WF121 GUI SOFTWARE

User Guide

Saturday, 09 June 2012

Version 1.1

VERSION HISTORY

Version	Comment
1.0	First version
1.1	Endpoint view documentation added

TABLE OF CONTENTS

1 Introduction

WiFiGUI is a simple user interface application that allows a developer to quickly test and evaluate Bluegiga's WF121 Wi-Fi module. The main purpose of WiFiGUI is to hide the complexity of the Bluegiga BGAPI^{TM} binary protocol used by the host to control the Wi-Fi Software running on the WF121. It offers a more user friendly approach to the usage of the BGAPI protocol. WiFiGUI can however be a very good tool for quick prototyping and debugging of Wi-Fi applications. This user guide walks you through the basic usage of WiFiGUI.
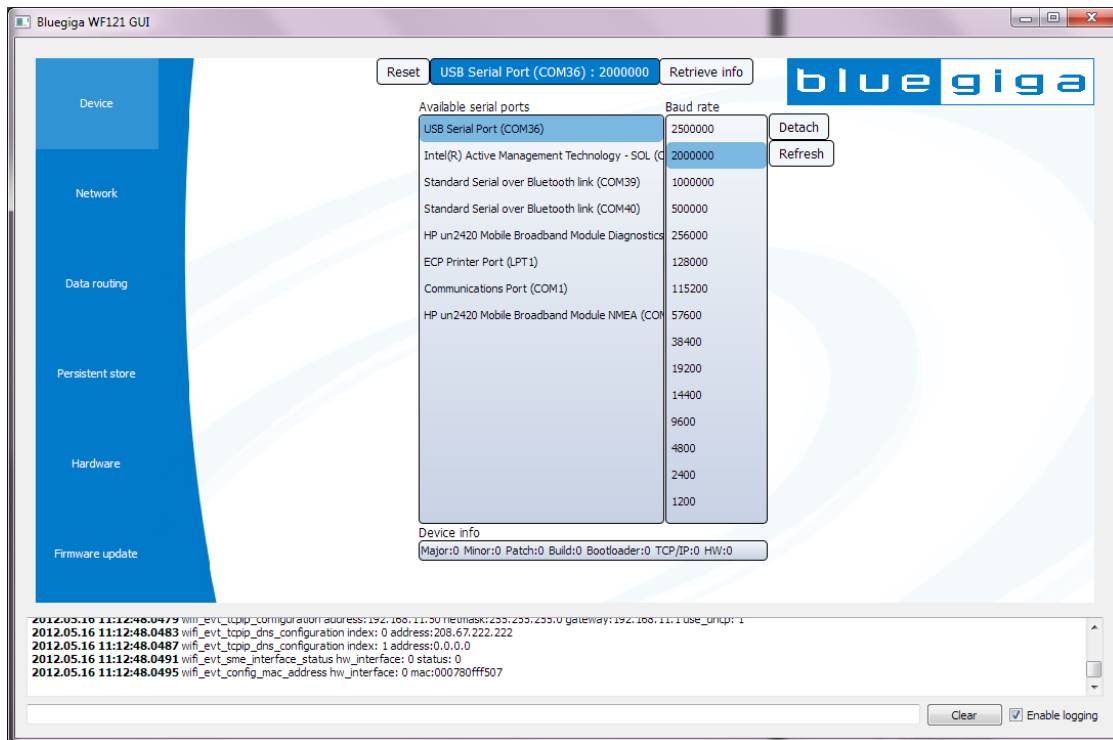
Figure 1: Wi-Fi GUI application

1.1 Compatible products

WiFiGUI can currently be used with Bluegiga WF121 Wi-Fi module.

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2 Preparations

If you have not used WiFiGUI before, you first need to do some preparations:

2.1 Preparing the WF121 development kit

1. Make sure the jumpers are connected as shown in the figure below
2. Make sure the **UART1** and **UART2** switches are turned **ON**
3. Finally turn the **Board power** switch **ON**

Figure 2: DKWF121

2.2 Installing the driver

1   Download the latest Wi-Fi software from Bluegiga's Tech Forum: http://techforum.bluegia.com.

2   Extract it you your PC.

3   Connect the WF121 development kit to your PC using USB.

    3.1   Connect the USB cable to USB port labeled "**USB to UART converter".**

4   Windows will automatically recognize the FTDI USB to UART converter and automatically install the drivers.
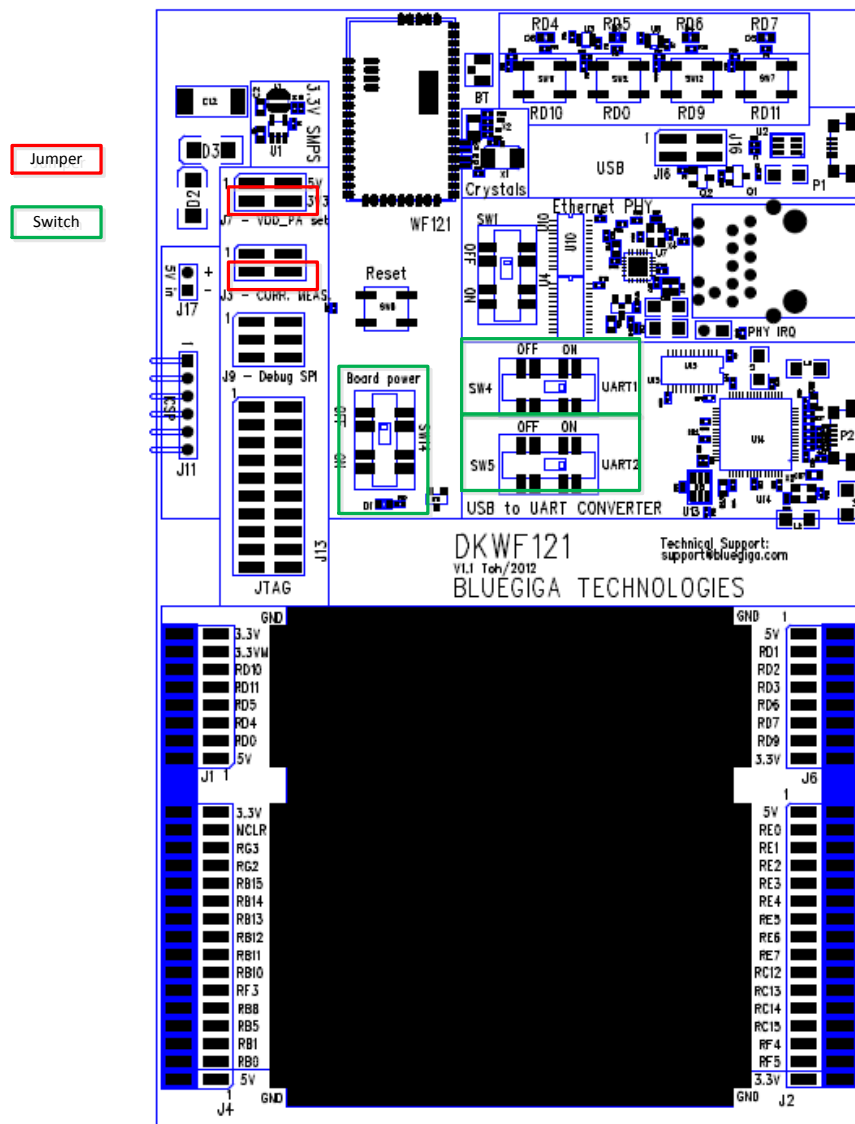
    4.1   If the driver is not automatically installed it can be downloaded from FTDI web site: www.ftdichip.com/FTDrivers.htm.

