

GSM-CONTROL SMS Gateway Software

for M2M remote control in automation
applications using GSM communications

User Manual

Ver 4.x Rev 4.5

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GSM-CONTROL

Overview

GSM-CONTROL SMS Gateway is a Microsoft Windows software used for 2-way remote control in automation and other applications using standard GSM (Global System for Mobiles) cellular phones and GSM network. Based on the standard GSM cellular phones and other GSM-capable devices, GSM-Control offers a low-cost and easy alternative to create wireless control and monitoring applications. Implementation of GSM network's SMS (SMS Message Service) technology secures reliable transmission even in the most error-sensitive applications.

The main task of GSM-Control software is to work as a **gateway** between GSM environment at one side (interfacing with GSM environment by sending/receiving SMS messages) and MS Windows environment (by using DDE (Dynamic Data Exchange), OPC (OLE for Process Control), SQL (Structured Query Language) or Wonderware MXAccess (Lmx Proxy interface to Application Server) interfaces) at another side.

The GSM-Control runs on a PC and accesses operator interface applications or directly field devices by using DDE, OPC or MXAccess interfaces. GSM-Control also supports the reading/writing of data from/to SQL databases. The remote control is based on GSM SMS messages two-direction communication, where the GSM-modem (preferable models are Siemens TC35T/MC35T) is connected to the computer's standard (RS-232) serial port and GSM cellular phone (remote GSM phone) is used by remote operator(s). Also the communication between two GSM-modems is supported, i.e. remote GSM-modems can be used instead of remote GSM phone.

The GSM-Control software includes two MS Windows application programs: GSM-Control Configuration Program (**GSMCFG**) and GSM-Control Communication Program (**GSMCTRL**, further in the text also **GSM-Control**). The GSMCFG is used to prepare the source information and GSMCTRL is used to perform the GSM SMS communications and DDE/OPC/SQL/MXAccess data exchange on the basis on information prepared by GSMCFG. These two application programs are completely independent, i.e. each can work separately and doesn't need another program to be started. The data prepared by GSMCFG is saved in GSM-Control configuration file - XML (eXtensible Markup Language) format file used as an input file for GSMCTRL program. As many GSM-Control configuration files can be created as necessary.

Basically, the data exchange through GSM-Control can be initiated both from GSM and MS Windows environments:

- 1 From **GSM** environment - by sending SMS message to GSM-Control, where the received message is checked and processed according the GSM-Control current configuration. The received SMS message can contain some data to be transferred via DDE, OPC, SQL or MXAccess from GSM-Control to other MS Windows applications (e.g. to PC operator interface applications or field devices through appropriate communication servers) or databases. This SMS message received can have the corresponding response message configured (also possibly containing data values obtained by via DDE, OPC, SQL or MXAccess) - in this case GSM-Control will respond with SMS message to the sender.
- 2 From **MS Windows** environment - when some alarm or event occurs in MS Windows application (e.g. in PC operator interface application or directly in the field device) and the corresponding alarm or event condition is specified in GSM-Control. In this case GSM-Control will send the correspondingly configured SMS message (possibly containing also some data obtained via DDE, OPC, SQL or MXAccess) to remote GSM operator or device linked to this alarm or event condition. The receiver of such SMS message can respond to GSM-Control - for example, send some acknowledgment SMS message possibly containing some data for delivery via DDE, OPC, SQL or MXAccess.

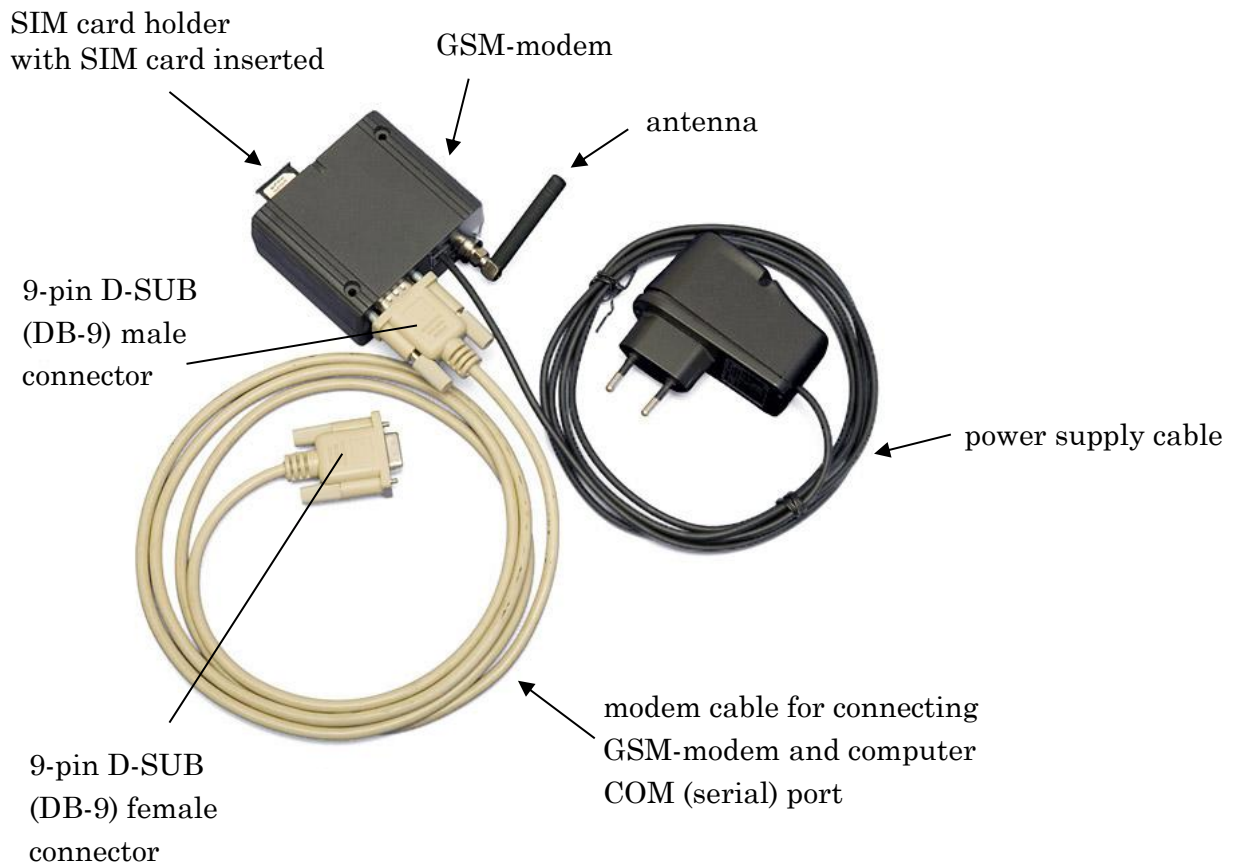
Moreover, it is possible to send (manually or automatically through DDE, OPC or MXAccess) any pre-configured text message ("standard 1-way messages") from GSM-Control to remote GSM operator or device. The SMS messages also can be received from any (not configured) phone number (so called "ANYUSER" feature) and correspondingly replied with information depending on contents of received message.

The GSM-Control can be used on Internet - it is possible to send SMS messages by e-mails from GSM-Control to GSM network and to receive SMS messages as e-mails from GSM network. In this case GSM-Control may run without GSM-modem connected - modem is replaced by e-mail connection.

The GSM-Control may be accessed by any Microsoft Windows (NT, 2000, XP) program working as a DDE or OPC Server (or DDE or OPC Client in case of direct sending/receiving of SMS Messages via GSM-Control). The GSM-Control has extended functions and support for Wonderware **InTouch (for MMI)**, **Application Server (via MXAccess)** and for **I/O Servers (for field interfacing)** developed with Wonderware I/O Server Development Toolkit.

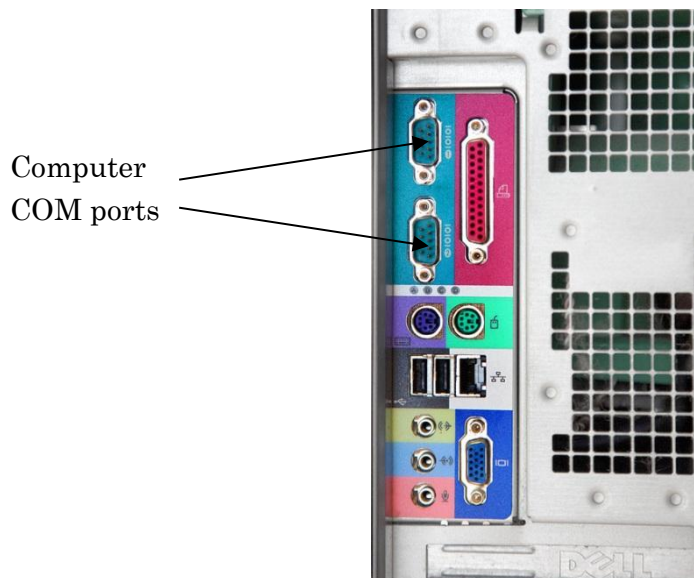
GSM-modem and accessories

The main function of GSM-Control is receiving and sending SMS-messages. For this purpose the external GSM-modem must be connected to computer where GSM-Control software is running:

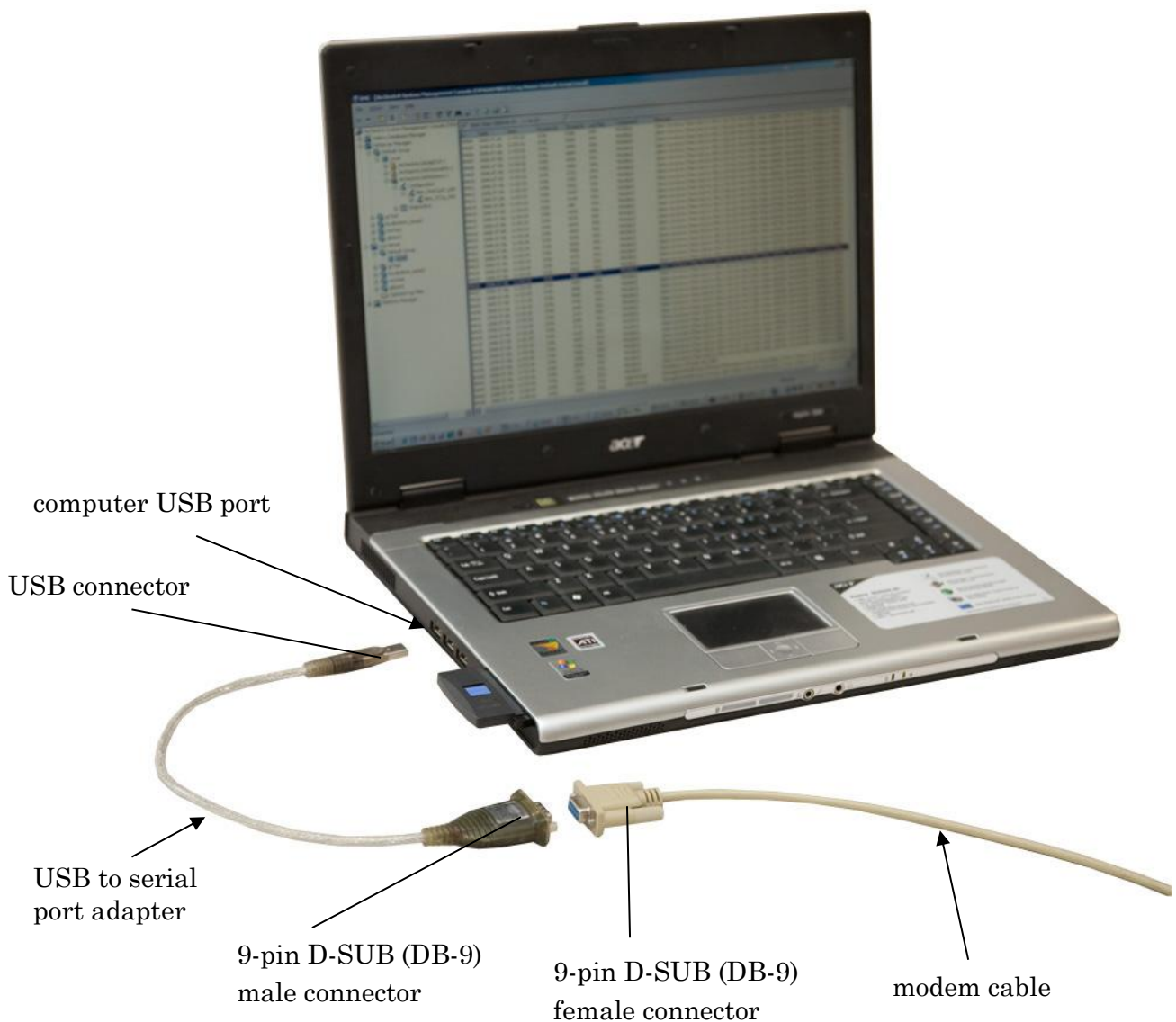


The GSM-modem and all necessary accessories (antenna, power supply cable and modem cable) are already included in **PC GSM SET** package provided by Wonderware Finland & Baltics.

The modem cable 9-pin D-SUB (DB-9) female connector must be inserted into computer COM (serial) port socket (9-pin D-SUB (DB-9) male), usually located on the rear panel of the computer:



If the computer where GSM-Control is running has no COM (serial) port, an additional **USB to serial port adapter** is needed (not included in PC GSM SET package and not supplied by Wonderware Finland & Baltics). The adapter must have a 9-pin D-SUB (DB-9) male connector which must be connected to the modem cable 9-pin D-SUB (DB-9) female connector:



There are different kinds of USB to serial port adapters available on the market, as a rule also the corresponding USB/serial driver software is supplied – after installing the driver, the new virtual COM port (physically using USB port) is added to the computer; this COM port must be selected in GSM-Control as a COM port where GSM-modem is connected.

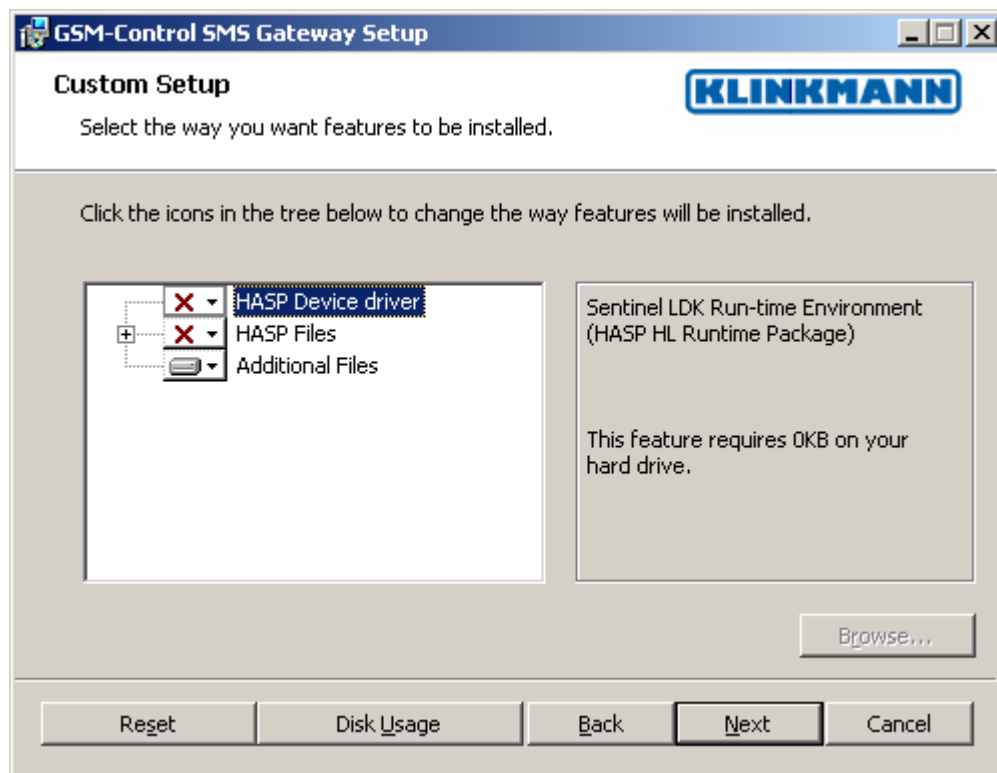
Installing the GSM-Control

The GSM-Control installation package is supplied as a Microsoft Installer file P067_xxx.msi, where xxx is the current (latest) version of GSM-Control.

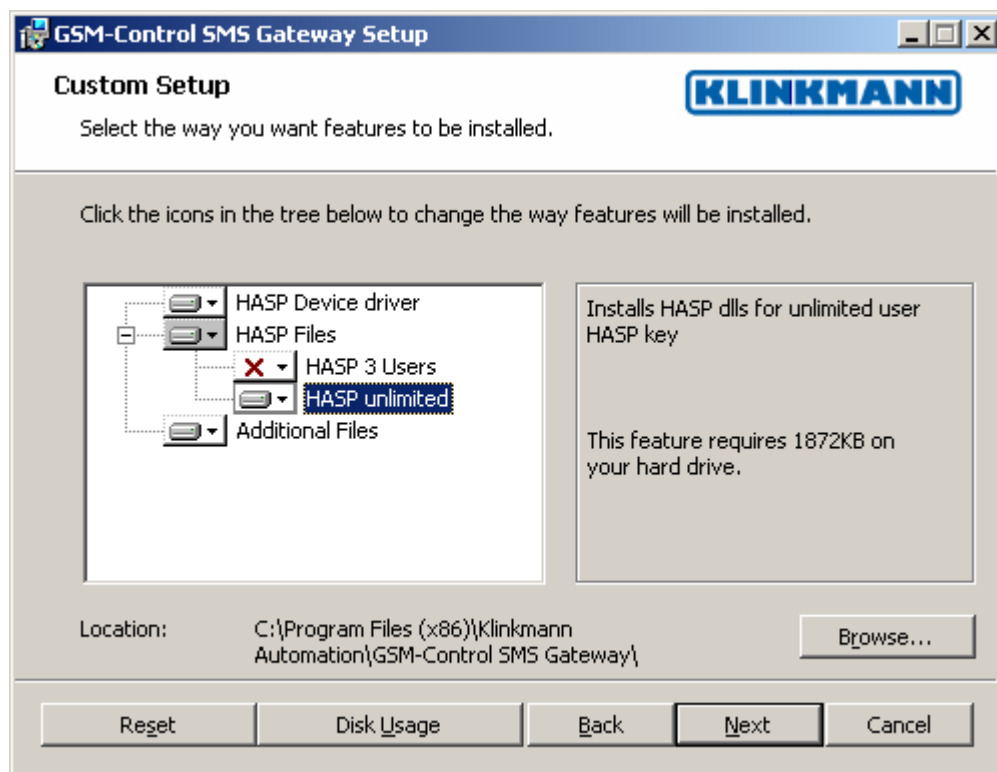
To install the GSM-Control, run the P067_xxx.msi and proceed as directed by the GSM-Control Setup Wizard. The installation is simple and straightforward, only it is important to select the correct protection (**HASP key** or **software license**) in “Custom Setup” dialog.

The HASP key or software license key is needed for full time running of GSM-Control. The **HASP key** is an USB key (dongle) to be installed into PC USB port and needs the SafeNet Sentinel LDK Run-time Environment (HASP HL Runtime Package) to be installed and running – see details in “Licensing by using HASP HL key” section below. The **software license key** is a 16-character alphanumeric “computer-dependent” string, provided after purchasing the GSM-Control (for more information, see “Software license key” section below. Without HASP key installed or software license key entered, the GSM-Control will run one hour in demo mode. After purchasing the GSM-Control, the appropriate HASP key or software license key is provided and no re-installation of GSM-Control is needed.

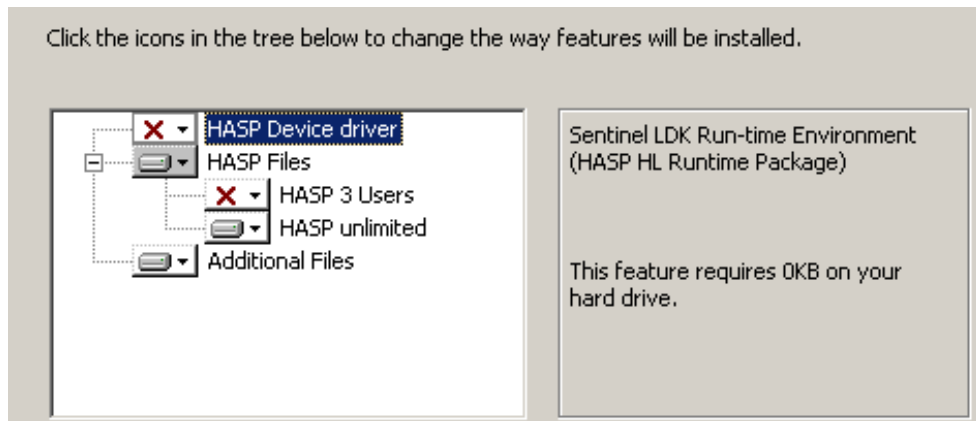
In case “HASP Device driver” and “HASP Files” **are not selected** then HASP USB key will not be supported and only the **software license** will be available (files needed for HASP USB key will not be installed):



In case “HASP Device driver” and “HASP Files” (“HASP 3 Users” or “HASP unlimited”) **are selected** then HASP USB key will be supported and both HASP-key and software license will be available (files needed for HASP USB key will be installed):



Note: In case the SafeNet Sentinel LDK Run-time Environment (HASP HL Runtime Package) is already installed on your computer (separately or by some other software) then it can be disabled:



When installation is finished, the subdirectory specified as a folder where to install the GSM-Control files will contain the following files:

GSMCTRL.EXE	The GSM-Control Communication Program. This is a Microsoft Windows 32-bit application program.
GSMCFG.EXE	The GSM-Control GSM-Control Configuration Program. This is a Microsoft Windows 32-bit application program.
GSMCFG.CHM	The GSM-Control Help file.
OPCLIB.DLL	Dynamic Link Library necessary for GSM-Control OPC part.
LMXLIB.DLL	Dynamic Link Library necessary for GSM-Control MXAccess (Lmx Proxy) part.
KLSERVER.DLL	Dynamic Link Library necessary for GSM-Control OPC Server part.
GSMCSQL.DLL	Dynamic Link Library necessary for GSM-Control SQL part.
DEFAULT.XML	An example default configuration file.
LICENSE.RTF	Wonderware Finland license file.
haspdinst.exe	Sentinel LDK Run-time Environment Installer (HASP HL Runtime Package), copied to CL Server/Client folder only if "HASP Device driver" is selected during the installation in "Custom Setup" dialog.
hasp_windows_11610.dll	Dynamic Link Library installed only if "HASP 3 Users" is selected during the installation in "Custom Setup" dialog.
hasp_windows_11436.dll	Dynamic Link Library installed only if "HASP unlimited" is selected during the installation in "Custom Setup" dialog..

The following files are copied to in *\additional files* sub-folder only in case it is selected at “Custom Setup” dialog:

EXEXCEL.XML	An example configuration file for using GSM-Control with MS Excel.
EXEXCEL.XLS	An example MS Excel spreadsheet file to be used together with EXEXCEL.XML.
EXWW.XML	An example configuration file for using GSM-Control with Wonderware InTouch.
EXWW.ZIP	An example Wonderware InTouch application (packed) to be used together with EXWW.XML.
USRDLL.ZIP	An example user extension DLL source code written by Microsoft Visual C++ 6.0. User extension DLL allows to perform special user defined tasks when SMS is sent or received. This feature is optional.
EXOPC.XML	An example configuration file for using GSM-Control with Vision OPC Server.
EXLMX.XML	An example configuration file for using GSM-Control with Wonderware Application Server via MXAccess (Lmx) interface.
GSMCtrlTestGalaxy Dump.csv	An example Application Server Galaxy dump file for using GSM-Control with Wonderware Application Server via MXAccess (LMX Proxy) interface.
EXSQL.XML	An example configuration file for using GSM-Control SQL interface with MS Access.
EXSQL.MDB	An example MS Access database to be used with GSM-Control EXSQL.XML configuration file.
EXFORW.XML	An example configuration file for forwarding received SMS message to e-mail

The following files will be copied (only if same or newer versions are not yet there) to MS Windows system directory (e.g. to C:\WINDOWS\SYSTEM32\) and if necessary also will be automatically registered in the system:

OPCPROXY.DLL	Proxy/stub DLL used for marshalling interfaces to local or remote OPC Servers. This DLL is provided from OPC Foundation.
OPCENUM.EXE	OPC Foundation OpcEnum Module necessary for OPC browsing.
Opc_aeps.dll	OPC Foundation Alarms and Events Proxy.
Opcbc_ps.dll	OPC Foundation Batch custom Proxy.
Opchda_ps.dll	OPC Foundation Historical Data Access Proxy.
Opcsec_ps.dll	OPC Foundation OPC Security Proxy.
OPCCOMN_PS.DLL	OPC Foundation Common Interfaces Proxy.

To **uninstall** the GSM-Control, start Control Panel, select “Uninstall a program” (“Add/Remove Programs” on XP/2003) and select the “GSM-Control SMS Gateway” from the list of available software products. Click on “Uninstall” (“Add/Remove...” on XP/2003) and proceed as directed by the Uninstall Wizard.

Licensing by using HASP HL key

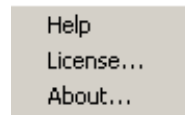
The following should be done to enable the licensing by HASP HL key:

- 1) The “HASP Device driver” and “HASP Files” (“HASP 3 Users” or “HASP unlimited”) are selected during the GSM-Control installation in “Custom Setup” dialog – that causes correspondingly haspdinst.exe and hasp_windows_11610.dll or hasp_windows_114361.dll file are copied to GSM-Control folder and Sentinel LDK Run-time Environment (HASP HL Runtime Package) is installed and started, enabling the GSM-Control can detect the HASP HL USB dongle;
- 2) insert the received HASP HL key into USB port, and **wait** until “Installing device driver software” message disappears and “Device driver software installed successfully” message appears;
- 3) start GSM-Control and check - if “Software key or HASP HL key not found!” message does not appear then it means everything is done correctly and GSM-Control runs in full mode with licensing by HASP HL key enabled.

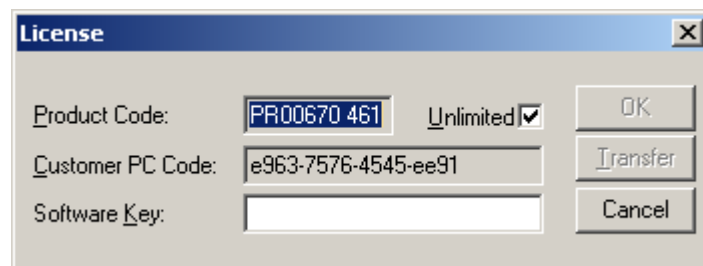
Software license key

GSM-Control supports the “computer dependent” **software licensing**. The following steps are required to enable it:

1) Start GSM-Control Communication Program (GSMCTRL.EXE), click on "Help" menu item (also short-cut Alt+H can be used) and pop-up menu with "Help" menu commands will appear:

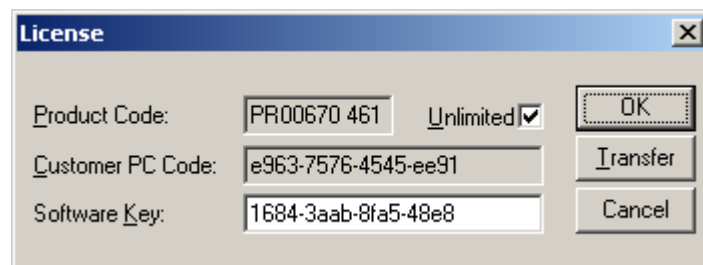


Select “License...” and “License” dialog will appear:



2) Here the “Customer PC Code” is “computer-dependent” string generated by GSM-Control and it is unique for this computer. Write it down or Copy/Paste to e-mail when ordering the GSM-Control.

3) After purchasing the GSM-Control, you will get the software license key - 16-character alphanumeric string. Open the “License” dialog again and Copy/Paste it to “Software Key” field:



4) Click OK and software license now is enabled.

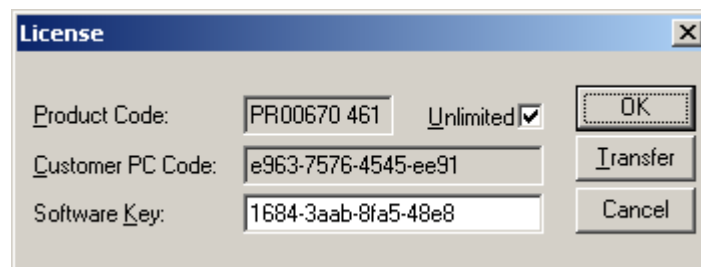
Note – the “Software Key” string is saved to GSMCTRL.INI file to enable it is automatically detected at GSM-Control next start-up .

Transferring the software license to other computer

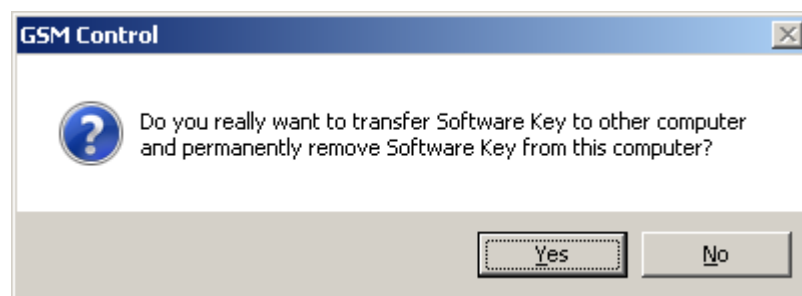
The transfer of Software License Key might be needed in very rare situations when it is necessary to move Klinkmann software to other computer (or operation system change is planned for same computer). Such transfer PERMANENTLY removes the Software License Key, so be very careful when deciding to use this option.

The following steps are required to transfer the Software License Key:

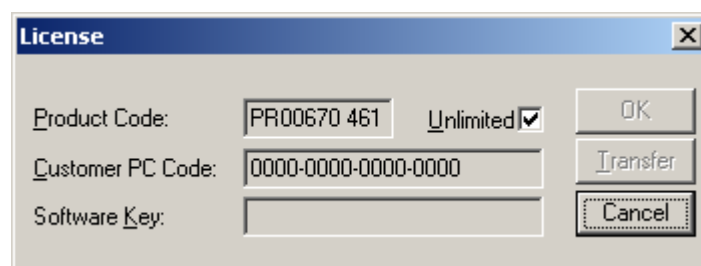
- 1) Select Help/License from main menu and click the “Transfer” button on “License” dialog:



- 2) Confirm the transfer of Software License Key by clicking on Yes button:



The “License” dialog now will contain the empty “Customer PC Code” and “Software Key” fields:



- 3) Take the string with “Software License Key removal message” directly from GSM-Control log file:

2013/01/07 16:36:44.911/Software Key 1684-3aab-8fa5-48e8 removed. PC Code: e963-7576-4545-ee91, Product Code: PR00670 461

4) Provide the obtained “Software License Key removal message” string together with new “Customer PC Code” when applying for new Software License Key without purchasing the new license (in situations when it is necessary to move Klinkmann software to other computer or operation system change is planned).

Note!

Without providing the “Software License Key removal message” screenshot or string, the new Software License Key will not be assigned.

Getting started quickly with GSM-Control

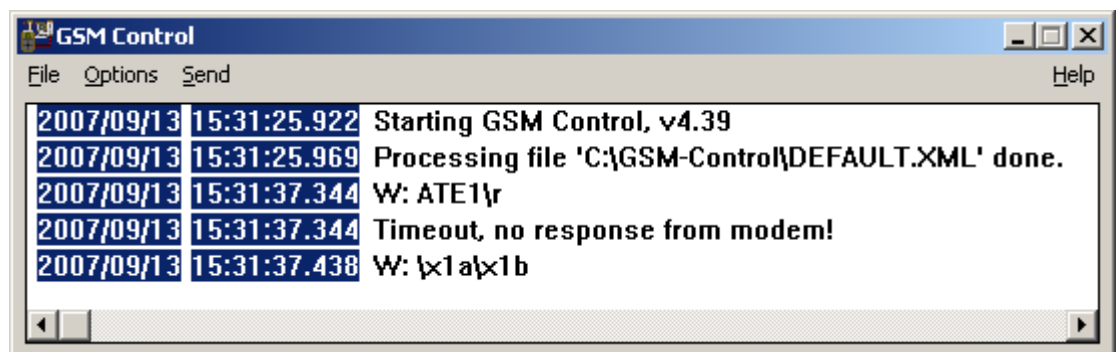
The easiest way to start with GSM-Control is to use the default configuration (default configuration file DEFAULT.XML) supplied with GSM-Control distribution package. The following very basic can be done by using the default configuration: if SMS message “?” is sent to GSM-Control then GSM-Control will respond with SMS message “Value:X” where X is the current value from cell A1 (DDE address R1C1) in MS Excel.

To use the default configuration, the MS Excel always should be started before GSM-Control Communication Program (GSMCTRL.EXE) because within GSM-Control default configuration the GSM-Control acts as a DDE client requesting data from MS Excel acting as a DDE server.

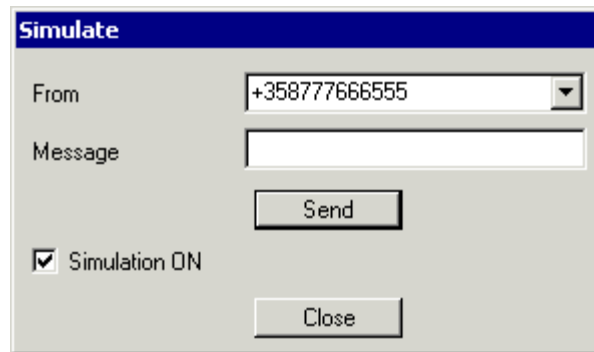
Getting started in simulation mode (without GSM-modem connected)

The following sequence can be used to start quickly with GSM-Control in simulation mode, i.e. without GSM-modem connected and without real sending/receiving of SMS messages:

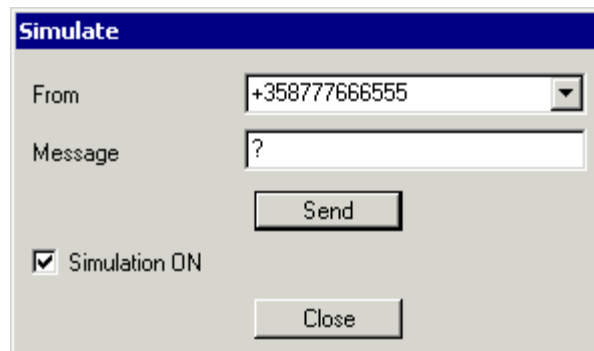
- 1 Start MS Excel. Enter some value (e.g. 33) in the cell A1 of default Sheet1.
- 2 Start GSM-Control Control Communication Program (GSMCTRL). The window like following will appear:



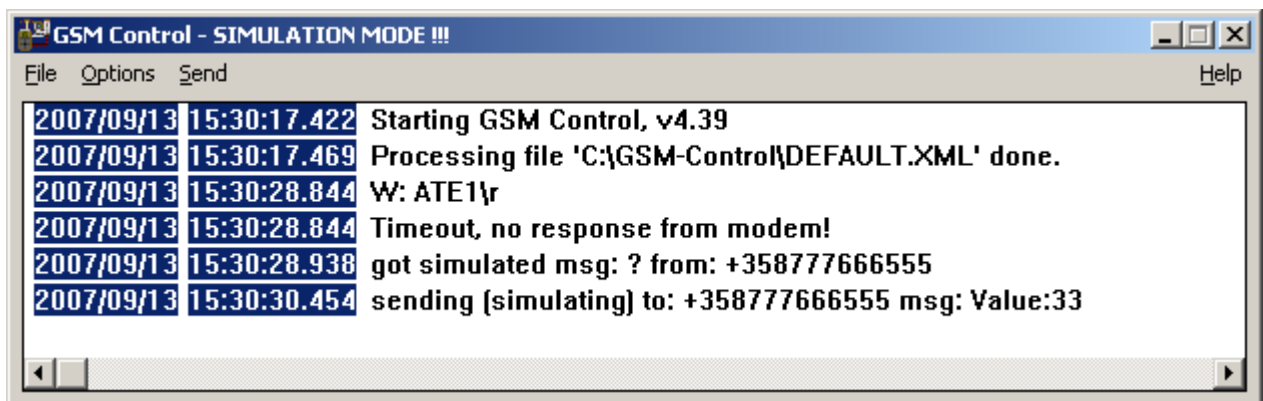
- 3 Open the “Simulate” dialog box by selecting *Send/Simulate* from GSM-Control main menu. Select the “Simulation ON” option - the GSM-Control will change to simulation mode (the GSM-Control main window title bar will change correspondingly). Now we are ready to simulate the sending of SMS message:



- 4 Enter the “?” in the “Simulate” dialog box “Message” field and press the **Send** button:



- 5 The following will appear on GSM-Control main window:



The information logged to GSM-Control main window informs about the following:

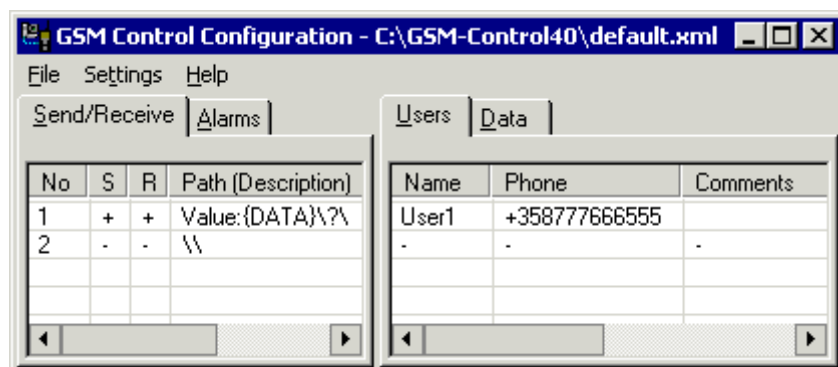
- at 15:30:28.938 the simulated message “?” was received (simulated) from “+358777666555”;
- at 15:30:30.454 the GSM-Control responded to “+358777666555” with simulated message “Value:33”, where value 33 was obtained from MS Excel cell A1 (DDE address R1C1).

- 6 Now, if changing values in MS Excel, the receiving of new values can be simulated by sending again simulated “?” from “Simulation” dialog box.

