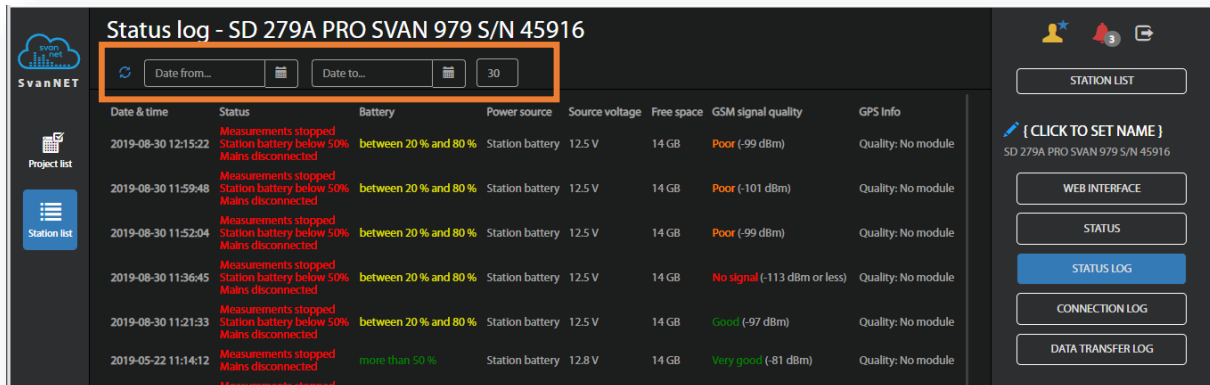
5. Made selections are displayed in the ACTIONS and MEASUREMENT POINTS areas.

4.2.2 LOG views

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

- Status log which registers power source (type and charge level), memory free space and GSM signal quality,

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



- **Data Connection log** which registers history of station connections.

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

Date & time	Result	Address	Version
2019-08-30 12:28:26	Success	46.215.10.198	SVAN 979 3.14.2
2019-08-30 12:27:02	Disconnected	46.215.10.198	SVAN 979 3.14.2
2019-08-30 12:15:10	Success	46.215.10.198	SVAN 979 3.14.2
2019-08-30 12:15:00	Disconnected	46.215.10.198	SVAN 979 3.14.2
2019-08-30 11:59:39	Success	46.215.10.198	SVAN 979 3.14.2
2019-08-30 11:59:29	Disconnected	46.215.10.198	SVAN 979 3.14.2
2019-08-30 11:21:19	Success	46.215.10.198	SVAN 979 3.14.2
2019-05-22 11:15:43	Disconnected	87.251.227.219	SVAN 979 3.14.2
2019-05-22 11:14:02	Success	87.251.227.219	SVAN 979 3.14.2
2019-05-22 11:11:06	Disconnected	46.215.9.204	SVAN 979 3.14.2
2019-05-22 11:10:07	Success	46.215.9.204	SVAN 979 3.14.2
2019-05-22 11:09:54	Disconnected	46.215.9.204	SVAN 979 3.14.2
2019-05-22 11:03:26	Success	46.215.9.204	SVAN 979 3.14.2
2019-05-22 11:02:45	Disconnected	46.215.9.204	SVAN 979 3.14.2

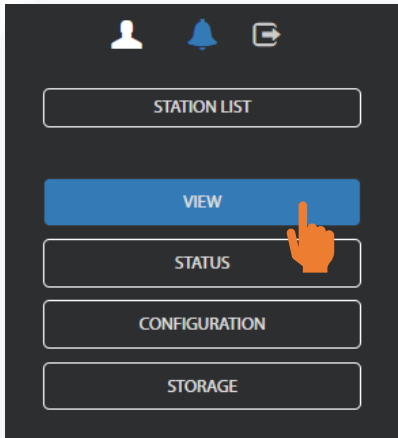
- **Data transfer log** which registers history of data transfers (uploads).

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

Date & time	Total transfer	Station upload	SvanPC++ upload
2019 August	15 kB	15 kB	0 bytes
2019 July	0 bytes	0 bytes	0 bytes
2019 June	0 bytes	0 bytes	0 bytes
2019 May	28 kB	26 kB	1.77 kB
2019 April	69 kB	49 kB	19 kB

4.3 WEB INTERFACE VIEW

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



The **VIEW** button switches you to the **Live data** view (see Chapter [4.3.1](#)) in which you can view broadband results, 1/1 or 1/3 octave spectra and a time-history.

The **STATUS** button switches you to the station status view (see Chapter [4.3.3](#)) in which you can check the station status and start/stop measurements.

The **CONFIGURATION** button switches you to the station **Configuration** view (see Chapter [4.3.2](#)) in which you can configure measurement and instrument parameters.

The **STORAGE** button switches you to the **Storage** view (see Chapter [4.3.4](#)) in which you can download files manually.



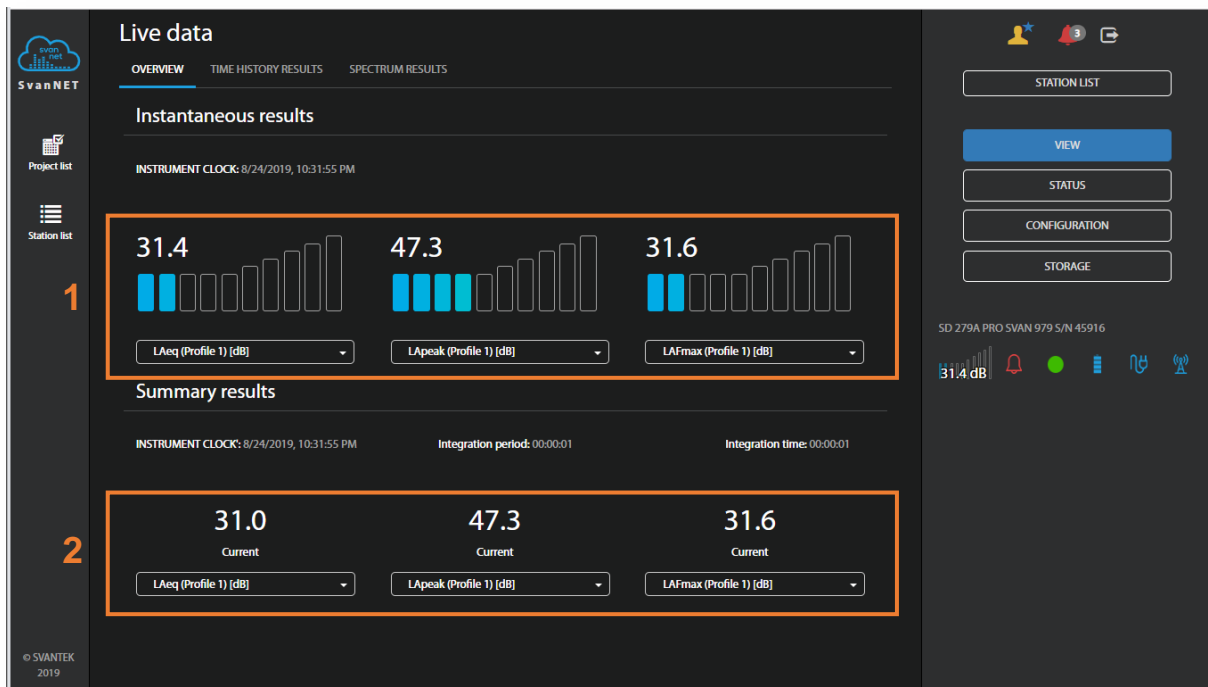
Note: Content of the **Configuration** tabs depends on the selected parameters. The objective of this manual is not to present all possible combinations of parameters, but to indicate the principles of working with SvanNET.

