SAE
AUTOMATION, s.r.o.

SAEAUT SMS Server

User's Manual

Table of Contents:

0

1 Introduction

1.1 About

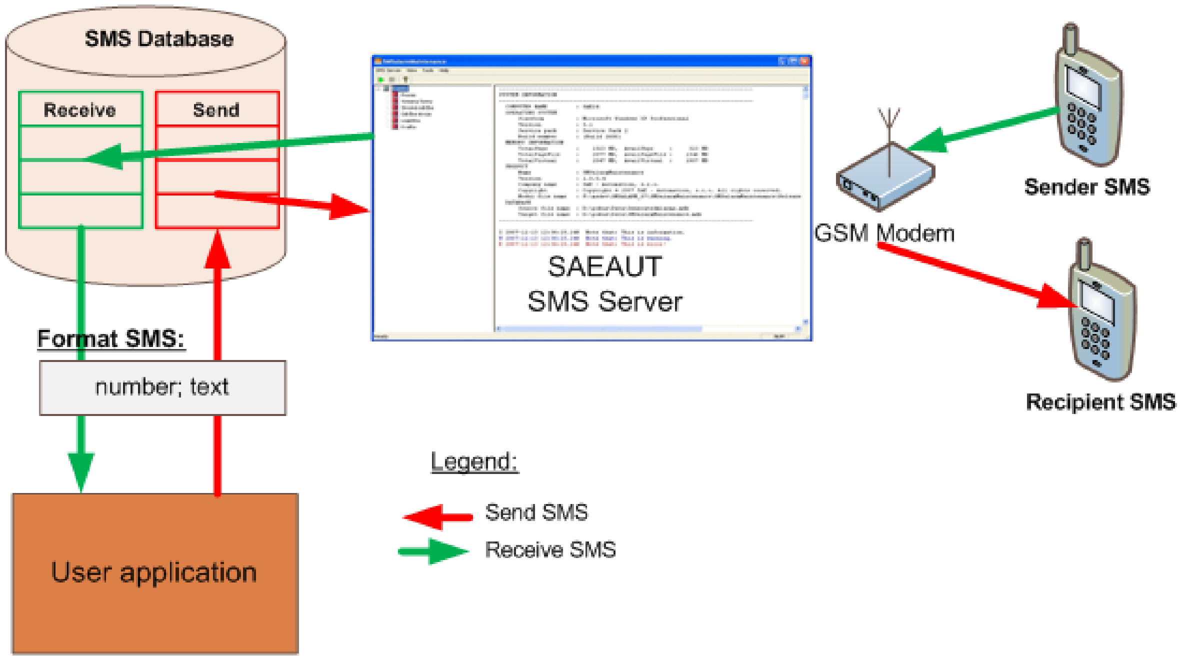
SAEAUT SMS Server is a group of application designed for:

1. sending and receiving SMS messages via devices with a GSM modem
2. for cooperation with other applications via database files

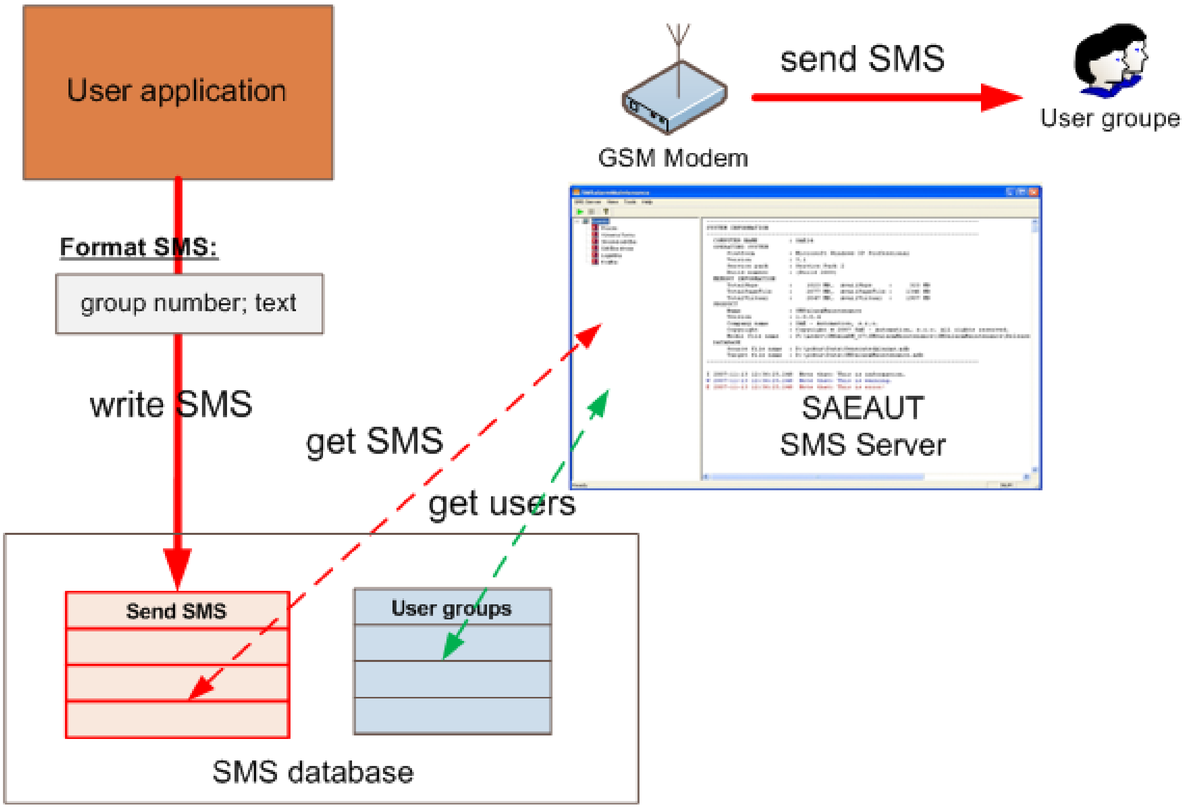
Guide how to use SMS server can be found here: Configuration, Controlling SMS Server

Main features:

1 Creation of recipient groupe and recipient structure that should receive a SMS message
2 Sending SMS message created by the client application
3 Receiving SMS message and processing
4 Open for other applications

