

Networking and Port-forwarding Guide

Connecting the DVR/NVR/IP camera to the network for remote viewing

Did you know we can do this for you remotely? For a small charge, one of our qualified after sales technicians can set up your router and one device for £25.00 + VAT per device. *Please note PC/Mac/Mobile device would equal 3 devices.* If you would like to purchase this service please contact our sales team on 0844 947 3000

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Network Terminologies guide

This is a basic network guide which covers the main networking terms and basics of what is usually required to successfully set up a DVR/NVR or an IP camera to work over your network. *If you're familiar with the basics of networking please refer to page 8 for port-forwarding.*

This guide will cover the following terms:

- **Clients**
- **LAN**
- **IP Addresses**
- **Dynamic IP address and DHCP**
- **Static IP address**
- **Subnet mask**
- **Default gateway**
- **Local IP address**
- **Ports**
- **Routers and switches**

Clients – In networking this term means an object which will communicate using certain protocols with other clients on the network. These clients range from computers, DVRs, NVRs, IP cameras, tablets and smart phones.

LAN – A Local Area Network is a combination of clients which communicate between each other in the same network (i.e. the same building) using a communication protocol such as TCP/IP.

IP addresses – These are required for clients on the network, they must all be unique; a typical example is 192.168.0.100. If there are 2 clients using the same IP address this will cause a conflict. If there is a conflict both IP addresses will be unusable.

Static IP address – A static IP is the best option to use when setting up multiple IP clients; once the IP address is set to static it won't change.

DHCP – The DHCP setting is used for the client to automatically be configured/assigned an available IP address on your network. Using DHCP with your CCTV equipment is not advised as the IP address will be random and keep changing over time meaning that port forwarding will then not work.

Subnet mask – The most common subnet mask is 255.255.255.0. You need to be aware of this as in all clients a subnet mask is required, although it will usually always be 255.255.255.0.

Default gateway – This is another word for router or the main client which routes all the data on your network. A typical IP address for a gateway is 192.168.1.1 or 192.168.0.1.

Local IP address: These are the addresses that only function within the network of your gateway; each client will have its own unique IP address on the network.

Ports: - Ports range from 1-65535. A default port is 80 and this is the default port which is used in the examples in this guide.

Router – This is a piece of hardware which routes all the data between all the clients connected to it. Routers can also provide an internet connection to all clients connected to it. All modern routers have security features added for protection and restrictions which can be set on your network.


Switches – This is a lesser version of a router. Switches are designed just to route the traffic between the clients that are connected to the switch. Multiple switches can be used on the same network.

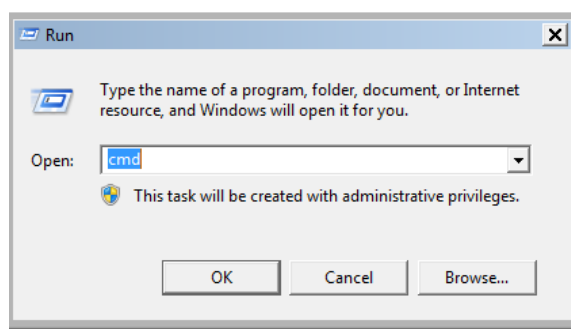
Using command prompt

Configuring clients

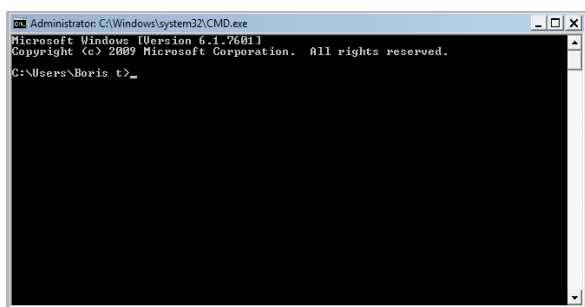
In this example we will set up an Xvision DVR to the local network. The following is used in this example: DVR, Windows PC/Desktop, Router, and 2 Ethernet patch cables.

1. Attach the Ethernet patch cable to the DVR and the other end to your router
2. Attach the 2nd Ethernet patch cable to your computer and the other end to the same router.

3. On your keyboard press the windows key  and the letter R together
4. The run bar will appear, as shown in the image to the right.



