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ESP8266 Module
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Features:
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1) Basic Building Block of IoT (Internet of Things).
2) Has Three Modes namely AP, Station and AP+Station.
3) Can Operate on TCP and UDP both the protocol.
4) Supports multiclient TCP server mode.
5) Supports http get and post methods.
6) Can be accessed through AT Command set

Hardware description
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1) ESP8266 Module
2) ESP8266 Adaptor
3) USB to TTL Communicator
4) Set of wires to connect the ESP8266 adaptor with TTL communicator. The ground and supply voltage connection is straight forward whereas the Rx and Tx pins need to be connected in crisscross way.

Software Description

The Desktop Utility for ESP8266, made by Elementz engineers guild pvt ltd (elementzonline.com) is user friendly interactive tool. This tool can be used to access all the features mentioned above in the features section.

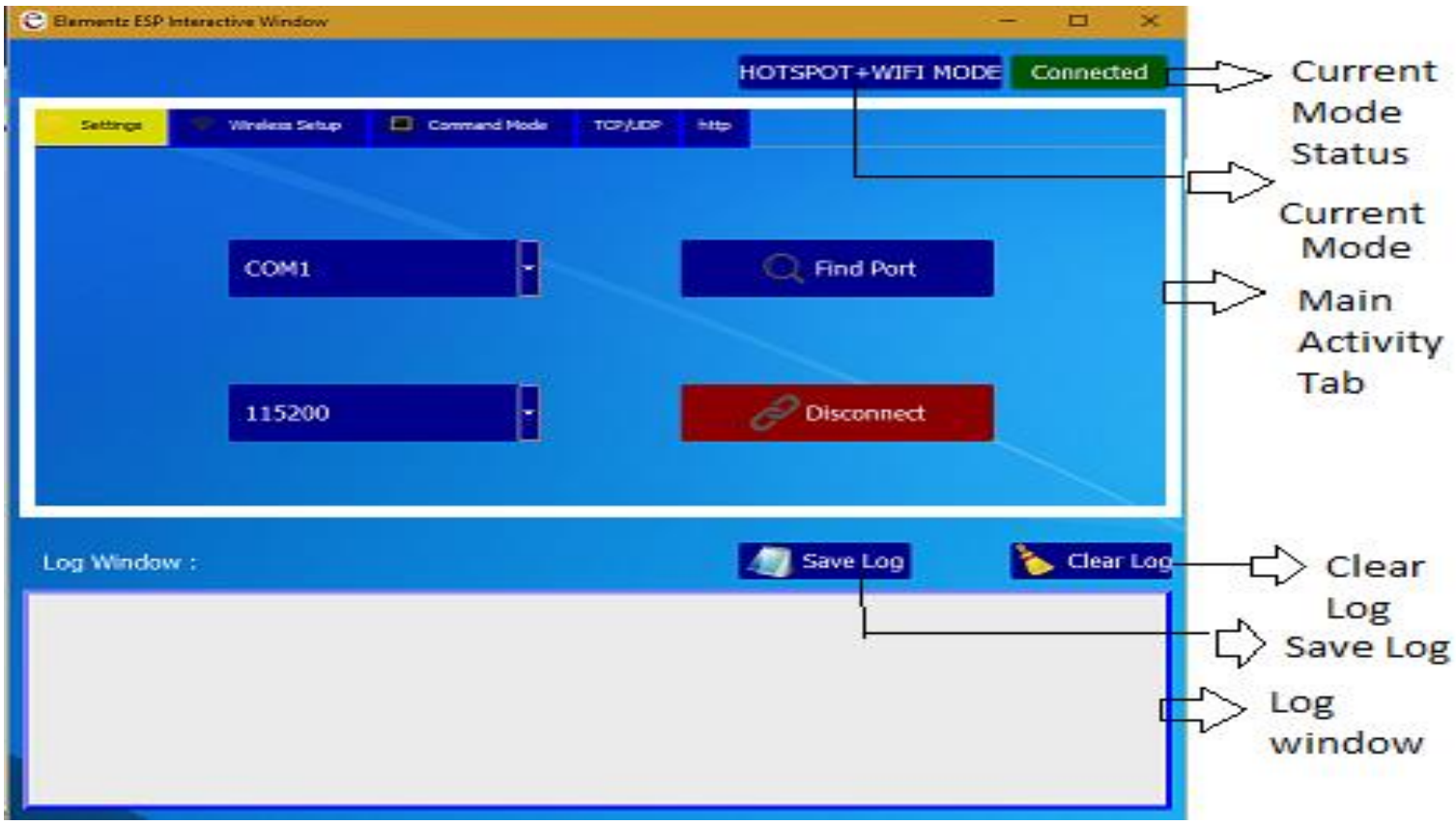

Fig 1.1 – Home layout

After Connecting the Complete setup (ESP and the Adaptor along with USB to TTL Communicator) to PC check which COM port ESP module is connected to. It can be checked in device manager window. To go to Device manager window right click on “this PC”→more→properties→Device Manager (In W10 PC). After choosing the right COM port choose the baud rate from the hardware. The baud rate will be written on the hardware and then press the button as connect which will reply as connected and at the same time one **AT** command is also sent to the ESP module which will give an **OK** reply if your device is connected properly and ready for serial communication. Both the reply can be seen in the log window which is the white box below the main activity tab. After successfully connected to the hardware go to the next tab which is wireless setup tab. In this tab wireless modes can be set. As discussed before ESP Module has three Modes of operation. One among the three modes need to be chosen according to the need. After Choosing the necessary mode press the button **select WIFI** which will help to load the available Wi-Fi in the drop down combo box. Choose one whose password is known. In the **password** field put the correct password and press the button **connect.** Now device is ready for any Wi-Fi related operation. The connection status is shown in the current mode status label whereas current mode of known from current mode label both can be found at the top right corner. On the **Wi-Fi setup** tab there are two checkboxes one is sow the password which will show the text typed by the user as the default setup does not let user to see what they are typing. Another checkbox is for saving the current setup into the flash memory. The Wi-Fi connection will automatically be established if this checkbox is checked. Below fog 1.2 shows the details of the tab.

