

GreenEye Monitor

GEM Setup WiFi/Ethernet Combination

For GEM model: GEM-WE



Document Code: GEM-SET-WE

Ver 3.5

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INTRODUCTION

IMPORTANT

This manual is for GreenEye Monitors models with “WiFi / Ethernet Combination” module only (with or without an XBee module). The picture in Figure 1 displays the “WiFi/Ethernet Module” (outlined in blue).

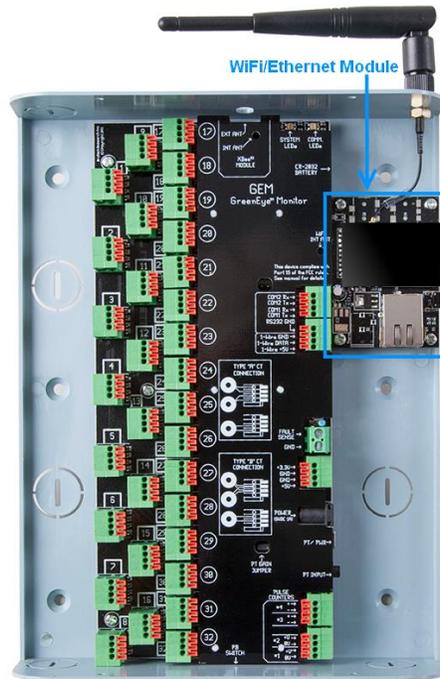


Figure 1

If the GEM has a communication option other than “WiFi/Ethernet Combo” then refer to Table 1 to determine the appropriate setup document required.

Communication Option	Document Name	Document Code
No communication module	GEM Setup No Module	GEM-SET
WiFi Only	GEM Setup WiFi Only Option	GEM-SET-W
Ethernet Only	GEM Setup Ethernet Only Option	GEM-SET-E
WiFi / Ethernet Combination	GEM Setup WiFi/Ethernet Combination	GEM-SET-WE
Indirect Communication via the DashBox	GEM Setup Via DashBox	GEM-SET-DB

Table 1

MISSION

The objective of this document is to establish a connection between a PC and the GEM. The connection is used to access the GEMs setup page and upgrade the GEMs firmware. The tasks covered in this manual are listed below.

- **Setting Communication Module to Factory Defaults.** The factory defaults provide a known IP address for initial connection.
- **Connecting a PC directly to the GEM for configuration purposes.**
- **Establish a direct connection between a PC and the GEM.** The connection enables the user to access the WiFi/Ethernet setup page in order to configure local network information (SSID, Password, etc.) allowing the GEM to connect to a network.
- **Connecting the GEM to a Network.**
- **Connecting to the GEM's Setup Interface.** After the GEM is connected to a network, all GEM settings then be configured using any web browser.
- **Upgrading the GEM's Firmware.** A guide is provided to perform firmware upgrades to the GEM.

STEPS

A typical initial setup procedure would consist of the following order of steps, although some scenarios may differ.

1. Set communication module to factory default.
2. Establish a WiFi connection between a PC and the GEM.
3. Configure the "SSID", "Password", etc. to create a WiFi connection between the GEM and a local network.
4. Connect the PC to the same network and establish a TCP/IP connection to the GEM.
5. Upgrade the firmware if needed.
6. Open the GEM Setup page with a browser.

Once the GEM Setup page has been opened, then refer to the "GEM Configuration Manual" (Document code: GEM-CFG) to proceed with setting up the GEM.

REQUIREMENT

- The "GEM Network Utility" version 4.2 or higher for Windows based PCs.
- For "Mac" or "Linux" users, a "Java" application is available for firmware upgrades, however different instructions are required.

THE COMMUNICATION MODULE

The WiFi/Ethernet module option for the GEM incorporates two methods of communication providing the choice of a WiFi or Ethernet connection. Both options are integrated on a single module.

Typically, a connection to a local network is established allowing data to be sent to a local server or remote host via internet.

START-UP SEQUENCE

When the GEM is powered up, the “Communication Status LED” (see Figure 2 on page 6) will remain dark (off) for approximately 30 seconds. This is the time required for the communication module to boot up and create or join a network. Once the module is booted the LED will turn to amber.

COMMUNICATION STATUS LED

The communication status LED is a dual color “green” and “amber” type. The three LED states are:

Dark: The communication module is booting up.

Amber: The communication module is active but there is no connection.

Yellow (green +amber): The module is connected.

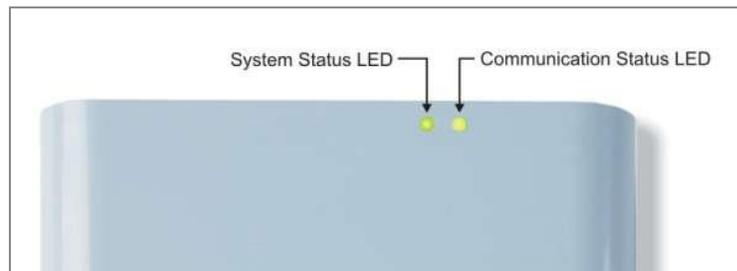


Figure 2

The picture in Figure 3 shows the “Communication Status LED” which consists of an amber LED and a green LED together in the same package. The combined color is **yellow** when the **amber LED** and the **green LED** are both lit.



Figure 3

GETTING STARTED – CONNECTING YOUR GEM TO THE NETWORK

IMPORTANT NOTE

This chapter describes the procedure for creating a WiFi connection between the GEM and a PC. The main purpose of this connection is to configure the GEM to connect it to a network.

Make sure there is no Ethernet cable connected between the GEM and a network when conducting the steps in this chapter.

Factory Default Values

The instructions on how to reset the module to factory defaults see APPENDIX B - Reset to factory defaults.

The factory default settings are:

- Set to Access Point (AP) mode.
- DHCP enabled. The server will assign an IP address to the PC, providing the PC is set to obtain an IP address automatically.
- The SSID is “GreenEye_xx”, where xx is the last two digits of the MAC address.
- WiFi security mode “Open”.
- Local IP address: 192.168.2.2
- Network setup port 80.
- GEM setup port 8000.

Network Connection Options

Two options are available to connect the GEM to a network, “WiFi” or “Ethernet”.

WiFi Connection

This option consists of connecting to the network wirelessly. This method is usually preferred as long as the GEM is within acceptable RF range of the WiFi Router it will be connected to.

Ethernet Connection

An Ethernet connection consists of connecting a network cable between the GEM and a network router or hub. This method is preferred when a WiFi connection is impractical due to signal range or if a dependable connection is desired.

STEP 1 - CONNECTING TO THE GEM VIA WiFi

The goal is to create a connection between the PC and the GEM as shown in Figure 4. After this step, continue to Step 2A to configure a WiFi connection or Step 2B to configure an Ethernet connection.

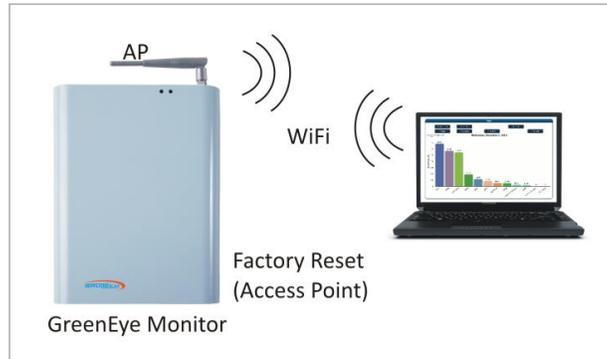


Figure 4

Steps

1. Search your local WiFi networks on any PC and look for a network called “GreenEye_xx”.
2. Connect to the “GreenEye_xx” network.
3. Open any web browser and set the address to <http://192.168.2.2/> and press “Enter”. A “Sign In” box should come up prompting for a “User” and “Password”. If so, then skip to step 5.
4. If the browser timed out connecting to <http://192.168.2.2/> in the previous step, the PC may not be set to “obtain an IP address automatically”. Modify the PC’s network settings to do so then repeat the steps in this section. If you don’t know how to change this network setting, then search “how to obtain an IP address automatically” on the internet for instructions for your operating system.
5. A “sign in” box will prompt for a user name and password. Type in “admin” for both.

A web page as displayed in Figure 5 will open. This is the interface used to setup the GEM to connect to the Network.

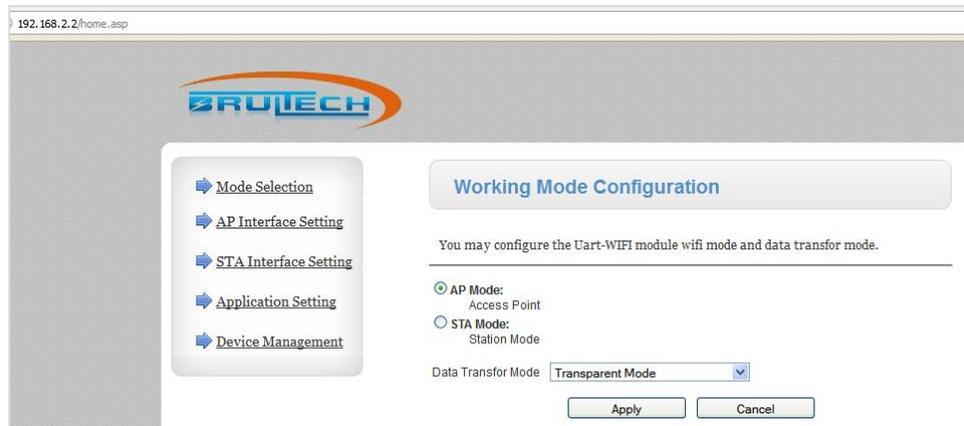


Figure 5

STEP 2A - WiFi CONNECTION TO A NETWORK

This chapter describes how to create a WiFi connection between the GEM and a local network. See Figure 6.

