

SVM Manual



SVM Manual

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1 Introduction

This manual covers the SVM module equipped with firmware version 1.0 and higher.

The SVM is a combination of 2G/3G Internet modem and SMS alarm dialler, and can be used to control and monitor technical installations.

The modem has a wide range of uses. For example, the SVM can help you connect old installations based on a dialup modem connection to your SCADA system over the Internet.

1.1 Variants

The SVM is available in three variants:

- SVM0000-R 3g modem without contact inputs
- SVM2000-R 3g modem with two contact inputs

1.2 Features of the SVM series

- Configurable delay times (models SVM2000-R and SVM8000-R only)
- Reporting of power failure
- Periodic restart (reset) of the SVM (can be switched on and off)
- Serial interface RS-232 connection (9-pole D-sub)
- Ethernet interface UTP connection
- Settings and SMS texts are permanently stored in the internal flash memory of the SVM (models SVM2000-R and SVM8000-R only).



We recommend that you read the user manual carefully so that you can make optimal use of all SVM options.

1.3 Safety criteria

Before using the SVM, there are several criteria that the user should meet.

- The SVM should be installed in a controlled environment (for reasons of fire prevention).
- The SVM should be supplied with power using a SELV-type power supply.
- External Ethernet should not be connected directly to an SVM, but should be connected via an overvoltage protection device.
- To reduce the probability of damage to the equipment, the SVM should be placed in an environment protected against electrostatic discharge (ESD).
- The SVM is intended for use as a modem or alarm dialler. The SVM is not intended for use as part of a critical safety system in a critical process.

1.4 Checking the delivery

Check the packaging for damage. Contact your supplier immediately if the delivery is found to be damaged or incomplete upon receipt.

The standard delivery includes:

- SVM module
- Connection terminals
- Ethernet cable



- This user manual

Optional items include:

- Antenna and antenna cable (various models, including vandalism-proof antennas)
- Mains adapter 230 Vac/12 Vdc (item number **SV-20**)
- RS-232, 9-pole D-sub cable male / female (item number **TB-14**)
- USB SERIAL adapter (item number **TB-18**)

1.5 Environment



This product contains materials that can harm the environment. For the sake of the environment, if the product has to be replaced at the end of its service life please do not dispose of it through the household waste. Please return the device to your supplier or hand it over to a designated depot.

1.6 Warranty and repair

ADÉSYS performs a series of extensive tests on each SVM before dispatch. ADÉSYS uses a warranty period of **1 year**.

Warranty claims are invalidated if:

- The defect is caused by gross negligence or inexpert installation
- The device has been opened and/or repairs or modifications have been performed without the permission of ADÉSYS
- It is found that the serial number has been removed or damaged.

Please get in touch with Adésys customer service if you have any questions regarding the warranty or repairs.

1.7 Liability

ADÉSYS accepts no liability for consequential loss in the event of the stagnation of the alarm. An alarm dialler does not provide a 100% guarantee against damage, it is merely a tool to prevent damage. You should therefore discuss the remaining risk with your insurer.