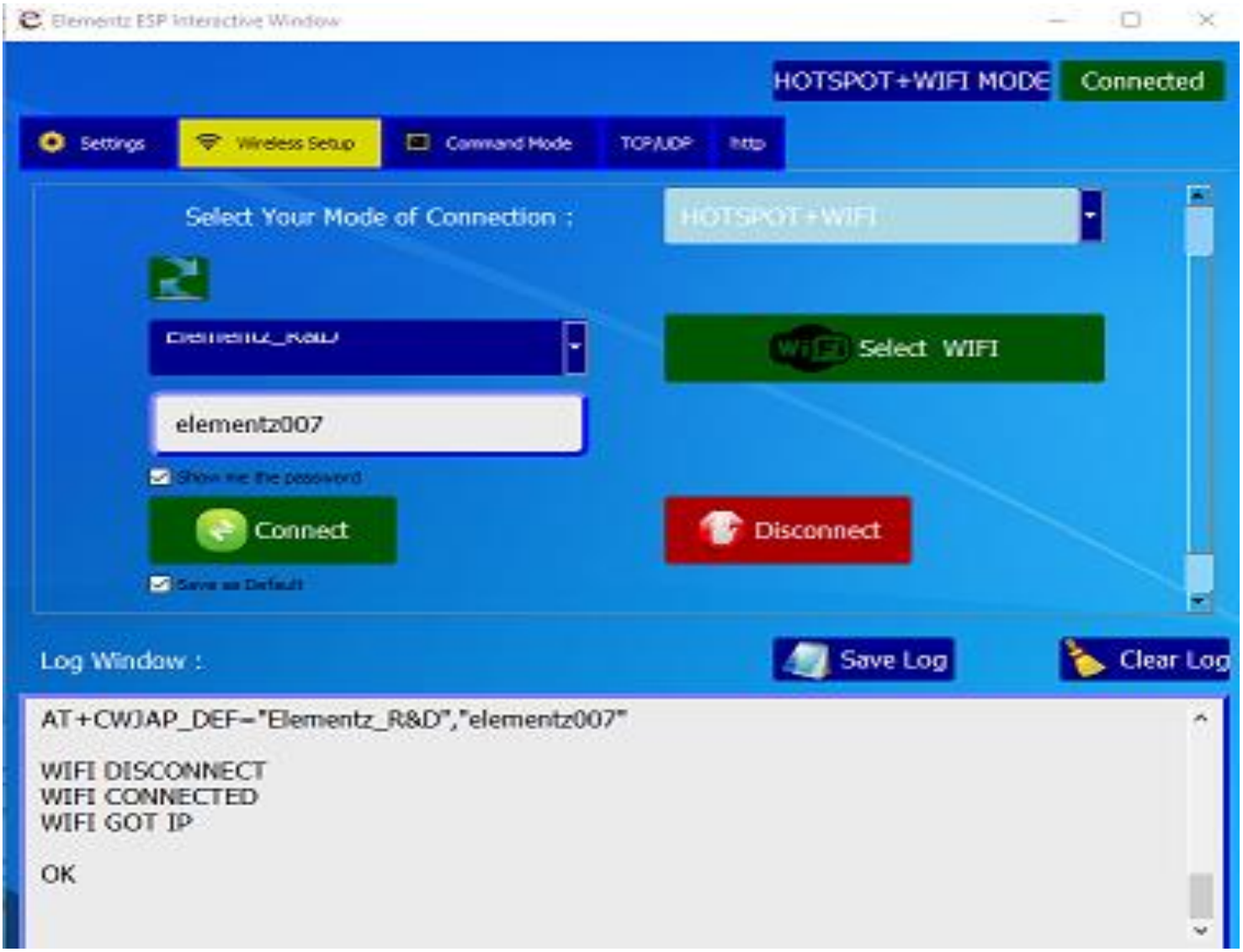

Fig 1.2-Wifi setup

The next tab is called the **command mode.** In this tab the **AT** commands can be checked without any hyper terminal. The screenshot is attached below in fig 1.3

