

The logo for Nubitek SMS Lite, featuring the word "nubitek" in a lowercase, sans-serif font with a purple accent on the letter 'k', and "sms lite" in a smaller, lowercase, sans-serif font below it.

nubitek  
sms lite

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# **Nubitek SMS LITE**

**User Manual**

## Nubitek SMS LITE v1.3

### User Manual.

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## Introduction

The purpose of this manual is to explain how to install and use the Nubitek SMS Lite library to manage the sending and receiving of SMS messages from a Siemens PLC S7-200 device.

### Nubitek Industrial IT, S. L.

Nubitek Industrial IT is an industrial software development company that specialises in the integration of automation systems with new computer technologies.

Nubitek develops customised projects, as well as producing and distributing applications for general use with the Siemens PLC S7-200 device, such as Nubitek SMS Lite.

Nubitek's corporate philosophy is to create software that is simple but powerful at the same time, thus providing access to advanced industrial communication techniques via modem without the need to undertake any development work.

nubitek

### Who is this document for?

- S7-200 programmers who want to use the Nubitek SMS Lite library to integrate the sending and receiving of SMS messages into their control projects.
- Automation customers who are not experts in development for the S7-200 and who want to know something specific about the Nubitek SMS Lite library.

### How is this document organised?

Chapter 1 explains what Nubitek SMS Lite is and the advantages it offers to the user.

Chapters 3 to 6 provide the guidelines for using Nubitek SMS Lite: software installation, assigning memory to the library, minimum requirements, equipment connections, and how to obtain the Nubitek Key.

Chapters 7 to 10 provide detailed explanations of how to use the 3 functions of Nubitek SMS Lite for sending and receiving SMS messages.

Chapter 11 contains the list of variables that the library produces in order to provide more information and control to the user.

Chapter 12 explains how to access the CPU via Teleservice and how to perform the appropriate port control.

### Notations used in this guide

This document uses differences in print to identify the type of text, as shown in the following table:

Print	Use and examples
<i>Italics</i>	Menu options Example: <i>File -&gt; Add or remove library</i>
<b>Bold</b>	Important notifications for the reader. Example: <b>Attention</b>
Monospaced	File names and directory paths. Example: nubitek_sms_manager_lite_v1.3.mwl
	Text referring to program code. Example: VB2000 "Alarm message."

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## 1. What is Nubitek SMS Lite?

### Description

Nubitek SMS Lite is a piece of control software that enables a Siemens PLC S7-200 device to be combined with a GSM modem for sending and receiving SMS messages, integrating such SMS communication into any control program in a simple, robust and secure manner.

Nubitek SMS Lite is a library that is ready to be added to the STEP7-MicroWIN programming environment. It consists of 3 functions and their use is extremely simple: for each message that you wish to send or receive, you simply need to add a segment to your control program.

### Fields of application

Nubitek SMS Lite offers numerous application possibilities:

- Receiving alarms or maintenance notifications to your mobile
- Consulting the status of a remote station
- Receiving production data
- Commanding an installation remotely
- Communicating by SMS between widely-distributed stations
- And much more: contact Nubitek Support online and we will study the technical feasibility of your idea

### Features

#### Total control of the GSM modem:

The application takes full control of everything related to the management of SMS messages: initialising and configuring the GSM modem, sending outgoing SMS messages, receiving and analysing incoming SMS messages, configuring and managing port communication, managing and recovering from incidents, etc.

#### Sending SMS messages:

Nubitek SMS Lite manages an unlimited number of outgoing SMS messages to multiple destination telephones. In order to send an SMS message, all you need to do is indicate the basic parameters: condition for activation, text of the message and destination telephone number(s).

The text of the SMS messages is freely defined in the Data Block and the simultaneous alarms are managed with no losses whatsoever.

#### Receiving SMS messages:

The recognition of incoming messages is performed by using keywords to identify the message, thus providing great flexibility.

Nubitek SMS Lite analyses the incoming SMS messages and provides notification if it receives a message that fulfils any of the defined parameters.

#### Teleservice:

Nubitek SMS Lite is compatible with Teleservice access, which can be activated locally or remotely by means of a SMS message.

## 2. Quick start and application examples

The quick start manual is available for download from the Nubitek website, providing rapid contact with the library from a mainly practical perspective.

The same page of the website also contains example projects that demonstrate and discuss in detail exactly how Nubitek SMS Lite can be applied:

- Tutorial example with all the basic SMS sending and receiving options, discussed and explained from an educational perspective.
- Examples of how to program the practical situations that are shown in the graphic animations on the Nubitek website.

If you would like to receive a programming example that addresses a specific requirement, do not hesitate to contact the Nubitek Support experts via the online support form or by calling to (34) 91 448 24 39.

### 3. Minimum requirements

#### CPU S7-200

Nubitek SMS Lite requires a latest generation (in other words, with reference xxx23, firmware 2.0) CPU 224 or above. The following is a list of valid CPUs:

- CPU 224 DC                      6ES7 214 1AD23 0XB0
- CPU 224 AC                     6ES7 214 1BD23 0XB0
- CPU 224XP DC                 6ES7 214 2AD23 0XB0
- CPU 224XP AC                 6ES7 214 2BD23 0XB0
- CPU 226 DC                     6ES7 216 2AD23 0XB0
- CPU 226 AC                     6ES7 216 2BD23 0XB0

#### PC/PPI Cable

The PC/PPI cable that has been taken into consideration for the development of this application is the Multimaestro PC/PPI cable with reference Siemens 6ES7 901 3CB30 0XA0. Therefore, this is the cable that Nubitek recommends for connecting the CPU port to the GSM modem. Previous versions of the cable or other PC/PPI adaptor models may be valid, however Nubitek can not guarantee correct communication functions.