Connecting the GEM to a Network

The GEM can connect to a WiFi router or access point. This requires changing the GEM's communication module from its default access point mode (AP mode) to station mode (STA mode).

As most WiFi networks are security enabled, the SSID security type and passphrase will be required for the network that we wish to connect to. Before starting the configuration, you should determine the following information with regards to the network you will be connecting to:

- The WiFi router's SSID and Pass Phrase (WiFi password)
- The gateway IP address
- An available static IP address
- The IP address or domain name of the data host.

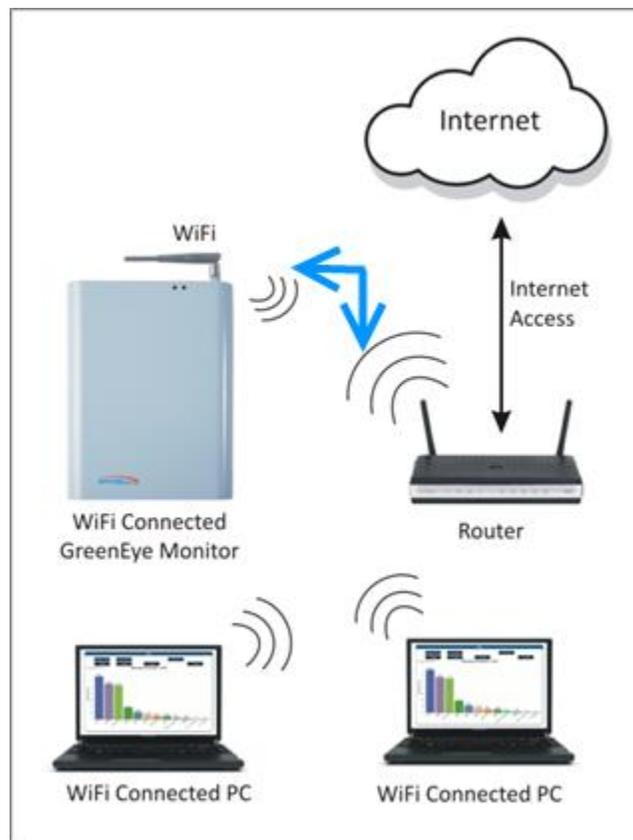


Figure 6

Important Note

Throughout each step, after clicking “Apply” to a given option, a link to “**Device Management**” will appear. **DO NOT SELECT THIS OPTION AT THIS TIME.** This link is used to restart the module and save the changes. This is only required to be done once at the end of all changes. You will be instructed when to do so.

Steps

1. Refer to Figure 7.
 - Select “Mode Selection” from the left menu.
 - Click “STA Mode” radio button.
 - Click “Apply”.

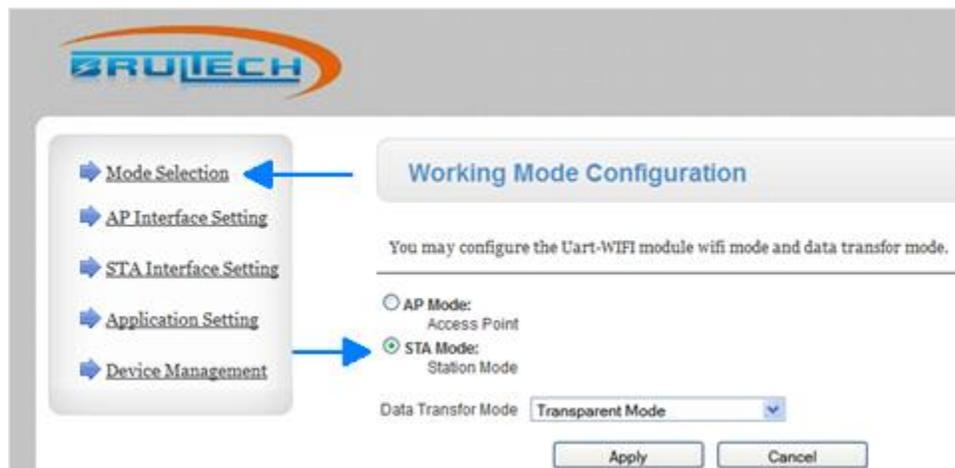


Figure 7

2. Refer to Figure 8
 - Select “AP Interface Setting” from the left menu.
 - Set “IP Address” to “1.2.3.4”.
 - Set “Subnet Mask” to “255.255.255.0”.
 - Set “DHCP Type” to “Disable”.
 - Click “Apply”.

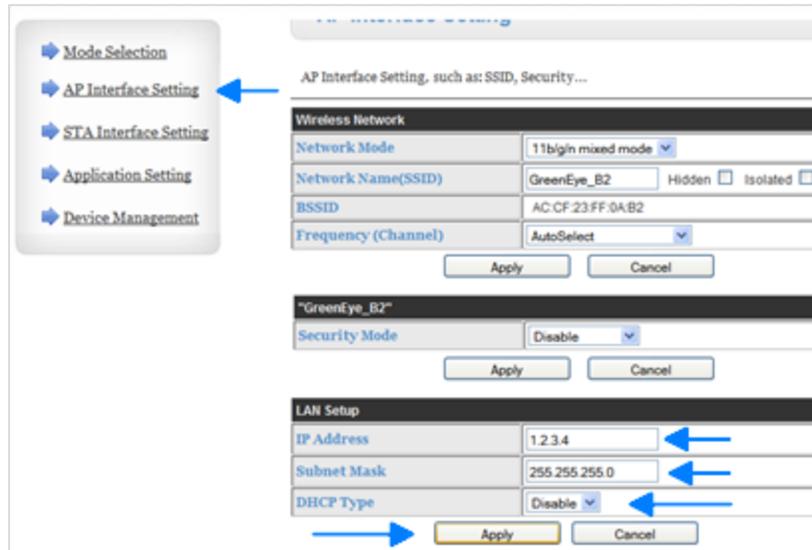


Figure 8

3. Refer to Figure 9
 - Select “STA Interface Setting” from the left menu.
 - Enter your network’s WiFi name (SSID) in the “AP’s SSID” box.
 - Set the “Security Mode” to match that of your wireless network.
 - Set the “Encryption Type” to match that of your wireless network.
 - Enter your WiFi network’s security “Pass Phrase”.
 - Click “Apply”.

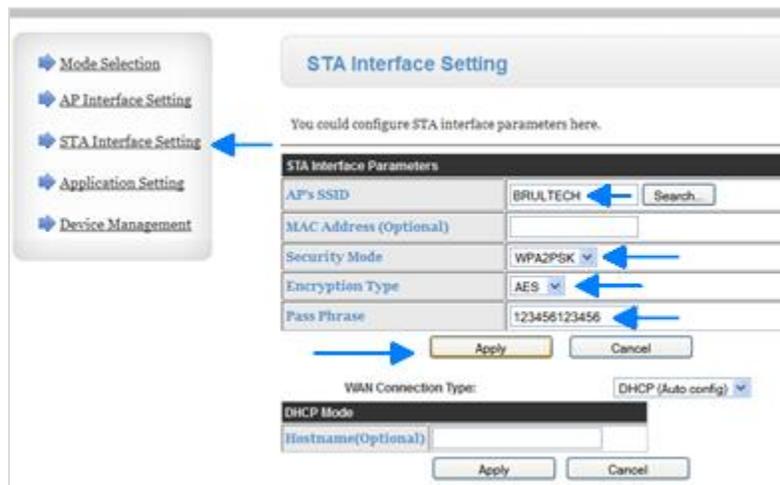


Figure 9

4. **OPTIONAL:** You can assign a name to the GEM so that it is readily identifiable when viewing all of the network connected devices on a router’s setup page. This is done by entering this user assigned name in the “Hostname” box in Figure 9, then clicking “Apply”.

