GS-AN045
S2W UDP, TCP, HTTP CONNECTION MANAGEMENT EXAMPLES

Table of Contents

1 Pre-Requirement

Please verify that the “Serial To Wi-Fi” application firmware binaries are loaded on the Gainspan module. For more details on the usage of AT commands described in this document, please refer to the “Serial-to-Wi-Fi Adapter Programming Guide.pdf” document.

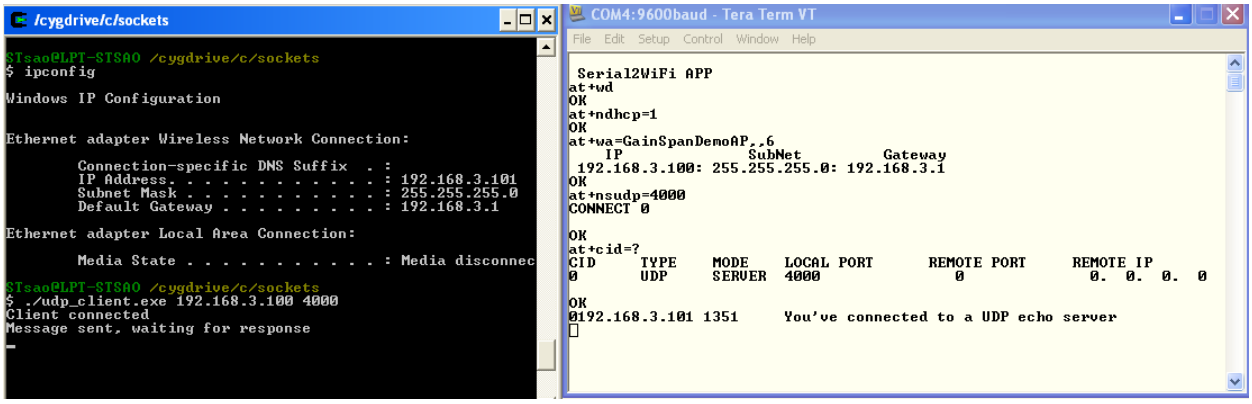
2 UDP

2.1 UDP Server

This section describes the steps to setup UDP Server on the Evaluation board using either command mode or auto-connect mode.

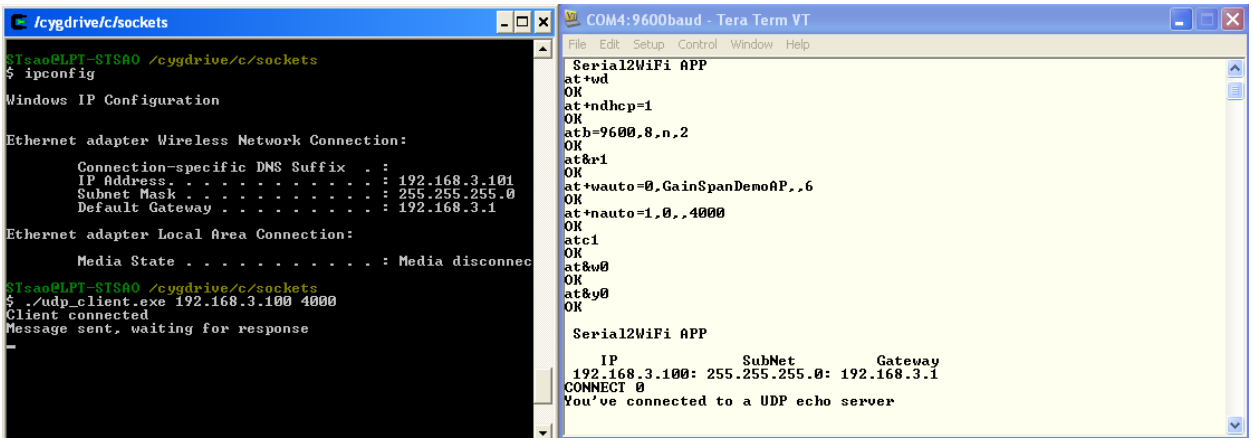
2.1.1 Command Mode

1. Disassociate from the current network
   - at+wd
2. Enable DHCP: *AT+NDHCP=<disable=0/enable=1>*
   - at+ndhcp=1
3. Associate to an access point: *AT+WA=<SSID>[,[<BSSID>][,<Ch>]]*
   - at+wa=GainSpanDemoAP,,6
4. Start a TCP server on a specific port number: *AT+NSUDP=<port>*
   - at+nsudp=4000
5. Upon successful creation of the UDP server, you will see a "CONNECT <CID> "message, where CID is the newly allocated connection identifier. You can check for this new CID by issuing the command: *AT+CID=?*
   - at+cid=?
6. User can now connect to this UDP server by:
   a. Have a PC connected to the GainSpanDemo AP
   b. In PC's command prompt, run UDP client with GS node's IP address (obtained from step 3), and the port number specified in step 4. For example: telnet 192.168.3.101 4000.
   c. Now anything you type in the client's command prompt window will be displayed on the TeraTerm. Here's an example.



2.1.2 Auto Connect Mode

1. Disassociate from the current network
   - ► at+wd
2. Enable DHCP: *AT+NDHCP=<disable=0/enable=1>*
   - ► at+ndhcp=1
3. Set the UART communication parameter:
   ATB=<baudrate>[[,<bitsperchar>][,<parity>][,<stopbits>]]
   - ► atb=9600,8,n,2
4. Enable hardware flow control: *AT&R< disable=0/enable=1>*
   - ► at&r1
5. Set the auto connection wireless parameters for the AP profile:
   AT+WAUTO=<mode: Infrastructure=0, Ad-hoc=1>,<ssid>,<bssid>,[channel]
   - ► at+wauto=0,GainSpanDemoAP,,6
6. Set the network parameters for auto connection operation for the current profile:
   AT+NAUTO=<client=0/server=1>,< udp=0/tcp=1>,<destination IP>,<destination port>
   Destination IP address is optional if the Adapter is acting as a server
   - ► at+nauto=1,0,,4000
7. Enable auto connection: *ATC<enable=1/disable=0>*
   - ► atc1
8. Save the current profile: *AT&W<profile0=0/profile1=1>*
   - ► at&w0
9. Select the default profile: *AT&Y<profile0=0/profile1=1>*
   - ► at&y0
10. Power off the Evaluation Board
11. Power on the Evaluation Board. The board is now in auto-connect mode where it will associate with GainSpanDemoAP, obtain an IP address using DHCP, and listens on port 4000. For example:



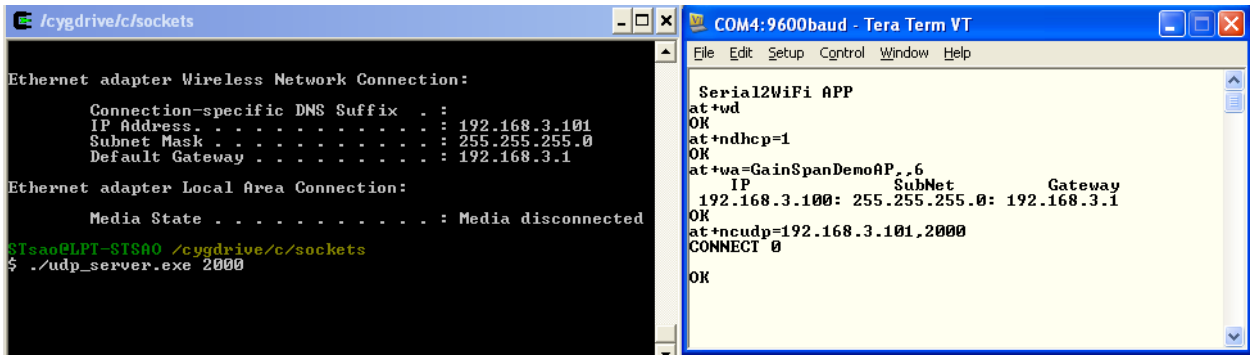
12. To exit out of the auto connection mode, enter the "+++" command, and wait for 1 second. After 1 second, the GS node will exit auto connect mode and enters command mode. Note, do not issue the "enter" key after "+++".
    - ► +++

2.2 UDP Client

This section describes the steps to setup UDP Client on the Evaluation board using either command mode or auto-connect mode.

2.2.1 Command Mode

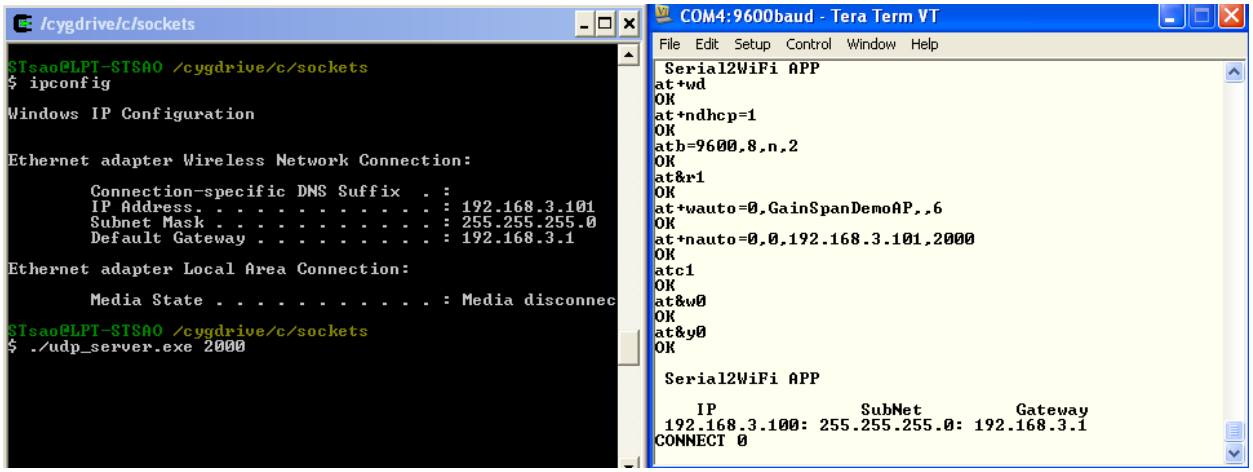
1. Disassociate from the current network
   - ► at+wd
2. Enable DHCP: *AT+NDHCP=<disable=0/enable=1>*
   - ► at+ndhcp=1
3. Associate to an access point: *AT+WA=<SSID>[,[<BSSID>][,<Ch>]]*
   - ► at+wa=GainSpanDemoAP,,6
4. Start a TCP server: *AT+NCUDP=<Dest-Address>,<Port>>[<,Src.Port>]*
   - ► at+ncudp=192.168.3.101,2000
5. Upon successful connection to the UDP server, you will see a "CONNECT <CID> " message, where CID is the newly allocated connection identifier