#### STEP7 MicroWIN

In order to install and use Nubitek SMS Lite, **STEP7 MicroWIN 4.0 Service Pack 2**, or a later version, is required.

#### Program memory

The Nubitek SMS Lite library requires 4.9 Kbytes of the S7-200 program memory.

#### Variables memory

The Nubitek SMS Lite library reserves a total of 771 bytes of V memory in order to be able to perform the internal management of its operation variables. Users should not use this area in their control program.

## 4. Installing Nubitek SMS Lite

Nubitek SMS Lite is a library that manages the sending and receiving of SMS messages and is ready for integration into the STEP7-MicroWIN programming environment.

### What is a Library?

A library is a sub-program that performs a specific control function, in an independent and encapsulated manner. For that reason, whoever uses a library does not need to worry about the internal operations within the library.

Nubitek SMS Lite is an example of a library. Whoever uses it in their programs only needs to worry about the usage parameters, such as the destination mobile number or the text. The library itself handles the complicated task of managing the modem and sending the SMS message.

An important characteristic of a library is that it integrates itself into the development/programming environment as an additional system function, which enables the programmer to use it in any of his control programs, with significant time savings in terms of development and with increased reliability.

### How to Install the Library in STEP7-MicroWIN

In order to be able to use the Nubitek SMS Lite tool, the library must firstly be installed into the STEP7-MicroWIN programming environment.

1. Download the Nubitek SMS Lite library from the Nubitek website downloads page.
2. Open STEP7-MicroWIN
3. From the menu bar, click on *File -> Add or remove library...*

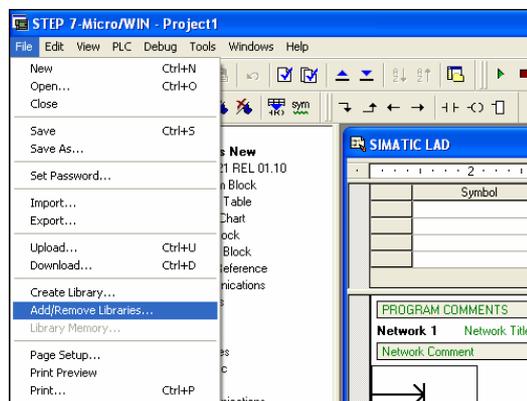


Figure 4.1: Add library

4. Click on *Add*, enter the directory where you downloaded Nubitek SMS Lite and select the `nubitek_sms_manager_lite_v1.3.mwl` file of the library. Once the library has been added, click on *Accept*.

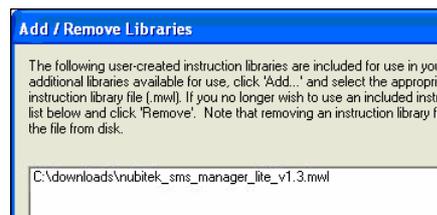


Figure 4.2: Select library

At this point, the Nubitek SMS Lite library should now be installed. This can be checked by accessing the Libraries icon on the operations tree: the library folder should be displayed together with the 3 functions it consists of.



Figure 4.3: library at the operations tree

The library has been installed: you can use these 3 SMS management functions as if they were MicroWIN functions.

## Assigning Memory to the Library

When you start to use the library functions on your project, and always before loading or compiling it, a memory range must be assigned to the library: its internal management requires 771 bytes of V memory, the location of which can be defined by the user.

1. Click on *File->Library memory*.

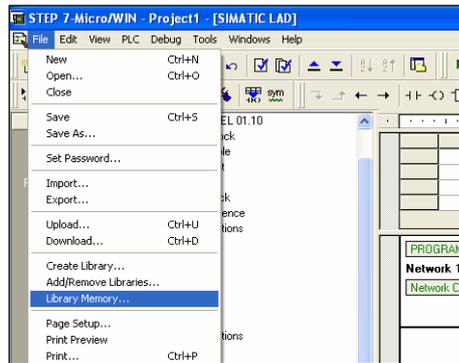


Figure 4.4: Library memory

2. Select the Nubitek SMS Lite tab from the window that opens (if you have no other libraries installed, it will be the only tab available).
3. Click *Suggest address* and MicroWIN will indicate a range of free memory.
4. If, for any reason, you would prefer to use a different range, all you need to do is click *Suggest address* again or directly type in the desired start location.

**Important:** user variables of the control program should never be included in this memory range used by the library.

5. Click *OK*

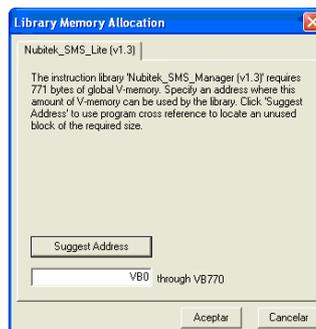


Figure 4.5: Library memory

## 5. Hardware: connections and configuration

### Required Equipment

The following hardware elements are required for installation:

- A SIMATIC S7-200 CPU (CPU224 firmware v2.0 or higher)
- A GSM modem, with antenna and power supply. There are two options available:
  - Siemens TC35i Dual-Band EGSM900 / GSM1800 MHz
  - Siemens TC65 Quad band: GSM 850/900/1800/1900 MHz
- A SIM card from any mobile telephone operator.
- A PC/PPI Multimaster cable (ref. 6ES7 901 3CB30 0XA0, of Siemens)
- A 9 pin, male-male Sub-D adapter.