5   Once the driver is installed two (2) virtual COM ports should be visible in the Windows Device Manager.

6   If two new virtual COM ports are visible the installation is complete.
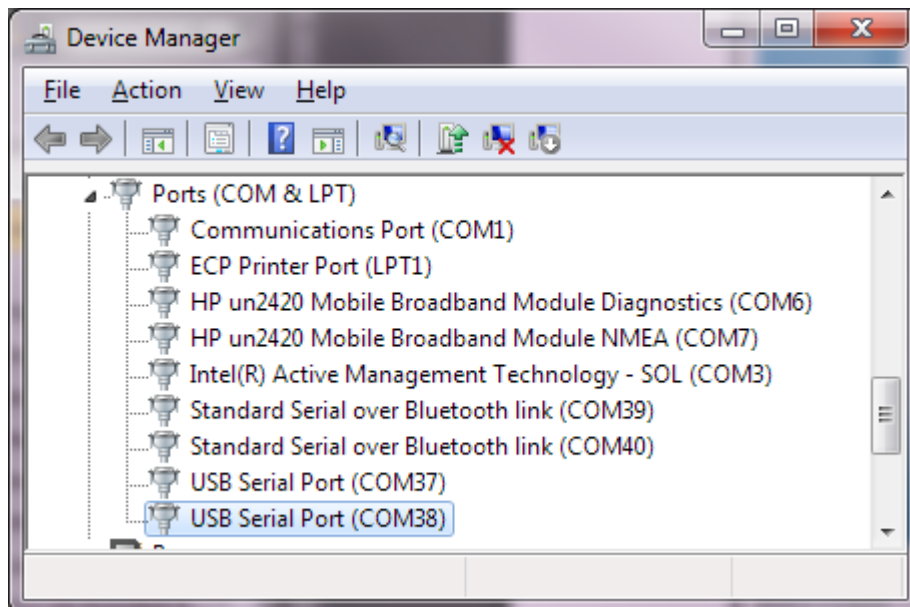
7   Finally Start the WiFiGUI software.

Figure 3: Windows Device manager

Note: On Linux and MAC computer no drivers are needed, however WiFiGUI software does not work on these platforms at the moment.

3 Using WiFiGUI software

This chapter contains brief step-by-step instructions how to use the WiFiGUI software.

3.1 Device view

The device view simply shows you the available COM ports on the PC and allows you to open the COM port where the WF121 Wi-Fi module is connected to.

It will also show you the devices' firmware and hardware information.
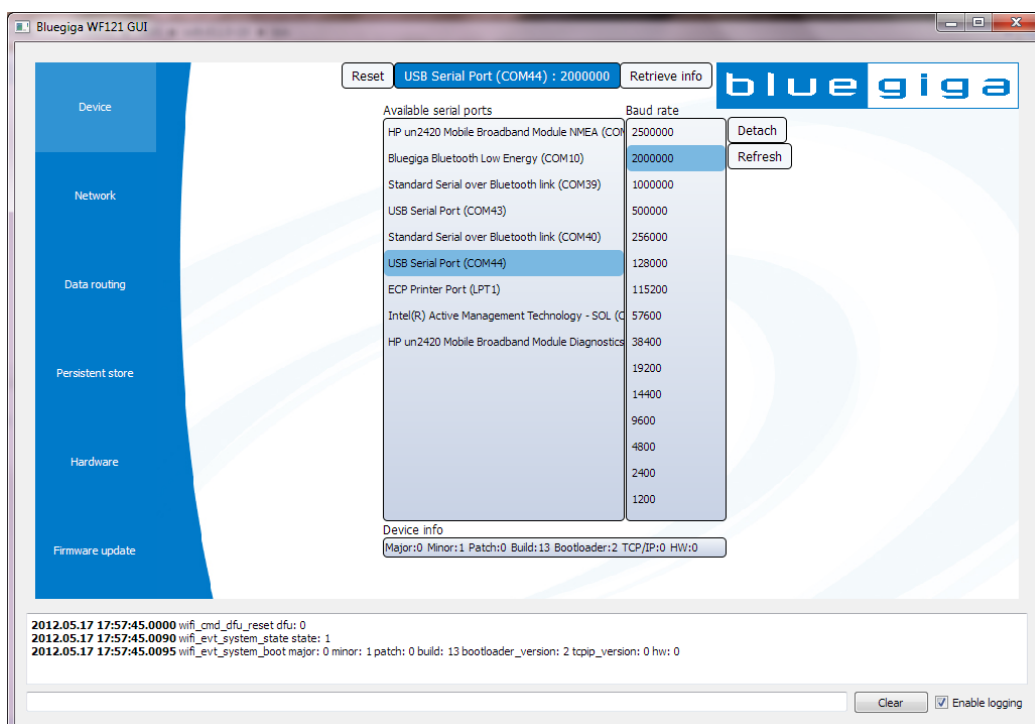
Figure 4: Main view

Controls	
Attach / detach	Opens or closes the selected COM port
Refresh	Refreshes the COM port list
Reset	Sends a reset command to WF121 also refreshes the **Device info** field
Retrieve Info	Reads the current status information from the WF121 and also syncs the status with the WiFiGUI software
Enable logging	Enables the command, response and event logging
Clear	Clears the log window

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Low view
The log view shoes the user readable BGAPI^{TM} commands the **WiFiGUI** sends to the WF121 hardware as well the BGAPI responses and events the WF121 sends back to the **WiFiGUI.**

