SV 279 PRO Monitoring Station

User Manual

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Technical Support Contact Information:
web: www.svantek.com
e-mail: office@svantek.com.pl
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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 IP 65-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.

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 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.
- The 1/3 Octave real-time frequency analysis allows the 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 SvanPC++ software that provides the calculation of overall results such as Leq, Lmax, Lmin, Lpeak as well as 1/3 octave and FFT calculations.
- 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 the 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 an outdoor use.
- Military standard CONNECTORS provide reliable, robust and waterproof cable connections.

ACCESSORIES INCLUDED:

SVAN 979  
Class 1 Sound & Vibration Analyser with 1/1 and 1/3 octave, FFT, Time Domain Signal Recording including: prepolarised ½” condenser microphone with nominal sensitivity 50 mV/Pa (GRAS 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

ACCESSORIES AVAILABLE:

SV 33A  
Class 1 acoustic calibrator: 1000 Hz/114 dB

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 274  
Vaisala Weather Transmitter WXTxx type meteo module.
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 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. acoustic calibrator (SV 33A), - 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 274) - see chapter 2.2.4

5. mast with adjustable height from 1.5 meter to 4 meters (SA 206), Type: Manfrotto 269BU

6. light and sound alarm lamp, 12V DC (SP 271) Type: WERMA, LED Buzzer WM Contin. tone
2.1.1. SV 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.

⚠️ **Note:** Only the SVAN 979 and 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.

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>` push-buttons,
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 return it the user should put the controller in the slot and press on it to achieve a good fix with the connector.

⚠️ **Note:** The producer does not recommend the removal of the controller without a sound reason. Double check that the controller has a good fixation in the connector after a 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).

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

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

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

- input signals from the microphone (**INPUT**).
- external Interface for SP 274 meteo module or alarm lamp.
- powering station and charging the internal battery (**DC SUPPLY**).
To connect the cable to the case socket, start by lining up the key on the plug and socket, then lock the connector by turning the ring clockwise (only the ring close to the socket will rotate).

To disconnect cables, 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 a 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:** It is necessary to charge the battery after any total discharge, otherwise the battery may lose its capacity.

⚠️ **Note:** It is recommended to charge the battery at least every 6 months in the case of the station not being used.
The case cover is equipped with an antenna.

2.1.2. SD 270 PRO Controller

The SV 279 PRO monitoring station is equipped with the SD 270 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 274 meteo module, alarm lamp etc.

A 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 the 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.

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 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](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 is inserted with the circuit side facing left in the slot 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 “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 \( \text{Spl, Leq, Sel, Lden, LEPd, Ltm3, Ltm5, LN\%, LR15, LR60, Ovl, Peak, Max and Min} \)).

- 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: \( A, B, C, Z \) are available with this instrument.

- **SVAN 979** can, simultaneously to the meter mode, perform real time \( 1/1 \text{ Octave} \) or optional \( 1/3 \text{ Octave} \) analysis including calculations of statistical levels.
**Note:** See also SVAN 979 user manual.

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 via a **USB Host** socket, the serial interface working with speeds up to 2 Mbit/s.

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

**Note:** For safety reasons, it is recommended to remove the internal batteries from the instrument when it is inside of the monitoring station case.

To extract the batteries the user should switch off the instrument, unscrew the bolt, 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 8GB micro SD-card.

The user may exchange it for a 32GB card, but before insertion the card must be formatted as FAT32.

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

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 as 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 (the acoustic signal is parallel to the microphone’s grid) or airport (the acoustic 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 server SvanNET or SvanPC++ program.
2.1.5. **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
2.1.6. 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 ¾" screw on its bottom which enables the use 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.

As an option the user 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 dessicator.

![Image](image.png)

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

![Image](image.png)

**Note:** *The correct connection of the microphone is not signalled by the controller therefore it is recommended to perform a test measurement each time the station is turned on.*
2.2. Optional accessories for SV 279 PRO system

2.2.1. SV 33A – Class 1 Acoustic 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.

An acoustic calibrator is a device which produces an acoustic pressure of defined level and frequency.