5. Optional steps to assign a static IP.

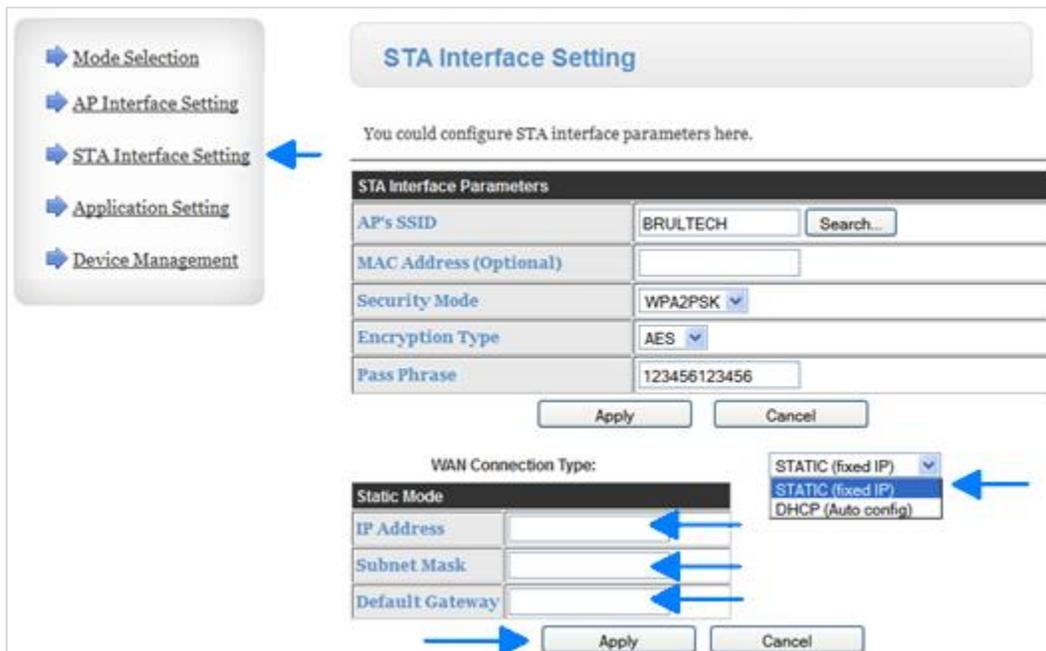
This step is required **ONLY** if you wish to assign a static IP to the GEM. If a static IP is used, the following conditions must be met:

- The static IP must be on the same subnet as that of the network. For example, if the network's router is "192.168.0.1" then the static IP must begin with "192.168.0." and the last number must be between 2 and 254.
- The IP address assigned must not be used by another device on the network. This can be verified by accessing the router's setup interface.

Further explanation of static IP is beyond the scope of this document, information can be found using an internet search.

Refer to Figure 10

- Select "STA Interface Setting" from the left menu.
- Click the "DHCP/STATIC" drop down box and select "STATIC (fixed IP)".
- Enter the IP address you wish to assign to the GEM.
- Enter the subnet mask (typically "255.255.255.0").
- Enter the IP address of your gateway (router).
- Click "Apply".



The screenshot shows the 'STA Interface Setting' configuration page. On the left, a navigation menu highlights 'STA Interface Setting'. The main content area is titled 'STA Interface Setting' and contains the following fields:

- AP's SSID:** BRULTECH
- MAC Address (Optional):** (empty)
- Security Mode:** WPA2PSK
- Encryption Type:** AES
- Pass Phrase:** 123456123456

Below these fields are 'Apply' and 'Cancel' buttons. The 'WAN Connection Type' section includes a dropdown menu for 'Static Mode' with options: 'STATIC (fixed IP)', 'STATIC (fixed IP)', and 'DHCP (Auto config)'. Below this are fields for 'IP Address', 'Subnet Mask', and 'Default Gateway', each with an 'Apply' and 'Cancel' button.

Figure 10

6. Save changes.

This step saves all changes made and re-starts the WiFi module.

Refer to Figure 11

- Select “Device Management” from the left menu.
- Click “Restart”.

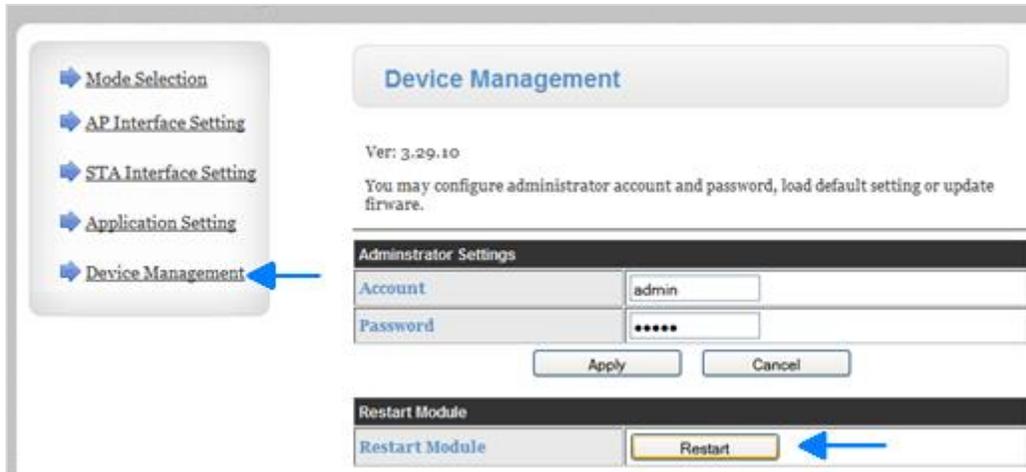


Figure 11

The module will now re-boot. This takes approximately 30 seconds.

After rebooting, the “Com LED” will glow amber then shortly after, will turn to yellow indicating that the GEM has connected to the router.

If the “Comm LED” changed to yellow (amber + green Comm LEDs both “on”) indicating a connection to the network, then proceed to “Step 3 - Connect a PC to the GEM via Network” on page 18.

GEM Did Not Connect

If the GEM did not connect to the router via WiFi, indicated by the amber only “Comm LED” active, then one of the following situations may have occurred:

- Range too far between the GEM and the router.
- Improper WiFi security type selected. This can be verified by viewing the router’s security settings. Refer to your router manual for this.
- TKIP was selected instead of AES, or vice versa. If you’re using AUTO security on your router, try both options.
- Typing mistake was made while entering SSID, password, etc.

If a connection was not established you will need to return to factory defaults (see APPENDIX B - Reset to factory defaults.) then attempt the steps in this chapter again. If the connection problem persists, you

may try **temporarily** disabling the router's security option to narrow down the issue. This will indicate if the problem lies with security settings or not.

STEP 2B- ETHERNET CONNECTION TO A NETWORK

This option consists of connecting the GEM to a network “router”, “hub” or “switch” using an Ethernet network cable instead of a WiFi connection. See Figure 12.

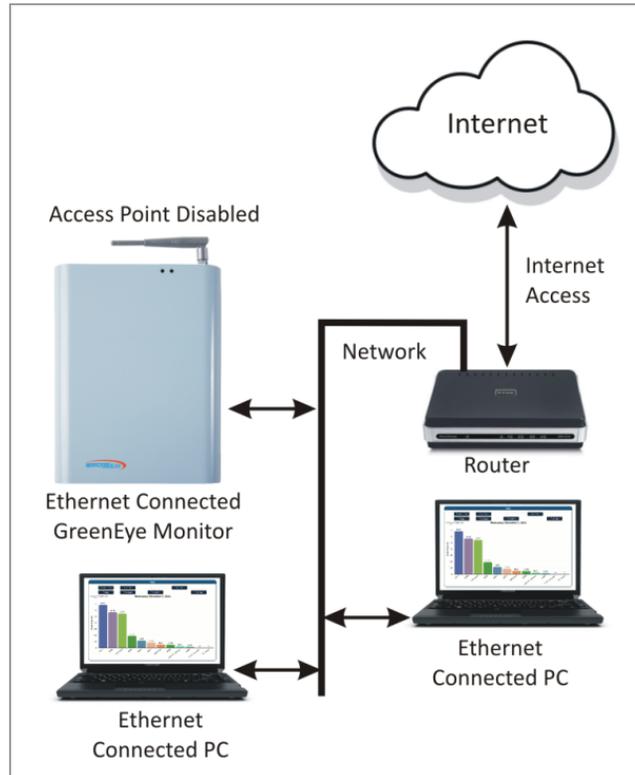


Figure 12

Important Note

Throughout each step, after clicking “Apply” to a given option, a link to “Device Management” will appear. DO NOT SELECT THIS OPTION AT THIS TIME. This link is to restart the module and save the changes. This is only required to be done once at the end of all changes. You will be instructed when to do so.