2.2.2 Auto Connect Mode

1. Disassociate from the current network
   - ► at+wd
2. Enable DHCP: *AT+NDHCP=<disable=0/enable=1>*
   - ► at+ndhcp=1
3. Set the UART communication parameter:
   ATB=<baudrate>[[,<bitsperchar>][,<parity>][,<stopbits>]]
   - ► atb=9600,8,n,2
4. Enable hardware flow control: *AT&R< disable=0/enable=1>*
   - ► at&r1
5. Set the auto connection wireless parameters for the AP profile:
   AT+WAUTO=<mode: Infrastructure=0, Ad-hoc=1>,<ssid>,<bssid>,[channel]
   - ► at+wauto=0,GainSpanDemoAP,,6

6. Set the network parameters for auto connection operation for the current profile:
   AT+NAUTO=<client=0/server=1>,< udp=0/tcp=1>,<destination IP>,<destination port>
   - ▶ at+nauto=0,0,192.168.3.101,2000
7. Enable auto connection: *ATC<enable=1/disable=0>*
   - ▶ atc1
8. Save the current profile: *AT&W<profile0=0/profile1=1>*
   - ▶ at&w0
9. Select the default profile: *AT&Y<profile0=0/profile1=1>*
   - ▶ at&y0
10. Power off the Evaluation Board
11. Power on the Evaluation Board. The board is now in auto-connect mode where it will associate with GainSpanDemoAP, obtain an IP address using DHCP, and connects to UDP server on port 2000. Here's an example:



12. To exit out of the auto connection mode, enter the "+++" command, and wait for 1 second. After 1 second, the GS node will exit auto connect mode and enters command mode. Note, do not issue the "enter" key after "+++".
    - ▶ +++

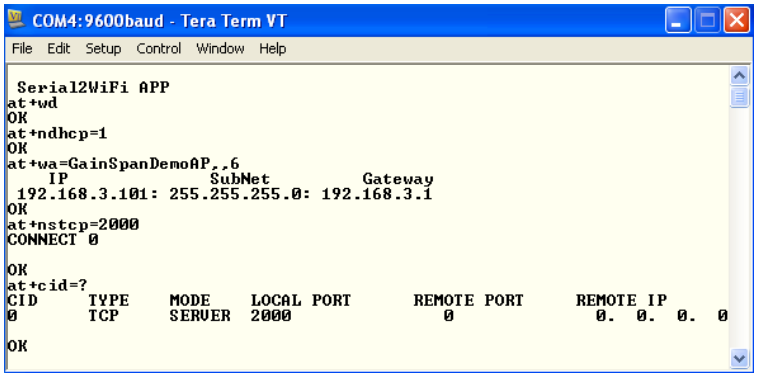
3 TCP

3.1 TCP Server

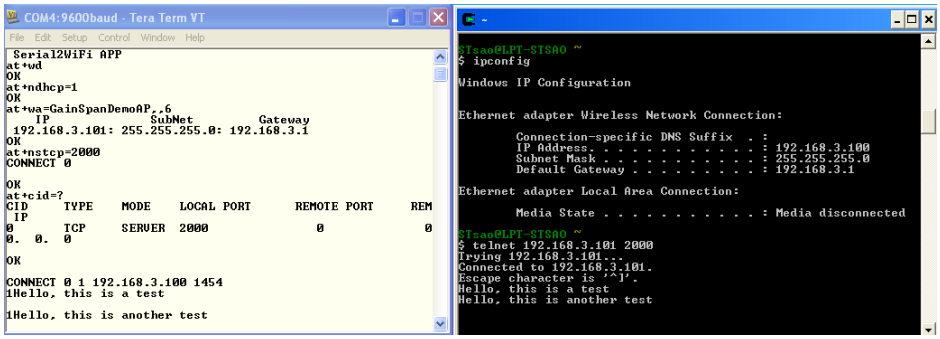
This section describes the steps to setup TCP Server on the Evaluation board using either command mode or auto-connect mode.

3.1.1 Command Mode

1. Disassociate from the current network
   - at+wd
2. Enable DHCP: *AT+NDHCP=<disable=0/enable=1>*
   - at+ndhcp=1
3. Associate to an access point: *AT+WA=<SSID>[,[<BSSID>][,<Ch>]]*
   - at+wa=GainSpanDemoAP,,6
4. Start a TCP server: *AT+NSTCP=<port>*
   - at+nstcp=2000
5. Upon successful creation of the TCP server, you will see a "CONNECT <CID> " message, where CID is the newly allocated connection identifier. You can check for this new CID by issuing the command: *AT+CID=?*
   - at+cid=?



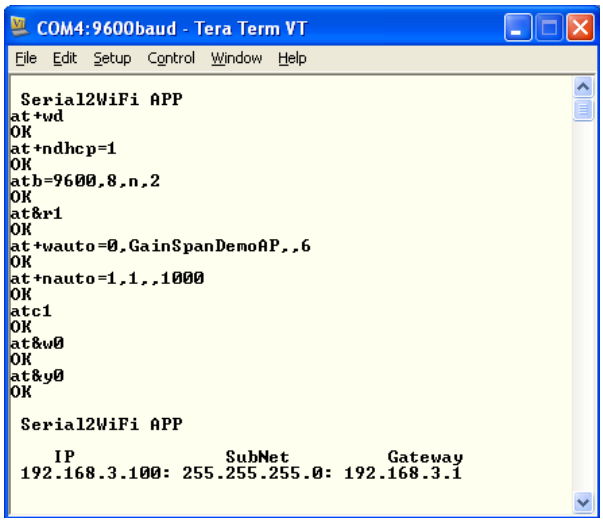
6. User can now telnet into this server by:
    a. Have a PC connected to the GainSpanDemo AP
    b. In PC's command prompt, issue the command:
        telnet <IP address from step 3> <port number set in step 6>
        For example: telnet 192.168.3.101at 2000
    c. Now anything you type in the command prompt window will be displayed on the TeraTerm.



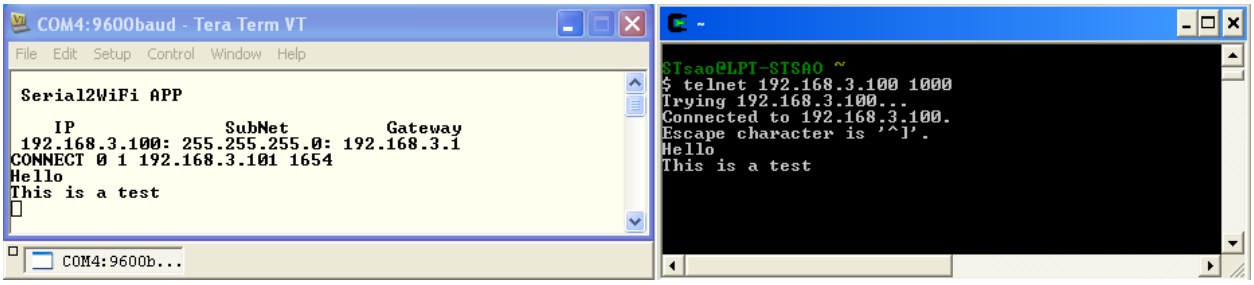
3.1.2 Auto Connect Mode

1. Disassociate from the current network
    ► at+wd
2. Enable DHCP: *AT+NDHCP=<disable=0/enable=1>*
    ► at+ndhcp=1
3. Set the UART communication parameter:
    ATB=<baudrate>[[,<bitsperchar>][,<parity>][,<stopbits>]]
    ► atb=9600,8,n,2
4. Enable hardware flow control: *AT&R< disable=0/enable=1>*
    ► at&r1
5. Set the auto connection wireless parameters for the AP profile:
    AT+WAUTO=<mode: Infrastructure=0, Ad-hoc=1>,<ssid>,<bssid>,[channel]
    ► at+wauto=0,GainSpanDemoAP,,6
6. Set the network parameters for auto connection operation for the current profile:
    AT+NAUTO=<client=0/server=1>,< udp=0/tcp=1>,<destination IP>,<destination port>
    Destination IP address is optional if the Adapter is acting as a server
    ► at+nauto=1,1,,1000
7. Enable auto connection: *ATC<enable=1/disable=0>*
    ► atc1
8. Save the current profile: *AT&W<profile0=0/profile1=1>*
    ► at&w0
9. Select the default profile: *AT&Y<profile0=0/profile1=1>*
    ► at&y0
10. Power off the Evaluation Board

11. Power on the Evaluation Board. The board is now in auto-connect mode where it will associate with GainSpanDemoAP, obtain an IP address using DHCP, and listens on port 1000. In the following example, the board got an IP address 192.168.3.100.



12. User can now telnet into this server by:
    a. Have a PC connected to the GainSpanDemo AP
    b. In PC's command prompt, issue the command:
       telnet <IP address from step 11> <port number set in step 6>
       For example: telnet 192.168.3.100 1000
    c. Now anything you type in the command prompt window will be displayed on the TeraTerm. Here's an example.



