



GSM module Interfacing with PIC18F4550

Overview of GSM

Global System for Mobile communication (GSM) is a digital cellular system used for mobile devices. It is an international standard for mobile which is widely used for long-distance communication.

There are various GSM modules available in market like SIM900, SIM700, SIM800, SIM808, SIM5320, etc.

SIM900A module allows users to send/receive data over GPRS, send/receive SMS, and make/receive voice calls.

It communicates serially with the devices like microcontroller, PC using AT commands.

To interface the SIM900A module with a cellular network, it requires a SIM card provided by a network operator.

For more information about Sim900A and how to use it, refer to the topic Sim900A GSM/GPRS Module (<http://electronicwings.com/sensors-modules/sim900a-gsmgprs-module>) in the sensors and modules section.

The GSM/GPRS module uses USART communication to communicate with the controller or PC terminal.

For information about USART in PIC18F4550 and how to use it, refer to the topic USART in PIC18F4550 (<http://electronicwings.com/pic/pic18f4550-usart>) in the PIC inside section.



SIM900A GSM Module

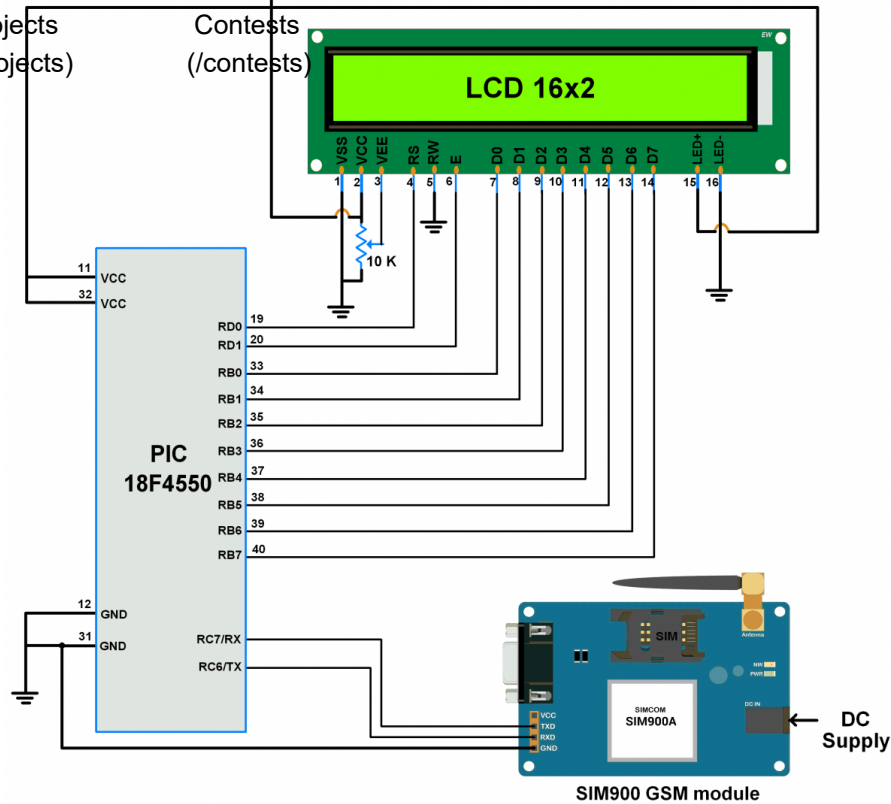
Connection Diagram of SIM900A GSM Module to PIC18F4550



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GSM Module Interfacing with PIC microcontroller

SIM900A GSM Code for PIC18F4550

```

/*
 * SIM900A Interfacing with PIC18F4550
 * http://www.electronicwings.com
 */

#include <pic18f4550.h>
#include "Configuration_Header_File.h"
#include "LCD_16x2_8-bit_Header_File.h"
#include "USART_Header_File.h"
#include <stdio.h>
#include <string.h>
#include <stdlib.h>

void GSM_Init();
void GSM_Calling(char *);
void GSM_HangCall();
void GSM_Response();
void GSM_Response_Display();
void GSM_Msg_Read(int);
void GSM_Wait_for_Msg();
void GSM_Msg_Display();