1.8 Identification

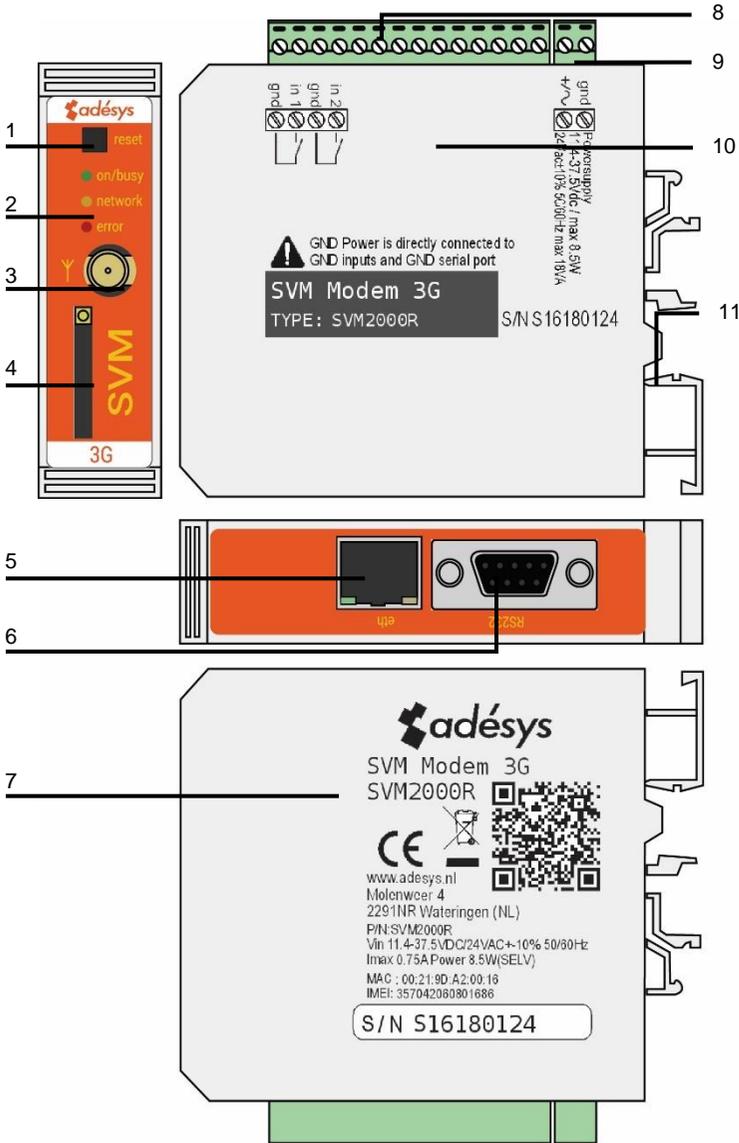


Figure 1 Identification of SVM



- 1 Reset button
- 2 LED status indicator: antenna level (network), error messages (error) and general status (on/busy)
- 3 Antenna connection type: SMA female
- 4 SIM card holder
- 5 Ethernet connection
- 6 Serial interface RS-232 9-pole D-sub connection
- 7 Information sticker
- 8 Input/output connection terminals
- 9 Supply voltage connection terminals
- 10 Connection sticker
- 11 DIN-rail mounting clamp

2 Connection

To connect the SVM correctly, we recommend using exclusively Camden CTB922HE/# type connectors. Measurements may be affected if other connectors are used.

2.1 Positioning

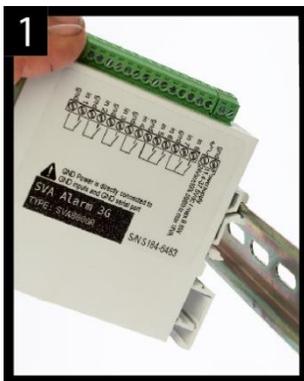
Position the SVM where it is not affected by direct sunlight or other heat sources. Choose the place of installation such that moisture cannot penetrate the device. The SVM can be mounted onto the TS35 rail without screws. The permitted ambient temperature range for the electronics is -20°C to +55°C.



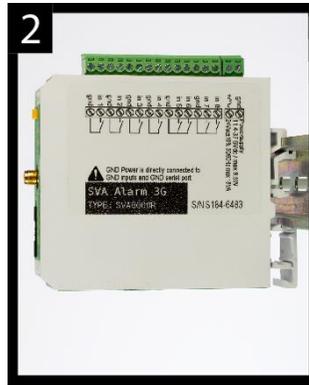
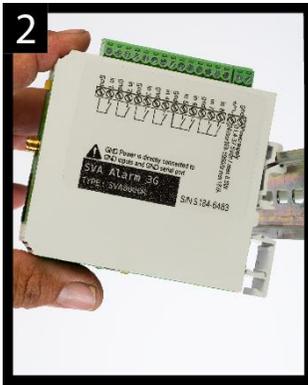
The transmission power of the SVM's internal GSM/3G module is higher than that of a standard mobile phone. Under certain conditions this may affect the functioning of surrounding electronic equipment. The effects depend upon the distance between the antenna and surrounding equipment.

2.2 Affixing and removal: DIN rail

The SVM should be affixed to a DIN rail before connection.



- Put the SVM onto the DIN rail at an angle [1]. It is important that the SVM's DIN rail clip is positioned on the top of the DIN rail.



- Tilt the SVM to clip it into place [2]. Then check whether it is securely seated.

The SVM is removed from a DIN rail as follows.



- Place a screwdriver on the underside of the DIN rail clip [3]. Use this as a lever; after approx. 3 mm the SVM can be tilted to release it from the DIN rail.

2.3 SIM card

If the SIM card has a PIN code, this should be entered in the setup tool SV-prog. The required SIM card is installed as follows:

- Switch the SVM off by disconnecting the supply voltage, then press and hold the reset key for 8 seconds to switch off the dialler.
- The SIM card holder is made accessible by pressing the button next to it using a sharp object. The holder is then pushed outwards.
- Place the SIM card in the holder and slide this back into the SVM.
- Reconnect the supply voltage to switch the SVM on.