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3.2 Network view

Network view gives the basic control to WF121 network controls like turning on or off the Wi-Fi radio in WF121, scanning and connecting to Access Points and configuring the IP address.
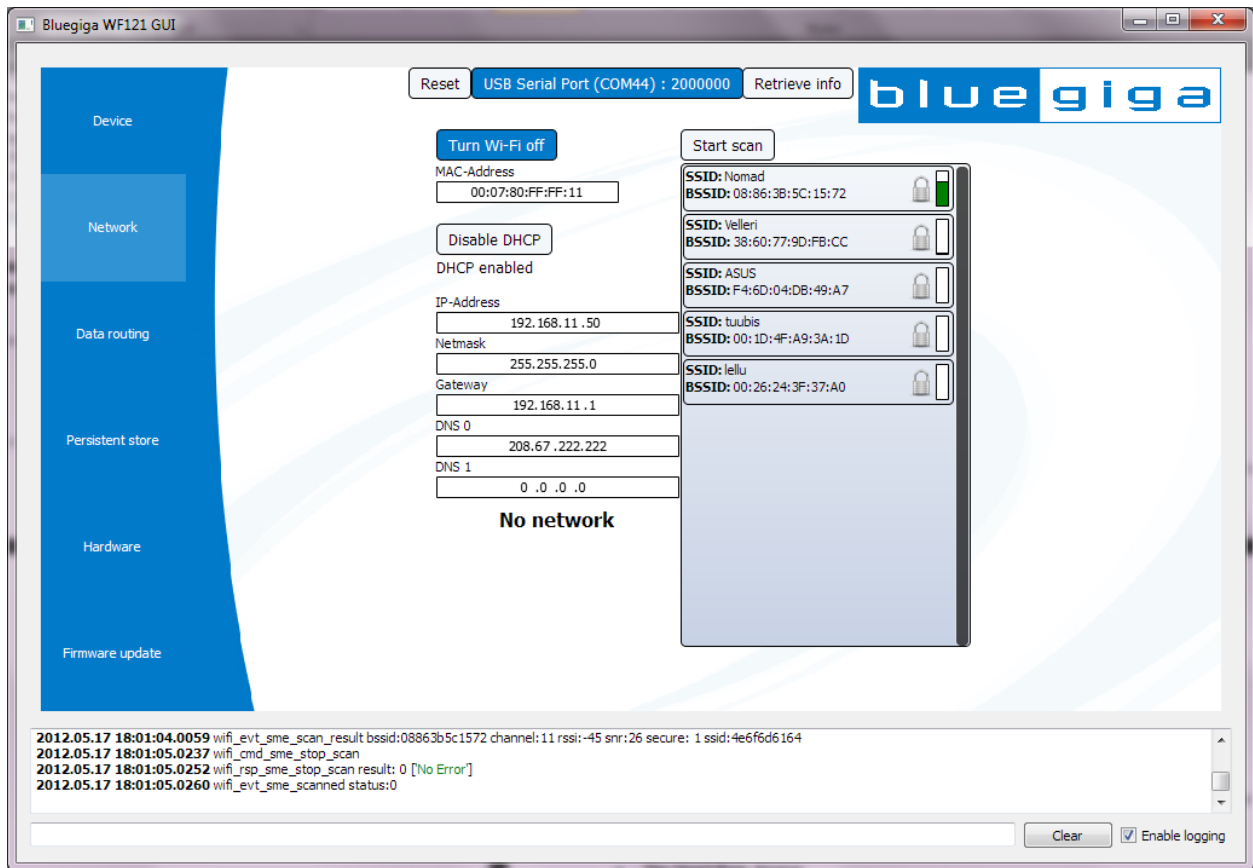
Figure 5: Network view

Controls	
Turn Wi-Fi on/off	Enables or disables the Wi-Fi radio on WF121 module.
Start scan	Starts the Access Point scan procedure. If scanning is in progress pressing the button again, will stop the scan.
Disable DHCP	Disables the DHCP client and allows manual IP address configuration.

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Fields	
MAC-address	Shows the WF121's IEEE address
IP-address	Shows the current IP address
Netmask	Shows the current IP netmask
Gateway	Shows the current IP gateway
DNS 0	Shows the primary DNS gateway address
DNS 1	Shows the secondary DNS gateway address
Access Point	Shows the list of discovered Wi-Fi access point sorted based on RSSI

3.2.1 Turning Wi-Fi radio ON or OFF

Turing Wi-Fi radio ON:

1. Press **Turn Wi-Fi on** button
2. Wait until button turns permanently blue
3. Wi-Fi is ready to be used

Turing Wi-Fi radio OFF:

1. Press **Turn Wi-Fi on** button
2. Wait until button turn grey
3. Wi-Fi is OFF

3.2.2 Scanning for Access Points

1. Turn Wi-Fi radio on

2. Press Start **Scan** button
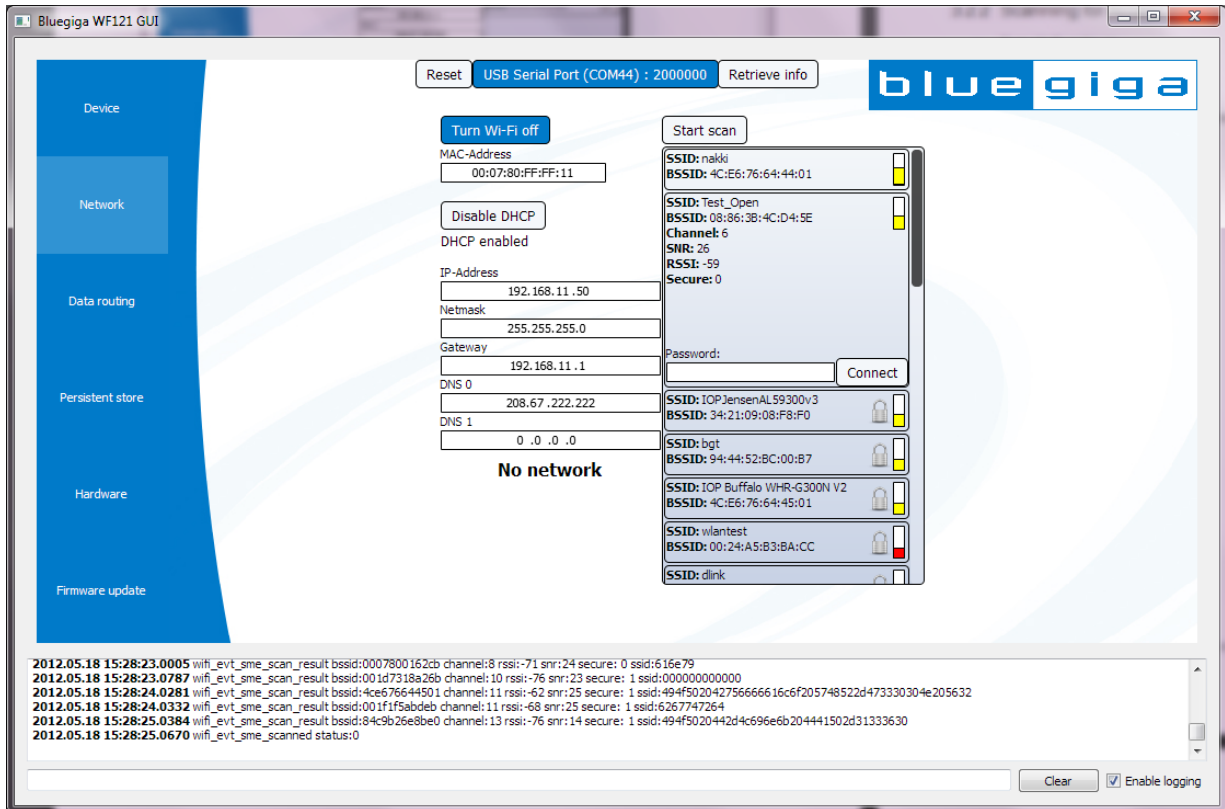
3. Wait until the scan is finished

Figure 6: Scanning for Access Points

Note: To stop the scanning while it's in progress press **Stop scanning** button.

