ELBRO BUTLER

ELBRO AG
Swiss Technology Company

User's Guide

SMSB482

SMS Switch Butler

Warning notices

This manual contains notices which you must observe for your personal safety and for the avoidance of property damage. The notices for your personal safety are emphasised with a warning triangle; warnings of general property damage do not have a warning triangle. Depending on the hazard level, warning notices are designated as follows in descending in order of severity.

DANGER

means that death or severe bodily injury will occur if the corresponding precautionary measures are not taken.

WARNING

means that death or severe bodily injury can occur if the corresponding precautionary measures are not taken.

CAUTION

with a warning triangle means that minor bodily injury can occur if the corresponding precautionary measures are not taken.

CAUTION

without a warning triangle means that property damage can occur if the corresponding precautionary measures are not taken.

ATTENTION

means that an undesired result or status can occur if the corresponding notice is not observed.

If multiple hazard levels are present at the same time, the warning notice with the highest level is always used. If a warning notice against personal injury has a warning triangle, the same warning notice can also include a warning against property damage.

Qualified personnel

The product/system corresponding to this documentation may only be handled by personnel qualified for the respective task in observance of the documentation corresponding to the respective task, particularly the safety instructions and warning notices contained therein. Qualified personnel are capable of recognising risks and avoid potential dangers when working wit these systems and products due to their training and experience.

Exclusion of liability

We have carefully checked the contents of the documentation and the conformity with the described hardware and software. However, deviations cannot be eliminated altogether. Therefore we assume no guarantee for the exact conformity. The specifications in this documentation are reviewed regularly and necessary corrections are included in the subsequent editions.

Comments

- **All information contained in this document can be changed without prior notification.**
- The duplication of this manual is, depending on the respective technology and means used for this purpose, both electronically and physically, including photocopies or saving, are only permitted to the user for personal use and prohibited in all other cases without special written authorisation.
- The use, copying, modification, dismantling or transfer of the software are only permitted for the purposes expressly authorised by this license; otherwise they are prohibited.
- All other brands or products relate to the respective owners.

Table of contents

Safety instructions

- The SMSB482 contains the latest generation of GSM quad-band module. The instructions contained in this manual must be precisely observed for correct installation and proper use.
- Do not install the SMSB482 in the vicinity of pacemakers, hearing aids or medical devices in general. The SMSB482 can interfere with the correct operation of these devices.
- The SMSB482 may not be installed in aircraft.
- The SMSB482 may not be operated in atmospheres with gas or flammable gases.
- The SMSB482 operates using a wireless signal. No wireless operator can guarantee a connection at all times. For this reason the SMSB482 cannot be used with emergency call systems.

Installation

For the safety of the user and in order to ensure the fault-free operation of the SMSB482, the device may only be installed by qualified experts. The specifications listed below must also be observed.

Environmental conditions

The SMSB482 (the device and all connected cables) must be installed in locations which satisfy the following conditions:

- No dust, no moisture, no high temperatures
- No direct solar radiation
- No devices which radiate heat
- No objects which generate a strong electromagnetic field
- No corrosive liquids or chemical substances
- The SMSB482 was designed for operation at temperatures between and 45 °C (standard operating temperature).
- Sudden changes in temperature and/or humidity must be avoided.

Protection class

The following protection class must be ensured with the installation of theSMSB482:

- IP40: Minimum protection class which must always be ensured
- IP54: Protection class which only has to be ensured for use outdoors

Supply ⚠

The following specifications must be observed:

- Do not use any cables longer than 2m
- The external power supply unit must conform to European standard EN60950 (Electrical safety)
- Ensure the correct polarity (+/-)

Digital and analogue inputs

The following specifications must be observed:

- Only zero-potential contacts may be connected. If analogue sensors are connected, they must be suitable for this purpose and certified.
- Do not use any cables longer 2m.
- Do not connect analogue inputs to sources of voltage.
- Do not install cables near electromagnetic fields; otherwise use shielded cable.
- Ensure the correct polarity for the analogue inputs.

Relay outputs ⚡ ⚠

- Observe the technical data in the corresponding chapter.
- Do not use any cables longer than 2m.
- Use the same voltage level for all relays: With high-voltage circuits, only the phase conductor may be connected via the relay contacts.