**SV 33A** Acoustic Calibrator produces an acoustic pressure of defined level 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. SB 272 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 case.

SB 272 has one 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 itself (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:** 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:** It is necessary to charge the battery pack after discharge, otherwise the battery may lose its capacity.

**Note:** It is recommended to charge the battery at least every 6 months in the case of the station not being used.
2.2.3. **SB 271 - Solar panel**

The **SB 271** solar panel (40 Watt, 12 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 274 - meteo module**

**SP 274** is a Vaisala Weather Transmitter WXTxx type meteo module used with the SV 279 PRO monitoring station.

It measures the 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 lightweight, has no moving parts, has internal heating and USB connection and can be easily installed with a one-bolt mounting method.

SP 274 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 274 via USB to the monitoring station controller 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*: 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).
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. Therefore, it is advisable to remove the internal batteries from SVAN 979 for 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.
Colour of LEDs can be red, orange or green. Colour of \textit{SVAN} and \textit{3G} LEDs reflect the communication state with the corresponding unit. Colour of \textit{DC, CHARGING, BAT 1} or \textit{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.

<table>
<thead>
<tr>
<th>Power from</th>
<th>Internal battery</th>
<th>Power supply</th>
<th>External battery</th>
<th>Solar panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>off</td>
<td>green</td>
<td>off</td>
<td>off</td>
</tr>
<tr>
<td>CHARGING</td>
<td>off</td>
<td>• red when charging; • green when charged</td>
<td>off</td>
<td>• red when charging; • green when charged</td>
</tr>
<tr>
<td>BAT 1</td>
<td>• green if loaded &gt; 50%; • orange if loaded 20-50%; • red if loaded &lt;20%; • off if 0% loaded or disconnected</td>
<td>• when charging, colour is changed: red-orange-green; • green when charged</td>
<td>off</td>
<td>• when charging, colour is changed: red-orange-green; • green when charged</td>
</tr>
<tr>
<td>BAT 2</td>
<td>off</td>
<td>off</td>
<td>• green if loaded &gt; 50%; • orange if loaded 20-50%; • red if loaded &lt;20%; • off if 0% loaded or disconnected</td>
<td>off</td>
</tr>
</tbody>
</table>

\textit{SVAN} LED colour is green when there is a connection between the controller and the \textit{SVAN 979} instrument. If there is no connection the colour is red (for example, when the \textit{SVAN 979} instrument is switched off). When there is data transmission between controller and \textit{SVAN 979} the green LED will be blinking.

\textit{3G} LED colour is green when there is a connection with a modem. If the modem is not ready or there is an error in data transmission the colour of \textit{3G} LED is red. When there is data transmission to or from the modem the green LED is blinking.
3.3. Modes of station operation

**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. A transmission error is indicated by the red colour of the 3G LED.

In the operational mode, the following modules are powered continuously: SVAN 979 instrument, controller, 3G modem and outdoor microphone (optionally also the SP 274 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.

**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 show:

- connection of AC/DC converter indicated by green DC LED,
- charging of the internal battery indicated by green CHARGING LED,
- status of the internal battery charging indicated by green-orange-red BAT 1 LED (green if loaded > 50%; orange if loaded 20-50%; red if loaded <20%).

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

**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 by a green BAT 1 LED on the controller panel.

**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](http://www.svantek.com)
3.4. Configuration of 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 of 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.
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, the 3G modem (optionally also the SP 274 meteo module). Additionally, system power and internal temperature of the station and the battery state are checked.

During the checking procedure, all diodes are red and steady. All errors are indicated on the front panel by appropriate LED indicators. If all red indicators turn off after above procedure, then 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 6-8 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 service

SvanNET is an Internet service that simplifies the remote connection between PC and Svantek monitoring stations.
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 6.

SVAN 979 enables the user to define 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.