The discovered access points are show in the in the Network view and the results are sorted based on the signal strength. When you click a discovered Access Point more information will be displayed about the selected AP.

Access Point details	
SSID	SSID (name) of the discovered AP
BSSID	BSSID (IEEE address) of the discovered AP
Channel	802.11 channel the AP uses
SNR	Signal-to-Noise ratio
RSSI	Received Signal Strength Indication
Secure	Tells if the AP is secure or insecure. **0: no security used** **1: security used**
SSID	SSID (name) of the discovered AP

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3.2.3 Connecting to an Access Point

To connect an Access Point:

1. Select the AP you want to connect to
2. Type the security key to the **password** field
3. Press **Connect** button
4. Wait until the Access Point field turns blue and **Connect** button will change to **Disconnect**

    a. If the connection is not successful the WF121 will try to reconnect the AP for eight (8) times
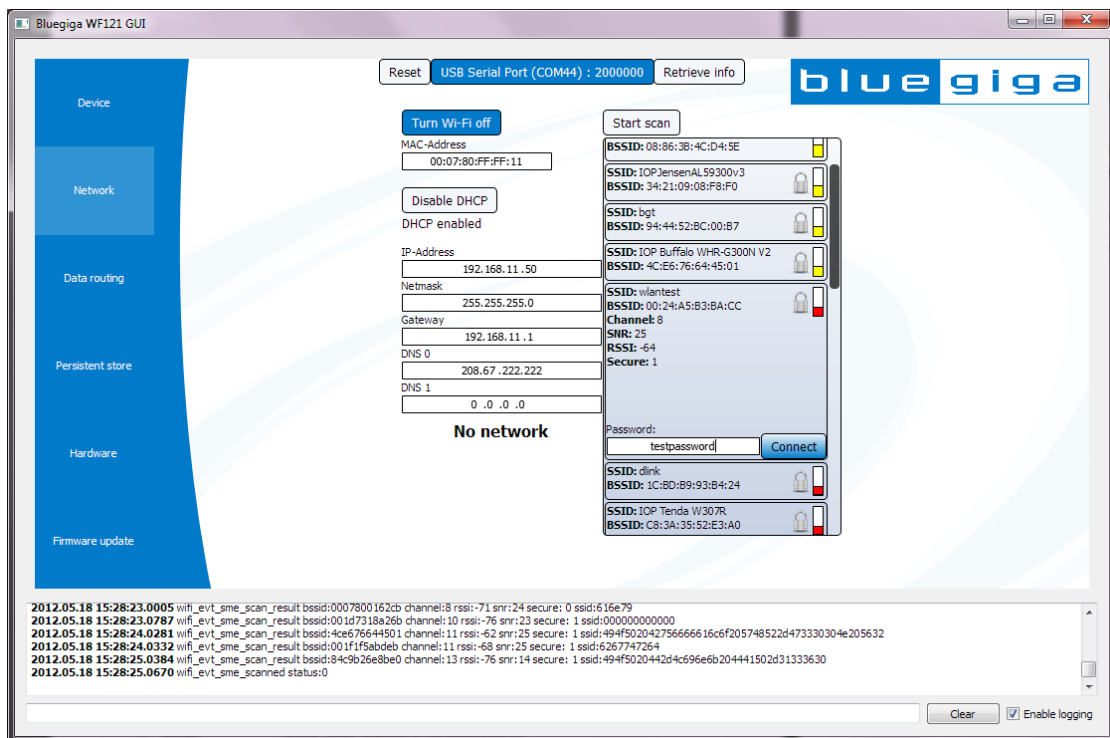

Figure 7: Connecting to an AP

Note: When connected to an Access Point scanning cannot be made.

Note: In case DHCP is enabled after the Wi-Fi connection has been established the IP-address and other fields are updated assuming DHCP negotiation is successful. Once this is competed **No Network** text is changed to **Network ready.**

3.2.4 Disconnecting an Access Point

To disconnect an Access Point:

1. Select the AP you are currently connected to (shown in blue)

2. Press **Disconnect** button

3. Wait until the Access Point field turns grey and **Disconnect** button will change to **Connect. Also Network ready** field will change to **No network**
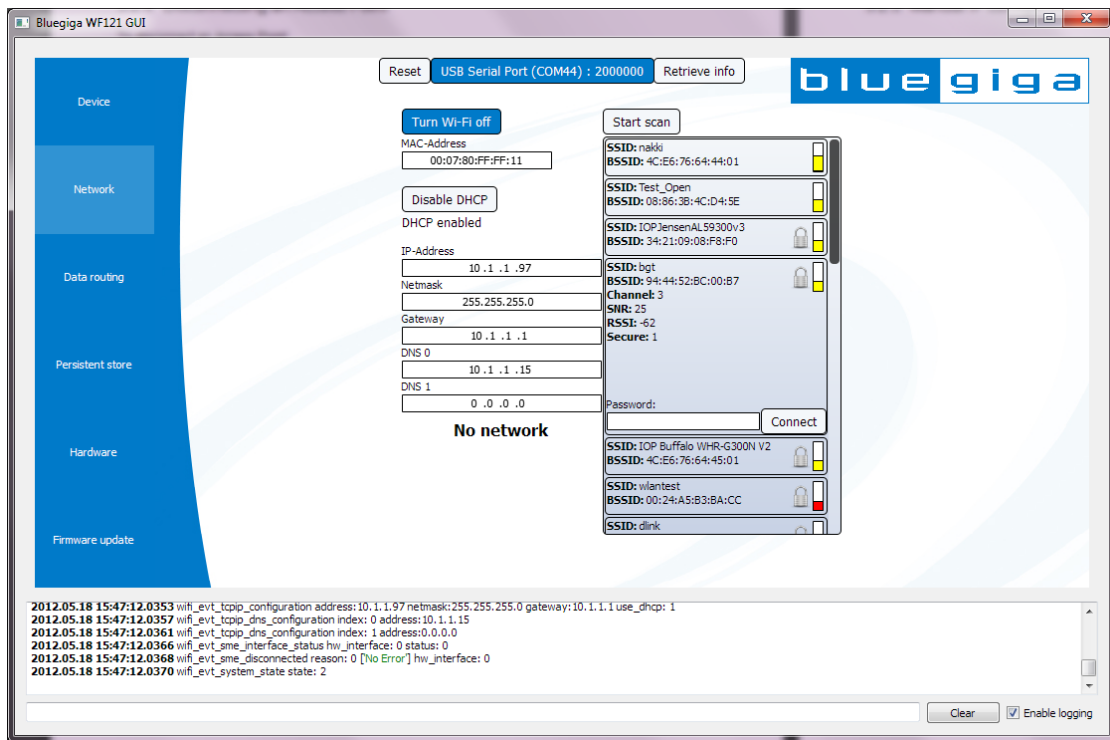