The SVM should be completely switched off before the SIM card is installed. Fitting or removing the SIM card with the SVM switched on may damage the SIM card.



The use of a "Prepaid" SIM card for dialling purposes is strongly discouraged. The mobile network cannot automatically request the call credit, which means that this can be run down without anyone noticing, resulting in outgoing notifications coming to a standstill.



For use of the SVM server mode, the SVM should always contain a SIM card or have a subscription to a static IP address. Consult your telecom provider.

2.4 Antenna

Connect the antenna cable to the SVM's antenna connection. The antenna plus associated cable can be obtained from Adésys. The antenna should be affixed to as high a point as possible to obtain the best possible range.



After installation, always check the field strength of the antenna signal (max. is 5 flashes of the yellow "network" LED). Notification of changes in signal strength will always take place after a long delay (± 30 seconds). Take this into account if, for example, the antenna is moved.

2.5 Power supply

2.5.1 SV-20 mains adapter

A 230Vac/12Vdc mains adapter with item number SV-20 can be obtained as an option to supply power to the SVM.



When fitting the terminal block to the power supply cable, ensure that the polarity plus (+) and minus (-) is correct.

An extra power supply fuse is not necessary here.

If the SVM is not supplied with power using the above-mentioned mains adapter, the connection regulations in the section below apply.

2.5.2 Power supply

Connect the SVM to a DC power supply of 12 to 37.5 Vdc (at least 8.5 W) or a transformer of 24Vac (at least 18VA). The power supply input of the SVM is **not galvanically isolated** from the other connections. The GND connection of the power supply connector is directly connected internally to the GND connection of the input connector and the COM port.



If the SVM is connected to an application (process controller, PLC, computer, active sensor, etc.) without galvanic isolation and the SVM is connected to the same power supply, there is a real chance of earth loops and/or short circuits in this power supply.



2.6 Reset key

The reset key has three functions: first of all, it is used to interrupt the alarm. Pressing this briefly ends the current notification; the SMS messages that have not yet been sent are not sent.

A second function of the reset key is to restart the dialler. The dialler can be restarted by holding this key down for a period of 8 seconds. This only occurs if a power supply is connected.

If no power supply is connected, the reset key functions as an off button. Holding the key down for a period of 8 seconds switches off the dialler.



Statuses of inputs will **not** be stored in a permanent memory. If the supply voltage fails, and the built-in supercap is entirely discharged, the contents of this memory is lost. If the SVM is restarted manually, this status will also be reset. When the supply voltage is restored, the SVM behaves as if it is being started up for the first time. This means that:

- After the supply voltage has been restored, **only** active inputs are reported **once again**.
- **No** Recovery message will be sent if the status of the input has been recovered **during** this power failure.

2.7 RS-232

A port for a serial connection with peripheral equipment. For example, a PLC that should communicate with an external server application (SCADA) via the SVM.

For RS-232, the modem can be set up to emulate a direct connection or an analogue Hayes modem. For more information about the options, please refer to the section **Modem/Steady connect**.

2.8 Ethernet

The Ethernet connection can be used for an **external** connection. This is set up in the SVM: see the **SV-prog** section.

2.9 2G/3G connection

To use the SVM with a 2G/3G connection, a SIM card with Internet subscription should be installed in the SVM. It is important that the correct APN, APN user and APN password are entered, otherwise the SVM will not be able to connect. This can be entered in SV-prog in the 2G/3G window.



The SVM does not provide a notification if something goes wrong with the APN. For more information about the APN, please contact your provider.

3 SV-prog

3.1 Installation

SV-prog is used to set up the SV series. This program can be downloaded free of charge from the Adésys website (www.adesys.nl). All settings will be stored in the internal flash memory. It is **not** possible to store the settings on the SIM card.

SV-prog must be installed on your PC before it can be used. Follow the instructions displayed on your screen during the installation process. As soon as the installation process is complete, start the program via the shortcut or via the program menu in MS Windows.



Connect the SVM to a power source and connect the SVM to the PC using the Ethernet cable set supplied. The SVM can be connected to the local network or directly to the PC.

As soon as the SVM has been switched on, the tool will display this in the overview after a few seconds and the SVM can be configured by clicking it. When search diallers is pressed, SV-prog shows all accessible diallers.

Terms used in SV-prog

The terms you will encounter in SV-prog are explained below.

3.2 Status screen

The status screen provides you with information on the SVM. Examples of this information are the IMEI code, the serial number, the MAC address and the current status of the inputs and alarms/errors.

3.3 Call list

A call list is a group of contacts (telephone numbers) that can be coupled to the input to send an alarm message or alarm recovery message. One to eight telephone numbers can be programmed into a call list.

