AT COMMAND SET FOR SENDING DATA VIA TCP USING SIM900GSM/GPRS MODULE

Command: AT

Response: OK

Notes: This command typically the first command sent to the MODEM. It is used to test the communication between the Two devices.

Command: AT+CREG?

Success Result: +CREG=1,1

OK

Notes: This means the SIM is ready and has connected to the network.

Command: AT+CGATT?

Response: +CGATT: 1

Notes: Check if the SIM has Internet access.

Command: AT+CIPSTATUS

Response : OK

STATE: IP INITIAL

Notes: Query the IP settings.

Command: AT+CIPMUX=0

Response: OK

Notes: Configure modem to make a single port open for connections.

Command: AT+CSTT="web.digiceljamaica.com","",""

Response: OK

Notes: Connect to Internet (Parameters are as follows; "APN","USERNAME","PASSWORD" Note that both the Username and Password are blank in the above instance. (BALNK HERE)

Command: AT+CIICR

Response: OK

Notes: Bring up wireless network. Ensure that the modem has a SIM with credit and/or has a data plan activated.

Command: AT+CIPSTART="TCP","104.237.143.204","80"

Response: OK

CONNECT OK

Notes: Make a TCP Connection to the server at 104.237.143 on Port 80, the Default TCP and HTTP port.

Command: AT+CIPSEND

Response: >

Notes: This command allows you to make request of the server. You enter your request after the prompt (>). Commands may either be GET, PUT or POST. Each command has a specific manner in which the command is to be written. In the Example below. A GET request is made to the server. The GET REQUEST can be used to ask for pages, call php scripts or pass data to the server. The GET REQUEST uses the following Format:

```
GET /page_you_want_to_request.html HTTP/1.1
Host: 124.456.798:80
Connection: keep-alive
<Empty Line...just press Enter>
```

PRESS Ctrl+Z or type "#026", The Hex value for ASCII 0x1A. In an embedded environment we could just send (0x1A) serially.

EXAMPLE:

Command:	AT+CIPSEND

Response:	>

TYPE:	GET /page_on_server.php HTTP/1.1

Host: 104.237.143.204:80

Connection: keep-alive

PRESS CTRL+Z

Response:	SEND OK

HTTP/1.1 200 OK

Date: Wed, 15 Apr 2015 23:14:53 GMT

Server: Apache/2.2.22 (Debian)

X-Powered-By: PHP/5.4.36-0+deb7u3

Vary: Accept-Encoding

Content-Length: 60

Keep-Alive: timeout=3600, max=10

Connection: Keep-Alive

Content-Type: text/html

19Connection Successful!Connection to database secured!

Command:	AT+CIPCLOSE

Response: CLOSE OK

Notes: Once the response is received, close the connection.

Command: AT+CIPSHUT

Response: SHUT OK

Notes: Close the TCP Port Explicitly.

WARNING!!!!

In some cases, the Connection will automatically CLOSE. This is particularly the case when no response is sent from the server to the client and also in the event of a TIMEOUT. Nonethless, I recomment explicitly closing the TCP Socket with the "AT+CIPSHUT" command after each attemt to connect to the server. The reason is this: An error will occur if the CIPSHUT command is not eventually sent after a CIPSTART COMMAND in the case where only a single connection was opened (with the AT+CIPMUX=0 COMMAND.) The connection must be closed prior to attempting a second connection.

Let us say for instance we sent the follow command chain without first closing the previous connection.

Command: AT+CIPSTART="TCP","104.237.143.204","80"

Response: ERROR
Note: The error occurs because the previous connection was not closed.

Command: AT+CIPSEND

Response: ERROR
Note: It follows that any attempt to send data will fail.

Command: AT+CIPSTART="TCP","104.237.143.204","80"
Response: ERROR
Note: Any other attempt to connect will fail.

Command: AT+CIPSHUT
Response: SHUT OK
Note: Here we explicitly close the connection.

Command: AT+CIPSHUT
Response: SHUT OK
Notes: The repeat is not necessary however, I have learnt not to take chances.

Command : AT+CIPSTART="TCP","www.google.com","80"
Response: OK
CONNECT OK

Command: AT+CIPSHUT
Response: SHUT OK

Command: AT+CIPSTART="TCP","www.google.com","80"
Response: OK
CONNECT OK
Notes: A second attempt is made here after the Command to close the connection was made. It returns a successful connection.
Command: AT+CIPSHUT
Response: SHUT OK
Notes: Explicitly close connection.

Command: AT+CIPSHUT

Response: SHUT OK

Notes: Explicitly close connection.