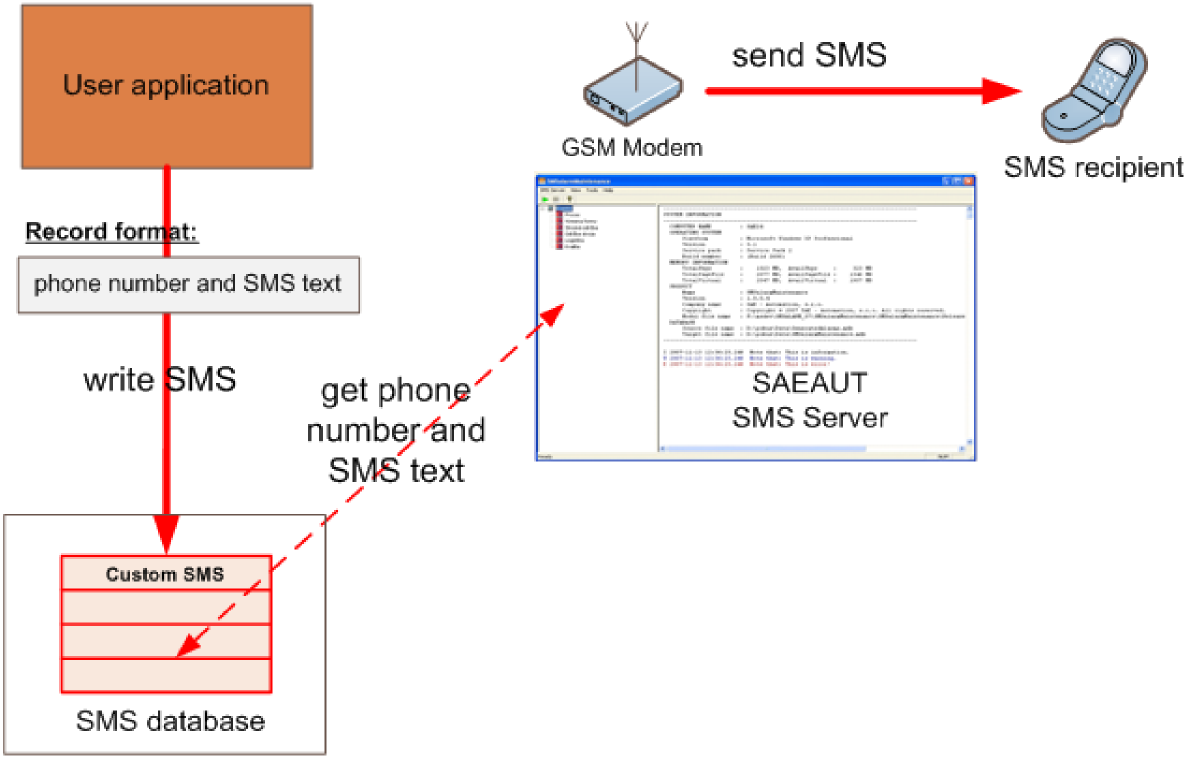


1. Sending SMS to defined group of recipents



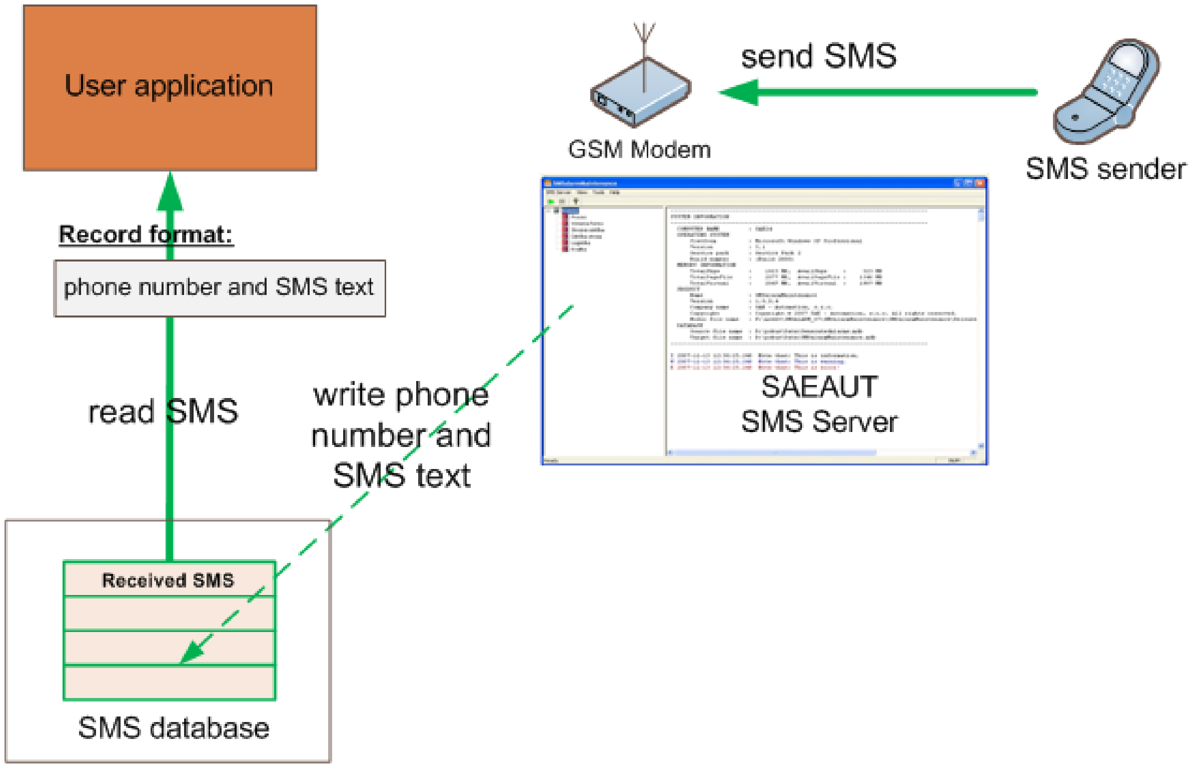
- User application adds a new record into database for sending SMS in a predefined format:
  group number; text
- When SMS Server detects a new record in the database, it retrieves users who belong to given user group.
- A SMS message is created based on the retrieved data and sent to each of the users via connected GSM modem.

2. Sending SMS to a specified phone number



- User application adds a new record into database for sending SMS. This record has to contain two inputs:
  1. **Recipent's phone number** (in separate column)
  2. **Text of SMS message** (in separate column)
- When SMS Server detects a new record in the database, it retrieves the phone number and the text of SMS message.
- A SMS is created based on the retrieved data and sent to the specified phone number via connected GSM modem.

3. Receiving SMS



- When SMS Server receives a SMS message, these data are stored in the database of received SMS.
- When the client application detects a new record in the database, it retrieves the data (phone number and the text of SMS) and displays them.

1.2 Main features

1. Communication

- Communication via GSM modem.
- Connection to GSM modem via: serial communication interface (RS-232); IrDA, Bluetooth, USB (virtual serial port).
- Communication parameters: serial port used, transfer speed, etc. can be configured directly using the application.
- Application is optimized for GSM modems by WAVECOM, SAMBA, FALCOM. (System is open for using GSM modems by other vendors.)

2. GSM parameters

- Connection to GSM network is interposed by a mobile network operator's SIM card. Application is optimized for services of operators as follows: ORANGE, T-MOBILE, O2. (System is open for use in networks of other operators.)
- PIN code for used SIM card can be set in the application.
- SMS center phone number (service center) can be set in the application.

3. Creating SMS message

- Maximum length of single SMS message is max. 160 characters.
- SMS message can be created by using simple client applications.

4. Sending SMS message

- SMS message can be sent to one or several phone numbers at once.
- Application can send two types of SMS messages:
  - *Group SMS messages* - SMS is sent to a predefined phone number(s) that are assign to the group.
  - *Custom SMS messages* - SMS created by client applications.

5. Receiving SMS message

- Application allows to receive two types of SMS messages:
  1. *Delivery report* about sent SMS message.
  2. *SMS sent by other user.*

6. Address book

- Allows to create phone numbers address book in the format: Name and phone number.

7. Application portabitlity

- Application user can create or use own application that can cooperate with SAEAUT SMS Server. These applications will communicate with each other through database interface.

1.3 System requirements

- **Computer/CPU**
  - Pentium II or compatible
- **RAM**:
  - 128 MB (256 MB recommended)
- **Communication interface**
  - Serial port
- **Operating system**:
  - Windows 98, Windows 2000, Windows XP, Windows Vista
- **Prerequisities**
  - In case of client web application a web server is required (IIS server best)
- **Free hard disk space**
  - 10 MB for full install

2 About SMS technology

SMS technology was created GSM pioneers in Europe and later accepted as ETSI standard. SMS technology was created to offer infrastructure for delivering short messages with the maximum length of 140 bytes (160 characters) in telecommunication networks. SMS message is created with the help of PDU standard and then over GSM networks. SMS message is transmitted as binary string that contains all required data for transfering message over GSM network.

GSM technology

GSM (Global System for Mobile communication) is the most popular standard for mobile phones in the world. GSM phones are being used by over 1 billion people from over than 200 different countries.

Widespreading of GSM standard makes international calling a conventional routine, thanks to "roaming agreements" among mobile network operators. GSM differs from its ancestors in digital quality of signal and communication channels, that means we speak about second generation (2G) of mobile phone systems. GSM is an open standard that is being developed by 3GPP.