Getting started with GSM-modem connected

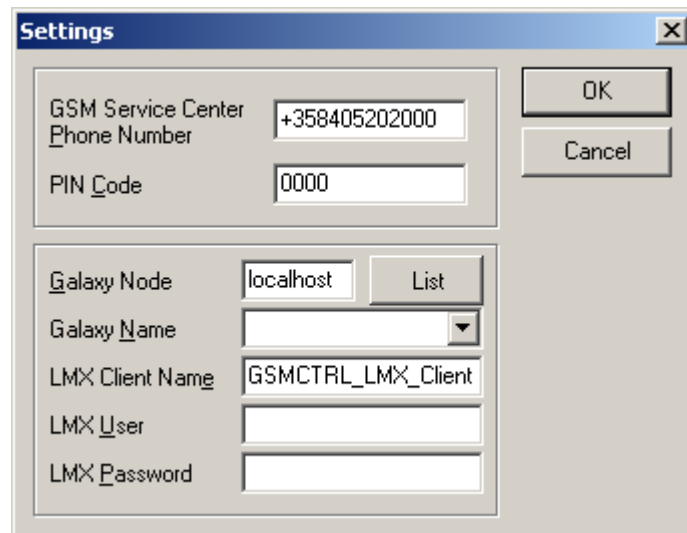
The following sequence to start quickly with GSM-Control by using GSM-modem and sending/receiving of SMS messages by mobile phone:

- 1 Find out and remember the PIN code, phone number and GSM Messages Service Center Number of the SIM card to be used with GSM-modem. The GSM Messages Service Center Number can be found by inserting SIM card into the mobile phone and selecting menu sequence like “Messages/Message Setup/Service Center” or similarly.
- 2 Insert the SIM card into the GSM-modem. Connect GSM-modem to computer serial port, e.g. to COM1 and power-up the GSM-modem. It is assumed the GSM-modem has default serial port configuration: baud rate 19200, 8 data bits, 1 stop bit, no parity, no flow control. If GSM-modem settings differs from default then it is necessary to restore the default settings - it can be done e.g. by Windows HyperTerminal program by issuing AT&F (“Set all current parameters to manufacturer defaults”) command.
- 3 Start GSM-Control Configuration Program. The window like following will appear:



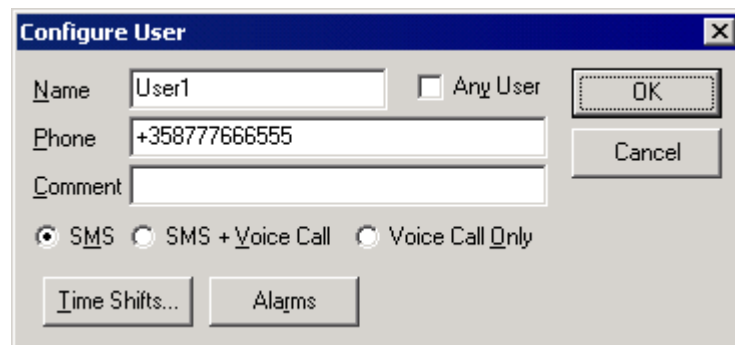
Now it is necessary to change some settings according to your current environment:

- 3.1 Open the “Settings” dialog box by selecting *Settings* from GSM-Control Configuration Program main menu:



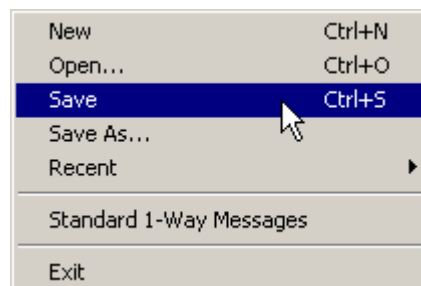
Enter your current settings in the *GSM Service Center Phone Number* and *PIN Code* fields. Click **OK**.

- 3.2 Click on *Users* page control to select “Users” page (if not already selected) and open the “Configure User” dialog box by double-clicking on User1:

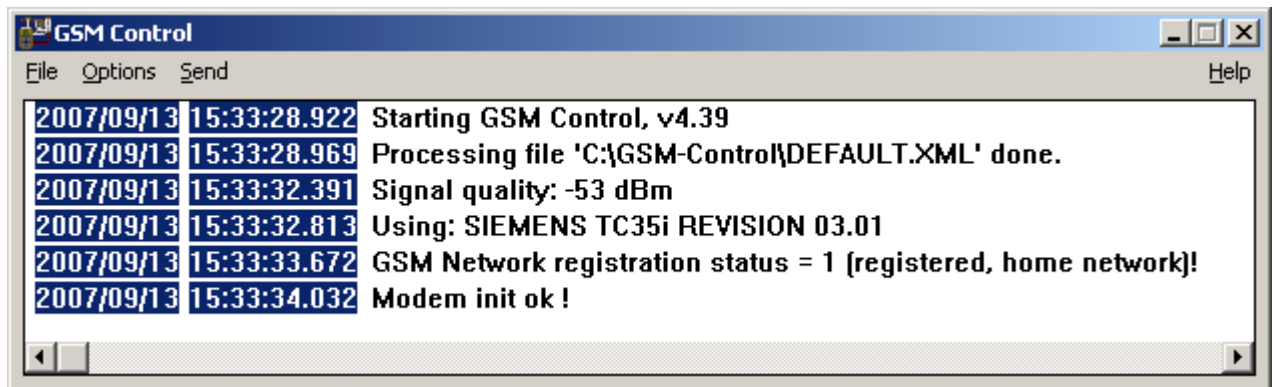


Replace the default *Phone* number “+358777666555” with your mobile phone number (the number of mobile phone from where you are going to send/receive SMS messages to/from GSM-Control) and press **OK**.

- 3.3 Select *File/Save* from GSM-Control Configuration Program main menu to save the modified GSM-Control configuration under the same file name *default.xml*:

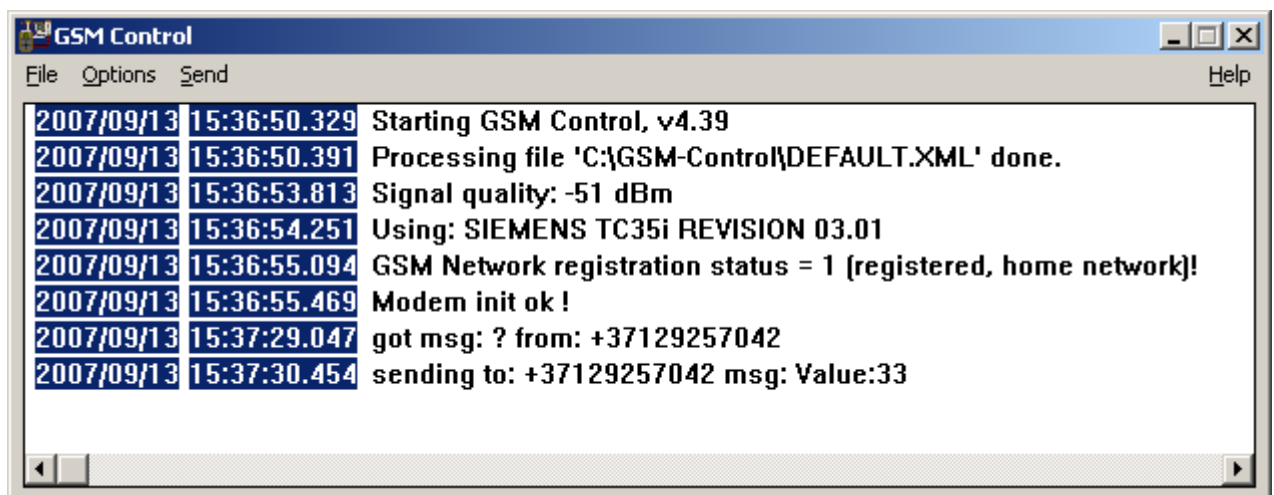


- 4 Start MS Excel. Enter some value (e.g. 33) in the cell A1 of default Sheet1.
- 5 Start GSM-Control Control Communication Program. The window like following will appear:



If there is no errors logged on GSM-Control Communication Program main window and last message logged is “Modem init ok!” then it means GSM-Control is ready to receive and send SMS messages.

- 6 Send the SMS message consisting only from one character “?” from your mobile phone to GSM-Control (to the phone number of the SIM card inserted into GSM-modem). GSM-Control will respond and on your mobile phone you will receive the SMS message “Value:33”, where value 33 is the current value from MS Excel cell A1 (DDE address R1C1). The information like following will appear on GSM-Control main window:



The information logged to GSM-Control main window informs about the following:

- at 15:37:29.047 the SMS message “?” was received from mobile phone with number “+37129257042”;
- at 15:37:30.454 the GSM-Control responded to “+37129257042” with SMS message “Value:33”, where value 33 was obtained from MS Excel cell A1.

- 7 Now, if changing values in MS Excel, the receiving of new values is possible by sending SMS messages “?” again.

GSM-Control user interface

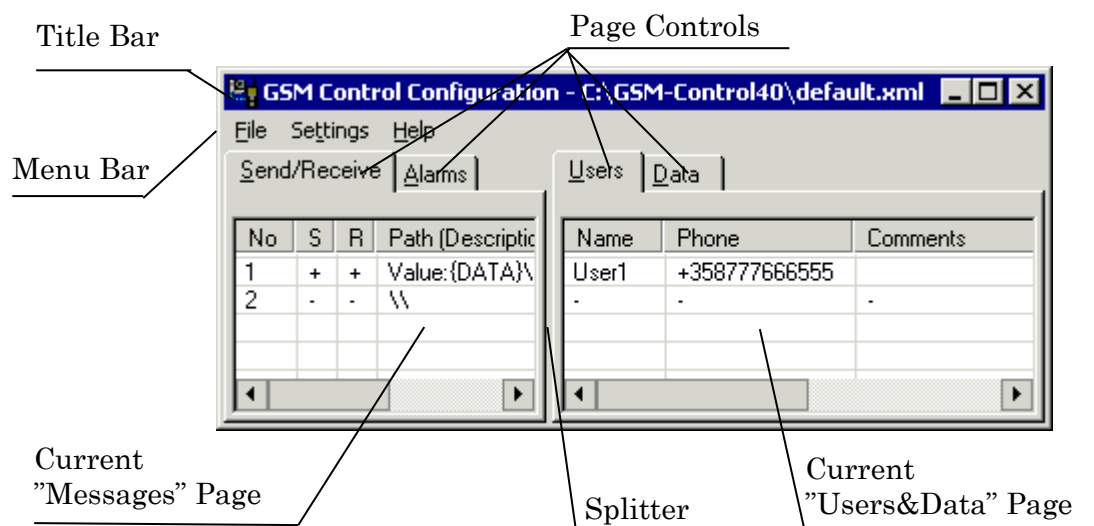
This section explains the basics of GSM-Control user interface - how to enter and edit the GSM-Control configuration information and what is possible to do with GSM-Control Communication Program.

GSM-Control Configuration Program

The GSM-Control Configuration Program (**GSMCFG.EXE**, further in the text also **GSMCFG**) is used to prepare the configuration information to be used by GSM-Control Communication Program (run-time module). The data prepared by GSMCFG is saved in XML format GSM-Control configuration file. As many as necessary different GSM-Control configuration files can be created.

GSMCFG Main Window

After startup, the GSMCFG main window is displayed, containing the following main parts:



where:

Page Controls

By clicking mouse on some of page controls (Send/Receive, Alarms, Users or Data) the selected Page becomes available.

Current "Users&Data" Page

Depending on corresponding page control selected, the "Users" or "Data" page is displayed.

Current "Messages" Page

Depending on corresponding page control selected, the "Send/Receive" or "Alarms" page is displayed.

Splitter

Used to change the horizontal proportion between current “Users&Data” page and current “Messages” page - by clicking the mouse left button on the Splitter bar (separator of pages) and dragging (moving the mouse without releasing the left button).

Menu Bar

Contains the following Main Menu selections: “File”, “Settings” and “Help”.

Title Bar

Contains the path to currently opened GSM-Control configuration file or in simulation mode changes to “SIMULATION MODE !!!!”.

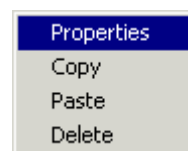
Editing data in “Users&Data” and “Messages” Pages

There are common rules how to edit information in “Users”, “Data”, “Send/Receive” and “Alarms” pages.

To edit, copy or delete some already entered information, at first select the corresponding row by clicking the mouse left button, like following:

Name	Phone	Comments
User1	+3587776665...	
-	-	-

To edit already entered information (invoke the corresponding dialog box) - double-click on the selected row or click mouse right button and then select “Properties” from invoked pop-up menu:



To delete already entered information - select “Delete” from pop-up menu or press **Delete** key on the computer keyboard. To copy the selected row (remember in the clipboard) - select “Copy” from pop-up menu or press **Ctrl+Insert** on the computer keyboard. To paste the selected row (replace the current information with the data from clipboard) - select “Paste” from pop-up menu or press **Shift+Insert** on the computer keyboard.

Notes!

1. The “Copy”, “Paste” and “Delete” works also if several rows are selected. The consecutive rows can be selected by holding **Shift** key and then at first clicking mouse left button on first selected row and then on last selected row. The non-

consecutive rows can be selected by holding **Ctrl** key and clicking mouse left button on rows to be selected.

2. Be careful when using “Copy” and “Paste”- after copying do not forget to edit the copied information!

To create a new row, at first select the row next to last entered one (containing “-“ in some fields) by clicking the mouse left button, like following:

Name	Phone	Comments
User1	+3587776665...	
-	-	-

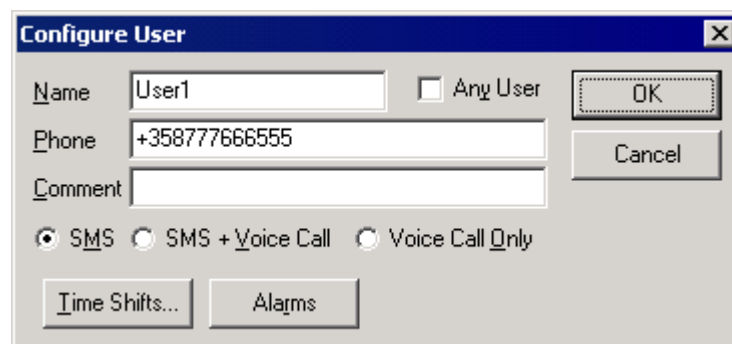
To create a new empty row (invoke the corresponding dialog box with all entries empty) - double-click on it or click mouse right button and then select “Properties” from invoked pop-up menu. To fill the new row with the data from clipboard - select “Paste” from pop-up menu or press **Shift+Insert** on the computer keyboard.

“Users” Page

To activate the “Users” page, click on Users page control. The “Users” page contains information about all currently entered **Users**. On the GSMCFG main window there are three fields “Name”, “Phone” and “Comments” displayed for each User:

Name	Phone	Comments
User1	+3587776665...	
-	-	-

The following “**Configure User**” dialog box will appear if creating new User or editing already existing User (all fields are empty if new User is created):



The "Configure User" dialog box contains the following fields and controls:

- Name:** Text field containing "User1".
- Any User:** Check box, currently unchecked.
- Phone:** Text field containing "+358777666555".
- Comment:** Empty text field.
- Buttons:** "OK" and "Cancel" buttons on the right.
- Radio Buttons:** "SMS" (selected), "SMS + Voice Call", and "Voice Call Only".
- Buttons:** "Time Shifts..." and "Alarms" buttons at the bottom.

There are following entries available:

Name

Enter any desired name of User here.

Phone

Enter the *phone number* of User here. Always use preceding international country code (e.g. +358 for Finland).

The *phone number* can be replaced by *e-mail address* of this User in case it is expected to send SMS Messages by e-mails from GSM-Control to GSM network and to receive SMS Messages as e-mails from GSM network (see *Additional Features/Sending and Receiving SMS message by e-mail* section later in this manual).

Comments

Any comment can be entered here if necessary.

Any User

GSM-Control supports the possibility to receive SMS Messages from **any** (not pre-configured) phone number or e-mail address, so called “**ANYUSER**” feature. If **Any User** is selected then **Name** field automatically changes to “ANYUSER” and **Phone** field to “ANYPHONE”. There can be only one “**ANYUSER**” in one GSM-Control configuration.

”SMS”, “SMS+Voice Call” or “Voice Call Only”

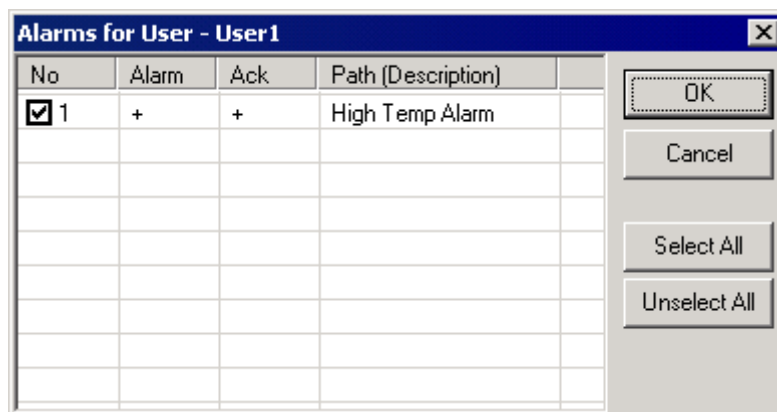
The delivery type for this User can be selected. If **SMS** is selected (default), the User will receive SMS Message only (default). If **SMS+Voice Call** is selected then User will receive SMS Message plus additional voice call (GSMCTRL will wait 30 seconds for User answer, after that immediately will hang-up the connection). If **Voice Call Only** is selected then User will receive only a voice call (GSMCTRL will wait 30 seconds for User answer, after that immediately will hang-up the connection). Note - the **Voice Call** feature will work only for Alarm messages (see “*Alarms*” Page section later in this manual) and only for Users without dialog menus enabled (see *Additional features/Advanced User* section later in this manual).

Time Shifts

By pressing this button, the “Time Shifts” dialog box can be invoked where day/time when Alarm messages will be sent to this User can be entered (see *Additional Features/Time Shifts* section later in this manual).

Alarms

By pressing this button, the “Alarms for User – *User Name*” dialog box can be invoked, where all currently created Alarm messages (see “*Alarms*” Page section later in this manual) can be easily linked/unlinked with current User:



The single Alarm message can be linked/unlinked with current User by checking/unchecking the checkbox in **No** column. All currently created Alarm messages can be linked with current User by pressing the **Select All** button and unlinked by pressing the **Unselect All** button.

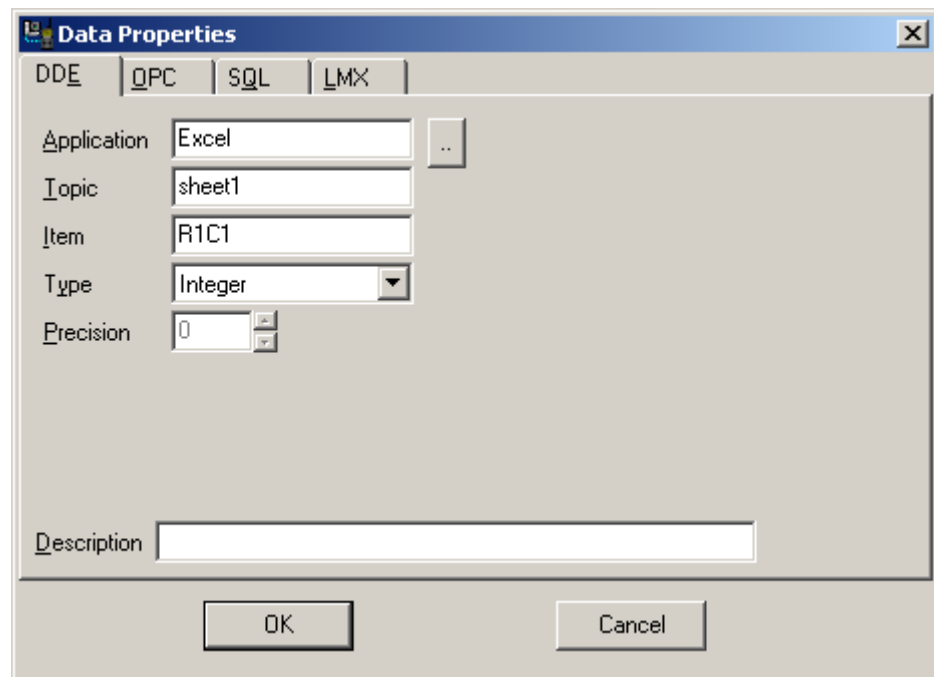
Click on **OK** to accept the entered User information or click on **Cancel** to reject the entered data.

"Data" Page

To activate the "Data" page, click on Data page control. The "Data" page contains information about all currently entered **Data items**. On the GSMCFG main window there are three fields "Source", "Type" and "Path (Description)" displayed for each Data item:

Source	Type	Path (Description)
DDE	Integer	Excel.sheet1.R1C1
-	-	-

The following “**Data Properties**” dialog box with current Data item configuration displayed will appear if creating new Data item or editing already existing Data item (if new Data item is created then default *Source* “DDE” with all fields empty (except *Type* equal to “Integer”) will be displayed):



Four different “**DDE**”, “**OPC**”, “**SQL**” and “**LMX**” data item *Source* pages can be selected by clicking on corresponding *DDE*, *OPC*, *SQL* or *LMX* page controls. The details how to enter information about OPC and SQL data items is explained in the “*Examples how to use GSM-Control*” section later in this manual. For DDE data items the following fields are available:

Application

Application (DDE Server) name.

Topic

DDE Topic name.

Item

DDE Item name.

Type

There are following types available: **Integer**, **Real**, **Discrete** and **String**. The appropriate type can be selected by clicking mouse left button on combo box:

- **Integer** (default selection) - signed 32-bit integer, range of values from - 2147483648 to 2147483647;
- **Real** - 32-bit floating (decimal) point, value may be between $\pm 3.4e^{38}$;
- **Discrete** - discrete with a value of either 0 (False, Off) or 1 (True, On);
- **String** - text string that can be up to 131 characters long;.

Precision

This field is accessible only for Real and String types:

- if *Type* is **Real** then *Precision* field is used to enter the number of digits after decimal point. The default *Precision* is 0;
- if *Type* is **String** then *Precision* field is used to enter the maximum length of string.

The *Type* and *Precision* fields are used to format the values of Data items in *Send* and *Alarm* messages to be sent from GSM-Control. For example, if *Type* **Real** and *Precision* **1** is used then following values will be sent from GSM-Control depending on actual value, for example:

- if actual value is 24.7 then SMS message sent from GSM-Control will contain "24.7";
- if actual value is 24.74 then SMS message sent from GSM-Control will contain "24.7";
- if actual value is 24.75 then SMS message sent from GSM-Control will contain "24.8";
- if actual value is 24 then SMS message sent from GSM-Control will contain "24.0".

Description

This field is common for all data item *Source* pages and any desired description of data item can be entered here and correspondingly it will be displayed on GSMCFG main window "Data" page "Path (Description)" field for this Data item.

If **Description** field is empty then on GSMCFG main window "Data" page this Data item "Path (Description)" field will be filled with *Path*, which depends on Data item current configuration (for example, for DDE items it will be as *application.topic.item*).

Click on **OK** to accept the entered User information or click on **Cancel** to reject the entered data.

"Send/Receive" Page

To activate the "Send/Receive" page, click on *Send/Receive* page control. The "Send/Receive" page contains information about all currently entered **Send** and **Receive** messages - SMS Messages to be sent from GSM-Control to remote GSM operator or device are called **Send** messages and SMS messages which can be received by GSM-Control from remote GSM operator or device are called **Receive** messages. All **Send** and **Receive** messages are grouped in the pairs consisting of:

- 1 both **Send** message and **Receive** message - in this case GSM-Control after receiving this **Receive** message will respond with this **Send** message;

- 2 only **Send** message - the sending of this message can be done via DDE or OPC;
- 3 only **Receive** message - no response message will be sent.

On the GSMCFG main window there are four fields “No“, “S“, “R” and “Path (Description)” displayed for each row (pair) of Send/Receive messages:

No	S	R	Path (Description)
1	+	+	Value:{DDE item}\?\
2	-	-	\\

where:

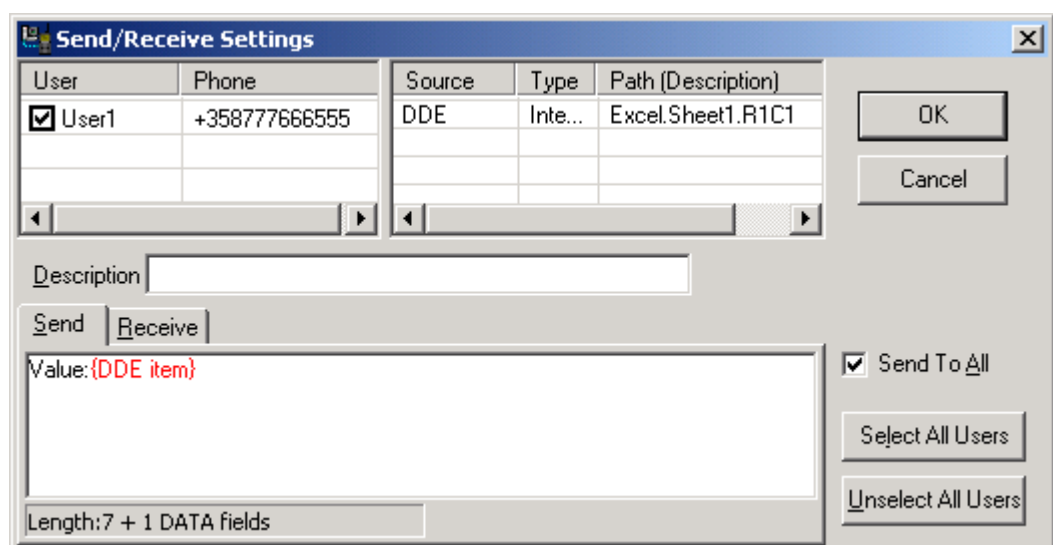
No - the number of Send/Receive message; this number is created/updated automatically when new Send/Receive message pair is created or some existing one deleted;

S - sign “+” indicates the Send message exists; sign “-” indicates the Send message does not exist;

R - sign “+” indicates the Receive message exists; sign “-” indicates the Receive message does not exist;

Path (Description) - the contents of Send/Receive message or additionally entered description of this Send/Receive message pair.

The following “**Send/Receive Settings**” dialog box with selected Send/Receive message pair configuration will appear if creating new Send/Receive message or editing already existing one (if new Send/Receive message is created then “Send”, “Receive” and “Description” fields are empty):



The dialog box titled "Send/Receive Settings" contains the following elements:

- User/Phone Table:**

User	Phone
☒ User1	+358777666555
- Source/Type/Path Table:**

Source	Type	Path (Description)
DDE	Inte...	Excel.Sheet1.R1C1
- Description:** A text field with the label "Description".
- Send/Receive Tabs:** Two tabs labeled "Send" and "Receive". The "Send" tab is currently selected.
- Value Field:** A large text area containing the text "Value:{DDE item}" in red.
- Length:** A label at the bottom left indicating "Length: 7 + 1 DATA fields".
- Buttons:** "OK", "Cancel", "Send To All" (checked), "Select All Users", and "Unselect All Users".

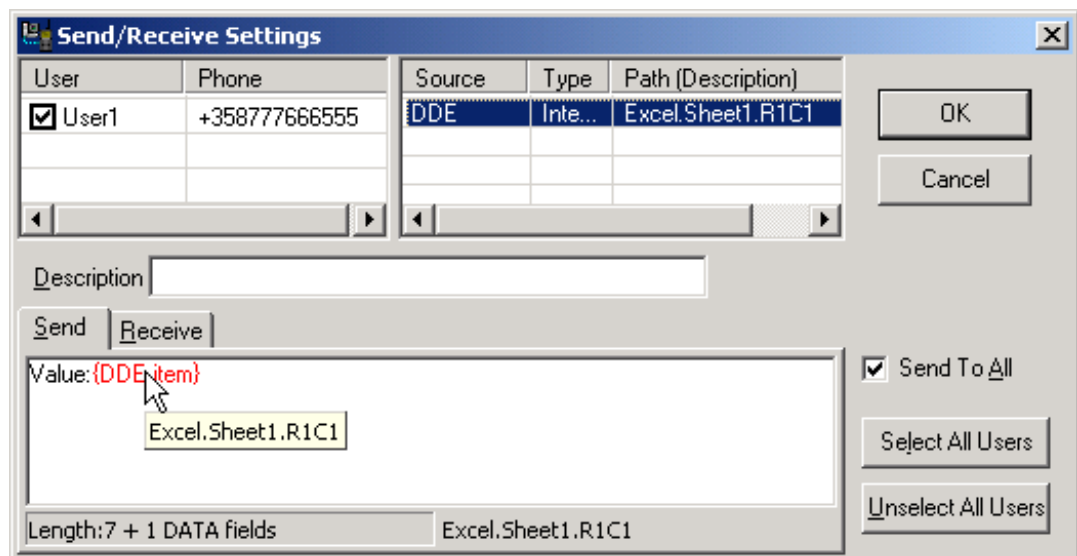
Contents of Send/Receive messages

The “Send” or “Receive” message pages (fields where to enter the text of message and locate the Data items) can be selected by clicking on corresponding Send or Receive page controls. The information in “Send” or “Receive” message fields can be entered the following way:

- the **text** can be entered directly by locating cursor on necessary Send or Receive message position (by clicking mouse left button); the entered text appears in **black color**; in Send message - this text will not change in the SMS message sent from GSM-Control; in Receive message - this text will be used to process the received SMS message;

- the **Data item** (DDE item, OPC item, LMX item or SQL field) can be inserted the following way: at first locate the cursor on the necessary position in the Send or Receive message text (by clicking mouse left button) and then double-click on the Data item to be inserted (all available Data items can be selected from “Send/Receive Settings” dialog box upper right part) - the selected Data item will be inserted in the necessary location and marked with

{ } in **red color**; the contents of inserted Data item can be easy determined by positioning mouse on it - the *Path(Description)* of Data item appears in the right part of bottom status bar as well as also near the Data item as a tip, like following:



- the **special symbols** also can be entered - currently the following ones are supported (the inserted ones will be marked by [] and will appear in **green color**):

- 1) change to a new line (0D in hex) can be entered by pressing **Ctrl+M** - will be marked as [cr].

The current length of Send or Receive message is displayed on the left part of bottom status bar, like following: “**Message Length:7 + 1 DATA fields**”, where **7** is the number of currently entered text characters; the total length of message

cannot be exactly determined if there presents at least one Data item (the length of **DATA fields** is not fixed and depends on current values).

Important Notes!!!

1. To simplify the recognition of **Receive** messages, GSM-Control Communication Program (GSMCTRL) checks for matching (for all Receive messages configured for User with phone number matching with sender phone number) the received SMS message's text only till the first **Data item** (DDE item, OPC item, LMX item or SQL field) inserted, therefore it is important to configure unique first text parts for User all Receive messages. For example, the following configuration of Receive messages: "**N:{DDE item}**" and "**N:{DDE item}P:{ DDE item}**" is incorrect - GSM-Control cannot recognize the difference if receiving these SMS messages.
2. The processing of received SMS messages is case insensitive, so GSM-Control will not recognize the difference, for example, between following SMS messages received: "**N:{DDE item}**" and "**n:{DDE item}**".

Linking Users with Send/Receive messages

Each Send/Receive message pair should be linked with at least one **User**. This can be done by selecting (checking the checkbox before User name) one or several Users from "Send/Receive Settings" dialog box upper left part. The "Select All Users" and "Unselect All Users" buttons can be used to correspondingly select/unselect all Users currently linked with this Send/Receive message pair. The Send and Receive Users may be different. The selected Receive Users have permission to send configured message to GSM-Control, but unselected Receive Users do not have such permission. The Send Users will receive configured Send message form GSM-Control, after receiving corresponding Receive message from one of selected Users. If **Send To All** checkbox is checked (by default), then all selected Send Users will receive configured Send message. If **Send To All** checkbox is unchecked, then configured Send message will be send only to User who sent the Receive message, if such User or ANYUSER is selected as a Send User.

Note!

*If **ANYUSER** is selected both for Send and Receive messages then Receive message can be received from **any** (not included in GSM-Control current configuration) phone number and Send message will be replied to sender's phone number.*

Click on **OK** to accept the entered Send/Receive message information or click on **Cancel** to reject the entered data.

"Alarms" Page

To activate the "Alarms" page, click on Alarms page control. The "Alarms" page contains information about all currently entered **Alarm** and **Alarm Acknowledgment** messages - SMS Messages to be sent from GSM-Control to remote GSM operator or device when some alarm/event occurs are called **Alarm** messages and SMS messages which can be received by GSM-Control as an alarm acknowledgment are called **Alarm Acknowledgment** (further **Ack**) messages. The **Ack** messages are optional and can be used if it is necessary to receive the confirmation of **Alarm** message successful delivery .

On the GSMCFG main window there are four fields "**No**", "**Alarm**", "**Ack**" and "**Path (Description)**" displayed for each row of Alarm message:

No	Alarm	Ack	Path (Description)
1	+	-	High temp. alarm
2	-	-	\\

where:

No - the number of Alarm message; this number is created/updated automatically when new Alarm message is created or some existing one deleted;

Alarm - sign "+" indicates the Alarm message exists; sign "-" indicates the Alarm message does not exist;

Ack - sign "+" indicates the Ack message exists; sign "-" indicates the Ack message does not exist;

Path (Description) - the contents of Alarm message or additionally entered description of this Alarm message.

The following “**Configure Alarm**” dialog box with selected Alarm message configuration will appear if creating new Alarm message or editing already existing one (if new Alarm message is created then “Alarm and Ack Items”, “Alarm Message”, “Ack Message”, “Options” and “Description” fields are empty):

Source	Type	Path (Description)
DDE	Integer	Excel.sheet1.R1C1
DDE	Discrete	Excel.sheet1.R2C1

Description:

OK Cancel

Alarm and Ack Items | Alarm Message | Ack Message | Options | Users

Available Users

User	Phone
User1	+358777666555

Selected Users

User	Phone
------	-------

The “**Alarm and Ack Items**”, “**Alarm Message**”, “**Ack Message**”, “**Options**” or “**Users**” message pages (fields where to select or enter the data) can be selected by clicking on corresponding *Alarm and Ack Items*, *Alarm Message*, *Ack Message*, *Options* or *Users* page controls.

Alarm and Ack Items

Here this Alarm message’s **Alarm** and **Ack** items can be selected.

The **Alarm** item can be any already configured DDE, OPC or LMX item (all DDE, OPC or LMX items are activated at GSM-Control Communication Program startup) used to determine if some alarm/event occurred. The value of **Alarm** item is interpreted the following way: 0 (zero) value means "no alarm/event", any non-zero value indicates some alarm/event.

To select **Alarm** item: at first click on “Alarm Item” radio button and then double-click on the Data item to be used as **Alarm** item. The already selected **Alarm** item can be replaced by other Data item the same way. If **Alarm** item is once selected then it can be removed only by deleting the whole Alarm message.

The **Ack** item also can be any already configured DDE, OPC or LMX item used to acknowledge the alarm by receiving **Ack** message (alarm acknowledgement SMS message). The acknowledgment is performed the following way: if Ack message is received then GSM-Control pokes (writes) value 1 to Ack item. So, Ack item needs the Ack message to be configured.

To select **Ack** item: at first click on “Ack Item” radio button and then double-click on the Data item to be used as **Ack** item. The already selected **Ack** item can be

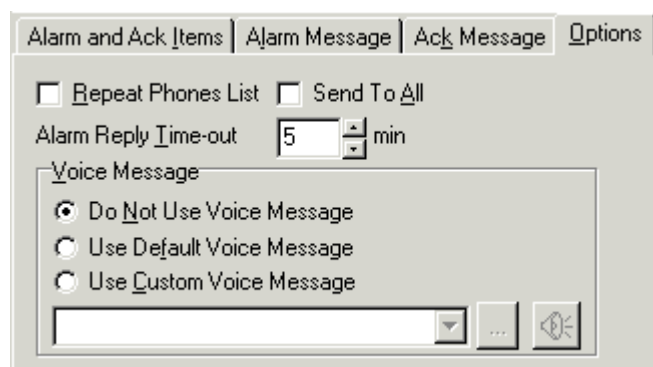
replaced by other Data item the same way. To remove **Ack** item, click on **Clear Alarm Item** button.

Alarm Message and Ack Message

Here the texts of **Alarm Message** and **Ack Message** can be entered as well as if necessary also **Data items** (DDE item, OPC item, LMX item or SQL field) can be inserted. The entering/editing contents of Alarm Message and Ack Message is completely same as Send/Receive messages - refer to "*Send/Receive*" Page section upper in this manual.

Options

The **Options** page allows to specify some Alarm message features:



The following can be entered in this dialog box:

The **Repeat Phones List** checkbox is used to enable/disable the repeating of **Alarm** message sending to Users (selected Users, see *Users* section below) linked with Alarm message in case the **Ack** message is configured. If this checkbox is not checked then GSM-Control stops to work with current alarm after the last User is not answering.

If this checkbox is checked then GSM-Control returns to the first User after the last User in Phones list is not answering, i.e. the sending of Alarm message continues until some User answers. The switching to next User (or to the same User in case only one User is linked with this Alarm message) is performed after **Alarm Reply Time-out** expires and there was no response.

Note - The **Repeat Phones List** and **Send To All** are mutually exclusive, i.e. no response (Ack message) in **Send To All** case is needed (but can be received if Ack message is configured).

The **Send To All** checkbox is used to enable the sending of this Alarm message to all Users linked with this Alarm message. The sending will be done without any delay (of course one by one). Any of linked Users can respond with Ack message.

The **Voice Message** feature enables the processing of alternative (voice) call in case the GSM SMS Service becomes inaccessible. The following three selections are possible:

“Do Not Use Voice Message”

This is default selection. In this case no alternative (voice) call will be performed for this Alarm message.

“Use Default Voice Message”

In this case the default Voice Message processing will be performed for this Alarm message, i.e. the **GSMCTRL.INI** file **WAVFile=** setting will be used to obtain the name of sound file (.WAV) containing pre-recorded voice message and

WAVSendRetries= setting will be used as number of voice call retries before rejecting the voice calls (see also *Additional features/GSMCTRL.INI file/ Entries for alternative (voice) call support in case SMS Service not available* section later in this manual.