To exit out of the auto connection mode and restore all settings to factory defaults:

13. Switch to command mode
    ▶ +++
14. Reset to factory defaults
    ▶ at&f
15. Save the current profile using the profile number in step 8
    ▶ at&w0
16. Set the default profile to be the same as that in step 15
    ▶ at&y0
17. Power cycle the evaluation board and the board will power on in command mode

3.2 TCP Client

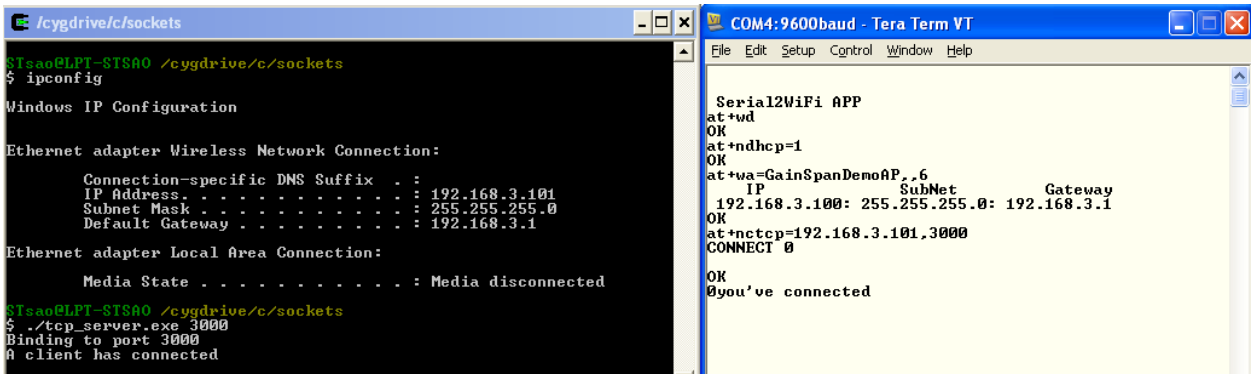
This section describes the steps to setup TCP Client on the Evaluation board using either command mode or auto-connect mode.

3.2.1 Command Mode

Before you start, have a PC connect to the GainSpanDemoAP and start a TCP server on a specific port number. This example uses port 3000.

1. Disassociate from the current network
   - at+wd
2. Enable DHCP: *AT+NDHCP=<disable=0/enable=1>*
   - at+ndhcp=1
3. Associate to an access point: *AT+WA=<SSID>[,[<BSSID>][,<Ch>]]*
   - at+wa=GainSpanDemoAP,,6
4. Start a TCP client: *AT+ NCTCP=<Dest-Address>,<Port>*
   - at+nctcp=192.168.3.101,3000

Upon successful connection to the TCP server, you will see a "CONNECT <CID> " message, where CID is the newly allocated connection identifier. Here's an example:



3.2.2 Auto Connect Mode

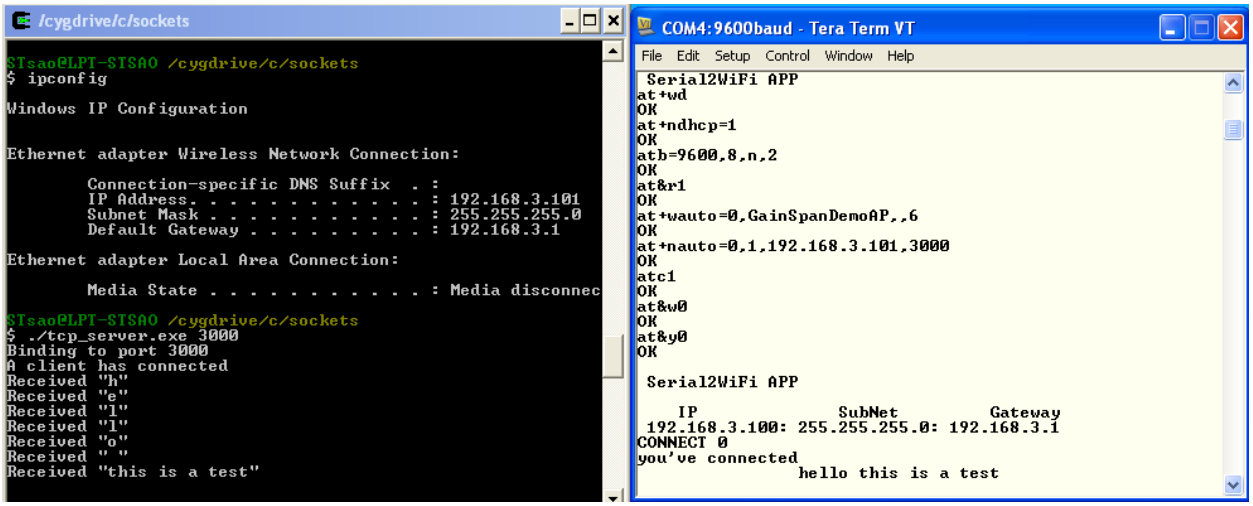
Before you start, have a PC connect to the GainSpanDemoAP and start a TCP server on a specific port number. This example uses port 3000.

1. Disassociate from the current network
   - at+wd
2. Enable DHCP: *AT+NDHCP=<disable=0/enable=1>*
   - at+ndhcp=1
3. Set the UART communication parameter:
   ATB=<baudrate>[[,<bitsperchar>][,<parity>][,<stopbits>]]

- atb=9600,8,n,2

4. Enable hardware flow control: *AT&R< disable=0/enable=1>*
   - at&r1
5. Set the auto connection wireless parameters for the AP profile:
   AT+WAUTO=<mode: Infrastructure=0, Ad-hoc=1>,<ssid>,<bssid>,[channel]
   - at+wauto=0,GainSpanDemoAP,,6
6. Set the network parameters for auto connection operation for the current profile:
   AT+NAUTO=<client=0/server=1>,< udp=0/tcp=1>,<destination IP>,<destination port>
   - at+nauto=0,1,192.168.3.101,3000
7. Enable auto connection: *ATC<enable=1/disable=0>*
   - atc1
8. Save the current profile: *AT&W<profile0=0/profile1=1>*
   - at&w0
9. Select the default profile: *AT&Y<profile0=0/profile1=1>*
   - at&y0
10. Power off the Evaluation Board

11. Power on the Evaluation Board. The board is now in auto-connect mode where it will associate with GainSpanDemoAP, obtain an IP address using DHCP, and connect to the TCP server at 192.168.3.101 on port 3000. If connection to the server is successful, you will see "CONNECT <CID>" followed by "you've connected" message. Anything you type in TeraTerm will be received by the TCP server. Here's an example:



12. To exit out of the auto connection mode, enter the "+++" command, and wait for 1 second. After 1 second, the GS node will exit auto connect mode and enters command mode. Note, do not issue the "enter" key after "+++".
    - +++

4 HTTP

This sections provides instructions to install Apache server in Windows and provides several HTTP GET/POST examples using the Serial To Wi-Fi application.