GSM is backward compatible with original GSM phones. At the same time continues GSM standard by developing of packet data transmission, accepted to standard in 1997 under the common short name GPRS. Higher data transfer speed was introduced in 1999 as EDGE and UMTS (in this case we speak about 3G).

SMS message

Short text message (Short Message Service) describes a service available on most phones that allows sending short text messages between mobile phones. Its success made them spread also to landline phones.

SMS is one of the basic GSM services. SMS can be delivered also during a parallel call or forwarding, it is not possible to forward SMS unlike normal calls.

There are 2 basic types of SMS:

SMS-PP (Short Message Service Point to Point)

In single SMS message it it possible to use maximum of 160 characters, i.e. 140 octets. Some phone allow to send longer messages, however, the phone sends them like several 160-characters messages and the recipent's phone connects them again to a single SMS. This same applies when sending a message to more recipents but effectively they are sent as single message to each of the recipents.

SMS-CB (Short Message Service Cell Broadcast)

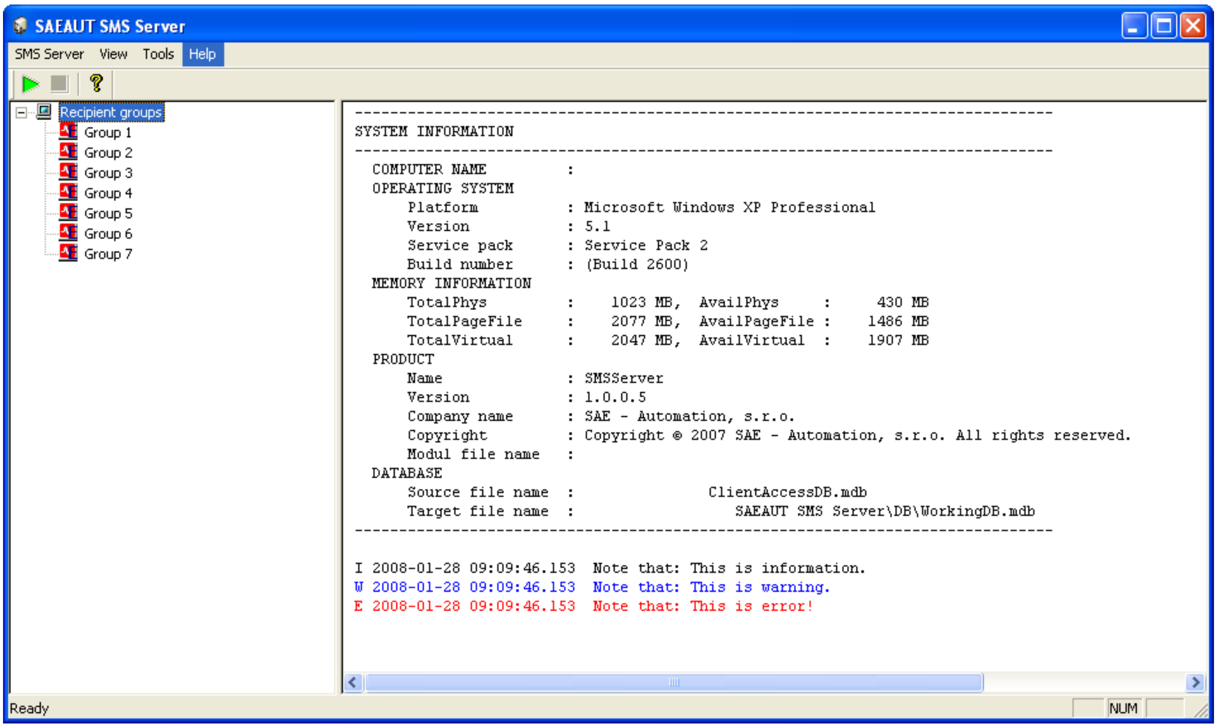
Maximum length is 93 characters.
This type uses so called Cell Broadcast channels. They are used for weather forecasts, local news, traffic situations or for localization services. The message is being sent to all phone in given area that have CB service turned on and particular channel is set.

(Source: http://sk.wikipedia.org/)

3 User Interace

3.1 Running SMS Server

After sucessful installation and application launch a window as follows appears:



```
-------------------------------------------------------------------------------
SYSTEM INFORMATION
-------------------------------------------------------------------------------
  COMPUTER NAME         :
  OPERATING SYSTEM
      Platform          : Microsoft Windows XP Professional
      Version           : 5.1
      Service pack      : Service Pack 2
      Build number      : (Build 2600)
  MEMORY INFORMATION
      TotalPhys         :    1023 MB,  AvailPhys     :     430 MB
      TotalPageFile     :    2077 MB,  AvailPageFile :    1486 MB
      TotalVirtual      :    2047 MB,  AvailVirtual  :    1907 MB
  PRODUCT
      Name              : SMSServer
      Version           : 1.0.0.5
      Company name      : SAE - Automation, s.r.o.
      Copyright         : Copyright © 2007 SAE - Automation, s.r.o. All rights reserved.
      Modul file name   :
  DATABASE
      Source file name  :               ClientAccessDB.mdb
      Target file name  :                  SAEAUT SMS Server\DB\WorkingDB.mdb
-------------------------------------------------------------------------------

I 2008-01-28 09:09:46.153  Note that: This is information.
W 2008-01-28 09:09:46.153  Note that: This is warning.
E 2008-01-28 09:09:46.153  Note that: This is error!
```

3.2 Configuration

To work with this application the user has to configure it first.

The configuration consists of several steps as follows:

1. Configuring GSM modem settings

When the user connects a GSM modem to the computer, the application has to be configured for this modem. The description of configuration parameters can be found at the tab Settings.

Default settings of most modems:

- Baud rate = 9600
- Data bits = 8
- Parity = no parity
- Stop bits = 1

- **SMS center phone numbers in Slovak Republic:**

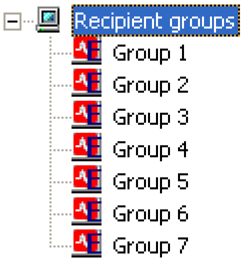
Orange	+421905303303
T-Mobile	+421903333000
O2	+421949909909

2. Configuring application settings

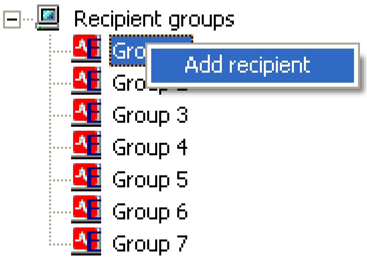
Before the user starts SMS server it is useful to enable or disable log files - Options.