**S7-200**



**GSM TC35 MODEM**



**9 pin Sub-D Adapter**



**PC/PPI**

Figure 5.1: Equipment required for SMS communication

### Configuration of the PC/PPI cable

The Multimaestro cable has 8 micro-switches on the side of the casing that enables its mode of operation to be configured.

In order for Nubitek SMS Lite to be able to communicate correctly with the GSM modem, the PC/PPI cable must be configured in 9600 bauds mode, 10 bits, PPI/Freeport and remote connection: 01000110.

Micro-switch	1	2	3	4	5	6	7	8
Position	0	1	0	0	0	1	1	0

If a previous generation of PC/PPI cable is to be used, with only 6 micro-switches, the configuration is 000110. Nubitek does not guarantee the operation of all the Nubitek SMS Lite characteristics if this type of cable is used, particularly the Teleservice functions.

**NOTE:** Each time the configuration of the micro-switches is changed, the power should be disconnected from the PC/PPI cable in order for the new configuration to take effect. To do so, the cable must be disconnected from the CPU S7-200 port. Once the lights on the side have turned off, it can be connected again.

## Connecting the Equipment

The following steps should be followed for connecting the equipment:

1. Insert the SIM card into the GSM modem. The slot to be used for this is labelled on the modem as SIM and has a small yellow button to one side. Pressing this button with a pointed object will cause the tray for placing the SIM card to eject. It is important to ensure that this tray is re-inserted correctly.
2. Insert the 9 pin male male adapter into the female serial port of the GSM modem.
3. Connect the antenna and the power source to the modem (to the RJ11 socket).
4. Configure the PC/PPI cable as indicated in the previous section.
5. Connect the end of the PC/PPI cable (female) to the modem using the 9 pin male male adapter. The PPI (male) end must be connected to port 0 of the PLC S7-200.

**Warning:** the application will not function correctly if the PC/PPI cable is connected to port 1 of the CPU.

6. Connect the power to both pieces of equipment. On some TC65 versions, the On/Off button needs to be pressed for one second.



Figure 5.2: Connecting the equipment

## The GSM modem

The level of coverage during installation can be quickly checked by using a normal mobile telephone. Place the mobile at the location where the antenna is situated and observe the coverage indicator on the display.

### Port speed

It is usual for the modem to be factory packed with the port configured to 9600 bauds (TC35i) or to 115200 bauds (TC65). If this is the case, Nubitek SMS Lite will have no problem connecting to the modem. The user will only need to connect it to the PC/PPI cable.

If the port is not configured to one of these speeds, Nubitek SMS Lite will be unable to connect to the modem. If this happens, you can try to change the port speed manually: connect the modem to a serial port of a PC and open the HyperTerminal, establish communication via the COM port at the corresponding

speed, and 8 data bits, no parity, 1 stop bit and no flow control. In order to verify that a connection has been established, type `AT (+ Enter)`. You should receive an OK response. The command `'AT+IPR=9600'` sets the modem speed to a level that will enable Nubitek SMS Lite to communicate.

### TC35i modem

The TC35i modem will switch on automatically when it receives power. The SIM card should be inserted or removed when the power is disconnected.

The modem indicator light has three different statuses:

- Off: the modem is not receiving power or has received an instruction to switch off.
- Regular flashing (1 second on and 1 second off): the modem is switched on and active but has not yet established a link to the mobile telephony operator (equivalent to having a mobile telephone switched on but with no PIN entered).
- Rapid flash every 2 seconds: a link has been established with the mobile telephony operator, this happens just after entering the PIN on the SIM card. This is the mode in which the modem should operate and should be achieved a few seconds after activating the installation. If this does not happen, check the error code by referring to the chapter regarding the user variables area.

### TC65 modem

Version 2.0 of the TC65 behaves in exactly the same way as the TC35i.

Version 1.4 of the TC65, also compatible with Nubitek SMS Lite, behaves slightly differently. The indicator light is used to display the communication status, meaning that it flashes when an SMS message is being sent or received. In addition, the modem does not switch on automatically: once the power source and the ports have been connected, the On/Off button must be pressed for approximately one second.

## 6. Test mode and Nubitek key

The Nubitek SMS Lite library:

- can be **downloaded and distributed for free** and can be freely installed into STEP7-MicroWIN
- requires a key to run successfully in S7-200
- can be run in test mode in order to try it out for free

### Nubitek Key

This key will enable Nubitek SMS Lite to function during an unlimited period of time. Without a correct password the program shuts down the modem and freezes.

The key must be entered in the PLC program itself as parameter `Nubitek_KEY` of the `SMS_Manager` function.

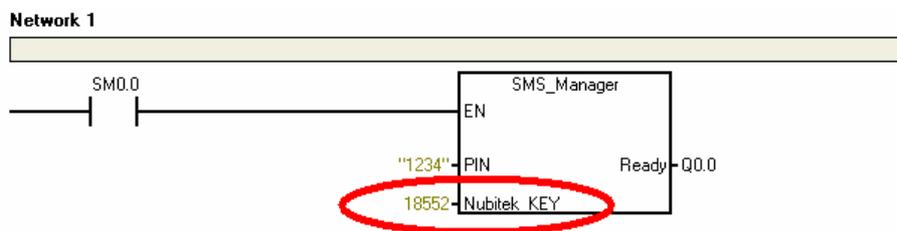


Figure 6.1: Nubitek key in the control program

**IMPORTANT:** the Nubitek key is associated to the GSM modem used during installation, in other words:

- In order to obtain a key, the IMEI of the GSM modem that is going to be used must be declared.
- The key enables Nubitek SMS Lite to function solely and exclusively with that modem and no other.