3.4 I/O

Inputs are displayed in this window. All inputs can be set up separately from one another. Settings can also be established here for **Power Failure** and **System Errors**.

One call list can be set up for each input. As soon as an input becomes active, the notification procedure starts. The associated alarm message is sent to all set telephone numbers one after the other. This is explained further in the **Alarm Procedure** section.

3.4.1 Input delay

A delay can be set for the status notification (active and idle message) in *input delay*. This means the status notification will not be sent until the contact has been activated or deactivated for longer than this period. The maximum that can be set is "3600" seconds.



If an input goes back into idle mode during the delay time, the notification procedure does **not** start.

3.4.2 Recovery report (idle)

If desired, a recovery *report* SMS can be sent after the input goes into idle mode. The default setting is off even if nothing has been selected. Select "Yes" to activate this notification. A recovery report will always be sent to the external server.

3.4.3 System errors

Various system errors can be detected by the SVM. Notifications can be set up individually for each error. Depending upon the error, this is displayed in the programming tool and a notification is sent via SMS. By default the notification of all system errors via SMS is switched off.

3.5 Modem / Steady-connect

The SVM can couple existing applications to an Internet application via the 2G/3G network or the fixed internet (Ethernet) connection. The SVM maintains a stable, transparent connection. If the option Redundant is selected, the SVM will use the 3G network only if a connection via Ethernet is not possible.



The Steady-connect should preferably be programmed by an installer with sufficient experience and knowledge in the field of Internet communication in general and network protocols (IP) in particular.

3.5.1 Client mode

In this mode, the initiative for establishing an Internet connection (with a server) is taken locally, by the client. Depending upon the configuration, the establishment of the connection can be initiated when the data is ready or when an ATD command is given, or it can be permanently online via autologon. If the SVM is in client mode, the following settings are possible:

3.5.1.1 Modem emulation (RS-232 connected)

In this mode, it is possible to establish a connection with a server using the ATD command. In fact, a conventional Hayes modem is emulated: if the connection is established a CONNECT notification is sent. The various RS-232 signals, such as DCD, DTR, RI, etc., are also supported. The telephone number used in the ATD command is not relevant and thus will not be used.

Status changes at the contact inputs can also be reported in this mode.

3.5.1.2 Transparent (RS-232 connected)

Transparent mode for RS-232 can be set if you have not selected modem emulation.

At the moment that data is sent to the serial/Ethernet port, a connection is established with the server. Data that is now sent to the serial port is buffered (a maximum of 50 characters) and sent at the moment that the connection is ready.

Status changes at the contact inputs can also be reported in this mode.

3.5.1.3 Autologon (RS-232 connected)

Autologon mode for RS-232 can be set when you have not selected modem emulation.

After start-up, the SVM will establish a connection with the server immediately and automatically. If the connection is terminated, an attempt will be made to restore this immediately.

Depending on the DTR setting (&D0 of &D1/&D2), it is also possible to control the connection using DTR. This means that the SVM waits before connecting if DTR is not present. The connection is established as soon as DTR appears. The connection is also terminated if DTR fails.

With DCD, you can check whether the 3G connection has been successful. It may also be possible to set up a start string. This string is sent to the server at the moment that the connection is ready.

Once the SVM has connected via the mobile network, the connection is temporarily interrupted if there is an alarm so that one or more SMS messages can be sent.

3.5.2 Server mode

In this mode, the initiative for the establishment of an Internet connection lies with the external server application. With 2G/3G, this is only possible if a SIM card/subscription with a fixed IP address is used and if the correct APN details are filled in.



If no connection can be established, it is important to recheck the APN details.



In server mode, the following settings are possible:

3.5.2.1 Transparent (RS-232 connected)

If a device is connected to the SVM via RS-232 and modem emulation is switched off, the server mode connection structure is transparent.

The server application can take the initiative to establish a connection and is transparent as soon as the local and external connections have been established. Therefore, no modem is emulated in this mode, but the connection immediately becomes transparent.

In this mode, too, a configurable start string can be sent to the server application (SCADA) to inform it that the PLC is ready. Status changes at the contact inputs can also be reported in this mode.

3.5.2.2 Modem emulation (RS-232 connected)

In server mode, the external server application can take the initiative to establish a connection. Depending upon the auto-answer command ATSO, the connection will become transparent either automatically or not until the application has sent the answer command ATA. For the server application (SCADA), the connection (with the SVM) is ready immediately, whilst the local connection between SVM and PLCE does not yet need to be transparent. A configurable start string can be sent to inform the server application (SCADA) when the connection has been fully established (is transparent).