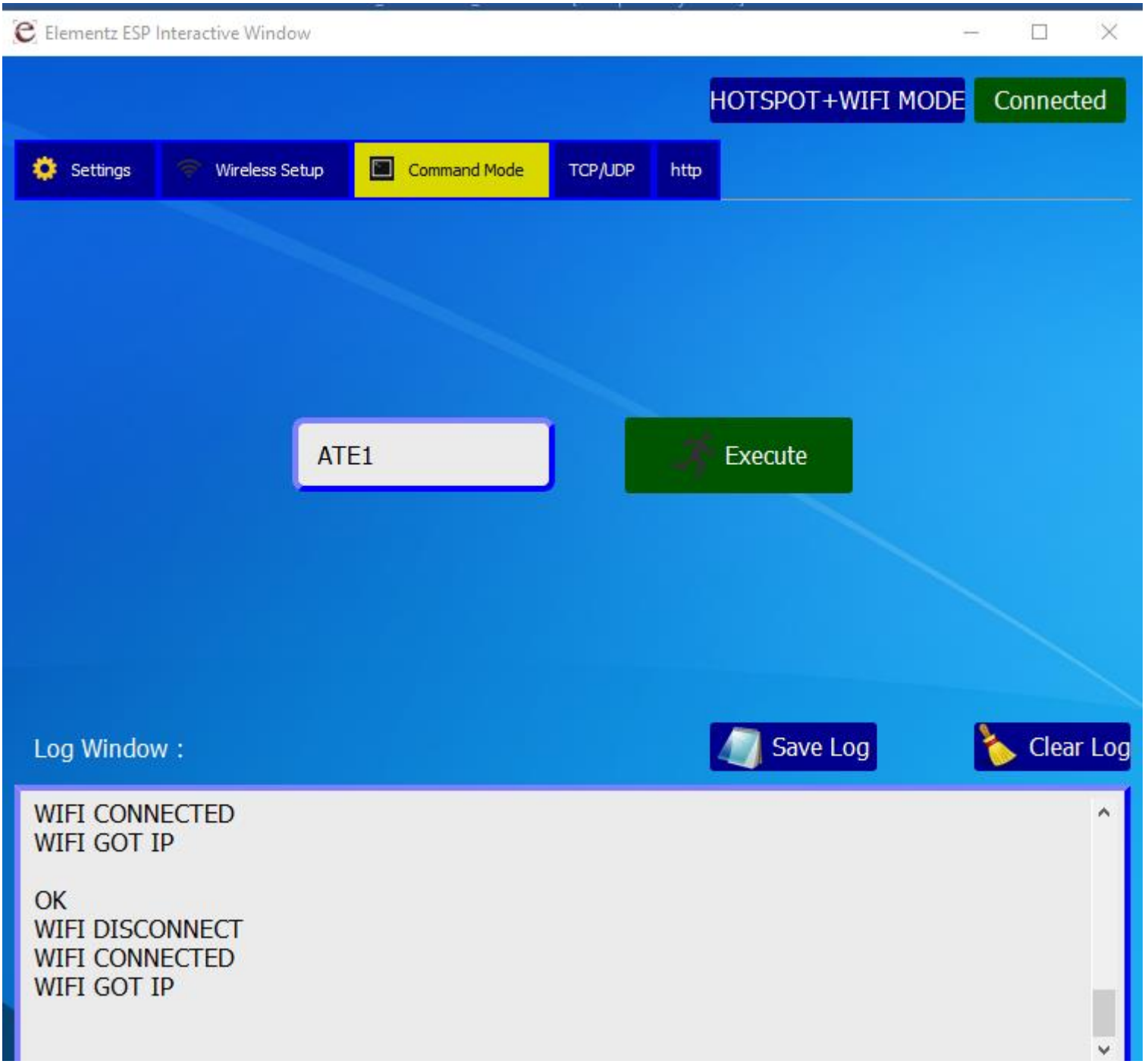

Fig 1.3-Command Mode

The next tab is **TCP UDP** tab. In this tab there are two types of connection one is client type connection another is server type connection. ESP8266. In the **TCP-UDP Client** tab first the mode of connection need to be selected (Either TCP or UDP) After that the server address need to provide along with port no then press the **connect** button for connection. There is a chatting window attached with this interactive tool. Which can be opened by checking the button as **feeling lonely** checkbox. The next tab is **TCP sever tab**. With this mode ESP module can act as a TCP Server. Before **Configuring** the server server port no is needed, as soon as **Server Configuration** button is pressed the server IP will be shown in **server IP** box. To terminate the connection **close server** button is to be pressed with the specific connection

no. In this tab also one same chat box is there but with added functionality. User can chat more than one client at the same time. To do this they need to specify the connection no in the specific box. And the client reply will be shown in the side box. User can check the server or client status in the chat box as well. The screen shots are as bellow.