4.3.1 Live data view

The **Live data** view includes three tabs: **OVERVIEW**, **TIME HISTORY RESULTS** and **SPECTRUM RESULTS**.

The **OVERVIEW** tab displays current broadband results:

1. three **Instantaneous Results**, measured/averaged by 1-second period and
2. three **Summary Results**, measured/averaged by the “Integration time” period.



Instantaneous and Summary results are updated every second.

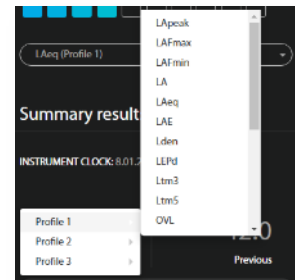
The type of the measured result along with filter and detector as well as profile in which this result is measured is presented in the selector field below the result value. To change the displayed result, click the selector button and choose the profile and the result.

- for **Instantaneous results**, you can select the result out of list: **Lpeak**, **Lmax**, **Lmin** or **Leq**.



- for **Summary results**, you can select the result out of list: **Lpeak**, **Lmax**, **Lmin**, **LA**, **Leq**, **LAE**, **Lden**, **LEPd**, **Ltm3**, **Ltm5**, **OVL** and ten statistical level results (**Lnn**).

Such results as **Lpeak**, **Lmax**, **Lmin** or **Leq** have in their names also filter abbreviation (**A**, **B** or **Z**) and **Lmax**, **Lmin** results have also detector type abbreviation (**F**=Fast, **S**=Slow, **I**=Impulse).



All results and formulaes are presented in Appendix D to SVAN 979 User Manual.



Note: The *Instantaneous results* are not saved in the instrument's files, while the *Summary results* can be saved if the **Save summary results** option is switched on in the **STORAGE** tab of the **Configuration** view.

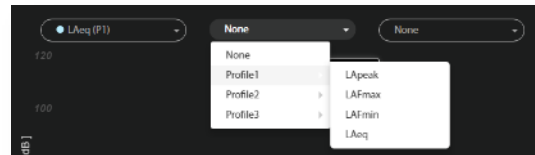
The **TIME HISTORY RESULTS** tab displays the time history of the selected measurement results.



In this tab you can:

1. Choose results for simultaneous displaying with the use of selector buttons (Leq, Lpeak, Lmax and Lmin) measured in profiles with weighting filters (A, B, C or Z) and detectors (Fast, Slow or Impulse).
2. Change the time range for presentation of results.
3. Point your mouse cursor on the plot to readout the values for this time point.
4. Scroll the time window over the time history.

There are four results (**Leq**, **Lpeak**, **Lmax** and **Lmin**) measured with appropriate weighting filters and detector types and available for each measurement profile from the pop-down list.




The **SPECTRUM RESULTS** tab displays current 1/1 or 1/3 octave Instant and Averaged results (LZeq) and three Total results.

1. Point your mouse cursor on the plot to readout the values of instantaneous and averaged results for each 1/1 or 1/3 octave band.
2. Point your mouse cursor on the last three bars of the plot to readout the values of instantaneous and averaged three Total results.



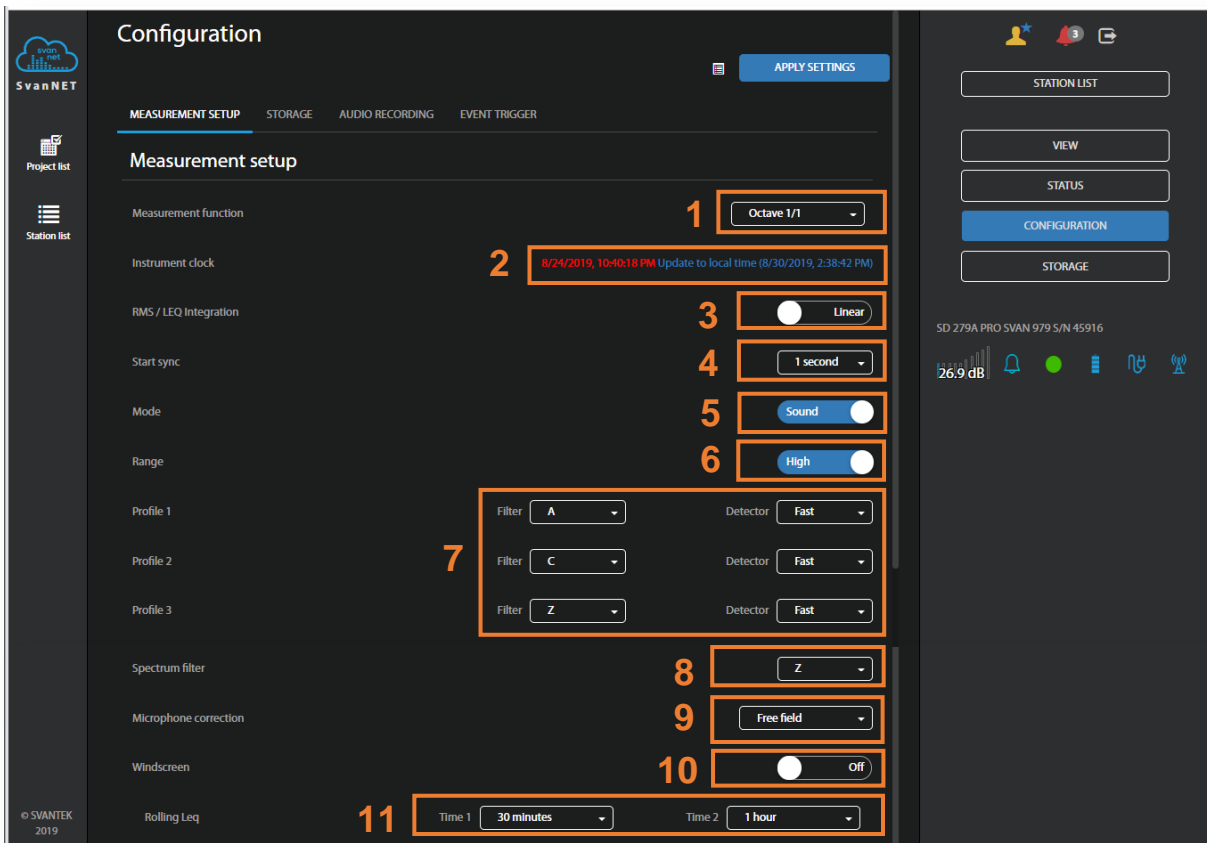
Note: Spectra can only be displayed, when **Octave 1/1** or **Octave 1/3** measurement function has been selected in the **Configuration** → **Measurement setup** tab.