```

EW

ElectronicWings

Video of SMS Sending using GSM Modem with PIC18F4550


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Components Used


(https://www.mouser.in?utm_source=electronicswings&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

Powered By

SIM900A GSM GPRS Module
SIM900A is dual band GSM/GPRS 900/1800MHz modul... X 1

 (https://www.mouser.com/ProductDetail/M5Stack/M031-D?qs=%2Fha2pyFadugEKx3cUjc5DGB4hxc12iWakV7YxEmv6c%3D&utm_source=electronicswings&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

 Datasheet (/components/sim900a-gsm-gprs-module/1/datasheet)

Components Used

Powered By

PICKit 4 MPLAB
PICKit 4 MPLAB

X 1

(https://www.mouser.in/ProductDetail/Microchip-Technology/PG164140?qs=r5DSvIrkXmLKDuYNJlmlWw%3D%3D&utm_source=electronicswings&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

Datasheet (/components/pickit-4-mplab/1/datasheet)

PIC18f4550
PIC18f4550

X 1

(https://www.mouser.in/ProductDetail/Microchip-Technology/PIC18F4550-I-P?qs=oKK8NaWdAJs8nLDXBGwMXw%3D%3D&utm_source=electronicswing&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

Datasheet (/components/pic18f4550/1/datasheet)

EW

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MOUSER

+ Project Electronics project

(https://www.mouser.in?utm_source=electronicswing&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

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(https://www.mouser.com/ProductDetail/Adafruit/1447?qs=XAKIUOoRPe6ACImsjw7y7g%3D%3D&utm_source=electronicswing&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

LCD16x2 Display

LCD16x2 Display

X 1

(https://www.mouser.com/ProductDetail/Adafruit/1447?qs=XAKIUOoRPe6ACImsjw7y7g%3D%3D&utm_source=electronicswing&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

Downloads

<div><div></div></div> <div>SIM900 AT Commands Manual</div>	<div>Dow (/api/download/platform-attachment/191)</div>
<div><div></div></div> <div>GSM Interfacing with PIC18F4550 Project File</div>	<div>Dow (/api/download/platform-attachment/340)</div>

Comments

Comment

ARUP

(/users/ARUP/profile)

2017-12-29 00:44:15



when i trying to compile the code bellow message given on the screen.

```

C:\gsm\18f4550_gsm3.mcp started.
Language tool versions: MPASMWIN.exe v5.51, mplink.exe v4.49, mplib.exe v4.49
Preprocessor symbol '__DEBUG' is defined.
Thu Dec 28 12:01:02 2017

-----

Clean: Deleting intermediary and output files.
Clean: Deleted file "C:\Documents and Settings\User1\My Documents\HI TECH
C\gsm\18f4550_gsm3.mcs".
Clean: Done.
Build aborted. The project contains no source files.

-----

Debug build of project `C:\Documents and Settings\User1\My Documents\HI TECH
C\gsm\18f4550_gsm3.mcp' failed.
Language tool versions: MPASMWIN.exe v5.51, mplink.exe v4.49, mplib.exe v4.49
Preprocessor symbol '__DEBUG' is defined.
Thu Dec 28 12:01:02 2017

-----

BUILD FAILED
  
```

what i will do please give me your opinion.....

Reply Like



lokeshc

(/users/lokeshc/profile)
2017-12-29 02:13:34

@ARUP: This program is compiled using XC8 compiler whereas I guess you are using hi-tech compiler which is different.

Definition are different in both compiler for pic microcontroller.

Try to compile the program using xc8 compiler.

Reply Like 1

samadhanshinde020

(/users/samadhanshinde020/profile)
2018-03-23 03:27:23

I test this code in my project hardware but this code is not working. showing error msg on display.what is problem. gsm not responding.