A CONNECT is thus sent to the serial port. The various RS-232 signals, such as DCD, DTR, RI, etc., are also supported. Status changes at the contact inputs can also be reported in this mode.

In this mode, the IP address obtained can be requested with the ATI4 command. This is particularly handy if the set IP address is unknown, but this information is needed by the installer on site.

3.5.3 Server/client mode

If the server/client mode is switched on, the SVM waits in idle mode until a connection is established from outside. If, however, the status of the contact inputs changes, or if data is sent to the RS-232 port/Ethernet port, the SVM switches to client mode and takes the initiative for the connection.

3.6 Advanced connection settings

3.6.1 Connection string upon initial connection

A string has to be set up for sending to the server application as soon as the connection is transparent. This informs the server which device is connected and that it is possible to communicate. This string is sent to the server application when a connection is established in the following situations:

- RS-232 connected, server mode
- RS-232 connected, client mode autologon

3.6.2 Time-outs

Various time-outs have been implemented to prevent the modem from getting stuck in a particular state due to unforeseen events. These ensure that the modem is reset and will then return to idle mode.



Data time-out

This time-out occurs if there is a connection to the server, but data is no longer coming in via the 3G network. This time is configurable between 1 and 10800 minutes (7 days). If the value 0 is entered, this time-out is not active.

Connect time-out

This time-out occurs if the connection with the server takes longer than the set period of time and is configurable between 1 and 168 hours (7 days). If the value 0 is entered, this time-out is not active.

No activity time-out

This time-out occurs if there has been no connection with the server for a set period of time and is configurable between 1 and 168 hours (7 days). If the value 0 is entered, this time-out is not active.

3.6.3 Terminate connection in the event of alarm

If an alarm occurs whilst the SVM is sending data, in this option it is possible to choose whether the data connection can be terminated so that the alarm notification can be sent.

3.7 System

In the system section you can change the general SVM settings, enter GSM and mobile data settings or trigger a factory reset.

3.7.1 Device

In this window you can change device-specific settings such as device name, alarm active text, alarm recovered text, automatic updates and a periodic reset.

3.7.2 Ethernet

Ethernet can be set up with a DHCP server or with the IP, DNS and gateway entered by the user.

3.7.3 GSM and mobile data

Here, the GSM module can be switched off, the PIN code entered, 2G/3G mobile data switched off or the data from the APN set up. Please contact your provider for the APN settings.

3.7.4 Factory reset

By performing a factory reset all settings will be lost and a reset to the default settings will be prompted.

4 Notification procedure

The notification procedure starts in the event of a status change or error. If set up, the SVM will first establish a data connection and send data, and then send the associated notification message to the first contact on the call list that has been set up.

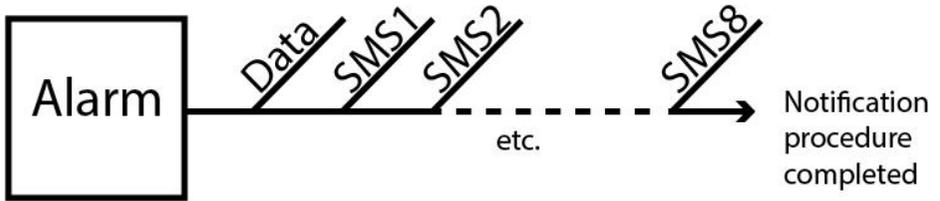


Figure 2: Notification procedure

4.1 SMS notification message

An SMS alarm message is structured as follows.

Device name, input name, status

- “Device name”: contains a text chosen by the user. This can be set up in the system menu.
- “Input name”: contains a text chosen by the user, which is coupled to the input channel. This can be set up in the I/O menu for the relevant input.



System errors such as the Ethernet error and the ‘no numbers coupled’ error have a fixed text (in English) that cannot be changed. For example, **powerfailure** is used for a mains power failure.

- “STATUS” shows whether an input channel is *Active* or *Idle*. Active and recovered texts can be set up in the system menu.

4.2 External server application message (client mode)

The SVM can connect to another system remotely. This remote system is called the external server application. This could be a SCADA system, for example. If set up, the SVM will send a message to an external IP. This can be set up in the Modem Client Mode window and can again only be used if client mode is active. The message is structured as follows.