3. Assigning recipient to particular recipient group

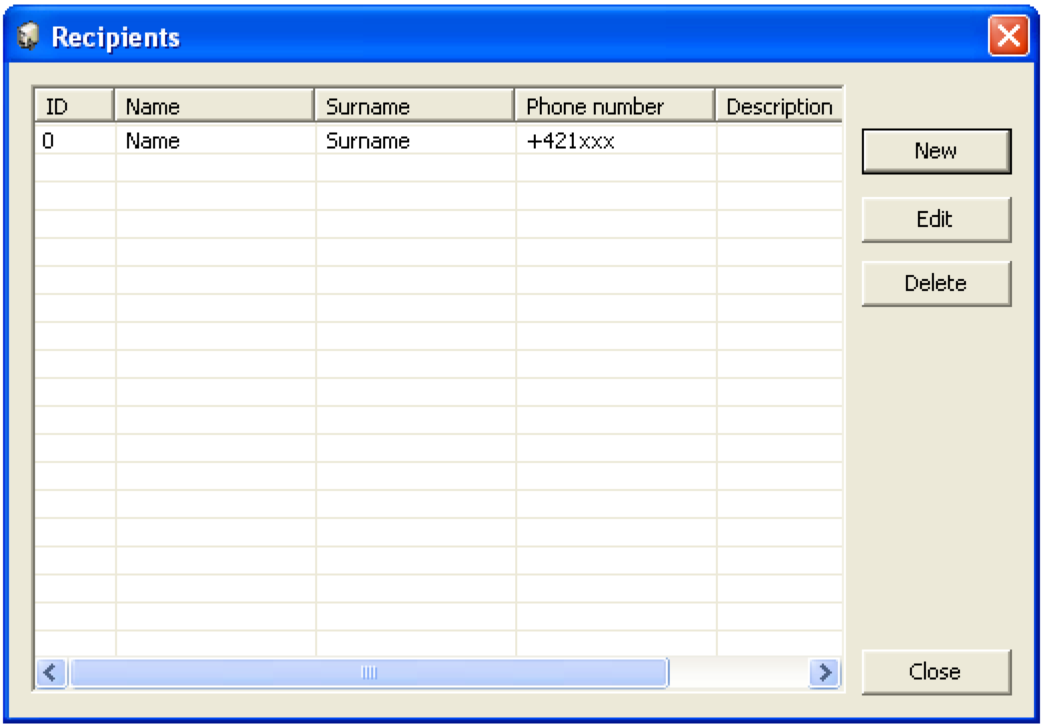
Application SAEAUT SMS Server includes function for sending SMS message to chosen recipient group. The recipient can be selected by the Recipients item. The list of events is located in the left panel.



When user wants add recipient to the selected group , right-click on group and choose **Add recipient**.

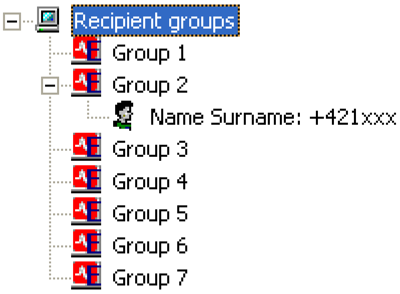


Then a dialog window appears that contains all recipients.

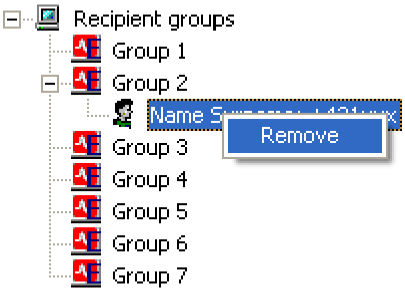


ID	Name	Surname	Phone number	Description
0	Name	Surname	+421xxx	

Click on the button **Add** to add recipient to the selected group.



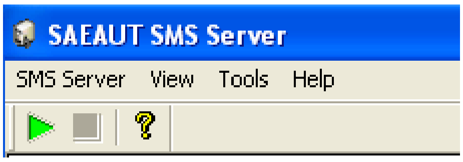
To remove a recipient from a selected group, proceed accordingly. Right-click on the recipient to remove and select **Remove**.



This way the user can create own **Recipient group - Recipient** configuration. After selecting Start item from the menu, the SMS server is launched.

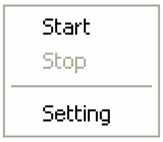
3.3 Navigation

Application menu server for application control.



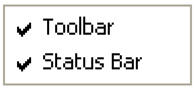
Application menu constains items group:

1. **SMS Server** - this group of command controls the run of SMS server.



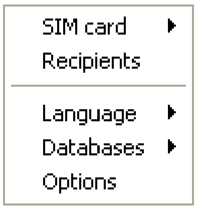
Start, Stop, Settings

2. **View** - this command shows / hides application components.



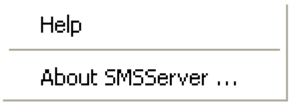
View

3. **Tools** - this group of command contains various utilities and application settings.



SIM card, Recipients, Language, Databases ,Options

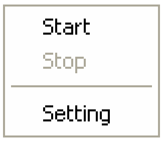
4. **Help** - To display help or details about application select **Help** menu.



Help

3.3.1 SMS Server

This group of command controls the run of SMS server. They are accessible through **SMS Server** menu.

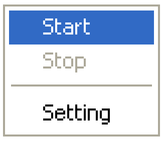


Contents of this command group:

- Start - start SMS server
- Stop - stop SMS server
- Settings - SMS server configuration

3.3.1.1 Start

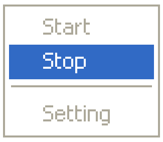
This command runs SMS server. It is accessible through **SMS Server - Start** menu or by pressing ▶ button on the toolbar.



After launching SMS server the initialization of connected GSM modem is performed. After sucessful modem initialization SMS server is ready to send and receive SMS messages.

3.3.1.2 Stop

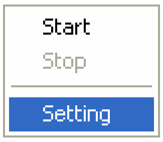
This command stops SMS server. It is accessible through **SMS Server - Stop** menu or by pressing 🟥 button on the toolbar.



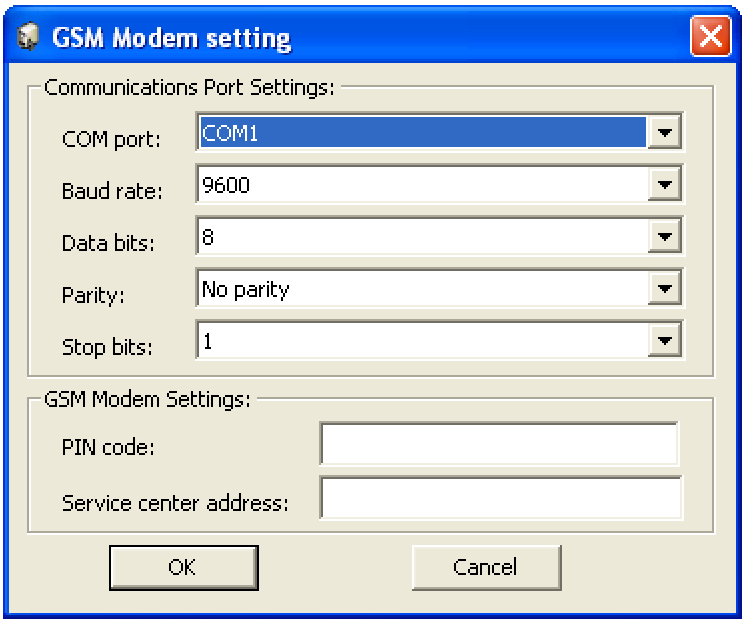
While SMS server is shutting down, first sending/receiving of current SMS message is finished and only then the SMS server is stopped.

3.3.1.3 Settings

This command displays a dialog window with GSM modem configuration parameters. It is accessible through **SMS Server - Settings** menu.



After selecting item a dialog window appears:


GSM Modem setting

Communications Port Settings:

COM port: COM1

Baud rate: 9600

Data bits: 8

Parity: No parity

Stop bits: 1

GSM Modem Settings:

PIN code:

Service center address:

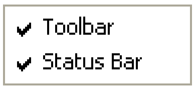
- **Communication port settings**
  - *COM port:*
    - COM port to be used by GSM modem
  - *Transfer rate (speed):*
    - transfer rate in bytes
  - *Data bits:*
    - number of bits
  - *Parity:*
    - way how parity is counted
  - *Number of stop bits:*
    - amount of stop bits

- **GSM modem settings**
  - *PIN code:*

  - SIM card PIN code used in GSM modem
- *SMS service center:*
  - telephone number of mobile network operator's SMS center

3.3.2 View

This command shows / hides application components. It is accessible through **Display** menu.

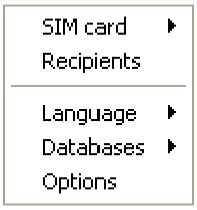


These commands allow to show/hide:

1. **Toolbar** - toolbar with icons.
2. **Status Bar** - application status bar.