4.3.2 Configuration views

The **Configuration** view consists of several tabs that enable configuring of: the measurement parameters (**MEASUREMENT SETUP**), data saving (**STORAGE**), audio signal recording (**AUDIO RECORDING**) and triggering of events and alarms (**EVENT TRIGGER**). To send new configuration to the station, click .

In the **MEASUREMENT SETUP** tab, you can:

1. Select the **Measurement function**: **Level Meter**, **Octave 1/1**, **Octave 1/3**
2. Update the **Instrument clock**
3. Select the type of **RMS/LEQ Integration**: **Linear** or **Exponential**
4. Set the start synchronisation period: **Off**, **1 minute**, **15 minutes**, **30 minutes** or **1 hour**
5. Select the measurement **Mode**: **Sound** or **Vibration**
6. Select the measurement **Range**: **Low** or **High**
7. Select **Filter** for profiles: for the **Sound** mode: **Z**, **A**, **C**, **G**, **B** or for the **Vibration** mode: **HP1**, **HP10**, **Vel1**, **Vel3**, **Vel10**, **VelMF**, **Dil1**, **Dil3**, **Dil10**, **W-Bxy**, **W-Bz**, **H-A**, **W-Bc**, **KB**, **Wk**, **Wd**, **Wc**, **Wj**, **Wm**, **Wh**, **Wg**, **Wb**) and **Detector** type (for the **Sound** mode: **Impulse**, **Fast**, **Slow** or for the **Vibration** mode: **100ms**, **125ms**, **200ms**, **500ms**, **1s**, **2s**, **5s**, **10s**)
8. Select **Filter** for the spectrum (position appears when Octave 1/1 or Octave 1/3 function is selected): for the **Sound** mode: **Z**, **A**, **C**, **B** and for the **Vibration** mode: **HP**
9. Select **Microphone correction**: **Off**, **Free field**, **Diffuse**, **Environment** or **Airport**
10. Switch the **Windscreen** compensation **On** or **Off**
11. Select time frame for calculating **Rolling Leq**.



The screenshot displays the 'Configuration' view for the SV 279 PRO station. The 'Measurement setup' tab is selected, showing various configuration options. The interface includes a sidebar with navigation icons, a top navigation bar with 'APPLY SETTINGS', and a right sidebar with 'STATION LIST', 'VIEW', 'STATUS', 'CONFIGURATION', and 'STORAGE' buttons. A status bar at the bottom right shows 'SD 279A PRO SVAN 979 S/N 45916' and a signal strength indicator.

Numbered callouts (1-11) highlight specific settings:

1. Measurement function: Octave 1/1
2. Instrument clock: 8/24/2019, 10:40:18 PM Update to local time (8/30/2019, 2:38:42 PM)
3. RMS / LEQ Integration: Linear
4. Start sync: 1 second
5. Mode: Sound
6. Range: High
7. Filter and Detector for three profiles (A, C, Z)
8. Spectrum filter: Z
9. Microphone correction: Free field
10. Windscreen: Off
11. Rolling Leq: Time 1: 30 minutes, Time 2: 1 hour

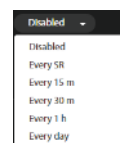


Note: Definitions and formulae for measurement results are presented in Appendix D of the SVAN 979 User Manual.

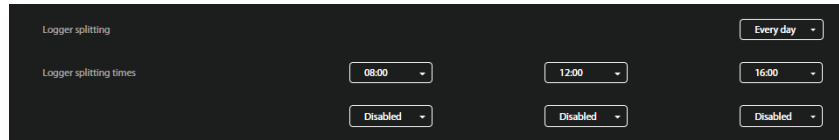
In the **STORAGE** tab, you can:

1. Enable data logging
2. Program splitting of the logger file (**Logger splitting**)
3. Configure the **Summary results** parameters: switch on/off saving of the Summary results in a file (**Save summary results**), define measurement time and step of saving (**Integration period**), select number of measurement repetitions (**Repetition cycles**) and define 10 statistical levels switching on **Save statistics**
4. Configure saving of the **Time history** in a file: define step of saving (**Step**) and select results to be saved as a Time-history for three profiles (Lpeak, Lmax, Lmin and Leq for the Sound mode and Peak, P-P, Max and RMS for the Vibration mode), switch on 1/1 or 1/3 octave spectra logging (**Save spectrum**).

The **Logger splitting** position enables splitting of logger files and selecting the splitting mode: **Disabled**, **Every 15 m**, **Every 30 m**, **Every 1 h** and **Every day**.

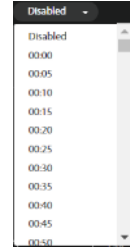


If **Every day** is selected, you can define up to six points during a day when splitting will take place.



Integration period defines the period during which the signal is being measured (integrated) and recorded in the file as the set of Summary Results.

The integration period can be selected in the pop-up list in the range from 1s to 24h.



If you switch on Save statistics, additional selectors Statistical levels will appear.



You can define ten statistical noise levels, named from **L01** to **L99**, to be calculated, displayed and saved in the file as Summary results.

Statistical noise level **Lnn** is a level in dB which was exceeded during **nn** percent of the Integration period. Statistical noise levels are calculated from histogram, created from 100ms Leq results (see Appendix D).



Note: To ensure saving of any results you should enable data logging. Summary results are saved in the same file with Time history results.