5. Type: **CMD** and press the **enter** key on the keyboard. The command prompt will appear as shown below:

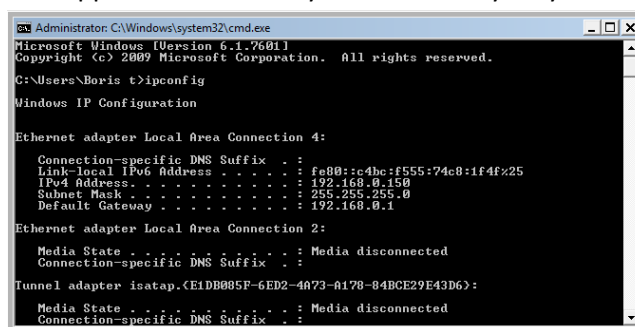


6. Type in the following command: **ipconfig** and press the enter key on the keyboard.

```
C:\Users\Boris t>ipconfig
```

7. After typing in the above command the details below will appear. Please note your details may vary:

8. Take note of what the **default gateway** and **subnet mask** is under the Ethernet adapter. In this example the default gateway is 192.168.0.1 (it may be different for other users) and subnet mask is 255.255.255.0.



9. Next we need to find an available IP address on the network. In the picture to the right IPv4 shows an IP address of 192.168.0.150. This address is the IP address of the computer which is used in the example. This means that the gateway is using the IP address of 192.168.0.1 and the computer is using the IP address of 192.168.0.150. This also means we can't use these two addresses because they are in use.

10. In the command prompt type in "ping" and press the space bar then enter an IP address within the range of you network (i.e. 192.168.0.X or 192.168.1.X), then press enter. So for example **ping 192.168.0.50**, You can pick any number between 192.168.X.2 and 192.168.X.254.

```
C:\Users\Boris t>ping 192.168.0.50_
```

11. If the IP address is free a message will display with **Destination host unreachable** as shown in the picture below:

```
C:\Users\Boris t>ping 192.168.0.50
Pinging 192.168.0.50 with 32 bytes of data:
Reply from 192.168.0.150: Destination host unreachable.
Reply from 192.168.0.150: Destination host unreachable.
Reply from 192.168.0.150: Destination host unreachable.
Reply from 192.168.0.150: Destination host unreachable.
```

12. If the IP address is in use there will be a reply from that IP address. The example below shows a reply when I try doing the ping command with the routers (gateway) IP address. I used the following command: **ping 192.168.0.1**.

```
C:\Users\Boris t>ping 192.168.0.1
Pinging 192.168.0.1 with 32 bytes of data:
Reply from 192.168.0.1: bytes=32 time<1ms TTL=254
Reply from 192.168.0.1: bytes=32 time<1ms TTL=254
Reply from 192.168.0.1: bytes=32 time<1ms TTL=254
Reply from 192.168.0.1: bytes=32 time<1ms TTL=254
```

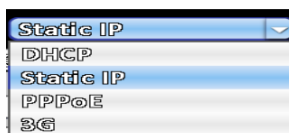
Device setup

Configuring and accessing the device on the network

13. Now that there is a known free IP address it can be given to the DVR/NVR/IP Camera. In this example we are using our own Xvision X16D1H. Please refer to your device’s manual for where to find the network menu.