3.3.3 Tools

This group of command contains various utilities and application settings. It is accessible through **Tools** menu.

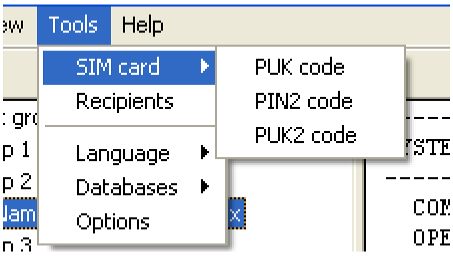


This group of commands contains:

- SIM card - utilities to unblock SIM card
- Recipients - utilities to manage recipients
- Language - language settings
- Databases - configuration of paths to database files
- Options - application settings

3.3.3.1 SIM card

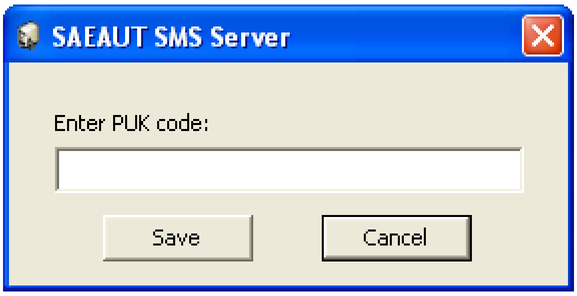
To unblock a blocked SIM card that is used in GSM modem go to the **Tools - SIM card** menu.



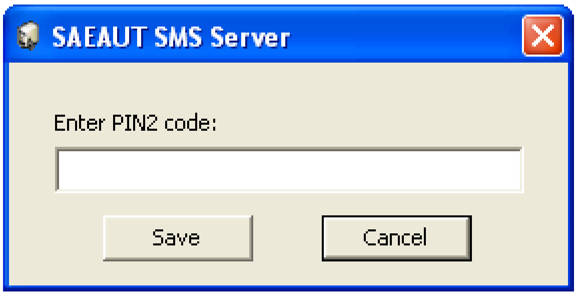
This group of command allows to unblock SIM card in various cases:

1. User entered wrong PIN number and repeatedly launched the application with incorrect PIN number. The SIM card is blocked after 3 attempts by default. After 10th attempt to enter PUK code the SIM card is definitely blocked and further

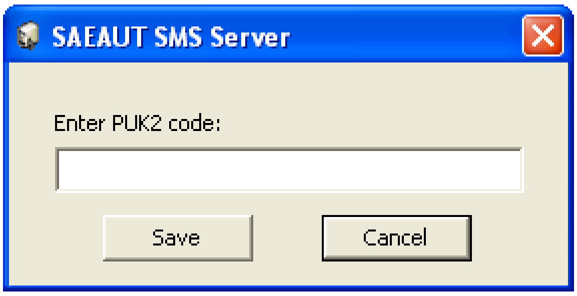
unusable. It is necessary to purchase new SIM card. To unblock a blocked SIM card the user can enter PUK code by selecting **Tools - SIM card - PUK code** menu.



2. **PIN2 code** is secondary protection code for some of the phone functions. It is necessary for some selected phone functions or network services. The user can enter the PIN2 code by selecting **Tools - SIM card - PIN2 code** menu.

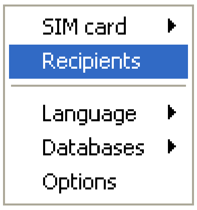


3. The user repeatedly entered incorrect PIN2 code. The SIM card is blocked after 3 attempts by default. To unblock the SIM card it is necessary to enter PUK2 code. The user can unblock the SIM card by selecting **Tools - SIM card - PUK2 code** menu.

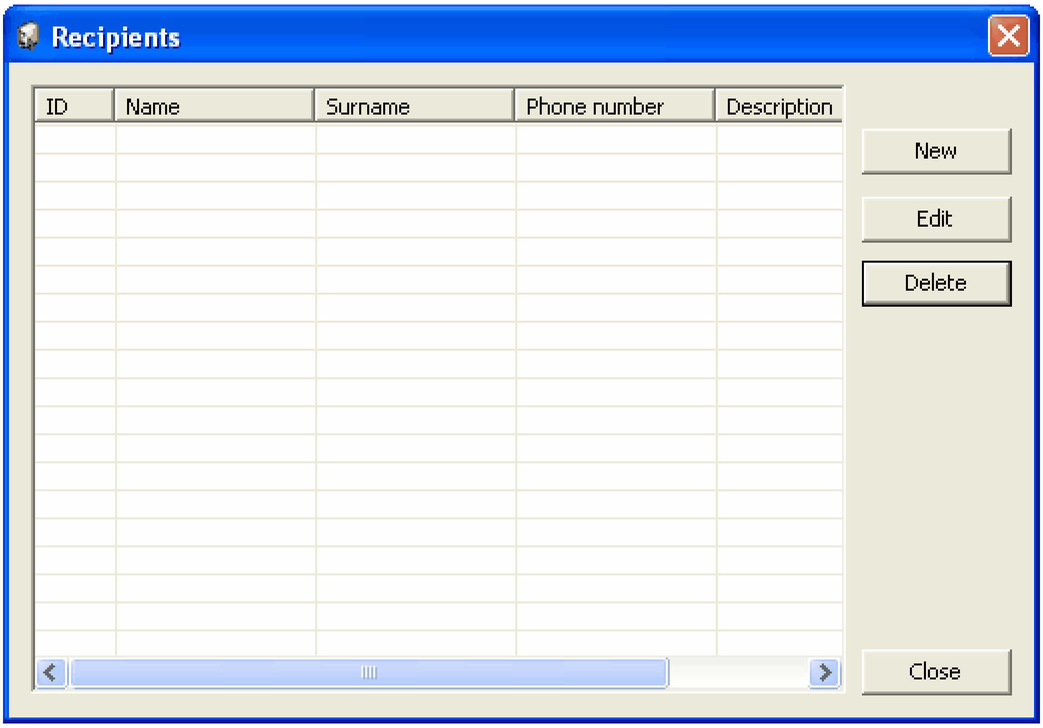


3.3.3.2 Recipients

To configure recipients that should be notified with a SMS in case of an group occurs, select **Utilities - Recipients** menu.

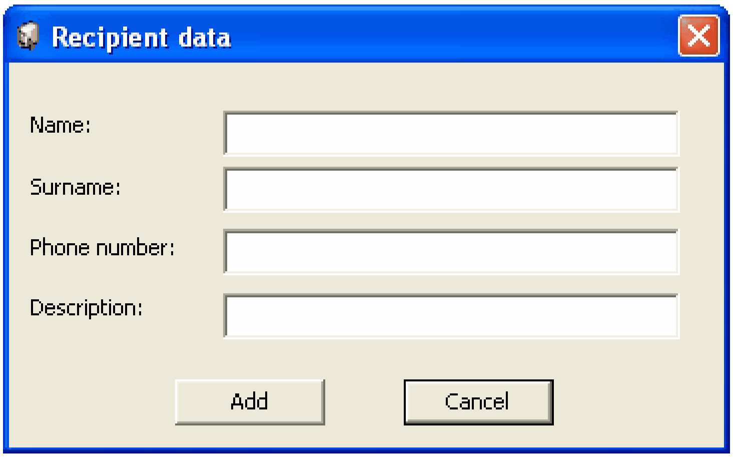


Then a dialog window appears:



1. Adding new recipient

- click on **New** button



1. **Name** - recipient's given name (for easier navigation when browsing/assigning groups and assigned recipients).
2. **Surname** - recipient's family name (for easier navigation when browsing/assigning groups and assigned recipients).
3. **Phone number** - recipient's phone number (required).
4. **Description** - recipient's description (for easier navigation when browsing/assigning groups and assigned recipients).