### ¿What is the IMEI?

The IMEI is a unique identification code that each GSM hardware device has (modems, mobiles, etc.).

It is a 15 digit number that indicates the manufacturer, country and serial number: it is unique in each modem.

On Siemens modems, the IMEI is indicated on the label on the back, beneath the bar code.



Figure 6.2: Back of the TC35i modem and location of the IMEI

## Test mode

The test mode is configured by indicated a value of zero in the field where the Nubitek key is located, in other words, creating the parameter `Nubitek_Key = 0`.

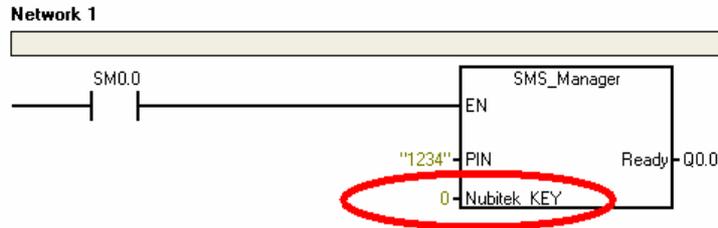


Figure 6.3: Test mode

The test mode enables full use of Nubitek SMS Lite and enables as many tests or client demos as may be necessary.

There is only one limitation: during test mode, SMS management freezes approximately every 5 hours and the modem switches off. In order to continue the tests, all you need to do is switch on the modem again and restart the CPU.

If you would like to know when a test period is going to come to an end, the field `Minutes_LEFT` in the user variables area displays the number of minutes remaining until the end of the current test period.

## How to obtain a Nubitek Key

In order to obtain a key, it is essential to indicate the IMEI number of the GSM modem you are going to use. The application will only operate if the S7-200 is combined with the GSM modem declared.

Nubitek key can be obtained:

- Through an automation equipment distributor, indicating the IMEI of the modem with which it is going to operate.
- Directly from the Nubitek website, [www.nubitek.com](http://www.nubitek.com), by purchasing a Nubitek SMS Lite licence online and obtaining the final usage key. The FAQ section of the website contains further information about the purchase process and the management of licences and keys.
- Calling Nubitek at (34) 91 448 24 39 and asking for a Nubitek\_Key for your system.

## 7. Program functions: introduction and example

Nubitek SMS Lite consists of 3 functions that are simple to use and easily integrated into any control program.

### Description

- **SMS\_Manager** performs all the general management procedures of the application, as well as port control and modem initialisation. It must be called once during all program cycles, at the start.
- **Send\_SMS** is used once for each of the SMS messages that need to be sent. It is called with the activation or sending condition and it requires the text and the destination mobile number. There is no limit to the number of different SMS messages that can be sent.
- **Receive\_SMS** is used to define the keywords that the control program must recognise within the incoming SMS messages. The function analyses the received SMS messages and activates an output bit when they are found. There is no limit to the number of different messages that can be recognised.

### A simple example

In this simple example, the 3 functions are called from the main program block.

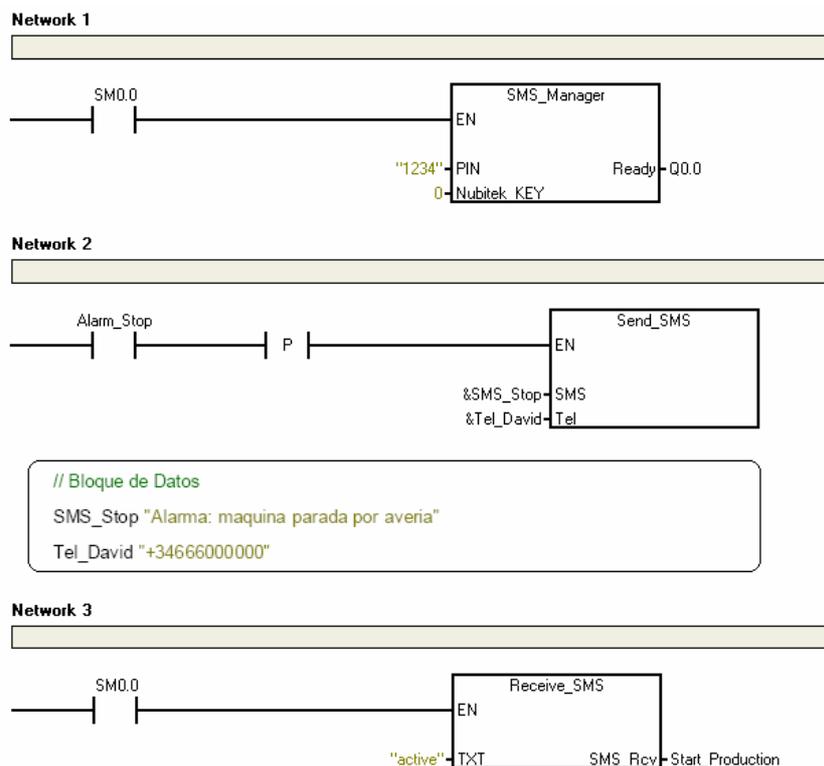


Figure 7.1: Simple example of Nubitek SMS Lite in use

- **Segment 1:** **SMS\_Manager** configures the modem and performs the full control of the SMS application. It only requires the PIN of the SIM card. In test mode `Nubitek key = 0`. When it is ready it sets the output `Q0.0`.
- **Segment 2:** **Send\_SMS**, when the rising edge of `Alarm_Stop` happens, sends an alarm SMS message to David's mobile. Both message text and phone number are defined in the Data Block.
- **Segment 3:** **Receive\_SMS** defines the keywords for the activation of the process. When the SMS message with the word "active" is received the `Start_Production` bit is activated.

