

## Management of SMS Messages with GSM Modem and C # Language in WPF

### Gestión de Mensajes SMS con Modem GSM y Lenguaje C# en WPF

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#### Abstract

In this project a system with graphical interface in Windows Presentation Foundation was proposed and realized, which was written in C # programming language, in which the sending of text messages using the available GSM (Global System Mobile) networks is allowed, with GSM modems of different compatible brands that connect to these GSM networks, in order to carry out the process of sending text messages, without keeping record of it in the sending team, with a process in the simplest way possible, that allows to have a greater agility to increase the productivity, all this from a Windows environment in which the text message must be entered and the telephone number to which the message will be sent and the result of this operation will be shown on the screen, in addition to allow the system to be portable, since it does not save configuration information.

**Messages, GSM, Networks**

#### Resumen

En este proyecto se planteó y se realizó un sistema con interfaz gráfica en Windows Presentation Foundation el cual se escribió en lenguaje de programación C #, en el que se permite el envío de mensajes de texto usando las redes GSM (Global System Mobile) disponibles, con modems GSM de distintas marcas compatibles que se conecten a estas redes GSM, para realizar de esta manera el proceso de envío de mensajes de texto, sin guardar registro de ello en el equipo de envío, con un proceso de la manera más sencilla posible, que permita tener una mayor agilidad para aumentar la productividad, todo ello desde un entorno Windows en el cual se debe ingresar el mensaje de texto y el número telefónico al cual se enviara el mensaje y se mostrara el resultado de esta operación en pantalla, además de permitir que el sistema que sea portable, ya que no guarda información de configuración.

**Mensajes, GSM, Redes**

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## Introduction

Currently there are systems for sending SMS messages (nd) through GSM networks from desktop devices, which are paid, are easy to find on the Web, but the vast majority charge for the amount of messages sent and / or a monthly or annual subscription. Taking as reference the above, we decided to develop an open system that used the existing GSM networks through a modem compatible with them, which allows messages to be sent using AT commands, so that the costs would be only those that the network operator applies. for each message sent and the cost of the hardware used for this purpose, which would facilitate the client to have a more precise control of the messages sent without incurring extra costs.

In the development of this project we used Visual Studio 2017 (2017 Microsoft Corporation) with the .Net Framework 4.7, C # language (2017, April 17) 5.0 and Windows Presentation Foundation (2018, February 25) for the development of the interface in environments Windows (version 7 or higher), which can be downloaded at no cost on the official website.

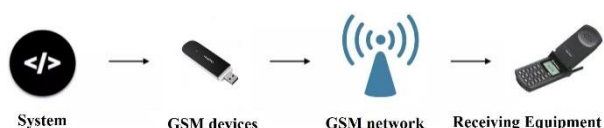


Figure 1 Message sending process

## Development of the program with user interface for sending messages

Once the user interface with Windows Presentation Foundation has been designed and written in C # language, it is made in a single form in two tabs, the first one manages the connection to the GSM modem and the second one sends the message.