<Device Name><InputNo><InputName><Status>

Example message

<Adésys><1><Input1><Active>

4.3 Notification of status changes

After input channel 1 has been activated, the following can be observed:

- The green LED (on/busy) flashes 1x to indicate that input channel 1 is active.
- After a few seconds, the green LED (**on/busy**) flashes faster to indicate that the SMS message is being sent.
- The green LED (**on/busy**) again flashes 1x. The SMS message has been sent.
- The notification message appears on the mobile phone to which the SMS message has been sent; this message can be structured as follows:
LOCATION PUMP FAULT Active
- The green LED (**on/busy**) continues to show the status of the input until this ceases to be active.



- If the input returns to idle mode and a recovery report has been set up, the notification message will be structured as follows:

LOCATION PUMP FAULT Idle

4.4 Notification of mains power failure

The SVM is equipped with a supercap. This gives the dialler the option of sending a few messages in the event of a power failure. The associated notification message is sent to the first number in the call list linked to the mains power failure. After the power fails, the following can be observed:

- The red LED (**error**) flashes 5x to indicate that the supply voltage has been lost.
- After a few seconds, the green LED (**on/busy**) flashes faster to indicate that the SMS message is being sent.
- The green LED (**on/busy**) remains on. The SMS message has been sent.
- The notification appears on the mobile phone to which the SMS message has been sent; this message can be structured as follows:

LOCATION powerfailure Active

- The red LED (**error**) continues to show the status of the mains power failure until this has been recovered.



A mains power failure message always takes priority over an ongoing notification of a status change. After notification of the mains power failure, any interrupted notification can be restarted. Notification of status changes that have not yet been notified then continues. This priority arrangement applies for both **Active** and **Idle**.

5 The SVM as Hayes modem

The SVM can be configured with modem emulation, with the SVM behaving like any standard analogue modem. The basic set of AT commands thus results in the same response regardless of the selected communication network. It can therefore be used for older PLCs based upon an old-fashioned modem.

5.1 THE BASIC AT COMMANDS

In most cases, the SVM's basic set of AT commands offers all control options for setting up a modem connection. An AT command always begins with the letters AT (abbreviation for "attention"). This is followed by a letter for the command, sometimes followed by a number as a parameter. The command ends with a return, or enter. After receipt, the modem sends a response to indicate whether the command has been carried out.

The SVM AT commands:

Control commands

- AT Control of connection, does not contain a command.
ATI Provides information such as type and version number of the modem (info).

Commands regarding response in the COM port

- ATE Determines whether commands typed in are also sent back to the user (Echo).
ATQ Determines whether the modem gives feedback (Quiet).
ATV Determines whether modem responses are given by means of legible text or numerical codes (Verbal).
ATX Determines whether modem gives extended or abbreviated responses (eXtended reply).

**Commands relating to the modem connection**

ATA	Start modem when this is called (Answer).
ATD	Start modem to start calling (Dial).
ATO	Switches back from command to modem mode (Online).
ATH	Cuts off any modem connection (Hangup).
ATN	Determines behaviour of error checking during a modem connection.
AT%C	Determines behaviour of data compression during a modem connection.
+++	Switches from modem mode to command mode, if preceded and followed by 1 second of data silence.

Other commands

ATL	Determines the loudspeaker volume (Loudness).
ATM	Determines the loudspeaker behaviour (Monitor).
ATS	Filling or requesting of so-called S registers such as: S0 Determines automatic answering. S7 Maximum waiting time for establishing connections.
ATZ	Resets all modem settings into initial position.
AT&D	Defines the response to the DTR signal.
AT&F	Resets all settings to factory default.
AT&W	Sets the current settings as the new initial position.
AT+CSQ	Requests RF receiving quality.

After an AT command, the SVM sends a modem response. Depending on the ATQ, ATV and ATX commands, a response in text, a numerical code or no response follows. The table below gives all possible responses of the SVM:

Response	Code	Description	ATX
OK	0	Command carried out successfully	0..4
CONNECT	1	Modem connection established, line speed \geq 300bps	0..4
RING	2	Calling	0..4
NO CARRIER	3	Modem connection, or establishment of connection, terminated	0..4
ERROR	4	Command error or SVM occupied during initialisation or alarm notifications	0..4
NO DIALTONE	6	No dialling tone detected	4
BUSY	7	Telephone number occupied	3,4
NO ANSWER	8	No modem detected after dialling out	0..4

5.1.1 ATA

After receiving a RING, the modem can be started by means of the ATA command. After the ATA command has been sent, the responses CONNECT (...) or BUSY should be awaited. If data is transmitted via the COM port during this time, the establishment of the connection is interrupted (without modem response).