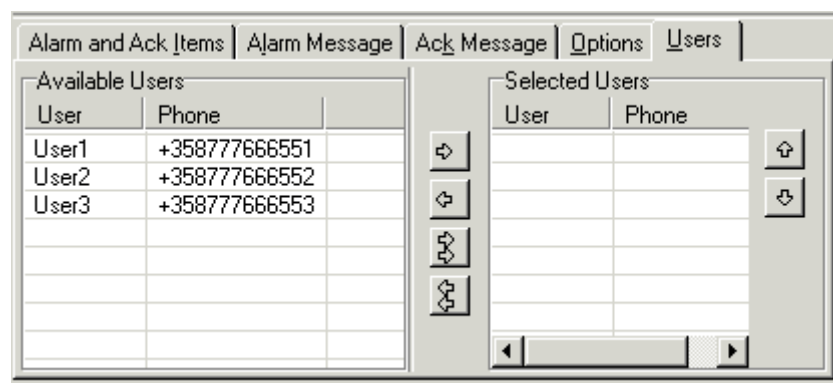
“Use Custom Voice Message”

In this case the sound file (.WAV) for this Alarm message can be selected from combo box, i.e. the Alarm message can be associated with unique sound file containing pre-recorded voice message. The **GSMCTRL.INI** file

WAVSendRetries= setting still will be used as number of voice call retries before rejecting the voice calls.

Users

The **Users** page is used to select and link Users with this Alarm message (the Alarm message should be linked with at least one User). The Users page consists of “Available Users” list box, “Selected Users” list box and six action buttons used to create the necessary configuration:



When first time configuring Users for this Alarm message, the “Available Users” list box contains all currently configured Users and “Selected Users” list box is empty (like in above picture). By selecting Users (both on “Available Users” and “Selected Users” list boxes; consecutive ones - by holding **Shift** key and at first clicking mouse left button on first User and then on last User; non-consecutive ones - by holding **Ctrl** key and clicking mouse Users to be selected) and using six

action buttons, the necessary Users and their order can be selected. There are following action buttons available:

-  “Add User” - move one or more Users from “Available Users” to “Selected Users”
-  “Remove User” - move one or more Users from “Selected Users” to “Available Users”
-  “Add All Users” - move all available Users from “Available Users” to “Selected Users”
-  “Remove All Users” - move all selected Users from “Selected Users” to “Available Users”
-  “Move Users Up” - move one or more Users up in “Selected Users” list box
-  “Move Users Down” - move one or more Users down in “Selected Users” list box

For example, the following configuration can be created where two Users (“User3” and “User1”) are selected to receive this Alarm message:

Available Users		Selected Users	
User	Phone	User	Phone
User2	+358777666552	User3	+358777666553
		User1	+358777666551

Note - Moving from “Available Users” to “Selected Users” does not mean theses selected Users are no more available - this selection applies only to Alarm message currently configured and allows to set up the order in which this Alarm message will be sent and acknowledgement expected (in case corresponding Ack message exists and **Send To All** is not selected on Options page).

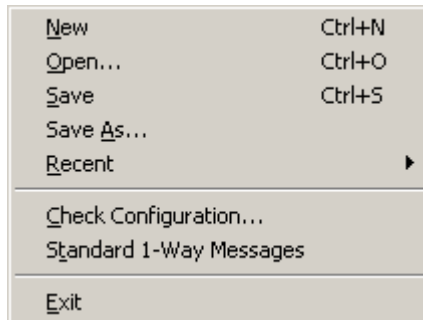
Click on **OK** to accept the entered Alarm message information or click on **Cancel** to reject the entered data.

GSMCFG Main Menu

The following top-level menu items and corresponding pop-up menus are used.

File

To access the "File" menu commands, click on "File" menu item (also short-cut Alt+F can be used) and pop-up menu with "File" menu commands will appear:



The "File" menu commands are used to process GSM-Control configuration file(s). There are following commands available:

New

The "New" command is used to start the creation of new GSM-Control configuration. The "New" command automatically invokes the "Settings" dialog box (see below). The "New" command also can be invoked by using short-cut Ctrl+N.

Open

The "Open" command is used to open existing GSM-Control configuration file. By default the GSM-Control configuration file has the file name extension .XML (e.g. CONFIG1.XML), but also any other file name extension can be used. This command also can be invoked by using short-cut Ctrl+O.

Save

The "Save" command can be used to save the current GSM-Control configuration in the current GSM-Control configuration file. This command also can be invoked by using short-cut Ctrl+S.

Save As...

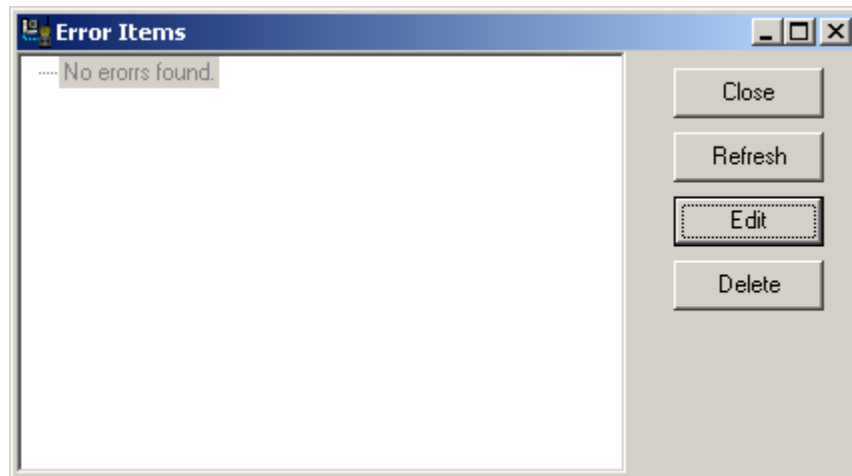
The "Save As..." command can be used to save the current GSM-Control configuration in the different (not current) GSM-Control configuration file.

Recent

The "Recent " command can be used to open some recently used GSM-Control configuration file.

Check Configuration...

The “Check Configuration” can be used to check configuration on logic errors. The command displays “Error items” dialog box:



If errors found, then items with errors are displayed, and items can be edited directly from this dialog box, by clicking on Edit button, or deleted by clicking Delete button. When error fixed, you can press Refresh button to search errors again.

Standard 1-Way Messages

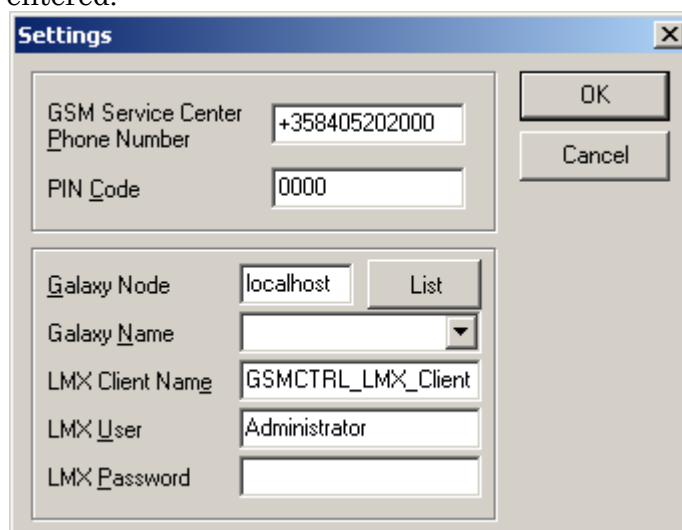
This command invokes the “One Way Messages” dialog box, see the *Additional features/One direction sending of SMS messages from GSM-Control/Sending “1-way” Messages* section later in this manual.

Exit

The "Exit" command can be used to exit from GSM-Control Configuration Program.

Settings

This command invokes the “Settings” dialog box, where the GSM Modem and LMX Settings can be entered:



The **GSM Service Center Phone Number** and **PIN Code** are necessary parameters to initiate the data exchange with GSM-modem connected to the computer's serial port. The **GSM Service Center Phone Number** and **PIN Code** are unique for each configuration, i.e. each GSM-Control configuration file contains one common **GSM Service Center Phone Number** and one **Pin Code**.

***Note:** The **GSM Service Center Phone Number** can be changed at GSM-Control Communication Program (GSMCTRL.EXE) runtime by using the reserved DDE or OPC item **SERVICE_NUMBER** (see Additional features / Sending messages by using DDE or OPC section later in this manual).*

The **Galaxy Node**, **Galaxy Name**, **LMX Client Name**, **LMX User** and **LMX Password** are parameters which describe the LMX data source - used for connection to Wonderware Application Server Galaxy via MXAccess (LMX Proxy):

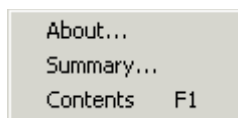
Galaxy Node and **Galaxy Name** parameters are used only by GSMCFG to browse Galaxy items. **Galaxy Node** specifies the Galaxy repository node, **Galaxy Name** is the name of Galaxy. Those parameters are not used by GSMCTRL because only one galaxy can be deployed at the time and GSMCTRL must run on the one of Application Server Galaxy nodes in purpose to access the LMX data. The pressing of **List** button enumerates galaxies for Galaxy Node and fills the Galaxy Name combo box.

LMX Client Name parameter can be any unique string. This parameter identifies LMX connection to the Application Server and is used internally by Application Server.

LMX User and **LMX Password** parameters specify the username and password of GSMCTRL connection, in case the security is enabled on the Galaxy.

Help

To access the "Help" menu commands, click on "Help" menu item (also short-cut Alt+H can be used) and pop-up menu with "Help" menu commands will appear:



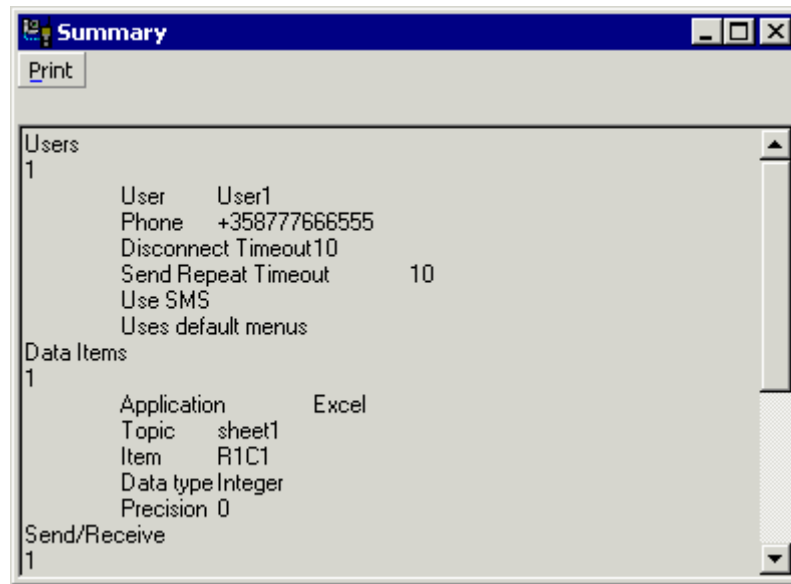
There are following "Help" menu commands available:

About...

This command can be used to display the general information about GSM-Control Configuration Program.

Summary...

This command invokes the “Summary” dialog box, where the whole current configuration can be displayed and printed:



The “Summary” dialog box is the only place from where the **indexes** of **Users** (phone numbers) and **Send messages** can be obtained - these indexes are displayed at the very left side before each User and Send/Receive pair information. The index of User (phone number) can be used with DDE or OPC item **NUMBERIDX** and index of Send message can be used with DDE or OPC item **MESSAGEIDX**.

Contents

This command can be used to display the contents of GSM-Control Configuration Program help.

GSM-Control Communication Program

The GSM-Control Communication Program is a MS Windows application program (**GSMCTRL.EXE**, further in the text also **GSMCTRL**) used to send/receive SMS messages via GSM-modem connected to computer serial port and to perform DDE, OPC, SQL or MXAccess (Lmx) data exchange on the basis on information prepared by GSM-Control Configuration Program (**GSMCFG.EXE**). GSM-Control Communication Program also allows to simulate the sending and receiving of SMS messages (for evaluation purposes without GSM-modem connected) as well as to send/receive SMS messages by e-mail (if such a service is available from GSM operator).

Communication Protocols

Dynamic Data Exchange (DDE) is a communication protocol developed by Microsoft to allow applications in the Windows environment to send/receive data

and instructions to/from each other. It implements a client-server relationship between two concurrently running applications. The server application provides the data and accepts requests from any other application interested in its data. Requesting applications are called clients. Some applications such as Wonderware InTouch and Microsoft Excel can simultaneously be both a client and a server.

OLE for Process Control (OPC) is an open interface standard to provide data from a data source and communicate the data to any client application in a common standard way. The OPC is based on Microsoft OLE, COM and DCOM technologies and enables simple and standardized data interchange between the industrial or office sector and the production sector. From general point of view many aspects of OPC are similar to DDE, but main difference is in the implementation by using Microsoft's COM (Component Object Model) technology. It enables fast exchange with process automation data and OPC open interface allows access to data from OPC Server in same standard way from OPC client applications supplied by different developers.

For more information on the basics of OPC, please refer to the **OPC Specification**. The OPC Data Access Custom Interface Specification is maintained by **OPC Foundation**, the current specification is 2.04 dated September 2000.

The **GSM-Control OPC** support is implemented both as **OPC Client** and **OPC Server**, i.e. GSM-Control Communication Program (GSMCTRL) can request data as OPC client and also can supply data as OPC server. The GSM-Control OPC version contains Server (IOPCServer), Group and Item interfaces. The item browsing and item value time stamping and quality is supported.

The GSM-Control OPC Server part is implemented based on **FactorySoft OPC Server Development Toolkit** and it conforms to OPC Data Access Custom Interface Specification 2.04. The GSM-Control OPC Server part is tested for compliance and is compatible with OPC Foundation OPC Data Access Compliance Test Tool. The GSM-Control OPC Client part is implemented by **Factory Soft OPC Client Development Toolkit** (version 2.01).

LMX (Lmx Proxy) is a Wonderware library for direct accessing to Wonderware Application Server Galaxy data via MXAccess interface.

Starting GSMCTRL

If starting GSMCTRL program first time after installation, it automatically will open and work with default configuration file DEFAULT.XML. To use some other configuration file, open it from GSMCTRL Main Menu by *File/Open* command or start GSMCTRL from command line with this configuration file name specified as command line parameter, like following:

GSMCTRL c:\gsmctrl\gsmdata.xml

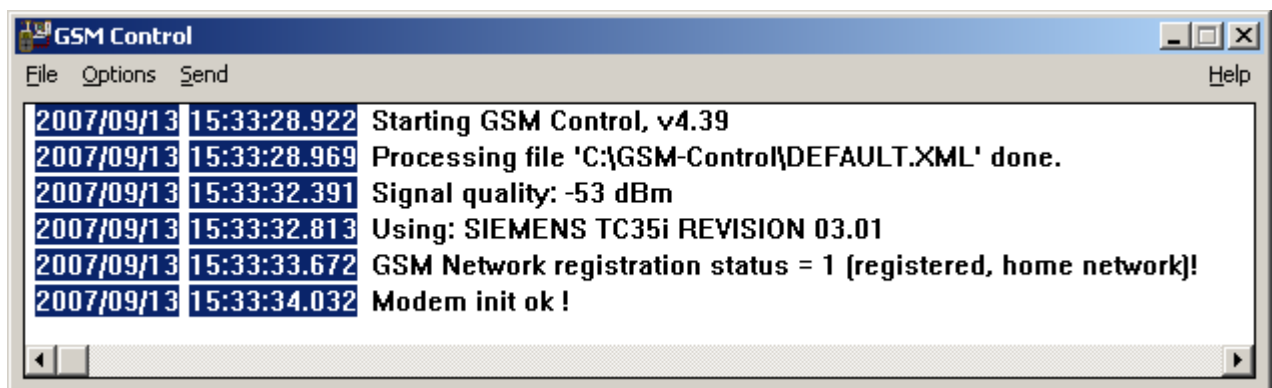
The last configuration file used is saved in GSMCTRL.INI file and will be used if closing GSMCTRL and starting again.

At GSM-Control Communication Program startup, the GSMCTRL main window appears and the following actions are performed:

- the GSM-Control configuration file is read and checked;
- the DDE, OPC and LMX links specified in the GSM-Control configuration file are activated; if current GSM-Control configuration contains OPC data items then GSM-Control tries to start the corresponding OPC Server(s);
- the GSM-modem is initiated depending on current settings;
- if some alarm conditions are configured and some of these alarms are active (the Alarm item values are non-zero) then corresponding Alarm messages are sent to Users linked with these Alarm messages.

Note: *the configured **SQL** connections are not initiated at GSMCTRL startup - these connections are initiated when corresponding SQL statements are executed first time. Therefore it is very important to check all configured SQL statements by using GSMCTRL **simulation mode**.*

The information about above actions is displayed on the GSMCTRL main window and also (as default) logged to GSMCTRL log file (see *GSMCTRL Menu Commands/Options/Logging* section below):



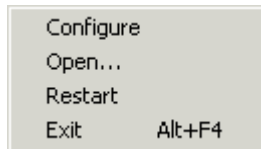
If GSM-modem is connected then GSM-modem successful initialization is logged by “**Modem init ok !**” string (as in above picture). The GSM-modem initialization can be done only if GSM-modem current settings are same as GSMCTRL communication settings (see *GSMCTRL Menu Commands/Options/Communications* section below).

GSMCTRL Menu Commands

The following top-level menu items and corresponding pop-up menus are used.

File

To access the "File" menu commands, click on "File" menu item (also short-cut Alt+F can be used) and pop-up menu with "File" menu commands will appear:



There are following commands available:

File/Configure

The "Configure" command can be used to start the GSM-Control Configuration Program (GSMCFG.EXE) at GSMCTRL runtime.

File/Open

The "Open" command is used to open any existing GSM-Control configuration file, which differs from currently used one.

File/Restart

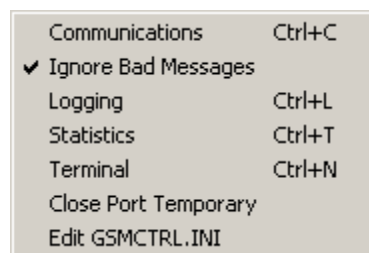
The "Restart" command can be used to restart the GSMCTRL program without exiting, i.e. to perform once more all startup sequence with currently used GSM-Control configuration file.

File/Exit

The "Exit" command can be used to exit from GSM-Control Communication Program.

Options

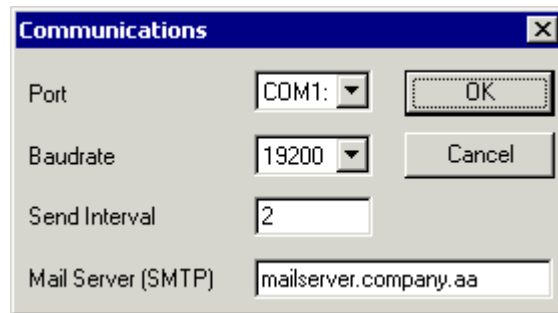
To access the "Options" menu commands, click on "Options" menu item (also short-cut Alt+O can be used) and pop-up menu with "Options" menu commands will appear:



There are following commands available:

Options/Communications

The "Communications" command is used to invoke the "Communications" dialog box:



The following can be entered in this dialog box:

"Port"

The COM port used by GSM-modem.

"Baudrate"

The baud rate used in the serial communication between computer serial port and GSM-modem (the default setting is 19200 bps). This baudrate should be same as current baudrate used on GSM-modem. GSM-modem other communication settings have to be the following: 1 start bit, 8 data bits, no parity, 1 stop bit.

"Send Interval"

The "Send Interval" (in seconds) is used to adjust the frequency between SMS messages sent from GSM-Control. The default and minimum value of "Send Interval" is 2 seconds. The "Send Interval" is used in the following way:

If there are several SMS messages waiting to be sent then before to send next SMS message, the GSM-Control will wait the "Send Interval" seconds after GSM-modem has responded with "send successful" response to previous SMS message. If GSM-modem has responded with "send failed" response then same SMS message will be repeated after "Send Interval" delay.

For example, if "Send Interval" default value 2 seconds is used and approximately 3 seconds are needed for GSM-modem to receive response on successful SMS message delivery from GSM Service Center and to deliver this "send successful" response to GSM-Control, then frequency between SMS messages sent from GSM-Control will be approximately 5 seconds.

"Mail Server (SMTP)"

The host name of the SMTP (Simple Mail Transfer Protocol) server used to process e-mails in case it will be necessary to send SMS messages by e-mails from GSM-Control. It is necessary to enter the SMTP server name if currently used GSM-Control configuration contains at least one *e-mail address* configured for some User and this User is expected to be a receiver of e-mail (see *GSM-Control*

Configuration Program / "Users" Page section upper in this manual) or you would like to send e-mails **manually** from GSM-Control Communication Program "Send Standard "1-way" Messages" dialog box (see *One direction sending of SMS messages from GSM-Control / Sending "1-way" Messages manually* section later in this manual). If you do not know the name of your SMTP server, ask your service provider or system administrator.

Options/Ignore Bad Messages

If **Ignore Bad Messages** is checked (default) then GSMCTRL will not respond with error message to wrong SMS messages received (wrong SMS message can be any message received not corresponding with GSM-Control current configuration, for example, SMS message is received from not configured sender's phone number or not configured Receive message is received, etc.). So, if **Ignore Bad Messages** is checked then received "good" SMS messages will be processed according to GSM-Control configuration, but any received "bad" SMS message will be simply ignored. The **Ignore Bad Messages** feature can be useful in auto-answering systems to prevent endless cycle of SMS messages exchanged in situations when by some reason system fails.

Note!

*To prevent the endless cycle of SMS messages exchanged in situations when two GSM-Control programs are communicating each with other, the GSM-Control Communication Program always (also if **Ignore Bad Messages** is not checked) will not respond with error message to received SMS message where some of following text strings are included (these are GSMCTRL own error responses):*

"Access denied"

"Bad command"

"Bad message received"

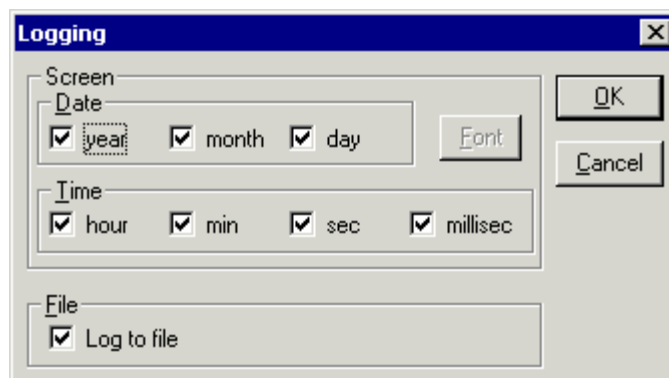
"You have sent invalid message"

"Invalid configuration"

"Can't add connection"

Options/Logging

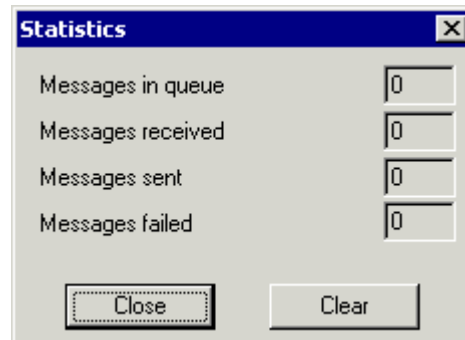
The "Logging" command is used to invoke the "Logging" dialog box:



The format of information displayed on the GSMCTRL main window and stored to the GSMCTRL log file can be configured here (the *Font* selection is not supported in the current version of GSMCTRL). The "Log to file" selection allows to enable/disable the storing of logging information to file. If "Log to file" is checked then all events, communication traffic and other information is stored to the GSMCTRL log file. The GSMCTRL log file name has the format *D_yymmdd.LOG* where *yy* is a year, *mm* is month and *dd* is a day in the month.

Options/Statistics

The "Statistics" command is used to invoke the "Statistics" dialog box:



The following information is displayed in this dialog box:

"Messages in queue"

Total amount of SMS messages waiting to be sent. This value can be also obtained through DDE (or OPC) by using built-in topic (data group) PHONE item **QUEUE_LEN**.

"Received messages"

Total amount of SMS messages received by GSM-Control after last restart; this value can be also obtained through DDE (or OPC) by using built-in topic (data group) PHONE item **STAT_RECV**.

"Sent messages"

Total amount of SMS messages sent from GSM-Control after last restart; this value can be also obtained through DDE (or OPC) by using built-in topic (data group) PHONE item **STAT_SENT**.

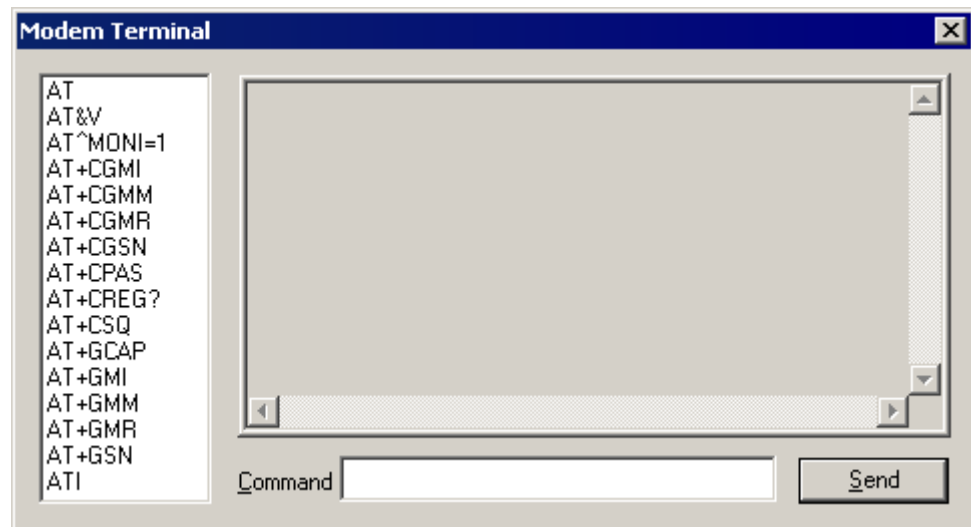
"Failed messages"

Total amount of SMS messages failed to send from GSM-Control after last restart; this value can be also obtained through DDE (or OPC) by using built-in topic (data group) PHONE item **STAT_FAIL**.

All statistic counters can be cleared (set to zero) by pressing "Clear" button. The statistic counters are not working in Simulation mode (see *Simulate* section below).

Options/Terminal

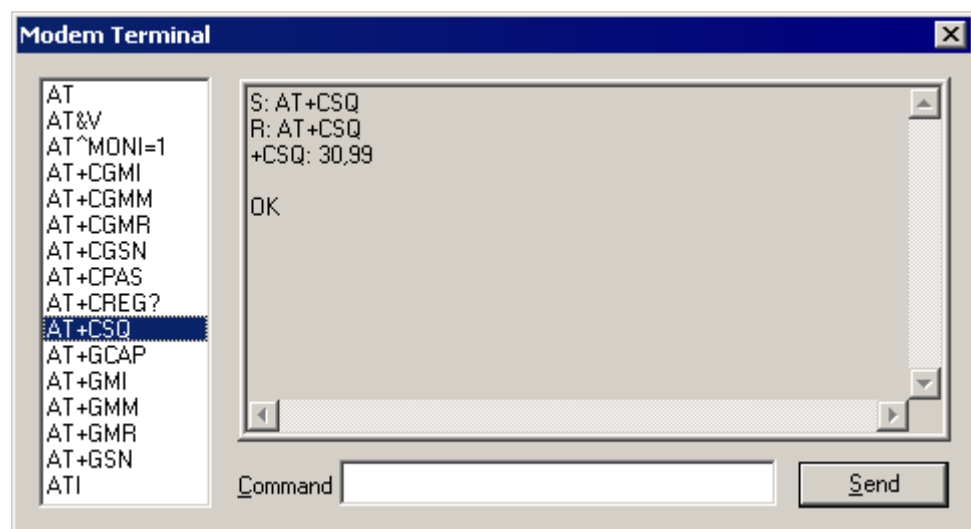
The "Terminal" command is used to invoke the "Modem Terminal" dialog box:



The "Modem Terminal" dialog box can be used to manually send AT commands to the modem and see modem responses. At left side of "Modem Terminal" dialog box there is provided a list of several most useful AT commands, the commands from this list can be executed by mouse double click. As well as any AT command can be entered in the "Command" edit box and executed by pressing the "Send" button. All commands and responses are displayed on the "Modem Terminal" dialog box log screen:

There are two important commands available to determine the **modem signal quality**:

- 1 **AT+CSQ** ("Signal quality" command):



This command returns received signal strength indication <rssi> and channel bit error rate <ber>, in the following format:

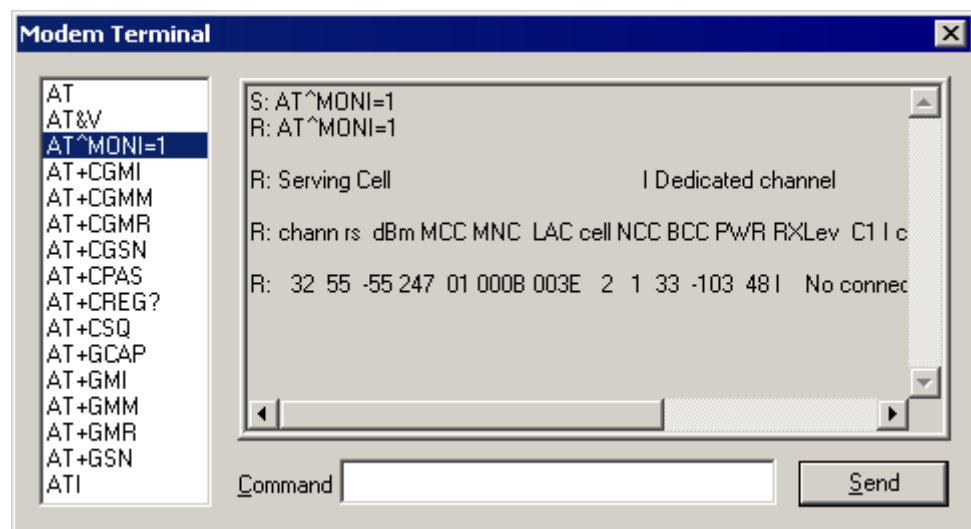
+CSQ: <rssi>,<ber>

The signal strength indication <rssi> should be at least 15 to get reliable connection, the possible values are 0...31 where 31 is the best signal (in modem

user manuals these values usually are converted to –dBms, the following correspondence:

<rsssi>	Receive level
0	-113 dBm or less
1	-111 dBm
2...30	-109...-53 dBm
31	-51 dBm or greater
99	Not known or not detectable

- 2 AT^MONI=n** (“Monitor idle mode and dedicated mode” command, supported only by Siemens TC35/TC35i and MC35/MC35i GSM-modems):



This command can be used to retrieve information of the serving/dedicated cell *automatically* every n seconds. The most important dBm value is returned as third parameter, see modem user manuals for explanation of other parameters). The execution **AT^MONI=n** command can be stopped by sending any other command to modem or by closing the “Modem Terminal” window.

Note!

The Options/Terminal selection is not available in simulation mode.

Options/Close Port Temporary

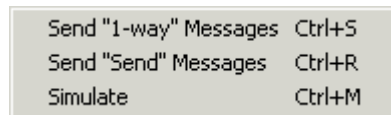
This selection can be used to temporary close the COM port used by GSM-Control and use this port for some other purposes (e.g. to make a data call) - after “Close Port Temporary” is selected, GSM-Control will wait 1 minute and after that will start to try re-open the COM port.

Options/Edit GSMCTRL.INI

This selection can be used to quickly open the edit the current GSMCTRL.INI file (see later in this manual).

Send

To access the "Send" menu commands, click on "Send" menu item (also short-cut Alt+S can be used) and pop-up menu with "Send" menu commands will appear:



There are following commands available:

Send/Send "1-way" Messages

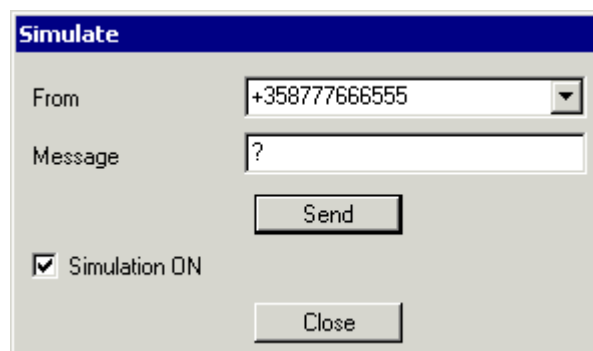
The *Send/Send "1-way" Messages* command invokes the "Send Standard "1-way Messages" dialog box, where appropriate text messages can be entered (or selected) and sent manually from GSMCTRL (one direction communication), see *Additional features/Send "1-way" Messages* section later in this manual.

Send/Send "Send" Messages

The *Send/Send "Send" Messages* command invokes the "Send Configured "Send" Messages" dialog box, where appropriate configured Send messages (see *GSM-Control Configuration Program/"Send/Receive" Page* section upper in this manual) can be selected and sent manually from GSMCTRL, see *Additional features/Send "Send" Messages* section later in this manual.

Send/Simulate

The *Send/Simulate* command invokes the "Simulate" dialog box, what can be used for testing/evaluation purposes to simulate the sending of SMS messages to GSMCTRL (to simulate the sending of Receive and Alarm Ack messages):



There are following fields available in this dialog box:

"From"

The phone number from which the SMS message is expected.

"Message"

The contents of SMS message to be sent to GSMCTRL.

"Send"

By pressing this button receiving of SMS messages is simulated.

"Simulation ON"

This checkbox is used to switch between GSMCTRL **normal** (default) and **simulation** modes.

If this checkbox is not checked then GSMCTRL is in **normal** mode and needs the GSM-modem to be connected to computer serial port. In normal mode SMS messages can be received by GSM-Control 1) via GSM-modem or 2) by simulating from "Simulate" dialog box. The sending of SMS messages from GSM-Control is done via GSM-modem. So, in normal mode it is still possible to simulate receiving of SMS messages.

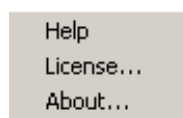
If this checkbox is checked then GSMCTRL is in **simulation** mode and does not need the GSM-modem to be connected. In simulation mode SMS messages can be received by GSM-Control only by simulating from "Simulate" dialog box. The sending of SMS messages from GSM-Control is not really performed - the sending of SMS messages is only displayed on GSMCTRL main window and stored to GSMCTRL log file. The simulation mode allows without connecting to GSM network very effectively check how the GSM-Control functions and test how the created GSM-Control configuration works.

"Close"

This button is used to exit from "Simulate" dialog box.

Help

To access the "Help" menu commands, click on "Help" menu item (also short-cut Alt+H can be used) and pop-up menu with "Help" menu commands will appear:



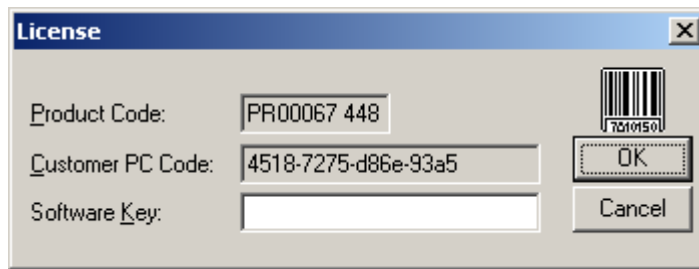
There are following commands available:

Help

The *Help/Help* command invokes the GSM-Control help.

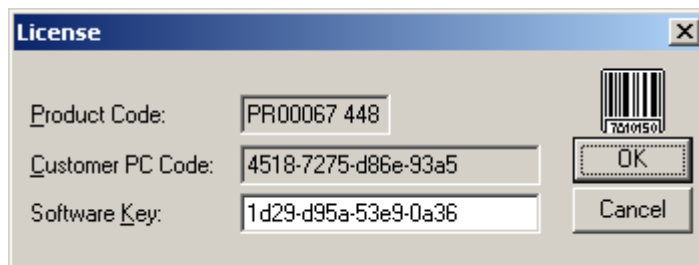
License...

The *Help/License...* command invokes the “License” dialog box:



Here the “Customer PC Code” is “computer-dependent” string generated by GSM-Control and it is unique for this computer. Write it down or Copy/Paste to e-mail when ordering the GSM-Control.

After purchasing the GSM-Control, you will get the software license key - 16-character alphanumeric string. Open the “License” dialog again and Copy/Paste it to “Software Key” field:



Click OK and restart GSM-Control Communication Program. GSM-Control software license now is enabled.

Note – the “Software Key” string is saved to GSMCTRL.INI file to enable it is automatically detected at GSM-Control next start-up .

About...

The *Help/About...* command displays the general information about GSM-Control Communication Program.

Examples how to use GSM-Control

The “Examples how to use GSM-Control” section explains the most common cases how to implement data transfer via SMS messages and DDE, OPC, SQL and MXAccess (Lmx) interfaces. In all following examples the GSM-Control **simulation mode** is used (no GSM-modem needed) and only one **User1** with phone number **+358777666555** is configured (for information how to use GSM-Control with GSM-modem connected and sending/receiving SMS messages by mobile phone, refer to *Getting started with GSM-modem connected* section upper in this manual).

Note - the *GSM-Control with MS Excel (DDE)* section below is the most comprehensive and is the only “examples” section where using GSM-Control as a DDE server is explained. This explanation can be used also for other DDE or OPC clients connecting to GSM-Control as DDE or OPC server.

GSM-Control with MS Excel (DDE)

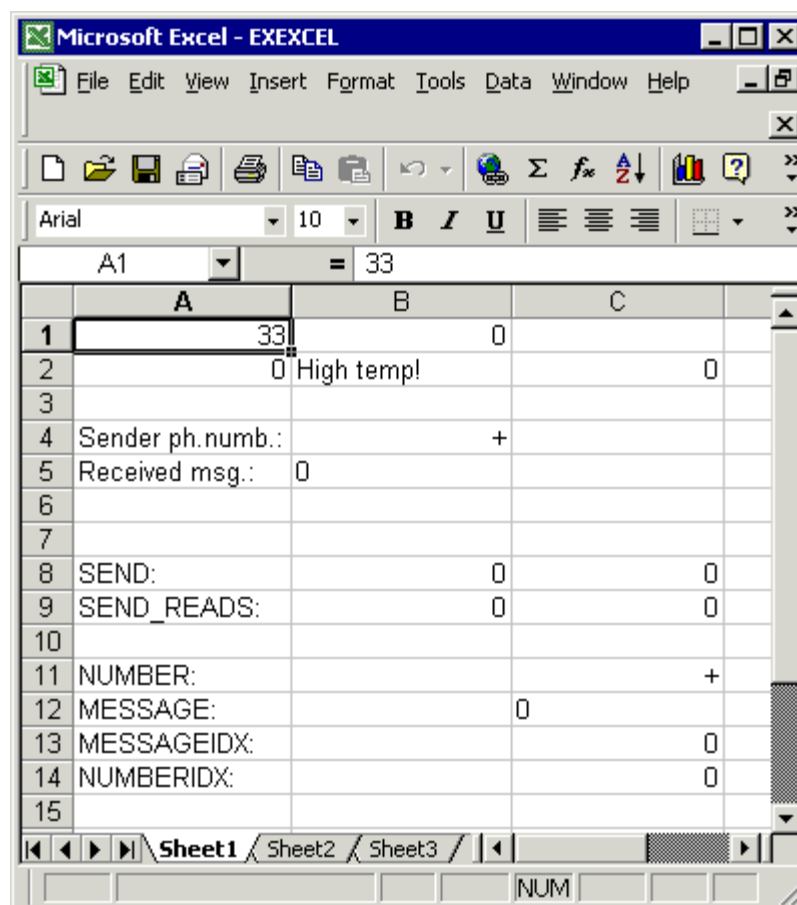
This section explains how to use GSM-Control together with MS Excel by using DDE interface. Both GSM-Control built-in DDE client and DDE server features are covered. The **EXEXCEL.XML** and **EXEXCEL.XLS** files supplied with GSM-Control installation are used. Before starting to execute following examples, start GSM-Control Configuration Program (**GSMCFG**), open the EXEXCEL.XML configuration file and examine the contents of configuration supplied.