CASES

Case 1: A successful connection but unsuccessful request.

```
Command:    AT+CIPSTART="TCP","104.237.143.204","80"

Response:   OK

            CONNECT OK

Command:    AT+CIPSEND

Response:   >

TYPE:       PUT /insert_via_url.php?unitId=17&unitName=uwi_test_unit17&lat=18.15988&long=-76.8220&unit_stat=online&unitDesc=UWI+Test+Unit+17&submit=Submit HTTP/1.1

            SEND OK

Response:   HTTP/1.1 400 Bad Request

            Date: Wed, 15 Apr 2015 13:45:14 GMT

            Server: Apache/2.2.22 (Debian)

            Vary: Accept-Encoding

            Content-Length: 310

            Connection: close

            Content-Type: text/html; charset=iso-8859-1


            <!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">

            <html><head>

            <title>400 Bad Request</title>

            </head><body>

            <h1>Bad Request</h1>

            <p>Your browser sent a request that this server could not understand.<br />

            </p>
```

<hr>

<address>Apache/2.2.22 (Debian) Server at www.remotedata.com Port 80</address>

</body></html>

CLOSED

Notes: This request fails for one primary reason. No host is specified, Additionally, the TCP ports may not be properly configured, Double check the fprmat of the command and the server Apache conf file.

Command: AT+CIPSHUT

Response: SHUT OK

Notes: Explicitly close the TCP connection.

Case 2: A successful connection and successful request.

Command: AT+CIPSHUT

Response: SHUT OK

Notes: Explicitly close the TCP connection.

Command: AT+CIPSTART="TCP","104.237.143.204","80"

Response: OK

CONNECT OK

Command: AT+CIPSEND

Response: >

```
TYPE:          GET /uwiremotedata.html HTTP/1.1

               Host: 104.237.143.204:80

               Connection: keep-alive

               <PRESS ENTER FOR A BLANK SPACE>

PRESS:         CTRL+Z

Response:      SEND OK

               HTTP/1.1 200 OK

               Date: Wed, 15 Apr 2015 21:42:34 GMT

               Server: Apache/2.2.22 (Debian)

               Last-Modified: Mon, 13 Apr 2015 17:23:40 GMT

               ETag: "60017-1255-5139e600e8be8"

               Accept-Ranges: bytes

               Content-Length: 4693

               Vary: Accept-Encoding

               Content-Type: text/html



               <!DOCTYPE html>

               <html lang="en">

               <head>



                <title>UwiRemoteData.com</title>

                <meta charset="utf-8">

               <meta name="viewport" content="width=device-width, initial-scale=1">

               <link rel="stylesheet"
href="http://maxcdn.bootstrapcdn.com/bootstrap/3.2.0/css/bootstrap.min.css">

          <script src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.1/jquery.min.js"></script>
```

```
        <script src="http://maxcdn.bootstrapcdn.com/bootstrap/3.2.0/js/bootstrap.min.js"></script>


               <!--Map Javascript-->

               <script type="text/javascript"
src="https://maps.googleapis.com/maps/api/js"></script>

              <script type="text/javascript">

              //<![CDATA[


                var customIcons = {

                 restaurant: {

                  icon: 'http://labs.google.com/ridefinder/images/mm_20_blue.png'

                 },

                 bar: {

                  icon: 'http://labs.google.com/ridefinder/images/mm_20_red.png'

                 }

                };


                function load() {

                 var loc_icon = new
       google.maps.MarkerImage('http://labs.google.com/ridefinder/images/mm_20_red.png');

          var map = new google.maps.Map(document.getElementById("map"), {

              center: new google.maps.LatLng(18.2118309,-76.830442),

               zoom: 12,

               mapTypeId: 'roadmap'

          });

              var infoWindow = new google.maps.InfoWindow;
```

```
                    // Change this depending on the name of your PHP file


                    downloadUrl("createXML.php", function(data) {
                     //FF cannot responseXML . Or it gives problems or something


                    var txt = data.responseText;


                     // So reponseText then parse it into xml


                      var parser = new DOMParser();
                     var xml = parser.parseFromString(txt, "application/xml");


 var markers = xml.documentElement.getElementsByTagName("marker");
for (var i = 0; i < markers.length; i++) {
  var id = markers[i].getAttribute("unitID");
  var name = markers[i].getAttribute("unit_Name");
  var status = markers[i].getAttribute("status");
  var description = markers[i].getAttribute("Description");
  var point = new google.maps.LatLng(
      parseFloat(markers[i].getAttribute("Lat")),
      parseFloat(markers[i].getAttribute("Long")));
  var html = "<b>" +name+ "</b> <br/>" +status;
  var icon = loc_icon;
  var marker = new google.maps.Marker({
    map: map,
    position: point,
    icon: icon
   });
   bindInfoWindow(marker, map, infoWindow, html);
  }
 });
}

function bindInfoWindow(marker, map, infoWindow, html) {
 google.maps.event.addListener(marker, 'click', function() {
  infoWindow.setContent(html);
  infoWindow.open(map, marker);
 });
}

function downloadUrl(url, callback) {
 var request;   // = window.ActiveXObject ?
          // new ActiveXObject('Microsoft.XMLHTTP') :
          //new XMLHttpRequest;
  if(window.XMLHttpRequest)
  {
      // if Browser is firefox IE7+ Chrome or Safari
      request = new XMLHttpRequest();
  }
```

```
   else
   {
       //code for IE6 IE5
       request = new ActiveXObject("Microsoft.XMLHTTP");
   }


  request.onreadystatechange = function() {
   if (request.readyState == 4 && request.status==200) {
    //request.onreadystatechange = doNothing;
    callback(request);//, request.status);
   }
  };

  request.open('GET', url, true);
  request.send(null);
 }

 function doNothing() {}

 //]]>

</script>

<style type="text/css">
```

```
  .jumbotron {background-color:#a7f090;}

  .btn-primary {background-color: #F2F5A9; color:black;}

  body {background-color:#dddada;}

  </style>

</head>


<body onload="load()">

<nav class="navbar navbar-inverse" >

  <div class="container-fluid">

    <div class="navbar-header">

      <a class="navbar-brand" href="uwiremotedata.html">UwiRemoteData</a>

    </div>

    <div>

      <ul class="nav nav-tabs">

        <li class="active"><a href="uwiremotedata.html">Home</a></li>

        <li><a href="get_units.php">Units</a></li>

        <li><a href="select_unit.php">Data</a></li>

        <li><a href="support.html">Help</a></li>

      </ul>

    </div>

  </div>

</nav>


<div class="container" style="width:1100px;"> <!-- Start of Container Div-->

        <div class="jumbotron">
```

```
   <h1>Welcome to UwiRemoteData.com</h1>

   <div id="map" style="width: 950px; height: 400px; padding-right:10px;"></div>

  </div>


       <p>UWIRemotedata.com host information related to the profiles of major rivers aound the island of
jamaica. We continuously monitor various parameters of environmental and social

 importance. Particularly, we seek to ensure that anthropogenic activities (in particular, industrial and
agricultural mal-practises) do not negatively impact river ecosystems </p>




</div><!-- End of Container -->

</body>

</html>

Command:        AT+CIPCLOSE

Response:       CLOSE OK


Command:        AT+CIPSHUT

Response:       SHUT OK
```