Dimensions

Interfaces
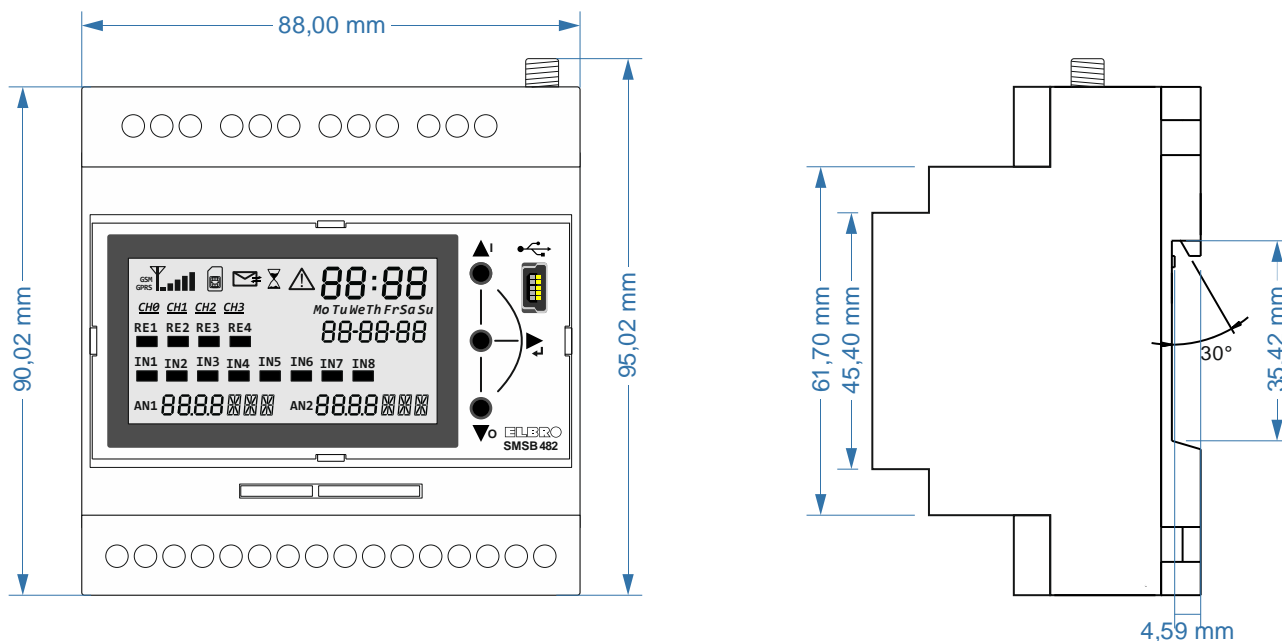
1. Relay outputs
2. SMA antenna connection (female)
3. Mini-USB B port
4. Micro SD card slot
5. SIM card slot
6. Infeed
7. Digital inputs (shared earth)
8. Analogue inputs (shared earth)
9. Code switch for analogue inputs
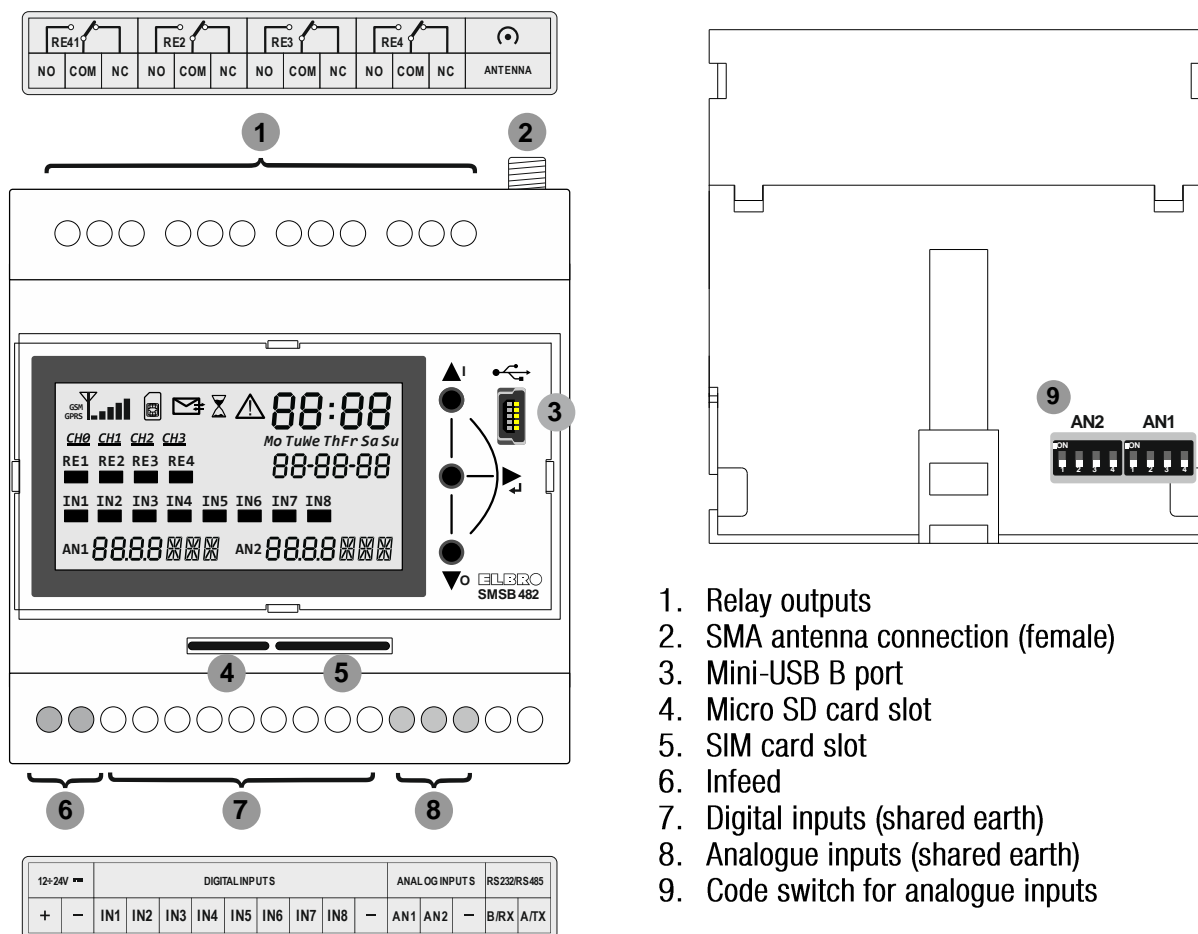
Wiring diagram

