# Connecting the EtherPort or EtherBee Gateway to a TCP/IP connection

## Table Of Content

# Introduction

This document describes various procedures for creating a TCP/IP connection to the EtherBee or EtherPort gateway device. Since this document applies to the EtherBee and EtherPort gateways, the term "**EtherDevice**" is used to represent either device throughout this document. The same procedure applies to either device.

Setting up the EtherDevice will require the EtherX Configuration software which is downloadable from www.brultech.com

This document describes how to configure the EtherDevice for four different scenarios:

1. **Connection to a Local Network (most common method)**
2. **Connecting directly to a PC**
3. **Connecting to a Remote Network (over internet)**
4. **Connecting directly to a website.**

## *Local Network Connection:*

This is the most common method used. This involves setting up the EtherDevice as another device on a Local Area Network (LAN) with its own IP address. The data from the EtherDevice may then be directed to any specified PC on the LAN.

## *Direct to PC's Ethernet Jack*

This method describes how to connect the EtherDevice directly to a PC's Ethernet jack without use of a network. This method is also recommended for debugging purposes or upgrading the EtherDevice's firmware.

## *Connecting to a Remote Network (over internet)*

This setup is similar to the first example of connecting to a Local Area Network (LAN). The difference is that the EtherDevice is configured to connect to a remote PC via the internet. Doing this allows the ECM-1240 system to run without needing a local PC.

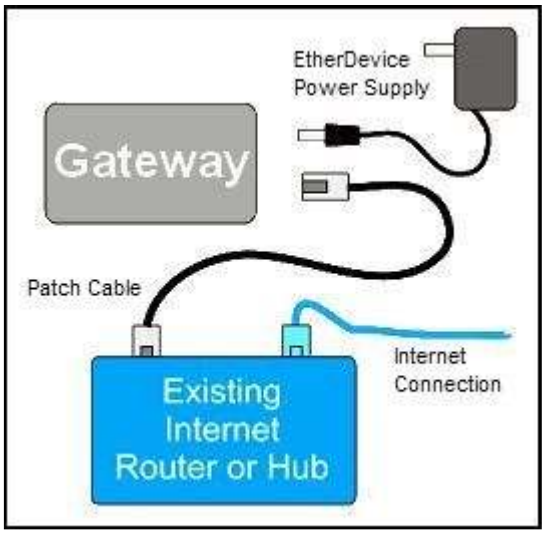
## *Connecting directly to a website*

This describes how to connect the EtherDevice directly to a hosting website eliminating the need for a PC to host the data. This method may only be used when the ECM-1240 is configured to send HTTP posts. (See associated document for setting up the ECM-1240).

# Local Network Connection

## *Connecting the hardware:*

This setup involves connecting the EtherDevice to a free network jack of an internet router, hub or network switch as shown in the diagram below.



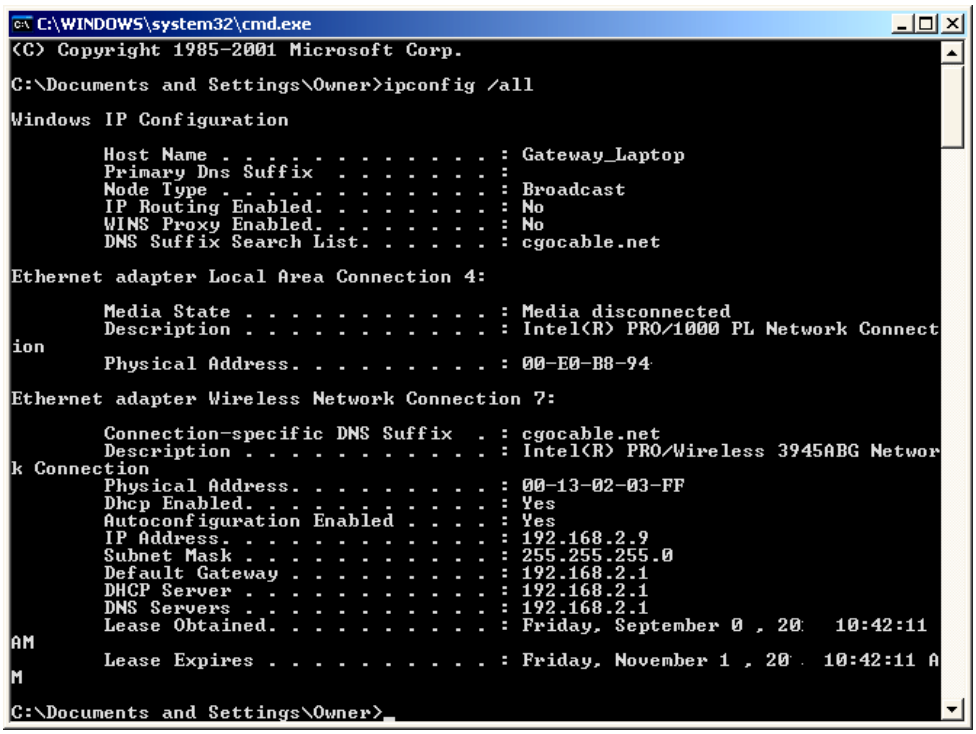

## *Obtaining IP information:*

The information required to complete the configuration portion of the setup is best obtained from the PC that will be hosting the data. The procedure for this is as follows:

Click “Start” -> “Run” then type “cmd” then click “OK” (Windows XP)

Click “Start”. In the “Start Search” box type “cmd” then click “OK” (Windows Vista, Windows7)

A command window will be displayed. Type the following “ipconfig /all” then press enter. This should cause the information similar to that of the screenshot (right) to be displayed.



```
C:\WINDOWS\system32\cmd.exe
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Owner>ipconfig /all

Windows IP Configuration

        Host Name . . . . . . . . . . . . : Gateway_Laptop
        Primary Dns Suffix  . . . . . . . :
        Node Type . . . . . . . . . . . . : Broadcast
        IP Routing Enabled. . . . . . . . : No
        WINS Proxy Enabled. . . . . . . . : No
        DNS Suffix Search List. . . . . . : cgocable.net

Ethernet adapter Local Area Connection 4:

        Media State . . . . . . . . . . . : Media disconnected
        Description . . . . . . . . . . . : Intel(R) PRO/1000 PL Network Connect
ion
        Physical Address. . . . . . . . . : 00-E0-B8-94

Ethernet adapter Wireless Network Connection 7:

        Connection-specific DNS Suffix  . : cgocable.net
        Description . . . . . . . . . . . : Intel(R) PRO/Wireless 3945ABG Networ
k Connection
        Physical Address. . . . . . . . . : 00-13-02-03-FF
        Dhcp Enabled. . . . . . . . . . . : Yes
        Autoconfiguration Enabled . . . . : Yes
        IP Address. . . . . . . . . . . . : 192.168.2.9
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 192.168.2.1
        DHCP Server . . . . . . . . . . . : 192.168.2.1
        DNS Servers . . . . . . . . . . . : 192.168.2.1
        Lease Obtained. . . . . . . . . . : Friday, September 0 , 20   10:42:11
AM
        Lease Expires . . . . . . . . . . : Friday, November 1 , 20   10:42:11 A
M

C:\Documents and Settings\Owner>_
```

The EtherX Configuration Software will require the three parameters from the displayed screen as outlined in red in the image below:

```
C:\WINDOWS\system32\cmd.exe
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Owner>ipconfig /all

Windows IP Configuration

        Host Name . . . . . . . . . . . . : Gateway_Laptop
        Primary Dns Suffix  . . . . . . . :
        Node Type . . . . . . . . . . . . : Broadcast
        IP Routing Enabled. . . . . . . . : No
        WINS Proxy Enabled. . . . . . . . : No
        DNS Suffix Search List. . . . . . : cgocable.net

Ethernet adapter Local Area Connection 4:

        Media State . . . . . . . . . . . : Media disconnected
        Description . . . . . . . . . . . : Intel(R) PRO/1000 PL Network Connect
ion
        Physical Address. . . . . . . . . : 00-E0-B8-94

Ethernet adapter Wireless Network Connection 7:

        Connection-specific DNS Suffix  . : cgocable.net
        Description . . . . . . . . . . . : Intel(R) PRO/Wireless 3945ABG Networ
k Connection
        Physical Address. . . . . . . . . : 00-13-02-03-FF
        Dhcp Enabled. . . . . . . . . . . : Yes
        Autoconfiguration Enabled . . . . : Yes
        IP Address. . . . . . . . . . . . : 192.168.2.9
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 192.168.2.1
        DHCP Server . . . . . . . . . . . : 192.168.2.1
        DNS Servers . . . . . . . . . . . : 192.168.2.1
        Lease Obtained. . . . . . . . . . : Friday, September 0 , 20   10:42:11
AM
        Lease Expires . . . . . . . . . . : Friday, November 1 , 20   10:42:11 A
M

C:\Documents and Settings\Owner>_
```