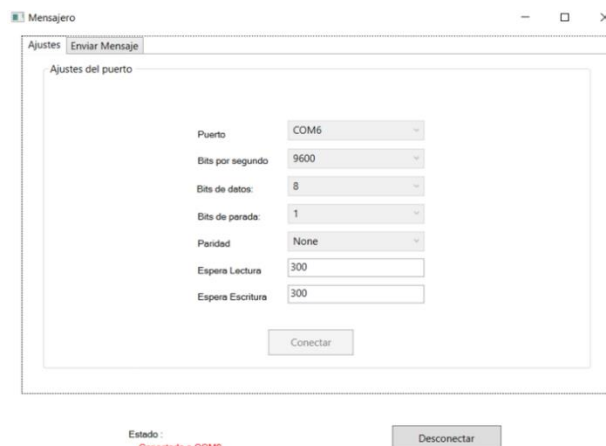


Figure 2 Settings Tab

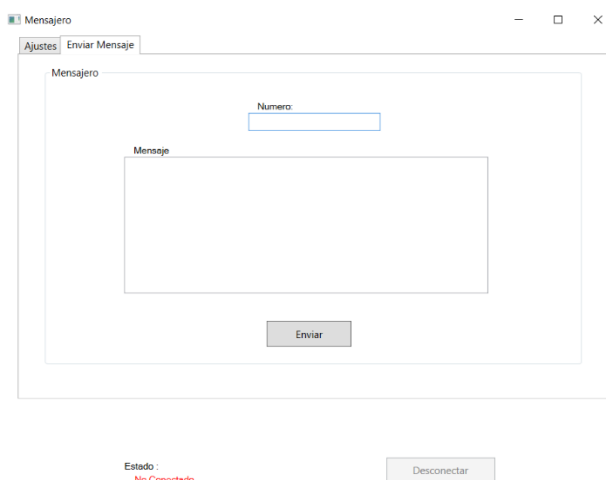


Figure 3 Message sending tab

In the first tab called "Settings" (Figure 1), the user can enter the necessary data for the connection to the GSM modem, such as the COM port to which the GSM modem is connected, bits per second to be handled, data bits, bit stop, parity, and wait in the reading and writing in addition to the connect button that will make the connection to the GSM modem and enable the "Send message" tab when activated.

In the second tab "Send message" (Figure 2), it shows the "Number" fields where the user enters the 10-digit telephone number, which will be the recipient of the message sent by the system, the second field shown called "Message" is where you write the text that will be the body of the message to send to the number entered in the previous field, finally you will find the "Send" button, which when activated prepares the AT commands (2007, March 28) necessary to be interpreted by the GSM modem and this proceeds to send the text message.

All the above (design and code) are written in a single form, which has in the lower part a label that shows the GSM port to which it is connected and the right of it the "Disconnect" button for safe release of the modem and lastly in the lower left are the states of the execution of the AT commands of the GSM modem (2015, June 25) as the sending of messages (Appendix A).

Integration



Figure 4 GSM modem used



Figure 5 Modem and System in test equipment

By having the system programmed, the integration with a compatible GSM modem (Figure 5) is carried out in a laptop computer running the Windows 10 operating system.

Components used:

- GUI designed with WPF and written in C #
- Huawei GSM modem model H353
- GSM chip Weex brand
- Dell laptop model Inspiron 15 5567

Tests

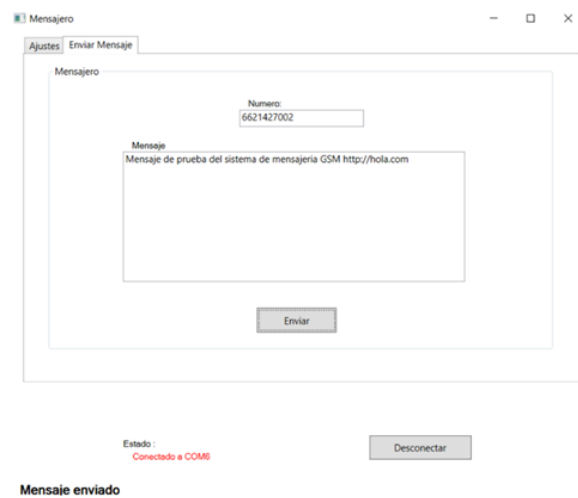


Figure 6 Test message sent



Figure 7 Test message received

By having all the integrated components send a text message with the content "Messaging system test message http://hola.com", and which was received on the client device successfully.

## Conclusions

With the development of this solution it was possible to verify the feasibility of creating a system using the C # programming language and Windows Presentation Foundation for the user interface, implementing the AT commands of the GSM mobile network system together with the use of modems compatible with these, the ability to manage it sent SMS messages without the use of third-party payment software or to make payments to a subscription service for sending bulk messaging to telephone companies, with which the only costs would be the acquisition of the modem GSM, cost of the SIM chip for access to the network and the cost of sending each message consumed to the telephone company.

Microsoft (2017, Abril 17) C# programming guide, Recuperado de <https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/index>

Blackside (2007, Marzo 28) COMANDOS AT GSM, Recuperado de <https://blackinside.wordpress.com/2007/03/28/comandos-at-gsm/>

## Appendix A System status messages

Error	Explanation
The port is closed	The Connect button was not clicked after selecting a port in the Settings tab
No COM ports found	There is no compatible device connected to your computer
Invalid port settings	The configuration for the port is incorrect
The COM port is already being used	Another application is using that port
There was no answer	Device problem, if the device persists it is not able to send messages
Incomplete received response	Failure to communicate the device, if it persists reboot the system and the device
No data was received from the device	Failure to communicate the device, if it persists reboot the system and the device
GSM device not connected	The device connected to that port is not GSM
Failed to set the message format	The GSM device does not support sending messages

## References

Microsoft (2018, Febrero 25) Getting Started (WPF), Recuperado de <https://docs.microsoft.com/en-us/dotnet/framework/wpf/getting-started/>

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