Infeed, relay outputs and digital inputs

For each relay, the output maximum current is 5A.
Total sum must not exceed 10A at 250V~

EARTH N L

LOAD1 LOAD2 LOAD3 LOAD4

85÷265V~
12÷24V
1000mA
− +

NC	COM	NO	NC	COM	NO	NC	COM	NO	NC	COM	NO	
RELAY 1			RELAY 2			RELAY 3			RELAY 4			

SMSB482

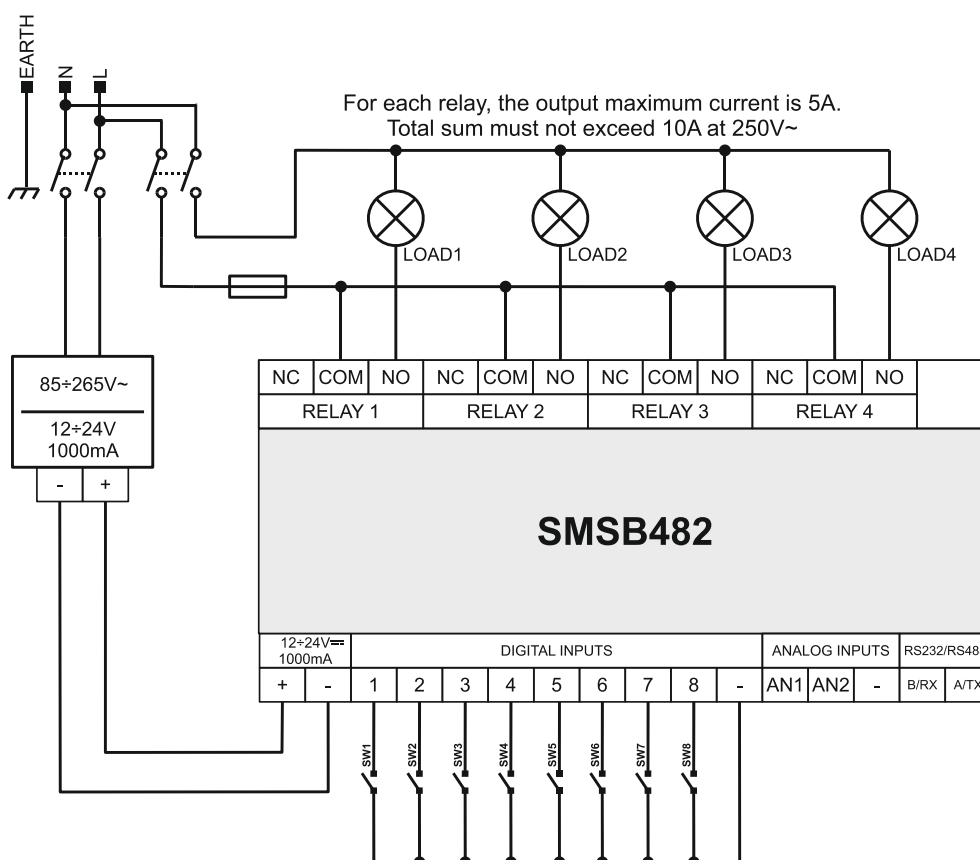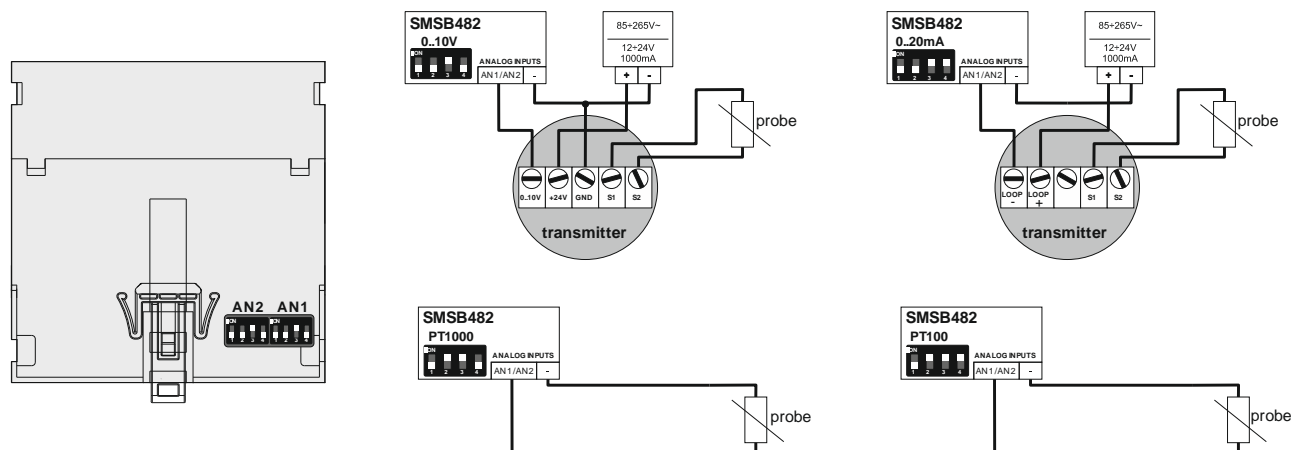| 12÷24V 1000mA		DIGITAL INPUTS									ANALOG INPUTS			RS232/RS485	
+	−	1	2	3	4	5	6	7	8	−	AN1	AN2	−	B/RX	A/TX

SW1 SW2 SW3 SW4 SW5 SW6 SW7 SW8

Maximum switching capacity per relay:

⚠️ 5A 250V~ ; 2A 30V=
   ⚠️ Maximum switching capacity over all relays: 10A
   ⚠️ This value may not be exceeded.

⚡⚠️ Do not connect any different voltages to the relay:
   With 250V~ circuit: Connect only the phase conductor: Never not connect phase and neutral conductors simultaneously at the relay contact.
   With low-voltage circuit (DC): Connect only the plus pole.

Analogue inputs

AN2 AN1

SMSB482
0..10V
ANALOG INPUTS
AN1/AN2 −

85÷265V~
12÷24V
1000mA
+ −

probe

0..10V +24V GND S1 S2

transmitter

SMSB482
0..20mA
ANALOG INPUTS
AN1/AN2 −

85÷265V~
12÷24V
1000mA
+ −

probe

LOOP− LOOP+ S1 S2

transmitter

SMSB482
PT1000
ANALOG INPUTS
AN1/AN2

probe

SMSB482
PT100
ANALOG INPUTS
AN1/AN2

probe

GSM antenna connection

Connect a GSM antenna (optional) with a gain of 0 dBm to the female SMA connection.

Digital alarm input connection

Connect the digital inputs to zero potential contacts of contactors, stepping switches and/or electromechanical switches (as shown in the wiring diagram) in observance of local regulations.

Relay output connection

The installation specifications must be strictly observed in consideration of the rated data (see corresponding chapter).

What is the SMSB482?

ELBRO AG developed the SMSB482 to meet the widest range of customer requirements. It is an innovative tool for the remote control of private and industrial applications via the GSM network. This new system enables remote control of up to four devices and the monitoring of up to eight alarms by means of simple SMS commands. The SMSB482 has four 5A relay outputs and eight zero-potential alarm inputs which do notify the registered administrators via SMS about the status of the installation, such as faults within an installation. The SMS text is freely configurable for each alarm input for both normally open and normally closed contacts. The device is password-protected and manage up to eight users.