Steps

1. Refer to Figure 13
 - Select “Mode Selection” from the left menu
 - Click “AP Mode” radio button
 - Click “Apply”

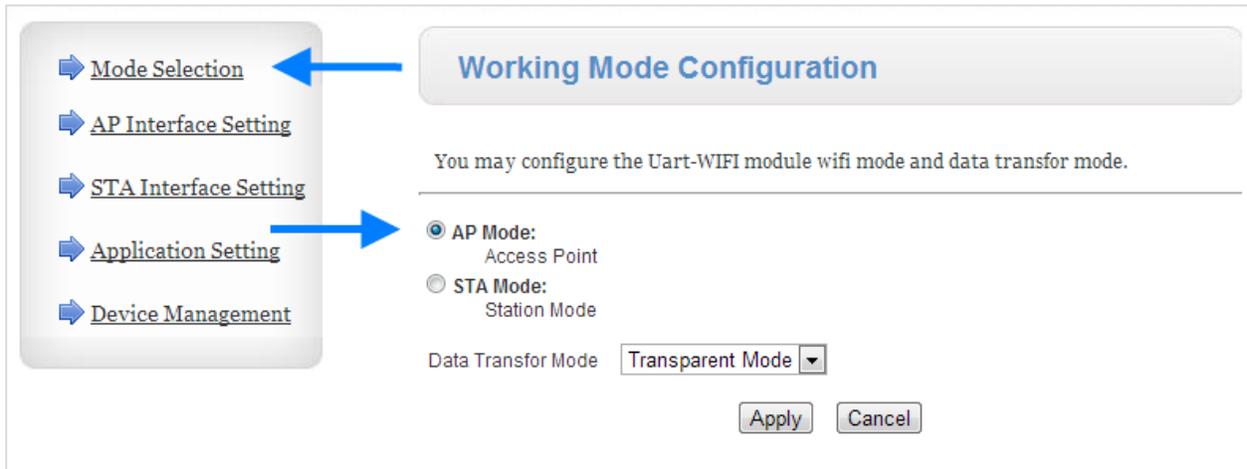


Figure 13

2. Refer to Figure 14

- Select “AP Interface Setting” from the left menu
- Set “IP Address” to “1.2.3.4”
- Set “Subnet Mask” to “255.255.255.0”
- **Optional:** The WiFi settings will be left in AP mode, if you don’t want this network visible then checkmark the Hidden checkbox.
- **Optional:** You can add security to the AP to disallow people from accessing your GEM through the AP.
- Click “Apply”

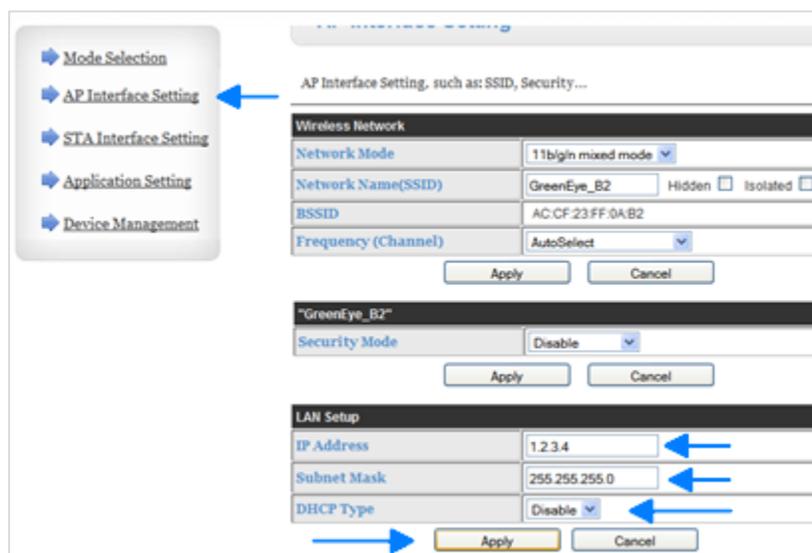


Figure 14

3. Refer to Figure 16

- Select “STA Interface Settings” from the menu.
- Set “WAN Connection Type” to DHCP.
 - Currently, sending data to a DNS such as “api.smartenergygroups.com” only works via DHCP. In the next iteration of WiFi/Ethernet firmware, we have support for DNS via Static IP.

You could configure STA interface parameters here.

STA Interface Parameters	
AP's SSID	BRULTECH <input type="text" value="Search..."/>
MAC Address (Optional)	<input type="text"/>
Security Mode	WPA2PSK
Encryption Type	AES
Pass Phrase	<input type="text"/>

Apply Cancel

WAN Connection Type:

DHCP Mode	
Hostname(Optional)	GreenEye

Apply Cancel

Figure 15

4. Refer to Figure 167

- Select “Device Management” from the left menu
- Click “Restart”

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You may configure administrator account and password, load default setting or update firmware.

Administrator Settings	
Account	admin
Password	*****

Apply Cancel

Restart Module	
Restart Module	<input type="button" value="Restart"/>

Figure 167

The module will now re-boot which takes approximately 30 seconds. After rebooting, the “Com LED” will glow amber. The amber LED only indicates connection for the WiFi portion of the module, it does not indicate the status of the Ethernet connection.

STEP 3 - CONNECT A PC TO THE GEM VIA NETWORK

Now that the GEM is connected to the local network, a PC may now connect to the same network and access the GEM to perform one or more of the following:

- Upgrade the GEM firmware (if required).
- Configure or modify the GEM settings.
- Change the communication module's settings.

Discovering the GEM's IP Address

If a "Static" IP address was assigned to the GEM, then this will be the GEM's IP address and this section may be skipped.

The simplest method of determining the GEM's IP address on the network is to use the "GEM Network Utility" software (version 4.2 or higher). Other methods may be used such as:

- Accessing the router's configuration page and reviewing all connected device IP addresses.
- Using software utility such as "Netscan" (free downloadable).

Discovery Using GEM Network Utility

If you have not already downloaded and installed the "GEM Network Utility" software, do so now. This application is downloadable from <http://brultech.com/software/> under the GreenEye Monitor section.

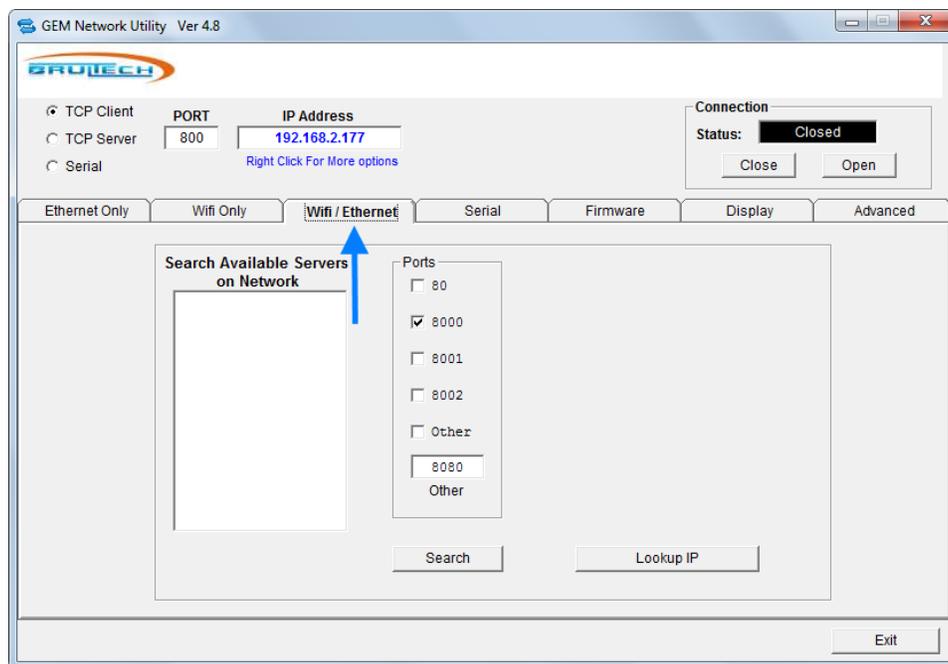
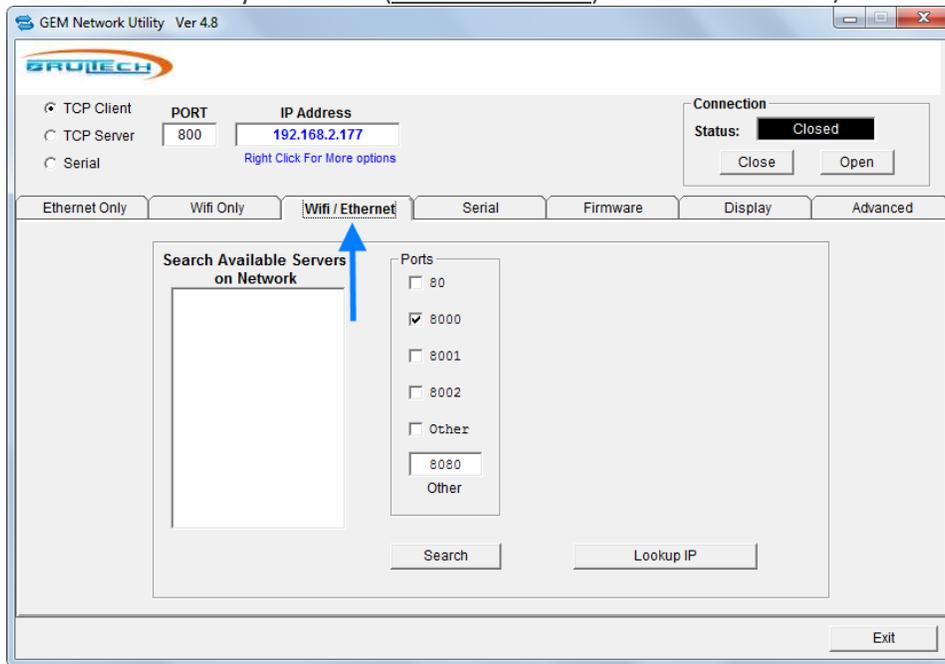


Figure 17

Steps

Run the “GEM Network Utility” software (**as administrator**) and click the “WiFi / Ethernet” tab. See



1. Figure 17.
2. Click “Lookup IP”. This will discover the PC’s IP address as well as that of the gateway. See Figure 18.
3. Make sure only port “8000” is selected and click “Search”. See Figure 18. After searching, the IP address will be discovered as shown in Figure 19.

