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GSM library

The GSM library ([//www.arduino.cc/en/Reference/GSM](http://www.arduino.cc/en/Reference/GSM)) is included with Arduino IDE 1.0.4 and later ([//www.arduino.cc/en/Main/Software](http://www.arduino.cc/en/Main/Software)).

With the Arduino GSM Shield ([//www.arduino.cc/en/Main/ArduinoGSMShield](http://www.arduino.cc/en/Main/ArduinoGSMShield)), this library enables an Arduino board to do most of the operations you can do with a GSM phone: place and receive voice calls, send and receive SMS, and connect to the internet over a GPRS network.

The GSM shield has a modem that transfers data from a serial port to the GSM network. The modem executes operations via a series of AT commands. The library abstracts low level communications between the modem and SIM card. It relies on the Software Serial library ([//www.arduino.cc/en/Reference/SoftwareSerial](http://www.arduino.cc/en/Reference/SoftwareSerial)) for communication between the modem and Arduino.

Typically, each individual command is part of a larger series necessary to execute a particular function. The library can also receive information and return it to you when necessary.

Library structure

As the library enables multiple types of functionality, there are a number of different classes.

- The *GSM* class takes care of commands to the radio modem. This handles the connectivity aspects of the shield and registers your system in the GSM infrastructure. All of your GSM/GPRS programs will need to include an object of this class to handle the necessary low level communication.
- Voice call handling, managed by the *GSMVoiceCall* class.
- Send/receive SMS messages, managed by the *GSM_SMS* class.
- The *GPRSClass* is for connecting to the internet.
- *GSMClient* includes implementations for a client, similar to the Ethernet and WiFi libraries.
- *GSMServer* includes implementations for a server, similar to the Ethernet and WiFi libraries. *NB* : *A number of network operators do not allow for incoming connections from the public internet, but will allow them from inside their own. Check with your operator to see what restrictions there are on data use.*
- A number of utility classes such as *GSMScanner* and *GSMModem*

Ethernet library compatibility

The library tries to be as compatible as possible with the current Ethernet library. Porting a program from an Arduino Ethernet or WiFi library to an Arduino with the GSM Shield should be fairly easy. While it is not possible

GSM class

This class prepares the functions that will communicate with the modem.

- *GSM* ([//www.arduino.cc/en/Reference/GSMConstructor](http://www.arduino.cc/en/Reference/GSMConstructor))
- *begin* ([//www.arduino.cc/en/Reference/GSMBegin](http://www.arduino.cc/en/Reference/GSMBegin)())
- *shutdown* ([//www.arduino.cc/en/Reference/GSMShutdown](http://www.arduino.cc/en/Reference/GSMShutdown)())

GSMVoiceCall class

Enables voice communication through the modem. A microphone and speaker need to be added for full use.

- *GSMVoiceCall*
([//www.arduino.cc/en/Reference/GSMVCSConstructor](http://www.arduino.cc/en/Reference/GSMVCSConstructor))
- *getVoiceCallStatus*
([//www.arduino.cc/en/Reference/GSMVCSGetVoiceCallStatus](http://www.arduino.cc/en/Reference/GSMVCSGetVoiceCallStatus))
- *ready*() ([//www.arduino.cc/en/Reference/GSMVCSReady](http://www.arduino.cc/en/Reference/GSMVCSReady))
- *voiceCall*() ([//www.arduino.cc/en/Reference/GSMVCSVoiceCall](http://www.arduino.cc/en/Reference/GSMVCSVoiceCall))
- *answerCall*
([//www.arduino.cc/en/Reference/GSMVCSAnswerCall](http://www.arduino.cc/en/Reference/GSMVCSAnswerCall))
- *hangCall*() ([//www.arduino.cc/en/Reference/GSMVCSHangCall](http://www.arduino.cc/en/Reference/GSMVCSHangCall))
- *retrieveCallingNumber*
([//www.arduino.cc/en/Reference/GSMVCSRetrieveCallingNumber](http://www.arduino.cc/en/Reference/GSMVCSRetrieveCallingNumber))

GSM_SMS class

Facilitates sending and receiving Short Message Service (SMS) messages.