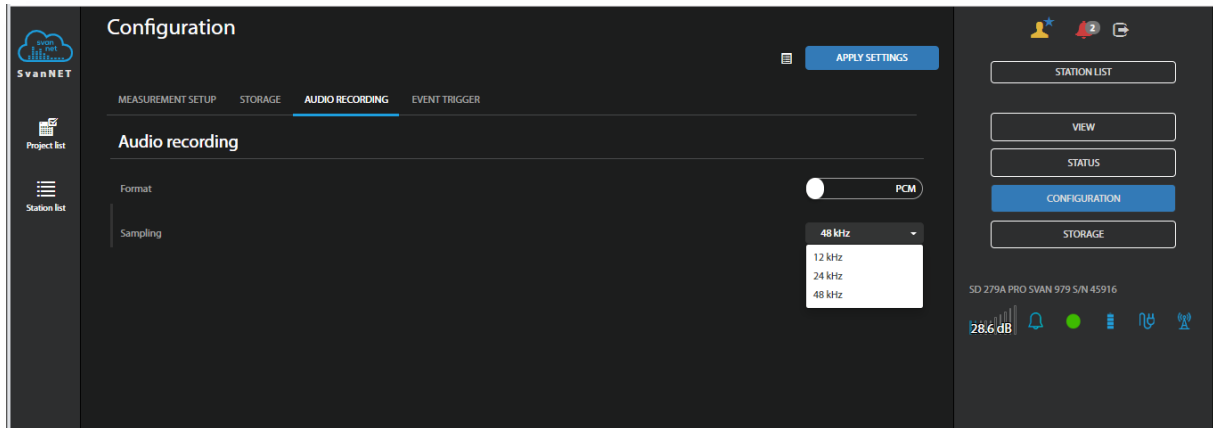


Note: All files with measurement result are automatically named in accordance with the rule: some prefix (string of letters) and number (string of digits) increased by one for the new created files. Default prefix is "L" and it can be changed via SvanPC++.

If the **Octave 1/1** or **Octave 1/3** function is selected, you can also switch on spectrum saving (**Save spectrum** button) as a time history with the same logger **Step**.

In the **AUDIO RECORDING** tab, you can configure an audio recording in a separate *.wav type file: **Format** of the Wave recording file (**PCM** or **Extensible**) and **Sampling** frequency (**12kHz**, **24kHz** and **48kHz**). Choosing of higher sampling frequency ensures recording of higher frequency of the signal but at the same time increases file size.

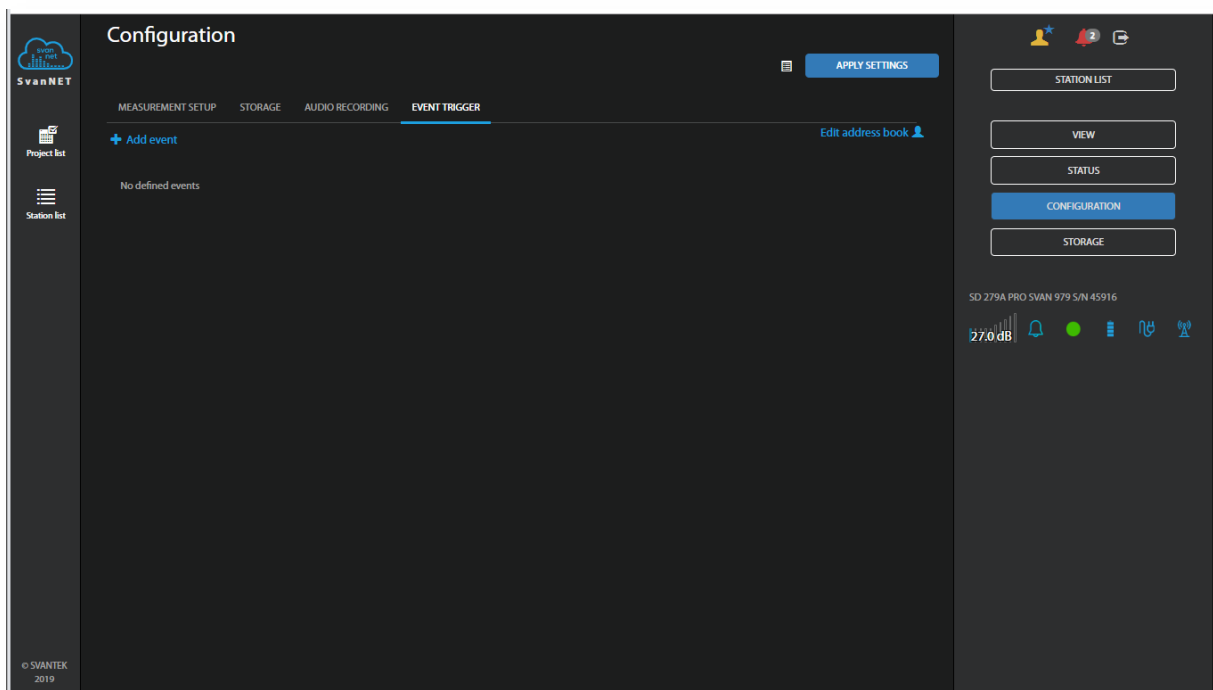
The audio recording trigger is configured in the **EVENT TRIGGERS** tab.



In the **EVENT TRIGGER** tab, you can configure events for triggering markers, audio recording and alarms.

1. Events are specified as a combination of superimposed **CONDITIONS** (logical AND) such as specific time intervals (**Time periods**) in which measurement threshold levels are exceed or system events occur (**Triggers**).
2. Each Event may relate to special triggers (**ACTIONS**) such as: marker recording to the logger file (**Marker**), audio signal recording to the wave file (**Audio**), generation of the alarm signal on the I/O socket (**I/O alarm**), alarm SMS sending (**SMS alarm**) or alarm e-mail sending (**E-mail alarm**).
3. Switch off the Event without deleting it. The Event becomes inactive, but you can switch it on when needed.

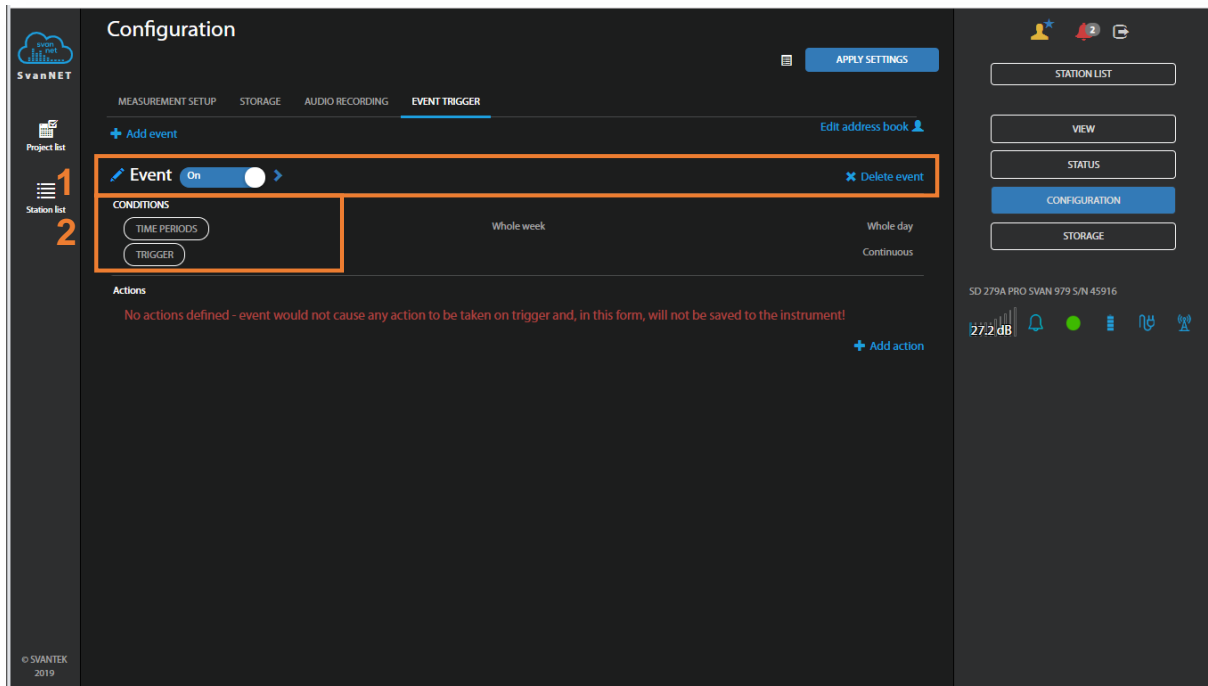
When the Events are not defined the **EVENT TRIGGER** tab is empty.