## 8. SMS Manager: the main function

This is the main control and management block of the application and is essential for it to operate.

It needs to be called just once and executed in all program cycles, before any other library function. The best option is to make the call with the SM0.0 contact at the start of the OB1 Main Block.

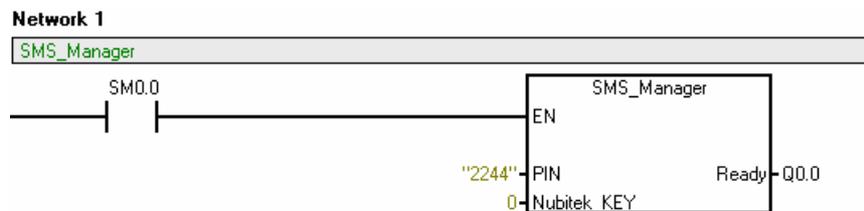


Figure 8.1: SMS\_Manager in use

### SMS\_Manager parameters

#### **PIN: (STRING)**

PIN code of the SIM card within the modem.

It is written directly as a string of 4 characters at the function call. For example, "2244".

If a SIM card is used with the PIN code deactivated, the string is entered as empty "".

#### **Nubitek\_KEY (INT)**

Numeric key that is supplied by Nubitek so that the library can be executed indefinitely.

In order to operate in trial mode, enter a value of 0.

It is written as an integer variable (no quotation marks).

#### **Ready (Bool)**

Output bit that indicates that the application is OK and ready to send and receive SMS messages.

During the initialisation phase and under normal conditions, it takes about 30 seconds to be set to 1.

It may be useful to apply it to any S7-200's output in order to be able to easily note whether the application and the modem are operating correctly.

## 9. Sending SMS messages

The Send\_SMS function sends an SMS message to a destination mobile telephone. It is used once for each different SMS message that you wish to send.

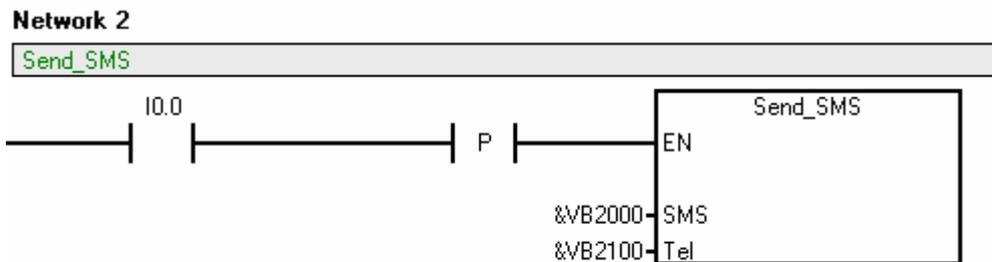


Figure 9.1: Send\_SMS function

### Send\_SMS parameters

#### SMS (Pointer to String)

Text of the SMS message that has been defined in the Data Block as a String variable. The start point of the text is indicated in pointer mode using the "&" pointer notation.

For example, to send the SMS message defined as VB2000 "ALARM: machine stopped due to motor failure", &VB2000 is indicated.

It is advised to make use of symbolic notation in order to facilitate the compression and maintenance of the program.

#### Tel (Pointer to String)

Destination telephone number for the SMS message that has been defined in the Data Block as a String variable. The start point is indicated in pointer mode using the "&" pointer notation.

For example, for the telephone defined as VB2100 "+34600123456", &V2100 is indicated.

It is advised to make use of symbolic notation in order to facilitate the compression and maintenance of the program.

### Definition of the texts and destination telephone numbers

Both the SMS text and the destination telephone numbers are comfortably defined in the Data Block as String variables. **Important:** double quotation marks must be used.

For example:

- VB2000 "ALARM: machine stopped due to motor failure"
- VB2100 "+34600123456"

Nubitek SMS Lite has no limitation on the number of SMS messages and destination telephone numbers. It admits as many SMS messages and different telephone numbers as can be stored by the Data Block.

The text of the SMS messages are defined in a flexible manner:

- They can be as long as is necessary, provided that they do not exceed 160 characters.
- Any text is admitted, however certain regional or uncommon characters may not be accepted by the modem or GSM operator. It is recommended to check that such characters are sent correctly.
- Nubitek SMS Lite enables numeric variables to be inserted into the text easily and automatically. How to do this is explained further in the relevant section of this chapter.

The destination telephone numbers:

- Must be defined using the '+' symbol and the country code. For example, in the case of Spain (prefix 34), telephone number 600123456 must be indicated as +34600123456.
- Telephone numbers from different countries can be used together in the same project provided that they are indicated with their corresponding prefixes.
- **Important:** The country prefix should not be included for certain countries and operators. If the texts produce a failure when sending the SMS (error code 32), it is advised to try changing the definition of the telephone number.

```
// SMS texts
VB3000 "ALARM: machine stopped due to motor failure"
VB4000 "Day production: &I items"
VB5000 "Oil LOW LEVEL"

// Telephone numbers
VB3100 "+34600123456"
VB3200 "+34600654321"
VB3300 "+49880200100"
```

Figure 9.2: Definition of the texts and telephone numbers in the Data Block

## Send condition

The Send\_SMS function must be called when the SMS send condition is fulfilled.