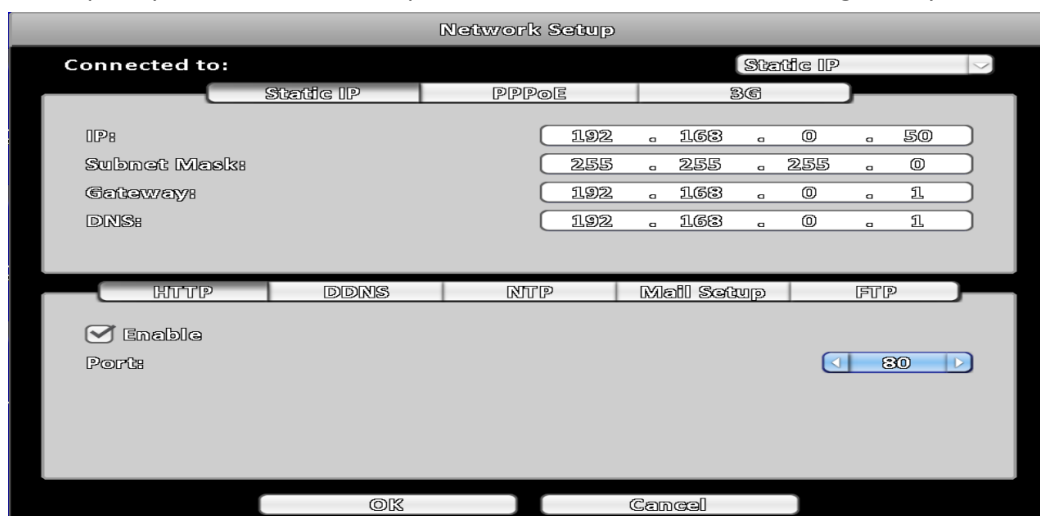


14. The first step is to choose Static IP:



15. Enter the available IP address which was found through command prompt earlier. Fill in the information which came up on the command prompt in the earlier example for the subnet mask and default gateway. The example below shows:

- IP address: 192.168.0.50
- Subnet mask: 255.255.255.0
- Gateway: 192.168.0.1
- DNS: 192.168.0.1



16. Press OK and exit out of all the menus so you can only see the cameras, we recommend to reboot the DVR/NVR/IP Camera after changing these settings. Once the unit has rebooted, ping the device's IP address on the command prompt again to see if there is a reply (The picture to the right shows a reply from the IP address 192.168.0.50):

```
Administrator C:\Windows\system32\cmd.exe
Pinging 192.168.0.1 with 32 bytes of data:
Reply from 192.168.0.1: bytes=32 time<1ms TTL=254
Reply from 192.168.0.1: bytes=32 time<1ms TTL=254
Reply from 192.168.0.1: bytes=32 time<1ms TTL=254
Reply from 192.168.0.1: bytes=32 time<1ms TTL=254

Ping statistics for 192.168.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Boris >ping 192.168.0.50

Pinging 192.168.0.50 with 32 bytes of data:
Reply from 192.168.0.50: bytes=32 time<1ms TTL=64
Reply from 192.168.0.50: bytes=32 time<1ms TTL=64
Reply from 192.168.0.50: bytes=32 time<1ms TTL=64
Reply from 192.168.0.50: bytes=32 time<1ms TTL=64

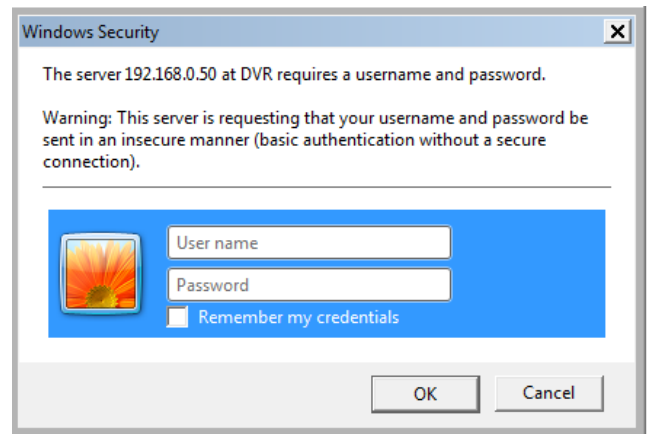
Ping statistics for 192.168.0.50:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Boris >
```

17. If there is a reply the device can now be accessed on the web browser. Open Internet Explorer and type in your IP address in the address bar and press enter on the keyboard. The correct way to type the address is (see below): <http://192.168.0.50>



18. The picture below will appear for this particular device when accessed on Internet Explorer. Enter the device's log in details and press OK. Please note the log in screen may look different when using your device. Please refer to your device's manual to compare and for default user name and password.