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

**Note:** Newly purchased stations have factory settings as standard.

3. Set **Network** to **GPRS** (path: `<Menu>` / **Instrument** / **Wireless Connection** / **Network`).
4. 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).

5. 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.

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

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

![Web interface of SvanNET](image)

**Note:** To learn more about SvanNET see “SvanNET Quick Start Guide”.
4.2. 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.

4.2.1. 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 the SVAN 979 User Manual. SvanPC++ assures this connection and provides the most accurate and real-time method of performing data download, performance validation and measurement start/stop.

Main communication channel of the SV 279 PRO can be established by one of two available methods: TCP Client or TCP Server.

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, the 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, the SV 279 PRO can exchange commands as in TCP Server mode. Should the connection attempt fail or is broken by the remote host, the 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.

The SV 279 PRO uses the TCP Client mode to connect to SvanNET (this is the default setting of the 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 the 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, the 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.

4.2.2. SMS / E-mail alarming

SMS / E-mail alarming functionality allows the SV 279 PRO to inform the user about exceeded thresholds by SMS and/or E-mail notification. The 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 sent to more than one phone number / e-mail address (for more details see Appendix L: Description of Advanced Alarms in SVAN 979 to the SVAN 979 User Manual).

The E-mail alarming requires the credentials of the e-mail server to be used for it, including the SMTP 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).

The SV 279 PRO stations support SSL (Secure Socket Layer) connections to e-mail servers that require encryption.

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.

4.2.3. SMS command exchange

SMS command exchange allows any command from the Appendix A. Remote Control to the SVAN 979 User Manual to be exchanged via SMS. By sending a command as specified by the said document, the 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.
4.3. Remote Communication module of SvanPC++

SvanPC++ is more sophisticated software than SvanNET in regards to 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 details in the SvanPC++ User Manual.

In the SvanNET Quick Start Guide, it is described how to install connection with the monitoring station from the SvanPC++ via SvanNET.
5. IMPORTANT NOTES ON OPERATING THE STATION

**Note 1:** Only the SVAN 979 and 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 2:** The producer does not recommend the removal of the controller without a sound reason. Double check that the controller has a good fixation in the connector after a reconnecting!

**Note 3:** Do not remove the battery from the case! This operation must be done only by the authorised service.

**Note 4:** For safety reasons, it is recommended to remove the internal batteries from the instrument when it is inside of the monitoring station case.

**Note 5:** The correct connection of the microphone is not signalled by the controller therefore it is recommended to perform a test measurement each time the station is turned on.

**Note 6:** During station operation it is recommended to charge the internal battery as often as possible; this will extend battery life.

**Note 7:** If the station is not in use for a long period, it is recommended that the internal battery is charged at least once every six months.

**Note 8:** 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 9:** SVAN 979 is powered from the external source and doesn't use its internal batteries. Therefore, it is advisable to remove the internal batteries from SVAN 979 for safety reasons.
Appendix A. SV 279 PRO Monitoring Station Technical Data

<table>
<thead>
<tr>
<th>Nr</th>
<th>Parameter</th>
<th>Value/ Description</th>
</tr>
</thead>
</table>
| 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                           |
| 5  | Working temperature range               | -30°C do +60°C (Ambient air temperature, without direct sunlight).  
Note: Outside this range the station will automatically switch itself off.  
Note: In charging mode the range of working temperature is:  
-20°C to +50°C ! |
| 6  | Storage temperature range               | SM 279 PRO and SA 250: -40°C to +70°C                                              |
| 9  | Working relative humidity range         | 0 – 100 %RH                                                                         |

**Physical data**

**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 charged) | Modem is switched off: ~190h (~8d)  
Mean infrequent short transmissions: ~120h (~5d)  
Continuous transmission: ~90h (~4d) |
| 23 | SV 279 PRO power consumption including charging | up to 30W ±5%                                                                   |