Reply Like

lokeshc

(/users/lokeshc/profile)
2018-03-23 03:42:15

Please check your hardware connection between gsm and mcu.

Can you tell me what kind of error you are getting on your display?

Reply Like 1

samadhanshinde020

(/users/samadhanshinde020/profile)
2018-03-23 22:48:49

Show error msg on lcd.means gsm not responding

Reply Like

lokeshc

(/users/lokeshc/profile)
2018-03-24 03:35:51

So just check for gsm module AT commands.

Try AT Commands to test gsm module using serial communication with PC having same baud rate as GSM.

If it works then test it with provided code by commenting other functions except



samadhanshinde020

(/users/samadhanshinde020/profile)

2018-03-24 06:54:36

i simply first tested gsm module on serial terminal through wire.it works fine.but problem is created in when it's connected to my project hardware.

Reply Like

arpatil510

(/users/arpatil510/profile)

2018-03-29 22:47:33

pls upload ur hex file

Reply Like

arpatil510

(/users/arpatil510/profile)

2018-03-29 22:48:12

pls upload the hex file of program..

Reply Like

lokeshc

(/users/lokeshc/profile)

2018-03-29 23:56:49

you can find attachment (.zip) provided in,

Supporting Files -> Source Code

You can download and extract it to get hex file

Reply Like

heramb629

(/users/heramb629/profile)

2018-04-14 14:05:57

when i used ur code in mlab x ide with compiler that time i got 2 errors but there are not gotted to me can you please help for code.

Reply Like

lokeshc

(/users/lokeshc/profile)

2018-04-14 16:36:26

Which compiler have you used?

What errors occurred while compiling this program?

Reply Like

heramb629

(/users/heramb629/profile)

2018-04-14 23:45:00

I'm using xc8 compiler...but they notify me only two errors are present in that one is is show 500 error for undifinite symbol:

Reply Like

heramb629

(/users/heramb629/profile)

2018-04-15 10:19:21

:0: error: (500) undefined symbols:

```
_USART_TxChar(dist/default/production\heramb2.X.production.obj)
_LCD_Char(dist/default/production\heramb2.X.production.obj)
_LCD_Init(dist/default/production\heramb2.X.production.obj)
_LCD_Clear(dist/default/production\heramb2.X.production.obj)
_USART_SendString(dist/default/production\heramb2.X.production.obj)
_LCD_String(dist/default/production\heramb2.X.production.obj)
```



```
nbproject/Makefile-default.mk:131: recipe for target
'dist/default/production/heramb2.X.production.hex' failed
make[2]: Leaving directory
'C:/Users/admin/Desktop/Heramb/Project/heramb2.X'
nbproject/Makefile-default.mk:90: recipe for target 'build-conf' failed
make[1]: Leaving directory
'C:/Users/admin/Desktop/Heramb/Project/heramb2.X'
nbproject/Makefile-impl.mk:39: recipe for target 'build-impl' failed
```

BUILD FAILED (exit value 2, total time: 7s)

This error i gotted. can you please help me for resolved it.

Reply Like

lokeshc

(/users/lokeshc/profile)
 2018-04-17 04:01:54

did you include header (USART and LCD) file in your project?

Have a look at the names of function, definitions and the names of the functions that are invoked. It may generate this kind of error.

Reply Like

epasichnikk

(/users/epasichnikk/profile)
 2018-12-10 11:16:48

Hello, can you give me your email, please?