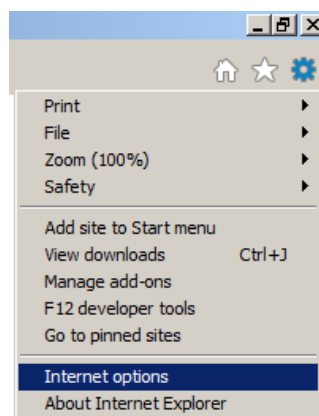


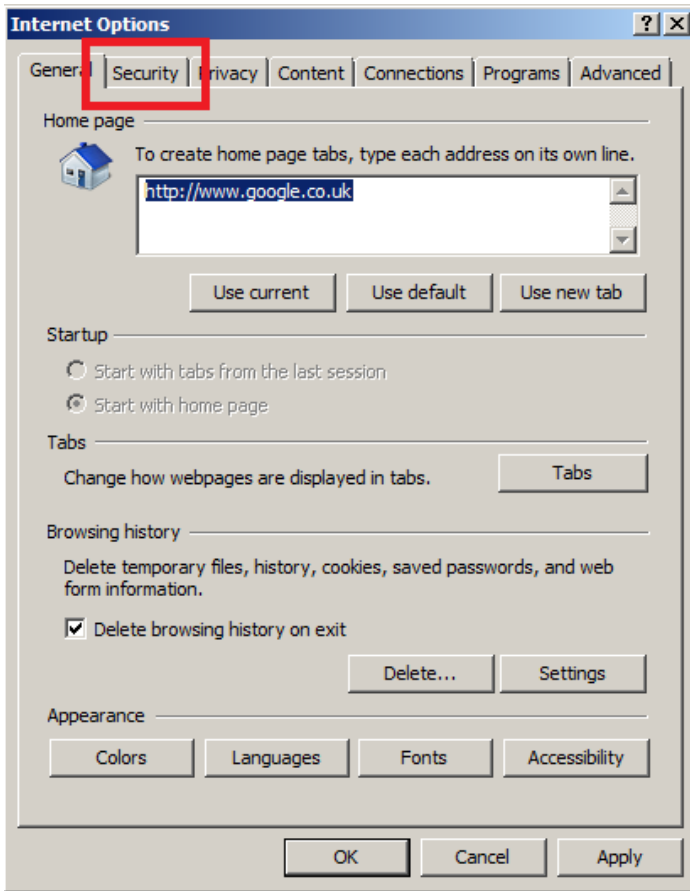
19. After logging in successfully into the device all the connected/added cameras will be seen in Internet Explorer.

ActiveX Controls and Plug-ins

When viewing your DVR/NVR/IP Cameras through Internet Explorer you may find that the web page loads up but there is no video image. If this is the case you will need to ensure that your ActiveX controls and plug-ins for the device are enabled:

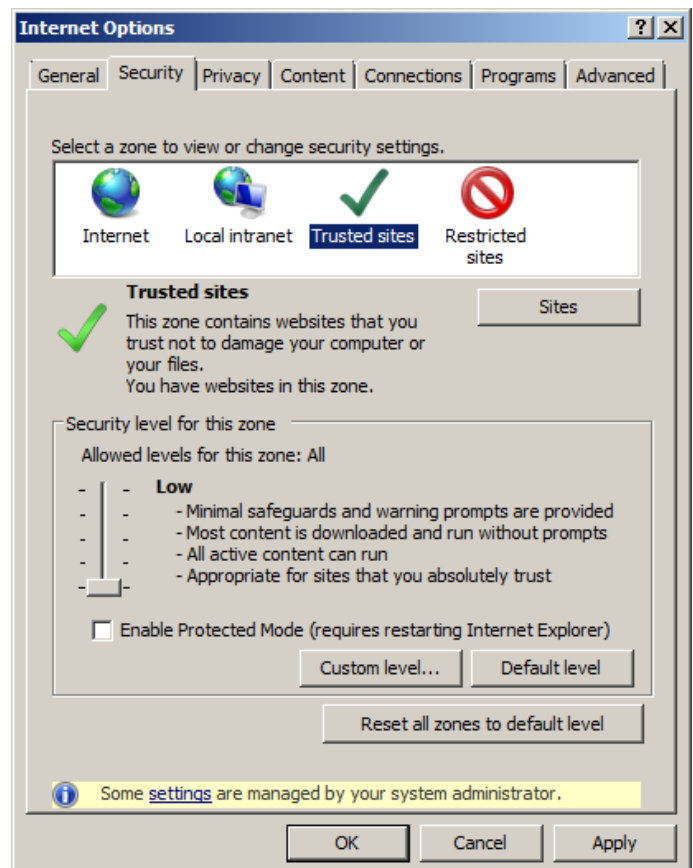
1. Open up Internet options, this can either be done from Control Panel on your PC or through Internet Explorers settings as shown below.