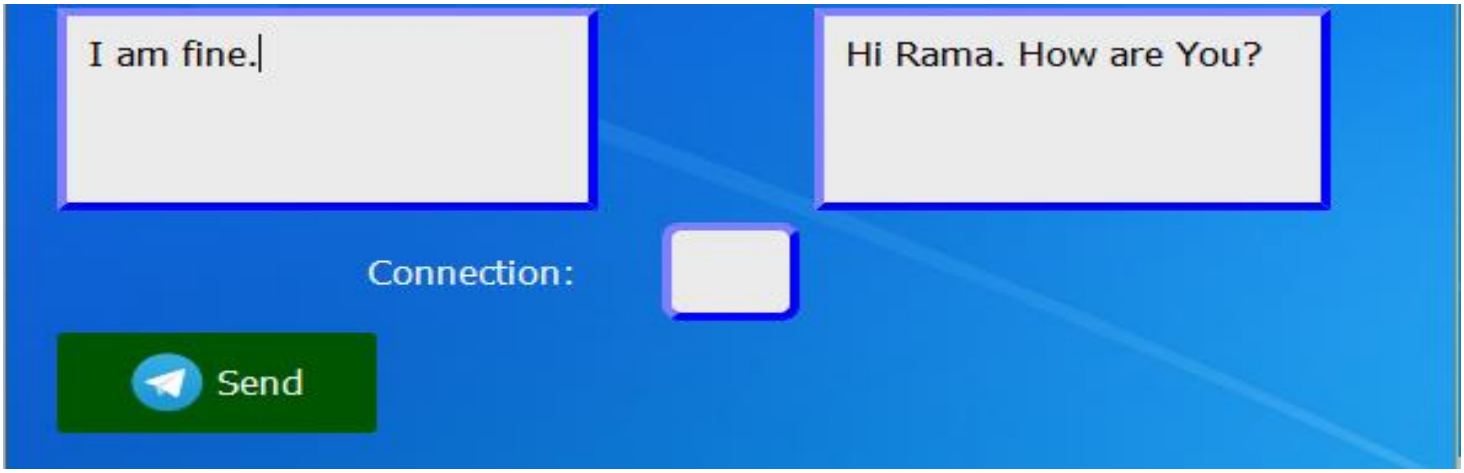

Fig1.4: Chat box

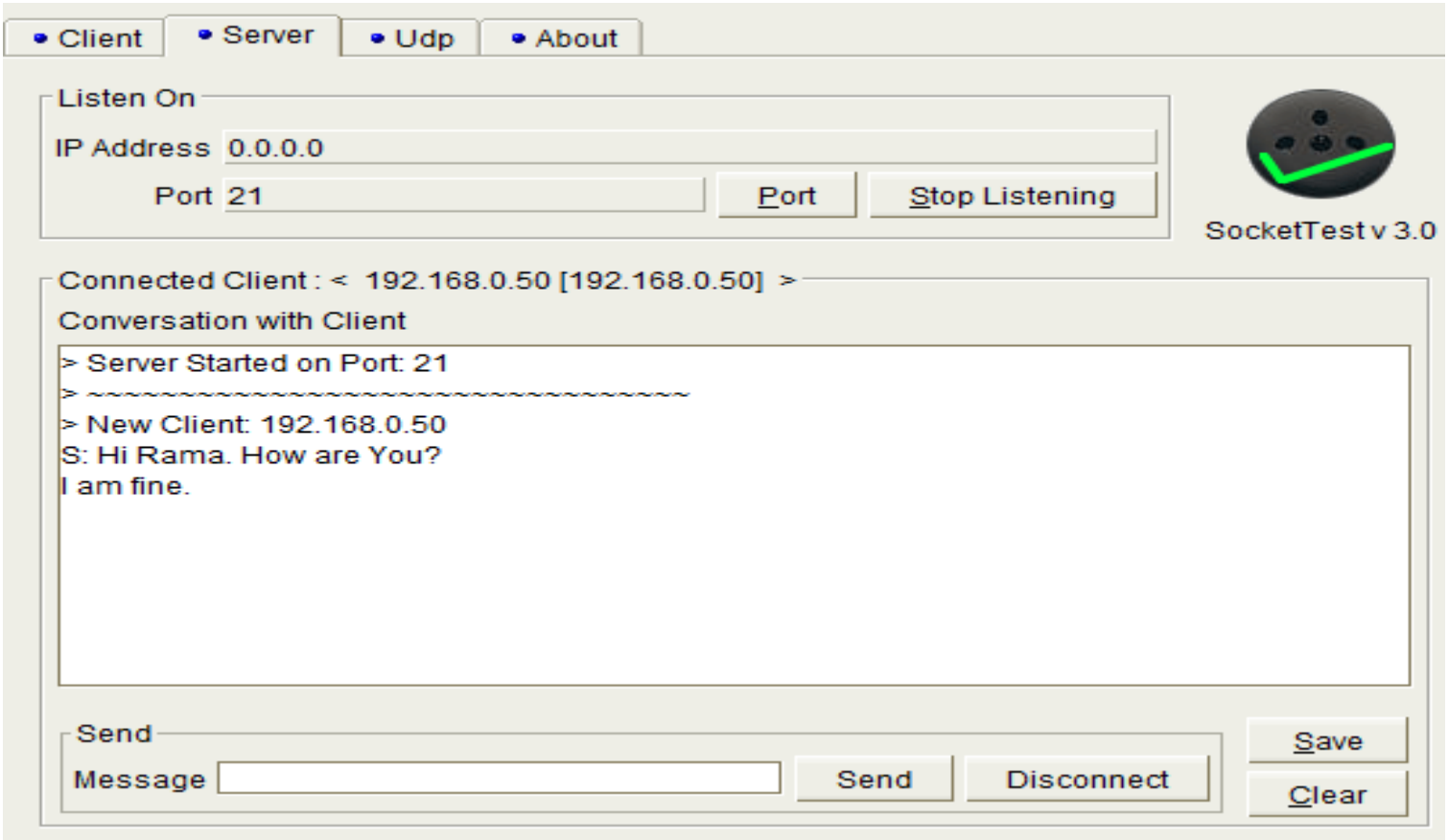

Fig 1.5: Server side message

Next tab is for HTTP connection. To establish a HTTP Connection first server address is needed. Then establish the connection by pressing the button **Connect http.** In the next step directory name should be given from where data will be either GET or POST. Then for the get connection **GET** button is to be pressed and user can see the data in the text field. For POST connection user need to mention the variable value with &(without any space) and press the button **POST.** The data will be posted in the specific server.the screenshots are specified below.