Creating Events

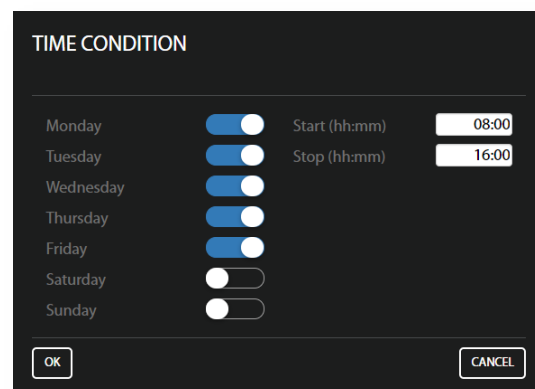
To create new event, click the **+ Add event** field. The new **Event** area will appear in which you can:

1. rename the event, switch it on/off or delete it, clicking on the appropriate field in the area,
2. configure conditions, clicking on the appropriate button.

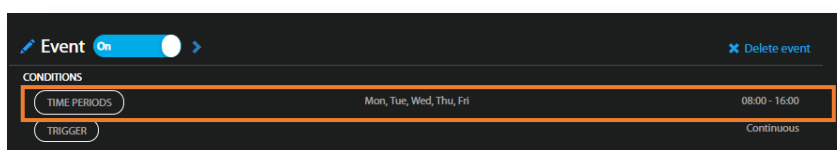


If you click the **TIME PERIODS** button the **TIME CONDITION** configuration box will pop-up.

In this box, you can select days and periods during which events occurrences will be registered.

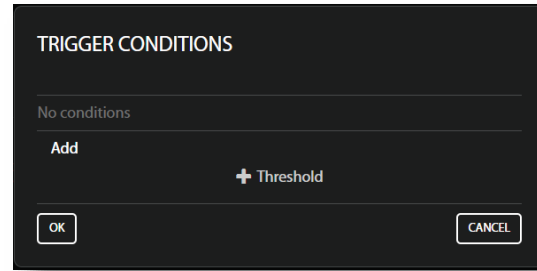


After confirmation (**OK**) the pop-up box closes, and the selection will be presented in the line of the **TIME PERIODS** button.



If you click the **TRIGGER** button, the **TRIGGER CONDITIONS** configuration box will pop-up.

In this box, you can add the condition type: **Threshold**.

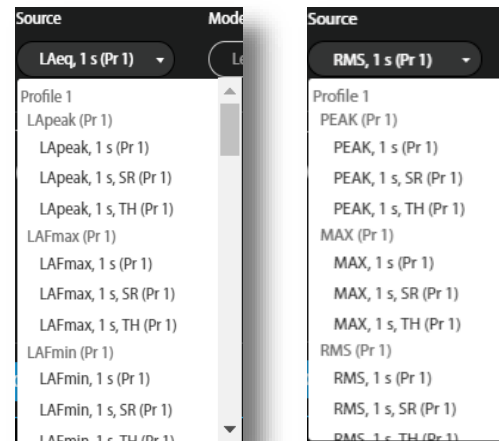


The **Threshold** condition can be of **Level+** or **Level-** type (**Mode**). The condition is fulfilled during the period in which the controlled value of the selected result (**Source**) will be higher/lower than the **Threshold** level.

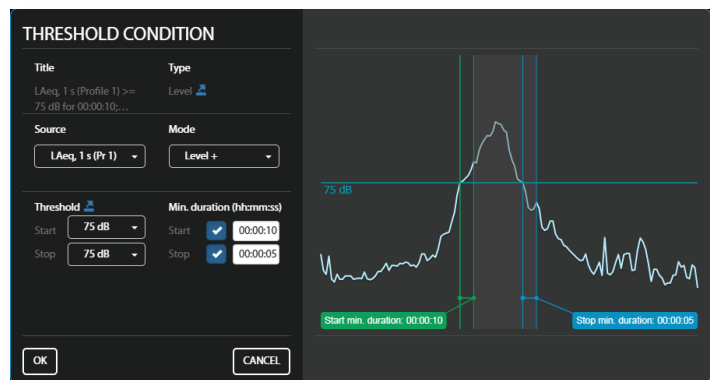


You can select as a **Source** different results (**Leq, Lpeak, Lmax, Lmin**, etc. in the Sound mode or **PEAK, MAX, RMS**, etc. in the Vibration mode) for three profiles (**Pr 1, Pr 2** and **Pr 3**), measured by: **1s**, integration period (for example, **1m, SR**) or time-history step (for example, **50, TH**).

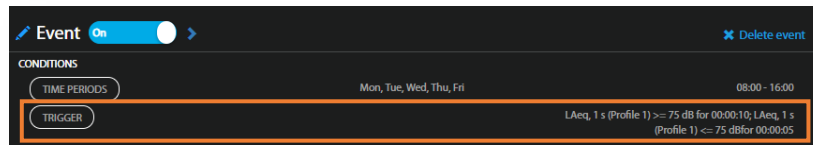
In the right-hand example, **1m, SR** means that the Integration period for the Summary results was set to 1 minute, while **50, TH** means that the Step for the time-history was set to 50 milliseconds.



If you expand the **Threshold** by clicking the **Threshold** field, you can define **Start** and **Stop** threshold levels and delays (**Min. duration**) of measurement start and stop.



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



Creating Actions

To create new action, click the **+ Add action** field and in the **ADD EVENT ACTION** pop-up box, click the action you wish to add and to configure: **Marker**, **Audio**, **I/O alarm**, **SMS alarm** or **E-mail alarm**.

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

The **Marker** action registers a marker in the logger file.

The Marker can be **Point** or **Block** type. The Point marker means, that it will be registered only at the beginning of the Event. The Block marker will be registered at the beginning and at the end of the Event.

The **Audio** action starts an audio recording in the WAV file (Wave recording).