- *GSM_SMS* ([//www.arduino.cc/en/Reference/GSMSMSConstructor](http://www.arduino.cc/en/Reference/GSMSMSConstructor))
- *beginSMS*() ([//www.arduino.cc/en/Reference/GSMSMSBeginSMS](http://www.arduino.cc/en/Reference/GSMSMSBeginSMS))
- *ready*() ([//www.arduino.cc/en/Reference/GSMSMSReady](http://www.arduino.cc/en/Reference/GSMSMSReady))
- *endSMS*() ([//www.arduino.cc/en/Reference/GSMSMSEndSMS](http://www.arduino.cc/en/Reference/GSMSMSEndSMS))
- *available*() ([//www.arduino.cc/en/Reference/GSMSMSAvailable](http://www.arduino.cc/en/Reference/GSMSMSAvailable))
- *remoteNumber*
([//www.arduino.cc/en/Reference/GSMSMSRemoteNumber](http://www.arduino.cc/en/Reference/GSMSMSRemoteNumber))
- *read*() ([//www.arduino.cc/en/Reference/GSMSMSRead](http://www.arduino.cc/en/Reference/GSMSMSRead))
- *write*() ([//www.arduino.cc/en/Reference/GSMSMSWrite](http://www.arduino.cc/en/Reference/GSMSMSWrite))
- *print*() ([//www.arduino.cc/en/Reference/GSMSMSPrint](http://www.arduino.cc/en/Reference/GSMSMSPrint))
- *peek*() ([//www.arduino.cc/en/Reference/GSMSMSPeek](http://www.arduino.cc/en/Reference/GSMSMSPeek))
- *flush*() ([//www.arduino.cc/en/Reference/GSMSMSFlush](http://www.arduino.cc/en/Reference/GSMSMSFlush))

to simply run Ethernet-compatible code on the GSM shield as-is, some minor, library specific, modifications will be necessary, like including the GSM and GPRS specific libraries and getting network configuration settings from your cellular network provider.

Examples

There are two groups of examples for the GSM shield. There are examples to illustrate the possibilities of the shield, like how to send SMS messages and connect to the internet. There is also set of example tools that you can use to debug the functionality of the library and the hardware at lower level.

- [Gsm Web Client \(/en/Tutorial/GSMExamplesWebClient\)](/en/Tutorial/GSMExamplesWebClient): Download the content of a website to your Arduino board through GPRS.
- [Gsm Web Server \(/en/Tutorial/GSMExamplesWebServer\)](/en/Tutorial/GSMExamplesWebServer): Create a wireless web server through GPRS.
- [Make Voice Call \(/en/Tutorial/GSMExamplesMakeVoiceCall\)](/en/Tutorial/GSMExamplesMakeVoiceCall): Get your shield to make phone calls from the Serial Monitor.
- [Send SMS \(/en/Tutorial/GSMExamplesSendSMS\)](/en/Tutorial/GSMExamplesSendSMS): Use the Serial Monitor to type in SMS messages to different phone numbers.
- [Receive Voice Call \(/en/Tutorial/GSMExamplesReceiveVoiceCall\)](/en/Tutorial/GSMExamplesReceiveVoiceCall): Check the status of the modem while getting voice calls.
- [Receive SMS \(/en/Tutorial/GSMExamplesReceiveSMS\)](/en/Tutorial/GSMExamplesReceiveSMS): Read SMS messages and prompt them to the Serial Monitor.

TOOLS

- [Band Management \(/en/Tutorial/GSMToolsBandManagement\)](/en/Tutorial/GSMToolsBandManagement): Manage the band the GSM shield connects to.
- [GSM Scan Networks \(/en/Tutorial/GSMToolsGsmScanNetworks\)](/en/Tutorial/GSMToolsGsmScanNetworks): Check for the available networks.
- [Pin Management \(/en/Tutorial/GSMToolsPinManagement\)](/en/Tutorial/GSMToolsPinManagement): Manage the PIN number of your SIM card.
- [Test GPRS \(/en/Tutorial/GSMToolsTestGPRS\)](/en/Tutorial/GSMToolsTestGPRS): Test the proper functionality of the GPRS network using your SIM card.
- [Test Modem \(/en/Tutorial/GSMToolsTestModem\)](/en/Tutorial/GSMToolsTestModem): Read the IMEI of your modem.
- [Test Web Server \(/en/Tutorial/GSMToolsTestWebServer\)](/en/Tutorial/GSMToolsTestWebServer): Create a webserver with your GSM shield.