**Important:** Send\_SMS need be executed only once, in other words, one single program cycle. In order to avoid the SMS message being sent repeatedly, it is advised to indicate the activation condition followed by a rising edge.

**Note:** the Send\_SMS function ignored the send instructions when the Ready bit is not active.

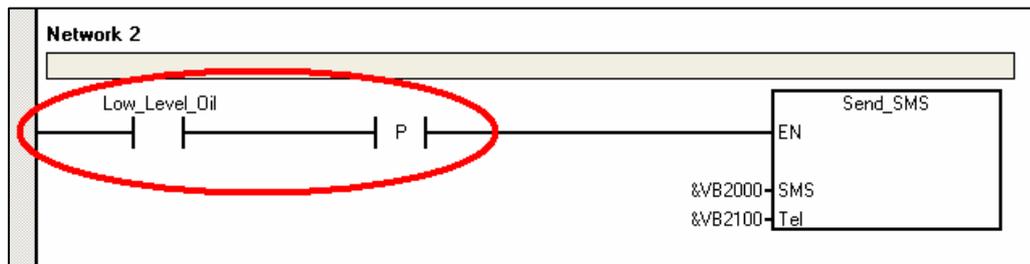


Figure 9.3: The call to Send\_SMS must be made using an edge

## The benefits of using symbols

The use of symbols to name program variables is always beneficial in any application. For an SMS management program, it can spectacularly improve the legibility and maintenance of the program.

Every message, every telephone number and every activation condition can have its own symbolic name.

Compare the example in Figure 9.1 with the example in Figure 9.4. Of the two ways to send a maintenance alarm when an alarm is activated due to excess oven temperature, the second is obviously the clearer of the two.

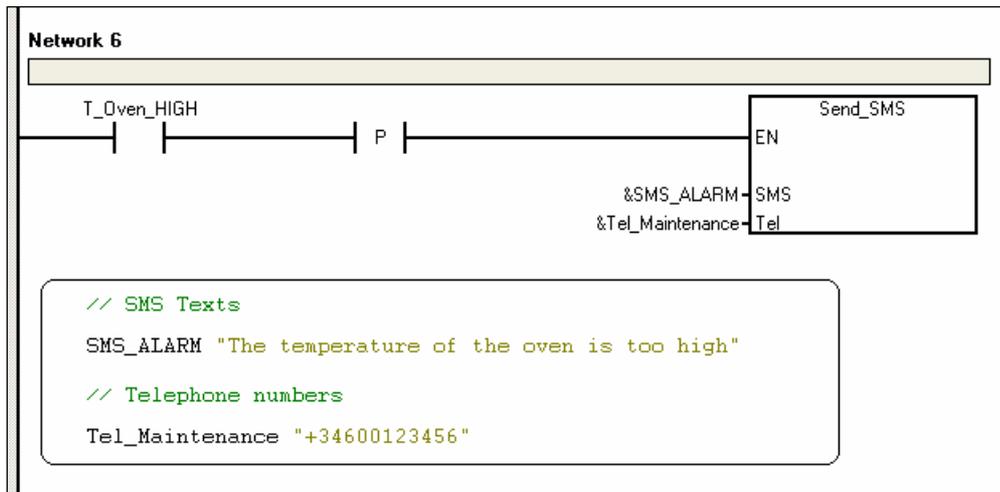


Figure 9.4: Sending an SMS message using symbolic notation

## How to apply symbolic notation

It is advised to name the message and the destination telephone numbers directly from the Data Block. Right click on the line in which they are defined and select "Define symbol...".

The names of the activation conditions are assigned in the normal way, whether in the program or from the symbols table.

For example, in the Data Block:

- SMS\_ALARM "The temperature of the oven is too high"
- Tel\_Maintenance "+34600123456"

And in the Send\_SMS function:

- SMS → &SMS\_Alarm
- Tel → &Tel\_Maintenance

## 10. Receiving SMS messages

The Receive\_SMS function recognises an incoming SMS depending on one keywords.

Receive\_SMS must be used once for each type of different message that you wish to recognise. There is no limit to the number of times it can be used.

The function must be called during all cycles, using the contact SM0.0.

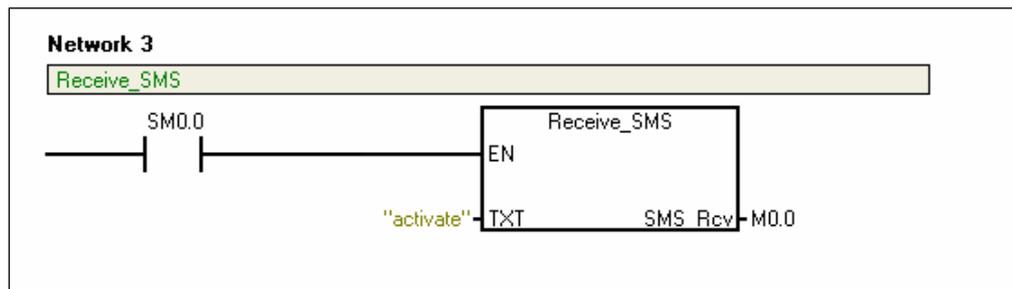


Figure 10.1: Recognition of incoming SMS message

### Receive\_SMS parameters

#### TXT: (String)

Keyword to be recognised in the incoming message.