5.1.2 ATD

The ATD command can be used to establish a modem connection. The original telephone number of the receiving modem is entered after the ATD. The SVM will disregard this number and set up



an IP connection with the selected server. After the ATD command has been sent, one of the responses CONNECT (...), NO DIALTONE, BUSY or NO ANSWER should be awaited. The establishment of the connection cannot be terminated by sending data to ATD.

5.1.3 ATE

ATE determines whether commands that have been typed are also sent back to a user. This is handy if a user is in contact with the SVM for terminal emulation, as the user can see precisely what has been entered. Some applications are, however, impeded by the returned characters. This is often the case where the modem is controlled by an automated system, such as a PLC. After ATE the modem responds with OK.

ATE0 (Echo off) typed commands are not sent back
ATE1 (Echo on) typed commands are sent back (=standard)

5.1.4 ATH

ATH is used to interrupt an active modem connection. The modem should first be set to command mode (see +++). After the ATH command has been sent, the modem responds with OK.

5.1.5 ATI

ATI can be used to request modem information so that differences in model or version can be determined. After the ATI command has been sent, the modem information is given, followed by OK.

ATI0 Requests the type code of the SVM in question
ATI1 Requests the version number of the SVM firmware
ATI2 Requests the date of firmware
ATI3 Requests the type of GSM modem
ATI4 Requests the IP address of the 3G modem

5.1.6 ATL

Speaker volume; not supported but responds with OK for compatibility.

5.1.7 ATM

Speaker on/off; not supported but responds with OK for compatibility.

5.1.8 ATO

ATO facilitates switching from command mode (see +++) to modem mode. This only takes place if a modem connection has already been established. The modem responds with CONNECT (..).

5.1.9 ATQ

ATQ switches the modem responses on and off. Some automated systems cannot process these modem responses, in which case the response should be switched off. The response to ATQ is OK.

ATQ0 (Quiet off) modem does respond (=standard)
ATQ1 (Quiet on) modem does not respond



5.1.10 ATS

The modem has so-called S registers to store certain settings. These registers can be read and described using ATS. Use a question mark (?) to read an S register. For example, the command `ATS0?` reads S register 0. The modem responds with the value of the requested register followed by OK. The equals sign (=) can be used to write to this register. For example, `ATS7=55` sets S register 7 to the value 55.

The SVM contains the following S registers:

ATS0 controls automatic answering if the modem is called. If S0 is set to 0, there is no automatic answering (=standard). Every value greater than 0 signifies the number of rings after which the modem must pick up. The modem starts up automatically in the same way as when the ATA command is used. The modem then responds with `CONNECT (...)` or `BUSY`. If data is transmitted via the COM port during this time, the establishment of the connection is interrupted (without modem response).

ATS7 determines the maximum time that may be taken to establish a modem connection. If the connection has not been established after the specified time (in seconds), the attempt is suspended and the modem goes into idle mode. The standard setting is 90 seconds (`ATS7=90`).

5.1.11 ATV

ATV determines whether the modem responses are given in the form of legible text or a numerical code. The latter is needed for certain automated systems that control the modem. The modem responds with OK (or 0).

ATV0 Modem gives numerical responses (numerical code)

ATV1 Modem gives text responses (=standard)

5.1.12 ATX

Response to switchboard signals; not supported, but responds with OK for compatibility.

5.1.13 ATZ

ATZ resets the modem to its initial position. All settings are returned to the last stored value and any connection is interrupted. The modem response is OK.

5.1.14 ATN

Fault checking on/off; not supported but responds with OK for compatibility.

5.1.15 AT%C

Data compression; not supported but responds with OK for compatibility.

5.1.16 AT&D

A modem connection can be terminated by the transmission of a DTR signal. However, if this signal is not present, this functionality should be switched off with the AT&D command.

AT&D0 DTR signal is disregarded and is presumed to be "ON". It is thus possible to work with terminals that do not have a DTR signal (=standard)

AT&D1 Does the same as the AT&D2 in the SVM

AT&D2 "hang-up". The modem is switched "OFF-LINE" if the DTR signal becomes inactive.

5.1.17 AT&F

AT&F resets all modem settings to the factory default. The response is OK.



5.1.18 AT&W

Store standard settings; not supported but responds with OK for compatibility.

5.1.19 AT+CSQ

Requests the RF reception quality. The value is shown on a linear scale from 0 to 31, where 0 corresponds to no reception (0%) and 31 to maximum reception strength (100%).

5.1.20 +++

When the modem is in data mode, +++ can be used to switch back to command mode. From command mode the connection can be terminated, for example (see ATH). To prevent switching from taking place too quickly, the +++ symbols should be preceded and followed by 1 second of data silence.

The modem thus switches to the command mode after: 1sec. rest, +++, 1sec. rest. The modem response is OK. Commands can then be entered.