Max. duration defines maximum time of recording after the event start.

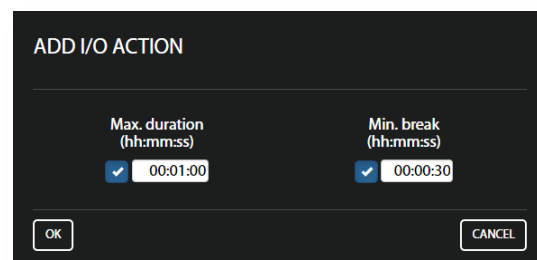
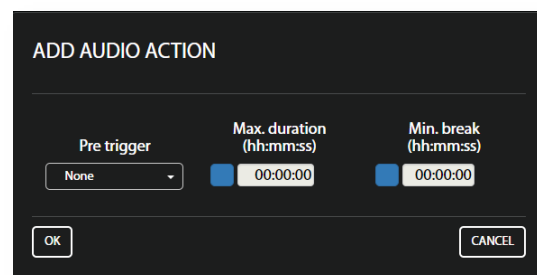
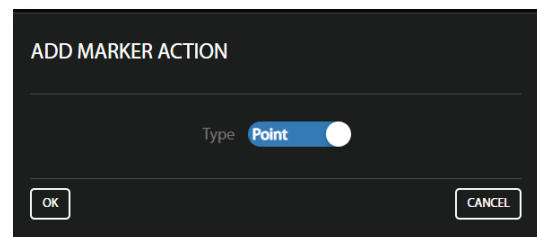
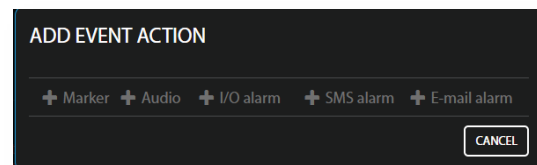
Min. break defines the minimum time break between two consequent records.

Pre trigger enables earlier start of recording with respect to the event start: **None**, **1 s** or **2 s**.

The **I/O Alarm** action starts an alarm signal at the MULTI I/O socket output to which some alarm device can be connected (for example, alarm lamp).

Max. duration defines maximum time of alarm signal after the event start.

Min. break defines the minimum time break between two consequent alarms.



The **SMS Alarm** action sends the SMS note (**Message**) to the defined recipient's phones, which are selected from the **ADDRESS BOOK** after clicking **+Add recipient** field.

Min. break defines the minimum time break between two consequent SMSs.

The **E-mail Alarm** action sends the E-mail note (**Subject** and **Message**) to the defined recipient's addresses, which are selected from the **ADDRESS BOOK** after clicking **+Add recipient** field.

Min. break defines the minimum time break between two consequent E-mails.

After confirmation (**OK**) the pop-up window closes, and the selection will be presented in the lines of the appropriate **Actions** buttons.

Address book

The **ADDRESS BOOK** pop-up window appears in the SMS and E-mail alarm actions pop-up windows when you click the **+Add recipient** field.

In this case you should select the required address (+) and click **OK**.

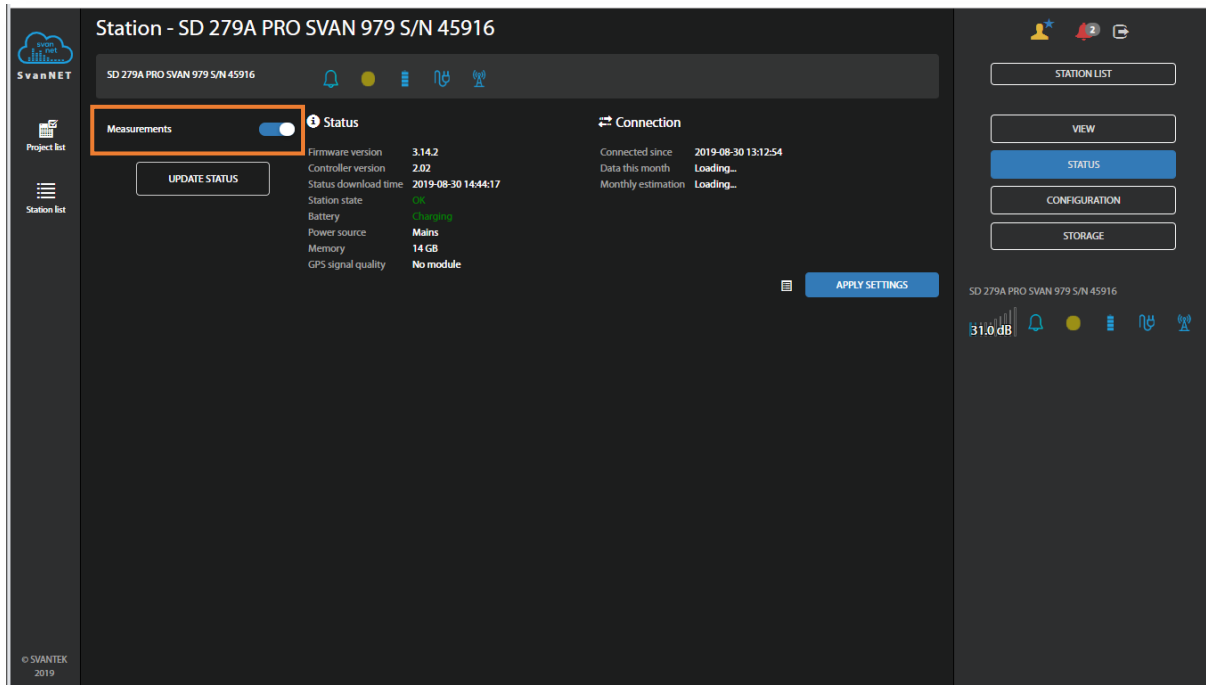
You can add the contact by clicking the **+ Add contact** field.

You can **Edit address book** from the **EVENT TRIGGER** tab of the **Configuration** view.

	Name	Phone number	E-mail	
+	Svantek	+48123456789	office@svantek.com.pl	🗑️
+				🗑️

4.3.3 STATUS view

The **STATUS** view is similar to that described in the Chapter [4.2.1](#). The difference is that instead of STATUS ALARMS, in this view, you can start/stop measurements.



4.3.4 DATA FILES view

The file **Storage** window presents a list of directories and files saved in the instrument's SD-card memory. SVAN 979 creates new directories for all new measurements using next rules.

Files with measurement results (SVL and WAV) are always saved automatically in the directory, which is created each time you start the measurement. The names of such directories are: **hh-mm-ss**, where **hh** is an hour, **mm** is a minute and **ss** is a second of the measurement start.

The measurement directory is created in the parent directory, which is created automatically when you perform the first measurement on a particular day. The names of such parent directories are: **YYYYMMDD**, where **YYYY** is a year, **MM** is a month and **DD** is a day of the first measurement.