Reply Like

dattlara76

(/users/dattlara76/profile)
 2019-01-10 18:21:43

hi,

build successfully. but why getting,

":: advisory: (1234) * Corrupted fast interrupt shadow registers">>why this is corrupted how get rid off.

the full compilation message:

//

```
LCD_16x2.c:62: warning: (373) implicit signed to unsigned conversion
LCD_16x2.c:67: warning: (373) implicit signed to unsigned conversion
USART_Source_File.c:14: warning: (373) implicit signed to unsigned conversion
gsm.c:142: warning: (373) implicit signed to unsigned conversion
gsm.c:142: warning: (373) implicit signed to unsigned conversion
gsm.c:152: warning: (373) implicit signed to unsigned conversion
gsm.c:161: warning: (373) implicit signed to unsigned conversion
gsm.c:163: warning: (373) implicit signed to unsigned conversion
gsm.c:185: warning: (373) implicit signed to unsigned conversion
gsm.c:209: warning: (373) implicit signed to unsigned conversion
gsm.c:252: warning: (373) implicit signed to unsigned conversion
gsm.c:257: warning: (373) implicit signed to unsigned conversion
gsm.c:283: warning: (373) implicit signed to unsigned conversion
gsm.c:283: warning: (373) implicit signed to unsigned conversion
gsm.c:292: warning: (373) implicit signed to unsigned conversion
gsm.c:294: warning: (373) implicit signed to unsigned conversion
gsm.c:328: warning: (373) implicit signed to unsigned conversion
gsm.c:328: warning: (373) implicit signed to unsigned conversion
gsm.c:335: warning: (373) implicit signed to unsigned conversion
gsm.c:342: warning: (373) implicit signed to unsigned conversion
```




```

gsm.c:346: warning: (373) implicit signed to unsigned conversion
gsm.c:348: warning: (373) implicit signed to unsigned conversion
"C:\Program Files (x86)\Microchip\xc8\v1.44\bin\xc8.exe" --chip=18F4550 -G -
mdist/default/production/gsm.X.production.map --double=24 --float=24 --
emi=wordwrite --opt=asm,asmfile,speed,+space,debug,local --addrqual=ignore --
mode=free -P -N255 --warn=-3 --asmlist-DXPRJ_default=default --summary=default,-
psect,class,+mem,-hex,-file --output=default,-inhx032 --runtime=default,+clear,+init,-
keep,-no_startup,-download,+config,+clib,-plib --output=-mcof,+elf:multilocs --
stack=compiled:auto:auto:auto "--errformat=%f:%l error: (%n) %s" "--
warnformat=%f:%l warning: (%n) %s" "--msgformat=%f:%l advisory: (%n) %s" --
memorysummary dist/default/production/memoryfile.xml -
odist/default/production/gsm.X.production.elf/default/production/gsm.p1
build/default/production/LCD_16x2.p1
build/default/production/USART_Source_File.p1
Microchip MPLAB XC8 C Compiler (Free Mode) V1.44
Build date: Sep 13 2017
Part Support Version: 1.44
Copyright (C) 2017 Microchip Technology Inc.
License type: Node Configuration

```

```

:: advisory: (1233) Employing 18F4550 errata work-arounds:
:: advisory: (1234) * Corrupted fast interrupt shadow registers
C:\Program Files (x86)\Microchip\xc8\v1.44\sources\common\doprnt.c:538: warning:
(373) implicit signed to unsigned conversion
C:\Program Files (x86)\Microchip\xc8\v1.44\sources\common\doprnt.c:541: warning:
(373) implicit signed to unsigned conversion
C:\Program Files (x86)\Microchip\xc8\v1.44\sources\common\doprnt.c:1259:
warning: (373) implicit signed to unsigned conversion
C:\Program Files (x86)\Microchip\xc8\v1.44\sources\common\doprnt.c:1305:
warning: (373) implicit signed to unsigned conversion
C:\Program Files (x86)\Microchip\xc8\v1.44\sources\common\doprnt.c:1306:
warning: (373) implicit signed to unsigned conversion
C:\Program Files (x86)\Microchip\xc8\v1.44\sources\common\doprnt.c:1489:
warning: (373) implicit signed to unsigned conversion
C:\Program Files (x86)\Microchip\xc8\v1.44\sources\common\doprnt.c:1524:
warning: (373) implicit signed to unsigned conversion
gsm.c:124: warning: (520) function "_GSM_Msg_Delete" is never called
gsm.c:225: warning: (520) function "_GSM_Calling" is never called
gsm.c:232: warning: (520) function "_GSM_HangCall" is never called
USART_Source_File.c:26: warning: (520) function "_USART_RxChar" is never called