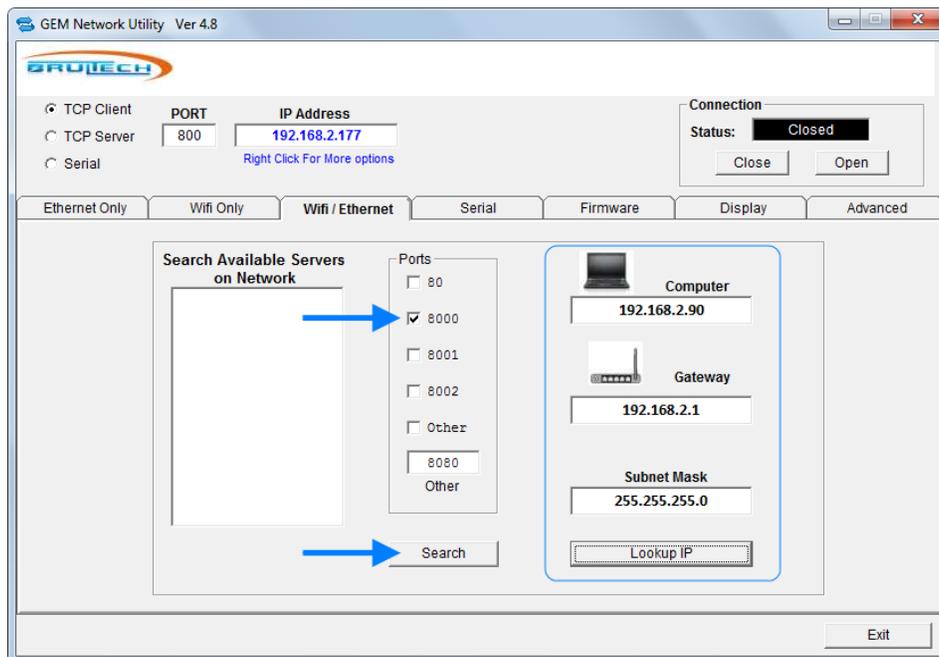


Figure 18

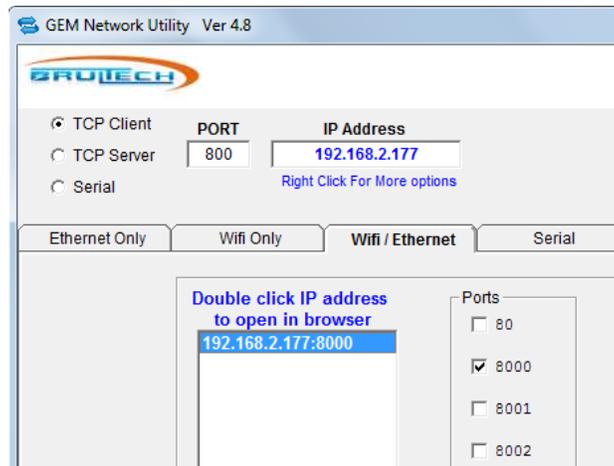


Figure 19

Checking Firmware Version

1. Highlight the IP address that was found then right click it. Select “Connect” from the popup menu. The software will transfer the IP address and port to corresponding boxes and a connection will be established, indicated by the “green” status box (Figure 20).

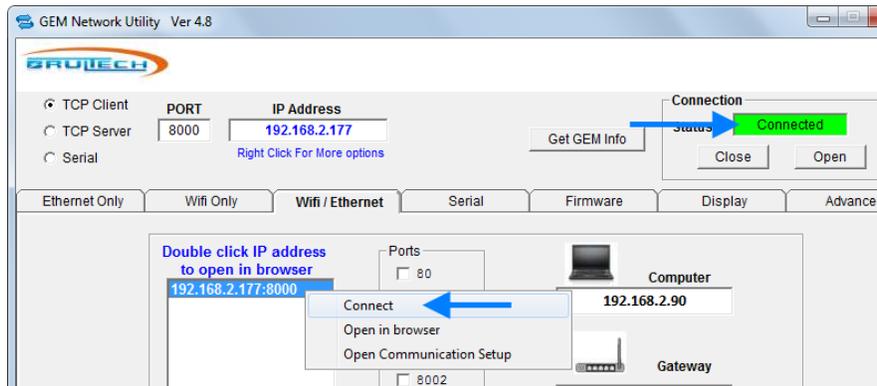


Figure 20

2. **NOTE: the results of this next step may vary depending on the firmware version currently residing on the GEM.** If the status box is still green, then click “Get GEM Info” button. If the box is no longer green, then click “Open” first and the status should change to “Connected” shortly after. See Figure 21 (newer firmware) and Figure 22 (older firmware) for the possible results.

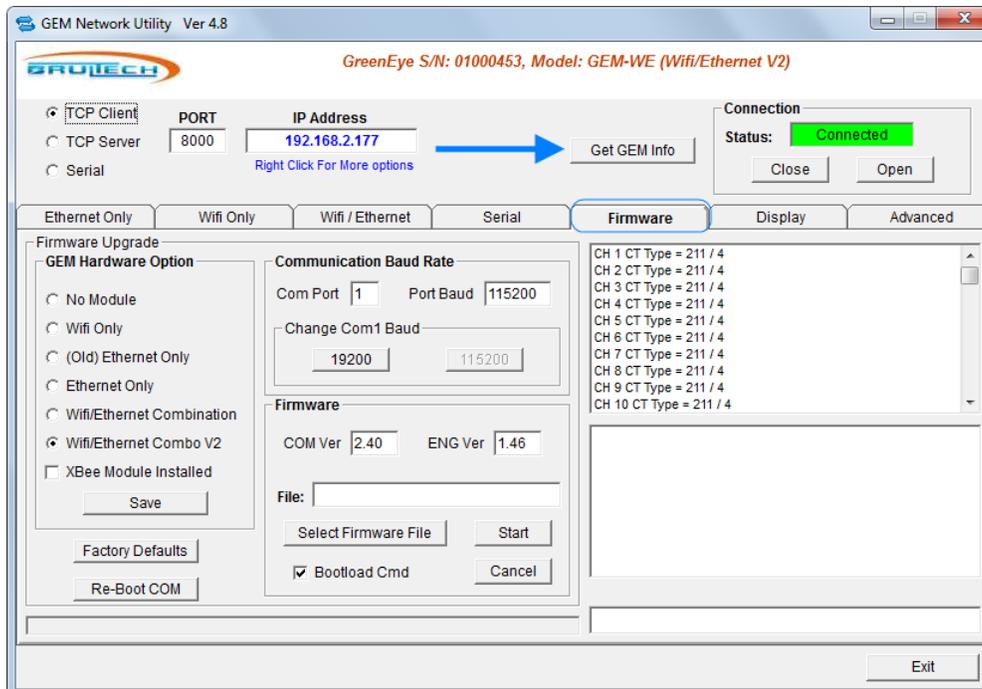


Figure 21

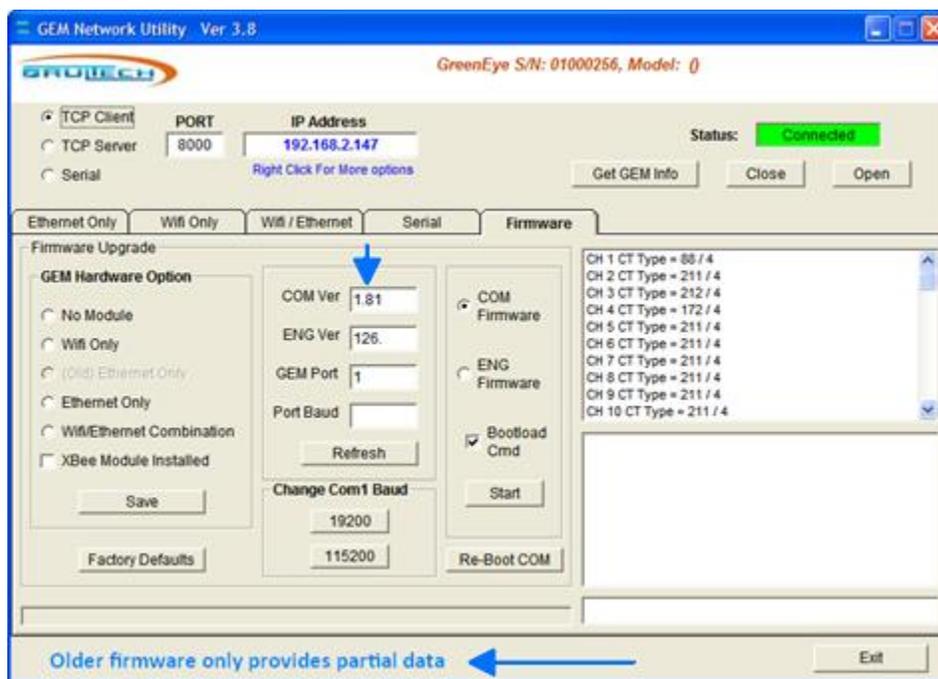


Figure 22

A GEM with “COM” firmware version older than “ver 2.18” will only display partial information after clicking “Get GEM Info” as shown in Figure 22. Notice in this example that the older version is COM ver 1.81. It does not display hardware information and baud rate. Furthermore the displayed ENG firmware version is improper. This is normal and proper results will be obtained once the firmware is upgraded.