2. Editing recipient's data

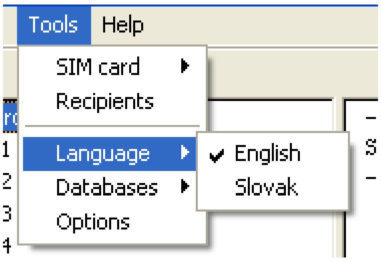
- To edit recipient data click on **Edit** button.

3. Removing recipient

- To remove user click on **Remove** button.

3.3.3.3 Language

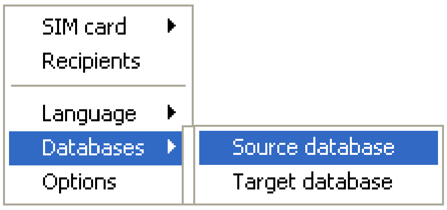
To select another language, select **Tools - Language** menu.



The user can select another language without the need of application restart.

3.3.3.4 Databases

To edit paths to database files select **Utilities - Databases** menu.

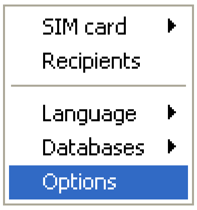


The user can set or modify path to:

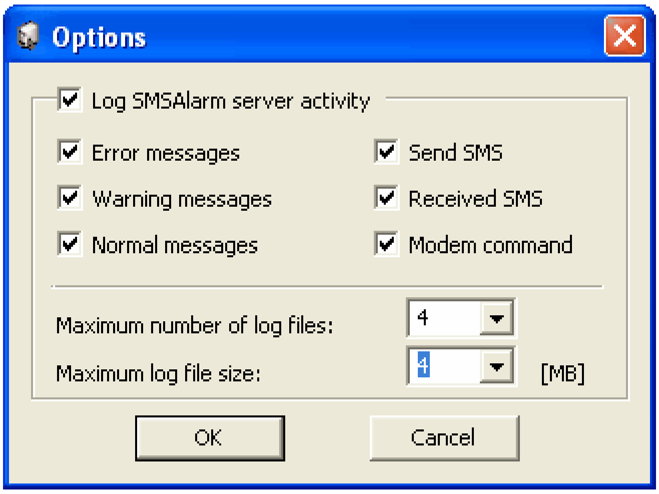
1. Database source file - Source database file
2. Target database file - Target database file

3.3.3.5 Options

To configure application's behavior select **Tools - Options** menu.



Then a dialog window appears:



☑ Log SMSAlarm server activity

☑ Error messages ☑ Send SMS

☑ Warning messages ☑ Received SMS

☑ Normal messages ☑ Modem command

Maximum number of log files: 4

Maximum log file size: 4 [MB]

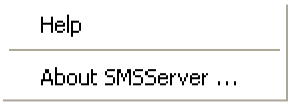
Log SMS Server activity

The application allows the user to save selected actions into a log file. The log file can be found in the application's sub-directory **LOG**.
You can turn on/off log settings by (un)checking particular checkbox.

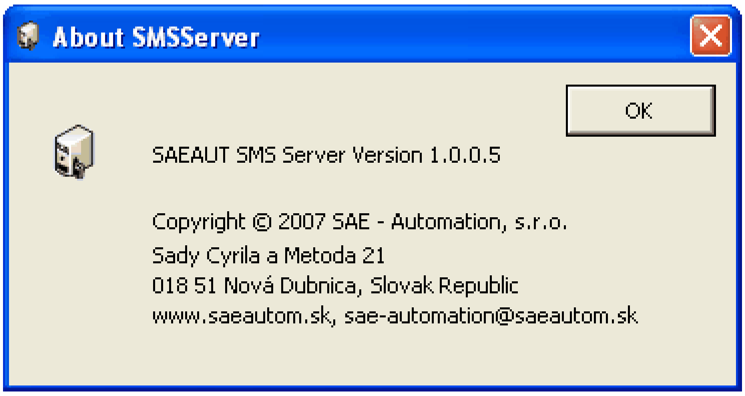
- **Error messages** - enable/disable logging of SMS server error messaeges.
- **Warning messages** - enable/disable logging of SMS server warning messages.
- **Normal messages** - enable/disable logging of SMS server informational messages.
- **Send SMS** - enable/disable logging of sent SMS messages.
- **Received SMS** - enable/disable logging of received SMS messages.
- **Modem command** - enable/disable logging of communication with connected GSM modem in the form of AT commands.
- **Max. number of log files** - set how many log files the application can create.
- **Max. log file size** - set the maximum size of a single log file.

3.3.4 Help

To display help or details about application select **Help** menu.



Application details dialog window:



SAEAUT SMS Server Version 1.0.0.5

Copyright © 2007 SAE - Automation, s.r.o.
Sady Cyrila a Metoda 21
018 51 Nová Dubnica, Slovak Republic
www.saeautom.sk, sae-automation@saeautom.sk

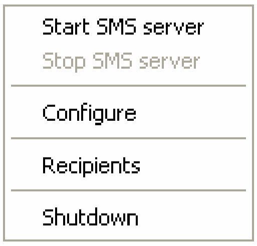
3.4 Controlling SMS Server

There are two ways how to control the application after it is configured:

1. Through Navigation menu.
2. Through taskbar tray icon.

Controlling via taskbar tray icon

- double click (left mouse button) popups application's interface window
- single click (right mouse button) displays application's menu



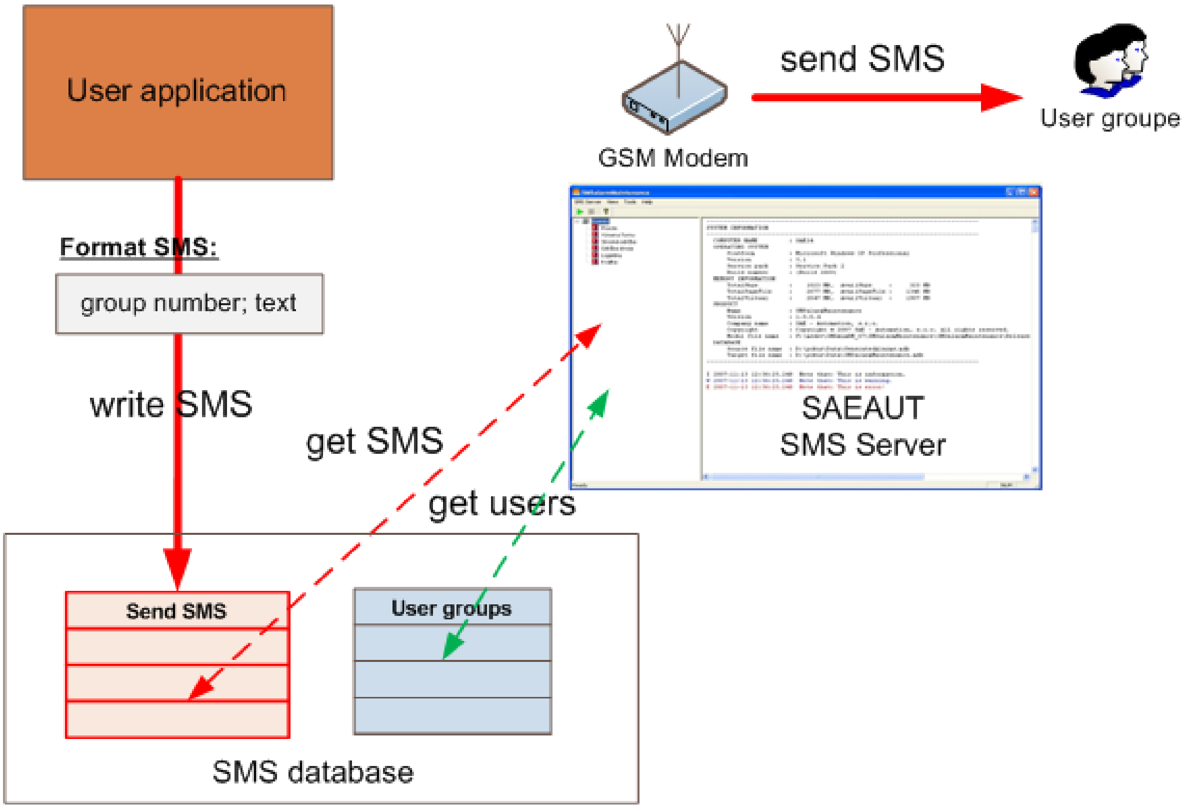
Start SMS server	Start
Stop SMS servera	Stop
Configure	Settings
Recipients	Recipients
Shutdown	terminate application