References:

[1.] http://www.tcpipguide.com/free/t_HTTPMessagesMessageFormatsMethodsandStatusCodes.htm

[2.] https://vsblogs.wordpress.com/2013/11/28/tcp-connection-over-gprs-using-sim900-and-at-commands/

[3.] http://www.cooking-hacks.com/documentation/tutorials/arduino-gprs-gsm-quadband-sim900

[4.] https://roysoala.wordpress.com/2012/11/20/gprs-shield-sim900-arduino-get-data-application/

[5.] http://www.cyberciti.biz/tips/linux-increasing-or-decreasing-tcp-sockets-timeouts.html

[6.] http://forum.arduino.cc/index.php?topic=116867.0

[7.] https://vsblogs.wordpress.com/2013/11/28/tcp-connection-over-gprs-using-sim900-and-at-commands/

[8.] http://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers

[9.] http://www.tcpipguide.com/free/t_HTTPMessagesMessageFormatsMethodsandStatusCodes.htm

[10] http://www.cooking-hacks.com/skin/frontend/default/cooking/pdf/SIM900_AT_Command_Manual.pdf

Supporting Documents:

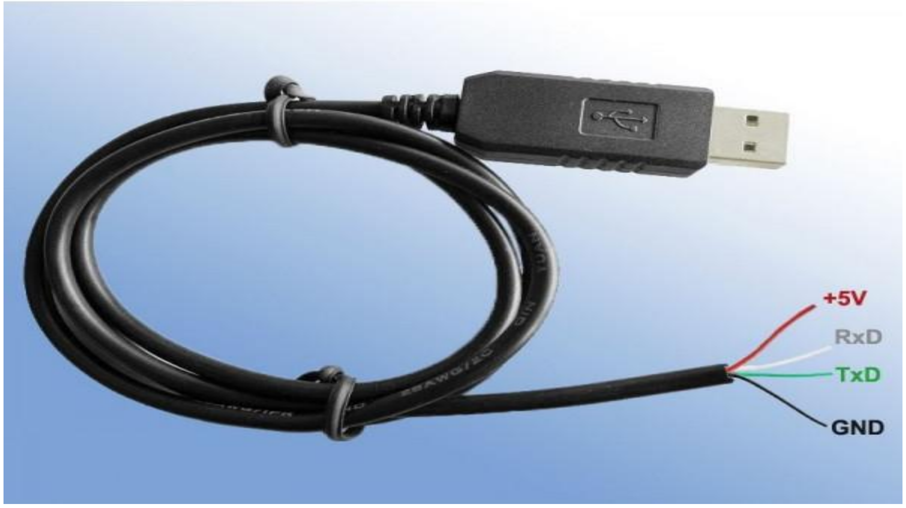
1) SIM900 AT COMMAND MANUAL_V1.05 (SIMCOM)

2)

Parts:

SIMCOM SIM900 GPRS_GSM MODEM with SIM CARD.

USB TO USART/UART CABLE



AND FINALLY A COMPUTER.