```

Memory Summary:

```

Program space used 1628h ( 5672) of 7800h bytes ( 18.5%)
Data space used 10Dh ( 269) of 7FFh bytes ( 13.1%)
Configuration bits used 7h ( 7) of 7h words (100.0%)
EEPROM space used 0h ( 0) of 100h bytes ( 0.0%)
ID Location space used 8h ( 8) of 8h bytes (100.0%)
Data stack space used 0h ( 0) of 660h bytes ( 0.0%)

```

You have compiled in FREE mode.

Using Omniscient Code Generation that is available in PRO mode,
you could have produced up to 60% smaller and 400% faster code.
See <http://www.microchip.com/MPLABXCcompilers> for more information.

```

make[2]: Leaving directory 'F:/0_ELECTRONICS/3_0_electwing_gsm/gsm/gsm.X'
make[1]: Leaving directory 'F:/0_ELECTRONICS/3_0_electwing_gsm/gsm/gsm.X'

```

BUILD SUCCESSFUL (total time: 5s)

Loading code from

F:/0_ELECTRONICS/3_0_electwing_gsm/gsm/gsm.X/dist/default/production/gsm.X.p



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epasichnikk

(/users/epasichnikk/profile)

2019-01-24 20:15:24

```
make[2]: *** [build/default/production/GSM_Functions.p1] Error 1
make[2]: *** Waiting for unfinished jobs....
make -f nbproject/Makefile-default.mk SUBPROJECTS= .build-conf
make[1]: Entering directory 'D:/SIM900_GSM.X'
make -f nbproject/Makefile-default.mk
dist/default/production/SIM900_GSM.X.production.hex
make[2]: Entering directory 'D:/SIM900_GSM.X'
"C:\Program Files (x86)\Microchip\xc8\v2.00\bin\xc8-cc.exe" -mcpu=18F4550 -c -fno-
short-double -fno-short-float -memi=wordwrite -fasmfile -maddrqual=ignore -
xassembler-with-cpp -Wa,-a -DXPRJ_default=default -msummary=-psect,-
class,+mem,-hex,-file -ginhx032 -Wl,-data-init -mno-keep-startup -mno-download -
mdefault-config-bits -std=c99 -gdwarf-3 -mstack=compiled:auto:auto:auto -o
build/default/production/LCD_16x2.p1 LCD_16x2.c
"C:\Program Files (x86)\Microchip\xc8\v2.00\bin\xc8-cc.exe" -mcpu=18F4550 -c -fno-
short-double -fno-short-float -memi=wordwrite -fasmfile -maddrqual=ignore -
xassembler-with-cpp -Wa,-a -DXPRJ_default=default -msummary=-psect,-
class,+mem,-hex,-file -ginhx032 -Wl,-data-init -mno-keep-startup -mno-download -
mdefault-config-bits -std=c99 -gdwarf-3 -mstack=compiled:auto:auto:auto -o
build/default/production/GSM_Functions.p1 GSM_Functions.c
"C:\Program Files (x86)\Microchip\xc8\v2.00\bin\xc8-cc.exe" -mcpu=18F4550 -c -fno-
short-double -fno-short-float -memi=wordwrite -fasmfile -maddrqual=ignore -
xassembler-with-cpp -Wa,-a -DXPRJ_default=default -msummary=-psect,-
class,+mem,-hex,-file -ginhx032 -Wl,-data-init -mno-keep-startup -mno-download -
mdefault-config-bits -std=c99 -gdwarf-3 -mstack=compiled:auto:auto:auto -o
build/default/production/USART_Source_File.p1 USART_Source_File.c
GSM_Functions.c:181:6: error: variable has incomplete type 'void'
void interrupt ISR()
^
GSM_Functions.c:181:15: error: expected ';' after top level declarator
void interrupt ISR()
^
;
2 errors generated.
(908) exit status = 1
nbproject/Makefile-default.mk:138: recipe for target
'build/default/production/GSM_Functions.p1' failed
make[2]: Leaving directory 'D:/SIM900_GSM.X'
nbproject/Makefile-default.mk:90: recipe for target '.build-conf' failed
make[1]: Leaving directory 'D:/SIM900_GSM.X'
nbproject/Makefile-impl.mk:39: recipe for target '.build-impl' failed
make[1]: *** [.build-conf] Error 2
make: *** [.build-impl] Error 2
```

BUILD FAILED (exit value 2, total time: 3s)

How i can fix it??