Starting sequence

As both MS Excel and GSM-Control Communication Program (GSMCTRL) has built-in DDE server and DDE client support, it is important to follow their starting sequence to have DDE interface properly working (it is assumed neither MS Excel nor GSMCTRL is currently running):

- 1 Start MS Excel. Open the **EXEXCEL.XLS** file supplied with GSM-Control installation. Select “**Enable Macros**” on the Excel message box displayed. Reply with “**No**” to “Remote data not accessible. Start application ‘GSMCTRL.EXE’?”.
- 2 Start GSM-Control Communication Program (GSMCTRL). Select *File/Open* from GSMCTRL main menu and select **EXEXCEL.XML** from the list of available GSM-Control configuration files. The GSMCTRL will restart. Now GSMCTRL as a DDE client is ready to request data from MS Excel acting as a DDE server (assuming there are no DDE errors displayed on GSMCTRL main window). Open the “**Simulate**” dialog box by selecting *Send/Simulate* from GSMCTRL main menu. Select the “Simulation ON” option - the GSMCTRL will change to simulation mode (the GSMCTRL main window title bar will change correspondingly).

- 3 In MS Excel open the “**Links**” dialog box by selecting *Edit/Links* from Excel main menu. Select (mark) all eight GSMCTRL items available, select “Automatic” update and press “**Update Now**”. Press **OK** - the information on sheet EXEXCEL.XLS have to look like following, indicating MS Excel as a DDE client is ready to request data from GSM-Control acting as a DDE server:



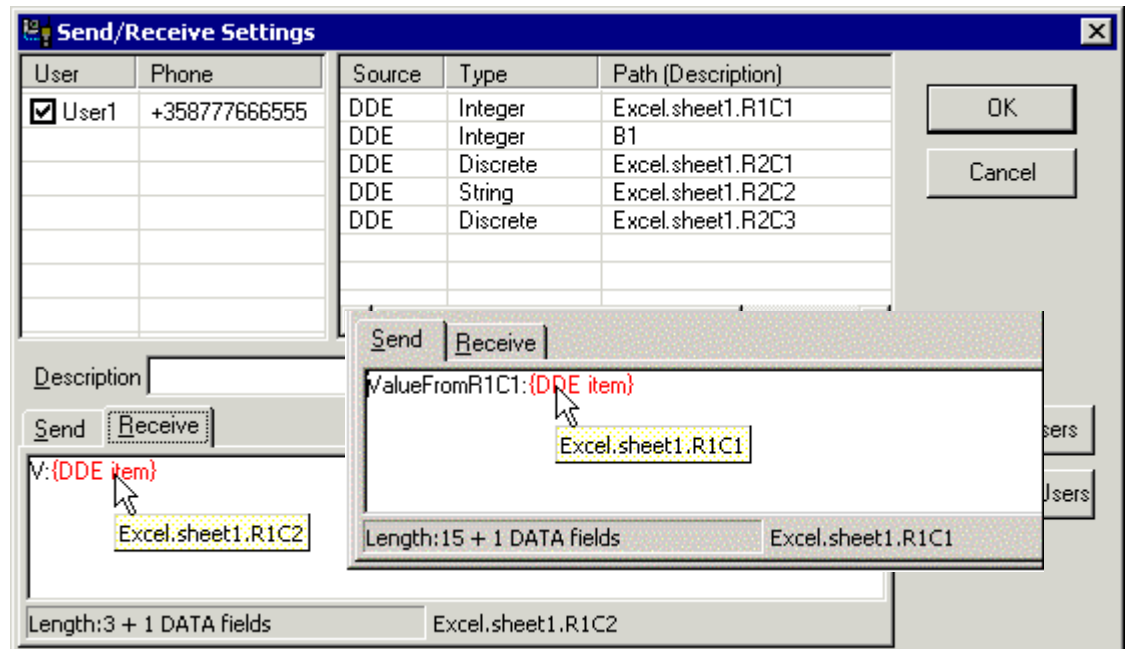
Check the content of cells B4, B5 C8, C9, C11, C12, C13, C14 - these cells are directly linked with GSM-Control built-in DDE items and correspondingly new (fresh) values are coming to these cells directly from GSM-Control. The cells B8, B9, B11, B12, B13, B14 are used to provide new values (poke) for GSM-Control - there is Excel VBA code included (can be viewed by *Tools/Macro/Visual Basic Editor* from Excel main menu) where *Worksheet_Change* function is used to poke values entered in cells B8, B9, B11, B12, B13, B14 to corresponding GSM-Control DDE items and *Worksheet_Calculate* function is used to refresh values in cells B8 and B9 depending on C8 and C9 state.

Note - the cells B4 and C11, which are linked with sender's phone number, has the special (Custom) formatting “+” to ensure the + sign indicating international code is displayed.

Receiving/Sending SMS message

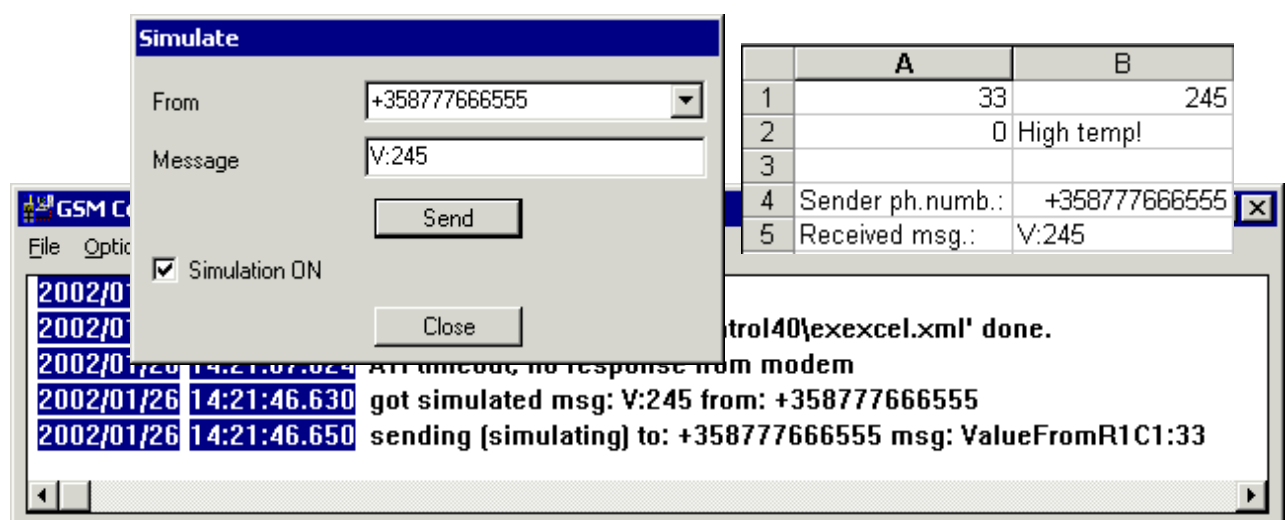
The following example will explain how to receive SMS message containing some value to be written to Excel cell B1 and immediately send the response from GSM-Control containing the current value from Excel cell A1.

The corresponding GSM-Control configuration is following:



where DDE item R1C2 is inserted at the end of **Receive** message “V:” and DDE item R1C1 is inserted at the end **Send** message “ValueFromR1C1:” and this Send/Receive message pair is linked with **User1** having phone number “+358777666555”.

The following happens if SMS message “V:245” is sent (simulated as below) from “+358777666555” to GSM-Control:



- at 14:21:46.630 the message “V:245” is received from “+358777666555”;
- the received value 245 is transferred to Excel cell B1;

- the sender's phone number is transferred to Excel cell B4 and whole text of received SMS message is transferred to Excel cell B5 (as these Excel cells are linked to GSM-Control built-in DDE items SENDER_NUM and RECV_MESSAGE);
- at 14:21:46.650 the GSM-Control responded to "+358777666555" with message "ValueFromR1C1:33", where value 33 was obtained from MS Excel cell A1 (DDE address R1C1).

Now, if GSM-Control will receive again SMS message "V:X" (where X is some integer value), this value will be delivered to Excel cell B1 and GSM-Control will respond to "+358777666555" with SMS message "ValueFromR1C1:Y" (where Y is the current value from Excel cell A1).

Sending Alarm message and receiving Acknowledgment

The following example will explain how to send Alarm message and how to receive Alarm Acknowledgment message. The Alarm message is sent if Excel cell A2 value changes from 0 to 1, the Alarm message will contain the current value from Excel cell B2. The Alarm Acknowledgment message text is "Ack it" and receiving this message will cause the change to value 1 in Excel cell B3 (used as Ack Item).

The corresponding GSM-Control configuration is following:

The image displays two screenshots of the GSM-Control configuration interface.

Top Screenshot: 'Configure Alarm' Dialog

- Source Table:**

Source	Type	Path (Description)
DDE	Integer	Excel.sheet1.R1C1
DDE	Integer	B1
DDE	Discrete	Excel.sheet1.R2C1
DDE	String	Excel.sheet1.R2C2
DDE	Discrete	Excel.sheet1.R2C3
- Description:** High Temp Alarm
- Alarm and Ack Items:**
 - ☒ Alarm Item: Excel.sheet1.R2C1
 - ☐ Ack Item: Excel.sheet1.R2C3
 -
- Alarm Message:** {DDE Item} Excel.sheet1.R2C2
- Ack Message:** Ack it
- Users:** (Empty list)

Bottom Screenshot: 'Ack Message' Dialog

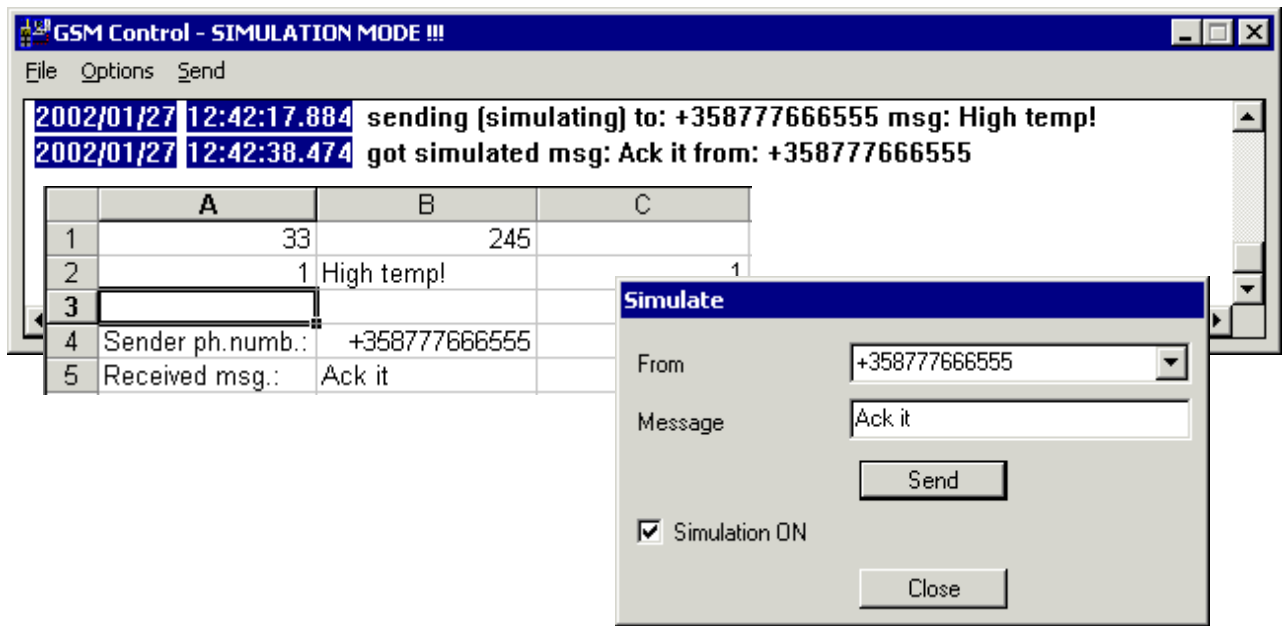
- Ack Message:** Ack it
- Users:**

User	Phone
User1	+358777666555

where:

- DDE item R2C1 is used as **Alarm Item**;
- DDE item R2C3 is used as **Ack Item**;
- the text of **Alarm Message** is linked with DDE item R2C2, no other text included;
- the text of **Ack Message** is "Ack it", no Data items inserted;
- these Alarm/Alarm Ack messages are linked with **User1** (phone number "+358777666555").

The following happens if Excel cell A2 value (used as alarm condition) is changed from 0 to 1 and afterwards “+358777666555” responds with “Ack it”:

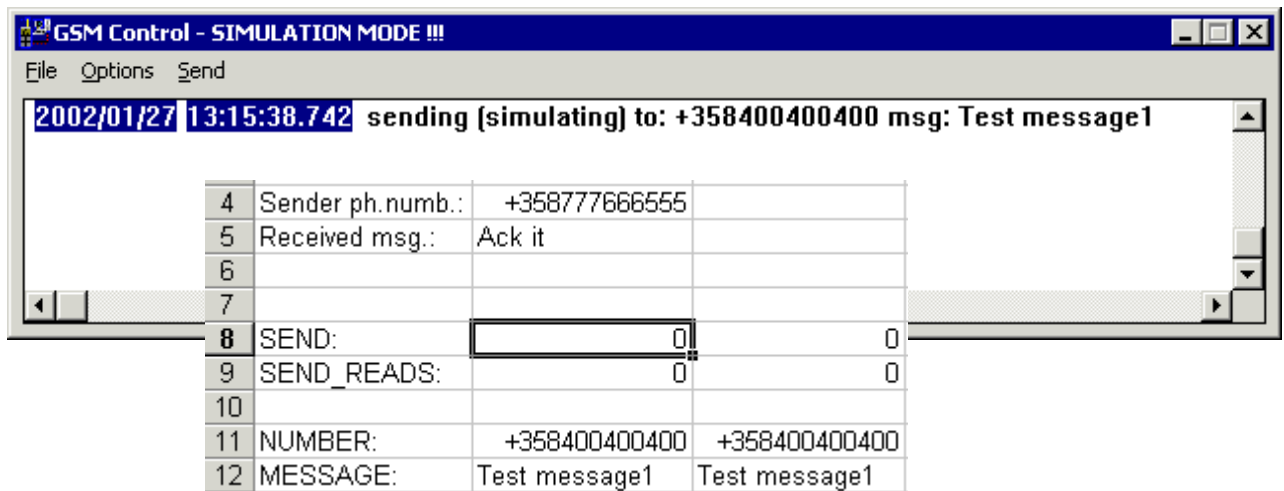


- at 12:42:17.884 the Alarm message “High temp!” is sent to “+358777666555”;
- at 12:42:38.474 “+358777666555” responds with Ack message “Ack it” and Excel cell value C2 changes to 1 indicating the alarm Acknowledgment is received.
- the Ack message sender’s phone number is in Excel cell B4 and text of received SMS message is in cell B5 (as these Excel cells are linked to GSM-Control built-in DDE items SENDER_NUM and RECV_MESSAGE).

Now, if at first changing values of A2 and C2 back to 0 (and possibly modifying Alarm text in B2) , the Alarm message sending and receiving Ack message can be done again.

Sending any SMS message to any phone number

This is an easiest way to send **any** SMS message from DDE client (MS Excel in our case) via GSM-Control (as DDE server) to **any** phone number. In following example: 1) at first the receiver's phone number ("**+358400400400**" in example below) is entered into cell B11 (linked with GSM-Control built-in DDE item NUMBER) and text of message ("**Test message1**" in example below) is entered into cell B12 (linked with GSM-Control built-in DDE item MESSAGE) and 2) then value **1** is entered into cell B8 (linked with GSM-Control built-in DDE item SEND). After sending of SMS message the value of SEND changes back to **0**:

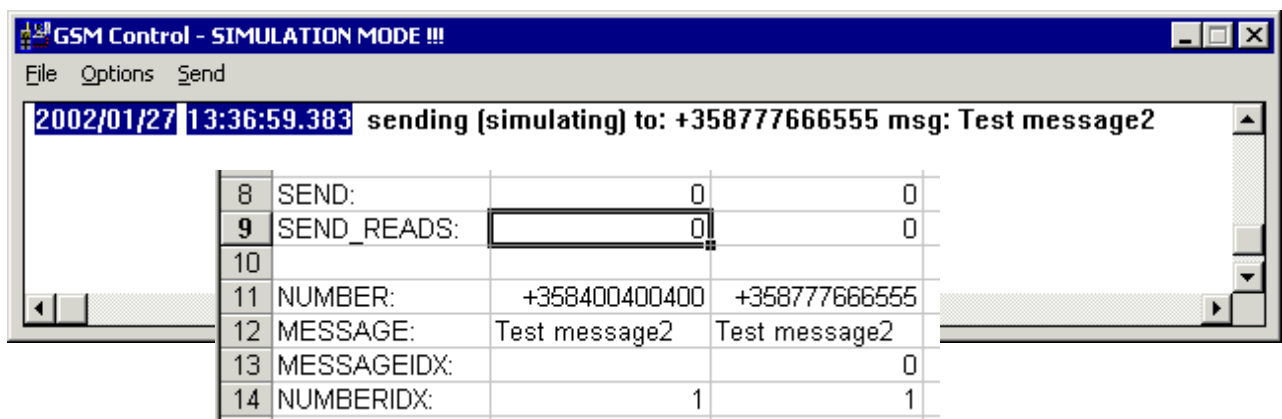


The screenshot shows the 'GSM Control - SIMULATION MODE !!!' window. At the top, a status bar displays the date and time '2002/01/27 13:15:38.742' followed by the message 'sending (simulating) to: +358400400400 msg: Test message1'. Below this is a table with 12 rows and 3 columns. The first 7 rows are empty. The 8th row has 'SEND:' in the first column, an input field containing '0' in the second column, and '0' in the third column. The 9th row has 'SEND_READS:' in the first column, '0' in the second column, and '0' in the third column. The 10th row is empty. The 11th row has 'NUMBER:' in the first column, '+358400400400' in the second column, and '+358400400400' in the third column. The 12th row has 'MESSAGE:' in the first column, 'Test message1' in the second column, and 'Test message1' in the third column.

4	Sender ph.numb.:	+358777666555	
5	Received msg.:	Ack it	
6			
7			
8	SEND:	0	0
9	SEND_READS:	0	0
10			
11	NUMBER:	+358400400400	+358400400400
12	MESSAGE:	Test message1	Test message1

Sending any SMS message to phone number configured in GSM-Control

Any SMS message can be sent to phone number **already configured** in GSM-Control. In this case it is necessary to use the GSM-Control built-in DDE item NUMBERIDX. In example below: 1) at first the index of configured User (**1** in our case because there is only one User (phone number “+358777666555”) in our current GSM-Control configuration) is entered into cell B14 (linked with GSM-Control built-in DDE item NUMBERIDX) and text of message (“**Test message2**” in example below) is entered into cell B12 (linked with GSM-Control built-in DDE item MESSAGE) and 2) then value **1** is entered into cell B8 (linked with GSM-Control built-in DDE item SEND). After sending of SMS message the value of SEND changes back to **0**:

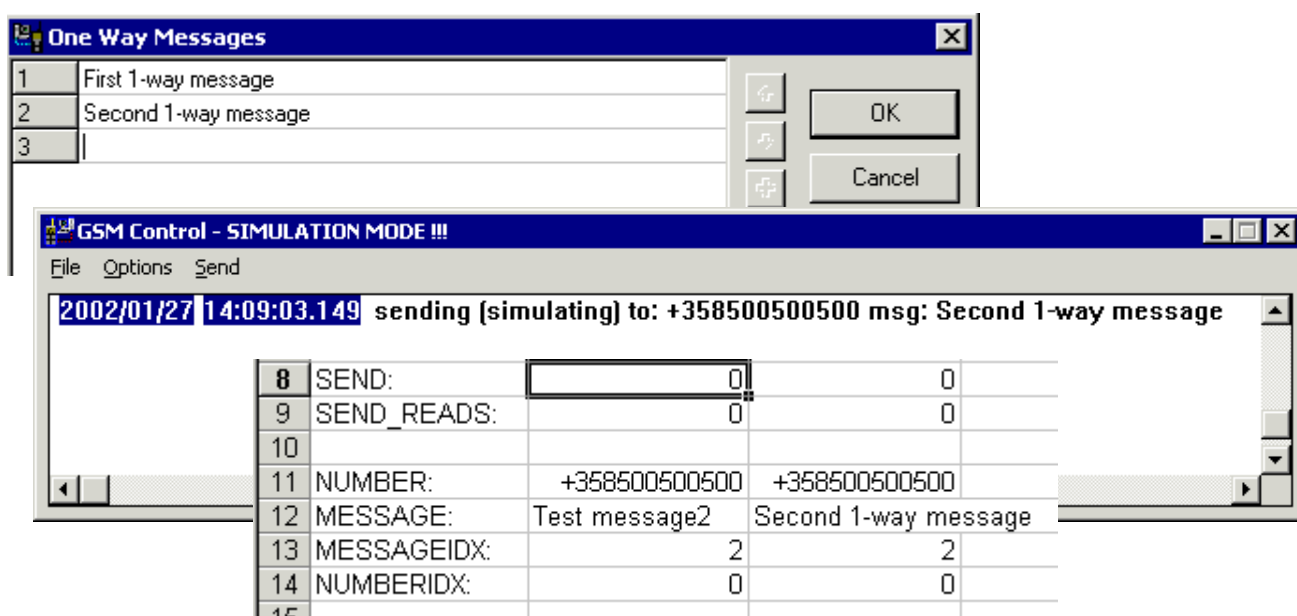


	8	9	10	11	12	13	14
SEND:	0	0					
SEND_READS:	0	0					
NUMBER:	+358400400400	+358777666555					
MESSAGE:	Test message2	Test message2					
MESSAGEIDX:		0					
NUMBERIDX:	1	1					

Sending “1-way messages”

GSM-Control supports so called “**1-way messages**” feature - the text of messages (containing only text, no Data items inserted) can be configured in GSM-Control configuration and then sent manually or via DDE or OPC in one direction (see *Sending “1-way” Messages* section later in this manual).

In this case it is necessary to use the GSM-Control built-in DDE item MESSAGEIDX. In example below: 1) at first the receiver’s phone number (“+358500500500” in example below) is entered into cell B11 (linked with GSM-Control built-in DDE item NUMBER) and index of “1-way” Message (2 in example below - the text of message is “**Second 1-way message**” as entered in GSMCFG “One Way Messages” dialog box) is entered into cell B13 (linked with GSM-Control built-in DDE item MESSAGEIDX) and 2) then value 1 is entered into cell B8 (linked with GSM-Control built-in DDE item SEND). After sending of SMS message the value of SEND changes back to 0:



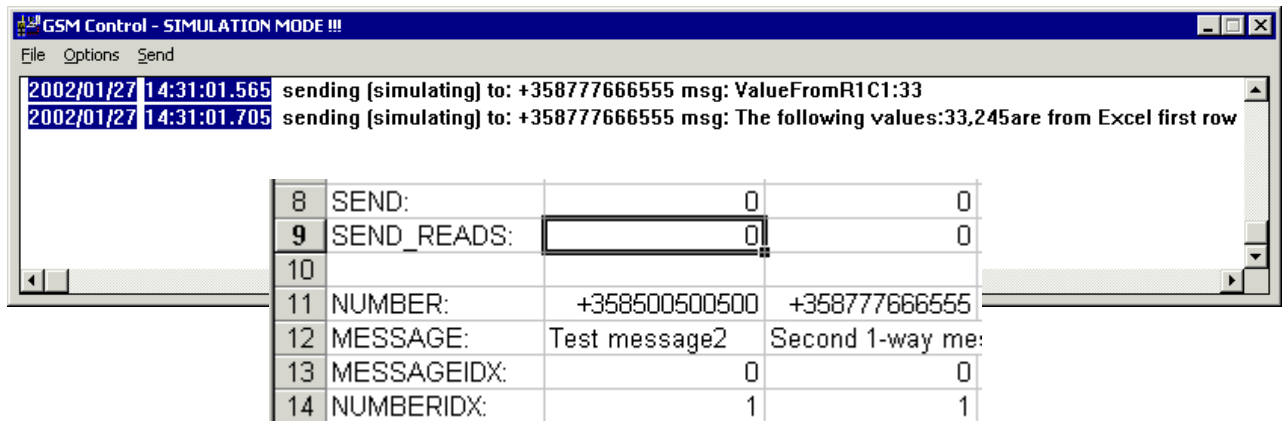
The “1-way” Messages can be sent also to phone numbers **already configured** in GSM-Control - in this case it is necessary to use the GSM-Control built-in DDE item NUMBERIDX (instead of NUMBER).

Sending “Send messages”

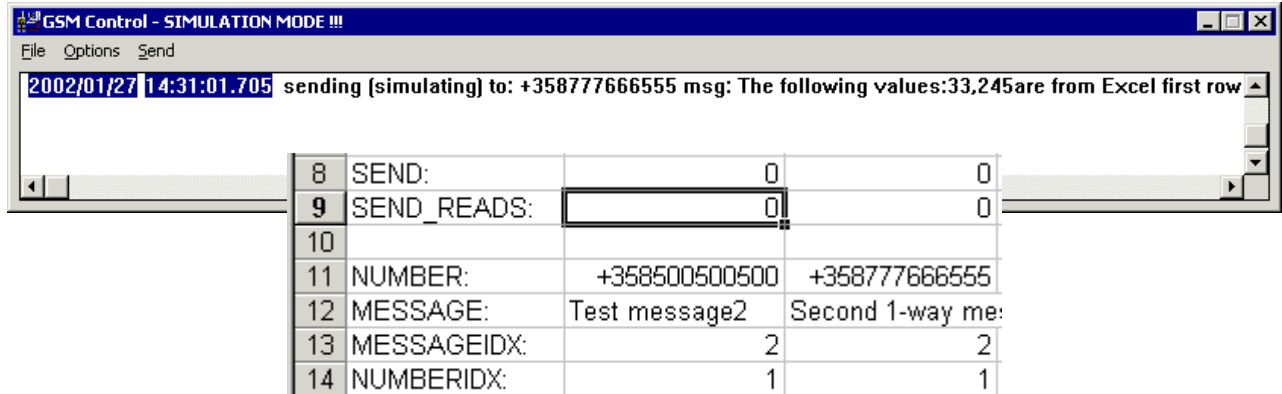
In GSM-Control configuration for each configured User there can be several **Send** messages configured (see “*Send/Receive*” Page section upper in this manual)). It is possible to send these Send messages automatically via DDE or OPC, in this case GSM-Control built-in DDE (or OPC) item SEND_READS has to be used.

In example below, to send **all** Send messages configured for some User : 1) at first the index of configured User (1 in our case because there is only one User (phone number “+358777666555”) in our current GSM-Control configuration) is entered into cell B14 (linked with GSM-Control built-in DDE item NUMBERIDX) and

value **0** is entered into cell B13 (linked with GSM-Control built-in DDE item MESSAGEIDX) and 2) then value **1** is entered into cell B9 (linked with GSM-Control built-in DDE item SEND_READS). After sending of SMS messages the value of SEND_READS changes back to **0**:



To send **only one** of Send messages configured for some User : 1) at first the index of configured User (**1** in our case because there is only one User (phone number “+358777666555”) in our current GSM-Control configuration) is entered into cell B14 (linked with GSM-Control built-in DDE item NUMBERIDX) and index of Send message (value **2** in example below) is entered into cell B13 (linked with GSM-Control built-in DDE item MESSAGEIDX) and 2) then value **1** is entered into cell B9 (linked with GSM-Control built-in DDE item SEND_READS). After sending of SMS message the value of SEND_READS changes back to **0**:



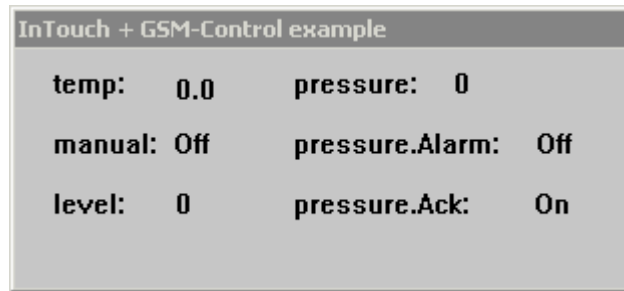
GSM-Control with Wonderware InTouch (DDE)

This section explains how to use GSM-Control together with Wonderware InTouch by using DDE interface. GSM-Control will be used only as a DDE client. The **EXWW.XML** and **EXWW.ZIP** files supplied with GSM-Control installation are used. The EXWW.ZIP file contains the InTouch example application, which is necessary to unpack to some directory. Before starting to execute following examples, start GSM-Control Configuration Program (**GSMCFG**), open the EXWW.XML configuration file and examine the contents of configuration supplied.

Starting sequence

As in following examples Wonderware InTouch will be used as DDE server and GSM-Control Communication Program (GSMCTRL) will be used as DDE client, InTouch run-time (View.exe) always has to be started before GSMCTRL. The following sequence:

- 1 Start InTouch run-time (View.exe) - the following “InTouch + GSM-Control example” window will appear:



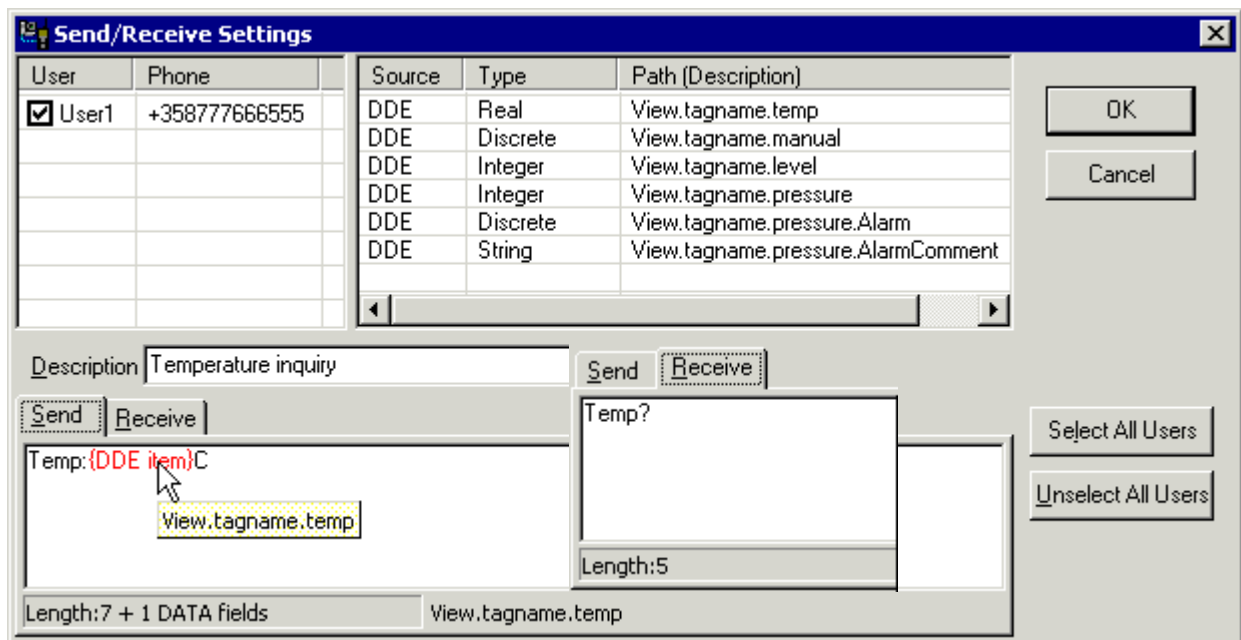
InTouch + GSM-Control example			
temp:	0.0	pressure:	0
manual:	Off	pressure.Alarm:	Off
level:	0	pressure.Ack:	On

- 2 Start GSM-Control Communication Program (GSMCTRL). Select *File/Open* from GSMCTRL main menu and select **EXWW.XML** from the list of available GSM-Control configuration files. The GSMCTRL will restart. Now GSMCTRL as a DDE client is ready to request data from Wonderware InTouch acting as a DDE server (assuming there are no DDE errors displayed on GSMCTRL main window). Open the “**Simulate**” dialog box by selecting *Send/Simulate* from GSMCTRL main menu. Select the “Simulation ON” option - the GSMCTRL will change to simulation mode (the GSMCTRL main window title bar will change correspondingly).

Receiving/Sending SMS messages

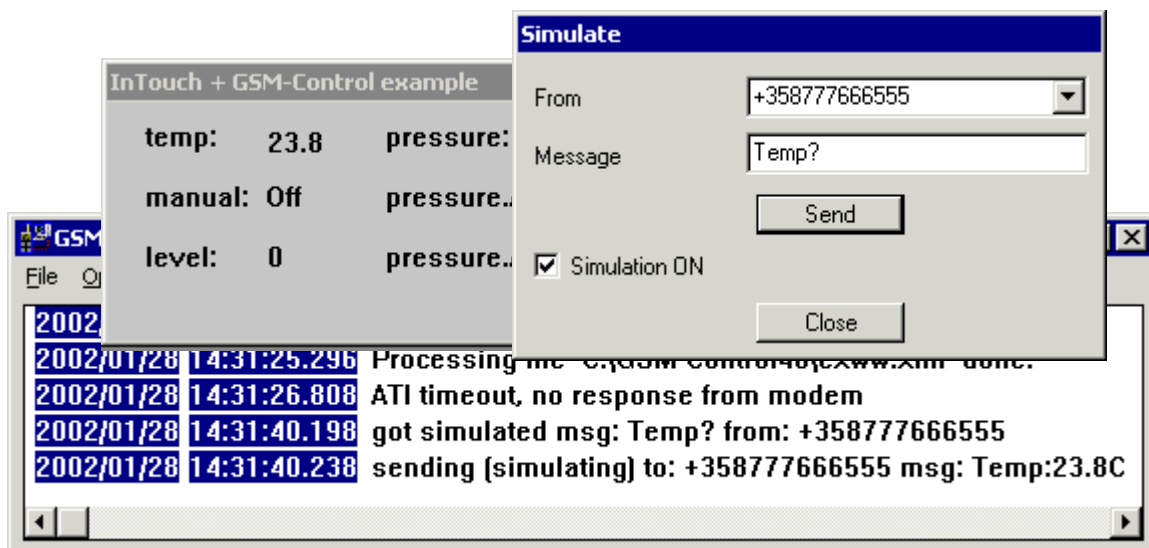
The first example will explain how to receive SMS message containing only text “**Temp?**” and immediately send the response from GSM-Control containing the current value of InTouch Memory Real tag **temp**.

The corresponding GSM-Control configuration is following:



where **Receive** message contains only the text **“Temp?”** and DDE item **temp** (belongs to application **View** and topic **tagname** - reserved topic name for InTouch tagnames database) is inserted into the **Send** message **“Temp:C”** before character **“C”** and this Send/Receive message pair is linked with **User1** having phone number **“+358777666555”**.

The following happens if at first the value of tag **temp** is changed to **23.8** in InTouch and then SMS message **“Temp?”** is sent (simulated as below) from **“+358777666555”** to GSM-Control:

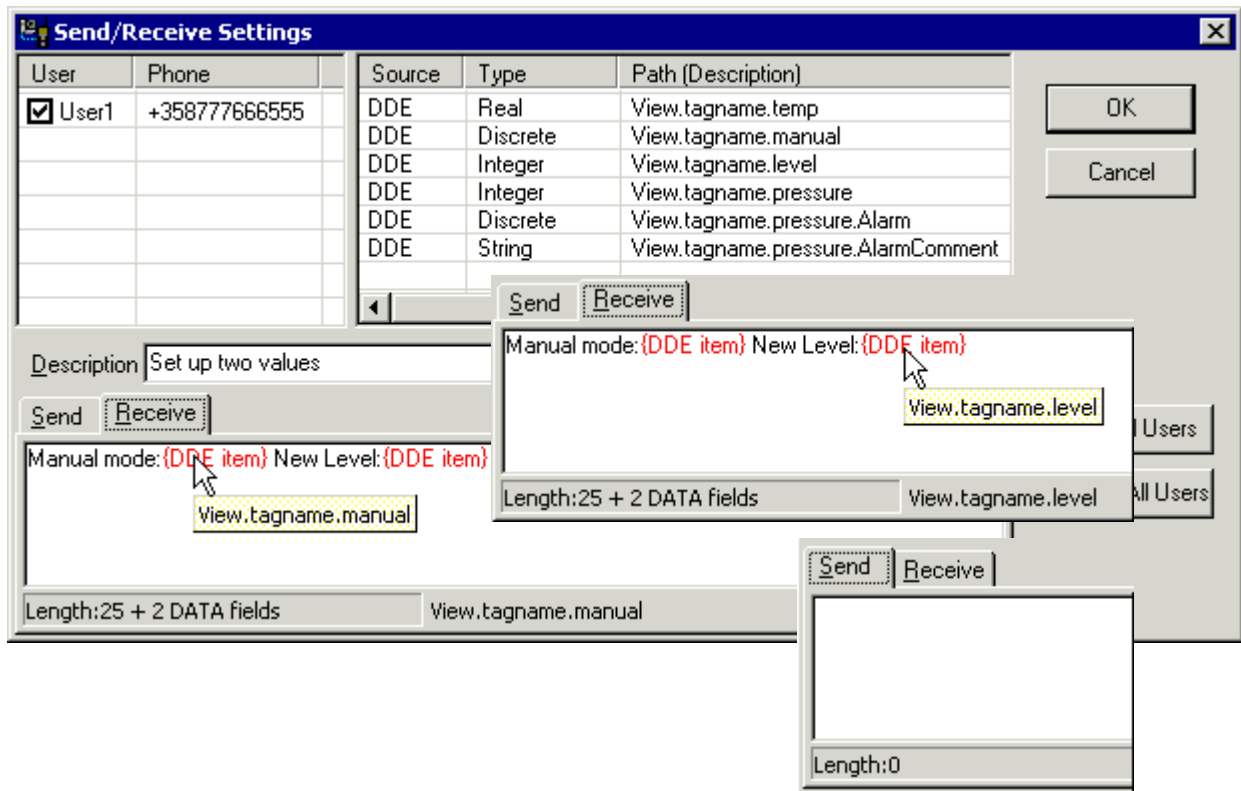


- at 14:31:40.198 the message **“Temp?”** is received from **“+358777666555”**;
- at 14:31:40.238 the GSM-Control responded to **“+358777666555”** with message **“Temp:23.8C”**, where 23.8 is the current value of tag **temp** in InTouch.