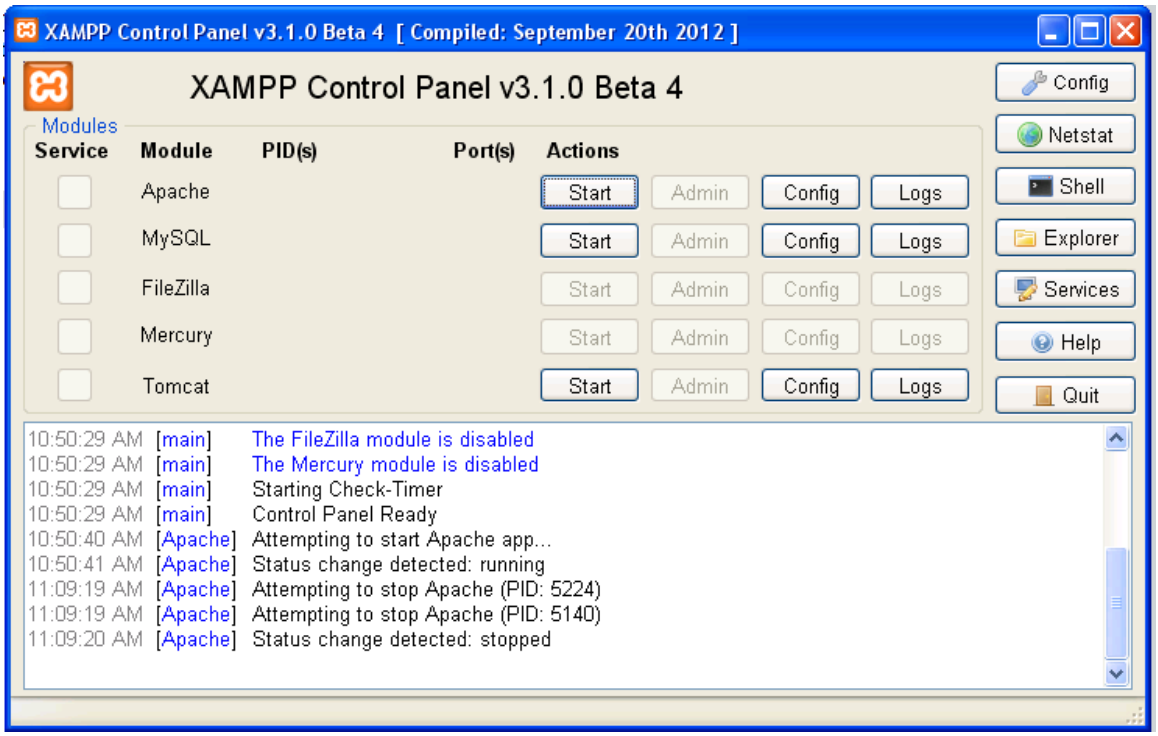
4.1 Installing Apache Server

4.1.1 Install Apache Server in Windows

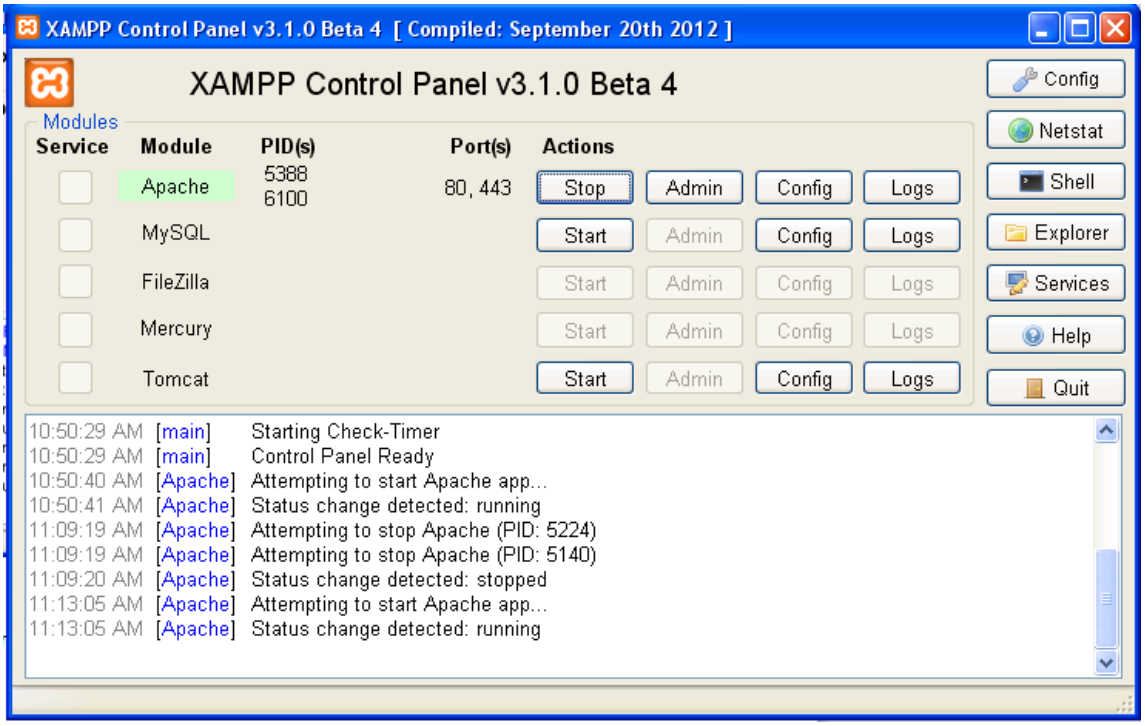
1. Download XAMPP for Windows from the following web link http://www.apachefriends.org/en/xampp-windows.html
2. Run the setup file to install XAMPP. All the files would be extracted to C:\xampp\. Please note to turn off your network connections and all web browsers to avoid any error during the installation process.

4.1.2 Run Apache Web Server

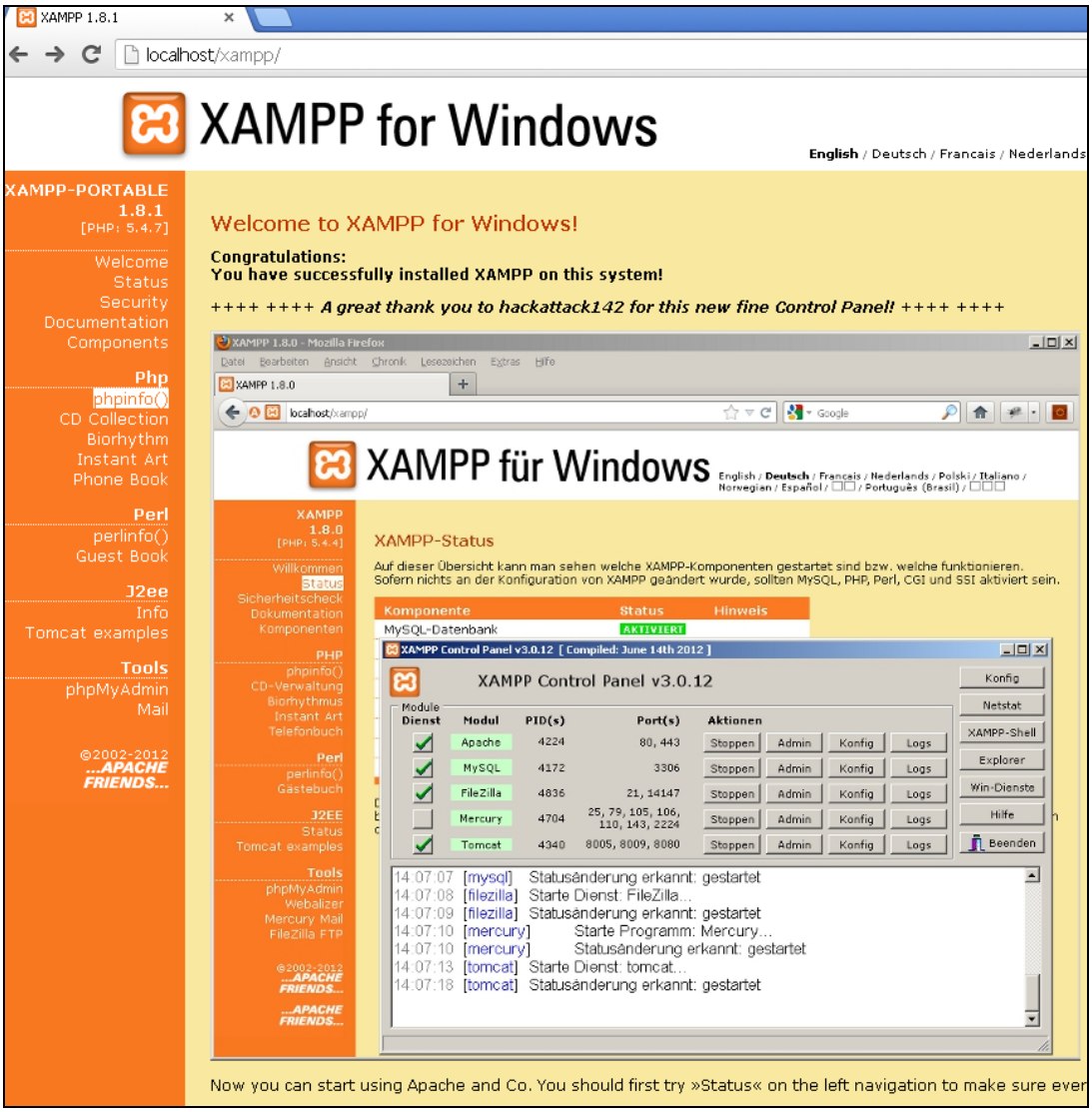
1. Browse to C:\xampp\ and run xampp-control.exe. The xampp control panel is as shown



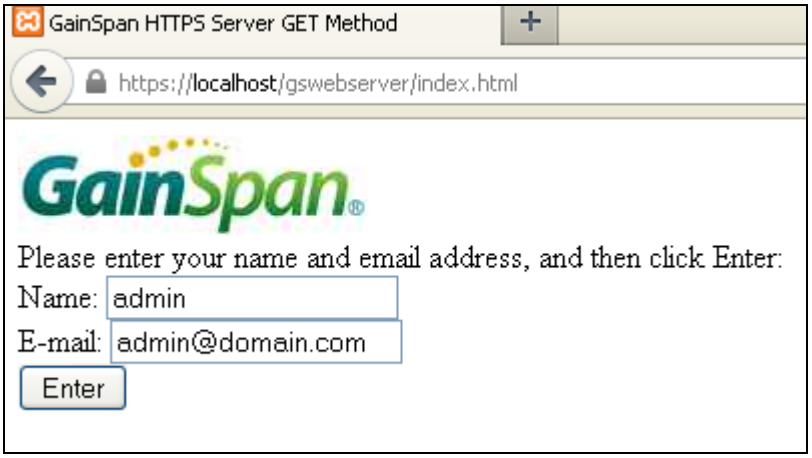
2. Click on the 'Start' button to start the Apache Web server.



3. After starting of Apache, go to the address http://localhost/ or http://127.0.0.1/ in your browser. This verifies that the web server is running properly.



4. GainSpan provides several example web pages for users to verify that the apache server is configured properly to access the web pages. Copy the Gainspan example "gswebserver" folder into C:\xampp\htdocs\.
    a. To test the index.html web page, open a web browser and go to the address http://localhost/gswebserver/index.html or http://127.0.0.1/gswebserver/index.html.



Enter the Name and E-mail details and click on Enter.

b. To test the post.html web page, open a web browser and go to the address http://localhost/gswebserver/post.html or http://127.0.0.1/gswebserver/post.html.

Enter the Name and click on Enter.