Server IP

Subnet

Gateway

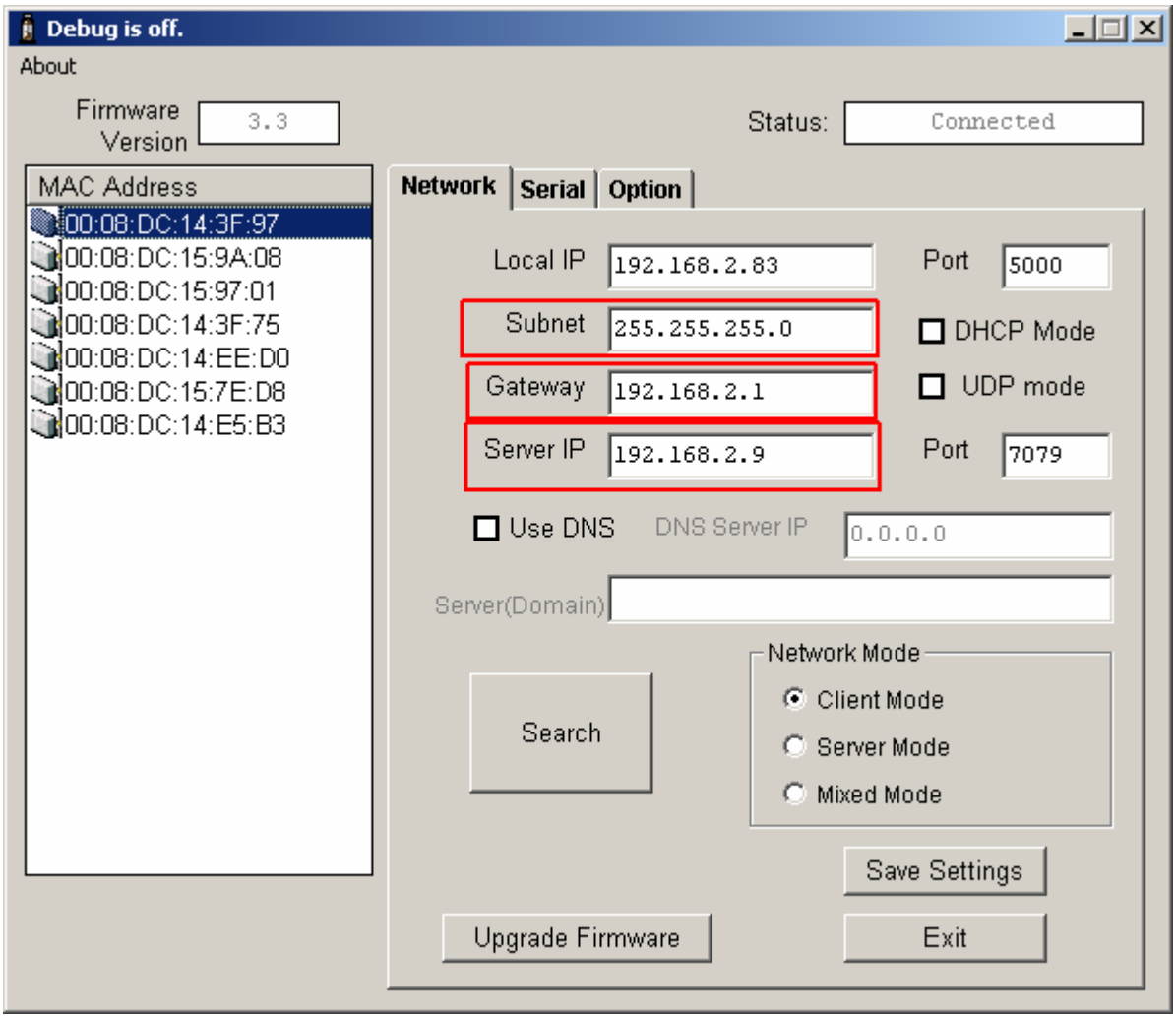
## *Configuring the EtherDevice:*

After having connected the EtherDevice to the network, verify that the green and yellow LEDs below the network jack of the EtherDevice are lit up.

Start the EtherX Configuration Software. Click the “Search” button. A “MAC” address value should be displayed in the MAC address box. This value is not important, but it does indicate that the EtherDevice was detected.

Enter the IP address values obtained when the “ipconfig /all” command was issued. The server IP port (displayed as 7079 in the image below) is the port value which will be used by the Engine to communicate with the ECM-1240. The port value may be set to that of any un-used port. Port 8082 is usually the default and may be used.

It is recommended to enter the “Server IP” value only then **check the DHCP box**. Doing this will cause the EtherDevice to automatically obtain the values for Local IP, Subnet and Gateway.




Make sure that the “Network Mode” is set to “Client Mode” and that “DHCP” box is checked.

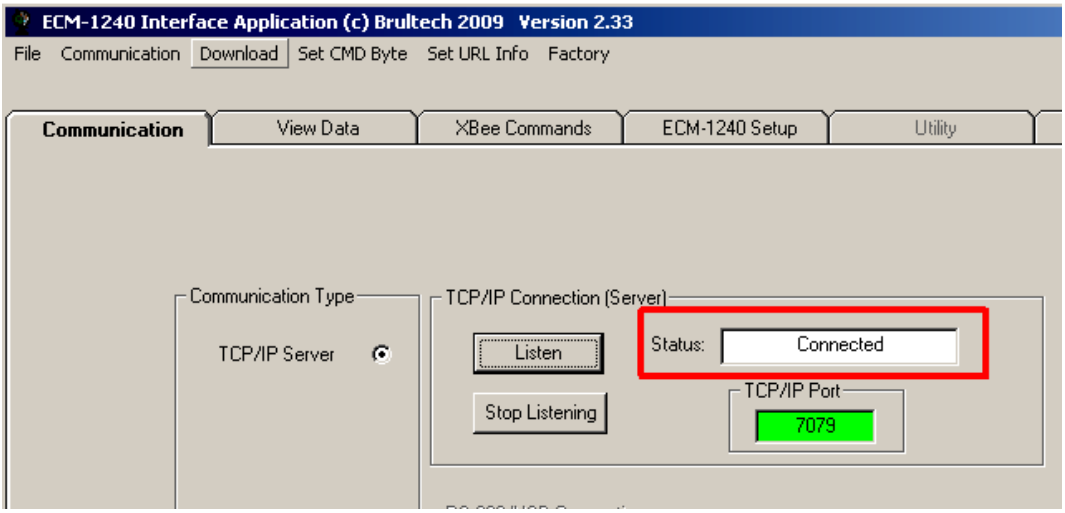
Click “Save Settings”.

## *Verify Operation:*

Start the IA Software. (May be downloaded from www.brultech.com).