If the firmware requires upgrading, refer to chapter “

Upgrading GEM Firmware (Optional)" on page 27.

STEP 4 - CONNECT TO THE GEM SETUP PAGE

This chapter describes how to connect to the GEM’s Setup Page using a browser such as IE, FireFox, Chrome, etc. Before pursuing this step, the following are recommended:

1. Verify that the “COM” firmware is version 2.22 or higher
2. The baud rate is set for 115,200

Preferred Baud

The “baud rate” is the speed at which data is transferred between the GEM and the communication module.

Originally the GEM’s operation was limited to 19,200 baud. This slower communication rate impaired the performance of the GEM’s setup page. It is recommended to set the GEM to operate at 115,200 baud and leave it set to this baud. The only time it should be reduced to 19,200 is for firmware upgrades.

NOTE: The GEM’s bootloader still operates at 19,200 baud only. This requires that the baud rate be changed to 19,200 for the firmware upgrade process. This is true for the “COM” and “ENG” firmware. After the upgrade is completed then the baud should be set to 115,200.

Switching to 115200 Baud

- Connect to the GEM using the “GEM Network Utility” as shown in Figure 23.
- Make sure a connection is established and the “Status” is connected. Refer to chapter “Step 3 - Connect a PC to the GEM via Network” for instructions.
- Click “Get GEM Info”. If the “Port Baud” value does not appear, then the GEM may have firmware older than version 2.00. It is recommended to upgrade the firmware.
- Verify the proper “GEM Hardware Option” setting! The “WiFi/Ethernet Combination” option should be selected. If not, click this option then click “Save”.
- If the “Port Baud” value is “19200” such as in the example of Figure 23, click the “115200” button in the “Change Com1 Baud” box. If the baud value is already 115,200 then move on to the next chapter.

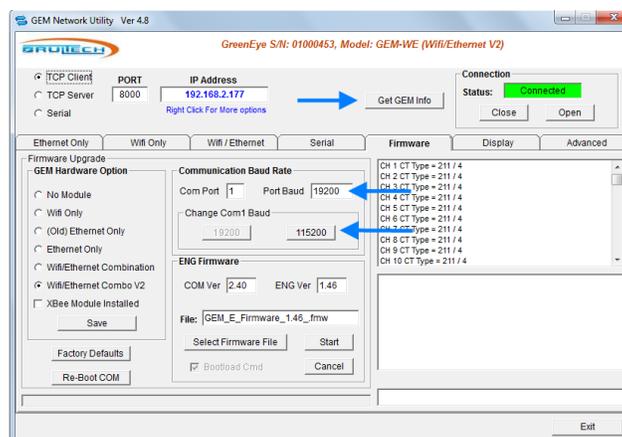


Figure 23

Opening the GEM Setup Page

If the GEM’s IP address is known, you can access the setup page by opening a browser, entering the IP address and adding “:8000” at the end of the address. If you changed the port on the communication modules setup page, you will use that port instead.

Alternately, the “GEM Network Utility” may be used to access the GEM setup page by right-clicking the discovered IP address and selecting the “Open in Browser” option. See Figure 24. The browser should open up with a web page such as that of Figure 25.

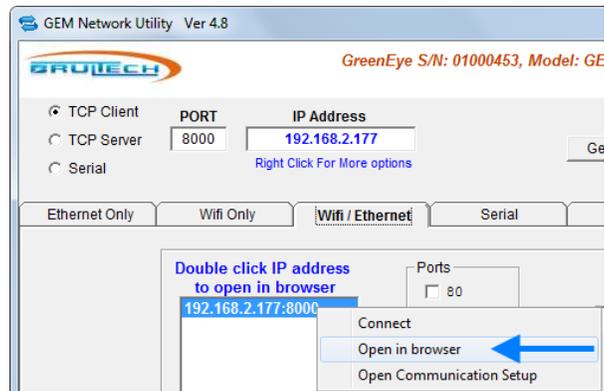


Figure 24

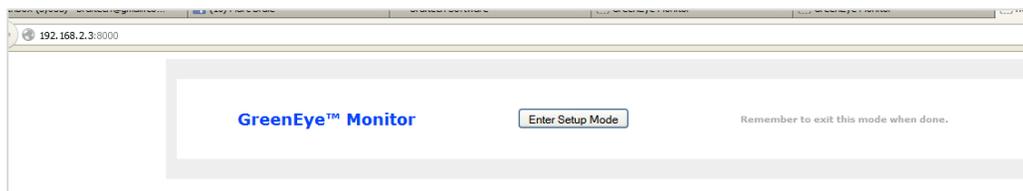


Figure 25

There is a possibility that the web page opens with text instead of a webpage, for example see Figure 26. To resolve this issue, simply close the web page and re-open the webpage. The issue generally occurs when accessing the web interface initially while packet data is being transmitted. Once the web page is accessed and “Setup Mode” is entered, packet data is paused which resolves the issue.



Figure 26

If the browser does not connect to the GEM setup page whatsoever and a timeout error occurs then make sure that the GEM communication module is configured as a “Server” using port “8000”.

CONNECTING TO COMMUNICATION MODULE SETUP PAGE

This chapter describes how to connect to the communication module's setup page once it has been connected to a network. The user's PC must be connected to the same local network.

The communication module's setup page can be accessed anytime, even while the GEM is reporting data to a host.

When the GEM is already connected to a network it may be desired to access the communication module's setup page to perform one of the following tasks:

1. Set the IP address and port of the remote host which will receive the GEM's packets.
2. Connect to a different network or make changes to the current network settings.
3. Change the "baud rate" manually in situation where the GEM's baud differs from that of the WiFi/Ethernet module and cannot automatically recover from the mismatch. (The latest GEM firmware version should recover from this situation automatically).

OPENING THE SETUP PAGE

If the GEM's IP address is known, simply open the browser and enter the IP address in the browser's address bar. (Figure 28)

The GEM Network Utility has provisions to automatically open the communication setup page and browser. This is done by highlighting the IP address that was found, right clicking it, then selecting "Open Communication Setup". See Figure 27 and Figure 28

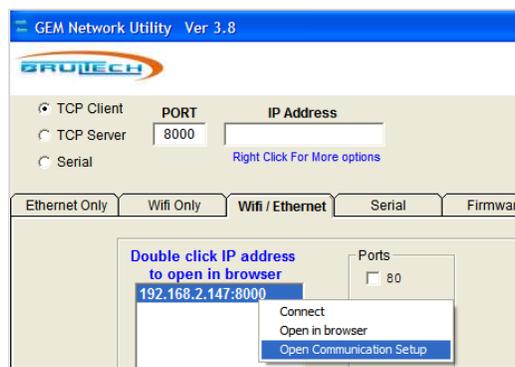


Figure 27



Figure 28

CONNECTING THE GEM TO REMOTE HOST

This chapter describes how to connect to the GEM to any remote host to collect packets, including web hosts. This section assumes that the GEM has access to the data host over the network or internet.

You will no longer have access to the GEM setup page so make sure your GEM is fully configured before configuring the WiFi/Ethernet module to send to your data host.

UPGRADING GEM FIRMWARE (OPTIONAL)

FIRMWARE

The “firmware” is the software program that runs inside the GEM’s processor. The concept of upgrading firmware is like that of upgrading software on a PC. Typically when a company releases a new version of software, improvements have been made and new features added. The same applies to firmware.

The GEM has two processors and therefore two firmware types: “COM” and “ENG”. The “COM” firmware is the principal operating system of the GEM and commonly upgraded.

COM Firmware

The COM firmware handles most of the GEM functions such as packet communication, all settings and system functions. Most upgrades to the GEM will involve this firmware.

ENG Firmware

The Engine (ENG) firmware does all of the energy processing for channels 1 to 32. This firmware rarely requires upgrading.

It is strongly recommended to upgrade the GEM’s firmware if the “COM” firmware version is older (less) than ver. 2.20. The ENG firmware should also be upgraded.

REQUIRED BAUD

The “baud rate” is the speed at which data is transferred between the GEM and the communication module.

The GEM requires a baud rate of 19,200 for “COM” and “ENG” firmware upgrades. Older GEMs used this baud rate exclusively however newer firmware versions allow the GEM to be switched between 19,200 baud and 115,200 baud. **The 19,200 baud rate is mandatory for firmware upgrades.** Under normal operating conditions, it is advised to set the GEM for the faster 115,200 rate to greatly improve its performance.

If clicking the “Get GEM Info” results in a response similar to REPLACEWITHFIGURE below, then the baud rate is not detected and no baud rate change is required since this older version used 19,200 baud only. If the response resembles Figure 29 in the “Changing to 19200 Baud” section below, then the baud rate is selectable and in this case **MUST** be changed from 115,200 to 19,200 before proceeding with the firmware upgrade.