In order to simplify the installation and operation of the device, the SMSB482 is equipped with a large, intuitive LCD display, which shows information about the GSM signal strength, status of the inputs and outputs, date and time, any errors, etc.

The SMSB482 is very versatile: With the two built-in analogue inputs which are freely configurable to 0-10V, 0-20mA, PT100 and PT1000 by means of code switches, it is possible to set up to two thresholds per analogue input, which trigger an SMS alarm when the values are undercut or exceeded. The measured values are shown directly on the display and by means of a status query via SMS. They can also be recorded electronically in the integrated microSD card (datalogger function).

The SMSB482 operates with subscription or prepaid mini SIM cards from mobile telephone operators, the DIN housing enables easy installation into the switch cabinet, the operating voltage is 12-24VDC, the configuration can be transmitted via PC software and mini USB connection. The installation software is stored on the integrated microSD card and is thus safeguarded against loss and the card can be used after several years for reprogramming.

Thanks to the built-in backup super capacitors, the registered users can be notified via SMS in case of power failures.

SMSB482 interface

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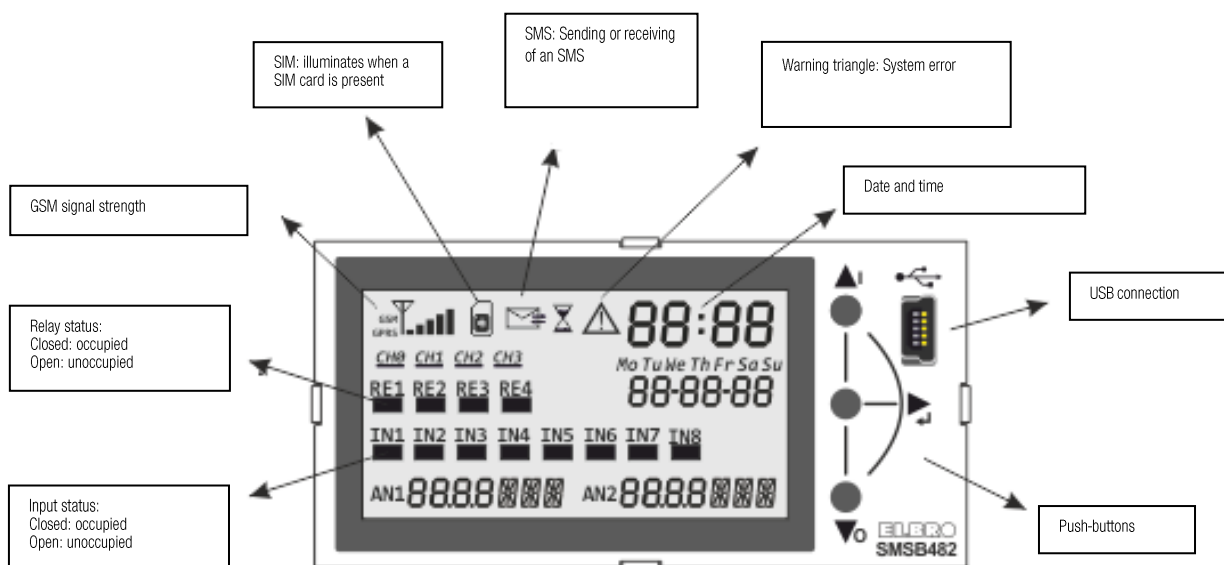
Installing the SIM card

The SIM PIN code, automatic telephone answerer and any services by the provider must be deactivated before installing the SIM card. Ensure that there is credit available on the SIM card and it is recommended to test the functions like calling and sending an SMS with a standard mobile phone.

The SMSB482 works with subscription or prepaid SIM, telephone or data cards. Due to the large number of inputs, the available credit on the SIM card may be used up immediately due to sending multiple SMS alarms, whereby the function of the device is impaired. We recommend the use of a **subscription SIM card**, because it uses its own wireless channel for data transmission.

If a prepaid SIM card is used, the SMSB482 has a **credit query function**. We recommend activating this function in order to always remain informed of the current available credit.
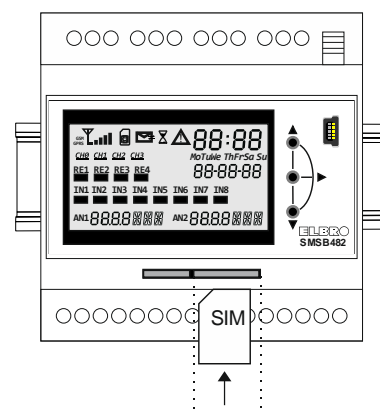
Installation software

The installation software of the SMSB482 is stored in the microSD mass storage.