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.
<table>
<thead>
<tr>
<th>Nr</th>
<th>Parameter</th>
<th>Value/ Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>External DC input</td>
<td>voltage: 10,5 V to 28 V</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> 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!</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>External DC power supply SB 270</td>
<td>15 V, 4 A, 60 W</td>
</tr>
<tr>
<td>26</td>
<td>External battery SB 272</td>
<td>Europower EP 33-12 (12 V, 33 Ah)</td>
</tr>
</tbody>
</table>
| 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±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. |
<p>| 30 | SVAN 979 Meter/analyser         | Datasheets are available at <a href="http://www.svantek.com">http://www.svantek.com</a>         |
| 31 | SA 279 outdoor kit              | Set of weather protection for SV 12L preamplifier and ACO 7052E microphone.         |
| 32 | ACO 7052E microphone            | Pre-polarised 1/2” condenser microphone with sensitivity 35 mV/Pa.                 |
|    | <strong>Note:</strong> With the use of Outdoor Airport 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 Outdoor Environmental type compensation filter the acoustic characteristics of SA 279 is switched to the direction 90 degree (parallel to the microphone membrane). |</p>
<table>
<thead>
<tr>
<th>Nr</th>
<th>Parameter</th>
<th>Value/ Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SP 274 meteo module and wind-gauge</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Temperature</td>
<td>range: -52°C do +60°C, accuracy: ±0.3°C (@ 20°C)</td>
</tr>
<tr>
<td>41</td>
<td>Atmospheric pressure</td>
<td>range: 600 – 1100 hPa, accuracy: ±0.5 hPa at 0 °C ... +30 °C (+32 °F ... +86 °F), ±1 hPa at -52 °C ... +60 °C (-60 °F ... +140 °F)</td>
</tr>
<tr>
<td>42</td>
<td>Relative humidity</td>
<td>range: 0 – 100 %RH, accuracy: ±3 %RH within 0 ... 90 %RH, ±5 %RH within 90 ... 100 %RH</td>
</tr>
<tr>
<td>43</td>
<td>Wind speed</td>
<td>range: 0 – 60 m/s, accuracy: ±3 % (@ 10 m/s)</td>
</tr>
<tr>
<td>44</td>
<td>Wind direction</td>
<td>range: 0° – 360°, accuracy: ±3°</td>
</tr>
<tr>
<td>45</td>
<td>Precipitation</td>
<td>Rainfall, Rain duration, Rain intensity, Hail, Hail duration, Hail intensity</td>
</tr>
<tr>
<td>46</td>
<td>Measurement update</td>
<td>Temperature, Pressure, Humidity, Wind: 1 s, Precipitation: 10 s</td>
</tr>
<tr>
<td><strong>Note:</strong> SVAN 979 acquire every 1s above data from the SP 274 and average them to the step of Summary Results or Logger (see SVAN 979 manual).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SR step range (integration period): 1 s – 24 hours.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LOG step range (logger step): 1 s – 24 hours.</td>
</tr>
<tr>
<td><strong>GSM Modem</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>3G modem type and features</td>
<td>GeMalto® EHS6-T Terminal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Five Bands UMTS (WCDMA/FDD): 800, 850, 900, 1900 and 2100 MHz</td>
</tr>
<tr>
<td>51</td>
<td>3G modem specifications</td>
<td>HSDPA Cat.8 / HSUPA Cat.6 data rates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DL: max. 7.2 Mbps, UL: max. 5.76 Mbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EDGE Class 12 data rates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DL: max. 237 kbps, UL: max. 237 kbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GPRS Class 12 data rates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DL: max. 85.6 kbps, UL: max. 85.6 kbps</td>
</tr>
<tr>
<td>52</td>
<td>3G modem approvals</td>
<td>R&amp;TTE, GCF, CE, FCC*, PTCRB*, IC*, UL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AT&amp;T* and other local approvals and provider</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Certifications *) EHS6-T only</td>
</tr>
</tbody>
</table>
Appendix B. List of related documents

1. SVAN 979 User Manual (www.svantek.com)
2. SvanNET Quick Start Guide (www.svantek.com)
4. SA 279 Assembly Guide (www.svantek.com)