6 Appendices

6.1 LED status indication

Number of flashes for error (red)	
1x	Problem with GSM module
2x	No SIM card detected
3x	Incorrect pin code
4x	PUK code necessary
5x	Power failure
6x	No SMS central number / no antenna level
7x	No telephone number coupled to input / 2G/3G connection cannot be established / Ethernet error
8x	Connection to external server cannot be established.

Number of flashes for network (orange)	
Off	No antenna
Constant	Connected to external server
1x	Antenna level 1% <> 20%
2x	Antenna level 21% <> 40%
3x	Antenna level 41% <> 60%
4x	Antenna level 61% <> 80%
5x	Antenna level 81% <> 100%
1x long	In case of modem emulation, ring signal
Faster	Establishing connection (client mode)



Number of flashes for on/busy (green)	
Off	SVM is switched off
On	SVM is switched on
Faster	Starting up / sending message
1x	Input 1 active
2x	Input 2 active
3x	Input 3 active
4x	Input 4 active
5x	Input 5 active
6x	Input 6 active
7x	Input 7 active
8x	Input 8 active

**6.2 Technical specifications**

General		
Number of dialling numbers	3 call lists, each containing 8 dialling numbers per call list, maximum of 20 digits per dialling number	
Notification by:	SMS message or text message over IP network	
Input/output options (differs for each SVM model)	Contact input	0 - 2
	Digital input (0=10V)	0 - 2

Physical properties	
Connection	DIN rail (TS35) enclosure
Dimensions (D x W x H)	104 x 95 x 23 (mm)
Weight:	125g
Max. operating temperature	-20°C to +55°C
Air humidity	Between 20 and 85 % (without condensation)
IP code	IP10
Operational height	Up to 2000 metres (Above 2000 metres the max. operating temperature is reduced by 1.5°C per 300 metres up to a maximum height of 4000 metres)
Enclosure	Fire resistant UL94-V0

Power supply	
Power supply:	Nominal: 1-2 watts (2W whilst the supercap is charging) Peak: 8.5 watts / 18 VA (AC) Imax: 0.75A @ Vin= 11.4 V
Power supply range	11.4 - 37.5 V DC (SELV) 24 V (± 10%)AC (SELV)* * if 24 Vac is used, it is possible that communication will not work if the following situations all arise at once. - GPRS 800/850 MHz mode - Weak connection with GSM mast (for example in the event of an incorrect antenna combination) and - Multi-slot class 1 to 10 not supported by the provider
Built-in emergency power supply	Supercap; this means the emergency power supply is very quickly charged and the dialler can still send a few alerts in the event of a mains power failure



GSM/GPRS/UMTS	
Mobile network:	GSM/GPRS/EDGE 850/900/1800/1900 MHz (Quadband) UMTS/HSPA+ 800/850/900/1900/2100 MHz (Pentaband)
Power supply	Class 4 (+33dBm \pm 2dB) with EGSM850 Class 4 (+33dBm \pm 2dB) with EGSM900 Class 1 (+30dBm \pm 2dB) with GSM1800 Class 1 (+30dBm \pm 2dB) with GSM1900 Class E2 (+27dBm \pm 3dB) with GSM 850 8-PSK Class E2 (+27dBm \pm 3dB) with GSM 900 8-PSK Class E2 (+26dBm +3 /-4dB) with GSM 1800 8-PSK Class E2 (+26dBm +3 /-4dB) with GSM 1900 8-PSK Class 3 (+24dBm +1/-3dB) with UMTS 2100, WCDMA FDD BdI Class 3 (+24dBm +1/-3dB) with UMTS 1900, WCDMA FDD BdII Class 3 (+24dBm +1/-3dB) with UMTS 900, WCDMA FDD BdVIII Class 3 (+24dBm +1/-3dB) with UMTS 850, WCDMA FDD BdV Class 3 (+24dBm +1/-3dB) with UMTS 800, WCDMA FDD BdVI
Antenna connection:	Connector type SMA female

Ethernet	
Type	10Base-T/ 100Base-TX
Auto MDIX	Yes

EMC rules	
CE	Emission: EN 301 489-01 V1.9.2 & EN 301 489-03 V1.4.1 (Class B) Immunity: EN 301 489-01 V1.9.2 & EN 301 489-03 V1.4.1(Class A)

Safety	
CE	EN 60950-1 (2006) + A11 (2009) + A1 (2010) + A12 (2011) + AC (2011) + A2 (2013)

Expected service life	
Calculated MTBF (According to component-counting method)	88167 hours (= 10 years)

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