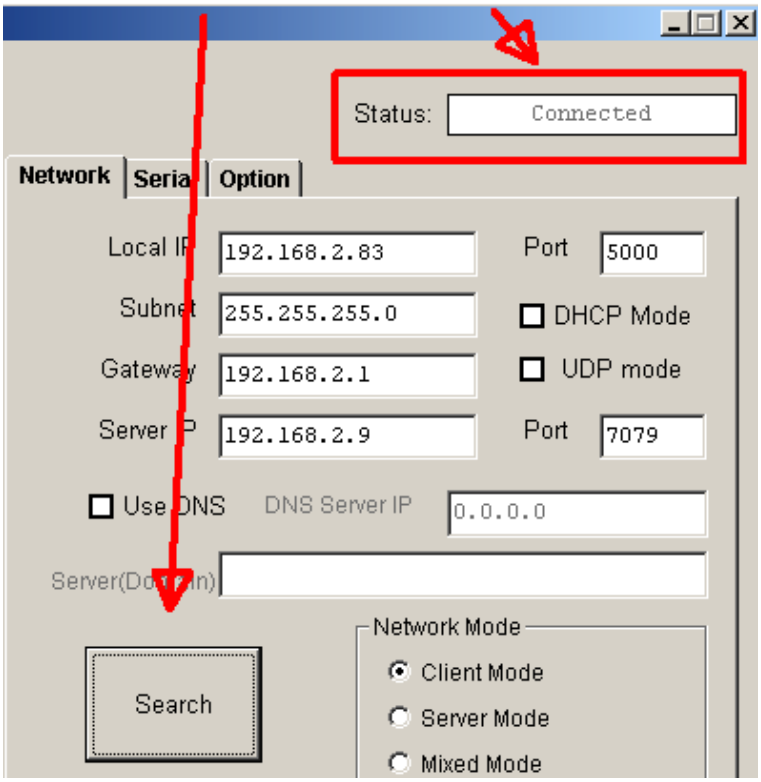
Under the “Communication” tab, click the TCP/IP radio button.

Enter the “Server IP” port which was entered in the EtherX configuration. Port 7079 was used in this example.




Click the “Listen” button in the IA software. The port box should change to yellow, then to green once a connection has been established. If the connection stays yellow, status “Listening”, then a firewall is likely preventing the connection from occurring. Refer to the “Firewall” section for more information.

After clicking the "Search" button, the status should change to "Connected".




When properly connected, the EtherX Configuration software will display “Connected” after clicking the “Search” button a second time. The IA Software will display “Connected” in the “Status” box.

**NOTE:**

**It is important to realize that the “Connected” status applies only to the TCP/IP connection and does not mean that the ECM-1240 device is connected. In fact, you can get the following results without an ECM-1240 device, using the EtherDevice and the IA software.**

The next step is to establish a connection between the ECM-1240 and the EtherPort or EtherBee gateway.

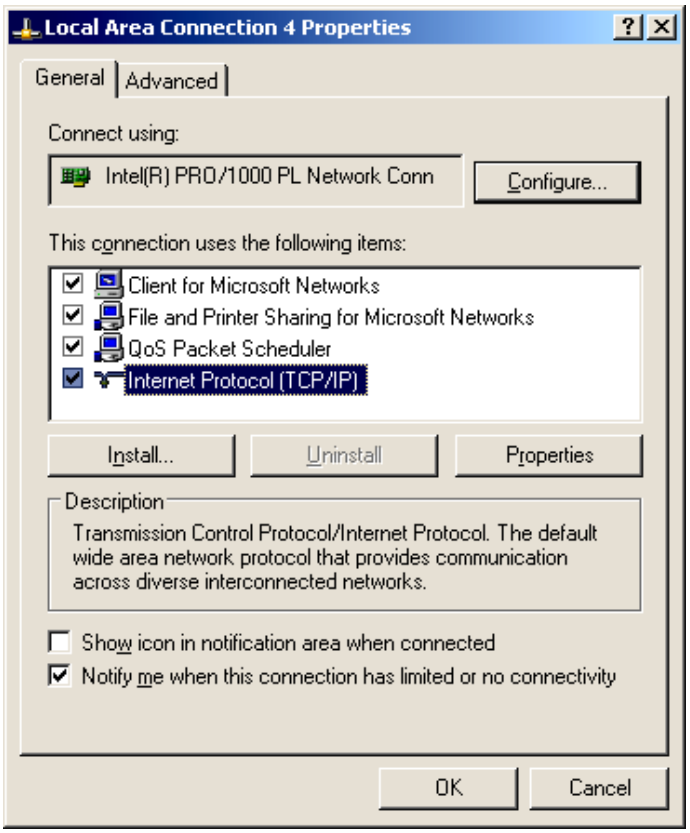
# Connecting Directly to a PC's Ethernet Jack

If the EtherDevice device is to be connected directly to a PC without using a router or LAN, these steps should be followed:

Disconnect the PC from any existing network. If a WiFi connection is active, disable the WiFi device to ensure there are no network connections. Make sure there are no network connections by disabling any active network connections other than the local network adaptor you will be connecting to via the PC's RJ-45 jack.

Access the "Local Area Connection" properties Window by selecting "Network Connections" from Windows "Control Panel".

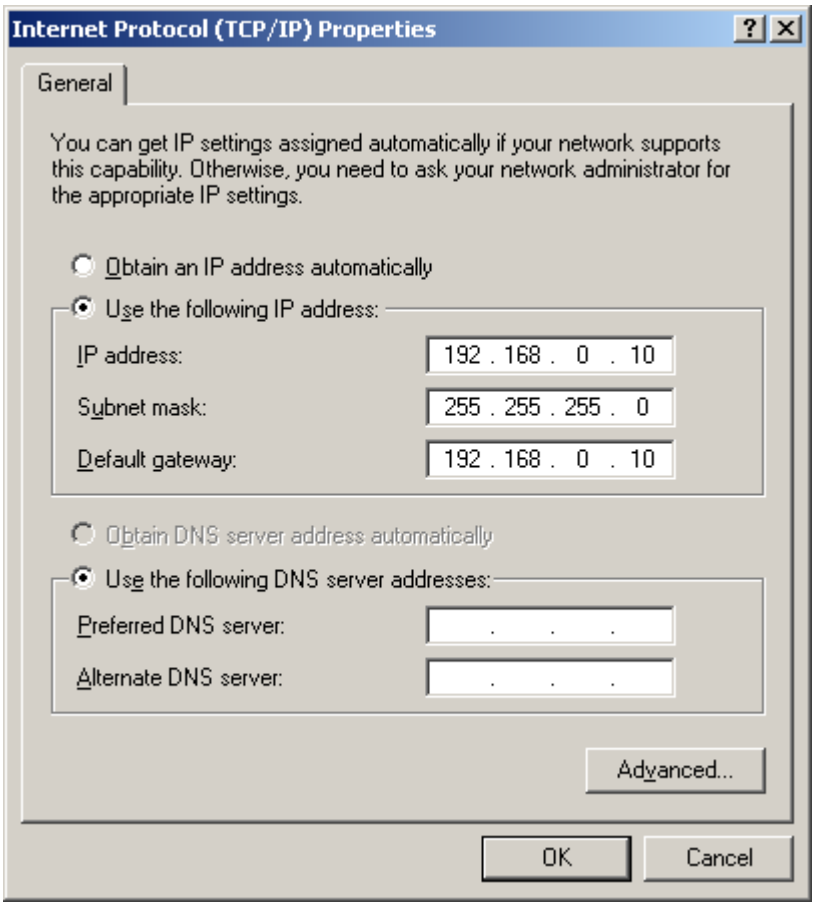
Select "Internet Protocol (TCP/IP)" from the window and click "Properties".



Setup the PC's Ethernet connection with the following parameters:

- Manually assign the PC with an IP address such as 192.168.0.10
- Set the subnet mask to: 255.255.255.0
- Set the default gateway to 192.168.0.10 (same as the PC's IP)

When completed, click "OK".




Connect the LAN cable from the gateway to the PC's Ethernet jack.