Now, if GSM-Control will receive again SMS message “**Temp?**” then GSM-Control will respond to “+358777666555” with SMS message “Temp:XC” (where X is the current value of tag **temp** in InTouch).

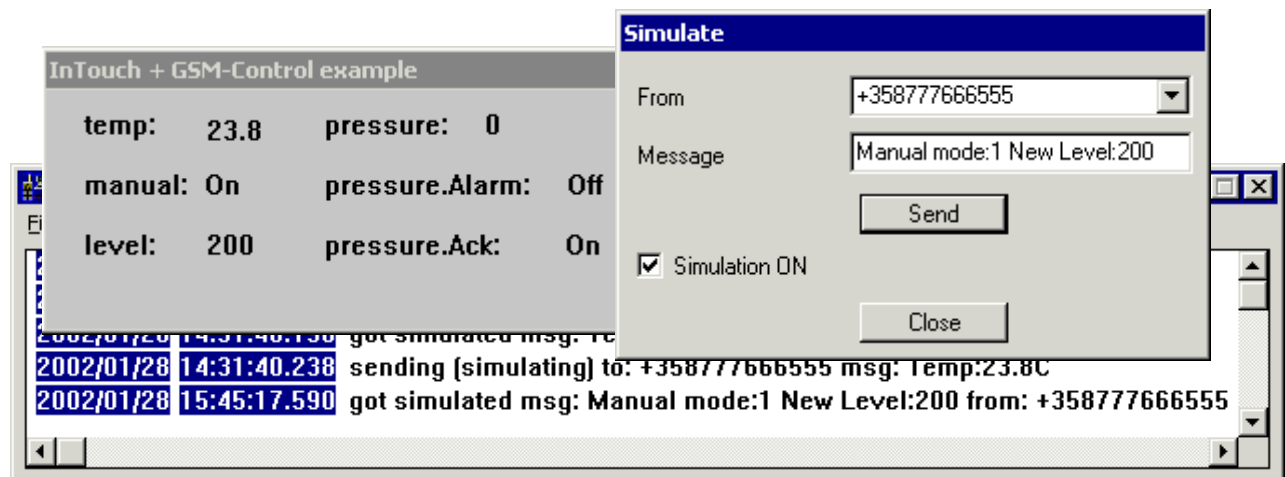
The second example will explain how to receive SMS message containing new values for InTouch Memory Discrete tag **manual** and Memory Discrete tag **level**, without no response sent back from GSM-Control.

The corresponding GSM-Control configuration is following:



where DDE items (InTouch tags) **manual** and **level** are inserted into **Receive** message, **Send** message is empty and this Send/Receive message pair is linked with **User1** having phone number “+358777666555”.

The following happens if SMS message “**Manual mode:1 New Level:200**” is sent (simulated as below) from “+358777666555” to GSM-Control:



- at 15:45:17.590 the message “**Manual mode:1 New Level:200**” is received from “+358777666555”;

- new values are received in InTouch: tag **manual** has new value 1 (On) and tag **level** has new value 200.

Now, if GSM-Control will receive again SMS message “Manual mode:X New Level:Y”, where X is new value for tag **manual** and Y is new value for tag **level**, these new values will be transferred to InTouch.

Sending Alarm message and receiving Acknowledgment

The following example will explain how to send Alarm message from InTouch and how to receive Alarm Acknowledgment message with some value included. The Alarm message is sent if value of InTouch tag **pressure** has reached alarm state (indicated by alarm dot field **.Alarm** value change from 0 to 1). The Alarm message will contain some text and two current values: the current value from tag **pressure** dot field **.AlarmComment** and the current value from tag **pressure** itself. No **Ack Item** is configured. The Alarm Acknowledgment message text configured is “Yes - change to X!” where X is linked with tag **pressure**.

The corresponding GSM-Control configuration is following:

The screenshot displays the GSM-Control configuration interface with several overlapping windows. The main window shows the 'Alarm and Ack Items' tab with the following configuration:

- Alarm Item:** View.tagname.pressure.Alarm (selected with a radio button)
- Ack Item:** (empty)
- Clear Ack Item:** (button)

Below this, the 'Ack Message' tab is visible, showing a table of 'Selected Users':

User	Phone
User1	+358777666555

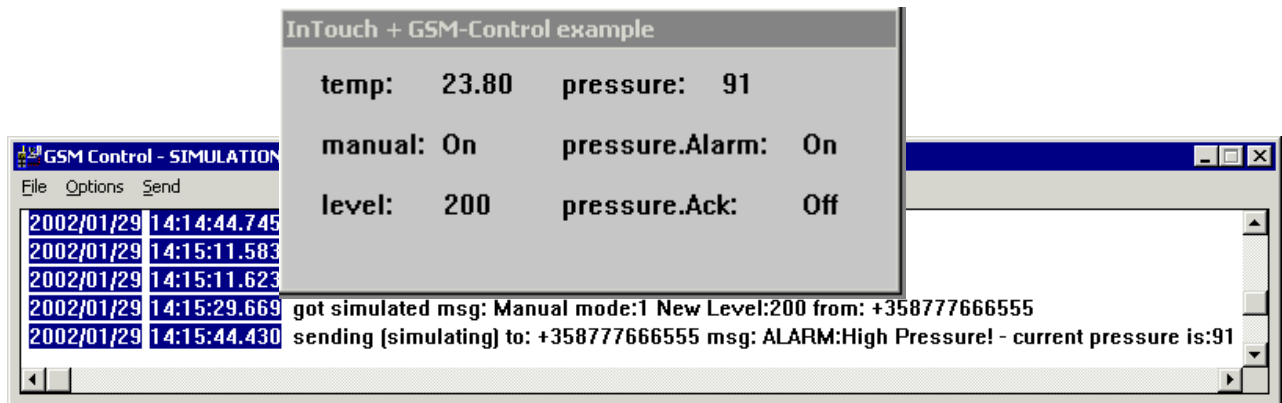
Two message configuration windows are also shown:

- Alarm Message Window:**
 - Text: ALARM:{DDE item} - current pressure is:{DDE item}
 - Link: View.tagname.pressure.AlarmComment
 - Length: 31 + 2 DATA fields
- Ack Message Window:**
 - Text: Yes - change to {DDE item}!
 - Link: View.tagname.pressure
 - Length: 18 + 1 DATA fields

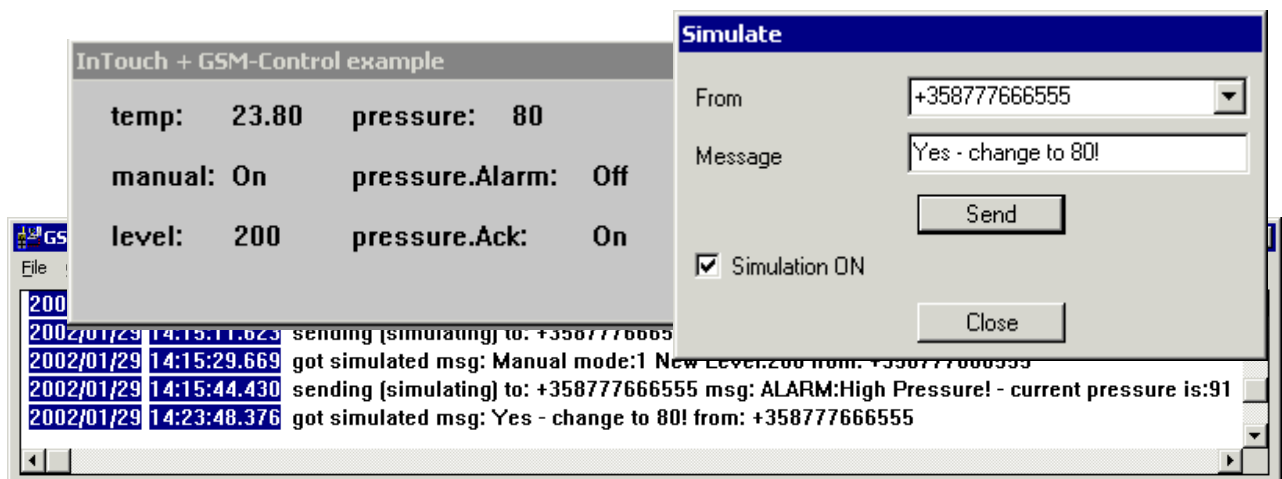
where:

- **pressure.Alarm** is used as **Alarm Item**;
- no **Ack Item** is configured;
- the text of **Alarm Message** is linked with **pressure.AlarmComment** and **pressure**;
- the text of **Ack Message** is linked with **pressure**;
- these Alarm/Alarm Ack messages are linked with **User1** (phone number "+358777666555").

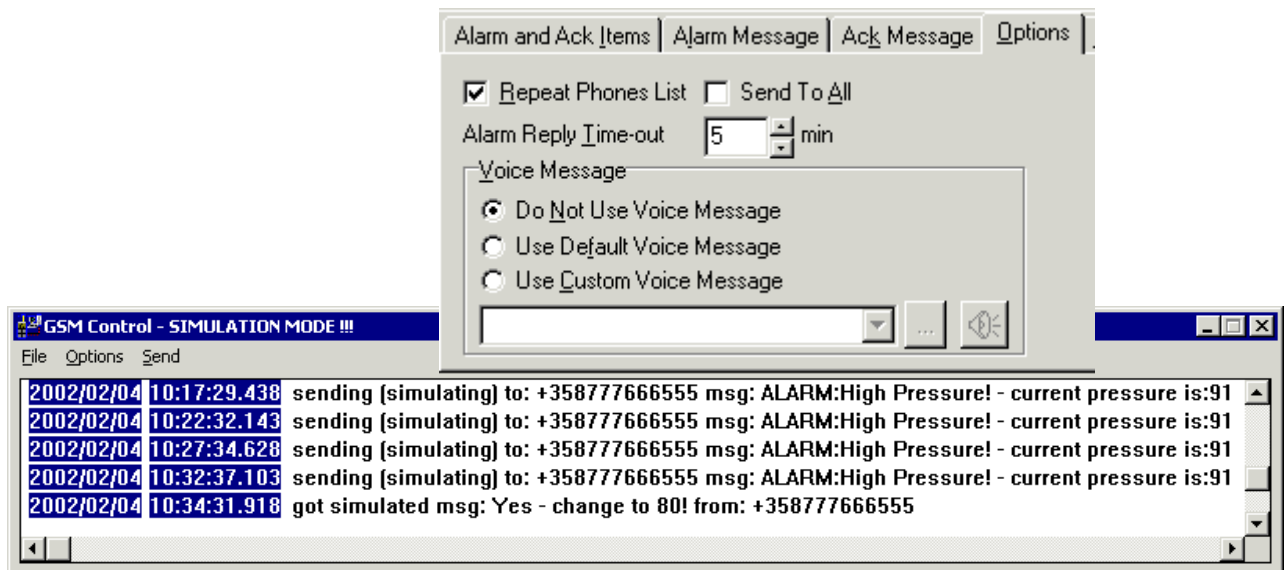
The following happens if in InTouch the new value **91** is entered for tag **pressure** (it is greater then **High Alarm Value** configured as **90** for this tag):



- the value of **pressure.Alarm** changes to 1 (On);
 - at 14:15:44.430 the Alarm message “ALARM:High Pressure! - current pressure is:91” is sent to “+358777666555”; the **High Pressure!** is taken from InTouch tag **pressure Alarm Comment** field and value 91 is the tag **pressure** current value.
- Now, by replying (acknowledging) from “+358777666555” with SMS message “**Yes - change to 80!**”, the received value **80** will go to InTouch tag **pressure** and alarm state is disabled:



As this Alarm message is configured with **Repeat Phones List** checked on **Options** page, the Alarm message will be repeated until the response from “+358777666555” is received (the sending interval 5 minutes is configured as **Alarm Reply Time-out** on **Options** page):



GSM-Control with OPC Server

This section explains how to use GSM-Control as OPC Client to exchange data with OPC Server. The Wonderware Finland & Baltics **Vision OPC&DDE Server** (can be downloaded from Wonderware Finland & Baltics web site www.wonderware.fi Software/Downloads, file name 44011XXX.EXE where XXX is the latest (current) version of the Server) will be used as an example OPC Server - this Server allows to access to data from Unitronics Programmable Logical Controllers (PLCs) using the Programming Interface (RS-232) on the PLC.

The **EXOPC.XML** file supplied with GSM-Control installation is used. Before starting to execute following example, start GSM-Control Configuration Program (**GSMCFG**), open the EXOPCL.XML configuration file and examine the contents of configuration supplied.

Starting sequence

- 1 Download and install the Vision OPC&DDE Server (further in the text **Vision**). Start it and ignore the “HASP key not found!” message, i.e. run the Vision in 1-hour demo mode. Select the *Configure/Node Definition...* from Vision main window and on “Vision Node Settings” first dialog box modify the **node1** - the “Vision Node Settings” second dialog box will appear:

To avoid conflict between Vision Server and GSMCTRL (GSMCTRL as default uses **COM1** where GSM-modem is expected to be connected), select Com Port **COM2** and press **OK**. Press **Done** on “Vision Node Settings” first dialog box.

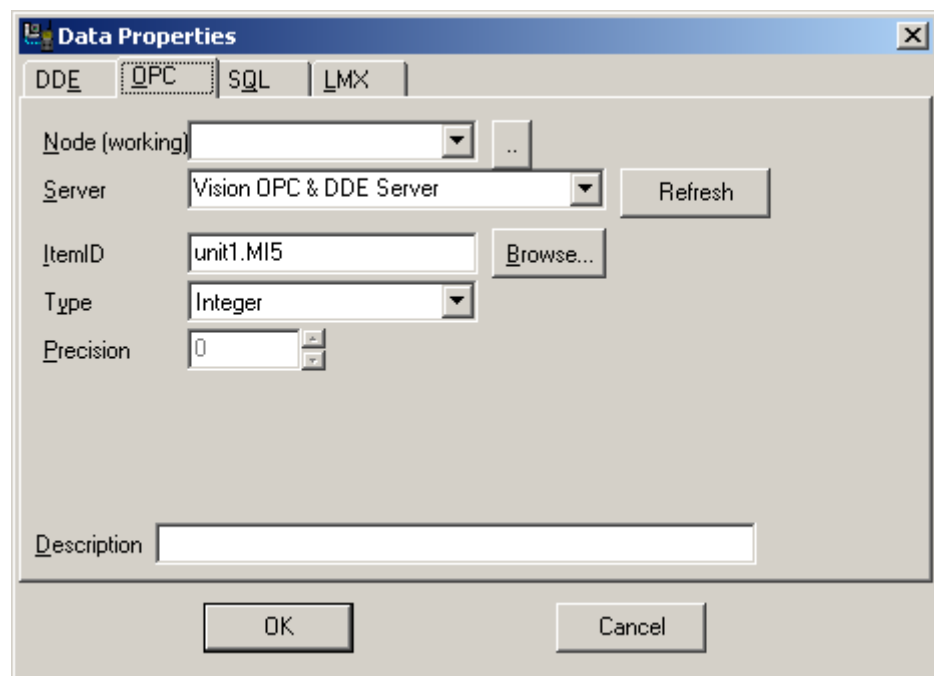
- 2 Start GSM-Control Communication Program (GSMCTRL). Select *File/Open* from GSMCTRL main menu and select **EXOPC.XML** from the list of available GSM-Control configuration files. The GSMCTRL will restart. At startup GSMCTRL as an OPC Client tries to activate all OPC links included in GSM-Control configuration file. If some of configured OPC Servers are not running then GSM-Control tries to start them. If there are no OPC errors displayed on GSMCTRL main window at startup then it means GSMCTRL is successfully

connected to Vision Server. Open the **“Simulate”** dialog box by selecting *Send/Simulate* from GSMCTRL main menu. Select the “Simulation ON” option - the GSMCTRL will change to simulation mode (the GSMCTRL main window title bar will change correspondingly).

Receiving/Sending SMS message

The following example will explain how to receive SMS message containing some value to be written (via Vision OPC&DDE Server) to Vision PLC and immediately send back the response from GSM-Control containing some values supplied by Vision OPC&DDE Server.

At first, let's examine the OPC items configured. There are three OPC items configured, by double-clicking on first of them (\\Vision.OPC_Server.1.unit1.MI5) on GSMCFG Data page, the “Data Properties” window appears:



The following can be configured on “Data Properties” window:

Node

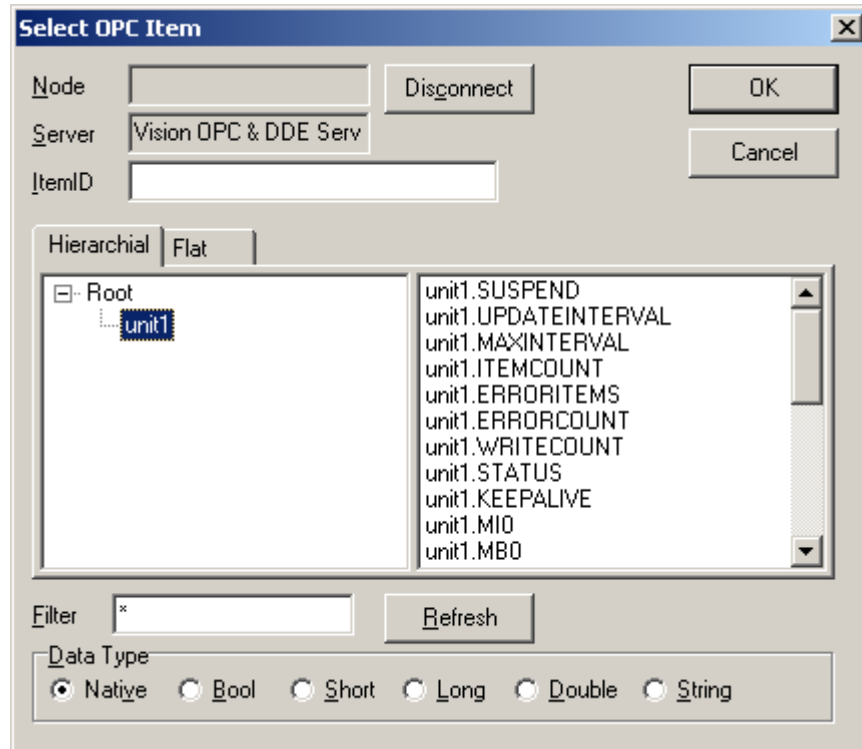
Name of computer where OPC Server resides. Can be selected by clicking on combo-box and selecting from list where all nodes currently available on local network are listed. Leave this field empty if OPC Server is running on same computer as GSM-Control.

Server

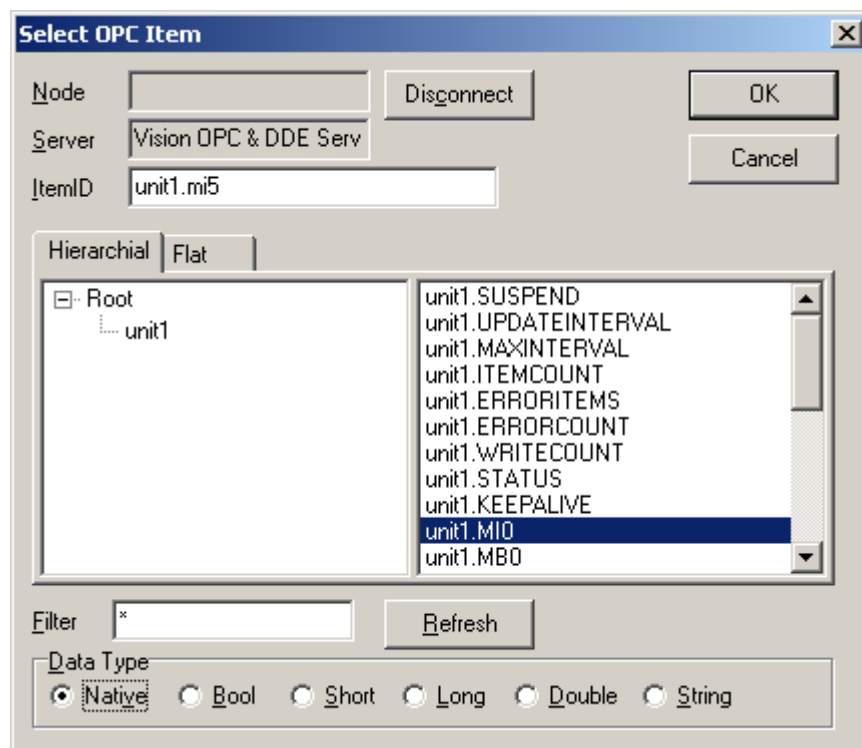
OPC Server, which can be obtained by clicking on combo-box and selecting from list where all currently available OPC Servers are listed. Only registered OPC Servers are available from this list.

ItemID

OPC item Identifier, which can be obtained by clicking on **Browse...** button and selecting from the list of OPC items available on “**Select OPC Item**” dialog box, like following (if OPC Server is not currently running then GSM-Control tries to start it - this can take some time):



To add the item with address greater than corresponding memory area start address, at first select the “start item” (e.g. **unit1.MI0**), then manually edit the address in the “ItemID” field and then press **OK** button:



Type

There are following types available: **Integer**, **Real**, **Discrete** and **String**, the corresponding OPC native types are listed below (OPC values are in the VARIANT format). The appropriate type can be selected by clicking mouse left button on combo box:

- **Integer** (default selection) - signed 32-bit integer, range of values from - 2147483648 to 2147483647; the corresponding OPC native types are VT_I4 and VT_I2;
- **Real** - 32-bit floating (decimal) point, value may be between $\pm 3.4e^{38}$; the corresponding OPC native types are VT_R4 and VT_R8;
- **Discrete** - discrete with a value of either 0 (False, Off) or 1 (True, On); the corresponding OPC native type is VT_BOOL;
- **Message** - text string that can be up to 131 characters long; the corresponding OPC native type is VT_BSTR.

Precision

This field is accessible only for Real and String types:

- if *Type* is **Real** then *Precision* field is used to enter the number of digits after decimal point. The default *Precision* is 0;
- if *Type* is **String** then *Precision* field is used to enter the maximum length of string.

The *Type* and *Precision* fields are used to format the values of Data items in *Send and Alarm messages* to be sent from GSM-Control. For example, if *Type* **Real** and *Precision* **1** is used then following values will be sent from GSM-Control depending on actual value, for example:

- if actual value is 24.7 then SMS message sent from GSM-Control will contain "24.7";
- if actual value is 24.74 then SMS message sent from GSM-Control will contain "24.7";
- if actual value is 24.75 then SMS message sent from GSM-Control will contain "24.8";
- if actual value is 24 then SMS message sent from GSM-Control will contain "24.0".

Description

Any desired description of OPC item can be entered here and correspondingly it will be displayed on GSMCFG main window "Data" page "Path (Description)" field for this OPC item.

If **Description** field is empty then on GSMCFG main window "Data" page this OPC item "Path (Description)" field will be filled with *Path*, which will contain

Node, ProgID and ItemID (e.g. `\\Vision.OPC_Server.1.unit1` in our example).

To accept the entered OPC item information on “Data Properties” window, click on **OK**, or click on **Cancel** to reject the entered data.

The configuration of two other OPC items (`\\Vision.OPC_Server.1.unit1.STATUS` and `\\Vision.OPC_Server.1.unit1.UPDATEINTERVAL`) is following:

The image shows two side-by-side screenshots of the 'Data Properties' dialog box for OPC items. Both dialogs have tabs for DDE, OPC, SQL, and LMX. The left dialog is for 'unit1.STATUS' with Type 'Discrete'. The right dialog is for 'unit1.UPDATEINTERVAL' with Type 'Integer'.

The STATUS item shows the state of communication with PLC (set to **0** when communication fails and set to **1** when communication is successful). The UPDATEINTERVAL item indicates the current requested update interval (in milliseconds).

The configuration of Send/Receive messages pair “**Receive/Send MI5**” in corresponding **Send/Receive** page is following:

The image shows the 'Send/Receive Settings' dialog box. It has a table with columns: User, Phone, Source, Type, and Path (Description). The table contains three rows of OPC items. The 'Description' field is 'Receive/Send MI5'. The 'Send' tab is active, showing a message template: 'FromPLC - STATUS:{OPC item}MI5:{OPC item}Update Rate:{OPC item}'. A mouse cursor is pointing at the first '{OPC item}' placeholder, which is highlighted with a tooltip showing the path '\\Vision.OPC_Server.1.unit1.STATUS'.

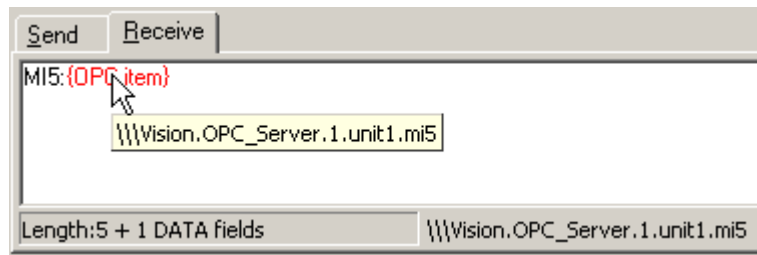
User	Phone	Source	Type	Path (Description)
☒ User1	+358777666555	OPC	Integer	\\Vision.OPC_Server.1.unit1.mi5
		OPC	Discrete	\\Vision.OPC_Server.1.unit1.STATUS
		OPC	Integer	\\Vision.OPC_Server.1.unit1.UPDATEIN...

Description: Receive/Send MI5

Send Receive

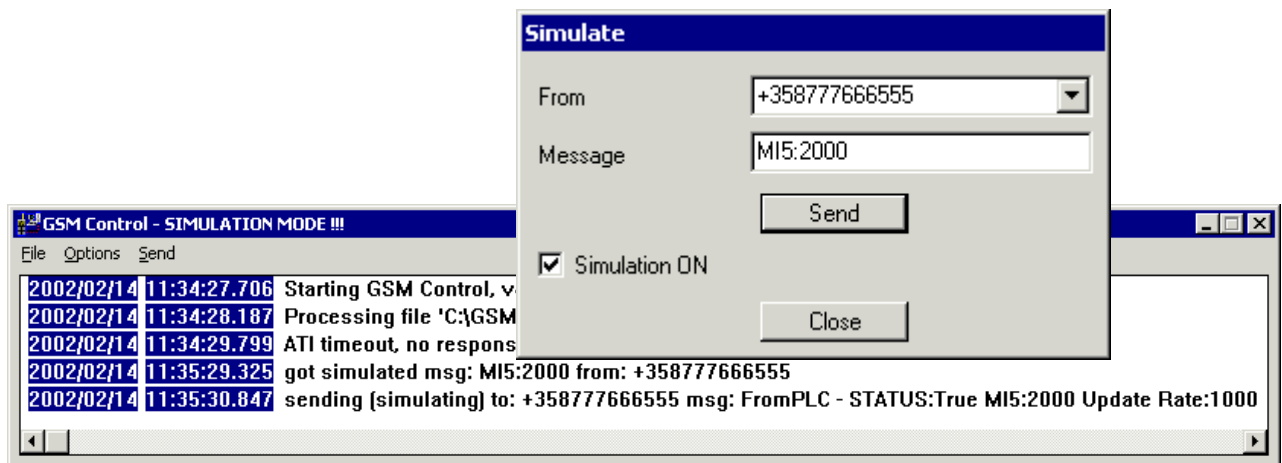
FromPLC - STATUS:{OPC item}MI5:{OPC item}Update Rate:{OPC item}

Length:36 + 3 DATA fields



where OPC item **unit1.MI5** is inserted into **Receive** message and OPC items **unit1.STATUS**, **unit1.MI5** and **unit1.UPDATEINTERVAL** (all belonging to M90 Server) are inserted into the **Send** message and this Send/Receive message pair is linked with **User1** having phone number “+358777666555”.

The following happens if SMS message “**MI5:2000**” is sent (simulated as below) from “+358777666555” to GSM-Control:



- at 11:35:29.325 the message “**MI5:2000**” is received from “+358777666555”;
- the new value **2000** for MI5 (Memory Integer address 5) is delivered to Vision PLC;
- at 11:35:30.847 GSM-Control responded to “+358777666555” with message “**FromPLC - STATUS:True MI5:2000 Update Rate:1000**”, containing the current values from Vision Server: the value of **STATUS** is **True**, what means the communication with PLC is successful; the value of **MI5** is **2000**, what means the new value was successfully delivered to PLC; the value of **UPDATEINTERVAL** is **1000** (current requested update interval).

Note!

For **Discrete** items the value to be put into **Send** messages depends on value supplied by OPC Server - the value can be **True** or **On** or **1** or **False** or **Off** or **0**. In **Receive** messages only values **1** and **0** are expected.

GSM-Control with Wonderware Application Server

This section explains how to use GSM-Control as MXAccess (LMX) client to exchange data with Wonderware Application Server via LMX Proxy.

The EXLMX.XML file supplied with GSM-Control installation is used. Before starting to execute following example, start GSM-Control Configuration Program (**GSMCFG.EXE**), open the EXLMX.XML configuration file and examine the contents of configuration supplied.

Starting sequence

- 1 Create new galaxy named GSMCtrlTestGalaxy and invoke Galaxy Load for the **GSMCtrlTestGalaxyDump.csv** file. Connect to galaxy by Archestra IDE and deploy the galaxy.

- 2 Open (e.g. by Notepad) the **GSMCTRL.INI** file (this file is located in same directory as other GSM-Control files) and add there the following line:

uselmx=1

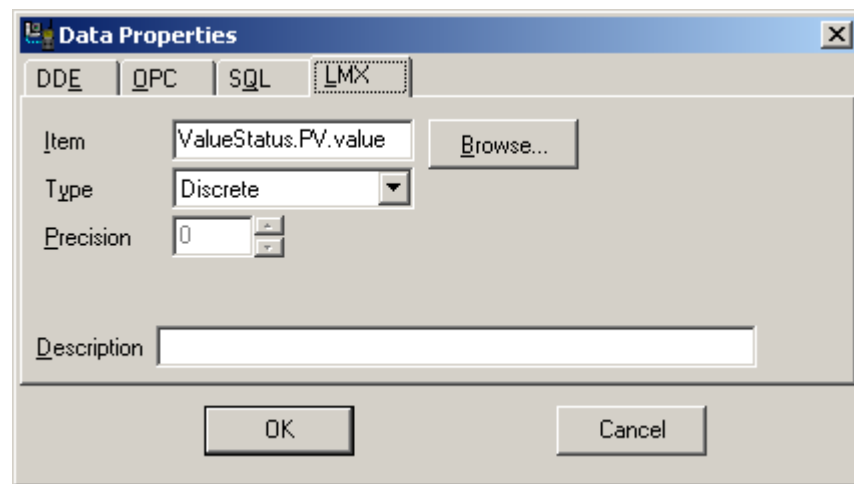
Save and close the GSMCTRL.INI file.

- 3 Start GSM-Control Communication Program (GSMCTRL.EXE). Select *File/Open* from GSMCTRL main menu and select **EXLMX.XML** from the list of available GSM-Control configuration files. The GSMCTRL will restart. At startup GSMCTRL as LMX Client tries to activate all LMX links included in GSM-Control configuration file. If there are no LMX errors displayed on GSMCTRL main window at startup then it means GSMCTRL is successfully connected to Application Server. Open the “**Simulate**” dialog box by selecting *Send/Simulate* from GSMCTRL main menu. Select the “Simulation ON” option - the GSMCTRL will change to simulation mode (the GSMCTRL main window title bar will change correspondingly).

Receiving/Sending SMS message

The following example will explain how to receive SMS message containing some value to be written to Application Server and immediately send back the response from GSM-Control containing some values supplied by Application Server.

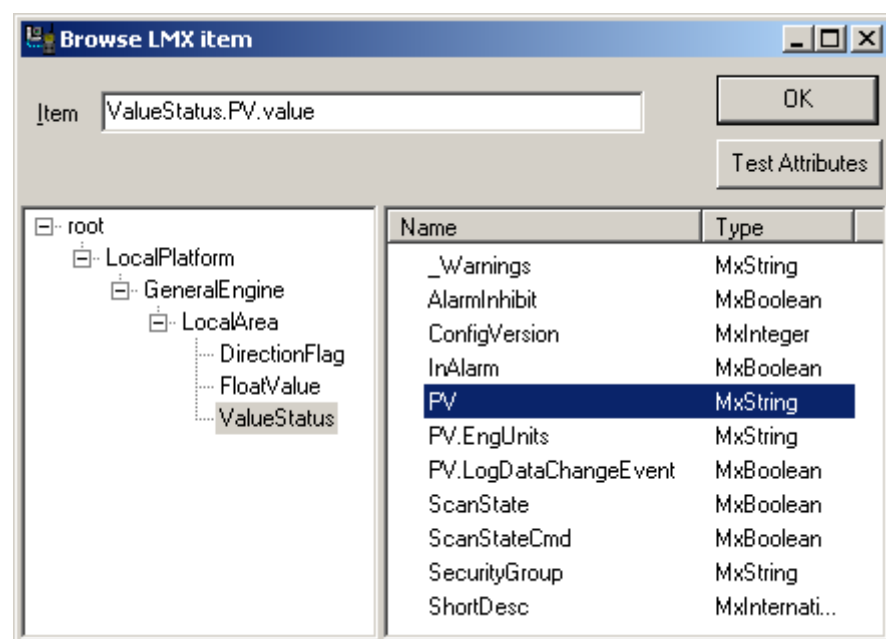
At first, let's examine the LMX items configured. There are three LMX items configured, by double-clicking on first of them (**Boolean_001.PV.value**) on GSMCFG Data page, the “Data Properties” window appears:



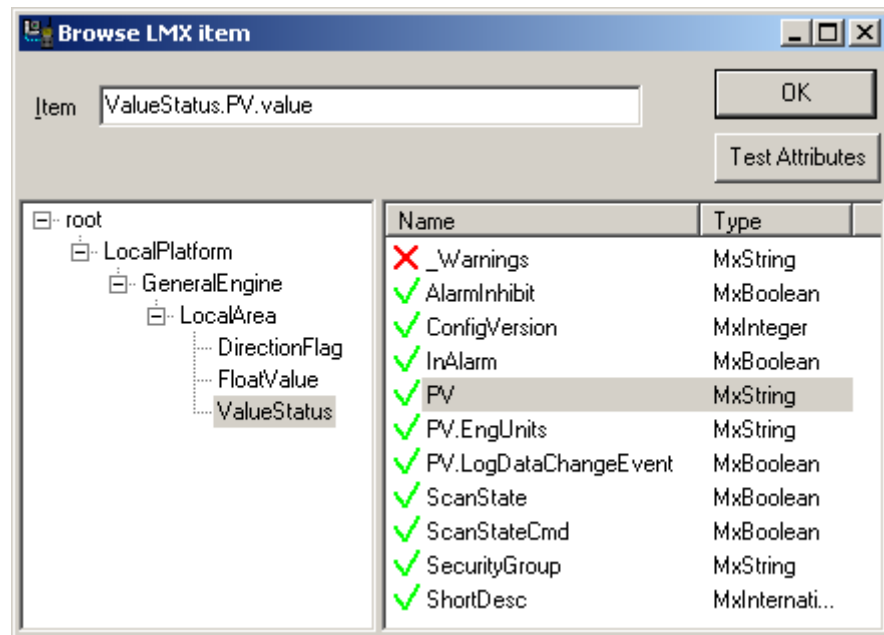
The following can be configured on “Data Properties” window:

Item

Application Server Object and attribute name. The name can be obtained by clicking on **Browse...** button and selecting from the list of Application Server items available on “**Browse LMX item**” dialog box. Browsing of items uses Wonderware GRAccess interface. Any item from any galaxy can be browsed, while runtime can access only items from the currently deployed galaxy:



Current Galaxy for which items are browsed can be configured under the “Settings” dialog box. Some of item attributes may be inaccessible from GSM Control by using LMX. To test whether attributes are accessible or not, press the **Test Attributes** button. The readable attributes are marked with green checkmark, but inaccessible or bad quality items are marked with red cross:



Type

There are following types available: **Integer**, **Real**, **Discrete** and **String**:

- **Integer** (default selection) - signed 32-bit integer, range of values from - 2147483648 to 2147483647;
- **Real** - 32-bit floating (decimal) point, value may be between $\pm 3.4e^{38}$;
- **Discrete** - discrete with a value of either 0 (False, Off) or 1 (True, On);
- **Message** - text string that can be up to 131 characters long.

Precision

This field is accessible only for Real and String types:

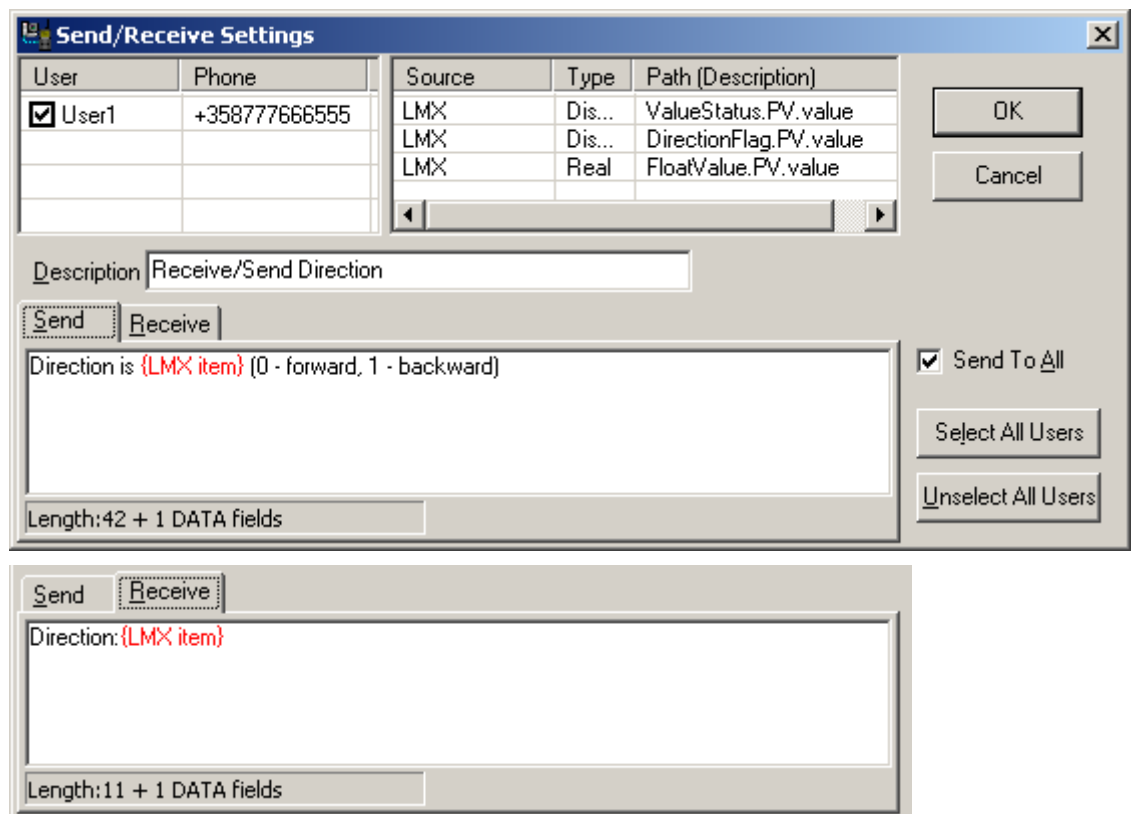
- if *Type* is **Real** then *Precision* field is used to enter the number of digits after decimal point. The default *Precision* is 0;
- if *Type* is **String** then *Precision* field is used to enter the maximum length of string.