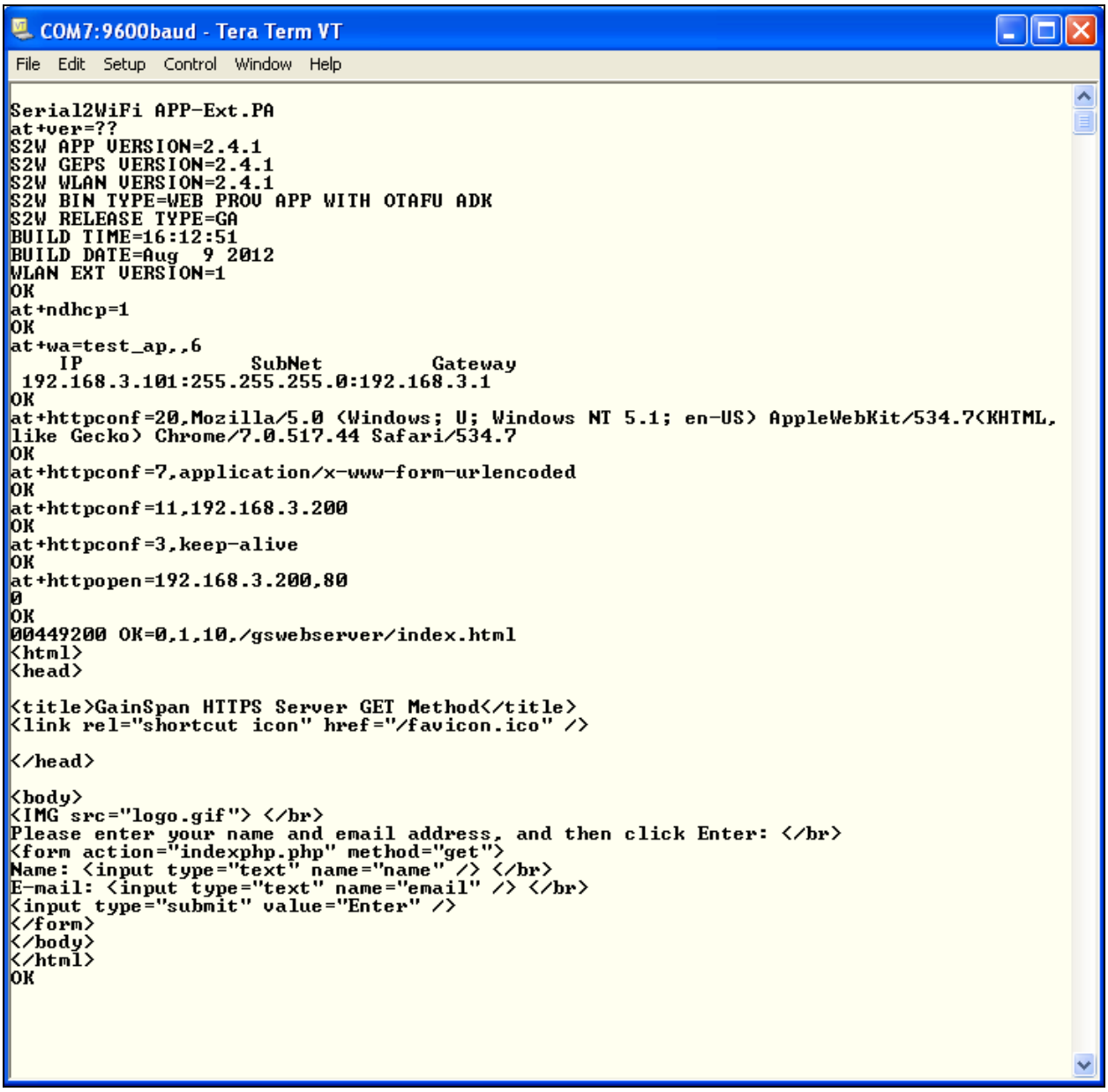
4.2 HTTP GET EXAMPLES

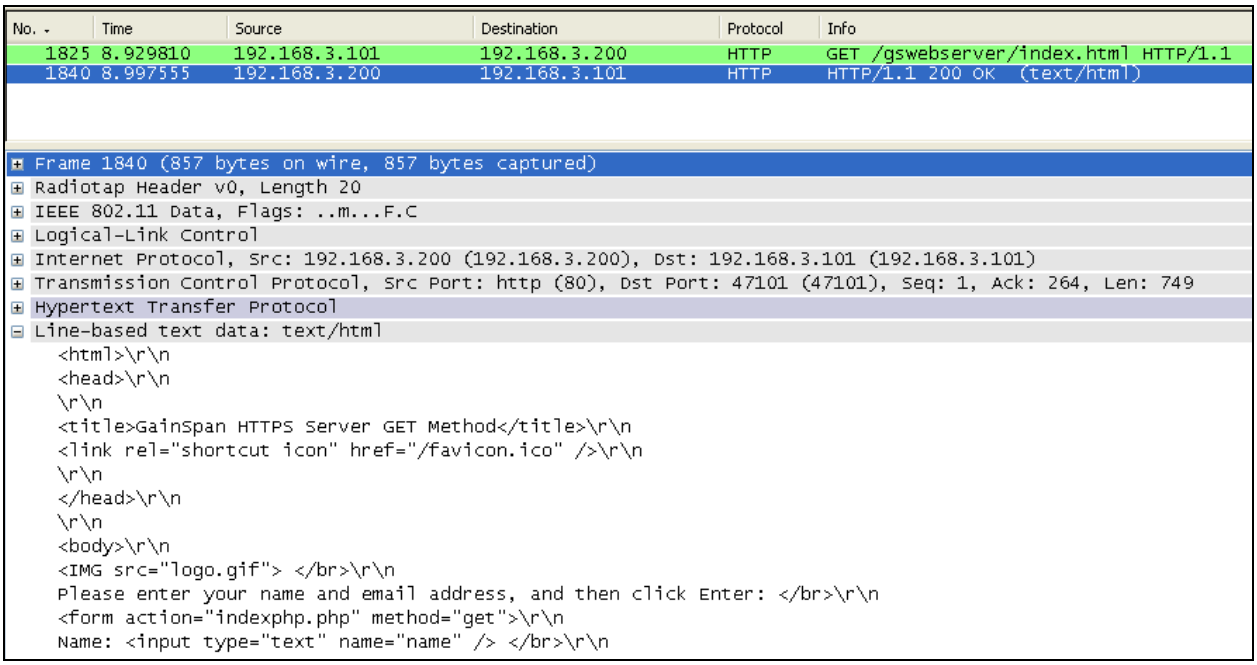
This section describes the steps to perform a HTTP GET using the Serial2WiFi application.

4.2.1 Example: HTTP GET on local Apache Server

This example shows how to do HTTP GET on a local Apache Server. Setup GSN as HTTP Client, and access the HTTP Server running on the Windows PC.

1. Associate with AP
   at+ndhcp=1
   at+wa=test_ap,,6
2. Configure thte HTTP parameters:
   at+httpconf=20,Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US) AppleWebKit/534.7 (KHTML, like Gecko) Chrome/7.0.517.44 Safari/534.7
   at+httpconf=7,application/x-www-form-urlencoded
   at+httpconf=11,192.168.3.200
   at+httpconf=3,keep-alive
3. Initiate HTTP client connection to the server
   at+httpopen=192.168.3.200,80
4. Do HTTP GET
   at+httpsend=0,1,10,/gswebserver/index.html


COM7:9600baud - Tera Term VT
File Edit Setup Control Window Help
Serial2WiFi APP-Ext.PA
at+ver=??
S2W APP VERSION=2.4.1
S2W GEPS VERSION=2.4.1
S2W WLAN VERSION=2.4.1
S2W BIN TYPE=WEB PROV APP WITH OTAFU ADK
S2W RELEASE TYPE=GA
BUILD TIME=16:12:51
BUILD DATE=Aug 9 2012
WLAN EXT VERSION=1
OK
at+ndhcp=1
OK
at+wa=test_ap,,6
IP SubNet Gateway
192.168.3.101:255.255.255.0:192.168.3.1
OK
at+httpconf=20,Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US) AppleWebKit/534.7(KHTML, like Gecko) Chrome/7.0.517.44 Safari/534.7
OK
at+httpconf=7,application/x-www-form-urlencoded
OK
at+httpconf=11,192.168.3.200
OK
at+httpconf=3,keep-alive
OK
at+httpopen=192.168.3.200,80
0
OK
00449200 OK=0,1,10,/gswebserver/index.html
<html>
<head>
<title>GainSpan HTTPS Server GET Method</title>
<link rel="shortcut icon" href="/favicon.ico" />
</head>
<body>
<IMG src="logo.gif"> </br>
Please enter your name and email address, and then click Enter: </br>
<form action="indexphp.php" method="get">
Name: <input type="text" name="name" /> </br>
E-mail: <input type="text" name="email" /> </br>
<input type="submit" value="Enter" />
</form>
</body>
</html>
OK



4.2.2 Example: HTTP GET on Gainspan.com

This example shows how to do HTTP GET on Gainspan web site.

1. Disassociate from the current network
   - at+wd
2. Enable DHCP
   - at+ndhcp=1
3. Perform network scan
   - at+ws
4. If AP security is open, then skip this step. If AP is using WPA-PSK/TKIP, then set the WPA passphrase with the following command:
   - at+wwpa=<*WPA-PASSWORD*>
5. Associate to a specified SSID, BSSID, and channel. at+wa=<SSID>,<BSSID>,<CHANNEL>
   - at+wa=GainSpanDemoAP,,6
6. Query DNS server for the IP address of hostname URL
   - at+dnslookup=www.gainspan.com
7. Configure the HTTP header parameter "GSN_HTTP_HEADER_USER_AGENT"
   - at+httpconf=20,User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.9.1.9) Gecko/20100315 Firefox/3.5.9
8. Configure the HTTP header connection parameter "GSN_HTTP_HEADER_CONNECTION". If it is a one-time HTTP GET, set the parameter to "close"
   - at+httpconf=3, close

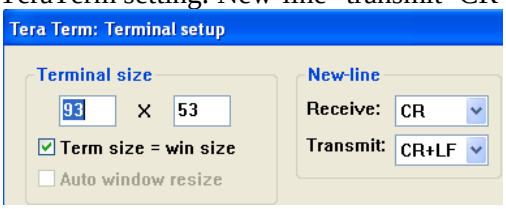
   If user wants to do consecutive HTTP GET on the same CID, and given that a server do keep the connection open after HTTP GET is complete, set the parameter to "keep alive"
   - at+httpconf=3, keep-alive
9. Configure the HTTP header host parameter "GSN_HTTP_HEADER_HOST"

- ► at+httpconf=11,76.12.140.77

10. Open HTTP client connection. This will return a unique CID.
    - ► at+httpopen=76.12.140.77
11. Send HTTP request to the server using the CID from the previous step
    at+httpsend=<CID>, <type: get=1, post=3>, <timeout>, <page>[,size of the content]
    - ► at+httpsend=0,1,10,/