Figure 8: Disconnecting an Access Point

3.2.5 Manual IP-address configuration

In case DHCP is not available or manual IP-address configuration is preferred the following steps need to be made:

First make sure you are **not connected** to a network

1. Configure the IP address manually:

    1.1   Type the preferred IP-address to **IP-address** field

    1.2   Type the preferred netmask to **Netmask** field

    1.3   Type the preferred gateway address **Gateway** field

    1.4   Type the primary DNS address to **DNS 0** field

    1.5   Type the secondary DNS address to **DNS 1** field

1.6   Then press **Disable DHCP** button to activate the settings

2.   Finally **Connect** to an Access Point

3.3 Data routing view

Data routing view exposes the IP stack controls and allows you to create TCP/UDP clients or servers. The view also exposes the controls to the endpoint configuration and displays the sent and received data.
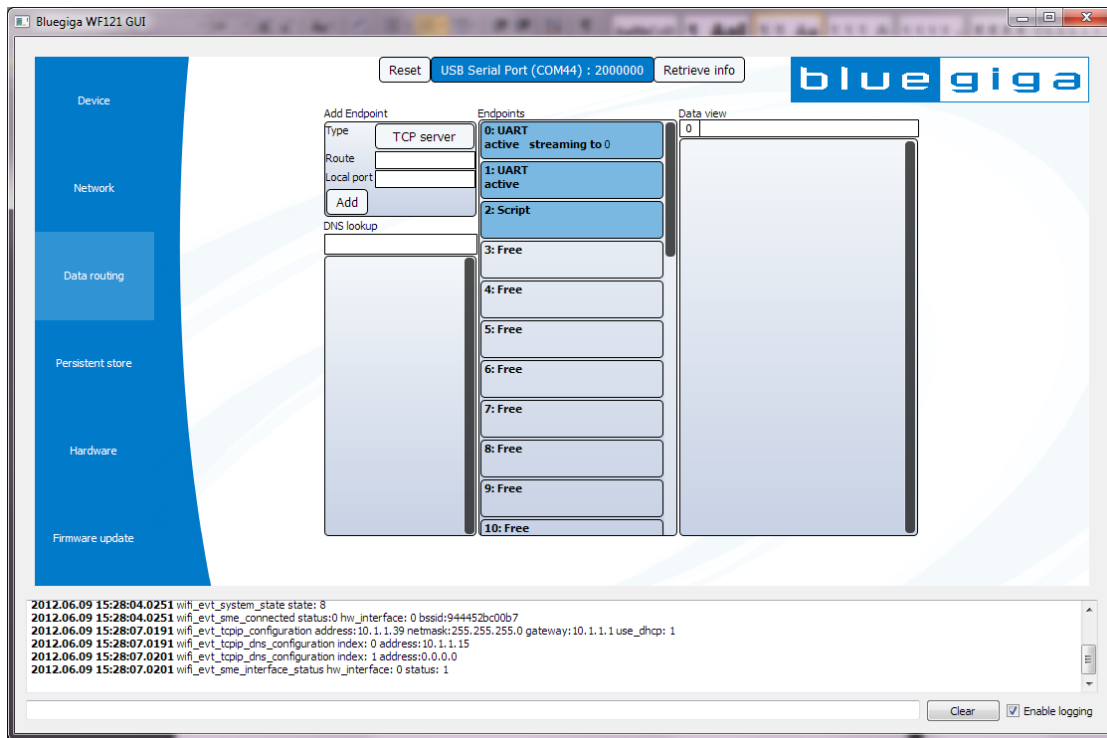

Figure 9: Data routing view

3.3.1 Add endpoints

This section allows you to create TCP and UDP clients and servers.

End point details	
Route:	The target destination for data. Can be any of the available endpoint IDs
Remote IP	Remote IP address
Local port	Local TCP or UDP port
Remote port	Remote TCP or UDP port
Add Endpoint button	Creates the endpoint and adds it to the list of available endpoint

3.3.2 DNS lookup

This tool allows you to perform DNS look-up requests.

DNS lookup tool	
DNS lookup field	Type an URL (like www.bluegiga.com) into the DNS lookup field. Press **Enter** to perform the lookup.

3.3.3 Endpoints

This section shows you active endpoints, their IDs, types and their status. You can also close the active endpoints using this tool or change the data routes.

3.3.3.1 Closing an endpoint

1.   Select the desired endpoint to be closed.
2.   Press **Close** to close the endpoint.

3.3.3.2 Changing data routing

1.   To change the data routing configuration, first select the desired endpoint.
2.   Type the new **endpoint ID** to the available **field**
3.   Press **Enter** to activate the change
4.   You can also press **Retrieve info** to update the endpoint status

3.3.4 Data view

Data view allows you to send data to an endpoint and also shows data received from the BGAPI endpoint.

To send data to an endpoint:

- Type the endpoint ID you want to send the data to
- Type the data into the following field
- Press **Enter** so send the data

Received data is shown in the field below.