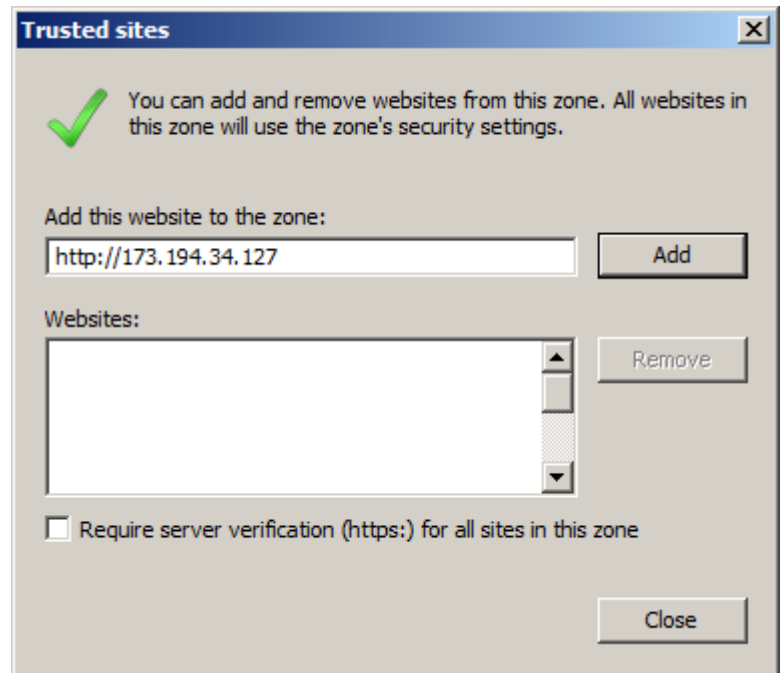



2. Once open select the Security tab from the top of the page.

3. In the security tab you will be given the options for Internet, Local Intranet and Trusted Sites. Select **Trusted Sites** and then click on the **Sites** button below.

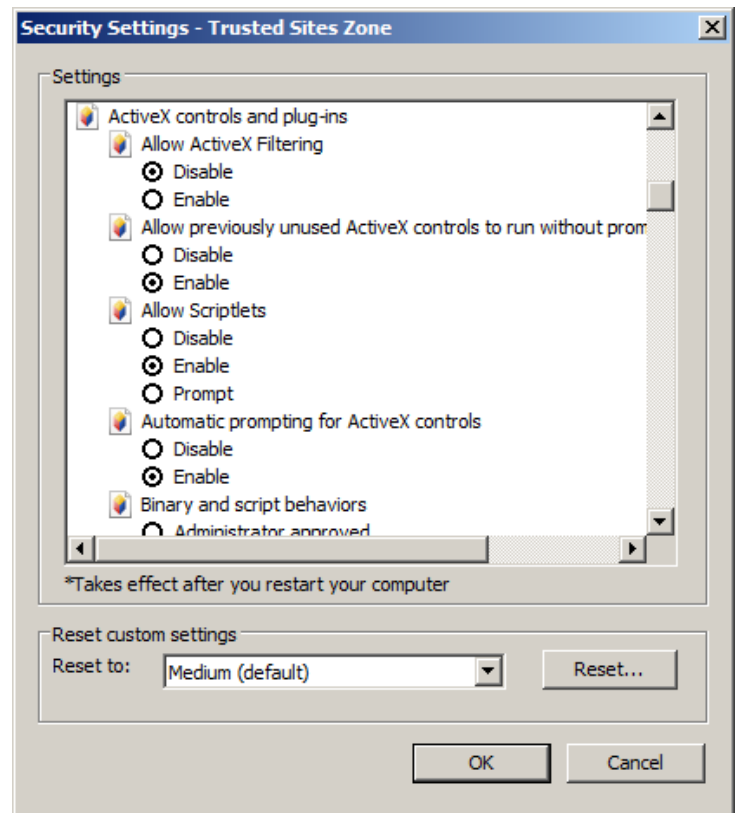


4. First, click on “Require sever verification (https:) for all sites in this zone” so that it is not ticked, as shown in the image below. Once done you can type the IP address of your DVR/NVR/IP Camera into the text box at the top and then click **Add**.



5. On the next page scroll down to the heading shown below, “ActiveX controls and plug-ins”. There will be around 12 items listed with the  ActiveX icon, ensure that ALL of these items are either set to **Enable** or **Prompt**. *Please note that some will have Enable marked as not secure, it is best to ensure that items like this are set to Prompt.*

As you can see in the example to the right, “Allow ActiveX Filtering” is set to Disable so this would need to be set to Enable, once complete press Ok and then refresh the connection to your device.