Changing to 19200 Baud

Figure 29 below shows the result of the “Get GEM Info” function of newer firmware. In this example the GEM is set for 115,200 baud and needs to be changed before proceeding with firmware upgrade.

Click the “19200” button in the “Change Com1 Baud” section (Figure 29). The entire procedure will take approximately 32 seconds.

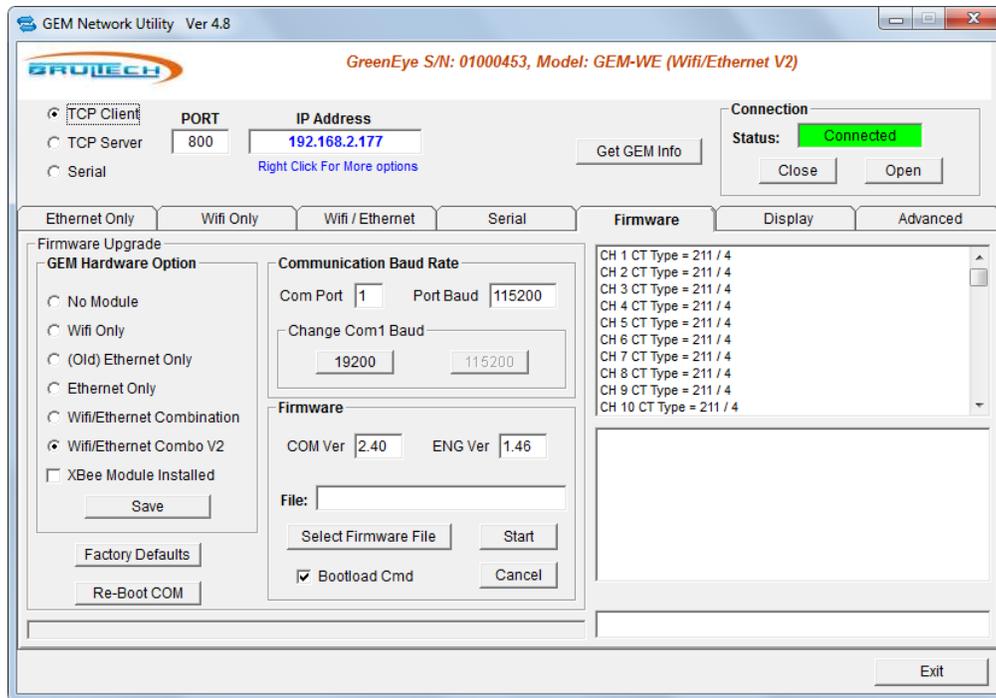


Figure 29

ENG FIRMWARE UPGRADE

1. Download the most recent “ENG” firmware version from “Brultech.com/software” and save it on the PC
2. Establish a connection with the “GEM Network Utility” software
3. Click “Get GEM Info”
4. Determine if the baud rate needs to be changed. See “Required Baud” on page 27
5. Select the “ENG Firmware” button and make sure “Bootload Cmd” is checked
6. If the status is not currently “Connected” (box is green), then click “Open” to connect
7. Click the “Start” button in the firmware selection section.
8. Select the firmware file. The filename for the “ENG” firmware will be “GEM_E Firmware x.xx.fmw” where “x.xx” is the firmware version. Firmware upgrade will then begin. See Figure 30

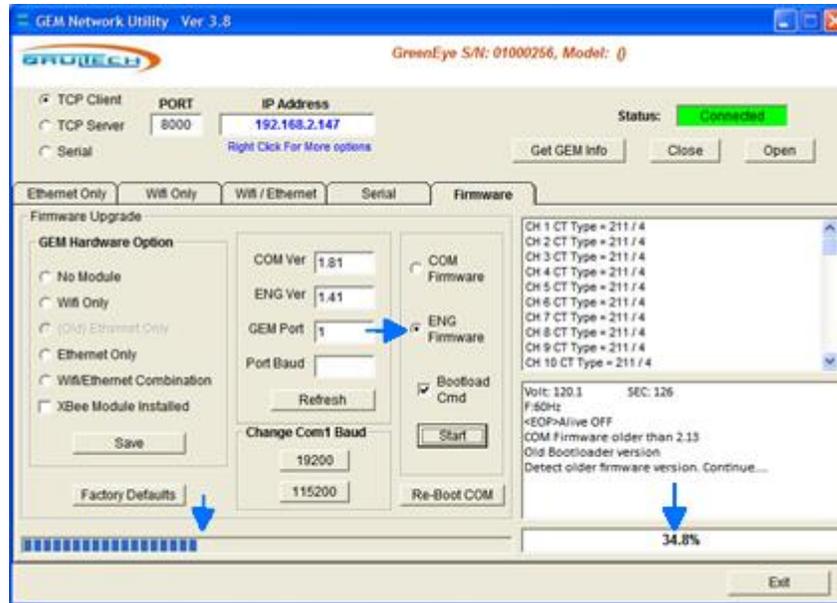


Figure 30

COM FIRMWARE UPGRADE

1. Download the most recent “COM” firmware version from “Brultech.com/software” and save it on the PC
2. Establish a connection with the “GEM Network Utility” software
3. Click “Get GEM Info”
4. Select the “COM Firmware” button and make sure the “Bootload Cmd” box is checked.
5. If the status is not currently “Connected” (box is green), then click “Open” to connect
6. Click the “Start” button in the firmware selection section
7. Select the firmware file. The filename for the “COM” firmware will be “GEM_C Firmware x.xx.fmw” where “x.xx” is the firmware version. Firmware upgrade will then begin. See Figure 31

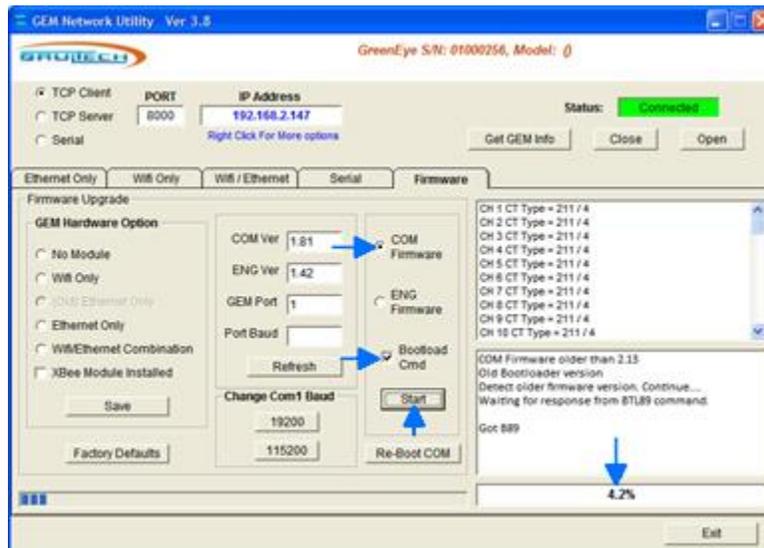


Figure 31

RECOVERY FROM FAILED COM FIRMWARE UPGRADE

It is possible that communication is lost during the firmware upgrade procedure or something happens to prevent the firmware upgrade from completing. When this occurs, the GEM may become unresponsive to any command and inoperable.

The method used to recover from a non-responsive state depends on which firmware upgrade failed.

1. Make sure that the communication module is set for 19200 baud. Open the communication module's setup page and select "Application Setting" from the left menu. If the baud rate is not set to "19200" then select "19200" from the "Baudrate" menu. See Figure 32.

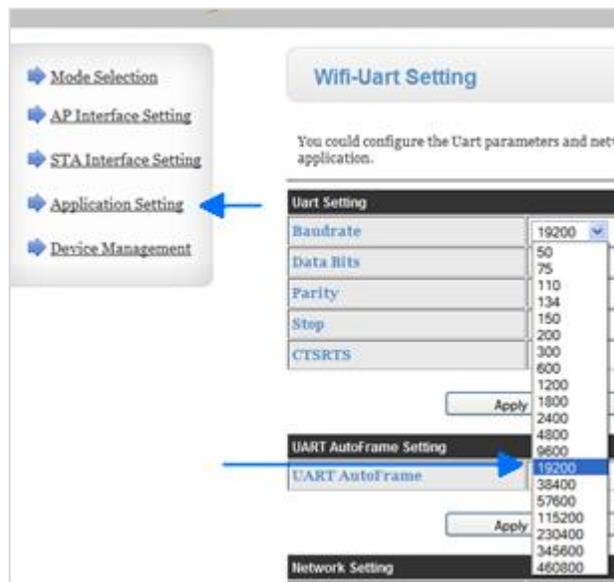


Figure 32

If no change was required to the baud rate, proceed to the next step, otherwise select "Device Management" from the left menu then click "Restart".

2. Unplug the 5VDC supply from the GEM. Press the recessed push button switch located at the very bottom of the GEM unit. While holding down the push button, apply power to the GEM. Once the GEM powers up, then release the button. The "System LED" should turn a solid red. If not, try again. If it fails to turn red a second time, the GEM's battery will need removal and the above step repeated.
3. With the GEM's "System LED" now glowing red, run the "GEM Network Utility" software and establish a connection. The connection will be obvious by a green "Status" box.
4. Select the "Firmware" tab of the "GEM Network Utility" and make sure the "Bootload Cmd" box is **NOT** checked.