It is entered directly as string at the entrance (for example, "activate").

#### SMS\_Rcv: (Bool)

Output bit that is activated when an SMS message is received containing the keyword.

**Important:** SMS\_Rcv is only activated during one single program cycle. It subsequently returns to 0.

### Other characteristics

If an SMS message fits two different keywords, the SMS\_Rcv exit will only be activated for the Receive\_SMS function that is first in the program.

Receive\_SMS recognises SMS messages in a flexible manner, freeing the user from having to remember strict formats.

- It is possible for there to be more text in addition to the keyword.
- It locates the keyword in any position in the SMS.

In the example shown in Figure 10.1, the keyword "activate" is defined. Any of the following messages will be recognised:

- "activate"
- "It must activate the irrigation system."

**Important:** Receive\_SMS does differentiate between upper and lower case letters. So an SMS message with the word "Activate", with an upper case first letter, won't be recognised.

## 11. User variables area

The user variables area holds a set of variables that the Nubitek SMS Lite application uses to provide information to the user, or to receive instructions for a specific purpose. It can be compared to the SM area for special marks of the S7-200.

The area is stored in the V memory, at the start of the area reserved for the library. The exact position of each variable can be consulted on the table of symbols, on the tab with the name of the library (once memory has been assigned to the library).

These variables can be integrated into the control program for advanced use. However, although they appear in the table of symbols with a symbolic name, they can only be used in the application with an absolute address (this is a rule of Step7-MicroWIN, due to the fact that they are internal variables of a library).

			Símbolo	Dirección	Comentario
1			SMS_Ready	V0.0	System Ready to send and receive SMSs
2			PPI_Mode	V0.1	Port 0 of the CPU in PPI mode
3			PPI_Request	V0.2	Request to set the port 0 to PPI mode
4			END_Teleservice	V0.3	Request to set the port 0 back to normal mode
5			FULL_Licence	V0.5	FULL Nubitek Key used
6			TEST_mode	V0.6	TEST mode
7			ERROR	V0.7	Error or event occurred, see Last_ERROR field
8			Last_ERROR	Vw2	Code of the last error or event detected
9			Minutes_LEFT	Vw4	Using TEST mode, operating minutes remaining
 USUARIO1 \ Símbolos UOP \ Nubitek_SMS_Lite (v1.3) /					

Figure 11.1: User variables area that can be found in the table of symbols

### Map of the user variables area

Assuming that the area assigned to the library starts with VBn, it is:

#### SMS\_Ready (Read, Bool, VBn + 0.0)

Indicates that the application is ready to send and receive SMS messages. During the initialisation stage, under normal conditions, it takes about 30 seconds to be set to 1. It is equivalent to the SMS\_Ready output of the main function.

#### PPI\_Mode (Read, Bool, VBn + 0.1)

Indicates that port 0 of the CPU of the S7-200 is in PPI mode.

In this mode, a connection can be made from Step7-MicroWIN, whether via Teleservice or directly, by disconnecting the modem and connecting the programmer to the port.

In this mode, SMS management is temporarily disabled.

#### PPI\_Request (Write, Bool, VBn + 0.2)

Bit for requesting the application to change port 0 to PPI mode.

**Important:** No direct changes should be made to the SMB30 control field of port 0. By activating this bit, the application makes the change in a controlled manner.

Connection can be made to a system input in order to facilitate access for the programmer without needing to put the CPU in STOP.

It is only necessary to activate the bit for one cycle. The application will set it to 0 again when the change to PPI mode has been made.

### END\_Teleservice (Write, Bool, VBn + 0.3)

Bit for requesting a return to normal operation mode from PPI mode. This is used to indicate to the application that the maintenance tasks have been completed and that it can make use of the port and the modem again.

By entering a value of 1 in this variable, a period of 90 seconds begins during which the bit will be intermittent. Upon completion, the change to normal mode occurs.

### FULL\_Licence (Read, Bool, VBn + 0.5)

Indicates that a Nubitek key is being used and that the application will function permanently.

### TEST\_mode (Read, Bool, VBn + 0.6)

Indicates that the application is functioning in test mode and it will freeze approximately every 5 hours.

The number of minutes remaining until the next freeze can be consulted in the variable `Minutes_LEFT`.

### ERROR (Read, Bool, VBn + 0.7)

Indicates that an error or event has occurred. This bit is set to 1 for only one program cycle.

The code representing the type of error or event that has occurred is stored in the field `Last_ERROR`.

### Last\_ERROR (Read, INT, VBn + 2.0)

Code representing the last error or event that has occurred, which remains the same until a new error or event occurs.

The meaning of each error code can be consulted in the following section of this chapter.

### Minutes\_LEFT (Read, INT, VBn + 4.0)

This is related to the test mode. In normal mode, this is set to 0.

It is a decreasing counter that indicates the number of minutes remaining until the next time the application will freeze.

## Error / Event codes

Nubitek SMS Lite provides a series of codes to help the programmer during the development stage and during maintenance. The field `Last_ERROR` in the user variables area stores the code representing the last error or event that occurred.

This field is updated every time the `ERROR` bit of the user variables area is activated and can be consulted from the control program itself in order for action to be taken.