4.2.3 Example: HTTP GET on Gainspan.com

1. Change the TeraTerm setting: New-line "transmit=CR+LF"



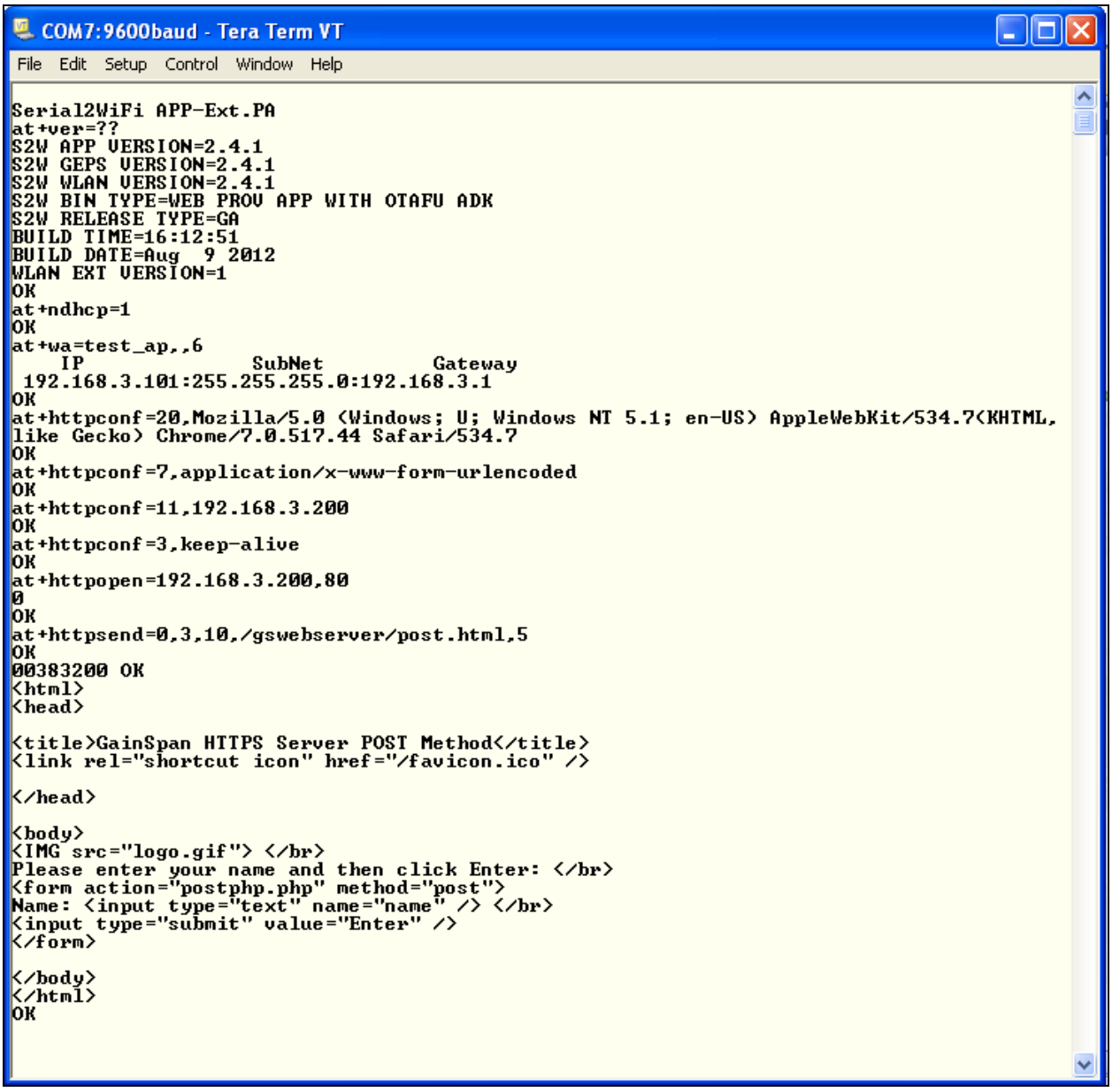
2. Associate with AP
   AT+NDHCP=1
   AT+WWPA=password
   AT+WA=GS-Guest,,01
3. Start TCP Client to the GainSpan IP and port 80
   AT+NCTCP=76.12.140.77,80
4. Send data to remote server by using the <ESC>S sequence and the CID number:
   Enter the [ESC] key
   Enter the [S] key
   Enter the [CID number from step 3]
5. Copy the highlighted text (the new line should also be copied), and paste it on TeraTerm (via the "Edit" menu, choose "Paste" Option)
   GET / HTTP/1.1
   User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.9.1.9) Gecko/20100315 Firefox/3.5.9
   Host: 76.12.140.77:80
   Accept: */*
   Connection: keep-alive
   [new line]
   [new line]
6. Indicate end of transmission by using the <ESC>E sequence:
   Enter the [ESC] key
   Enter the [E] key
7. The output of HTTP GET will now be displayed as output on TeraTerm. Since the GainSpan HTTP server closes the connection after HTTP GET is complete, you will see the following output message:
   DISCONNECT <cid>
8. To issue another HTTP GET, repeat step 2-6. If the HTTP server closes the connection after the HTTP GET is complete, then user must issue a HTTP OPEN prior to every HTTP GET. Gainspan.com is an example of such server.

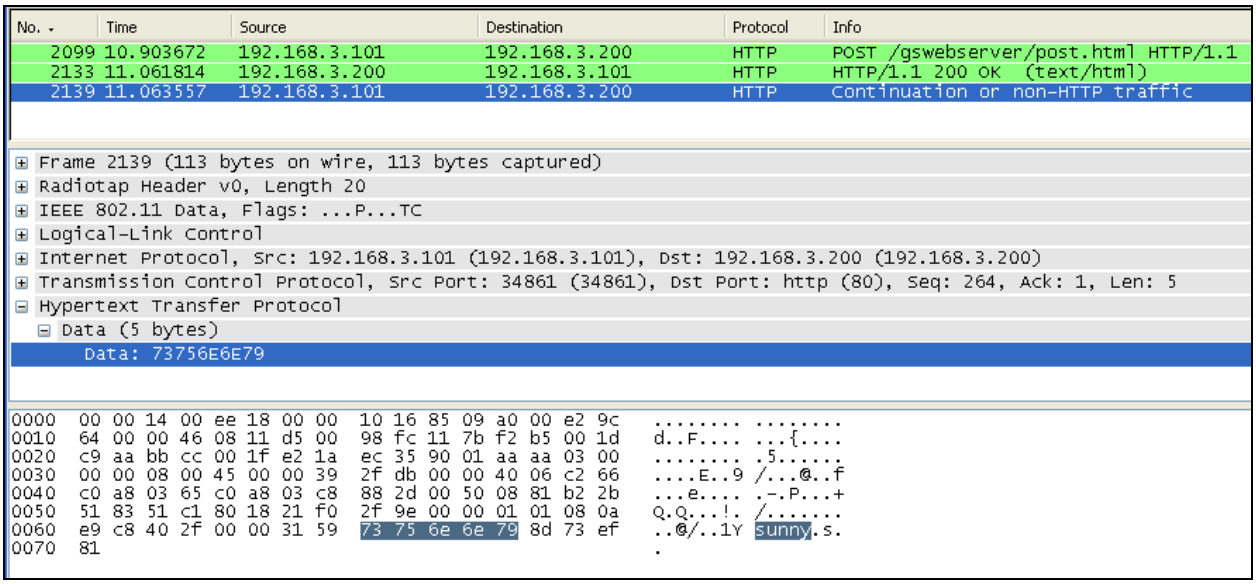
4.3 HTTP POST Examples

This section describes the steps to perform a HTTP POST command using the Serial2WiFi application.

4.3.1 Example: HTTP POST on Local Apache Server

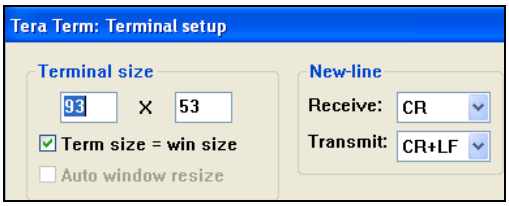
1. Associate with AP
   at+ndhcp=1
   at+wa=test_ap,,6
2. Configure thte HTTP parameters:
   at+httpconf=20,Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US) AppleWebKit/534.7 (KHTML, like Gecko) Chrome/7.0.517.44 Safari/534.7
   at+httpconf=7,application/x-www-form-urlencoded
   at+httpconf=11,192.168.3.200
   at+httpconf=3,keep-alive
3. Initiate HTTP client connection to the server
   at+httpopen=192.168.3.200,80
4. Do HTTP POST
   at+httpsend=0,3,10,/gswebserver/post.html,5
   - Enter the [ESC] key
   - Enter the [H] key
   - Enter the CID
   - Enter the text you want to POST.


COM7:9600baud - Tera Term VT
File Edit Setup Control Window Help
Serial2WiFi APP-Ext.PA
at+ver=??
S2W APP VERSION=2.4.1
S2W GEPS VERSION=2.4.1
S2W WLAN VERSION=2.4.1
S2W BIN TYPE=WEB PROV APP WITH OTAFU ADK
S2W RELEASE TYPE=GA
BUILD TIME=16:12:51
BUILD DATE=Aug 9 2012
WLAN EXT VERSION=1
OK
at+ndhcp=1
OK
at+wa=test_ap,,6
IP SubNet Gateway
192.168.3.101:255.255.255.0:192.168.3.1
OK
at+httpconf=20,Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US) AppleWebKit/534.7(KHTML, like Gecko) Chrome/7.0.517.44 Safari/534.7
OK
at+httpconf=7,application/x-www-form-urlencoded
OK
at+httpconf=11,192.168.3.200
OK
at+httpconf=3,keep-alive
OK
at+httpopen=192.168.3.200,80
0
OK
at+httpsend=0,3,10,/gswebserver/post.html,5
OK
00383200 OK
<html>
<head>
<title>GainSpan HTTPS Server POST Method</title>
<link rel="shortcut icon" href="/favicon.ico" />
</head>
<body>
<IMG src="logo.gif"> </br>
Please enter your name and then click Enter: </br>
<form action="postphp.php" method="post">
Name: <input type="text" name="name" /> </br>
<input type="submit" value="Enter" />
</form>
</body>
</html>
OK



4.3.2 Example: HTTP Post to Pachube.com

1. Change the TeraTerm setting: New-line "transmit=CR+LF"

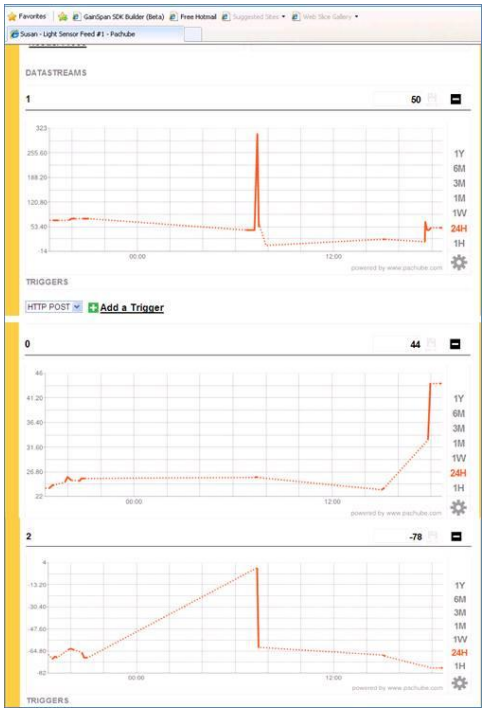


2. Associate with AP
   AT+NDHCP=1
   AT+WWPA=password
   AT+WA=GS-Guest,,01
3. Start TCP Client to Google's IP and port 80
   AT+NCTCP=173.203.98.29,80
4. Send data to remote server by using the <ESC>S sequence and the CID number:
   Enter the [ESC] key
   Enter the [S] key
   Enter the [CID number from step 3]
5. Copy the highlighted text, and paste it on TeraTerm (via the "Edit" menu, choose "Paste" Option)
   PUT /v2/feeds/11366.csv HTTP/1.1
   User-Agent: curl/7.19.5 (i486-pc-linux-gnu) libcurl/7.19.5 OpenSSL/0.9.8g zlib/1.2.3.3 libidn/1.15
   Host: api.pachube.com
   Accept: */*
   X-PachubeApiKey: 103338a658c84debc9d4d0609362056882b6ccaa312d3de7fbde57e592630007
   Content-Length: 4
   Content-Type: application/x-www-form-urlencoded