Accessing device

Port-forwarding guide

Step 1.

Connect the DVR/NVR/IP camera to your router via an Ethernet cable.

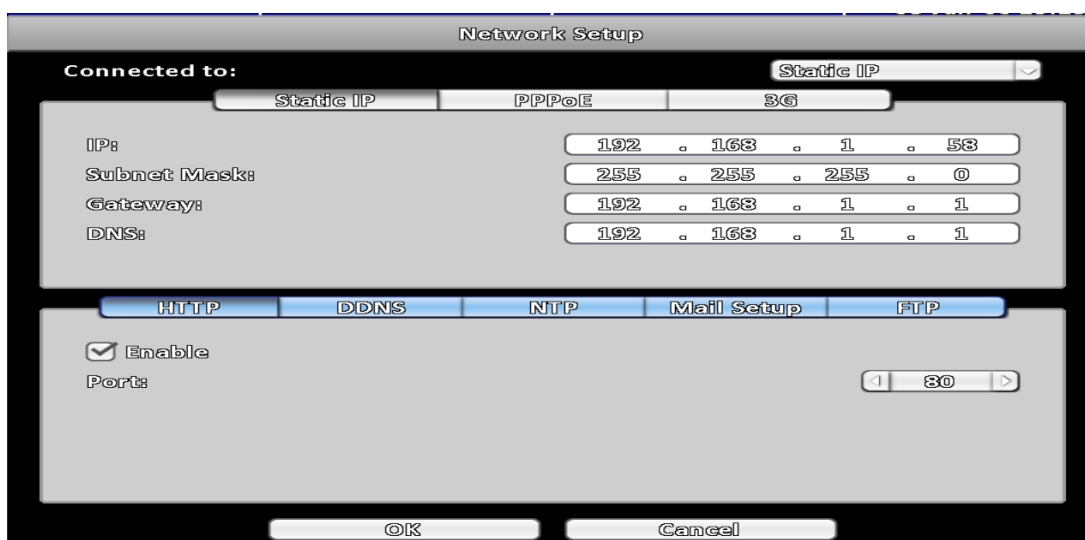
Step 2.

Enter the DVR/NVR/IP Camera network menu; please refer to the device's manual on how to do so.

Step 3.

Set the DVR/NVR/IP Cameras IP address to static IP, this will stop the IP address from changing. Below is our Xvision model X16D1H. In the top right corner static IP address is set.

*You may need to manually enter the IP address and gateway if the default one is not correct. Please refer to **page 2** of this guide if you are unsure of the definitions above and page 3 to find out how to find the gateway and set up an IP addresses.*



Step 4.

Make note of the IP address your DVR is using locally and make a note of the http port (this will usually be port 80 by default). Please refer to page 4 on how to find an available IP address for your device. In the example above the IP address is 192.168.1.58 and the port is 80. Because we know what IP address and port number to use we can now configure the router so that this device can have remote access.

Step 5.