4 Working with SMS Server

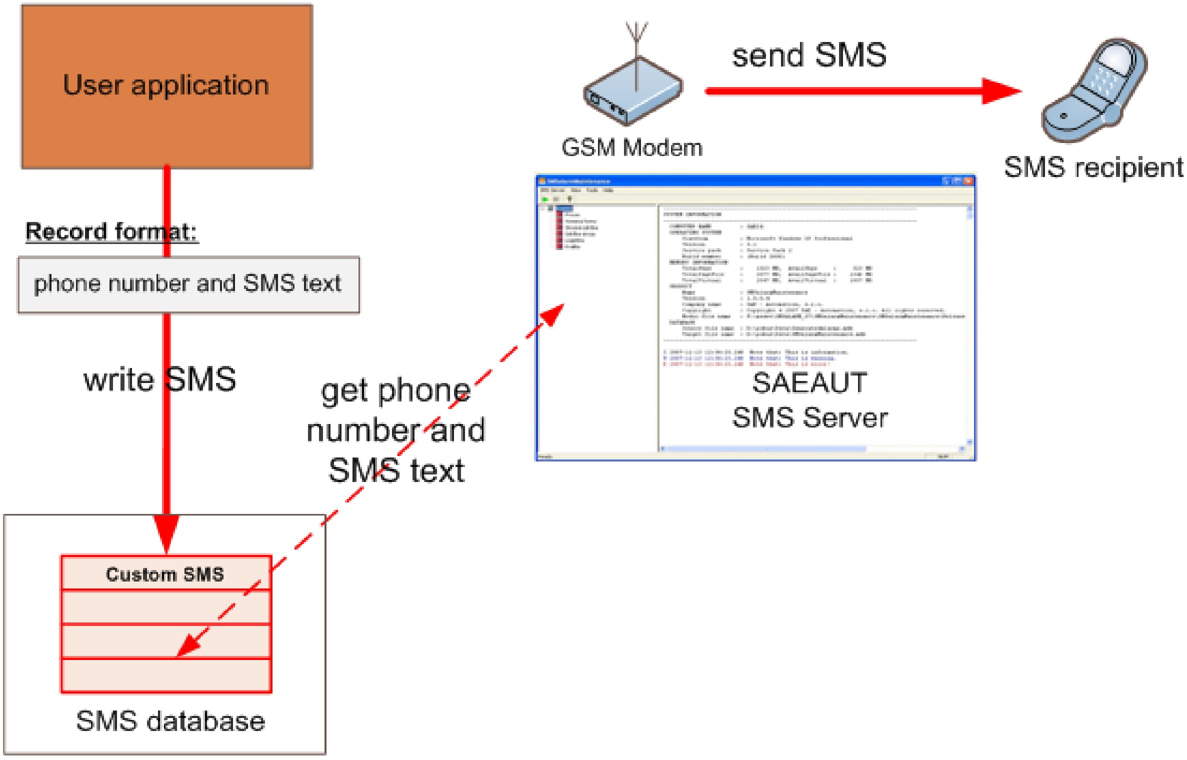
4.1 Sending SMS

The sending of SMS messages works as shown on the picture below:

1. Sending SMS to defined group of recipents



2. Sending SMS to a specified phone number



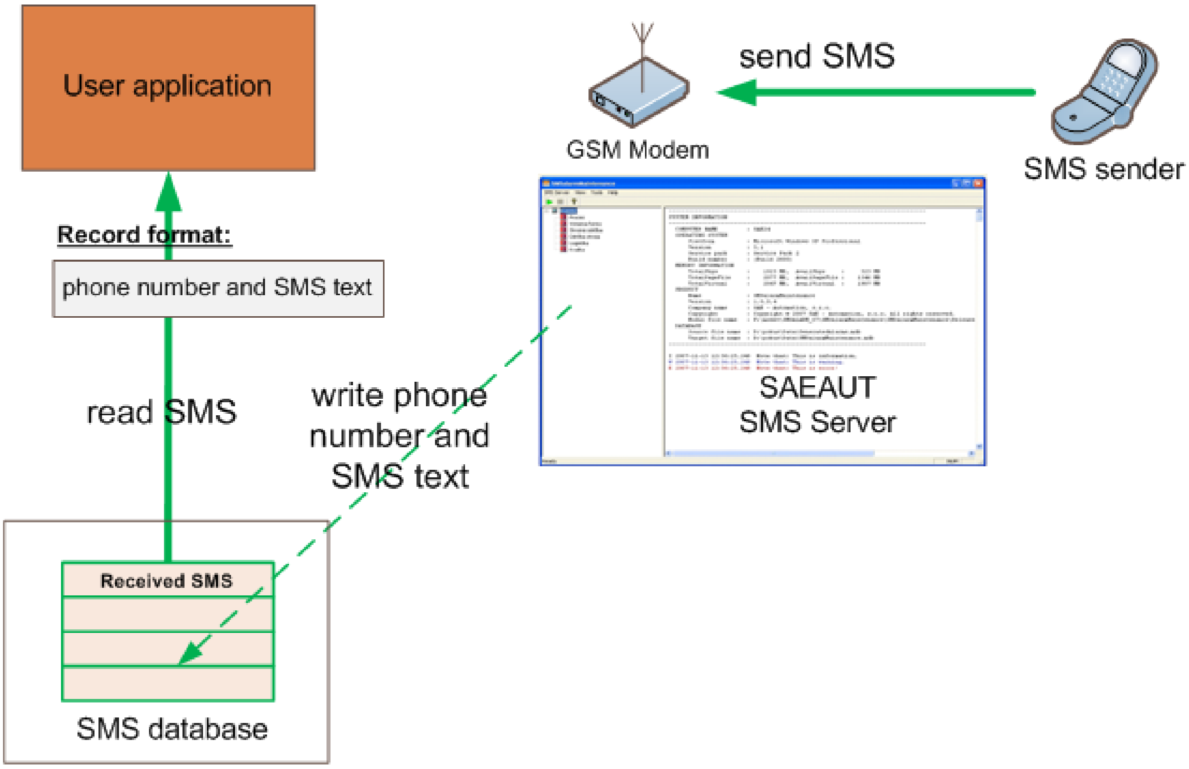
The client application created a SMS message. This message can be created in the form of SMS message or in the form of an event. This SMS is saved in source database file (

Source database file). The SMS server interface for sending SMS messages is launched when the user runs configured application (Application settings) - SMS server (Start).

After launching, the application will periodically check tables in source database file. If it detects addition of a new SMS message for processing, this SMS message is processed and sent to defined user. After that the data is saved in target database file. And again, the application will check source database file until the SMS server is terminated (Stop).

4.2 Receiving SMS

Receiving SMS message works as shown on the picture below:



SMS server application processes two types of SMS messages:

1. Delivery report messages
2. SMS messages from users

These accepted SMS messages are processed and stored into tables of the target database file (Target database file). SMS messages are processed until the SMS server is terminated (Stop).

5 Application portability

5.1 Database files

5.1.1 Database source file

This database file serves to client applications that either generate events or send SMS messages.