Description

Any desired description of LMX item can be entered here and correspondingly it will be displayed on GSMCFG main window “Data” page “Path (Description)” field for this LMX item.

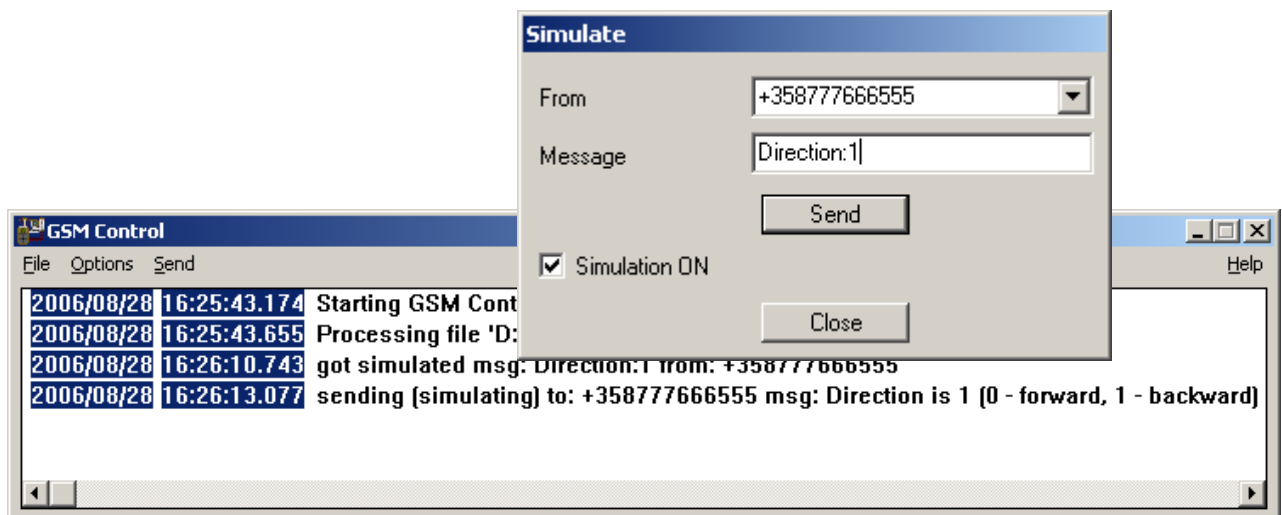
To accept the entered LMX item information on “Data Properties” window, click on **OK**, or click on **Cancel** to reject the entered data.

The configuration of Send/Receive messages pair “**Receive/Send Direction**” in corresponding **Send/Receive** page is following:



where LMX item **DirectionFlag.PV.value** is inserted into **Send** and **Receive** message and this Send/Receive message pair is linked with **User1** having phone number **“+358777666555”**.

The following happens if SMS message **“Direction:1”** is sent (simulated as below) from **“+358777666555”** to GSM-Control:



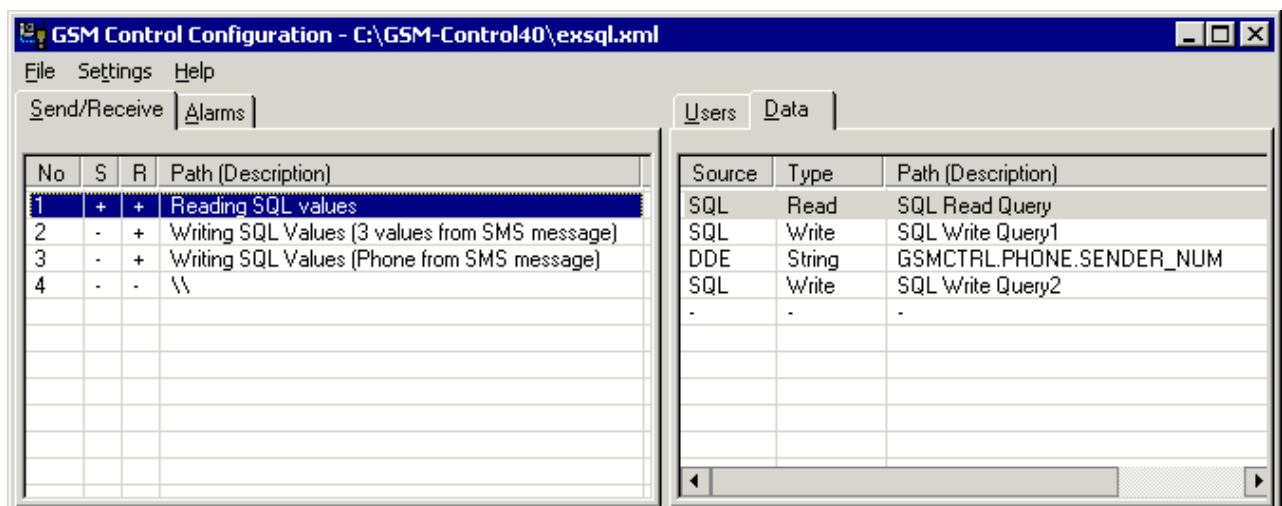
- at 16:26:10.743 the message **“Direction:1”** is received from **“+358777666555”**;
- the new value **1** for DirectionFlag is delivered to Application Server Galaxy;
- at 16:26:13.077 GSM-Control responded to **“+358777666555”** with message **“Direction is 1 (0 – forward, 1 – backward)”**, containing the current value of DirectionFlag from Application Server.

GSM-Control with SQL database

This section explains basics how to use GSM-Control to read/write data from/to SQL databases. The **EXSQL.XML** and **EXSQL.MDB** files supplied with GSM-Control installation are used. The EXSQL.MDB is a very simple MS Access database, containing only one record with three fields Name, Phone and Address.

Starting sequence

- 1 Before starting to use the EXSQL.MDB database with GSM-Control, some setup is necessary:
 1. Start **ODBC Data Source Administrator** program (e.g. from *Control Panel/Data Sources (ODBC)* on Windows NT or by selecting *Start/Programs/Administrative Tools/Data Sources (ODBC)* on Windows 2000).
 2. Select **System DSN** and click on **Add...**
 3. Select **Microsoft Access Driver (*.mdb)** as a driver for which you want to set up a data source. Click on **Finish** - the “ODBC Microsoft Access Setup” dialog box will appear.
 4. Enter ADB as **Data Source Name**. Press **Select...** and browse to EXSQL.MDB installed at GSM-Control setup. Press **OK**.
 5. Press **OK** on “ODBC Microsoft Access Setup” dialog box.
 6. Press **OK** on **ODBC Data Source Administrator** main window - the System Data Source “ADB” now is set up.
- 2 Start GSM-Control Configuration Program (**GSMCFG**) and open the **EXSQL.XML** configuration file:



Examine the contents of configuration supplied (detailed explanation continues later in this section).

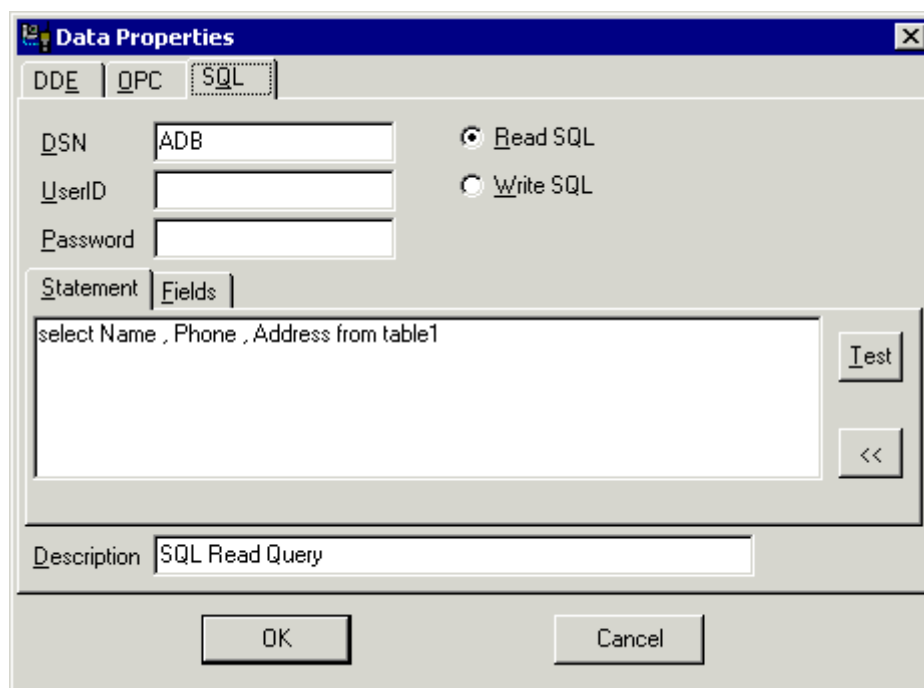
- 3 Start GSM-Control Communication Program (**GSMCTRL**). Select *File/Open* from GSMCTRL main menu and select **EXSQL.XML** from the list of available GSM-Control configuration files. The GSMCTRL will restart. Open the “**Simulate**” dialog box by selecting *Send/Simulate* from GSMCTRL main menu. Select the “Simulation ON” option - the GSMCTRL will change to simulation mode (the GSMCTRL main window title bar will change correspondingly).
- 4 It is recommended (but not mandatory, even it has not be installed) also the **MS Access** is started and EXSQL.MDB opened - the default (initial) contents are following:

	ID	Name	Phone	Address
▶	1	John	+441234554321	London

Reading values from SQL database

The following example will explain how to receive SMS message containing only text “**RSQL**” and immediately send the response from GSM-Control containing the current values from **EXSQL.MDB** database fields **Name**, **Phone** and **Address**.

At first, let’s examine the **SQL Read Query** configuration. By double-clicking on **SQL Read Query** on GSMCFG Data page, the “Data Properties” window appears:



The following can be configured on “Data Properties” window:

DSN

The **Data Source Name** of ODBC data source. The **Data Source Name** entered here must be some of System DSNs (System Data Sources) or User DSNs (User Data Sources) configured in **ODBC Data Source Administrator**.

UserID and Password

If necessary, here the **UserID** and **Password**, needed to access the Data Source Name, can be entered (our “ADB” data source does not need these fields to be entered).

Read SQL and Write SQL

These radio buttons are used to select the type of SQL operation - **Read** from database or **Write** to database. This selection must match with the SQL statement entered in the **Statement** field.

Description

Here any free description of SQL Data item can be entered - this will be displayed on GSMCFG main window in “Path/Description” field.

Statement/Fields

The *Statement* and *Fields* page controls are used to switch between **Statement** and **Fields** pages. On the **Statement** page the appropriate SQL statement has to be entered - it must match with current selection of **Read SQL** or **Write SQL** radio buttons. The **Fields** page is used to describe (format) the data values: for read statements this description will be used to format the values to be put into **Send** messages (SMS messages sent from GSM-Control including data obtained from SQL database); for write statements this description will be used to format the values to be written to SQL database - these values are obtained from **Receive** messages (SMS messages received by GSM-Control).

In our **SQL Read Query** the **Fields** are configured the following way:

No	Type	Length	Description
1	String	32	SQL Read Query: Name
2	String	32	SQL Read Query: Phone
3	String	32	SQL Read Query: Address

Configuration for selected field:

- Type: String
- Precision: 32
- Description: SQL Read Query: Name

Our current configuration contains three **String** type fields “**SQL Read Query: Name**”, “**SQL Read Query: Phone**” and “**SQL Read Query: Address**”, each field maximum length is configured as **32** characters. The order of fields on **Fields** page must match with fields on **Statement** page - in our example three fields from **Fields** page matches correspondingly with Name, Phone and Address fields included in SQL statement.

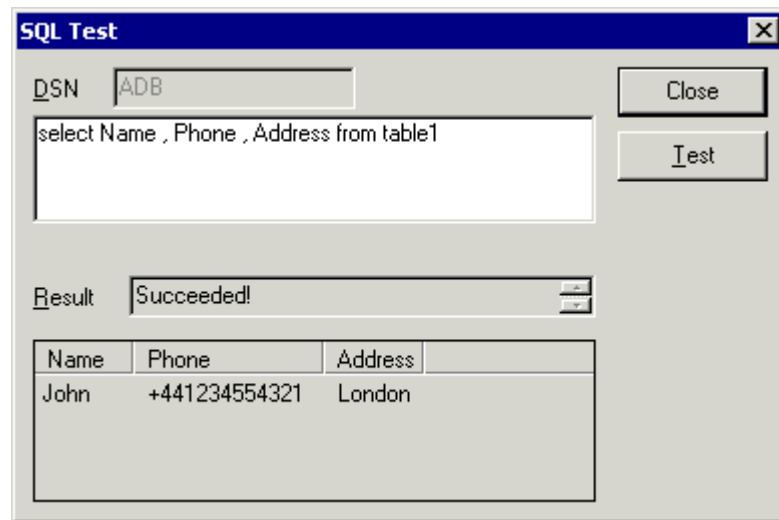
On the **Fields** page:

- the  and  buttons can be used to move already entered SQL Field up and down;
- the  and  buttons can be used to add new field or delete existing field;
- the  button executes the SQL statement (configured on **Statement** page) and can be used to automatically add all existing fields, like below (afterwards fields can be edited):

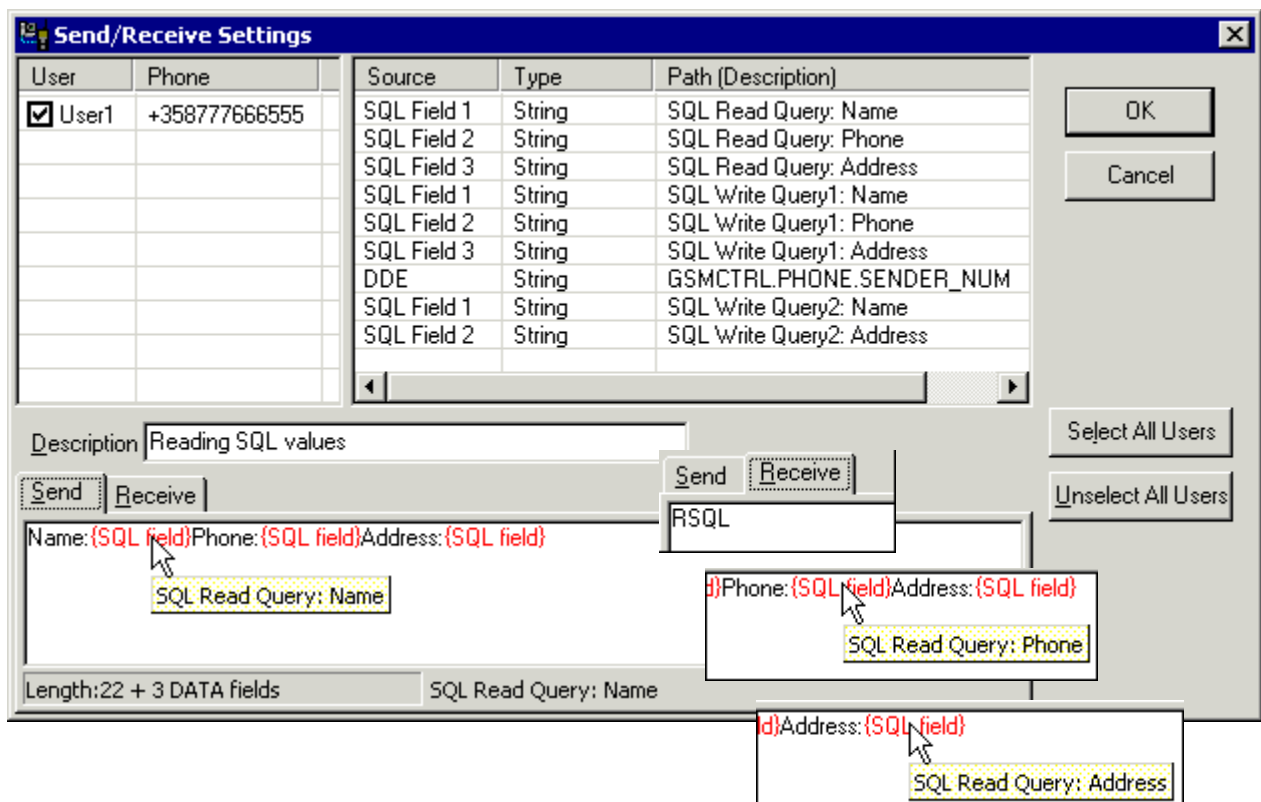
No	Type	Length	Description
1	String	32	Name
2	String	32	Phone
3	String	32	Address

- the following **Types** are available: **Integer** - signed 32-bit integer, range of values from -2147483648 to 2147483647; **Real** - 32-bit floating (decimal) point, value may be between $\pm 3.4e^{38}$; **Discrete** - discrete, value of either 0 (False, Off) or 1 (True, On); **String** - text string that can be up to 131 characters long;
- the **Precision** field is accessible only for **Real** and **String** types: if Type is **Real** then this field is used to enter the number of digits after decimal point; if Type is **String** then this field is used to enter the maximum length of string.
- in **Description** field any free description of this SQL field can be entered - this will be displayed as "Path/Description" on GSMCFG main window in Send/Receive and Alarm pages where all available Data items and SQL fields are listed.

If **Statement** page is active then on "Data Properties" window right side there is **Test** button available - by pressing it, the "SQL Test" window will appear with current SQL statement displayed. By pressing **Test** button here, the SQL statement will be executed and results displayed, as below the default (initial) contents of EXSQL.MDB are displayed:

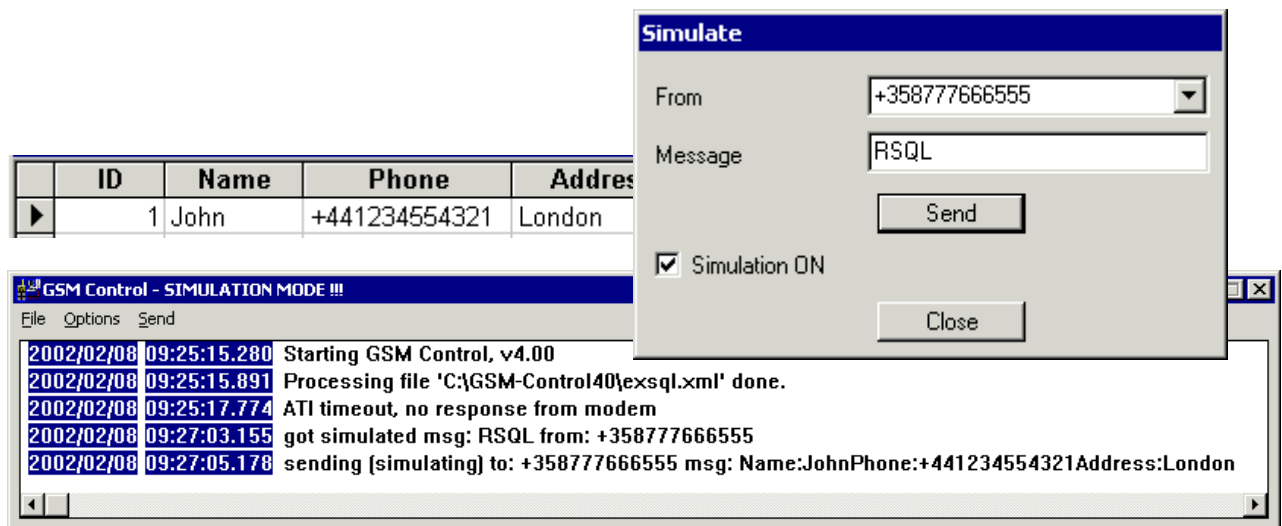


The configuration of Send/Receive messages pair “Reading SQL Values” in corresponding **Send/Receive** page is following:



where **Receive** message contains only the text “**RSQL**” and SQL fields “**SQL Read Query: Name**”, “**SQL Read Query: Phone**” and “**SQL Read Query: Address**” are inserted into the **Send** message text and this Send/Receive message pair is linked with **User1** having phone number “**+358777666555**”.

The following happens if SMS message “**RSQL**” is sent (simulated as below) from “**+358777666555**” to GSM-Control:



- at 09:27:03.155 the message “RSQL” is received from “+358777666555”;
- at 09:27:05.178 the GSM-Control responded to “+358777666555” with message “Name:John Phone:+441234554321Address:London”, where contents of SQL fields are filled with current data from EXSQL.MDB.

Note - the configured **SQL** connections are not initiated at **GSMCTRL** startup - these connections are initiated when corresponding **SQL** statements are executed first time, when possible **SQL** failures can be logged to **GSMCTRL** log file. Therefore it is very important to check all configured **SQL** statements by using **GSMCTRL simulation mode**.

Writing values to SQL database

The following examples will explain how to receive SMS message containing values to be written to SQL database. The first example (**SQL Write Query1**) will write three values received by GSM-Control to EXSQL.MDB fields Name, Phone and Address. The second example (**SQL Write Query2**) will write two values received by GSM-Control to EXSQL.MDB fields Name and Address and the sender’s phone number will be written to EXSQL.MDB field Phone. No response (Send message) from GSM-Control is configured and expected.

First example

At first, let’s examine the **SQL Write Query1** configuration. By double-clicking on **SQL Write Query1** on GSMCFG Data page, the “Data Properties” window appears:

Data Properties

DSN: ADB
 UserID:
 Password:
☐ Read SQL
☒ Write SQL

Statement: update table1 set Name=?, Phone=?, Address=?

No	Type	Length	Description
1	String	32	SQL Write Query1: Name
2	String	32	SQL Write Query1: Phone
3	String	32	SQL Write Query1: Address

Description: SQL Write Query1

OK Cancel

The **SQL Write Query1** is configured with DSN **ADB**, the SQL operation is **Write SQL** and there are three **String** type fields “**SQL Write Query1: Name**”, “**SQL Write Query1: Phone**” and “**SQL Write Query1: Address**”, each field maximum length is **32** characters. The order of fields on **Fields** page must match with fields on **Statement** page - in our example three fields from **Fields** page matches correspondingly with Name, Phone and Address fields included in SQL statement and the “?” (quotation mark) is used to specify the location in SQL statement where the new values (from SMS message received) will be put before executing the SQL statement.

If **Statement** page is active then on “Data Properties” window right side there is a **Test** button available - by pressing it, the “SQL Test” window will appear with current SQL statement displayed. By pressing **Test** button here, the “Enter String value” dialog box will appear as many times as there are “?” signs included in the SQL statement and “?” sign will be correspondingly substituted with value entered, like following:

SQL Test

DSN: ADB
 Close
 Test

update table1 set Name=?, Phone=?, Address=?

Result:

Enter String value

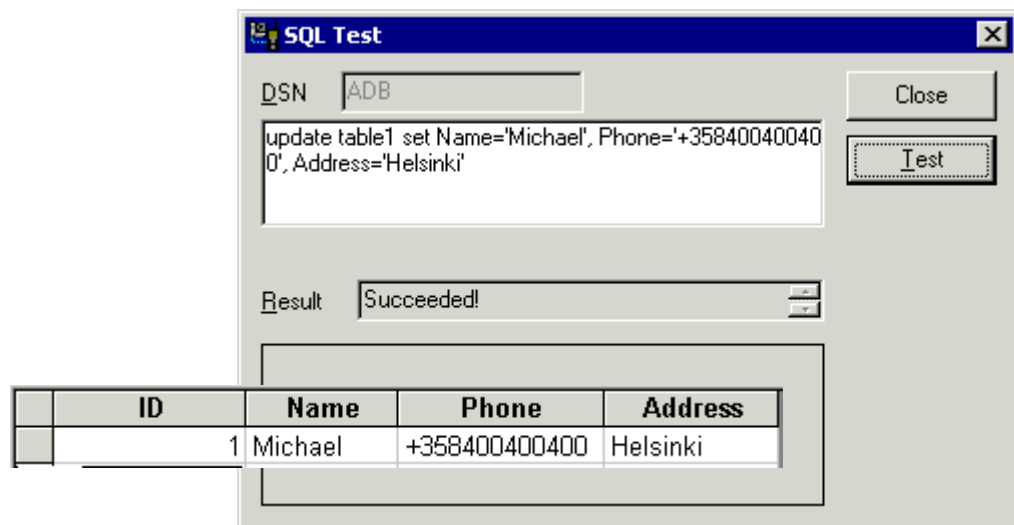
Type - String
 Length - 32
 SQL Write Query1: Name
 Value: Michael

SQL Write Query1: Phone
 Value: +358400400400

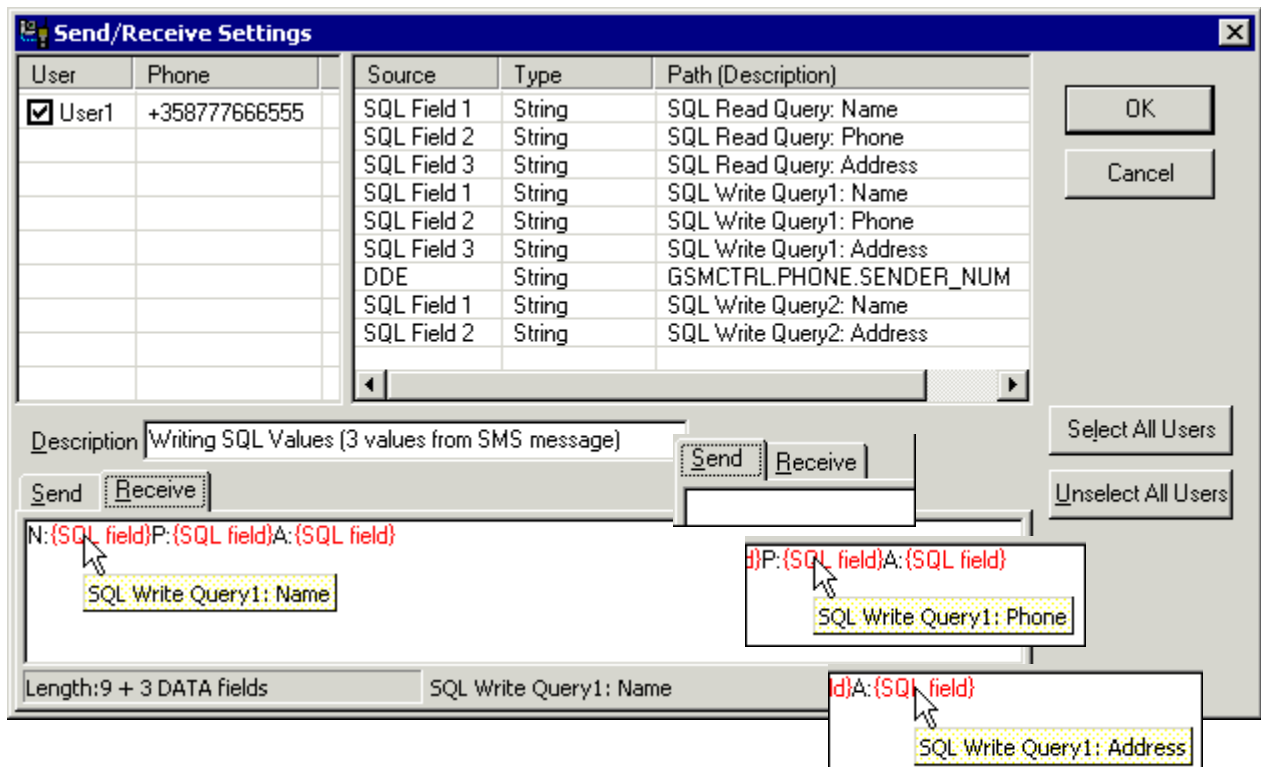
SQL Write Query1: Address
 Value: Helsinki

OK Cancel

When last substitution of “?” sign is done, the SQL statement will be executed, result displayed and EXSQL.MDB contains new values:

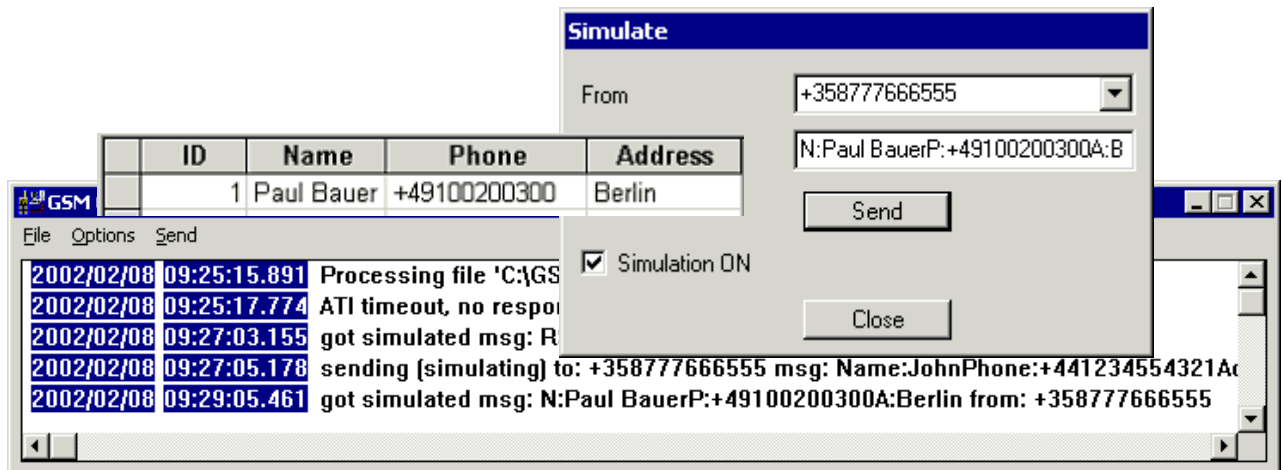


The configuration of Send/Receive messages pair “Writing SQL Values (3 values from SMS message)” in corresponding **Send/Receive** page is following:



where **Send** message is empty and SQL fields “SQL Write Query1: Name”, “SQL Write Query1: Phone” and “SQL Write Query1: Address” are inserted into the **Receive** message text and this Send/Receive message pair is linked with **User1** having phone number “+358777666555”.

The following happens if SMS message “N:Paul BauerP:+49100200300A:Berlin” is sent (simulated as below) from “+358777666555” to GSM-Control:



- at 09:29:05.461 the message “N:Paul BauerP:+49100200300A:Berlin” is received from “+358777666555”;
- the contents of SQL fields are filled with data received by SMS message.

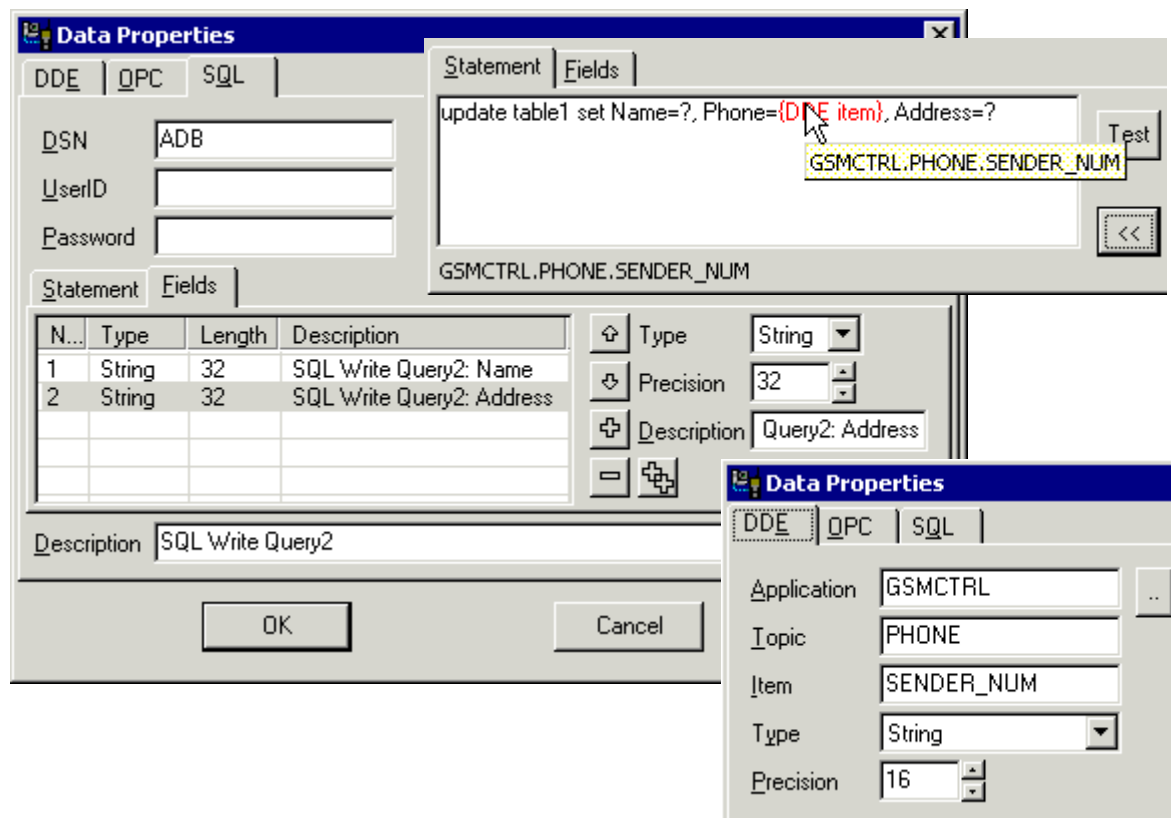
Important Note!

The above example exactly illustrates how the information is extracted from SMS message received - GSM-Control is using the text configured at **Receive** page to determine the **start** and **end** of each value to be written to database. For example, the text **Paul Bauer** is located between **N:** and **P:** and these strings define the start and end of value to be written, i.e. it is not expected “:” character inside the Phone number. Therefore it is very important to use appropriate texts (separators) to eliminate wrong interpretation of data received.

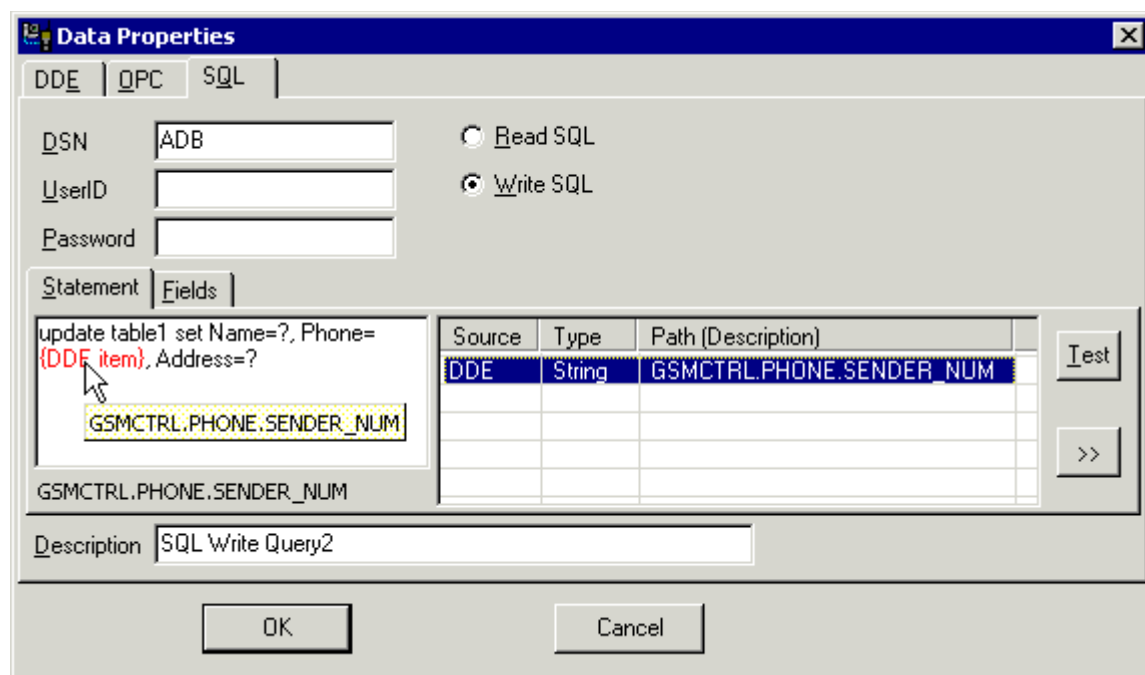
Second example

The second example (**SQL Write Query2**) will write two values received by GSM-Control to EXSQL.MDB fields Name and Address and additionally the sender's phone number will be taken from GSM-Control internal DDE item SENDER_NUM and written by same SQL query to EXSQL.MDB field Phone. No response (Send message) from GSM-Control is configured and expected.