5. Click “Start” and select the “COM” firmware which will look like this: “GEM_C Firmware x.xx.fmw”, where “x.xx” is the firmware version.

The firmware upgrade process should now begin.

RECOVERY FROM FAILED ENG FIRMWARE UPGRADE

If the “ENG” firmware upgrade fails, recovery is simply a matter of briefly pressing the recessed push button at the very bottom of the GEM device. This should cause the “System LED” to change from yellow to green. Repeat the procedure for upgrading the “ENG” firmware described on section “ENG Firmware Upgrade”.

UPGRADING WIFI/ETHERNET FIRMWARE (OPTIONAL)

The instructions in this section are only applicable to those running **V4** modules.

The WiFi/Ethernet module runs a firmware that is separate from the GEMs COM and ENG firmware. Before you update, check your WiFi/Ethernet modules firmware version. The **V3** modules are end-of-life in terms of firmware upgrades.

DETERMINING FIRMWARE VERSION

1. Connect to the Communication Modules setup page as explained in the “Connecting to Communication Modules Setup Page” section.
2. Select “Device Management” in the left menu.
3. The firmware version is at the top of the page, see Figure 34.



Figure 33

If the version number on that page starts with a 4, the module is **V4**. See Figure 18 for an example on where to find the firmware number. To reiterate, you cannot update a V3 module to a V4 firmware due to incompatibility.

WIFI/ETHERNET FIRMWARE UPGRADE

1. Download the most recent “WiFi/Ethernet” firmware version from “Brultech.com/software” and save it on the PC
2. Access the Communication Modules setup page as explained in the “Connecting to Communication Modules Setup Page” section.
3. Select “Device Management” in the left menu.
4. Scroll down to the “Update Firmware” section.
5. Click “Select File” and locate the firmware on your PC, then click “Apply” to apply the firmware.
6. Click “OK” on the Dialog Box that pops up.

The screenshot shows a web interface with a sidebar on the left containing 'Application Setting' and 'Device Management'. The 'Device Management' section is active, showing a form with 'Account' (admin) and 'Password' (admin) fields, and 'Apply' and 'Cancel' buttons. Below this are three sections: 'Restart Module' with a 'Restart' button, 'Load Factory Defaults' with a 'Load Default' button, and 'Update Firmware' with a 'Location:' label, a 'Choose File' button, and the text 'No file chosen'. A blue arrow points from the 'Choose File' button to the 'Update Firmware' section.

Figure 34

The firmware update process will now begin, it should take around 30 seconds. Once the module has finished the firmware update, a page appear indicating that it's rebooting.

After the module is has rebooted, connect to the communication modules page again and go to the "Device Management" section to verify the firmware updated correctly. If it didn't, repeat the "WiFi/Ethernet Firmware Upgrade" process

APPENDIX A – DIRECT ETHERNET CONNECTION

GEM TO PC DIRECT ETHERNET CONNECTION

If a PC with WiFi is not available for setting up the GEM access to a network, it is possible to use a direct connection between a PC's Ethernet jack and the GEM. This requires setting up a "Static IP Address" on the PC.

SET PC WITH STATIC IP ADDRESS

- Open Network Connections by clicking the "Start" button then clicking Control Panel
- In the search box, type adapter, and then, under Network and Sharing Center, click "View Network Connections"
- Right-click the connection that you want to change, and then click "Properties". If you're prompted for an administrator password or confirmation, type the password or provide confirmation
- Click the Networking tab. Under "This connection uses the following items", click Internet Protocol Version 4 (TCP/IPv4) then click "Properties". See Figure 35

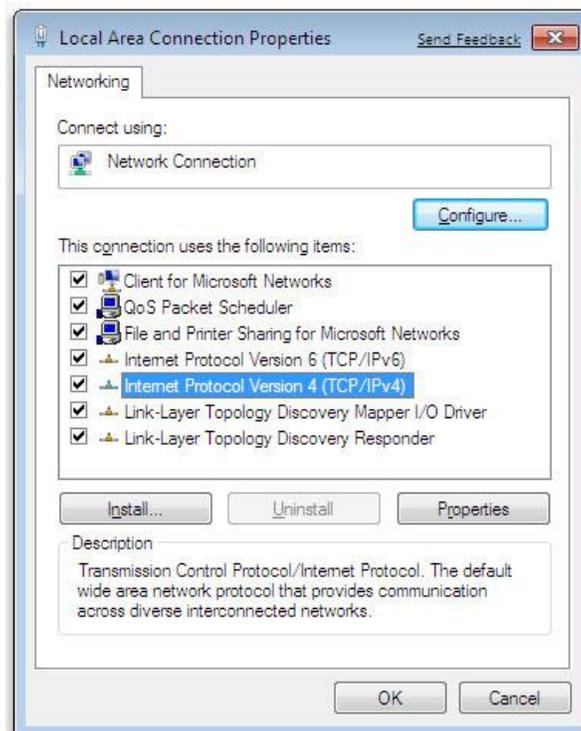


Figure 35

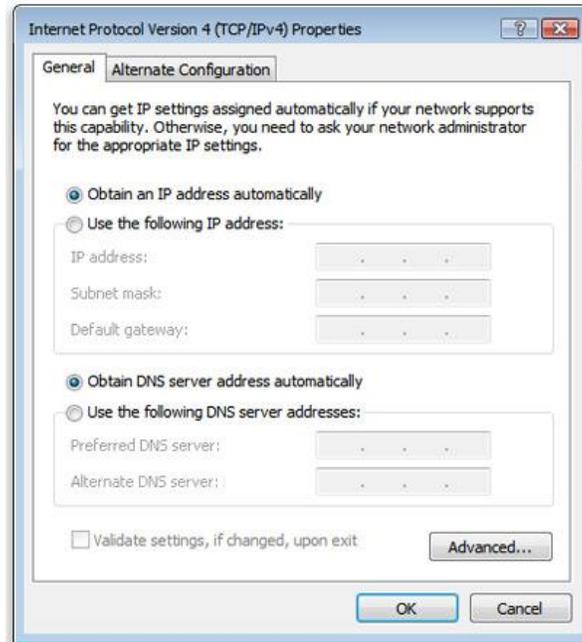


Figure 36

Referring to Figure 36, make the following changes:

- Click “Use the following IP address” and enter the following:
 - IP Address: “192.168.2.1”
 - Subnet Mask: 255.255.255.0”
 - Default Gateway: “192.168.2.1”
- Click “Use the following DNS server addresses”
 - Set “Preferred DNS server” to “192.168.2.1”
- Click “OK” then click “OK” on the “Local Area Network Properties” window

A network connection should now be established between the GEM and the PC.

Proceed to chapter “Step 2a - WiFi Connection to a Network” or chapter “Step 2B- Ethernet Connection to a Network” depending on the type of connection desired (wireless or wired).

APPENDIX B - RESET TO FACTORY DEFAULTS

The communication module factory reset provides a means of setting the GEM to a known IP address and port. This allows a PC to connect to it in order to re-direct it to a local or remote network. Factory reset can only be done with the communication module fully booted up which occurs roughly 30 seconds after the GEM is powered. The module is booted when the “communication status LED” comes “on”.

1. Make sure the “Comm Status LED” is “on”!
2. Locate the “Factory Reset Push Button” switch on the edge of the module (see Figure 37) then press it for approximately 6 seconds and release. (There will be no immediate LED response when the switch is released).
3. After roughly 10 seconds, the communication status LED will go dark. This indicates that the module is in the process of re-booting.
4. After approximately 30 seconds, the amber LED comes on. The wireless access point will become available after a few seconds.
5. Use a PC with WiFi capability and search for wireless networks. The GEM will now appear as a WiFi “Access Point” with a WiFi network name: “**GreenEye_xx**”, where “xx” are the two last characters of the MAC address.

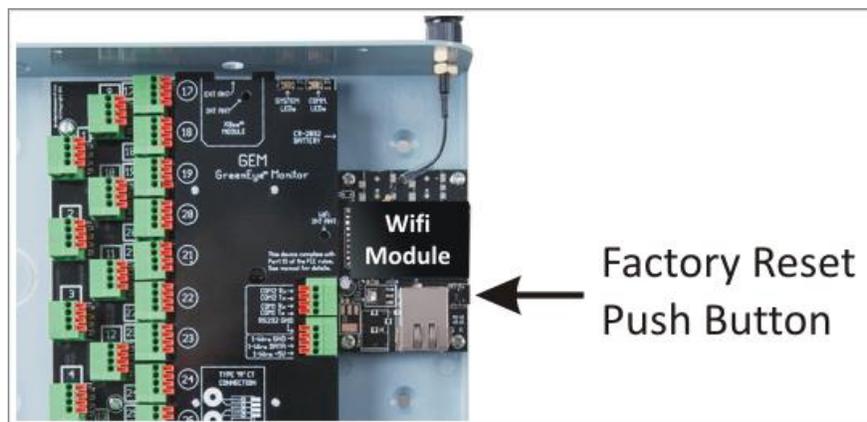


Figure 37