For additional information on the GSM shield, see the [Getting Started page \(/en/Guide/ArduinoGSMShield\)](/en/Guide/ArduinoGSMShield) and the [GSM shield hardware page \(/en/Main/ArduinoGSMShield\)](/en/Main/ArduinoGSMShield).

GPRS class

This class is responsible for including the files that are part of the library that involve TCP communication.

- [GPRS \(/www.arduino.cc/en/Reference/GPRSConstructor\)](/www.arduino.cc/en/Reference/GPRSConstructor)
- [attachGPRS \(/www.arduino.cc/en/Reference/AttachGPRS\)\(\)](/www.arduino.cc/en/Reference/AttachGPRS)

GSMClient class

The client class creates clients that can connect to servers and send and receive data.

- [GSMClient \(/www.arduino.cc/en/Reference/GSMClientConstructor\)](/www.arduino.cc/en/Reference/GSMClientConstructor)
- [ready\(\) \(/www.arduino.cc/en/Reference/GSMClientReady\)](/www.arduino.cc/en/Reference/GSMClientReady)
- [connect\(\) \(/www.arduino.cc/en/Reference/GSMClientConnect\)](/www.arduino.cc/en/Reference/GSMClientConnect)
- [beginWrite\(\) \(/www.arduino.cc/en/Reference/GSMClientBeginWrite\)](/www.arduino.cc/en/Reference/GSMClientBeginWrite)
- [write\(\) \(/www.arduino.cc/en/Reference/GSMClientWrite\)](/www.arduino.cc/en/Reference/GSMClientWrite)
- [endWrite\(\) \(/www.arduino.cc/en/Reference/GSMClientEndWrite\)](/www.arduino.cc/en/Reference/GSMClientEndWrite)
- [connected\(\) \(/www.arduino.cc/en/Reference/GSMClientConnected\)](/www.arduino.cc/en/Reference/GSMClientConnected)
- [read\(\) \(/www.arduino.cc/en/Reference/GSMClientRead\)](/www.arduino.cc/en/Reference/GSMClientRead)
- [available\(\) \(/www.arduino.cc/en/Reference/GSMClientAvailable\)](/www.arduino.cc/en/Reference/GSMClientAvailable)
- [peek\(\) \(/www.arduino.cc/en/Reference/GSMClientPeek\)](/www.arduino.cc/en/Reference/GSMClientPeek)
- [flush\(\) \(/www.arduino.cc/en/Reference/GSMClientFlush\)](/www.arduino.cc/en/Reference/GSMClientFlush)
- [stop\(\) \(/www.arduino.cc/en/Reference/GSMClientStop\)](/www.arduino.cc/en/Reference/GSMClientStop)

GSMServer class

The Server class creates servers which can send data to and receive data from connected clients (programs running on other computers or devices).

- [GSMServer \(/www.arduino.cc/en/Reference/GSMServerConstructor\)](/www.arduino.cc/en/Reference/GSMServerConstructor)
- [ready\(\) \(/www.arduino.cc/en/Reference/GSMServerReady\)](/www.arduino.cc/en/Reference/GSMServerReady)
- [beginWrite\(\) \(/www.arduino.cc/en/Reference/GSMServerBeginWrite\)](/www.arduino.cc/en/Reference/GSMServerBeginWrite)
- [write\(\) \(/www.arduino.cc/en/Reference/GSMServerWrite\)](/www.arduino.cc/en/Reference/GSMServerWrite)
- [endWrite\(\) \(/www.arduino.cc/en/Reference/GSMServerEndWrite\)](/www.arduino.cc/en/Reference/GSMServerEndWrite)
- [read\(\) \(/www.arduino.cc/en/Reference/GSMServerRead\)](/www.arduino.cc/en/Reference/GSMServerRead)
- [available\(\) \(/www.arduino.cc/en/Reference/GSMServerAvailable\)](/www.arduino.cc/en/Reference/GSMServerAvailable)
- [stop\(\) \(/www.arduino.cc/en/Reference/GSMServerStop\)](/www.arduino.cc/en/Reference/GSMServerStop)

GSMModem class

The GSMModem class facilitates diagnostic communication with the modem.