It contains tables as folllows:

- Events - list of events that are listed in transparent tree view.
- EventGenerator - process table for client applications that generate events.
- UserSMSTable - serves to client applications that send SMS messages to user defined numbers.

5.1.1.1 Tables

5.1.1.1.1 Events

This table contains list of events that are displayed in a tree view.

Index	Column name	Data type
1	**ID**	Automatic (number)
2	**evDescription**	Text
3	**evType**	Number

ID - number of the record in the database
evDescription - event name (this name is later displayed in the events tree view)
evType - event type: 0 - informational, 1 - warning 2 - error

5.1.1.1.2 EventGenerator

This is a process table for client applications that generate events. Event inserted into this table are then processed by the SMS server.

Index	Column name	Data type
1	**ID**	Automatic (number)
2	**egTimeStamp**	Date and time
3	**egSMSText**	Text

ID - number of the record in the database
egTimeStamp - timestamp of when the event occured
egSMSText - text of SMS message that consists of two inputs separated by semicolon: **event number;text message**

5.1.1.1.3 UserSMSTable

This table server to client applications that allow to send SMS messages to user defined numbers.

Index	Column name	Data type
1	**ID**	Automatic (number)
2	**usSenderPhone**	Text
3	**usSMSText**	Text
4	**usComputerName**	Text
5	**usTimeStamp**	Date and time

ID	- number of the record in the database
usSenderPhone	- recipent's phone number who should receive the SMS
usSMSText	- text of the SMS message (max. 160 characters)
usComputerName	- computer name from which the SMS was sent
usTimeStamp	- timestamp when the SMS was sent

5.1.2 Database target file

This database file serves for the purpose SMS server. It contains data about sent and received SMS messages and about users.

It contains tables as follows:

- Users - list of users who can be assigned to tasks
- EventUsers - bridge between events and users
- SMSStates - process table for SMS server applications
- CustomSMSStates - process table for SMS server applications
- ReceivedSMSStates - processed SMS messages by SMS server application

5.1.2.1 Tables

5.1.2.1.1 Users

This table contains list of users who can be assigned to events and who receive SMS messages.

Index	Column name	Data type
1	**ID**	Automatic (number)
2	**usName**	Text
3	**usSurname**	Text
4	**usPhoneNumber**	Text
5	**usDescription**	Text

ID	- number of the record in the database
usName	- given name of the user
usSurname	- surname of the user
usPhoneNumber	- phone number of the user
usDescription	- description of the user

5.1.2.1.2 EventUsers

This table serves as the bridge between events and users, it contains the definitions what users receieve a SMS at what event.

Index	Column name	Data type
1	**ID**	Automatic (number)
2	**evID**	Number
3	**usID**	Number

ID	- number of the record in the database
evID	- event's ID
usID	- user's ID

5.1.2.1.3 SMSStates

This table serves to the purpose of SMS server. It contains data about processed (sent) SMS messages. It also contains delivery reports.

Index	Column name	Data type
1	**ID**	Automatic (number)
2	**recordID**	Number
3	**usID**	Number
4	**smsState**	Number
5	**smsTimestamp**	Date and time
6	**smsMsgRef**	Number
7	**smsDeliveryTimestamp**	Date and time
8	**smsDeliveryStatus**	Number
9	**smsDelivery**	Yes / No

ID	- number of the record in the database
recordID	- event's ID
usID	- user's ID who received the SMS message
smsState	- SMS status: 0 - OK, 1 - Error (Unassigned user), 2 - Unknown error
smsTimestamp	- send timestamp
smsMsgRef	- reference number of sent SMS
smsDeliveryTimestamp	- timestamp of SMS delivery
smsDeliveryStatus	- delivery report of sent SMS
smsDelivery	- delivery status of sent SMS: 0 - Error, 1 - SMS delivered successfuly.

5.1.2.1.4 CustomSMSStates

This is a process table for SMS server. It contains data about processed/sent SMS messages that have been created by a client application. It also contains delivery reports.

Index	Column name	Data type
1	**ID**	Automatic (number)
2	**recordID**	Number
3	**usComputerName**	Text
4	**smsState**	Number
5	**smsTimestamp**	Date and time
6	**smsMsgRef**	Number
7	**smsDeliveryTimestamp**	Date and time
8	**smsDeliveryStatus**	Number
9	**smsDelivery**	Yes / No

ID - number of the record in the database
recordID - event's ID
usComputerName - computer name that created the SMS
smsState - SMS status: 0 - OK, 1 - Error (Unassigned user), 2 - Unknown error
smsTimestamp - timestamp of sent SMS
smsMsgRef - reference number of sent SMS
smsDeliveryTimestamp - timestamp of SMS delivery
smsDeliveryStatus - SMS delivery report
smsDelivery - SMS delivery status: 0 - Error; 1 - SMS delivered successfuly

5.1.2.1.5 ReceivedSMSStates

This table contains processed SMS message by SMS server.

Index	Column name	Data type
1	**ID**	Automatic (number)
2	**recSenderPhoneNumber**	Text
3	**recSendTimeStamp**	Date and time
4	**recSMSText**	Text

ID - number of the record in the database
recSenderPhoneNumber - phone number of the sender
recSendTimeStamp - timestamp of sending
recSMSText - text of SMS message

5.2 Making own client application

How to create own application for sending group SMS messages:

1. The user creates own applicaiton in any programming language (e.g.. C++, C#, ASP, ...)

2. The application should read recipients list from source database (Source database file) from Events table.

3. Sending SMS message:
   - Client application verifies if the user assigned all required input data.
   - These data are then stored into source database (Source database file) in EventGenerator table as follows:
     - Column egTimeStamp will contain local time
     - Column egSMSText will contain text of SMS message in the format:

   number of the group;text of SMS message
   - the nunber of recipient group equals to the record ID of given group
   - text of SMS message is the text that equals to the input for SMS text

4. The client application creates a new record this way that equal new event SMS, SMS server then sends this SMS to all defined users (Sending SMS).

How to create own application for sending user-defined SMS messages:

1. The user creates own applicaiton in any programming language (e.g.. C++, C#, ASP, ...)

2. Sending SMS message:
   - Client application verifies if the user assigned all required input data.
   - These data are then stored into source database (Source database file) in UserSMSTable table as follows:
     - Column usSenderPhone will contain the recipent's phone number
     - Column usSMSText willl contain the text of SMS message (max. 160 characters)
     - Column usComputerName will contain the computer name that created the SMS (it is possible to use this entry later for delivering SMS delivery report)
     - Column usTimeStamp will contain timestamp of delivery.

3. The client application creates a new record this way that equal new event SMS, SMS server then sends this SMS to all defined users (Sending SMS).

6 Known issues

While working with SMS server application you may encounter some problems. Some general comments and solutions are provided below.

1. Incorrect functionality while using USB - RS232 converter

Nowadays, more and more devices with in-built GSM modem provide only USB interface for communication with other device. Depending on the modem, it is required to install particular drivers. After installation of such device a new serial port appears in the device list that is just a virtual port.

After installation of such device it is recommended to **reboot the computer** because of driver initialization.

2. Incorrect functionality while using mobile phone data cable

A mobile phone is a device with in-built GSM modem. If the user wants to use a mobile phone with this application, it may happen that the application will not work correctly. The cause may be the data cable that is designed for data transfer just between the phone and a computer.

If such situation occurs, try to change the data cable or try to use other communication interface (e.g. IrDA, Bluetooth, etc.)

3. The application was sending SMS earlier but now it doesn't work

This problem may occur when a prepaid SIM card is used and the user ran out of limit.

In this case check your SIM card credit balance by inserting the SIM card into a mobile phone and then evaluating the remaining balance by mobile phone's services. If the credit balance is sufficient, try to send a test SMS directly from your mobile phone. If the sending of SMS fails, please contact your mobile network operator.