In order to start the butler in MSD mode for installing the software please proceed as follows:

1. Switch off the device (disconnect the supply cable and USB connection)
2. Press and hold the (▲) button and connect the USB connection cable to the PC;
3. After a few seconds the mass storage is automatically recognised and the folder is opened.
4. Click on setup.exe to install the software;
5. After successful installation, disconnect the USB cable and the device can be switched on again.

Software description

System status

This panel displays the SMSB482 system status on the PC. Every device information is gathered here, such as the input status, output status, GSM signal level, etc.. If the main power is connected, the relay output statuses can also be changed by simply clicking on the RE1-RE4 buttons.

The LOG table displays all the events occurring in the machine such as receiving or sending a text message as well as any input status change.

This table will be reset when the software is restarted.
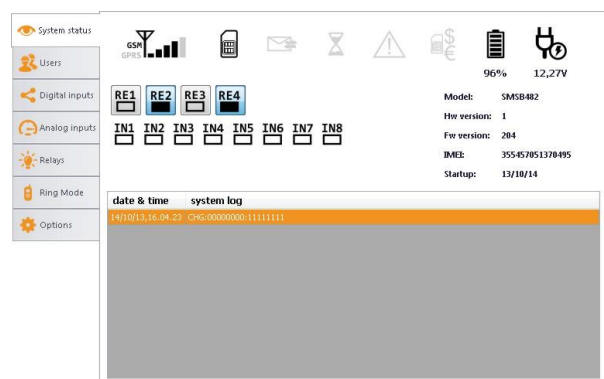
Password

In order to ensure the system safety, the device prompts the operator to enter a four-digit password to be able to send SMS commands. The default password is made up of four zeroes (0000). Please refer to the SMS commands section to get an overview of all available commands.

Users

This list contains the phone numbers of users (up to eight) authorized to receive alarm messages and SMS notifications.
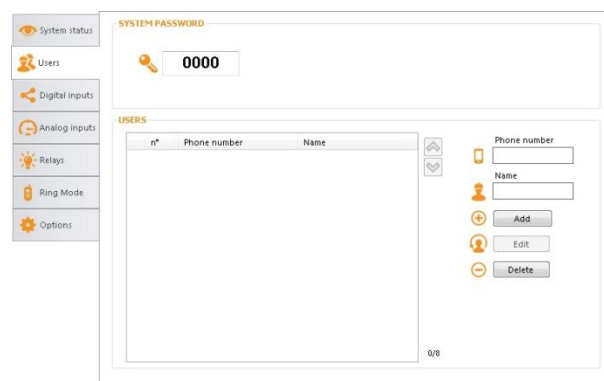
Digital Inputs

Digital inputs allow the user to know specific events regarding the system or the equipment to which the device is connected, such as a possible boiler block or current drop, as well as a valve opening, etc.

SMSB482 has eight alarm inputs, each of which allows sending to specific users an SMS when the contact is either opened or closed. The text is customizable for each event; the event can also be delayed in order to avoid false alarms (anti-bounce) and text messages can be sent sequentially.

Sequential function

The sequential mode is useful for plant supervisors that have several operators who can work in case of failure.

It allows sending sequentially the digital input alarming messages observing the order found on the list of users with a time interval (default 5 minutes) that can be configured on the system clock screen. The message will however be different compared to the customized standard, since the user must accept and lock the sequence by sending the command "QUIT" to the device before working. At this point the SMSB482 will send an SMS message exclusively to those users that were previously noticed, indicating the user that has accepted and therefore blocked the sequence. If no user blocks the sequence, the SMSB482 will repeat the entire operation.

In case there is another alarm following the device will automatically block the sequence and will send a message (custom) exclusively to those users that had been previously notified.

LINK Function

This function allows exchanging the status of the relay outputs when an event occurs on the digital inputs. Since the device has only 4 relays, the LINK function can only be activated for inputs 1,2,3 and 4.

NOTE: The changeover only takes place during an input change of state (event occurrence).

Analogue inputs

The SMSB482 has two analogue alarm inputs that can be configured in 0-10V, 0-20mA, PT100 and PT1000 with which text messages can be sent to a maximum of eight users when a threshold is exceeded. Two different thresholds can be set for each input.

Refer to the installation diagram to correctly set the dip-switch considering the chosen sensor.