The configuration of **SQL Write Query2** and DDE item is following:



The only difference between **SQL Write Query1** and **SQL Write Query2** is the following - the value to be written to EXSQL.MDB field Phone is taken from GSM-Control built-in DDE item **SENDER_NUM** (not from received SMS message's text). There are two **String** type fields "**SQL Write Query2: Name**" and "**SQL Write Query2: Address**" configured, each field maximum length is configured as **32** characters. The order of fields on **Fields** page matches with "?" (quotation marks) on **Statement** page. The  ("Show/Hide Data Items") button is used to insert (if necessary) some Data Item into the SQL statement, like below:



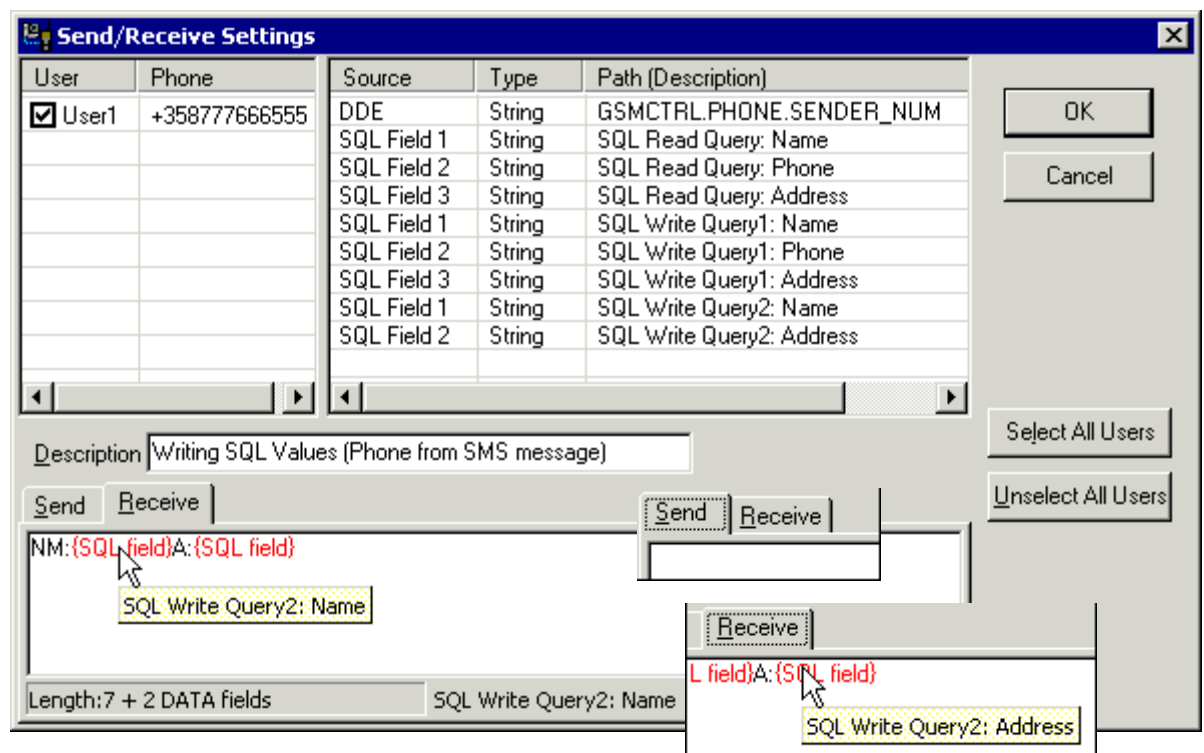
where DDE item **SENDER_NUM** is inserted into SQL statement.

Note!

Only already configured **DDE** or **OPC** items can be inserted into SQL statements.
It is not possible to insert SQL fields.

The testing of SQL Write Query2 can be done completely same way as testing of SQL Write Query1 - by pressing the **Test** button and substituting two “?” signs and link to DDE item in “Enter String value” dialog box.

The configuration of Send/Receive messages pair “Writing SQL Values (Phone from SMS message)” in corresponding **Send/Receive** page is following:

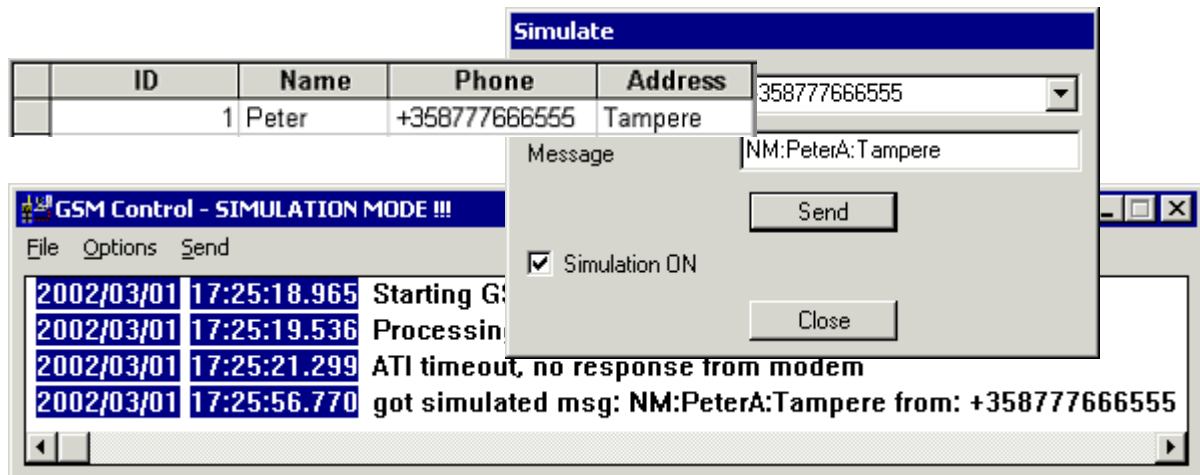


where **Send** message is empty and SQL fields “**SQL Write Query2: Name**” and “**SQL Write Query2: Address**” are inserted into the **Receive** message text and this Send/Receive message pair is linked with **User1** having phone number “+358777666555”.

Note!

Check the difference between **SQL Write Query2** and **SQL Write Query1** Receive messages (“**NM:{SQL field}A:{SQL field}**” and “**N:{SQL field}N:{SQL field}A:{SQL field}**”) - to ensure the incoming SMS messages are recognized correctly, the first text parts of these messages are configured as different: “**NM:**” and “**N:**”.

The following happens if SMS message “**NM:PeterA:Tampere**” is sent (simulated as below) from “**+358777666555**” to GSM-Control:



- at 17:25:56.770 the message “**NM:PeterA:Tampere**” is received from “**+358777666555**”;
- the SQL Write Query2 is executed, where contents of Name and Address fields is taken from SMS message received and sender’s phone number is inserted in the Phone field;
- the content of EXSQL.MDB changes according to SQL query executed.

Notes on using GSM-Control and SQL databases

- 1 Not only SQL queries, but also **SQL procedures** can be used as SQL statements.
- 2 There can be more values requested (returned) by SQL statement as there are SQL fields configured on **Fields** page and inserted in **Send** message. For example, the following Read SQL query can be used to obtain TagName “ReactTemp” last 5 Analog History values from Wonderware Industrial SQL Server Runtime database:

```
SELECT TOP 5 ah.Value
FROM INSQL Runtime.dbo.AlalogHistory ah
WHERE (ah.TagName = 'reactTemp') AND
(ah.wwResolution = 5000)
```

If on **Fields** page there is configured only one SQL field and only this field is inserted in **Send** message then only one (latest) value returned by SQL statement will be used in **Send** message.

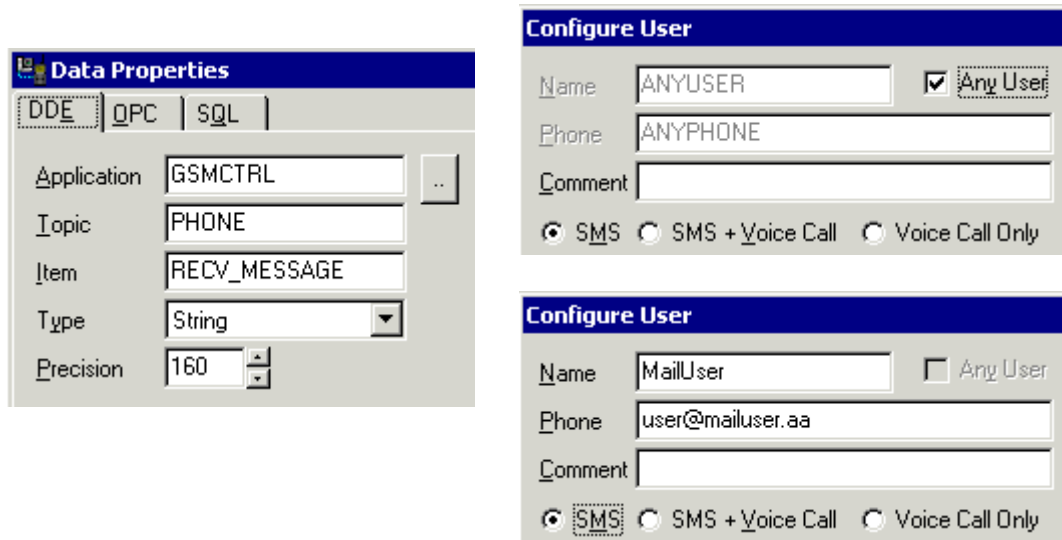
- 3 It is highly recommended always to test all configured SQL statements as well as simulate the sending/receiving of SMS messages.
- 4 The **MS SQL Server Enterprise Manager** can be used for graphic design of standard SQL queries. For SQL queries to **Wonderware Industrial SQL Server** you must refer to corresponding user documentation.

Example of forwarding received SMS message to e-mail

This simple example explains the basics how to perform forwarding of received SMS messages inside GSM-Control. The task is to forward any received message (can be received from any phone number or e-mail address) to some configured e-mail address. The **EXFORW.XML** configuration file supplied with GSM-Control installation is used. Before starting to execute this example, start GSM-Control Configuration Program (**GSMCFG**), open the EXFORW.XML configuration file and examine the contents of configuration supplied.

Start GSM-Control Communication Program (**GSMCTRL**). Select *File/Open* from **GSMCTRL** main menu and select **EXFORW.XML** from the list of available GSM-Control configuration files. The **GSMCTRL** will restart. Open the “**Simulate**” dialog box by selecting *Send/Simulate* from **GSMCTRL** main menu. Select the “Simulation ON” option - the **GSMCTRL** will change to simulation mode (the **GSMCTRL** main window title bar will change correspondingly).

The configuration of Data and Users is following:



where GSM-Control internal built-in DDE item **RECV_MESSAGE** is used to store the received SMS message and two Users are configured: 1) **ANYUSER** - allows to receive messages from **any** (not pre-configured) phone number or e-mail address and 2) **MailUser**, having e-mail address as phone number.

The configuration of **Receive** message is following:

User	Phone	Source	Type	Path (Description)
☒ ANYUSER	ANYPHONE	DDE	String	GSMCTRL.PHONE.RECV_MESSAGE
☐ MailUser	user@mailuser.aa			

Description: Forwarding SMS to e-mail

Send Receive

{DDE item}

GSMCTRL.PHONE.RECV_MESSAGE

Length: 1 + 1 DATA fields GSMCTRL.PHONE.RECV_MESSAGE

OK Cancel Select All Users Unselect All Users

where **any** message received from **any** phone number or e-mail address (as ANYUSER configured as User) will be put into DDE item **RECV_MESSAGE**.

The configuration of **Send** message is following:

User	Phone	Source	Type	Path (Description)
☐ ANYUSER	ANYPHONE	DDE	String	GSMCTRL.PHONE.RECV_MESSAGE
☒ MailUser	user@mailuser.aa			

Description: Forwarding SMS to e-mail

Send Receive

{DDE item}

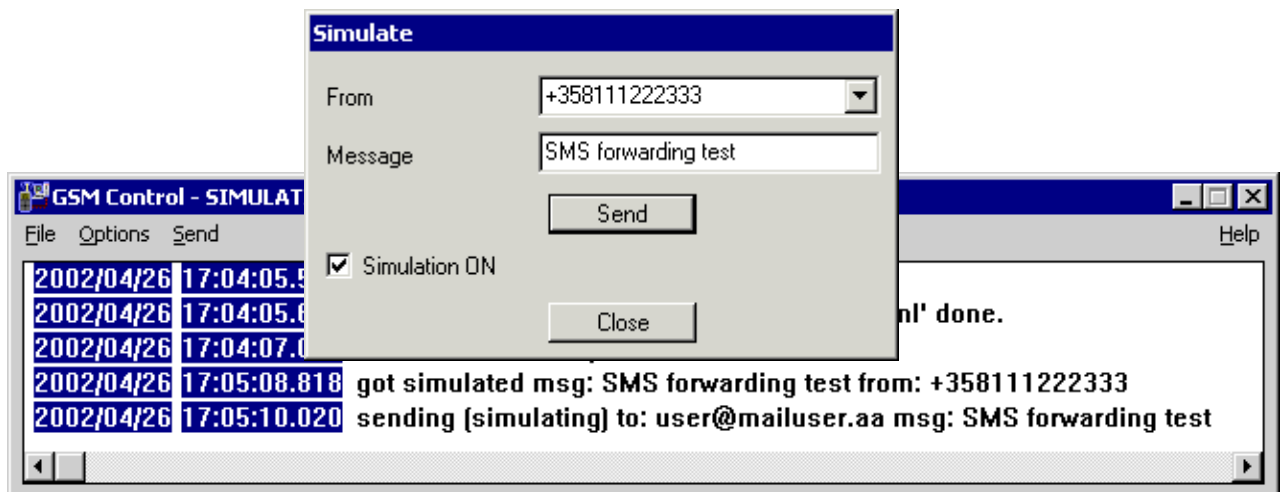
GSMCTRL.PHONE.RECV_MESSAGE

Length: 1 + 1 DATA fields GSMCTRL.PHONE.RECV_MESSAGE

OK Cancel Select All Users Unselect All Users

where the current contents of DDE item **RECV_MESSAGE** will be sent to e-mail address **user@mailuser.aa**.

The following happens if SMS message “SMS forwarding test” is sent (simulated as below) from some phone number (e.g. “+358111222333” to GSM-Control:



- at 17:05:08.818 the message “SMS forwarding test” is received from “+358111222333”;
- at 17:05:10.020 the GSM-Control forwarded the received message to e-mail address user@mailuser.aa.

Additional features

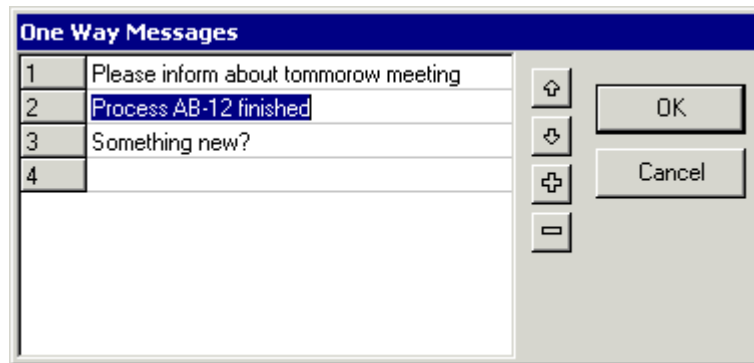
One direction sending of SMS messages from GSM-Control

GSM-Control supports the possibility to send SMS messages in one direction - from GSM-Control to remote GSM operator or device, without response expected. The sending can be done manually or via DDE or OPC. There are two kind of messages available (can be included in GSM-Control configuration) for one direction sending: **“1-way” messages** and **“Send” messages**.

Sending “1-way” Messages

The **“1-way” messages** are messages, which contains only text with no Data items linked. The text of message to be sent can be already included in GSM-Control current configuration or entered directly in corresponding GSMCTRL dialog box.

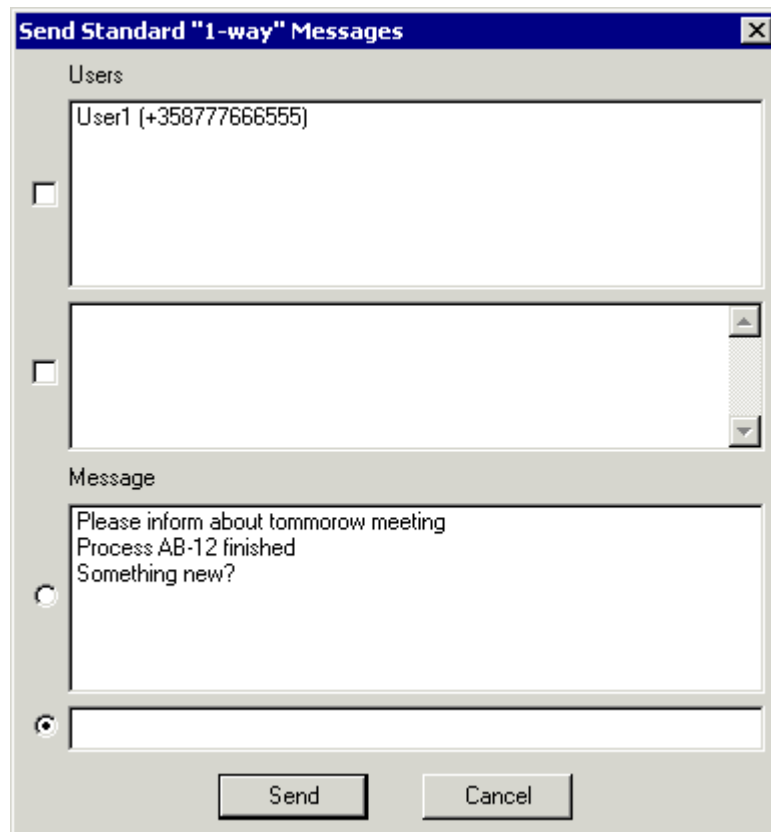
To include text of messages to be sent in GSM-Control current configuration - within GSMCFG by *File/Standard 1-Way Messages* command invoke the “One Way Messages” dialog box (no text messages are configured if entering this dialog box first time):



When entering “1-way” messages, the number (index) of message is automatically created (displayed at the left side) - this index will not be included in the text of SMS message and can be used as a value of MESSAGEIDX item if sending “1-way” messages via DDE or OPC. The  and  buttons can be used to move already entered messages up and down. The  and  buttons can be used to add or delete selected message.

Sending "1-way" Messages manually

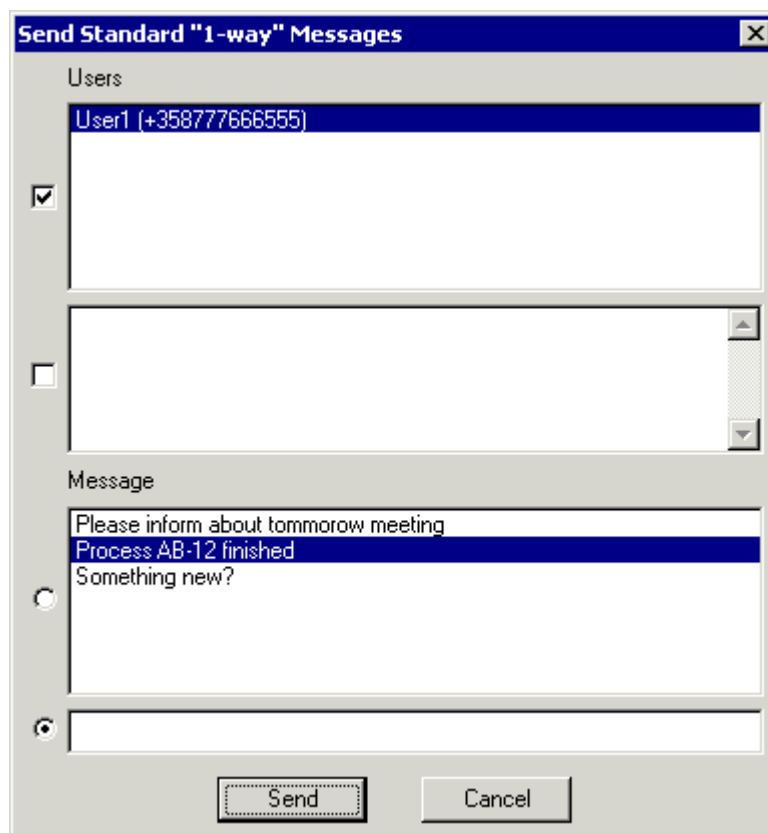
The manual sending of "1-way" messages can be done from GSMCTRL "Send Standard "1-way" Messages" dialog box (invoked by *Send/Send "1-way" Messages* command from GSMCTRL main menu). In "Send Standard "1-way" Messages" dialog box the appropriate text messages can be entered (or selected) and sent manually from GSMCTRL:



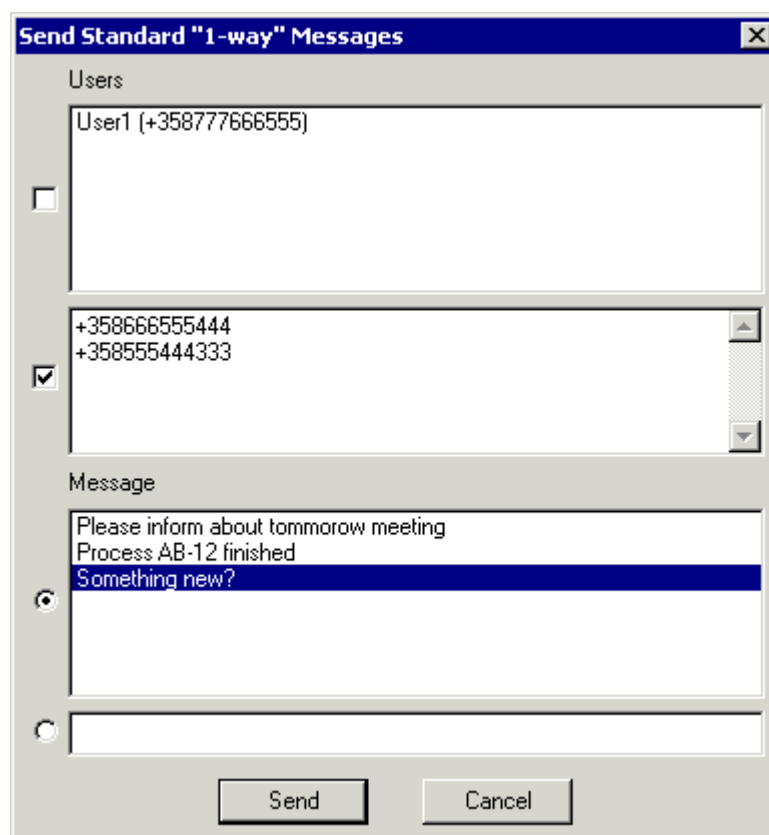
There are following elements on the "Send Standard "1-way" Messages" dialog box:

- Two *Users* windows: the upper one is used to display and select Users already configured in GSMCFG and the lower one can be used to enter phone numbers not configured in GSMCFG.
- Two checkboxes, one for each of above *Users* windows. These checkboxes can be used to set from where to take phone number(s) where to send the selected message.
- Two *Message* windows (upper window for already configured "1-way" messages and lower window where to enter a new (not configured in GSMCFG) message).
- Two radio buttons, one for each of above *Message* windows. These checkboxes can be used to set from where to take the message to be sent.

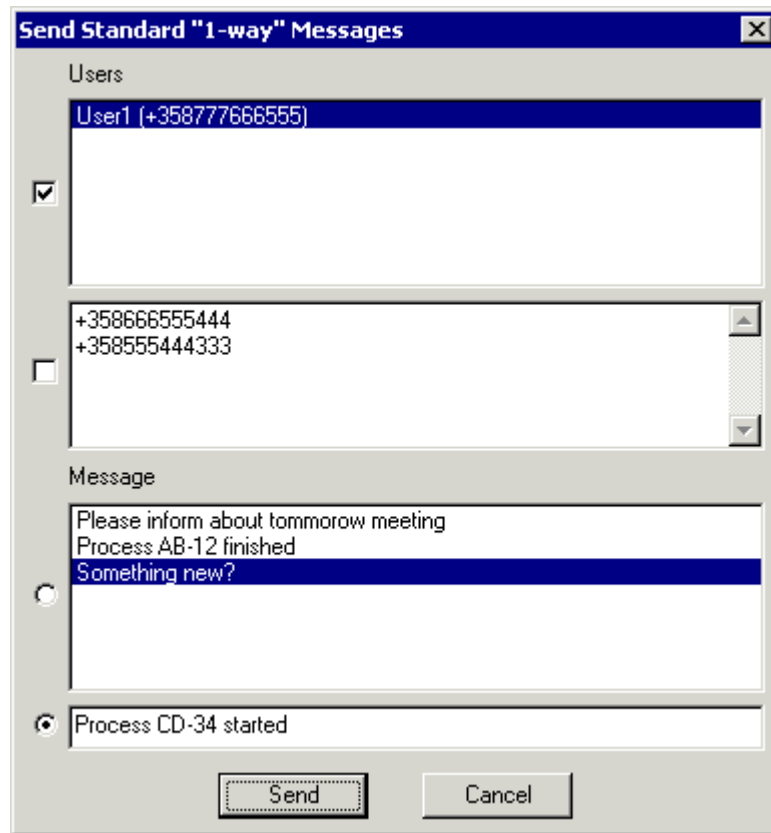
For information already configured in GSMCFG, the phone number can be selected by clicking mouse left button on corresponding upper *Users* window field and the message can be selected by clicking mouse left button on corresponding upper *Message* window field (also the upper *Users* checkbox must be checked):



Also it is possible to manually enter new phone number(s) where to send the selected message (in this case the lower *Users* checkbox must be checked). For example, the following settings allow to send message “Something new?” to phone numbers “+358666555444” and “+358555444333”:



Also it is possible to create some new message directly in the " Send Standard "1-way" Messages " dialog box. For example, the following settings allow to send message "Process CD-34 started." to phone numbers "+358777666555", "+358666555444" and "+358555444ss" (the "User1 (+358777666555)" is selected on upper *Users* window and both *Users* checkboxes are checked):



After the message is selected, it can be sent by pressing the **Send** button.

Sending "1-way" Messages via DDE or OPC

The sending of "1-way" messages via DDE or OPC can be done from DDE or OPC client application (e.g. MS Excel or Wonderware InTouch) by connecting to GSMCTRL built-in DDE or OPC server. The following DDE or OPC items can be used (see also *Additional features/Sending messages by using DDE or OPC* section later in this manual): **SEND**, **MESSAGEIDX**, **NUMBER** and **NUMBERIDX**. The sequence in client application is following:

- 1 poke the index of "1-way" message to be sent to item **MESSAGEIDX**;
- 2 poke the phone number where to send this "1-way" message to item **NUMBER** or poke the index of User (see *GSM-Control Configuration Program/ GSMCFG Main Menu/Help/Summary* section upper in this manual) to item **NUMBERIDX**;
- 3 poke the value "1" to item **SEND**.

Sending “Send” Messages

The “**Send**” **messages** are messages, which can contain not only the text, but also the current values of Data items (DDE item, OPC item or SQL field) inserted in the message. The “Send” messages are created in the GSMCFG “Send/Receive” Page (see *GSM-Control Configuration Program / “Send/Receive” Page* section upper in this manual).

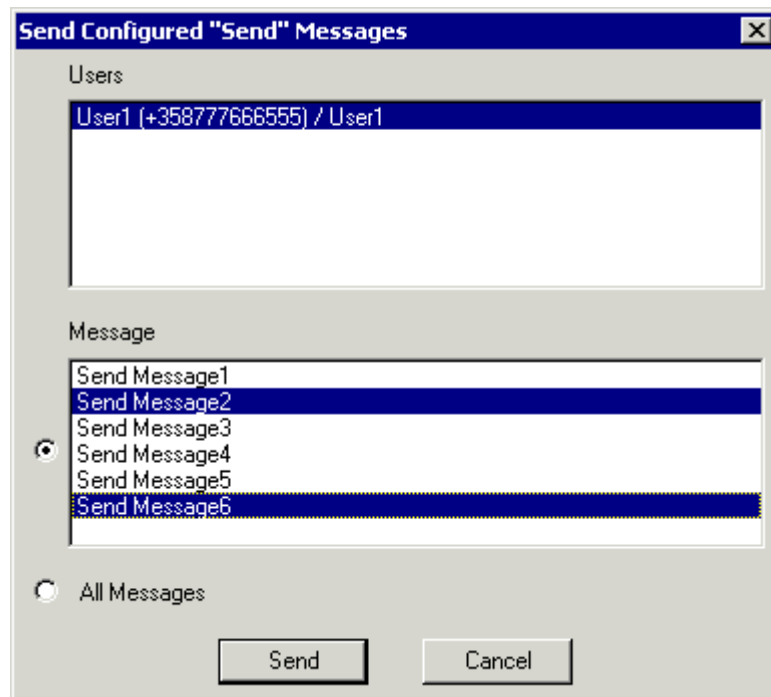
Sending “Send” Messages manually

The manual sending of “Send” messages can be done from GSMCTRL “**Send Configured “Send” Messages**” dialog box (invoked by *Send / Send “Send” Messages* command from GSMCTRL main menu):



In "Send Configured “Send” Messages" dialog box the appropriate **Send messages** (created in GSMCFG) can be selected and sent manually from GSMCTRL. The **User** can be selected by clicking mouse left button on corresponding *Users* window field and the **Send message(s)** can be selected by clicking mouse left button on corresponding *Message* window field (several messages can be selected by pressing Shift or Ctrl when clicking mouse left button). For example, the following settings allow to send **Send messages** “Send Message2” and “Send Message6” (the names of Send messages have to be entered

in **Description** field when creating Send/Receive messages in GSMCFG “Send/Receive” Page) to phone number “+358777666555”:



All configured **Send messages** can be selected by clicking on *All Messages*:



After messages are selected, they can be sent by pressing the **Send** button.

Sending “Send” Messages via DDE or OPC

The sending of “Send” messages via DDE or OPC can be done from DDE or OPC client application (e.g. MS Excel or Wonderware InTouch) by connecting to GSMCTRL built-in DDE or OPC server. The following DDE or OPC items can be used (see also *Additional features/Sending messages by using DDE or OPC* section

later in this manual): **SEND_READS**, **MESSAGEIDX**, **NUMBER** and **NUMBERIDX**. The sequence in client application is following: 1) poke the index (number) of “Send” message (see *GSM-Control Configuration Program / “Send/Receive” Page* upper in this manual) to be sent to item **MESSAGEIDX**; 2) poke the phone number where to send this “Send” message to item **NUMBER** or poke the index of User (see *GSM-Control Configuration Program / GSMCFG Main Menu/Help/Summary* section upper in this manual) to item **NUMBERIDX**; 3) poke the value “1” to item **SEND_READS**.

GSMCTRL.INI file

The GSM-Control Communication Program common settings are stored in the **GSMCTRL.INI** file. This file is located in the same directory as **GSMCTRL.EXE**. It is an ASCII file and can be altered manually if you wish with any text editor, e.g. MS Windows Notepad (*Do not use a program that formats text, such as MS Word unless the file is saved as DOS text*). The following is a typical content of the **GSMCTRL.INI** file:

[GSMCtrl]

AdjInterval=2

SMTPServer=

ViewFlags=255

LogFile=1

Left=15

Top=98

Height=168

Width=518

Usually there is no need to modify the **GSMCTRL.INI** file manually, because most of settings can be entered in **GSMCTRL** dialog boxes. Some special additional entries are described below.

SendErrorRetries entry

The **SendErrorRetries** entry is used to specify the number of attempts to send SMS Message before rejecting it. The default value (if there is no **SendErrorRetries** entry in **GSMCTRL.INI** file) is **5**. For example, by adding the following **GSMCTRL.INI** entry

SendErrorRetries=3

the GSM-Control will try to send SMS Message 3 times before rejecting it.

NoAlarmIfAck entry

The **GSMCTRL.INI** file can contain a special setting (**NoAlarmIfAck=1**), which can be used to disable the sending of *Alarm Messages* if alarm is already acknowledged in the operator interface application (e.g. in InTouch). The **NoAlarmIfAck=1** can be used only if there is an *Ack Item* configured for *Alarm Message* with which the alarm is associated. If **GSMCTRL.INI** file contains **NoAlarmIfAck=1** and *Ack Item* value is 1 (alarm is already acknowledged) then corresponding *Alarm Message* will be not sent.

Entries for alternative (voice) call support in case SMS Service not available

The **GSMCTRL.INI** file can contain two special settings **WAVFile=** and **WAVSendRetries** used to support the alternative (voice) call possibility in case the GSM SM Service becomes inaccessible. This feature can be implemented in the following way.

The **WAVFile=** entry is used to specify the name of sound file (prepared e.g. by Microsoft Sound Recorder program), which will be sent to the current GSM phone number by voice call after unsuccessful consecutive **SendErrorRetries** retries to send SMS Message to this phone number. The **WAVSendRetries** entry (default value is **3**) can be used to specify the number of voice call retries before rejecting the voice calls to this phone number (GSM-Control will wait 30 seconds for answer on each voice call retry). To support the sending of sound files, the computer sound card's line-out must be connected to modem audio-in lines (e.g. to 4-pole Western plug Microphone pins 1 and 4).

For example, by adding the following **GSMCTRL.INI** entries

WAVFile=C:\GSMCTRL\ALARM.WAV

WAVSendRetries =2

the GSM-Control will try to send (**2** times) the sound file **ALARM.WAV** to current GSM phone number (after unsuccessful consecutive **SendErrorRetries** retries to send SMS Message to this phone number). By default (no **WAVFile=** entry in **GSMCTRL.INI** file) the sending of alternative (voice) call is disabled.

AlarmCheckInterval

The **AlarmCheckInterval** entry can be added to **GSMCTRL.INI** file to specify the alarms scan rate (the update rate for DDE/OPC items configured as **Alarm Items** for Alarm messages). The default alarms scan rate (used if **GSMCTRL.INI** file does not contain this entry) is 2 seconds.

For example, the following entry can be used to specify the alarms scan rate equal to 5 seconds:

AlarmCheckInterval=5

ModemRestartTimeout

The **ModemRestartTimeout** entry can be added to **GSMCTRL.INI** file to disable or specify other value different from default value for the timeout when GSM-modem is in “not registered in GSM-network” state continuously on and after what GSM-modem will perform the GSM-modem reset and restart - whole GSM-Control start-up sequence plus additionally for Siemens modems in the beginning also the AT+CFUN=1,1 command will be executed.

The default **ModemRestartTimeout** (used if **GSMCTRL.INI** file does not contain this entry) value is 300 seconds.

For example, the following entry can be used to specify the GSM-modem reset and restart after being 10 minutes continuously in “not registered in GSM-network” state:

ModemRestartTimeout =600

To disable the GSM-modem reset and restart, the following entry can be used:

ModemRestartTimeout =0

***Note!** The GSM-modem reset and restart will be performed also if GSM-Control will detect modem power off/on (^SYSSTART received on COM port).*

ModemRestartPeriod

The **ModemRestartPeriod** entry can be added to **GSMCTRL.INI** file to enable the periodic automatic GSM-modem reset by executing the AT+CFUN=1,1 command. This setting is valid only for Siemens modems, the reset time interval is in minutes.

The default **ModemRestartPeriod** (used if **GSMCTRL.INI** file does not contain this entry) value is 0 – modem automatic reset disabled.

For example, the following entry can be used to specify the Siemens GSM-modem automatic reset each 10 minutes:

ModemRestartPeriod =10

To disable the Siemens GSM-modem periodic automatic reset, the following entry can be used:

ModemRestartPeriod =0

Special Character Sets

The processing of GSM-modem "AT+CSCS" command is included in GSMCTRL start-up. The special character sets are processed in the following way.

The GSMCTRL at startup detects the character sets supported by GSM-modem and selects “GSM” character set if available.

The character set can be specified in **GSMCTRL.INI** file by setting the line:

Charset=chset

Where **chset** is one of following: GSM, IRA, TTP, UCS2, PCCP850, PCCP852, PCCP1250, PCCP1252, 8859-1, 8859-2, UTF-8, ERICSSON.

For example if **PCCP1252** char set is used the GSMCTRL.INI file must contain line:

Charset=PCCP1252

SMS Message Prefixes

User configured *prefixes* can be automatically added to SMS messages sent from GSM-Control. To support prefixes, the following setting should be added to **GSMCTRL.INI** file:

MsgPrefix=prefix

where **prefix** is a text to be added in the beginning of SMS message. For example, the following setting:

MsgPrefix=*1#

will add characters ***1#** and one space before the SMS message text itself.

Mode settings

As default, GSM-Control sends short messages in PDU mode. The GSM-Control detects the modes enabled in the GSM-modem during the GSMCTRL program startup. By using **PDU_MODE** setting in **GSMCTRL.INI** file, you can force usage of text or PDU SMS-message sending mode:

PDU_MODE=mode

Where **mode** can be 0 or 1. If **mode** is **0** then text mode will be used, if **mode** is **1** then PDU mode will be used.

Unicode settings

Some GSM-modems supports the Unicode character set. In Unicode the character to be sent is precisely specified, but one character takes 2 times more space in the SMS-message. For this reason Unicode messages are 2 times shorter than messages if other character sets are used. If SMS-message to be sent by GSM Control exceeds the message length limit, then message is truncated before sending and corresponding warning is logged to GSM-Control logger. To force the Unicode usage, the following line should be placed in **GSMCTRL.INI** file:

UNICODE=mode

Where **mode** can be 0 or 1. The 0 specifies usage of character set specified by **Charset** setting in **GSMCTRL.INI** file or the modem default character set if

Charset setting is not specified. The **UNICODE=1** specifies the usage of Unicode character set **UCS2**, if it is supported by the GSM-modem.

Debug settings

It is possible to trace all serial communication between PC and modem. This may be useful in case of communication or GSM-Control program logic problems or if using modem not tested with GSM-Control program. If some problems occur then it is recommended to enable full logging of serial communication between PC and modem. To enable the full logging, you can use the following settings in GSMCTRL.INI file:

ShowSend=1

ShowReceive=1

To disable send and receive logging, you may delete these lines or specify value 0 instead of 1:

ShowSend=0

ShowReceive=0

User extension DLL

In some cases it is necessary to provide customized additional processing of received or sent SMS-messages. For this purpose the customized dynamic link library (dll) calls are implemented in GSM-Control to support the processing of SMS send or receive events. To specify to use this dynamic link library, following setting can be added in **GSMCTRL.INI** file:

EventDLL=path

where **path** is a full path to your own written dll file. If **EventDLL** setting is specified, path exists and dll has functions with specific names, then for each event one function of dll will be called with event code, phone number and message text in function parameters. The customer is responsible to write this dll. The errors in the customized dll can cause failure of GSMCTRL program, so the customized dll should be very tested very accurate. In GSM-Control installation package there is supplied example customized dynamic link library (USRDLL.ZIP, with source included), which is written with Microsoft Visual C++ 6.0. The customized dll must export two functions:

GSM_Version

GSM_Event

The **GSM_Version** function is called only once to determine the version of customized dll interface. For current version of GSM-Control the **GSM_Version** function must return hexadecimal value 00010000.

The **GSM_Event** function will be called on each SMS-message event with following parameters:

DWORD dwEv

LPCSTR lpszEv

LPCSTR lpszData1

LPCSTR lpszData2

Where **dwEv** is a number identifying the type of event, **lpszEv** string also identifies the type of event, **lpszData1** string specifies the phone number or error or warning text, **lpszData2** string specifies the short message text or WAV file path, or empty string.