1,44

6. Indicate end of transmission by using the <ESC>E sequence:
   Enter the [ESC] key
   Enter the [E] key
7. You should now see the data “1,44” on http://pachube.com/feeds/11366
8. Close current connection:
   AT+NCLOSE=0
9. Start a connection to the Pachube.com IP and port 80
   AT+NCTCP=173.203.98.29,80
10. Send data to remote server by using the <ESC>S sequence and the CID number:
    Enter the [ESC] [S][CID number from step 9]
11. Copy the highlighted text, and paste it on TeraTerm (via the "Edit" menu, choose "Paste" Option)
    PUT /v2/feeds/11366.csv HTTP/1.1
    User-Agent: curl/7.19.5 (i486-pc-linux-gnu) libcurl/7.19.5 OpenSSL/0.9.8g zlib/1.2.3.3 libidn/1.15
    Host: api.pachube.com
    Accept: */*
    X-PachubeApiKey: 103338a658c84debc9d4d0609362056882b6ccaa312d3de7fbde57e592630007
    Content-Length: 4
    Content-Type: application/x-www-form-urlencoded

    0,19
12. Indicate end of transmission by using the <ESC>E sequence:
    Enter the [ESC] key
    Enter the [E] key
13. You should now see the data “0,19” on http://pachube.com/feeds/11366
14. To post another set of data points to Pachube.com, just repeat step 8-12



5 Limited AP

Use the following steps to create a limited AP.

- Set the security type.
- Create the limited AP.
- Enable DHCP server, if needed.
- Enable DNS server, if needed.

Configuring security type to WEP, WPA/WPA2:

To configure security type to WEP, issue the following AT commands:

- AT+WAUTH to 1 or 2 for open or shared authentication
- AT+WWEPn to configure the WEP key.

When using GEPS version 2.3.x and 3.3.x:

- To configure module as Limited AP with WEP security, one should use the Serial to WiFi "Web Server Provisioning" application binaries.
- To configure module as Limited AP with WPA/WPA2 security, one needs to program the Serial to WiFi "Secure Web Server Provisioning" application binaries.

Configuring security type to WPA/WPA2:

To configure security type to WEP, issue the following AT commands:

- AT+WSEC to 4, 8 or 64 for WPA-PSK TKIP, WPA2-PSK AES or WPA2-PSK AES-TKIP correspondingly.
- AT+WAUTH to 0.
- AT+WWPA, AT+WPAPSK or AT+WPSK commands for configuring the key and passphrase.

When using GEPS version 2.4.x and 3.4.x:

- To configure module as Limited AP with WEP security, one should use the Serial to WiFi "Web Prov+OTA FWU" application binaries.
- To configure module as Limited AP with WPA/WPA2 security, one needs to program the Serial to WiFi "EAP +OTA FWU" application binaries.

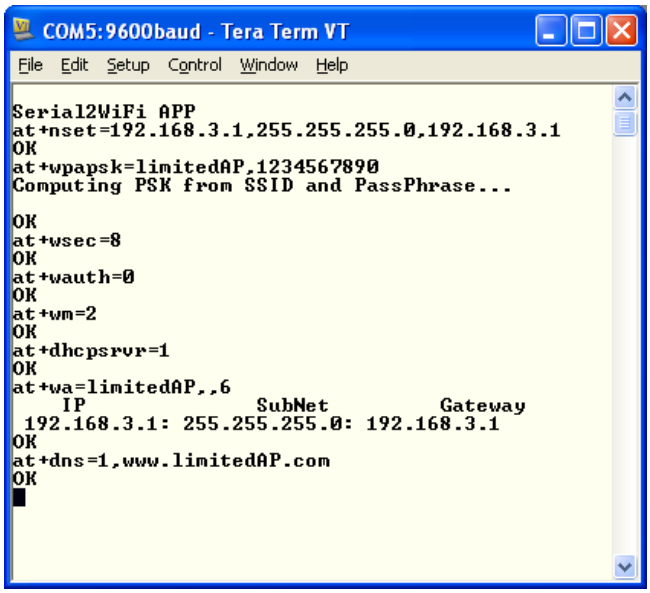
Enabling DHCP server

To enable/disable the DHCP server, issue the AT command: AT+DHCPSRVR=<0/1>.

Make certain to configure the preferred IP address by using AT+NSET command before issuing this command. The DHCP server will automatically start allocating IP address one higher than the assigned IP address to the node.

5.1 Example: Creating Limited AP in WPA2-PSK mode with DHCP and DNS server enabled

1. Configure network stack parameter: *AT+NSET=<Src Addr>,<Net-Mask>,<Gateway>*
   AT+NSET=192.168.3.1,255.255.255.0,192.168.3.1
2. Compute WPA2-PSK from a given SSID and Passphrase: *AT+WPAPSK=<SSID>,<PASSPHRASE>*
   AT+WPAPSK=limitedAP,1234567890
3. Configure security to WPA2-PSK: *AT+WSEC=<n>*
   AT+WSEC=8
4. Configure authentication mode to NONE: *AT+WAUTH=<none,WPA/WP2=0, open=1, WEP=2>*
   AT+WAUTH=0
5. Configure wireless mode to Limited AP: *AT+WM=<infrastructure=0, ad hoc=1,limited AP = 2>*
   AT+WM=2
6. Start the DHCP server: *AT+DHCPSRVR=<disable=0/enable=1>*
   AT+DHCPSRVR=1
7. Create the infrastructure network:
   AT+WA=<SSID>[,[<BSSID>][,<Ch>]]
   AT+WA=limitedAP,,6
8. Start the DNS server and specify a DNS name:
   AT+DNS=<disable=0/enable=1, <url>
   AT+DNS= 1,www.limitedAP.com

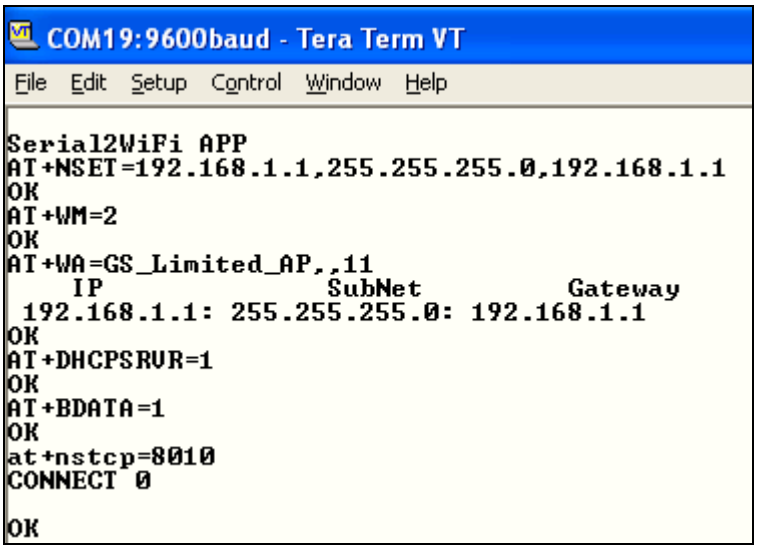


5.2 Example: Creating Limited AP in Open Security mode with TCP server enabled

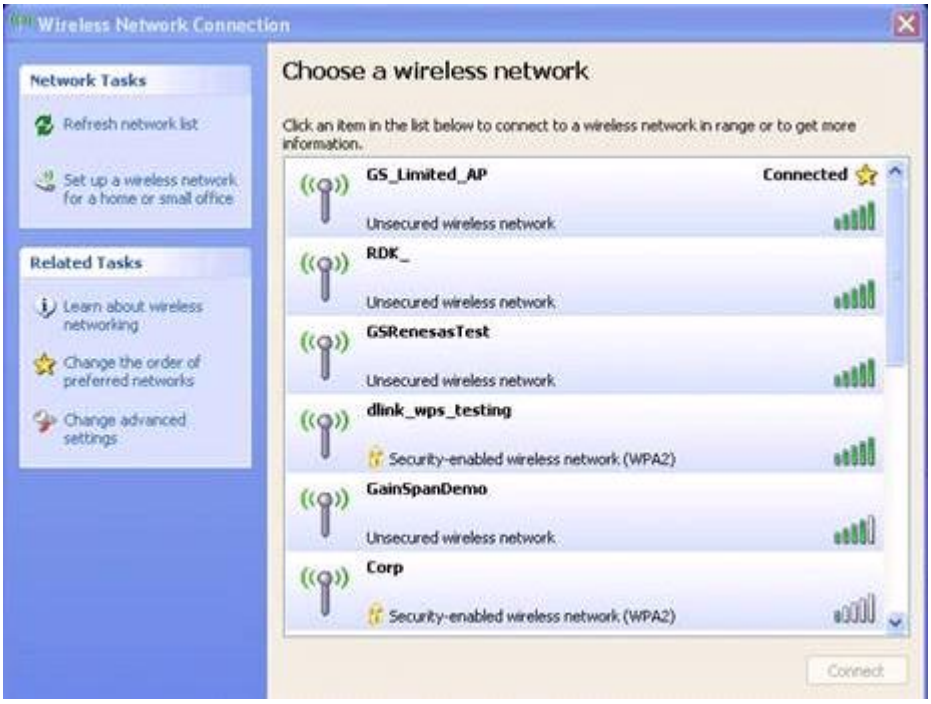
1. Issue the following AT command sequence to create a Limited AP and start TCP server on port 8010.

```
AT+NSET=192.168.1.1,255.255.255.0,192.168.1.1
AT+WM=2
AT+WA=GS_Limited_AP,,11
AT+DHCPSRVR=1
AT+BDATA=1
AT+NSTCP=8010
```