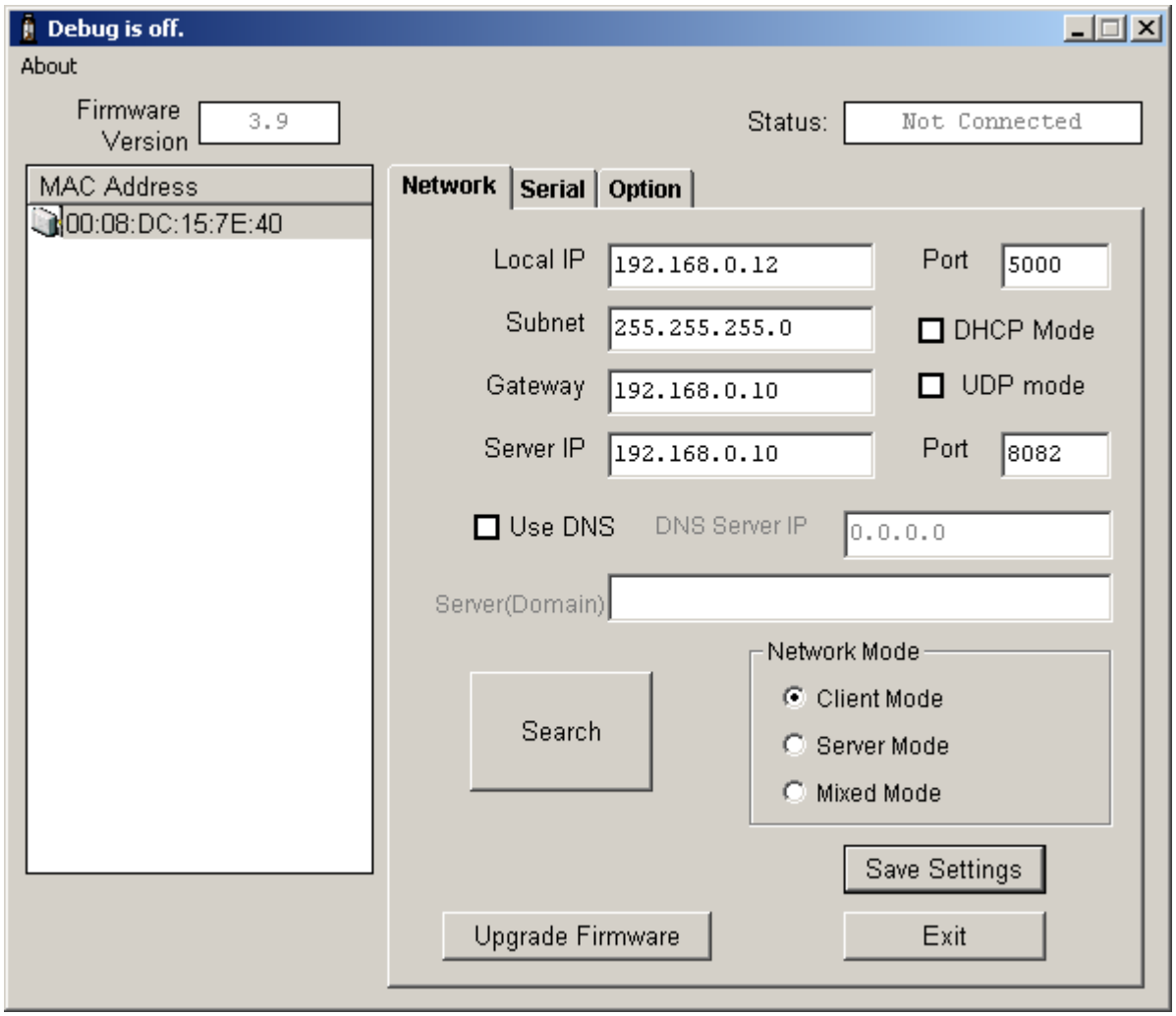
Apply power to the gateway.

Make sure that the yellow and green LEDs are lit.

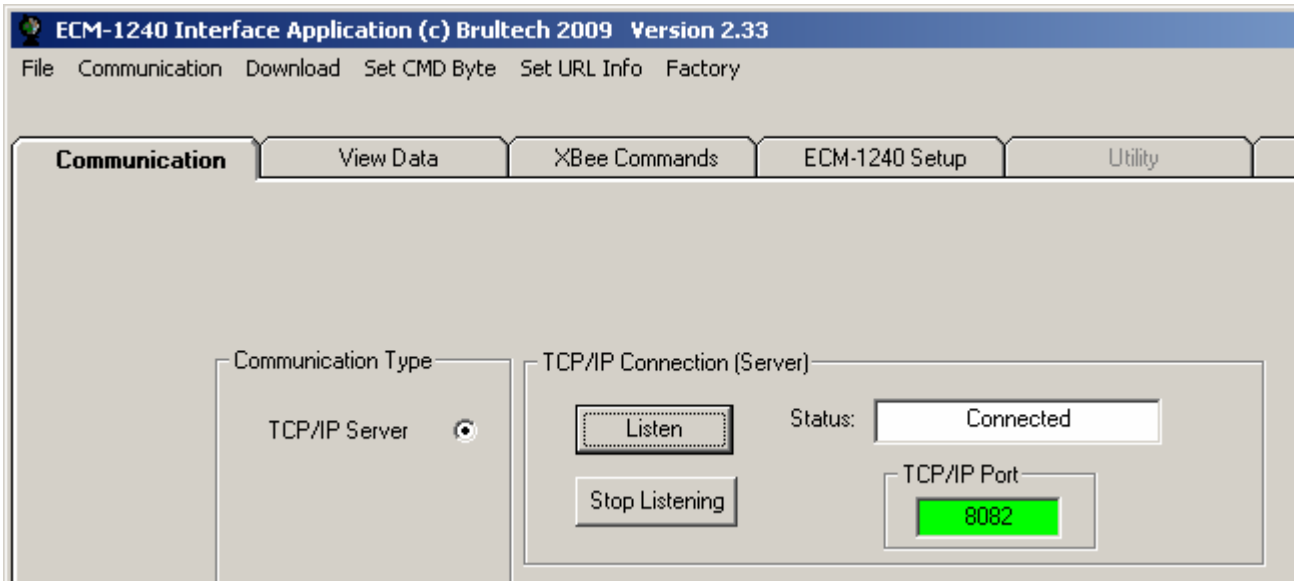
Run the EtherX Configuration program and click "Search". The gateway should be found and the MAC address displayed.

Set the Local IP to 192.168.0.12
Set the Subnet to 255.255.255.0
Set the Gateway IP to 192.168.0.10
Set the Server IP to 192.168.0.10
Set the Server port to 8082

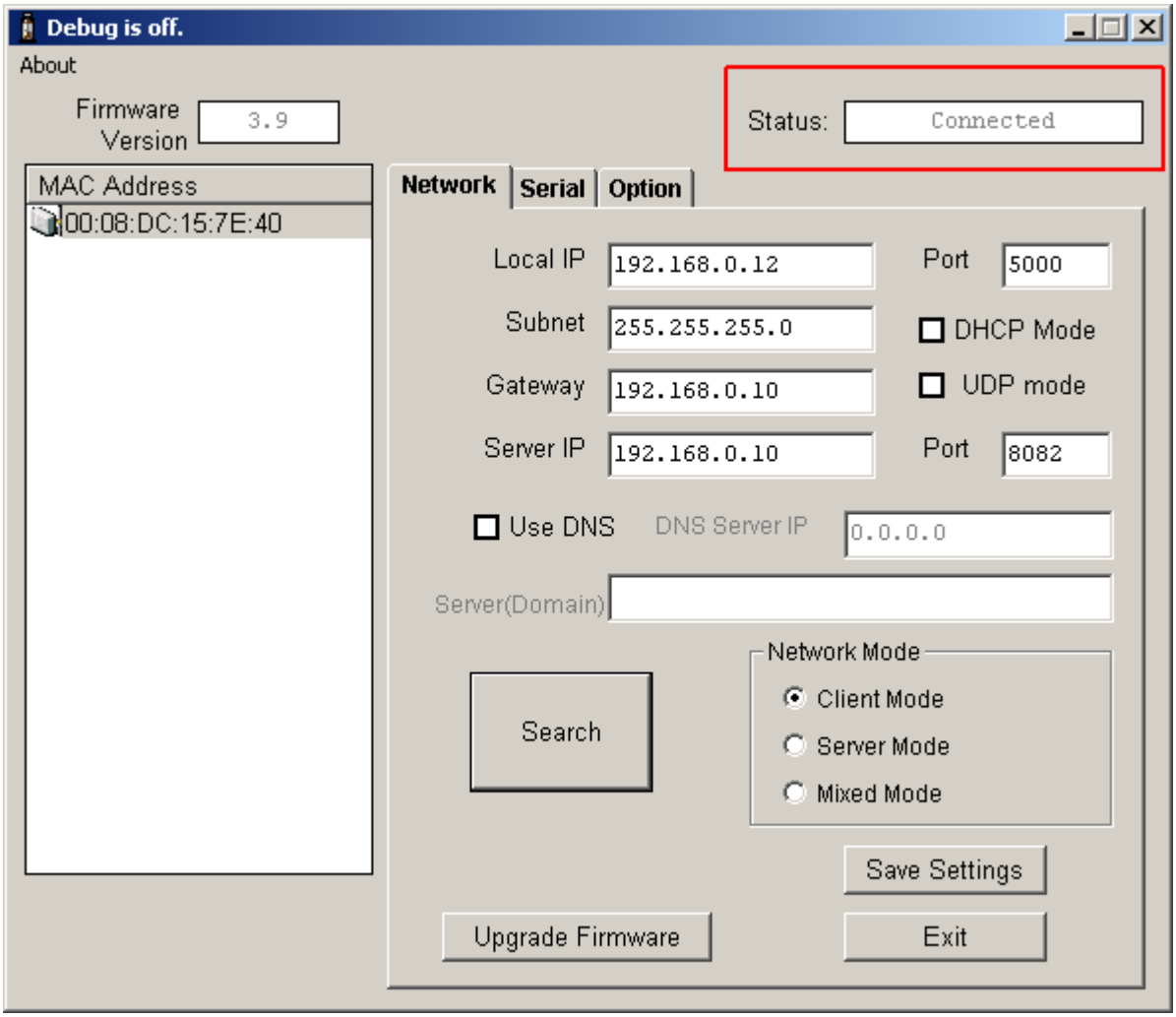
Verify that the gateway is in "client" mode.
Click "save".