3.4 Persistent store view

Persistent store view can be used to access the local PS key store. At the moment it only allows you to view the local PS keys and their values.
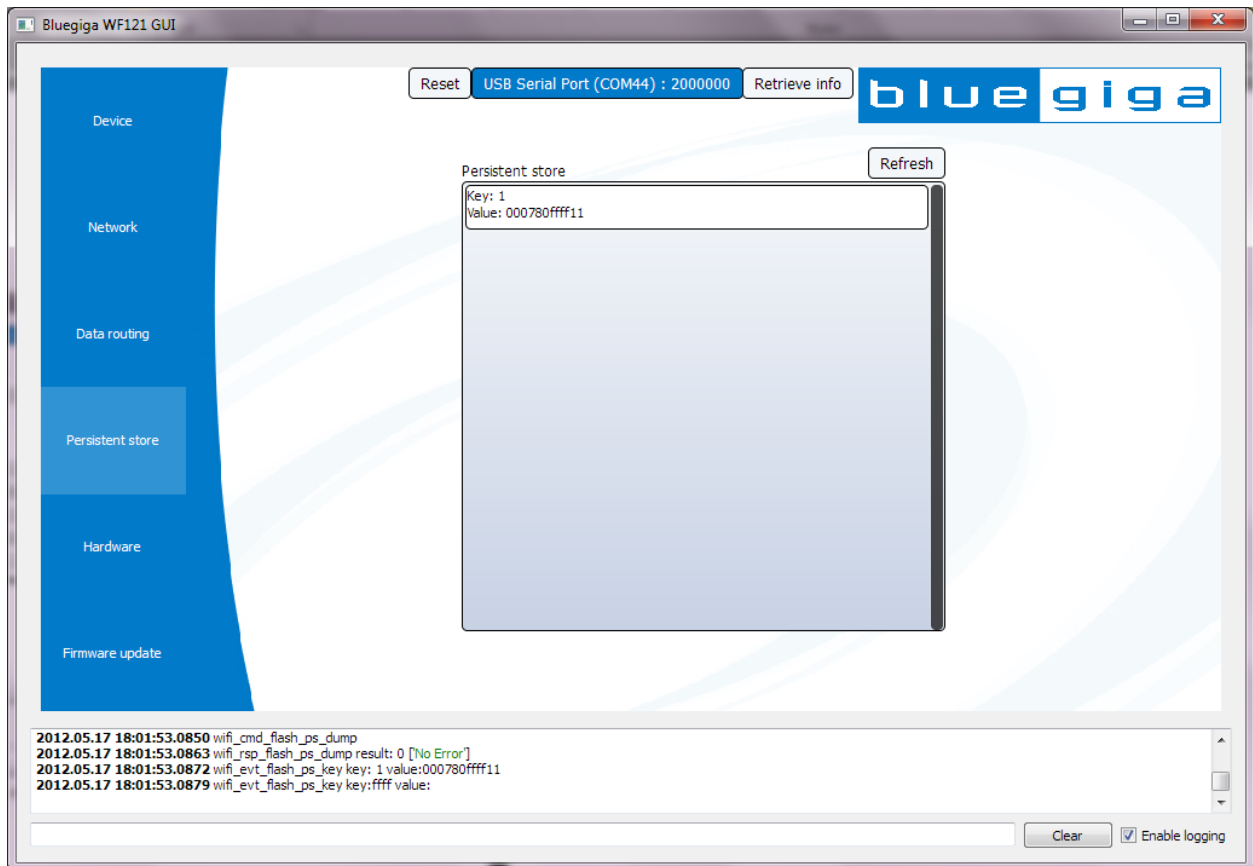

Figure 10: PS store view

3.5 Firmware update view

Firmware update view can be used to perform a DFU update of your local device.

To perform the update

1. **Boot** the device into DFU mode
2. Select a .DFU file you want to upload to the device
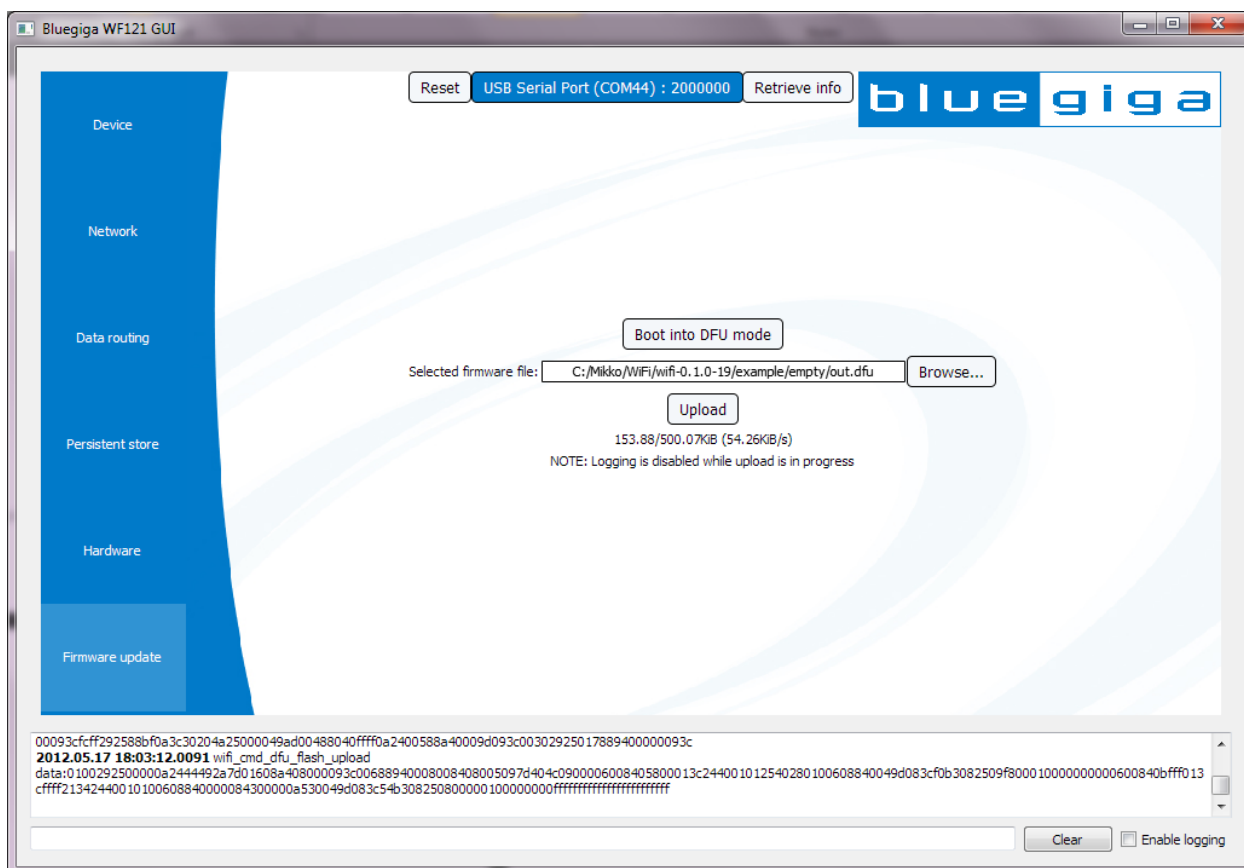3. Press **Upload**
4. Wait for update to finish