All parent directories are created in the working directory, which can be of pre-defined SVANTEK name or can be created by the user with the user specific name with the use of the instrument control panel or via SvanPC++.

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

1. Select several files and download or delete selected directories or files.
2. Delete individual directories or files by clicking the righthand icons on the directory/file line.
3. Download or delete all directories or files.
4. Exit the current directory by clicking the “folder up” button.
5. Open the directory by clicking its name.

The figure consists of three overlapping screenshots of the SvanNET Storage interface, demonstrating file management steps:

- Top Screenshot:** Shows a list of folders. Callout 1 points to the 'Download selected' button. Callout 2 points to the delete icon for a selected folder. Callout 3 points to the 'Download all' button. Callout 4 points to the selection checkboxes. Callout 5 points to a folder in the list.
- Middle Screenshot:** Shows a filtered list of folders. Callout 5 points to a folder in the list.
- Bottom Screenshot:** Shows a list of files. Callout 2 points to the download icon for a selected file.

Each screenshot includes a table of files/folders with columns for NAME, TYPE, DATE & TIME, and TOTAL SIZE. The interface also features a sidebar with navigation options (Project list, Station list) and a right-hand panel with buttons for STATION LIST, VIEW, STATUS, CONFIGURATION, and STORAGE. The bottom right corner of each screenshot displays the device model (SD 279A PRO SVAN 979 S/N 45916) and a signal strength indicator (e.g., 29.1 dB).



Note: See also “SvanNET User Manual”.

4.4 INTERFACE FUNCTIONALITIES OF 3G MODEM

The 3G modem enables the user a wide spectrum of interfacing capabilities using GSM based internet access.

Internet access, provided by GSM operators, comes with a set of parameters that define the visibility of the SIM card address in the network. This address can be **public** or **private** (accessible from the outside or not) and can be **static** or **dynamic** (same or different each time the card connects to the Internet). The set of parameters define the spectrum of available functionalities of the station remotely accessed.

The functionalities that 3G modem offers are:

- Main communication channel
- SMS / E-mail alarms
- SMS command exchange.

4.4.1 Main communication channel

Main communication channel is a TCP connection (a lossless data exchange protocol) that can be used to exchange commands as specified by Appendix A to SVAN 979 User Manual. SvanPC++ assures this connection and provides data download, performance validation and measurement start/stop.

Main communication channel of SV 279 PRO can be established by one of two available methods: TCP Client or TCP Server. The SV 279 PRO stations support SSL (Secure Socket Layer) connections.

The **TCP Client** is a mode of main communication channel in which the 3G Modem is configured to initiate connection to a designated address (**remote host**). Each time a **reconnection period** (default value is 30 seconds) has elapsed, SV 279 PRO attempts to establish a TCP connection to a designated address on a designated port (**Data Port**). Should the connection be established successfully, SV 279 PRO can exchange commands as in TCP Server mode. Should the connection attempt fail or is broken by the **remote host**, SV 279 PRO will attempt to connect again after another reconnection period has elapsed.

To prevent the connections from going *idle* (a state in which the connection seems active, but no data can be transferred – it may happen due to GSM operator terminating the link, but the TCP protocol not being able to detect it), the station maintains the connection to the server by sending small packages of data at reconnection period (which by default is one minute). If the transfer is not properly acknowledged by the other party, the connection will be terminated.



Note: TCP Client mode is used in the SvanNET service.

SV 279 PRO uses the TCP Client mode to connect to SvanNET (this is the default setting of SVAN 979). The user also connects to SvanNET via web browser or SvanPC ++, and the service creates a "bridge" between the station and the user. In this case, the user does not need to buy more options for SIM card (public dynamic or public static IP addresses are typically optionally payed and often hard to obtain). The essence of SvanNET is to simplify the procedures and requirements necessary for the connection.

TCP Server is a mode in which the 3G modem is configured to act as a server for incoming connections. The modem is waiting for the first connection to be established on a designated port (called **Data Port**, default 8001). Such connection can come from any application - an initiator of the TCP connection (such as SvanPC++) called **remote peer**. This mode is recommended as it gives the initiative to the application. This mode requires the SIM with a **public address** (also called **public IP**).

The **TCP Server** mode uses a so-called **Registration**. This is a method of translation of a **dynamic address** to a form of a static credentials. It is essential for effective use of a SIM card with a **dynamic IP**. The dynamic IP means that the IP address is changed each time the modem establishes connection to the Internet. The Registration feature allows to use the current internet address by an external application for the connection.

There are two Registration methods supported by SV 279 PRO:

1. DynDns
2. Address Server

The **DynDns** is a service that allows to translate a static name to the internet address. The special controlling application uses this name to identify SV 279 PRO in the Internet as an internet address. The properly configured station provides means to validate its internet address to be recognized in the Internet. The static name provided by DynDns service is translated by the DNS protocol to a given internet address to which an application can connect to.



Note: To use this method the user should have a DynDns account and to input its credentials (host name, login name and password) into the SVAN 979 configuration. For more details regarding DynDns service consult <http://www.dyndns.org>.

The **Address Server** is a Svantek own initiative of providing the instrument's current internet address. In this mode, SV 279 PRO provides its current internet address to Svantek server. SvanPC++ is getting said address to be able to connect to it. This mode doesn't require any payments for the account and obtaining any credentials as it comes preconfigured to the user, but it requires access to **www.svantek.com** domain from the GSM operator network.



Note: To use this method contact your local SVANTEK distributor.

4.4.2 SMS / E-mail alarming

SMS / E-mail alarming functionality allows SV 279 PRO to inform the user about exceeded thresholds by SMS and/or E-mail notification. SV 279 PRO can send an SMS to a defined number(s) and/or an E-mail to a defined address(s) with alarm, including the current value of the monitored result against the threshold level.

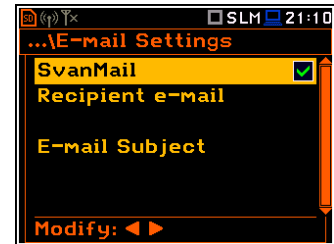
SVAN 979 has two alarm modes: simple and advanced. Simple alarm mode is based on the configuration of the I/O port in the **Multifunction I/O** window (*path: <menu> / Instrument / Multifunction I/O*) in which the user can set the trigger for alarm output signal with respect to the threshold level and additionally enable sending alarm messages by SMS to one number and/or e-mail also to one address.

Advanced alarm mode enables extended functionality and requires the use of SvanPC++ or SvanNET to set up alarms. In this case, the user can configure far more complex alarms (e.g. send an alarm when the level of source exceeds 75 dB during at least 10 seconds but only on weekdays). Additional extension is that alerts can be send to more than one phone number / e-mail address.

The E-mail alarming requires the credentials of the e-mail server to be used for it, including the SMPT server name, the port number, sender name, login and password. The content of the message is created automatically, and the user can add his own information to it.