Start the ECM-1240 IA software. Set the TCP/IP port to 8082. Click “Listen”.



Run the EtherX software and click “Search”. The EtherDevice should be connect to the IA Software server and the status should display “Connected”




If a “connected” status is not obtained, then make sure that you include the port 8082 in the Window’s Firewall exceptions. See the “Firewall” section of this document.

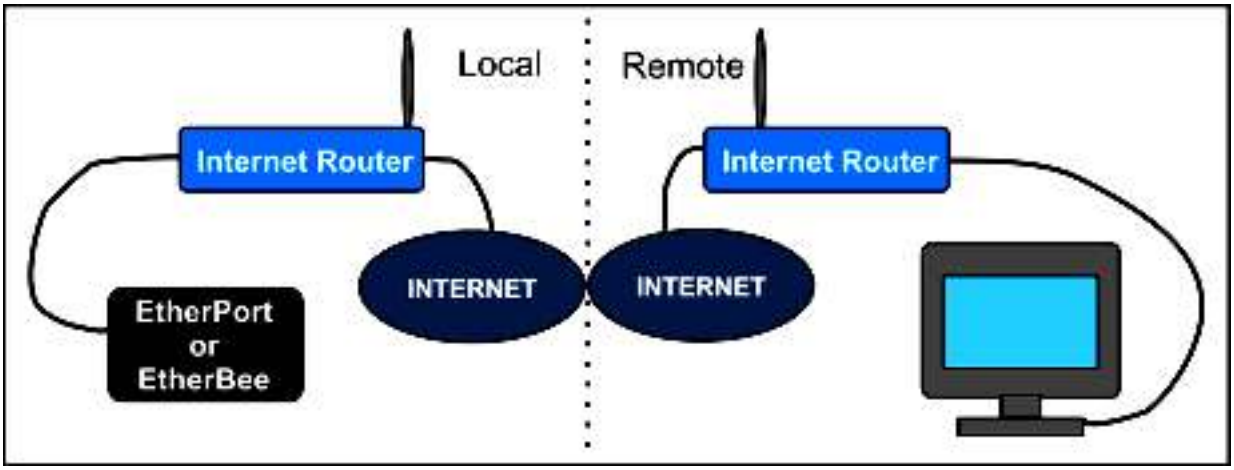
**NOTE:**

**It is important to realize that the “Connected” status applies only to the TCP/IP connection and does not mean that the ECM-1240 device is connected. In fact, you can get the following results without an ECM-1240 device, using the EtherDevice and the IA software.**

The next step is to establish a connection between the ECM-1240 and the EtherPort or EtherBee gateway.

# Connecting to a Remote Network (over internet)

It is possible to connect the EtherDevice to a remote network via the internet. This setup eliminates the need to have a PC running locally to collect data from the ECM-1240.

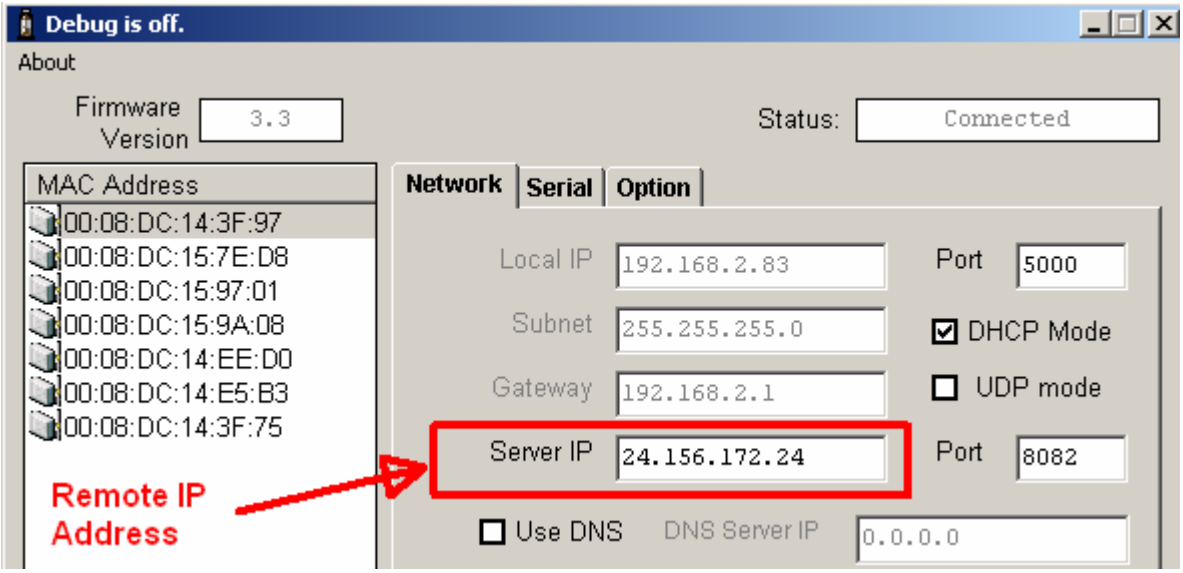



**Local is where the ECM-1240 device(s) are installed. Remote is where the monitoring PC is located.**

Using this setup, the EtherDevice sends data directly to the remote IP address. In order to configure this setup, the IP address of the "Remote" internet connection is required. This may be determined by accessing the following site from the remote PC http://www.ip-adress.com

## *Local Setup:*

For this example we will assume that an IP address of "24.156.172.24" was returned after accessing the "http://www.ip-adress.com" website using the remote PC. Using the EtherX Configuration software enter this IP address as the "Server IP".




Select the DHCP option. You may use a common server port such as 8082 as seen in this example.

Click "Save". The remaining setup will be performed at the "Remote" location.