Datalogger

If enabled, it collects the values of the analogue sensors in the microSD card in a CSV file. The sampling time can be set. The micro-SD card can be removed and read with a card reader, or else the device can be activated in SD mode (⬛) to read the card.
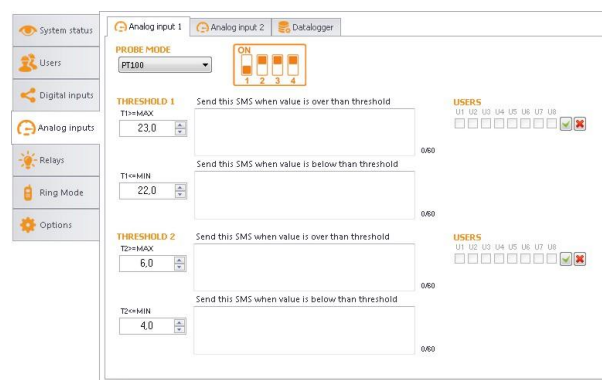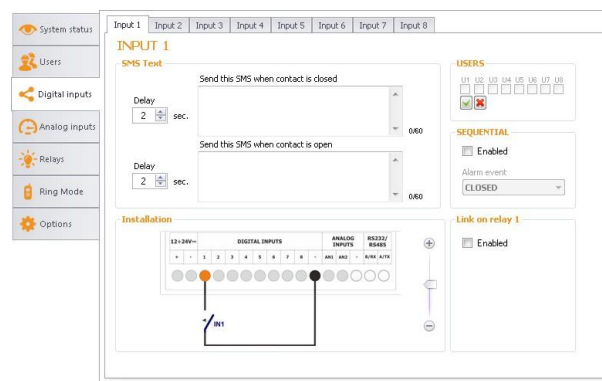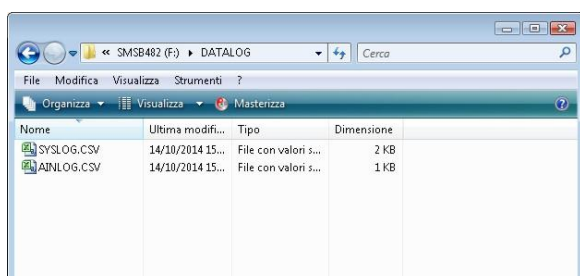
Relay

The relays can be managed manually, by phone ring function or through SMS.

When a switch-on or switch-off command is sent by SMS, the SMSB482 replies with a customizable SMS notification. This screen allows setting the text message for each relay.

Phone ring function (RING)

The device is able to store a list of phone numbers with their relevant names (max 300) that are authorized to activate and/or deactivate the relay output 1 with a simple phone ring at no cost. The device detects the incoming call and immediately hangs up, activating at the same time the system it is connected to.

This function can be set through the following modes:

- **Exchange**: simple relay exchange is done (ON/OFF)
- **Pulse**: a programmable pulse of 1 up to 65535 seconds (ca. 18 hours) is performed

The user can also activate the SMS feedback option (replying SMS) allowing the reception of an SMS confirming the system status on the mobile phone from which the phone ring was made.

The PULSE mode also allows customizing the SMS that confirms the command execution.

Option: No mains electricity

This feature allows selected users to receive a notification message when there is a power failure (power drop) and/or when power is restored.

To perform this function, the device is equipped with two super-capacitors; they require at least 30 minutes charging before any SMS can be sent.

The charge status can be viewed as a percentage in the 'System Status' screen.

Option: SIM credit (credit balance)

It is a very innovative feature for prepaid SIM cards, it allows communicating to the remote user the credit balance of the SIM card to which the device is connected. Since every phone carrier has a different method to query the credit, this feature can be configured in the three typical modes foreseen by current phone operators:

- Quick command – for querying the credit.
- Call – for querying the credit.
- Free SMS – for querying the credit.

Please consult your phone carrier for the specific credit query parameters.

This feature is not 100% guaranteed as every phone carrier has a different method to check the credit balance; in addition, they are always evolving.

Option: System clock

The system date can be updated in this screen; the system date is synchronized with the operating system (Windows).

Date and time are only used for the datalogger function.

The pause time between one user and the following of the sequential function can be changed in this screen.