- [GSMModem \(/www.arduino.cc/en/Reference/GSMModemConstructor\)](/www.arduino.cc/en/Reference/GSMModemConstructor)
- [begin \(/www.arduino.cc/en/Reference/GSMModemBegin\)\(\)](/www.arduino.cc/en/Reference/GSMModemBegin)
- [getIMEI \(/www.arduino.cc/en/Reference/GSMModemGetIMEI\)\(\)](/www.arduino.cc/en/Reference/GSMModemGetIMEI)

GSMScanner class

The GSMScanner class provides diagnostic information about the network and carrier.

- [GSMScanner \(/www.arduino.cc/en/Reference/GSMScannerConstructor\)](/www.arduino.cc/en/Reference/GSMScannerConstructor)
- [begin \(/www.arduino.cc/en/Reference/GSMScannerBegin\)\(\)](/www.arduino.cc/en/Reference/GSMScannerBegin)
- [getCurrentCarrier \(/www.arduino.cc/en/Reference/GSMScannerGetCurrentCarrier\)\(\)](/www.arduino.cc/en/Reference/GSMScannerGetCurrentCarrier)

- `getSignalStrength`
([//www.arduino.cc/en/Reference/GSMScannerGetSignalStrength](http://www.arduino.cc/en/Reference/GSMScannerGetSignalStrength))
()
- `readNetworks`
([//www.arduino.cc/en/Reference/GSMScannerReadNetworks](http://www.arduino.cc/en/Reference/GSMScannerReadNetworks))()

GSMPIN class

The GSMPIN class has utilities for communicating with the SIM card.

- `GSMPIN` ([//www.arduino.cc/en/Reference/GSMPINConstructor](http://www.arduino.cc/en/Reference/GSMPINConstructor))
- `begin` ([//www.arduino.cc/en/Reference/GSMPinBegin](http://www.arduino.cc/en/Reference/GSMPinBegin))()
- `isPIN` ([//www.arduino.cc/en/Reference/GSMPinIsPIN](http://www.arduino.cc/en/Reference/GSMPinIsPIN))()
- `checkPIN` ([//www.arduino.cc/en/Reference/GSMPinCheckPIN](http://www.arduino.cc/en/Reference/GSMPinCheckPIN))()
- `checkPUK` ([//www.arduino.cc/en/Reference/GSMPinCheckPUK](http://www.arduino.cc/en/Reference/GSMPinCheckPUK))()
- `changePIN` ([//www.arduino.cc/en/Reference/GSMPinChangePIN](http://www.arduino.cc/en/Reference/GSMPinChangePIN))()
- `switchPIN` ([//www.arduino.cc/en/Reference/GSMPinSwitchPIN](http://www.arduino.cc/en/Reference/GSMPinSwitchPIN))()
- `checkReg` ([//www.arduino.cc/en/Reference/GSMPinCheckReg](http://www.arduino.cc/en/Reference/GSMPinCheckReg))()
- `getPINUsed` ([//www.arduino.cc/en/Reference/GSMPinGetPinUsed](http://www.arduino.cc/en/Reference/GSMPinGetPinUsed))
()
- `setPINUsed` ([//www.arduino.cc/en/Reference/GSMPinSetPinUsed](http://www.arduino.cc/en/Reference/GSMPinSetPinUsed))
()

GSMBand class

The GSMBand class provides information about the frequency band the modem connects to. There are also methods for setting the band.

- `GSMBand` ([//www.arduino.cc/en/Reference/GSMBandConstructor](http://www.arduino.cc/en/Reference/GSMBandConstructor))
- `begin` ([//www.arduino.cc/en/Reference/GSMBandBegin](http://www.arduino.cc/en/Reference/GSMBandBegin))()
- `getBand` ([//www.arduino.cc/en/Reference/GSMBandGetBand](http://www.arduino.cc/en/Reference/GSMBandGetBand))()
- `setBand` ([//www.arduino.cc/en/Reference/GSMBandSetBand](http://www.arduino.cc/en/Reference/GSMBandSetBand))()

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Corrections, suggestions, and new documentation should be posted to the Forum
(<http://arduino.cc/forum/index.php/board,23.0.html>).

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