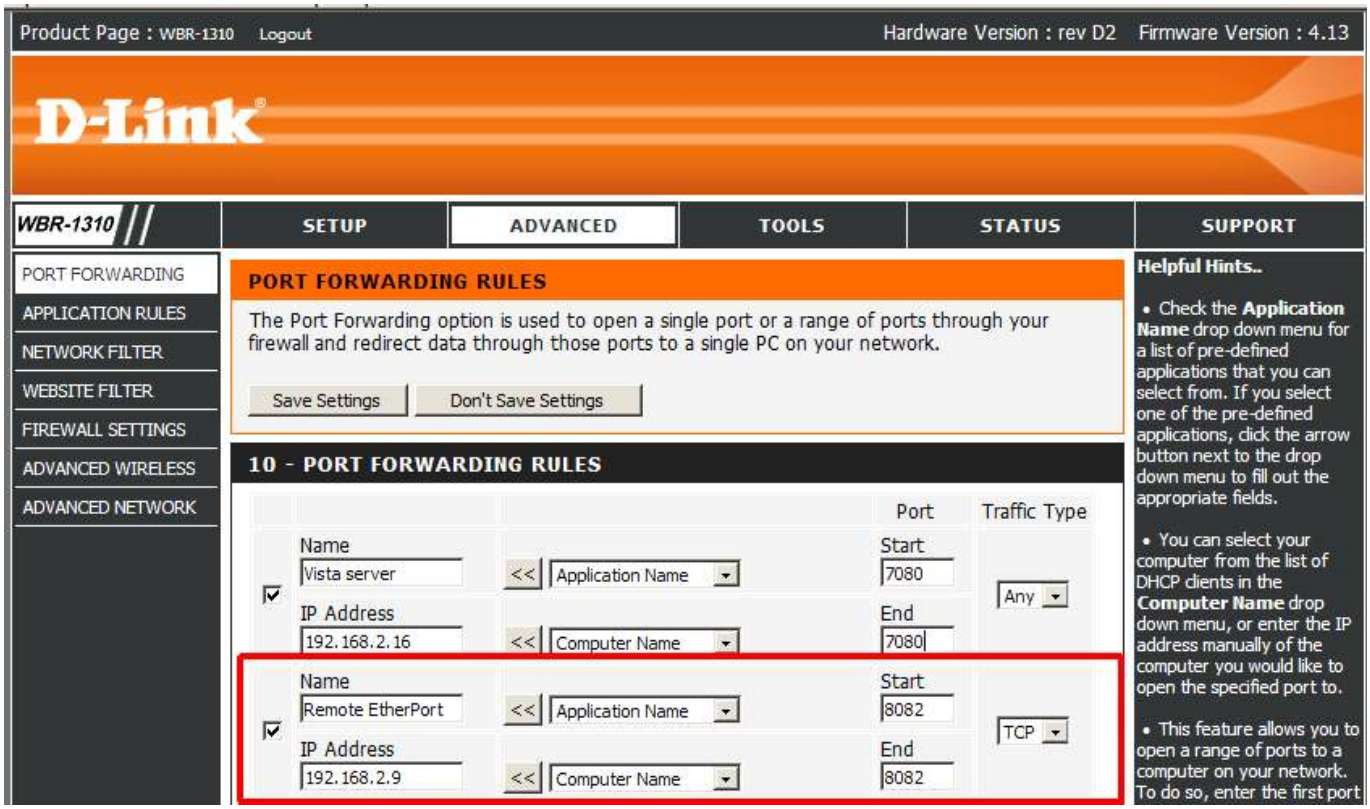
## *Remote Setup:*

The following steps are required to allow the connection from the EtherDevice to the remote PC which will be hosting the data:

1. The remote PC (hosting computer)'s IP address will need to be determined.
2. The internet router will be configured to forward the data from the TCP/IP port to the hosting computer.
3. The hosting PC's firewall will need to be configured to allow the TCP/IP port and connecting software as firewall "exceptions".

The hosting PC's IP address may be determined by running "ipconfig /all" from Windows' command prompt. For more information refer to pages 2 and 3 of this document. This example will assume that the hosting PC's local IP address is "192.168.2.9". This is the computer's IP address on the local area network (LAN).

The "Remote" router's setup utility will need to be started. This is typically done via a browser. If you are not sure how to do this, you should search the internet with your router's Make and Model. Below is an example of a DLink router's configuration screen.




Based on the above configuration, any data from the internet which is destined for IP address "24.156.172.24" and using port 8082, will be forwarded to the PC with an IP address of 192.168.2.9 of the LAN. This setup will create a direct link from the EtherDevice to the hosting PC, once the IA or Engine software is running as a server and software firewalls are opened.

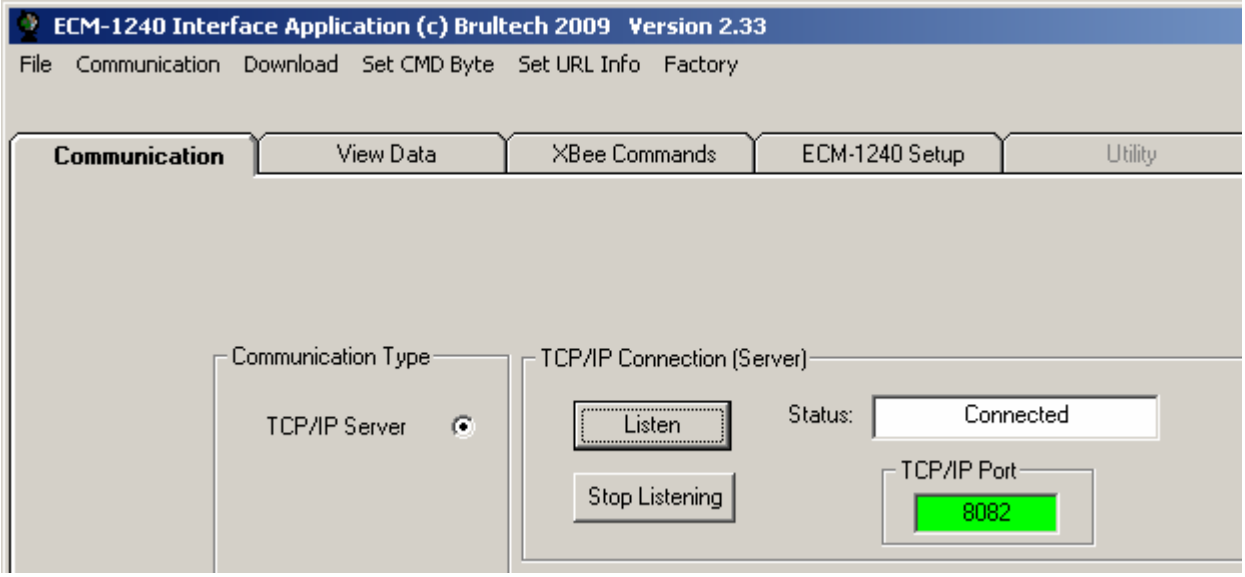
## *Opening the software firewall(s):*

There is one last obstacle which may prevent the connection of the software with the EtherDevice. A software firewall will prevent the connection and therefore will need to be to be configured so that the port and server software are allowed. This is done in the “exceptions” section of the firewall configuration. See the firewall section at the end of this document.

## *Verifying the connection:*

**It is important to note that this setup cannot be tested within a local network. The EtherDevice must be connected to a different internet connection than that of the hosting PC in order to test this setup.**

With all of the steps completed, run the IA software and set the TCP/IP port to the port number used. In this example we have used port number 8082. Click “Listen”. The port box should turn to yellow and eventually to green indicating a “Connected” status.



# Connecting directly to a website:

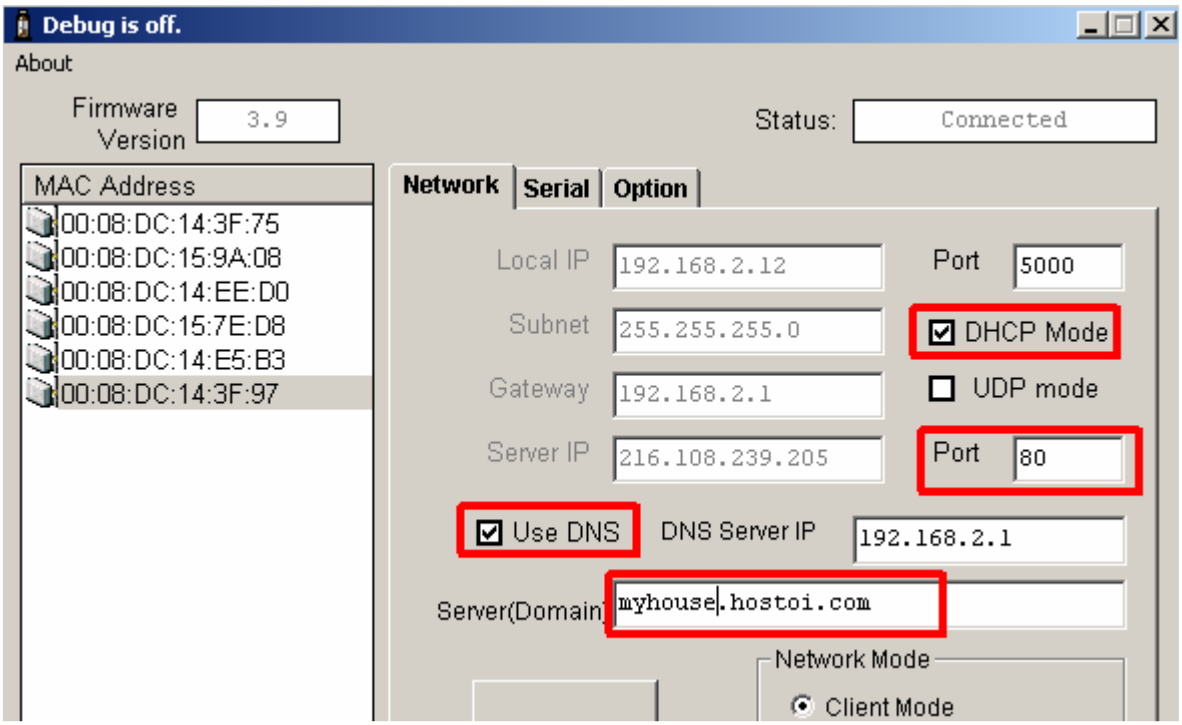
The standard binary data from the ECM-1240 device requires an active Engine program to be able to collect the ECM-1240's efficient binary packets. This method would require an expensive virtual website for hosting the binary packets.

