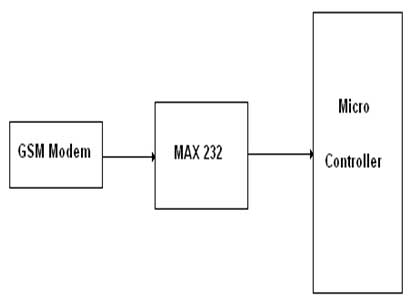
[**GSM**](https://www.pantechsolutions.net/wireless-boards/sim900a-gsm-modem)

Global System for Mobile Communication

[GSM](https://www.pantechsolutions.net/wireless-boards/sim900a-gsm-modem) is a digital mobile telephony system [GSM](https://www.pantechsolutions.net/wireless-boards/sim900a-gsm-modem) digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1800 MHz frequency band.

Interfacing [GSM](https://www.pantechsolutions.net/wireless-boards/sim900a-gsm-modem) Fig.1 shows how to interface the [GSM](https://www.pantechsolutions.net/wireless-boards/sim900a-gsm-modem) with microcontroller. The [GSM](https://www.pantechsolutions.net/wireless-boards/sim900a-gsm-modem) is communicate the microcontroller with mobile phones through **UART**. To communicate over **UART** or **USART**, we just need three basic signals which are namely, RXD (receive), TXD (transmit), GND (common ground).

Fig. 1- **Interfacing UART to Microcontroller**



[**GSM**](https://www.pantechsolutions.net/wireless-boards/sim900a-gsm-modem)**modem interfacing with microcontroller** for SMS control of industrial equipment. The sending SMS through [GSM](https://www.pantechsolutions.net/wireless-boards/sim900a-gsm-modem) modem when interfaced with **microcontroller** or PC is much simpler as compared with sending SMS through **UART**.

For Connection to GSM module you should use **“AT Commands”** that we will discuss about it here:

At first some general rules about AT Commands:

* Every AT command needs to be terminated by \r\n (CR + LF) combination.
* Our Connection must be with UART or console command line of PC’s.
* If we use the UART connection it is notable that don’t forget to use the “\r\n” at the end of the commands.
* please note, send the commands in uppercase only.

## **Get Start to Connect to Webserver via GPRS by GSM Sim900**

## Now comes the interesting part. Given below is a list of AT commands that you must fire in the exact given sequence to connect to a webserver using TCP over GPRS. The symbol => indicates the command you need to enter, <= indicates the response received from the SIM900. Text within /\*\* \*\*/ are my comments for further explanation. The response may contain additional information than what is shown here. I have listed down only the important part of the response that you need to be aware of.

Here is the sequence:

/\*\* First test if everything is okay \*\*/

=> AT

<= AT

/\*\* This should come back. SIM900 default is to echo back commands you enter \*\*/

<= OK

/\*\* This string should tell you all is well\*\*/

=>AT+CPIN?

/\*\*This is to check if SIM is unlocked. This sample assumes unlocked SIMs\*\*/

<= +CPIN: READY

/\*\* If your response contains this, then it means SIM is unlocked and ready\*\*/

=>AT+CREG?

/\*\*This checks if SIM is registered or not\*\*/

<=+CREG: 0,1

/\*\*This string in the response indicates SIM is registered\*\*/

=>AT+CGATT?

/\*\*Check if GPRS is attached or not\*\*/

<=+CGATT: 1

/\*\*A response containing this string indicates GPRS is attached\*\*/

=>AT+CIPSHUT

/\*\*Reset the IP session if any\*\*/

<=SHUT OK

/\*\*This string in the response represents all IP sessions shutdown. \*\*/

=>AT+CIPSTATUS

/\*\*Check if the IP stack is initialized\*\*/

<=STATE: IP INITIAL

/\*\*This string in the response indicates IP stack is initialized\*\*/

=>AT+CIPMUX=0

/\*\*To keep things simple, I’m setting up a single connection mode\*\*/

<=OK

/\*\*This string indicates single connection mode set successfully at SIM 900\*\*/

=>AT+CSTT= “APN”, “UNAME”, “PWD” /\*\*Start the task, based on the SIM card you are using, you need to know the APN, username and password for your service provider\*\*/

<= OK

/\*\*This response indicates task started successfully\*\*/

=> AT+CIICR

/\*\*Now bring up the wireless. Please note, the response to this might take some time\*\*/

<=OK

/\*\*This text in response string indicates wireless is up\*\*/

=>AT+CIFSR

/\*\*Get the local IP address. Some people say that this step is not required, but if I do not issue this, it was not working for my case. So I made this mandatory, no harm.\*\*/

<= xxx.xxx.xxx.xxx /\*\*If previous command is successful, you should see an IP address in the response\*\*/

=>AT+CIPSTART= “TCP” , “www.google.com”, “80”

/\*\*Start the connection, TCP, domain name, port\*\*/

<= CONNECT OK

/\*\*This string in the response indicates TCP connection established\*\*/

=>AT+CIPSEND

/\*\*Request initiation of data sending (the request)\*\*/

=> AT+CMGS=\"+ZZxxxxxxxxxx\"

/\*\* change ZZ with country code and xxxxxxxxxxx with phone number to sms \*\*/

=>Hello , this is a sample text

/\*\* at the end you should write ctrl+z OR ASCII number of that “26” \*\*/

--------------------Receiving SMS-------------------------

--------------------Sending SMS----------------------  
/\*\* First test if everything is okay \*\*/

=> AT

<= AT

/\*\* This should come back. SIM900 default is to echo back commands you enter \*\*/

<= OK

=> AT+CMGF=1

/\*\*AT command to set SIM900 to SMS mode\*\*/

=> AT+CNMI=1,2,0,0,0

/\*\* Decides how newly arrived SMS messages should be handled \*\*/

<= +CMT : “+ 00000000”,”TEXT”

<= >

/\*\*The response should be the string “>” to indicate, type your data to send\*\*/

=> xxxxxx

/\*\*Just type anything for now\*\*/

=>#026

/\*\*Now type the sequence #026. This tells the terminal.exe to send the hex code 0x1a (which is Ctrl+Z) to indicate end of data sending\*\*/

<= xxxxxxxxxx

/\*\*You should get some response back from the server…it would generally be a complain that the request string was not valid…but that is a different subject…you have established the connection\*\*/

/\*\*To close the connection\*\*/

=>AT+CIPSHUT

/\*\*Request shutting down of the current connections\*\*/

<=SHUT OK

/\*\*Indicates shutdown successful\*\*/

## **Get Start to Send and Receive SMS by GSM Sim900**

--------------------Sending SMS----------------------  
/\*\* First test if everything is okay \*\*/

=> AT

<= AT

/\*\* This should come back. SIM900 default is to echo back commands you enter \*\*/

<= OK

=> AT+CMGF=1

/\*\*AT command to set SIM900 to SMS mode\*\*/

Source:

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www.os.mbed.com

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