There are following event identifiers and corresponding **lpszData1** and **lpszData2** values used as parameters of **GSM_Event** function:

dwEv	lpszEv	lpszData1	lpszData2
1001	"WARN"	warning text	empty string
1002	"INFO"	info text	empty string
1003	"SMSEND"	phone number	short message text
1004	"WAVSEND"	phone number	wav file name
1005	"SMSFAIL"	phone number	empty string
1006	"SMSDROP"	phone number	short message text
1007	"SMSREC"	phone number	short message text
1008	"WAVFAIL"	phone number	wav file name

Enabling Wonderware MxAccess (LMX) interface

To enable GSM-Control to work as MxAccess (LMX) client in purpose to exchange data with Wonderware Application Server via LMX Proxy, the following setting should be added in **GSMCTRL.INI** file:

uselmx=1

Without this setting the GSM-Control MxAccess (LMX) interface will not work.

Running GSMCTRL as Windows Service

The GSMCTRL program can be configured to run as a Windows Service. To enable this, the GSMCTRL program must be started with command line parameter - **install**:

GSMCTRL -install

After execution of this command, the Service with name **GSMCTRLSRV** is installed with Startup type **Automatic**. Now rebooting the Windows will cause the GSMCTRL to run automatically as Windows Service. It is expected the default GSM-Control configuration file (DEFAULT.XML) will be used when starting GSMCTRL as Windows Service, i.e. to use GSMCTRL running as Windows Service with some other GSM-Control configuration file, it should be renamed to DEFAULT.XML and copied to same directory where GSMCTRL.EXE is located.

The Service Startup configuration can be changed by MS Windows NT *Control Panel/Services* configuration dialogs. The **Allow Service to Interact with Desktop** checkbox in “Service” dialog box (invoked by pressing the “Startup” button on “Services” dialog box when Service **GSMCTRLSRV** is selected) must be checked to allow the user to interact with GSMCTRL program.

To disable the possibility for GSMCTRL program to run as a Windows Service, at first the GSMCTRLSRV must be stopped by MS Windows NT *Control Panel/Services* “Stop” button, and then GSMCTRL program must be started manually with command line parameter **-uninstall**:

GSMCTRL -uninstall

After execution of this command, the Service with name GSMCTRLSRV will be removed from system.

Note!

*When starting the GSMCTRL program, the startup main events are logged to GSMCTRL log file (see **Menu Commands/Options/Logging** section below). In case the GSMCTRL program was started as Windows Service, the GSMCTRL log file can contain the consecutive lines like following:*

99/02/05 17:06:51.283/Can not open 'DEFAULT.XML'

99/02/05 17:06:51.283/Processing file 'd:\gsmctrl\DEFAULT.XML'

99/02/05 17:06:51.363/Processing file 'd:\gsmctrl\DEFAULT.XML' done.

The first line containing “Can not open 'DEFAULT.XML'” does not indicate some error when opening file - it only informs that GSMCTRL program at first tried to find the DEFAULT.XML file at location used by Services, and then next two lines informs about successfully opened and processed DEFAULT.XML file at location where GSMCTRL resides.

Running GSMCTRL as OPC Server

Usually GSMCTRL OPC support acts as OPC Client, but is it possible to use other OPC Clients for data transmitting through GSMCTRL. In this case GSMCTRL acts as OPC Server. To install GSM-Control OPC version to run as **OPC Server**, the GSMCTRL OPC version must be started with command line parameter **"/RegServer"**:

GSMCTRL /RegServer

After above operation **GSMCTRL OPC Server** will appear in the OPC Servers list and becomes accessible for OPC Clients.

Note!

GSMCTRL OPC Server registration is included in the GSM-Control installation package delivered by Wonderware Finland & Baltics. In this case above operation is not necessary.

For **GSMCTRL OPC Server** mode deactivation the **GSMCTRL** has to be started with the following command line parameter:

GSMCTRL /UnregServer

After above operation **GSMCTRL OPC Server** will disappear from the OPC Servers list accessible for OPC Clients.

Configuring DCOM

After **GSMCTRL OPC Server** installation the System Administrator must configure DCOM by DCOM configuration program - by **Dcomcnfg.exe** (or **Dcomcnfg32.exe** for Win9x) system tool. This utility is located in the Windows system directory - e.g. in \WinNT\system32\ or \Win9x\system\. After starting **Dcomcnfg.exe**, select **GSMCTRL OPC Server** on **Applications** page and click on **Properties** - the “**GSMCTRL OPC Server Properties**” window will appear. All further configuration is to be done from there.

Configuring DCOM to access GSM-Control as a local OPC Server

To access GSM Control as a local OPC server:

Authentication level can be any of:

(None)

Call

Connect

Default

Packet

Packet Integrity

Packet Privacy

Location

“Run application on this computer” must be checked.

Security/access permissions - default access permissions can be used in case using GSM-Control as local OPC server. If it is necessary to access GSM-Control

OPC Server from local OPC Clients configured as **services**, then **Allow Access** permission must be configured for **SYSTEM** and for all users, which need access to the GSM-Control OPC server.

Security/launch permissions - **Allow Launch** must be specified for each user, which launches OPC Client on local machine. Typically specify **Allow Launch** for “Users” group. If is necessary to access GSM-Control OPC Server from local OPC Clients configured as **services** then **Allow Launch** permission must be configured for **SYSTEM** also.

Security/configuration permissions

Administrators - **Full Control**

CREATOR OWNER - **Full Control**

SYSTEM - **Full Control**

Full Control for all users, which have permission to register GSM-Control as OPC server.

For users, which have permission to read data from OPC server the sufficient permission is **Read**.

***Note** - OPC server registration and unregistration is silent. No error messages are displayed if operation is unavailable due to permission restrictions.*

Identify

Identify has to be **The launching user**. In case of using GSM Control as local OPC server, the **Identify** can be also **The interactive user**, but this setting will not work if user is not logged on and OPC Clients which are running as **services** will not be able to connect to the GSM-Control OPC server while user is not logged on computer.

Also **This user** can be selected. In this case GSM-Control OPC Server will be invisible on the screen and GSM-Control user interface will be inaccessible. If user is different as user logged on then GSM-Control OPC Server cannot be terminated by Task Manager. The user specified in this setting can be any user which have access to hardware and software resources used by GSM-Control. This user can be without permission to launch or configure OPC Server specified in the **Security** page of DCOM configuration program.

Configuring DCOM to access GSM-Control as a remote OPC Server

To access GSM-Control as a remote OPC server (form remote computer) and to browse available OPC Servers, at first you have to configure DCOM settings for **OPCEnum.exe**. OPCEnum.exe, opccomn_ps.dll and OPCProxy.dll must be installed and registered on both - server and client computers and GSM-Control

OPC Server must be installed and registered at computer where it will run. For some OPC clients it may be necessary to register OPC Server on client computer.

OPCEnum is used to browse OPC servers on local or remote computer, the DCOM settings for OPCEnum.exe are following:

Location

“Run application on this computer” - must be checked on both computers.

Security/Access permissions can be default.

Security/launch permissions

Launch permission must be set for each user, which can be able to configure OPC items on OPC Server computer. On the client computer OPCEnum launch permissions can be default, but some OPC clients may handle this situation incorrectly, therefore it is better to assign launch permission for users working on remote OPC client computer.

Security/configuration permissions

SYSTEM must have at least **Read** permission on OPC Server computer. On OPC Client computers at least **Read** permission must be set for users working with OPC clients.

Administrators must have **Full Control** permission on both computers, otherwise nobody can be able to configure or unregister OPCEnum.

Identify

On GSM-Control OPC Server computer the **Identify** must be set to **The interactive User**. On remote OPC Client computer it can be **The interactive user** or **The launching user**.

DCOM Settings for GSM-Control as remote OPC Server:

Location - “Run application on this computer” must be checked.

Security/access permissions can be default. If GSM-Control OPC Server is running as **service**, then **Allow Access** permission should be set for **NETWORK** and remote OPC client computers.

Security/launch permissions must be set to **NETWORK** and for users working on remote client computers.

Security/configuration permissions - **Read** must be set for **NETWORK** and for users working on remote OPC client computers.

Identify - **The interactive user** must be selected.

Most frequent errors when configuring DCOM

The following table contains most frequent errors when configuring DCOM.

Error message	Possible reason
DCOM not installed	DCOM has not been installed
Server execution failed	1) OPC Server can not be started 2) Identity for OPC server not properly configured 3) OPC Server is not located on a local hard disk 4) OPC Server path in registry is too long or uses LFN (Long File Names) 5) DCOMCNFG Location is not set to Run on this computer.
Class not registered	OPC Server has not been registered
RPC server is unavailable	1) Remote Procedure Call service is not running on the OPC Server computer 2) Invalid computer name for remote OPC Server 3) Make sure TCP/IP is installed properly
Interface not supported	1) Permission not granted to OPC Client 2) Guest account disabled
Access is denied	1) DCOM security not configured properly 2) OPC Server application not located on local hard disk 3) SYSTEM account in DCOMCNFG must have Access, Launch and Configure privileges
Error 80070776	Network error - TCP/IP has not been configured properly
Catastrophic failure	1) Trying to access an object before it is created 2) Unhandled exception is occurs on the OPC Server
Not enough storage	SYSTEM account in DCOMCNFG must have Access , Launch and Configure privileges

Sending messages by using DDE or OPC

The direct sending (one direction communication) of SMS messages from GSM-Control Communication Program can be performed using DDE or OPC. In this case the GSMCTRL acts as a **DDE** or **OPC Server** allowing other Windows application programs to send SMS messages via the GSM-Control. This GSM-Control feature can be used by any Microsoft Windows program that is capable to act as a DDE or OPC Client.

DDE items

The DDE protocol identifies an element of data by using a three-part address, including: **Application**, **Topic** and **Item**.

Application refers to the name of the Windows program (server) with which the client wants to exchange the data. In the case of GSMCTRL the application portion of the DDE address is "GSMCTRL".

Topic is an application-specific subgroup of data. There is a topic with name "**PHONE**" reserved for GSMCTRL. The "**PHONE**" topic is used for dialing and sending/receiving SMS messages.

Item indicates a specific data within the specified topic. There are following pre-defined items for the "**PHONE**" topic:

CLIENT_CTRL_MSG DDE string

This item is used to specify the SMS message to be sent when DDE Client terminates connection or is closed. This item is separate for each Client, so different Clients can have different messages.

CLIENT_CTRL_NUM DDE string

This item is used to specify the GSM phone number where to send the SMS message when DDE Client terminates connection or is closed. This item is separate for each Client, so different clients can have different phone numbers.

MESSAGE DDE string

This item is used to specify the SMS message to be sent. Not supported for sending by **SEND_READS** item.

MESSAGEIDX DDE integer

This item is used to specify the index of SMS message to be sent from the list of "*1-way*" messages (see *Sending "1-way" Messages* section upper in this manual) or from the list of "*Send*" messages (see *Sending "Send" Messages* section upper in this manual). In this case the SMS message to be sent is taken from this list. The index starts from value **1**. If **MESSAGEIDX** value is **0** then SMS message to be sent must be specified in the **MESSAGE** item.

NUMBER DDE string

This item is used to specify the GSM phone number where to send the SMS message. If **SEND_READS** item will be used for sending then this phone number must be some of configured **User** phone number.

NUMBERIDX DDE integer

This item is used to specify the index of GSM phone number where to send the SMS message. Each configured **User** (phone number) has unique index (starting from 1), automatically assigned by GSMCFG (see *GSMCFG Main*

Menu/Help/Summary section above in this manual). If **NUMBERIDX** value is **0** then GSM phone number where to send the SMS message must be specified in the **NUMBER** item.

PORT DDE integer

This item can be used to specify the number of COM port used. If writing new value to this item then GSMCTRL closes the previous COM port and opens the new COM port as well as performs the GSM-modem startup initialization.

QUEUE_LEN DDE integer

Total amount of SMS messages currently waiting to be sent. The same value as "Messages in queue" on GSMCTRL "Statistics" dialog box (invoked by *Options/Statistics* command).

RECV_MESSAGE DDE string

This item contains the text of last received SMS message.

RECV_MSG_DATE DDE string

This item contains the date of last received SMS message.

RECV_MSG_TIME DDE string

This item contains the time of last received SMS message.

REGSTAT DDE integer

This item can be used to monitor the current registration status of GSM-modem. GSM-Control is periodically (each 60 seconds) sending AT+CREG? (network registration status inquiry) command to GSM-modem and received status value is assigned to item REGSTAT, so in DDE Client it is possible to detect GSM network fail or GSM-modem connectivity problems. The following REGSTAT values are possible:

- 0 not registered, GSM-modem is currently not searching for new operator;
- 1 registered, home (domestic) network;
- 2 not registered, but GSM-modem is currently searching for a new operator;
- 3 registration denied;

- 4 unknown;
- 5 registered, roaming.

Notes:

- 1 Only the values **1** and **5** indicates the GSM-modem is registered in the GSM-network and sending and receiving of SMS-messages is possible.
- 2 The “not registered in GSM-network” state (states 0, 2, 3 and 4) is indicated also by DDE item STATUS (see below) value –10.
- 3 Usually GSM-modems automatically registers back to GSM-network in case GSM-network fail is eliminated or signal level improves. In purpose to eliminate potential GSM-modem inability to register back automatically, if “not registered in GSM-network” state is continuously on for some time (5 minutes as default if not other **ModemRestartTimeout** value (see *GSMCTRL.INI* file section upper in this manual) is specified in GSMCTRL.INI file), GSM-Control will perform the GSM-modem reset and restart by executing the AT+CFUN=1,1 command (if GSM-modem supports this command and **ModemRestartTimeout** is not equal 0.

SEND DDE discrete

This item is used to start the sending of SMS message configured as “*1-way*” message. Initially this item is 0, to start the sending the DDE Client should set this item to 1. After the SMS message is sent then GSMCTRL returns this item value back to 0.

SEND_READS DDE discrete

This item is used to start the sending of SMS message configured as “*Send*” message. Initially this item is 0, to start the sending the DDE Client should set this item to 1. After the SM is sent then GSMCTRL returns this item value back to 0.

SENDER_NUM DDE string

This item contains the sender phone number of last received SMS message.

SERVICE_NUMBER DDE string

This item can be used to monitor/change the currently used number of GSM Service Center. If client application (e.g. InTouch or Excel) pokes new value to this item then GSM Control Communication Program will update the SMSC address, through which the mobile originated SMS messages are transmitted.

STAT_FAIL

DDE integer

Total amount of SMS messages failed to send from GSM-Control after last restart. The same value as "Failed messages" on GSMCTRL "Statistics" dialog box (invoked by *Options/Statistics* command).

STAT_RECV

DDE integer

Total amount of SMS messages received by GSM-Control after last restart. The same value as "Received messages" on GSMCTRL "Statistics" dialog box (invoked by *Options/Statistics* command).

STAT_SENT

DDE integer

Total amount of SMS messages sent from GSM-Control after last restart. The same value as "Sent messages" on GSMCTRL "Statistics" dialog box (invoked by *Options/Statistics* command).

STATUS

DDE integer

This item can be used to monitor the status of communication between PC and modem:

- 0 communication between PC and modem is O.K, i.e. SMS messages can be successfully delivered to/from the modem;
- 2 error opening communication port - cannot send SMS message; probably other application uses the same communication port or port settings are incorrect;
- 4 error when initializing modem - cannot send SMS messages; probably the modem is not connected to PC, modem's power is off, cable is bad or modem settings are incorrect;
- 6 error when trying to send SMS-message; probably the modem is switched off or disconnected from PC, GSM Service Center Phone Number and PIN Code settings in GSM-Control current configuration differs from actual settings on SIM card, invalid contents of message to be sent;
- 10 GSM-modem is in "not registered in GSM-network" state.

TIMER

DDE integer

Total amount of minutes elapsed after GSMCTRL start-up. This item can be used to determine if connection from DDE Client to GSMCTRL is still alive - as TIMER value each minute increases by 1.

Sending SMS message by using DDE

All necessary configuration should be done before sending SMS message.

To perform the sending of SMS messages, the DDE Client (for example, InTouch or Excel) has to perform the following steps (see also *Examples how to use GSM-Control / GSM-Control with MS Excel (DDE) / Sending "1-way messages"* and *Sending "Send" Messages* sections upper in this manual):

- 1 Establish DDE link with the GSMCTRL using **Application "GSMCTRL"** and **Topic "PHONE"**.
- 2 Directly specify the number of GSM phone where to send the SMS message in the DDE item **NUMBER** or specify the index of GSM phone number in the DDE item **NUMBERIDX**.
- 3 Poke the text of SMS message to be send directly into DDE item **MESSAGE** or specify the index of message (from the list of *"1-way" messages* or from the list of *"Send" messages*) in the DDE item **MESSAGEIDX**.
- 4 Poke "1" into DDE item **SEND** or **SEND_READS**.
- 5 Wait and monitor the value of DDE item **SEND** or **SEND_READS** while it becomes "0". When it happens then sending is completed.
- 6 Monitor the value of DDE item **STATUS** while sending the first SMS message. If the value of **STATUS** all the time is 0 then the communication between PC and modem is O.K. and SMS messages can be successfully delivered.

Sending SMS message when DDE client terminates the connection

It is possible to send SMS message when Client terminates the DDE connection, is closed or crashes. To do so, the DDE Client must write (poke) SMS message text into the DDE item **CLIENT_CTRL_MSG** and GSM phone number into the DDE item **CLIENT_CTRL_NUM**. These items are separate for each DDE Client, so different Clients can have different messages and phone numbers.

Special "DUMMY" Topic

The special topic **"DUMMY"** can be useful when GSMCTRL is used with some DDE Client (e.g. Wonderware InTouch) and DDE Server, which uses the serial port. Other programs should not use the serial port used for sending of SMS message, but serial DDE Servers are doing that when DDE Client has established the DDE link with them. This link must be closed before sending the SMS message and this can be done by redirecting this link to other topic (e.g. by **"SetDdeAppTopic"** script command in InTouch). After SMS message is sent, the link with serial DDE Server can be reestablished (e.g. again by **"SetDdeAppTopic"** script command in InTouch). The **"DUMMY"** topic can be useful in this case.

The "DUMMY" item accepts DDE requests for any DDE item, but does not send data as well as does not accept new data values.

OPC Items

The GSMCTRL as an OPC Server contains the data address space described below. This address space includes the following pre-defined items for the "PHONE" data group, the values of these items are in the VARIANT format.

MESSAGE native type - VT_BSTR

This item is used to specify the SMS message to be sent. Not supported for sending by **SEND_READS** item.

MESSAGEIDX native type - VT_I4

This item is used to specify the index of SMS message to be sent from the list of "1-way" messages (see *Sending "1-way" Messages* section upper in this manual) or from the list of "Send" messages (see *Sending "Send" Messages* section upper in this manual). In this case the SMS message to be sent is taken from this list. The index starts from value 1. If **MESSAGEIDX** value is 0 then SMS message to be sent must be specified in the **MESSAGE** item.

NUMBER native type - VT_BSTR

This item is used to specify the GSM phone number where to send the SMS message. If **SEND_READS** item will be used for sending then this phone number must be some of configured **User** phone number.

NUMBERIDX native type - VT_I4

This item is used to specify the index of GSM phone number where to send the SMS message. Each configured **User** (phone number) has unique index (starting from 1), automatically assigned by GSMCFG (see *GSMCFG Main Menu/Help/Summary* section above in this manual). If **NUMBERIDX** value is 0 then GSM phone number where to send the SMS message must be specified in the **NUMBER** item.

PORT native type - VT_I4

This item can be used to specify the number of COM port used. If writing new value to this item then GSMCTRL closes the previous COM port and opens the new COM port as well as performs the GSM-modem startup initialization.

QUEUE_LEN native type - VT_I4

Total amount of SMS messages currently waiting to be sent. The same value as "Messages in queue" on GSMCTRL "Statistics" dialog box (invoked by *Options/Statistics* command).

RECV_MESSAGE native type - VT_BSTR

This item contains the text of last received SMS message.

REGSTAT native type - VT_I4

This item can be used to monitor the current registration status of GSM-modem. GSM-Control is periodically (each 60 seconds) sending AT+CREG? (network registration status inquiry) command to GSM-modem and received status value is assigned to item REGSTAT, so in OPC Client it is possible to detect GSM network fail or GSM-modem connectivity problems. The following REGSTAT values are possible:

- | | |
|---|--|
| 0 | not registered, GSM-modem is currently not searching for new operator; |
| 1 | registered, home (domestic) network; |
| 2 | not registered, but GSM-modem is currently searching for a new operator; |
| 3 | registration denied; |
| 4 | unknown; |
| 5 | registered, roaming. |

Notes:

- 1 Only the values **1** and **5** indicates the GSM-modem is registered in the GSM-network and sending and receiving of SMS-messages is possible.
- 2 The "not registered in GSM-network" state (states 0, 2, 3 and 4) is indicated also by OPC item STATUS (see below) value -10.
- 3 Usually GSM-modems automatically registers back to GSM-network in case GSM-network fail is eliminated or signal level improves. In purpose to eliminate potential GSM-modem inability to register back automatically, if "not registered in GSM-network" state is continuously on for some time (5 minutes as default if not other **ModemRestartTimeout** value (see *GSMCTRL.INI* file section upper in this manual) is specified in GSMCTRL.INI file), GSM-Control will perform the GSM-modem reset and restart by executing

the AT+CFUN=1,1 command (if GSM-modem supports this command and **ModemRestartTimeout** is not equal 0).

RECV_MSG_DATE native type - VT_BSTR

This item contains the date of last received SMS message.

RECV_MSG_TIME native type - VT_BSTR

This item contains the time of last received SMS message.

SEND native type - VT_BOOL

This item is used to start the sending of SMS message configured as “*1-way*” message. Initially this item is 0, to start the sending the OPC Client should set this item to 1. After the SMS message is sent then GSMCTRL returns this item value back to 0.

SEND_READS native type - VT_BOOL

This item is used to start the sending of SMS message configured as “*Send*” message. Initially this item is 0, to start the sending the OPC Client should set this item to 1. After the SM is sent then GSMCTRL returns this item value back to 0.

SENDER_NUM native type - VT_BSTR

This item contains the sender phone number of last received SMS message.

SERVICE_NUMBER native type - VT_BSTR

This item can be used to monitor/change the currently used number of GSM Service Center. If OPC Client pokes new value to this item then GSM Control Communication Program will update the SMSC address, through which the mobile originated SMS messages are transmitted.

STAT_FAIL native type - VT_I4

Total amount of SMS messages failed to send from GSM-Control after last restart. The same value as "Failed messages" on GSMCTRL “Statistics” dialog box (invoked by *Options/Statistics* command).

STAT_RECV native type - VT_I4

Total amount of SMS messages received by GSM-Control after last restart. The same value as "Received messages" on GSMCTRL "Statistics" dialog box (invoked by *Options/Statistics* command).

STAT_SENT native type - VT_I4

Total amount of SMS messages sent from GSM-Control after last restart. The same value as "Sent messages" on GSMCTRL "Statistics" dialog box (invoked by *Options/Statistics* command).

STATUS native type - VT_I4

This item can be used to monitor the status of communication between PC and modem:

- 0 communication between PC and modem is O.K, i.e. SMS messages are successfully delivered to the modem;
- 2 error opening communication port - cannot send SMS message; probably other application uses the same communication port or port settings are incorrect;
- 4 error when initializing modem - cannot send SMS messages; probably the modem is not connected to PC, modem's power is off, cable is bad or modem settings are incorrect;
- 6 error when trying to send SMS-message; probably the modem is switched off or disconnected from PC, GSM Service Center Phone Number and PIN Code settings in GSM-Control current configuration differs from actual settings on SIM card, invalid contents of message to be sent;
- 10 GSM-modem is in "not registered in GSM-network" state.

TIMER native type - VT_I4

Total amount of minutes elapsed after GSMCTRL start-up. This item can be used to determine if connection from OPC Client to GSMCTRL OPC Server is still alive - as **TIMER** value each minute increases by 1.

Sending SMS message by using OPC

All necessary configuration should be done before sending SMS message.

To send a SMS message, the OPC Client must perform the following steps (in further explanation the FactorySoft OPC Client program is used as an example of OPC Client):

- 1 Establish the OPC connection with GSMCTRL OPC Server by using OPC Client menu item *OPC/Connect* and select the "**GSMCTRL OPC Server**".
- 2 By using the OPC Client menu item *OPC/Add Item*: add and directly specify in the OPC item **PHONE.NUMBER** the number of GSM phone where to send the SMS message or specify the index of GSM phone number in the OPC item **PHONE.NUMBERIDX**.
- 3 Put the SMS message to be send directly into OPC item **PHONE.MESSAGE** or specify the index of message ((from the list of "*1-way*" messages or from the list of "*Send*" messages)) in the OPC item **PHONE.MESSAGEIDX**.
- 4 Put "1" into OPC item **PHONE.SEND** or **PHONE.SEND_READS**.
- 5 Wait and monitor the value of OPC item **PHONE.SEND** or **PHONE.SEND_READS** while it becomes "0". When it happens then sending is completed.
- 6 Monitor the value of OPC item **PHONE.STATUS** while sending the first SMS message. If the value of **PHONE.STATUS** all the time is 0 then the communication between PC and modem is O.K. and SMS messages can be successfully delivered.

Sending and Receiving messages by e-mail

Using GSM-Control as a mailserver

GSM-Control has built-in support for sending and (or) receiving e-mails, i.e. GSM-Control can work as a "pure" mailserver - in this case GSM-Control may run even without GSM-modem connected - GSM-modem can be replaced by e-mail connection. To configure User as e-mail sender or receiver, simply replace User phone number by **e-mail address** (see *GSMCFG Main Window/"Users" Page* section upper in this manual).

The **e-mail address** of GSM-Control is automatically created the following way:

GSM@hostname.domain

where "**hostname**" is the name of computer where GSM-Control is running and "**domain**" is the domain name where this computer belongs to. For example, to send e-mail to GSM-Control running on computer **MyPC** and belonging to domain **mycompany.cc**, the e-mail address to be used is **GSM@MyPC.mycompany.cc**.

To enable the possibility to **send** e-mails from GSM-Control, the **Host name of the SMTP** (Simple Mail Transfer Protocol) Server used to process e-mails must be configured in GSM-Control Communication Program (see "*Options/Communications*" in *GSM-Control Communication Program/GSMCTRL Menu Commands* section upper in this manual).

To enable the possibility to **receive** e-mails in GSM-Control, your computer name has to be included in the list of local hosts on your local DNS server (like usually it

is) and on your mailserver the forwarding of incoming e-mails to GSM-Control e-mail address must be enabled. For example, if **MS Exchange Server** is used, GSM-Control e-mail address is **GSM@MyPC.mycompany.cc** and IP address of computer where GSM-Control is running is **111.222.333.444** then following actions are necessary:

- on MS Exchange Server create the custom recipient with address **GSM@MyPC.mycompany.cc**;
- on local DNS controller there must be record with host name and IP address: **MyPC/111.222.333.444**;
- if there is no record **MyPC.mycompany.cc** in DNS records at ISP (Internet Service Provider) then this record must be added (as **111.222.333.444 MyPC.mycompany.cc**) to the **hosts** file (located as %sysroot%\system32\drivers\etc\hosts).

Note!

If GSM-Control is used as a “pure” mailserver without GSM-modem connected then GSMCTRL log file is consecutively filled with messages “ATI timeout, no response from modem”. The support of “pure” mailserver is not a GSM-Control basic feature, so such a logging can be considered as dispensable.

Sending/receiving SMS Messages by e-mails from/to GSM-Control

GSM-Control supports the possibility to send SMS Messages by e-mails from GSM-Control to GSM network and to receive SMS Messages as e-mails from GSM network. To configure User as e-mail sender or receiver, simply replace User phone number by **e-mail address** (see *GSMCFG Main Window / “Users” Page* section upper in this manual). This e-mail address usually contains the mobile user GSM phone number. If your GSM provider does not support possibility to send/receive SMS Messages by e-mail, then you cannot use this GSM-Control additional feature.

The implementation of sending/receiving SMS Messages by e-mail varies for different mobile operators and countries. The following is some general example how sending/receiving SMS Messages could work:

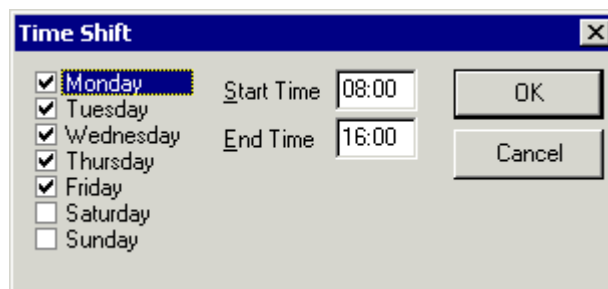
- to send SMS Message from mobile phone to GSM-Control by e-mail: on your mobile phone or device select “Write Message”, start message text with the GSM-Control e-mail address (receiver of message, e.g. GSM@MyPC.mycompany.cc), then enter some special separator (e.g. space or #) and then proceed with the message itself; then send it to your GSM provider phone number reserved for sending SMS Messages from mobile phone to e-mail (e.g. 9912); the SMS Message now will be delivered to GSM-Control by e-mail;
- to send SMS Message by e-mail from GSM-Control to GSM mobile phone or device: at first an “account” has to be opened at your GSM provider for receiver’s phone number and then you can send e-mail containing the message text to

address reserved for receiver (like xxxxxxxx@smsmail.mobileprovider.cc where xxxxxxxxxx is receiver's phone number); the text from GSM-Control now will be delivered by e-mail to receiver as SMS Message.

In GSM-Control the processing is the same if sending/receiving SMS Messages by modems or by e-mail. The main differences can be in delivery times. Also some GSM providers add some service information after SMS Message text when delivering SMS Message from GSM network by e-mail to GSM-Control - in this case GSM-Control ignores this additional information and in processing uses only the SMS Message pure text (received e-mail text until first carriage return (0D in hex) symbol).

Time Shifts

By pressing the “**Time Shifts...**” button on the “Configure User” dialog box (see *GSM-Control Configuration Program / “Users” Page* section upper in this manual), the “Time Shifts” dialog box can be invoked where day/time when Alarm messages will be sent to this User can be entered:



The above configuration enables the Alarm messages will be sent to this User only on working days between 08:00 and 16:00.

Errors

All GSM-Control Communication program (GSMCTRL) activity is displayed on the GSMCTRL main window and also (as default) logged to GSMCTRL log file, so all GSMCTRL errors are indicated there.

The following are most common errors, which can happen at GSMCTRL **startup/restart**:

Error Indication	Probable Cause	Solution
ATI timeout, no response from modem	1) GSM-modem not connected.	1) Connect GSM-modem to COM port currently selected at GSM-Control configuration “Options/ Communications”.
	2) GSM-modem switched off.	2) Switch GSM-modem on.

	3) The GSM-modem settings differs from settings specified at GSM-Control configuration "Options/Communications".	3) Check and correct the settings at GSM-Control configuration "Options/Communications".
AT+CPIN? timeout, no response from modem	No SIM card in the GSM-modem.	Insert SIM card into GSM-modem.
ERR0007: Bad PIN Code!	Different PIN codes on SIM card in the GSM-modem and configured at GSM-Control configuration "Settings".	Correct the PIN code configured at GSM-Control configuration "Settings".
ERR0008: SIM locked - need PUK Code!	SIM card locked - too many times the wrong PIN code tried.	Take SIM card away from GSM-modem, insert SIM card into mobile phone and enter PUK code to unlock the SIM card.
No PIN code in file	SIM card has PIN code, but no PIN code in GSM-Control current configuration	Enter the PIN code at GSM-Control configuration "Settings".
DDE Init Failed. App:'Server' Tpc:'Topic'	1) DDE server 'Server' not running. 2) DDE server 'Server' running, but DDE topic 'Topic' does not exist.	1) Start DDE server 'Server' 2) Create DDE topic 'Topic'
OPC Init Failed. Node:'Node' ProgID:'OPCServer'	OPC server 'OPCServer' not running on node 'Node'.	Start OPC server 'OPCServer' on node 'Node'.
DDE Advise Failed. Itm:"itemname"	The DDE item "itemname" not recognized.	Check the DDE item name "itemname" configured in GSM-Control.
OPC Advise Failed. ItemID:'itemname'	The OPC item 'itemname' not recognized.	Check the OPC item name 'itemname' configured in GSM-Control.

The following are most common errors, which can happen at GSMCTRL **run-time**:

Error Indication	Probable Cause	Solution
+CMS ERROR: 50 +CMS ERROR: 500	1) The SMSC phone number specified at GSM-Control configuration "Settings"	1) Check and correct the SMSC phone number specified at GSM-

	differs from actual SMSC phone number used by your GSM provider. 2) There is not good enough signal from the GSM network - in this case temporarily disconnection from network can happen and no SMS message can be sent/received.	Control configuration “Settings”. 2) Check and if possible improve the location of GSM-modem antenna (e.g. by using longer antenna connection cable). Check if antenna connector is firmly connected to GSM-modem.
ERR0105: Bad message received	Received SMS message does not match with any of SMS messages configured for sender of message.	Do not send anymore to GSM-Control such kind of non-expected SMS message. Notes: 1. The ERR0105 is not displayed (logged) if received SMS message does not belong to any of Users configured. 2. As default, no response is sent in case non-expected SMS message is received, but this can be changed by unselecting “Ignore Bad Messages” (see <i>GSMCTRL Menu Commands/Options/Ignore Bad Messages</i> section upper in this manual).
The value of DDE or OPC item is replaced by (DDE_Failed) or (OPC_Failed) in the text of SMS message sent from GSM-Control	The value of corresponding DDE or OPC item (inserted into configured Send message) cannot be obtained from DDE or OPC server (most probably the DDE or OPC server is shut-down).	Check and if necessary restart the corresponding DDE or OPC server.
The value of SQL field is	The corresponding SQL read	Check the configuration of

replaced by (SQL_Failed) in the text of SMS message sent from GSM-Control	query cannot be executed.	corresponding SQL query in GSM-Control. Execute the Test in GSMCFG.
SQL Error (Connect): -1 IM002 [Microsoft][ODBC Driver Manager] Data source name not found and no default driver specified	Wrong DSN configured in GSM-Control configuration.	Check the configuration of corresponding SQL query in GSM-Control. Execute Test in GSMCFG program.
SQL Error (ExecDirect): -1 07002 [Microsoft][ODBC xxxxx Driver] Too few parameters. Expected 1	Wrong SQL field name configured in GSM-Control configuration.	Check the configuration of corresponding SQL query in GSM-Control. Execute Test in GSMCFG program.
SQL Error (GetData): -1 07009 [Microsoft][ODBC xxxxx Driver]Invalid descriptor index	Not enough parameters configured for SQL query in GSM-Control configuration.	Check the configuration of corresponding SQL query in GSM-Control. Execute Test in GSMCFG program.

WONDERWARE FINLAND & BALTICS GSM-CONTROL Software

Revision History

Feb 98	Rev 1.0	First Release
Mar 98	Rev 1.1	Modifications in manual text. "Alarms" section finished.
Mar 98	Rev 1.2	Modifications in manual. "Item Properties" field added.
Apr 98	Rev 1.3	Modifications in manual. "Item Properties" field replaced with "DDE Properties" where "Request Initial Data" setting added. Text messages added. GSM-Control Communication Program section modified.
May 98	Rev 1.4	Modifications in manual text and pictures. "Getting started with GSM-Control" section added.
May 98	Rev 1.5	"Files on the GSM-Control distribution disk" and "Installing the GSM-Control" sections added.
May 98	Rev 1.6	Minor changes in manual text and pictures.
Sep 98	Rev 1.7	Support for "No password" and "No dialog" messages added. Several items in Write message added. Layout of GSMCTRL dialog menus and dialog boxes changed. "Send Interval" added. "Statistics" and "Send Reads" menu items and dialog boxes added.
Oct 98	Rev 1.8	GSM-modem added. Sending alarm message if connection established added.
Oct 98	Rev 1.9	Layout of pages changed.
Feb 99	Rev 1.10	E-mail support added. "ANYUSER" feature added. NoDialogReadDelay entry in GSMCTRL.INI added. "Modem/Settings" dialog modified. "Installing the GSM-Control" modified.
Apr 99	Rev 1.11	Introduction section (Wonderware Finland & Baltics software products for GSM communication) added.
Jul 2000	Rev 2.0	GSM-Control version 3.0 released: - SQL support added - Sending messages to all users linked to certain Alarm message without response from user expected - Sending alarm information by opening a voice call and playing a pre-configured wav-file created for certain Alarm message

		- Support up to 500 Alarm messages added - Special character sets support added - Support for special prefixes in SMS Messages added - Ignore Bad Messages feature added - Sonera Content Gateway support added
Dec 2000	Rev 2.1	GSM-Control OPC version added to this manual. Writing to SQL database support added.
Feb 2001	Rev 2.2	Configuring SQL Data in GSM-Control Configuration Tool section modified.
Mar 2002	Rev 3.0	New release 4.0 of GSM-Control.
Apr 2002	Rev 3.1	“Simulate” dialog box changed. “Sending and Receiving SMS messages by e-mail” section changed.
Jul 2003	Rev 3.2	“Installing the GSM-Control”, “Getting started with GSM-modem connected”, “Users” Page”, “GSMCTRL.INI file”, “DDE items” and “OPC items” sections modified. “Advanced User” section removed. Wrong “Running GSMCTRL as Windows NT Service” section removed.
Jan 2004	Rev 3.3	Modifications made in correspondence with GSM-Control version 4.15: “Options/Terminal”, “Options/Close Port Temporary”, “Options/Edit GSMCTRL.INI” sections added in “GSMCTRL Menu Commands/Options” chapter. “ModemRestartTimeout” section modified and “ModemRestartPeriod” section added in “GSMCTRL.INI file” chapter. New item TIMER added in “DDE items” and “OPC items” sections.
Sep 2004	Rev 3.4	“Send To All” feature added “Send/Receive Settings” dialog box
Aug 2005	Rev 3.5	Wonderware Lmx Proxy interface added.
Mar 2007	Rev 3.6	“GSMCTRL.INI file” chapter “ModemRestartPeriod” description modified.
Sep 2007	Rev 4.0	“Introduction, Wonderware Finland & Baltics Wireless M2M Concept” section modified.
Jun 2008	Rev 4.1	“Introduction, Wonderware Finland & Baltics Wireless M2M Concept” section removed. Lmx Proxy interface changed to MXAccess.
Jul 2008	Rev 4.2	“Modem and accessories” section added.
Jul 2010	Rev 4.3	Working with software license key description added. In “GSM-Control with Wonderware Application Server” section the description of “uselmx=1” setting added.

Aug 2012	Rev 4.4	“Installing the GSM-Control” section modified, the “Licensing by using HASP HL key” sub-section added.
Jan 2013	Rev 4.5	“Installing the GSM-Control” section modified.