Note: SvanNET provides also an e-mail service. The use of SvanNET simplifies the configuration of the station by only switching on the SvanMail position in the SVAN 979 configuration menu (path: <Menu> / Instrument / Wireless Transfer / E-mail Settings).



Note: SvanNET e-mail service uses SSL connection.

It should be noted that SMS alarming does not require the modem to establish internet connection and, as such, the SIM card does not require any data transfer plan as sending SMS messages is done entirely over GSM network. E-mails still require access to the internet.

4.4.3 SMS command exchange

SMS command exchange allows any command from the *Appendix A. Remote Control to SVAN 979 User Manual* to be exchanged via SMS. By sending a command as specified by the said document, SV 279 PRO can provide a response. This feature is particularly useful when retrieving the current state of the station.

Like SMS alarming, this feature does not require an active internet connection.

The functionality is useful tool in some situations. In particular, to send “Reset” or “#7,RM;” (reset communication) command when there is a loss of remote communication.

The functionality does not require any additional configuration as is always active when modem is on and SIM card is inserted.

4.5 REMOTE COMMUNICATION MODULE OF SVANPC++

SvanPC++ is more extended software than SvanNET regarding data view and data process functionality. It can utilize all above described communication channels, also via SvanNET. For this purpose, SvanPC++ should be completed with special **Remote Communication** module, which usually is delivered as an option to SvanPC++.

SvanPC++ with Remote Communication module is described in detail in the SvanPC++ User Manual.

APPENDIX A. SV 279 PRO TECHNICAL DATA¹

Nr	Parameter	Value/ Description
Physical data		
1	Dimensions	SM 279 PRO – 300 x 260 x 190 mm SA 250 – 450 x 400 x 155 mm
2	Weight	SM 279 PRO – ~10 kg SA 250 – ~4 kg
4	Leakproof classification	SM 279 PRO – IP67 according to EN 60529 (1997) + A1 (2000)
5	Working temperature range	-30°C do +60°C (Ambient air temperature, without direct sunlight). <i>Note: Outside this range the station will automatically switch itself off.</i> <i>Note: In charging mode the range of working temperature is: -20°C to +50°C !</i>
6	Storage temperature range	SM 279 PRO and SA 250: -40°C to +70°C
9	Working relative humidity range	0 – 100 %RH
Power Supply		
20	Internal battery	Europower EP 17-12 (12 V, 17 Ah)
21	SV 279 PRO power consumption without charging	Modem is switched off: ~1,1W Mean infrequent short transmissions: ~1,6W Continuous transmission: ~2,1W
22	Operating time when powered from the internal battery, (20°C, 17 Ah, fully	Modem is switched off: ~190h (~8d) Mean infrequent short transmissions: ~120h (~5d) Continuous transmission: ~90h (~4d)

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
	charged)	
23	SV 279 PRO power consumption including charging	up to 30W \pm 5%
24	External DC input	voltage: 10,5 V to 28 V Note: When external DC input voltage is in the range 11 V to 15 V, the station is powered from the external DC source, but the internal battery is not charged!
25	External DC power supply SB 270	15 V, 4 A, 60 W
	External battery SB 272	Europower EP 33-12 (12 V, 33 Ah)
26	Operating time when powered from the internal and external SB272 batteries, (20°C, 17+33 Ah, fully charged)	Modem is switched off: ~550h (~23d) Mean infrequent short transmissions: ~350h (~14d) Continuous transmission: ~280h (~12d)
27	Solar panel (option)	System best fit with solar panel with a MPPV voltage 17,5 \pm 0,5V and power in the range of 30W to 120 W (without control system). Note: Size and power of the panel depend on the climate of the area where the station operates.
Measurement Line		
30	SVAN 979 Meter/analyser	Datasheets are available at http://www.svantek.com .
31	SA 279 outdoor kit	Set of weather protection for SV 17 preamplifier and G.R.A.S. 40AE microphone.
32	G.R.A.S. 40AE microphone	Pre-polarised ½" condenser microphone with nominal sensitivity 50 mV/Pa.

Nr	Parameter	Value/ Description
		<p>Note: With the use of SA279 (0°) type compensation filter (filter must be defined in SVAN 979, see Chapter 2.1.4) the acoustic characteristics of SA 279 conforms the class 1 sound meters and IEC 61672:2002 standard for the direction 0 degree (normal direction regarding the microphone membrane). With the use of SA279 (90°) type compensation filter the acoustic characteristics of SA 279 is switched to the direction 90 degree (parallel to the microphone membrane).</p>
SP 275 meteo module and wind-gauge		
40	Temperature	range: -52°C do +60°C, accuracy: ±0.3°C (@ 20°C)
41	Atmospheric pressure	range: 600 – 1100 hPa accuracy: ±0.5 hPa at 0 ... +30 °C (+32 ... +86 °F) ±1 hPa at -52 ... +60 °C (-60 ... +140 °F)
42	Relative humidity	range: 0 – 100 %RH accuracy: ±3 %RH within 0 ... 90 %RH ±5 %RH within 90 ... 100 %RH
43	Wind speed	range: 0 – 60 m/s accuracy: ±3 % (@ 10m/s)
44	Wind direction	range: 0°– 360° accuracy: ±3°
45	Precipitation	Rainfall, Rain duration, Rain intensity, Hail, Hail duration, Hail intensity
46	Measurement update	Temperature, Pressure, Humidity, Wind: 1 s Precipitation: 10 s
		<p>Note: SVAN 979 acquire every 1s above data from the SP 275 and average them to the step of Summary Results or Logger (see SVAN 979 manual).</p> SR step range (integration period): 1 s – 24 hours. LOG step range (logger step): 1 s – 24 hours.
GSM Modem		
50	3G modem type and features	GeMalto® EHS6-T Terminal Five Bands UMTS (WCDMA/FDD): 800, 850, 900, 1900 and 2100

Nr	Parameter	Value/ Description
		MHz
51	3G modem specifications	HSDPA Cat.8 / HSUPA Cat.6 data rates DL: max. 7.2 Mbps, UL: max. 5.76 Mbps EDGE Class 12 data rates DL: max. 237 kbps, UL: max. 237 kbps GPRS Class 12 data rates DL: max. 85.6 kbps, UL: max. 85.6 kbps
52	3G modem approvals	R&TTE, GCF, CE, FCC*, PTCRB*, IC*, UL AT&T* and other local approvals and provider Certifications *) EHS6-T only

APPENDIX B. LIST OF RELATED DOCUMENTS

1. SVAN 979 User Manual (www.svantek.com)
2. SvanNET User Manual (www.svantek.com)
3. SvanPC++ User Manual (www.svantek.com)
4. SA 279 Assembly Guide (www.svantek.com)
5. GeMalto® EHS6 Terminal User Manual (www.gemalto.com)
6. WXT520 User Guide (www.vaisala.com)