Recently, an option has been added to the ECM-1240 to allow it to forward the data packets in the form of HTTP friendly data. Using this format, a simple PHP script can easily decipher the ECM-1240's data allowing easy data hosting from almost any low-cost or free web hosting site.

Such a setup completely eliminates the need for a hosting PC and provides 24/7 monitoring with the option to forward data to other services such as Google PowerMeter or www.pachube.com. Additionally, this options provides a developer with the option to integrate the data into a personal website.

## *Configuring the EtherDevice:*

The first requirement for this setup is to acquire a domain name for the site. This does not mean that you must purchase a domain name although you may if you wish. Free hosting site usually provide sub-domain names for free. An example of a sub domain is: http://myhouse.hostoi.com where myhouse is your personal subdomain provided by the free hosting site **http://www.000webhost.com**. We have successfully tested use of this free site in conjunction with the ECM-1240 and EtherDevice.




The EtherX Configuration for this setup is actually the most simple of all setups:

Check the DHCP and DNS boxes.
Set the Server Port to port 80.
Enter the domain name of the hosting site.
Click "Save".
Click "Search" again and verify that the "Status" shows "Connected".

There are no firewall issues to contend with using this setup since the system uses port 80 which is the standard internet port used for browsing.

# Firewalls

One of the most challenging obstacle for a successful TCP/IP connection is the software firewall or firewalls. Typically, Windows firewall is the first one to deal with. There may be other firewalls which are part of a virus protection program such as McAfee or Norton to name a few.

## *Windows Firewall:*

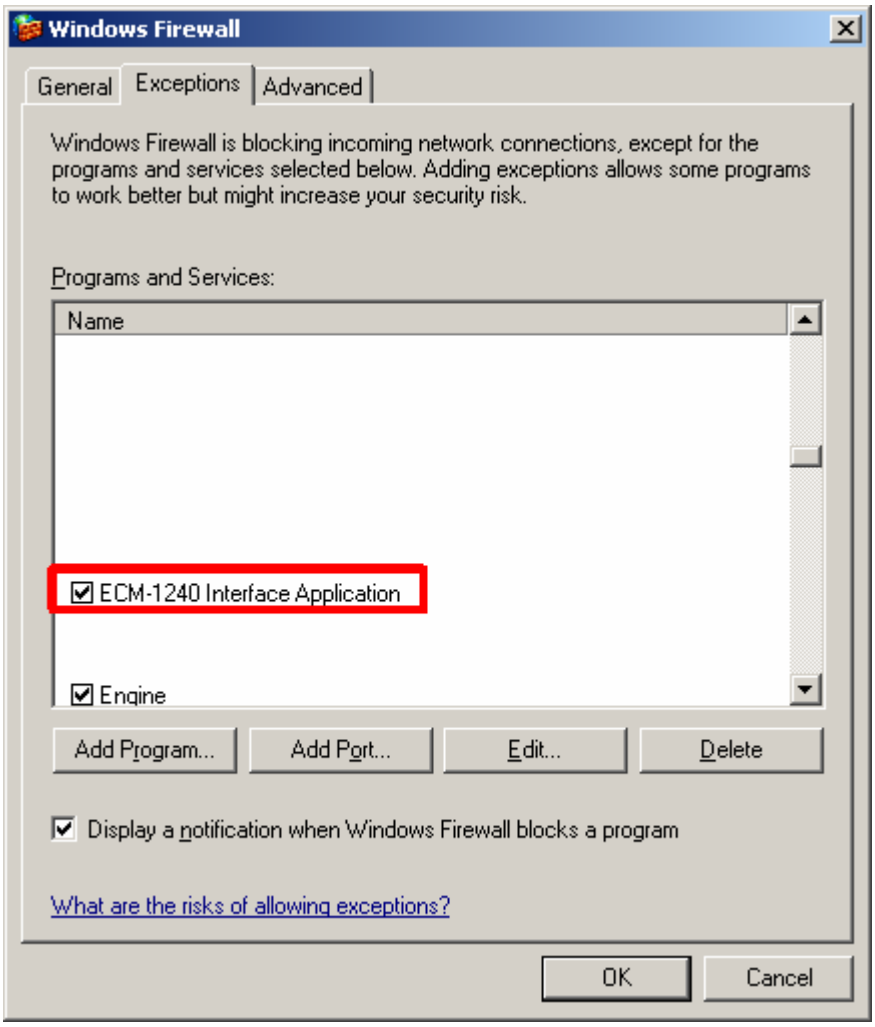
A connection through the Windows firewall is obtained by modifying the “Exceptions” option of Windows Firewall. It is important to note that two exceptions are required:

1. An exception for the server software such as the IA software and the Engine software.
2. An exception for the port that is used by the TCP/IP server.

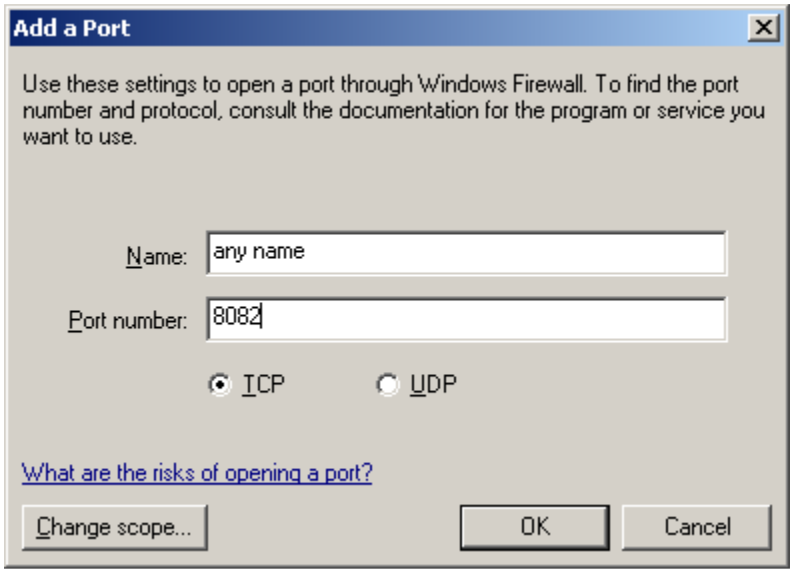
The Windows firewall is accessed by clicking “Windows Firewall” from the Windows “Control Panel”. **Make sure the IA software and Engine software are installed before modifying the firewall exceptions.**

## *Windows XP:*

The picture below shows the Windows Firewall exception for Windows XP and Vista machines. This window is where the program exceptions are selected. Once the IA software (ECM-1240 Interface Application) and Engine (or EngineG) software are installed, they should be selected as exceptions. If they are not listed, then use the “Add Program” options to locate them, most likely in the Program Files -> Brultech folder or subfolder.