Option: SMS Timer

This function periodically sends a system status SMS to the enabled users (daily, weekly or monthly). This mode is useful to keep a system monitored or to avoid SIM Card's expiration.
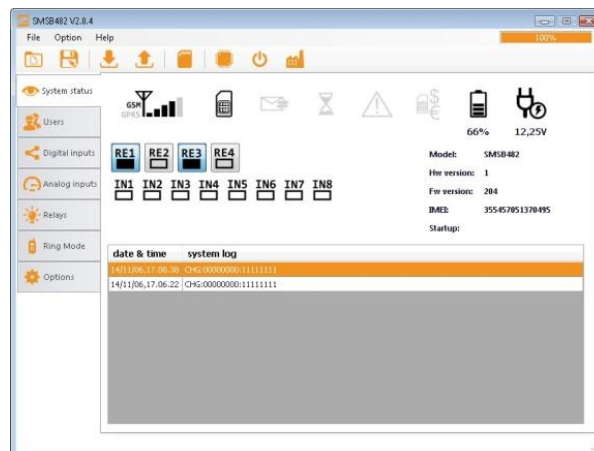
Toolbar

![icon] Loads settings from a file on the PC.

![icon] Save settings on a file

![icon] Reads settings saved in the SMSB482

![icon] Writes settings on the SMSB482

![icon] Switch to SD mode (the device becomes a mass storage device)

![icon] Returns to operation mode

![icon] Updates the firmware

![icon] Restarts the device

![icon] Resets the device to default settings

SMS commands

The SMSB482 can be configured and controlled through a command set that can be sent by sms. The command message is password protected (see chapter system password). The following is the command message format:

[PASSWORD]#[COMMAND]   for example: 0000#R1#1 (relay n.1 switch-on)

The password is always 4 character long plus #; the hash tag is a mandatory separator.
Commands can be linked and include spaces i.e. 0000#R1#1 R2#1 -> turns relays 1 and 2 on
The following table includes a list of SMS commands with their relevant description and example:

Command	Description	Example
[PW]#R[1-4]#0	deactivates relay outputs from 1 to 4	0000#R1#0
[PW]#R[1-4]#1	activates relay outputs from 1 to 4	0000#R1#1
[PW]#?	query on current status	0000#?
[PW]R[1-4]#T#[1-255]	generates a pulse from 1 to 255 seconds of the selected relay	0000#R1#T#5
[PW]#U?	Displays users	0000#U?
[PW]#U[1-8]:[NEW USER]	Adds or modifies the user on the indicated position	0000#U1:+123456789
[PW]#ADD:[NUMBER];[NAME]#	Adds a user to the RING list (phone ring function)	0000#ADD:+123456789;JERRY#
[PW]#DEL:[NUMBER]#	Removes a user from the RING list (phone ring function)	0000#DEL:+123456789#

Special commands

Stop sequential mode

Send the QUIT[1-8] command when requested by the device through alarm SMS.
Ex. QUIT1

Activation without reply

To stop receiving the replying message from the device, add the following code: **-NR** (meaning: no reply)

Ex. pulse without reply: 0000#R1#T#5-NR (activates relay 1 for 5 seconds and does not send any confirmation)

Software requirements

Operating system supported

- Windows XP SP3
- Windows Server 2003 SP2
- Windows Vista SP1 or later
- Windows 7
- Windows 7 SP1
- Windows 8

Supported architectures:

- x86
- x64

Hardware requirements:

Minimum suggested requirements: Pentium 1 GHz or higher with at least 512 MB of RAM

Minimum disk space:

- x86 850 MB
- x64 2 GB

Requirements:

Windows Installer 3.1 or later

Internet Explorer 5.01 or later

Technical data

GSM section	Quad-band mode 850-900Mhz, 1800-1900MHz
SIM card	Mini SIM
Supply	Rated supply voltage:12V÷24VDC; extended 9V÷24V DC Current: IMAX = 1000mA Power terminals: maximum conductors cross section 2.5mm^2 Power supply short-circuit protected through internal auto-resetting fuse Power supply protected against reverse polarity
Outputs	4 SPDT Relays; For each relay 5A, 250V AC (Resistive) - 2A, 30V DC. Maximum total load applicable to the device: 10A
Inputs	8 potential free contact digital inputs 2 analogue inputs: 0-10V; 0-20mA; PT100; PT1000
General specifications	Housing for DIN-rail (EN-50022), 5 modules Flammability: UL94V-0 Protection level: IP20 Standard operating temperature: from -5°C to +45°C Approximate weight: 250g Maximum conductors cross section that can be inserted in the terminals: 2.5mm^2 Programming port: micro-USB

Absorption (typical values)	Supply:	12V	24V
	Standby:	70mA	30mA
	Sending SMS:	250mA	150mA
	Relay switching:	500mA	300mA

Declaration of conformity

ELBRO AG herein declares that the product SMSB482 complies with the essential requirements and with the other relevant provisions of Directive 199/5/EC, and specifically:

EN 301 489-7 V1.1.1 (2000-09)

EN 301 511 V7.0.1 (2000-12)

EN 60950 (2000)