The following is a list of the codes:

Error / Event code	Description
11	The modem is not responding to the command sent by the PLC: possible disconnection of the PC/PPI cable or loss of power supply to the modem.
12	Unknown error: the response from the modem is not recognised by the PLC.
13	The modem is indicating an ERROR: possible parameterisation fault.
14	The PIN for the SIM card is incorrect.
23	Test mode: the modem has been disconnected. Restart the CPU and the modem for an additional 5 hours of operation.
24	Incorrect Nubitek key: modem switched off.
31	An SMS message has been received that does not correspond to any defined model.
32	It has not been possible to send the SMS correctly: reason unknown.
33	The SMS exit buffer is full (up to 7 SMS allowed in the queue). The last SMS message has not been sent.

## 12. Teleservice and management of port 0

Nubitek SMS Lite uses port 0 of the S7-200 CPU for connecting to the GSM modem. The application handles all port configurations and also uploads the parameters to the modem for Teleservice support from a remote PC.

**Important:** port 0 must be exclusively reserved for communication with the GSM modem, you should never try to create a network with additional elements.

**Important:** the programmer should never try to control the port in any way that is external to the application. This may cause conflicts and cause SMS management not to operate.

### How to access the CPU from STEP7-MicroWIN

The normal operation of the port under Nubitek SMS Lite control is in freeport mode. This is necessary to control the GSM modem and the SMS application. This mode is incompatible with Step7-MicroWIN access via the port, whether directly or via Teleservice.

In order to access the CPU from Step7-MicroWIN via port 0, it is necessary for the port to be configured in PPI mode.

There are 4 ways to access the CPU:

- Use a CPU with two ports and connect via port 1 in PPI mode.
- Put the CPU in STOP: this automatically sets the ports to PPI mode.
- Locally request Nubitek SMS Lite to temporarily suspend SMS management and set the port to PPI mode in a controlled manner. This enables the modem cable to be disconnected from the port and provides access with the programmer. For more details, refer to the relevant section of this chapter.
- Request the application, remotely by using an SMS, to configure itself to enable Teleservice access via the GSM modem. For more details, refer to the relevant section of this chapter.

### Remote access using Teleservice

The Step7-MicroWIN modems wizard is used to configure the remote and local modems.

- Configure the local modem in the normal way.
- **It is not necessary to configure the remote modem**, the application does it all automatically.

The following steps should be followed for undertaking remote Teleservice access:

1. Send an SMS message to the telephone number of the remote station with the word 'teleservice'. This will make the station permit Teleservice access.
2. Wait a reasonable amount of time, 1 minute for example, and proceed with the Teleservice access from Step7-MicroWIN as you would do normally.
3. Once you send the SMS message, you have a period of 2 hours access. When this period ends, the station will automatically return to SMS management mode. If you are going to need more time, consult Nubitek Support.
4. When you have finished the maintenance tasks, you can hang up the call and leave the station to return to normal operation mode itself when the two hour time period comes to an end.

If you do not want the station to wait the normal period of 2 hours but to return to operation mode as soon as possible:

- Stay online when you have finished the maintenance task.
- Open the table of symbols associated to the library.
- Find the position assigned to the `END_Teleservice` bit in the user variables area.
- Open the status table and put it online.
- Display the value of the `END_Teleservice` bit, which will be set to FALSE (MicroWIN forces absolute addressing for this variable because it belongs to a library).
- Enter the value TRUE for the `END_Teleservice` bit. Do not force it, just enter it for one cycle. You will see that it becomes intermittent.
- You have 90 seconds to disconnect, after which the station will return to SMS management mode.

## Local access via port 0

The user variables area provides the programmer with the `PPI_Request` bit so that Nubitek SMS Lite can change the port to PPI in a controlled manner.

The programmer can activate the `PPI_Request` bit using a button or operator panel. This should only be done during one program cycle. The bit will remain active until the mode change is complete: subsequently, `PPI_Request` will be set to 0 and `PPI_Mode` will be set to 1.

Once `PPI_Mode` is set to 1, you have 2 hours of free PPI access via port 0, after which it will automatically return to SMS management mode. During this time, the SMS application will be suspended. If you need more time, consult Nubitek Support.

In order to return to SMS management mode before the period of 2 hours comes to an end, you must act on the `END_Teleservice` bit during one program cycle. The `END_Teleservice` bit will become intermittent for 90 seconds, after which the port will be changed, `END_Teleservice` will cease to be intermittent, `PPI_Mode` will be deactivated and, a few seconds later, `SMS_Ready` will be activated again.

## 13. Internet service and support

### Nubitek Support

Nubitek's technical support service is comprised of extremely highly-qualified experts. We can help you during any stage of your IT Automation project in order for it to be completed successfully:

- **Initial stage:** tell us your idea: we will study it and tell you how you can use our communications libraries to cover your needs.
- **Development stage:** any question related to the use of Nubitek Solutions' libraries or what to do in order to obtain the expected result will be resolved by our experts.
- **Activation:** it is also essential to receive good support services during this stage. We will answer your questions as soon as possible.

Nubitek's website provides code examples, technical manuals and contact forms to help your development projects. If you would prefer a customised project, Nubitek Projects can develop one for you.

If you would like to receive technical support by phone, please call Nubitek at (34) 91 448 24 39.

nubitek  
SUPPORT

### FAQ

Nubitek's website also contains the answers to numerous questions related to our products, licence management or simply knowing what to do when a fault occurs with a modem for which you have already obtained a password.

Answers to these questions and more can be found in the More Technical Information section of each product and also on the FAQ page of our website.