Once the programs have been added to the exceptions list, the server port also needs to be added to the exceptions. This is done by clicking the “Add Port” option which will open a window similar to the one displayed below:

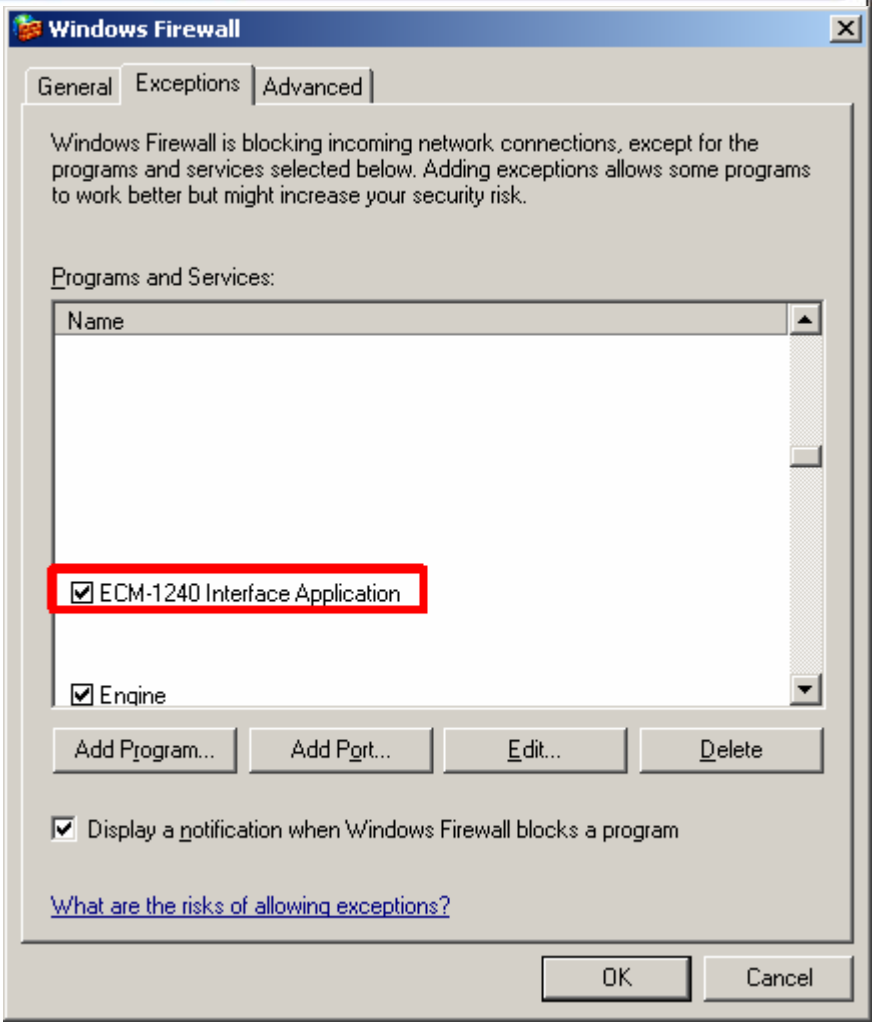


Enter an identifying name of your choice and type in the port number that was configured as the Server IP port of the EtherDevice, which is the same as the TCP/IP port used by the IA or Engine software.

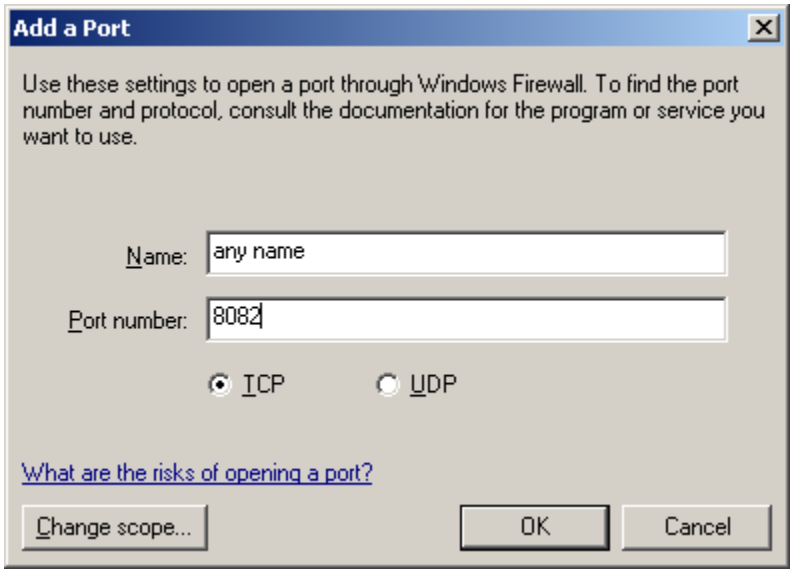
When finished, click OK for each window that was configured.

## *Windows Vista:*


The picture on the right shows the Windows Firewall exception for Windows XP and Vista machines. This window is where the program exceptions are selected. Once the IA software (ECM-1240 Interface Application) and Engine (or EngineG) software are installed, they should be selected as exceptions. If they are not listed, then use the “Add Program” options to locate them, most likely in the Program Files -> Brultech folder or subfolder.



Once the programs have been added to the exceptions list, the server port also needs to be added to the exceptions. This is done by clicking the “Add Port” option which will open a window similar to the one displayed below:

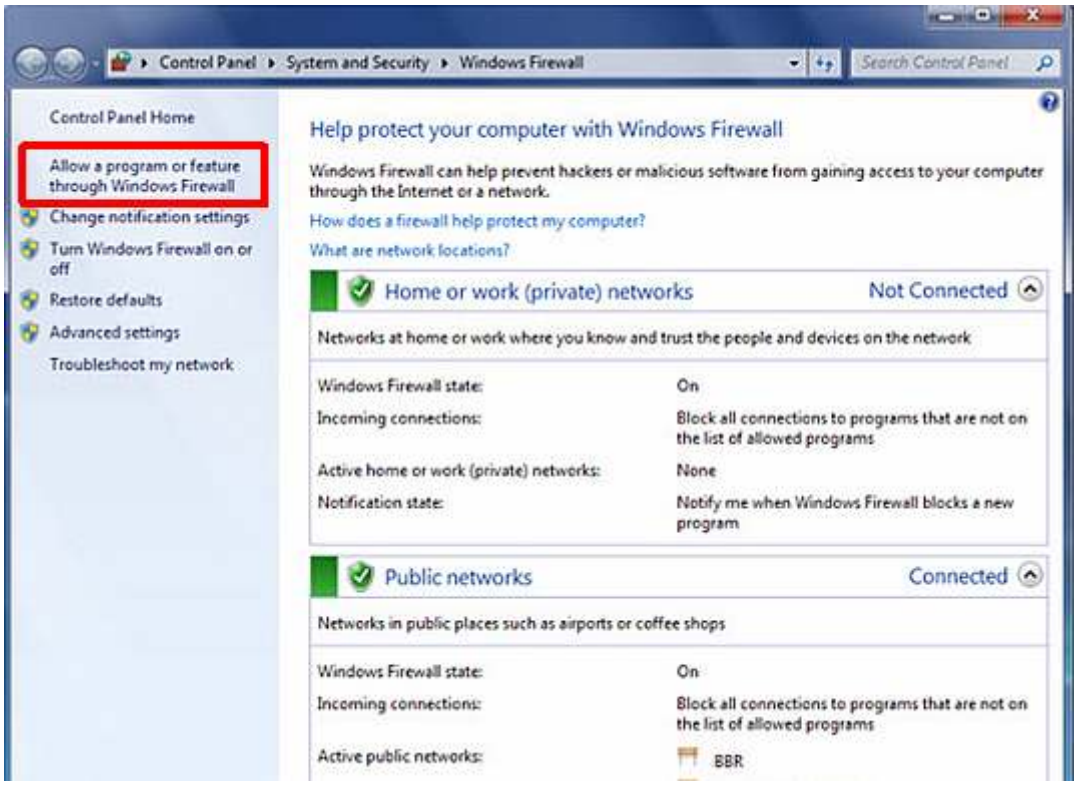



Enter an identifying name of your choice and type in the port number that was configured as the Server IP port of the EtherDevice, which is the same as the TCP/IP port used by the IA or Engine software.

When finished, click OK for each window that was configured.

## *Windows 7*

Choose the “Allow a program or feature through Windows Firewall” option from the Windows 7 Firewall options in the Windows control panel.




Add the “IA software” (ECM-1240 Interface Application) and “Engine” (or EngineG) software as exceptions. If they are not listed, they can be selected form the “Add Program” options. They may be located in the Program Files -> Brultech folder or subfolder.

## *Other Firewalls:*

Check the PC for any other firewall programs and perform similar steps with such programs, as they all do offer “exceptions” for various programs and ports.