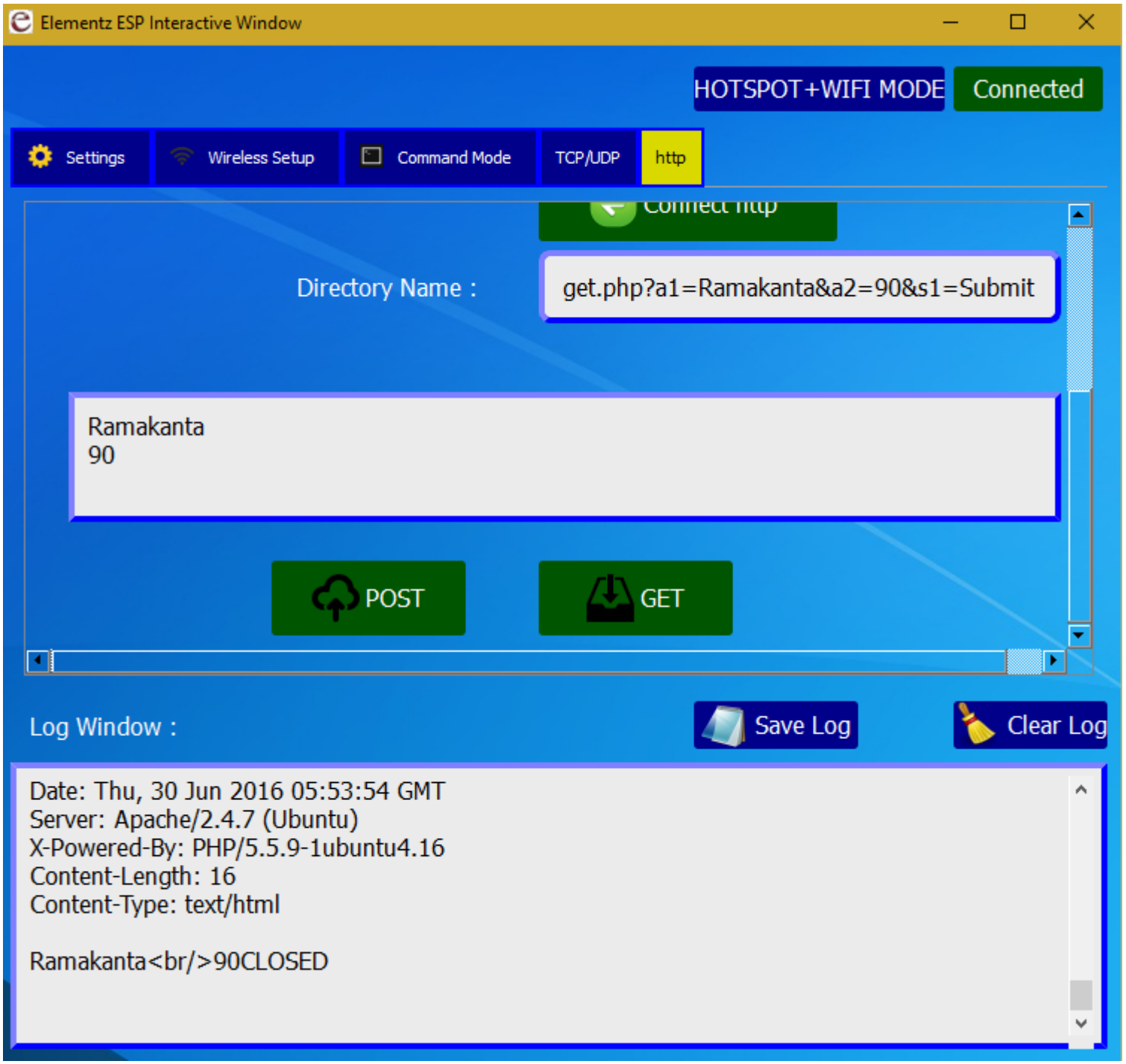

Fig:1.6:GET request.

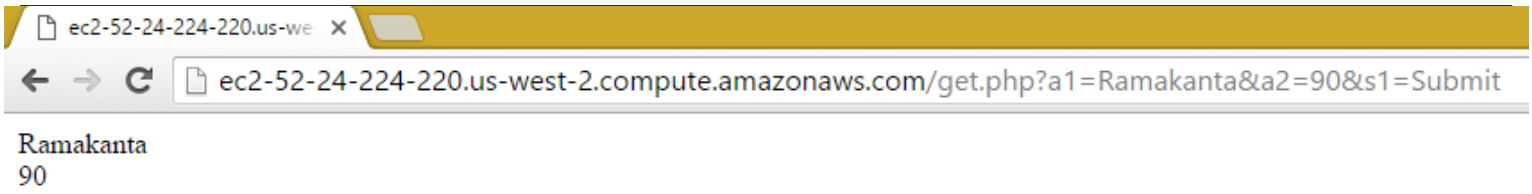

Fig 1.7: GET method server values