Hardware
Embedded PCB Antenna -> Chip Embedded Antennas

<- External Antennas ->

Embedded PCB Antenna ->

All available from and other distributors

GSM Antennas | Different Forms
http://web.media.mit.edu/~mellis/cellphone/
Figure 16-1
Basic SMS network architecture

From Wireless Crash Course by Paul Bedell
Figure 16-3
Basic GPRS network architecture

From Wireless Crash Course by Paul Bedell
Figure 8.1
Paths taken by voice and WAP data over a GPRS network.

From The Essential Guide to Wireless Communications Applications by Andy Dornan
What We Will Use Today
GSM Breakout Board + GSM Quad or Penta Band Antenna

Any Prepaid SIM Card

USB To Serial Converter (or you could use an Arduino board)

USB Cable for Converter or for Arduino board

A Computer running CoolTerm or other Terminal App
Software = AT Commands
AT COMMANDS

The dialect of GSM is the Hayes At command set, this is a protocol you can use to talk to almost all GSM modules and handsets.

Hayes AT ETSI GSM 07.07 (3GPP TS 27.007) commands
http://www.3gpp.org/ftp/Specs/html-info/0707.htm

Hayes AT commands are basic sets of ASCII characters that send different commands to the module.

The basic form is as follows:
   AT+(some command)

The commands you send to the modules fall into three categories:
1. Setting modules functionality.
2. Getting module and user info.
3. Interacting with the network.

Each module has specific commands to deal with its internal operations. There are standard AT commands that will most likely work across modules, but each manufacturer might have proprietary versions as well. For the module that is on the breakout boards and on the Arduino Shield here is the proper documentation: http://arduino.cc/en/uploads/Main/Quectel_M10_AT_commands.pdf
USEFUL AT COMMANDS

To check if the module has been powered on properly type:

```
AT
```

The module should return this:

```
OK
```

Yay!

Now here are a few other diagnostic commands that are always useful at the beginning of each session:

```
AT+CSQ  To check the signal strength and if the module has any reception.
+CSQ:99,99 means no antenna is attached or no reception at all, anything between 5 and 30 is good.

AT+CREG? To check if the module has successfully registered onto a network.
+CREG:0,1 means it is registered, 0,2 that is still trying, 0,3 that it gave up.

AT+COPS? To check what network the module registered on.
+COPS:0,0,"T-Mobile" means it is registered on T-Mobile, "310410" is AT&T, or "00101" is OpenBTS.
```
SENDING AN SMS

The control channel is what provides the pathway for SMS messages. When a friend sends you an SMS message, the message flows through the SMSC, then to the tower, and then the tower sends the message to your phone as a little packet of data on the control channel. Here are the AT Commands you need to send to send an SMS.

Set format:
AT+CMGF=1

Then send text message to a specified phone number:
(129 - number in national format, 145 - number in international format with the "+")
AT+CMGS="3474951237",129
AT+CMGS="+13474951237",145

The module should respond with this:
>

Now Type the body of your message and end it with Ctrl-Z, which is an escape sequence that tells the module you are done typing and ready to send. It is sent in HEX to differentiate from the ASCII body of the text message: 0x1A

The module should think for a minute, send your SMS and then return the following:
+CMGS:1 (This is the specific # identifier of the SMS sent)
OK
READING AN SMS

When there are incoming SMS messages, the module will display them in order and assign them an ID number:
+CMTI: "SM",1
+CMTI: "SM",2
+CMTI: "SM",3

To read them, you first set the module to Text format:
AT+CMGF=1

Then to read all text messages, you issue the following command:

These are the possible parameters:
+CMGL: ("REC READ", "REC UNREAD", "STO SENT", "STO UNSENT", "ALL")

AT+CMGL="ALL"

+CMGL: 2,"REC UNREAD","41478003","","2014/04/02 14:59:56-16"
AT&T Free Msg: Your password was changed. If this was done in error, please call 611 or 800.901.9878.

+CMGL: 3,"REC UNREAD","41478003","","2014/04/02 14:59:57-16"
AT&T Free Msg: Your password has been changed to 6821.
OK
GPRS INTRO

To open a data connection using GPRS you will need the following information from your service provider:

APN ADDRESS, AT&T IS wap.cingular, T-MOBILE IS epc.tmobile.com
USERID & PASSWORD ARE NO LONGER REQUIRED

Set the context for the connection and what channel is going to be on:
(Channel 0 is Virtual_Uart_1)
AT+QIFGCNT=0

OK

Set the correct APN settings for your carrier:
AT+QICSGP=1,"WAP.CINGULAR"

OR:

AT+QICSGP=1,"EPC.TMOBILE.COM"

OK

Now you can initiate the commands for a GET or POST request from a given server and URL. We will look at GET requests in order to download content from a specific URL.
To connect to a website, set the URL for the communication:
(The first parameter is the LENGTH of the URL, the second is the maximum amount of wait time in seconds to input the URL)

\texttt{AT+QHTTPURL=35,30}

NOW TYPE THE URL (notice it is 35 characters long):
\texttt{http://www.t4d.cc/Demo/getThat.html}

Then you can initiate the HTTP GET Request:
(The parameter is the maximum read time in seconds)
\texttt{AT+QHTTPGET=60}

To read the response from the HTTP Server:
(The parameter is the maximum wait time in seconds, when it times out the module will close the HTTP session)
\texttt{AT+QHTTPREAD=30}

Hello ITP-TOP Class, Success! :-)

CONGRATULATIONS! If you got the message above, you have successfully downloaded data via GPRS!
Play Telephone!
SMS Gateways
Connect users globally with Twilio

Airbnb gives hosts and guests a way to talk on the phone without revealing their phone numbers.

See how they built it »

Get started in minutes. No setup, no credit card required. See how it works Sign up for free »
Messaging Usage

View last: Week

Analytics are collected at different frequencies, therefore totals for different time ranges may differ slightly.
Hourly analytics are collected most often, followed by daily, weekly, etc.

Sent & Received

Total number of messages sent and received by your account over time. Any messages sent that resulted in a status of 'failed' are not included.

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<th>Sent API Total</th>
<th>Sent Reply Total</th>
<th>Sent Call Total</th>
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<tr>
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</tbody>
</table>

Send a Text To | +1 904 33 POWER
Hardware SMS Gateway

GSM Modem + PC, Laptop or any other Computer or Micro-controller Platform hooked up to the Internet/Network

OR

GSM Module
How to send AT commands through a Terminal Program

How to send an SMS

How to download content via GPRS

How to use the GSM library for Arduino

GSM Library for Arduino Shield:
http://arduino.cc/en/Reference/GSM#Uv-2d3ddW3A

What We Did | Basics we covered