Reply Like

authorized

(/users/authorized/profile)

2019-01-31 16:52:10

i think you have messed with semicolon ?

Reply Like

epasichnikk



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epasichnikk



[\(/users/epasichnikk/profile\)](#)
 2019-02-07 01:13:08

I compiled a project that I downloaded by reference

Reply Like

authorized



[\(/users/authorized/profile\)](#)
 2019-02-07 11:02:19

i think you should refer example of "how to write interrupt routines in XC8"

Link ==> <http://microchipdeveloper.com/faq:31>

Reply Like

rishabhchoksi98



[\(/users/rishabhchoksi98/profile\)](#)
 2019-02-28 10:06:15

I am facing the same issue.I tried removing the word "ISR",so it successfully got compiled,but message was not received.

Reply Like

anishpandit93



[\(/users/anishpandit93/profile\)](#)
 2019-06-21 11:15:16

Thanks for posting this article. I have one doubt about
 char buff[160], how and from where buff[] get the data. i am understand please help
 me..

.

.

Eg-

if(strstr(buff,"OK"))???

Reply Like

lokeshc



[\(/users/lokeshc/profile\)](#)
 2019-06-21 11:49:36

Hi anishpandit93,

The buff is receiving data in following routine,

void interrupt ISR()

whereas strstr is a function which find the 1st occurrence of sub-string in main
 string.

Reply Like 1

anishpandit93



[\(/users/anishpandit93/profile\)](#)
 2019-06-21 15:09:55

Thanks Mr. Lokesh

your code is successful build in MPLab, but while simulating in proteus i'm
 getting error msg on LCD kindly guide me...

Thank you

Reply Like

lokeshc



[\(/users/lokeshc/profile\)](#)
 2019-06-21 16:04:39

what kind of error you are getting?

Better to run it on Hardware.

If there is an error of MCLRE bit then you should TURN-OFF MCLRE bit in
 configuration register Header file especially for Proteus.

Reply Like



nkarthikeyan27

[\(/users/nkarthikeyan27/profile\)](#)
 2020-01-04 14:49:28

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I want to send and send back to the received message. How to do that. In GSM_Msg_Display() function, Please help me. While I am doing that i am getting AT+CMGR = 0 ERROR.

Reply Like

allrbest123

[\(/users/allrbest123/profile\)](#)
 2019-09-06 18:53:55

can anyone please help me in interfacing sim808 with pic16f18877

Reply Like

deepika290395

[\(/users/deepika290395/profile\)](#)
 2019-11-30 12:35:55

Can you please share the header files

Reply Like

nguyentrungdung12a

[\(/users/nguyentrungdung12a/profile\)](#)
 2020-02-22 22:39:51

hi sir, i got 2 errors when i compile this program, please help me!!

2 errors are : " expected ';' after top level declarator" and "variable has incomplete type 'void'"

Reply Like

othmanetalmouute

[\(/users/othmanetalmouute/profile\)](#)
 2020-03-10 21:14:34

can you link me plz the gsm library for proteus,so i can simulate it with pic18f?

Reply Like

maanikprince

[\(/users/maanikprince/profile\)](#)
 2020-07-13 11:02:15

in this program,what function to receive msg and response to call automatically can you clear with me

Reply Like

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[Youtube\(https://www.youtube.com/channel/UCNdqkukBtk4\)](https://www.youtube.com/channel/UCNdqkukBtk4)
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