Figure 11: DFU firmware update

4 Example how to create a TCP server and send data to it

4.1 Creating a TCP server

1. To create a **TCP server** select the TCP server from the **Add endpoint** tool
2. Type in a local **TCP port** number
3. Select streaming destination to **endpoint ID 1** (UART1)
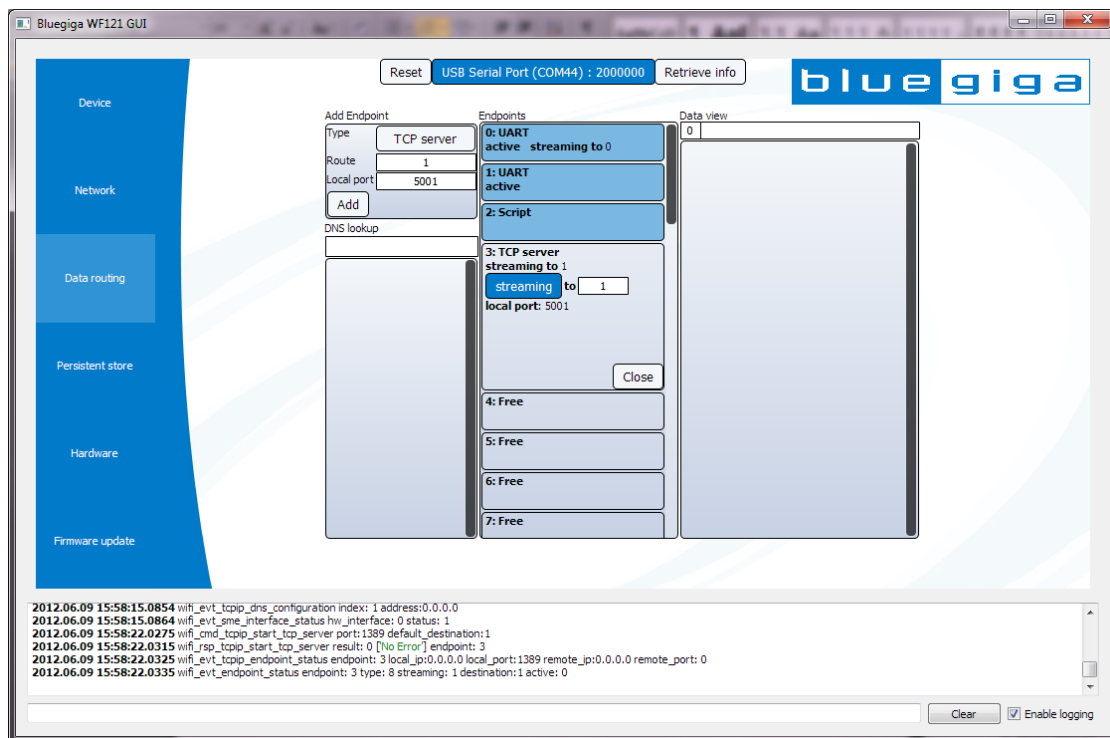4. Press **Add** to create the endpoint

Figure 12: TCP Server creation

4.2 Creating a TCP client

To create a TCP client connection you need TCP client software like Putty or Tera Term.

1. Open a TCP client software
2. Create a TCP client connection to the IP address your WF121 Wi-Fi module and the TCP port you've created.

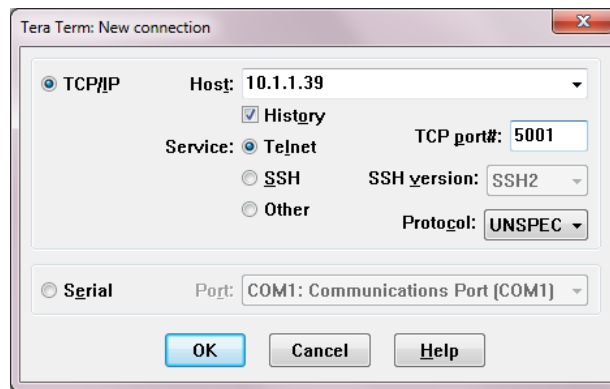   (Example uses : 10.1.1.39 and port 5001)

Figure 13: TCP client connection

4.3 Checking TCP connection status

Once the TCP connection has been established the endpoint views shows new endpoint for each TCP client connection.

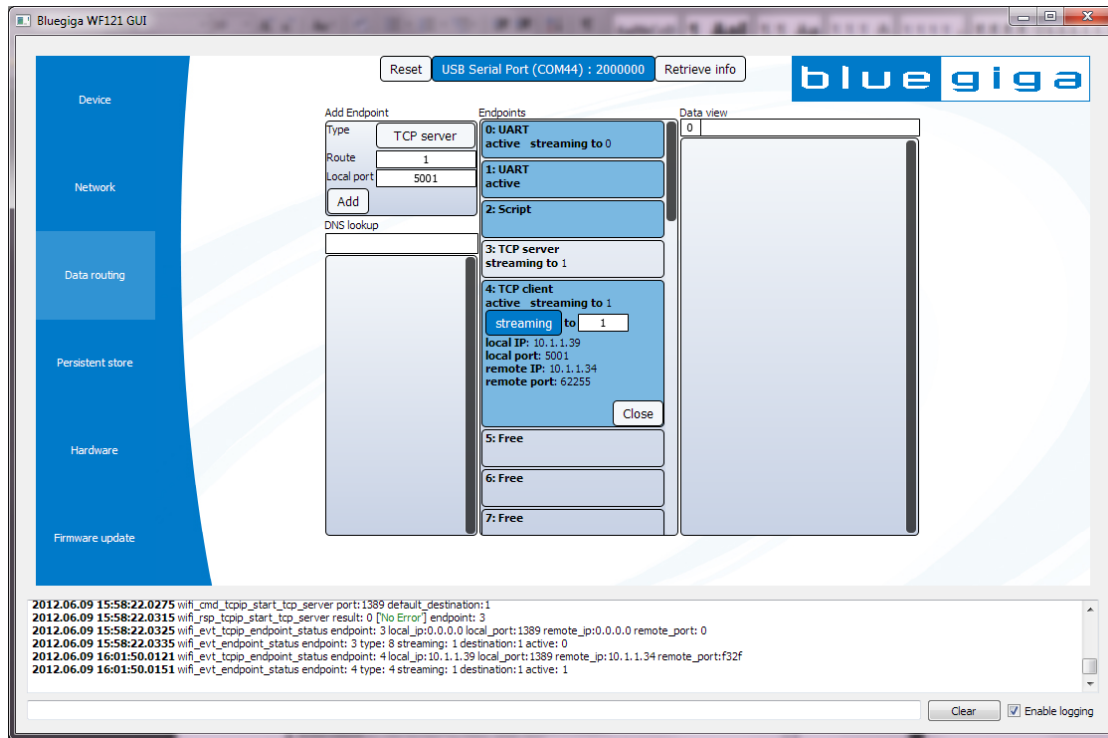In the example below the TCP client connection get a new endpoint ID 4.

Figure 14: TCP client endpoint

4.4 Transmitting data

In order to send data to the TCP client:

1. Change the endpoint ID in the data view to **4**.

2. Type in the data you want to send into the following field.

3. Press **Enter** to send the data.

4. Finally check that you've received the data at the TCP client.
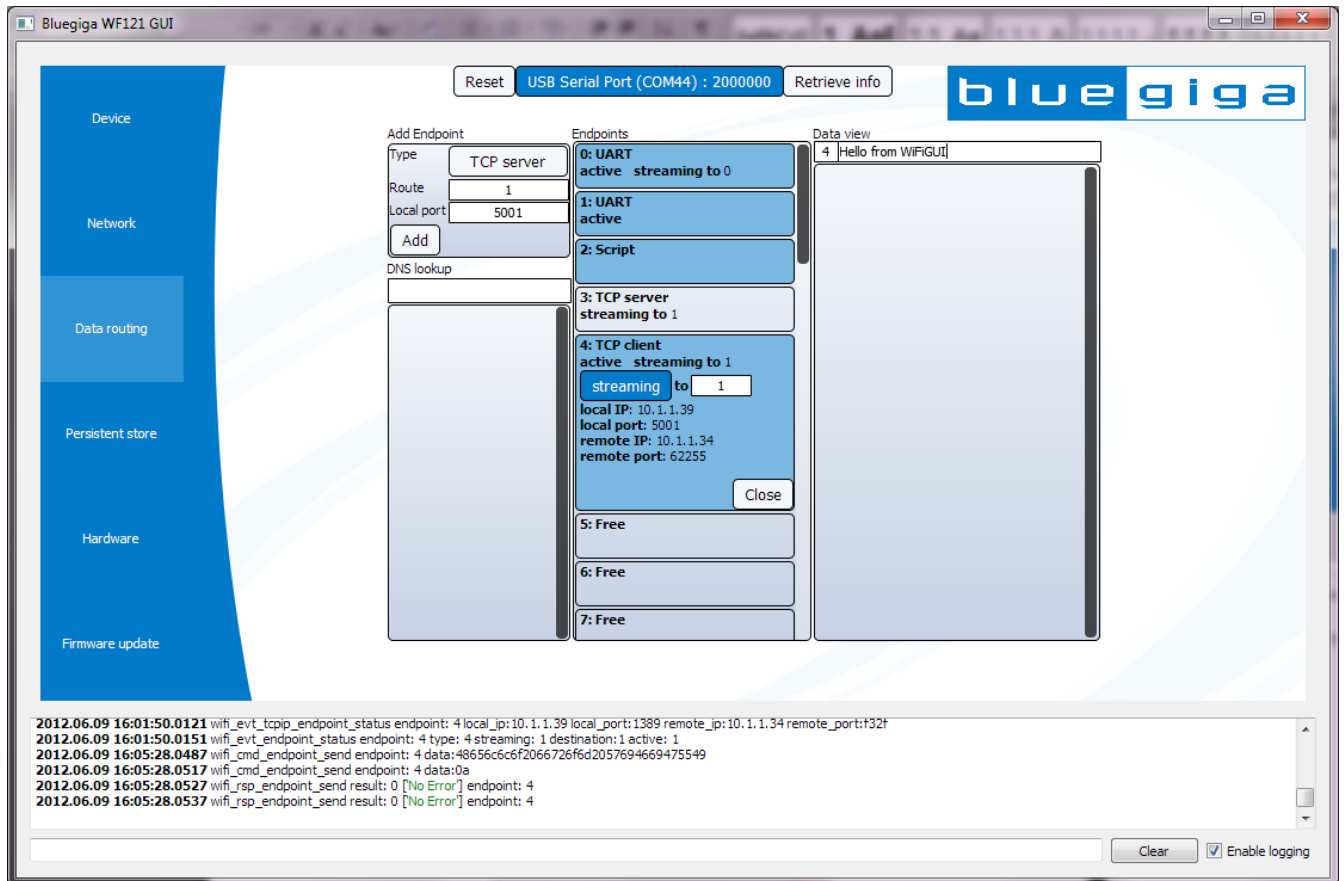
Figure 15: Sending data from the TCP server to the TCP client

Figure 16: Verifying data reception

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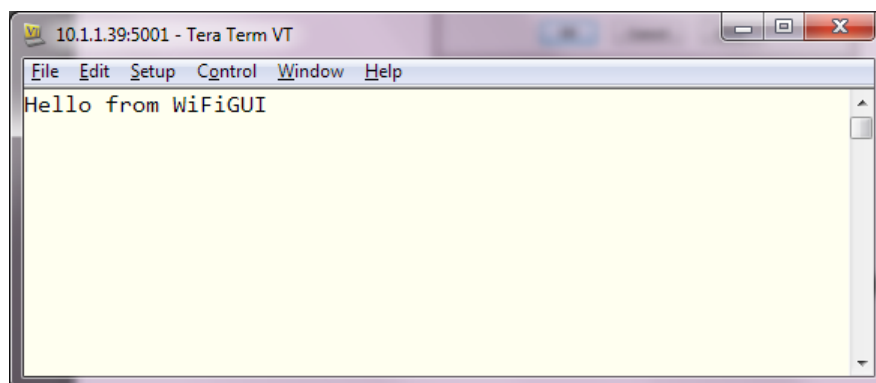
In order to send data to the TCP server:

1. Use the TCP client software to send data

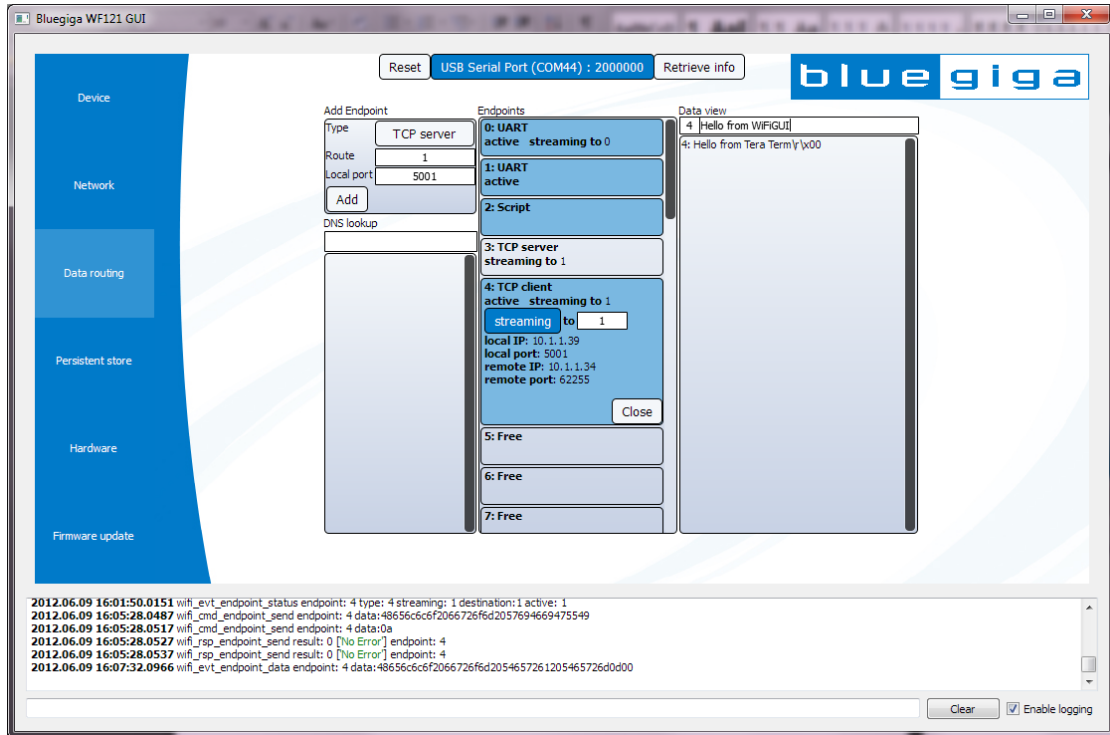2. Finally check that you've received the data at the WiFiGUI software's data view

Figure 17: Receiving data at the TCP server

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