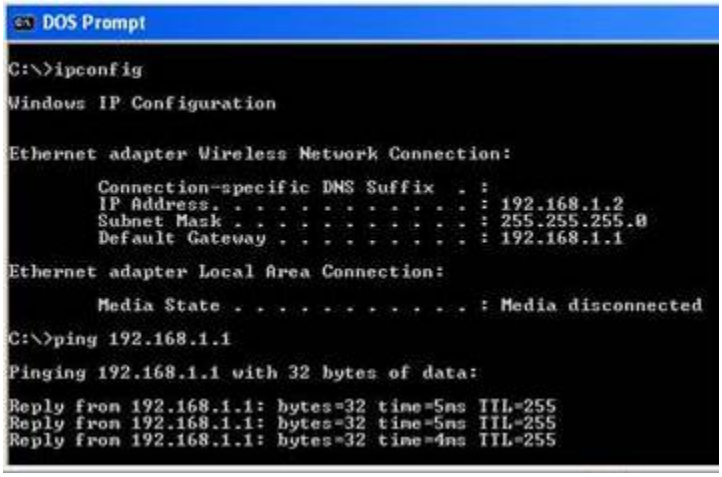
Example output in TeraTerm:



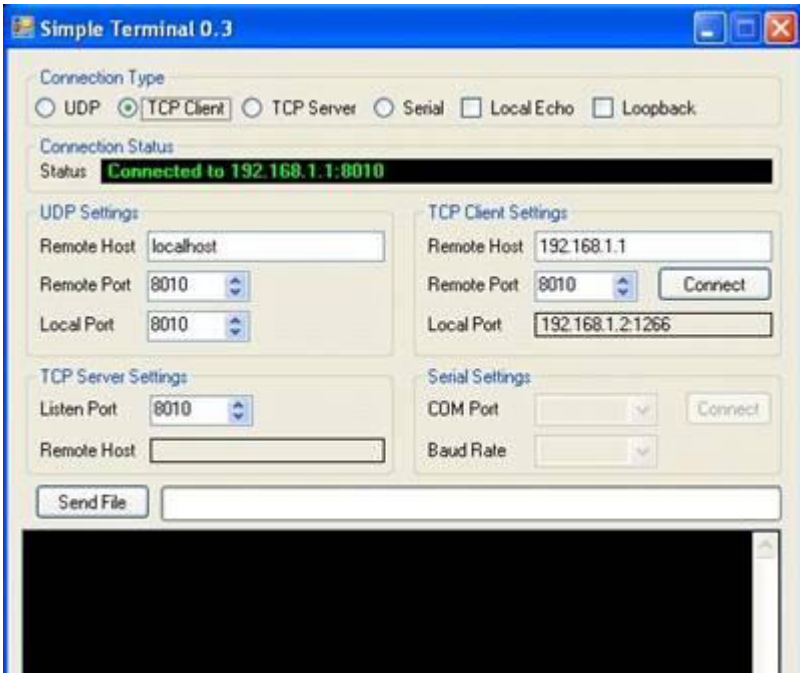
2. PC connected to “GS_Limited_AP”.



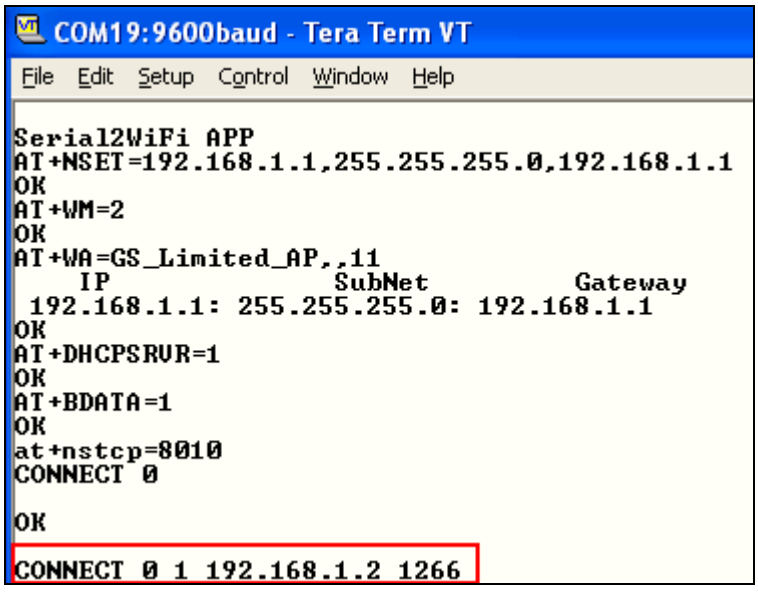
3. Confirm connection is established, ping to 192.168.1.1 from the PC:



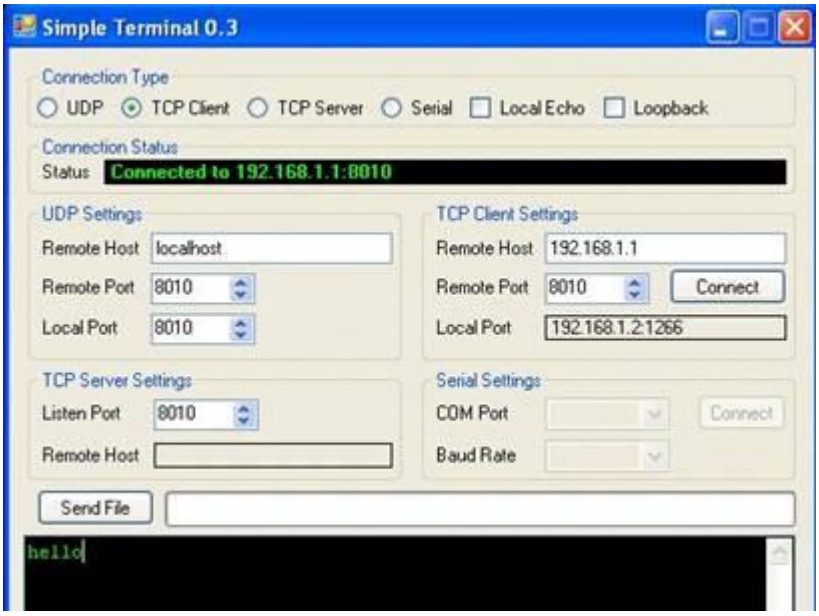
4. On the PC, launch the SimpleTerm and connect to GS1011M (example: 192.168.1.1 8010):



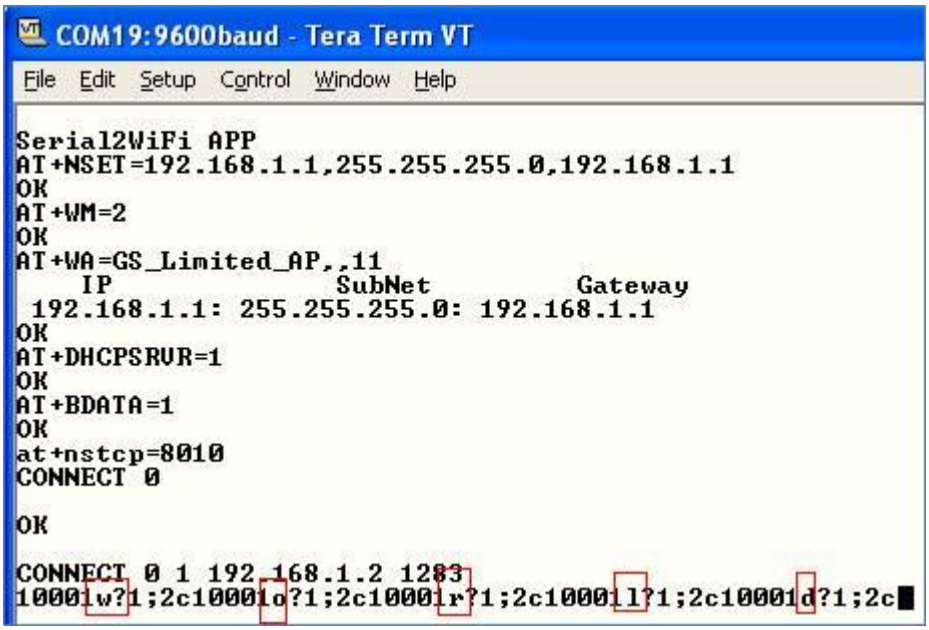
5. Upon successful TCP connection, locate the "CONNECT <CID> <CID> <IP Address> <Port number" message displayed on TeraTerm:



6. To send data (for example: hello) from TCP Server (GS1011M) to TCP client (SimpleTerm), go to TeraTerm and enter: <ESC>Z10005hello. You should now see "hello" received in the Simple Terminal window:



7. If you want to send data from TCP client to TCP server, simply enter any text in the Simple Terminal window. In the example shown below, user entered the text "world" slowly in the Simple Term, and the text is seen received on the TeraTerm screen:



6 Additional References

Serial to Wi-Fi Evaluation Kit Startup Guide.pdf

Serial to WiFi_Adapter_Guide.pdf

Detail description of the AT commands supported

Serial to WiFi_Command_Reference.pdf

List of the various AT commands supported

Serial to Provisioning Methods with S2W App Note AN039.pdf

Example of provisioning method supported as well as the steps necessary to connect to the infrastructure (i.e. Access Point) using either Web Based Provisioning or Wi-Fi Protected Setup (WPS).

Serial to WiFi Bridge App Note AN025.pdf

The GainSpan Ultra-Low-Power Wi-Fi System-On-Chip may be used as a transparent bridge to carry serial (UART) traffic over an 802.11 wireless link. Serial commands are used to manage the wireless network configuration. This application note will give the details necessary to setup this bridge.

Version	Date	Remarks
1.2	27-June-2012	▶ Added example for Posting to Pachube.com
1.3	10-July-2012	▶ Limited AP in Open Security mode with TCP
1.8	12-Feb-2013	▶ Updated Limited AP and HTTP example for HTTP POST
1.9	3-May-2013	▶ Updated with wireshark screen shots and optimized command sequence for HTTP GET & POST

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SP- 1.3