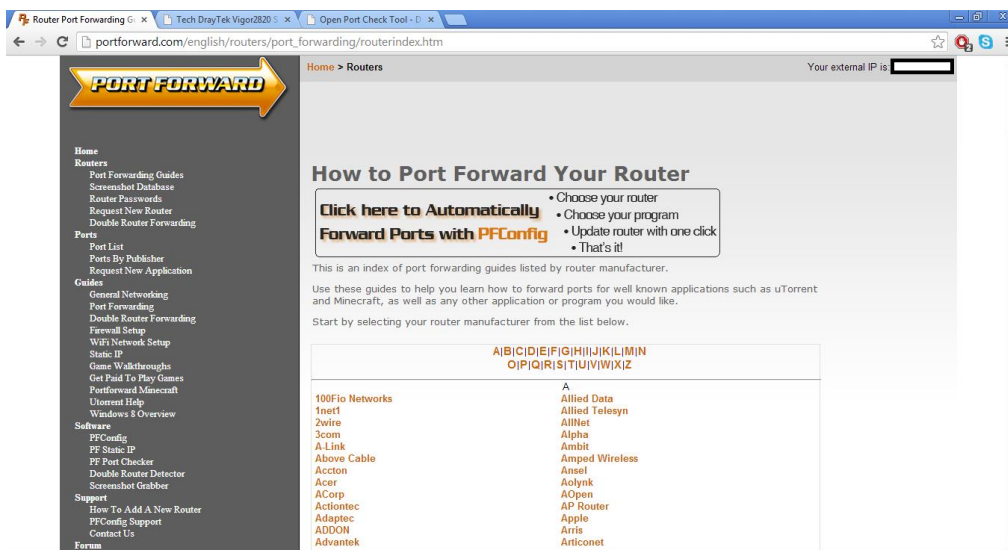
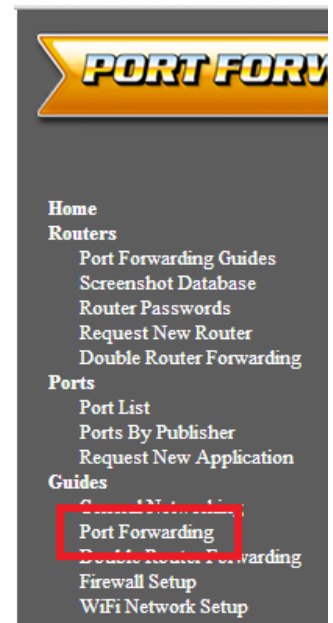
Go to <http://www.portforward.com>

Step 6.

On the left hand side there will be many options to choose from. Under **guides** click on **Port forwarding** as shown on the right.

Step 7.

The page below will appear. Click on the brand of your router. You may need to scroll down the page to find the brand of your router.



Step 8.

An advert will appear, click the close button as shown below. This will close the advert and you can continue.



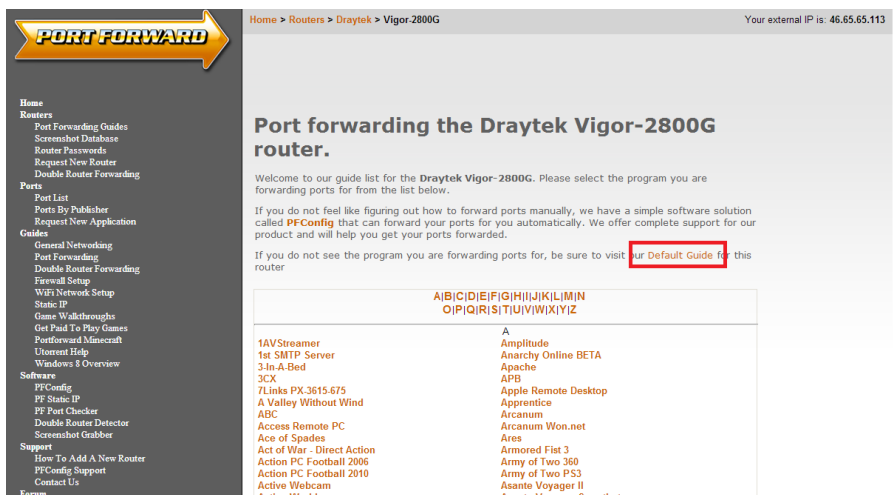
Step 9.

Once the advert is closed all the models will be available to select. Select the model of your router from this list. You may need to contact your ISP if you do not know what model you have.



Step 10.

The page below will appear once the model is clicked on. Click on **Default Guide** as shown below in the red box. This will now give you the tutorial for the specified router model.



Step 11.

The guide will take you through all the necessary steps on your router to set up port forwarding. You will need to add your local IP address and port number of the device you want to access remotely. If unsure how to find the devices IP address, please refer to page 6 of this manual or the device's manual.

If your device uses multiple ports (i.e. a http port and a server port) you will need to set up port forwarding for all of these ports.

Please also note that when setting up port forwarding your router may ask to specify to use TCP or UDP, you will need to select both.

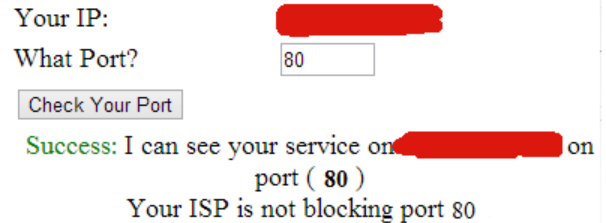
Checking Ports

Step 12.

Once done, go to <http://www.canyouseeme.org> to check that the port forwarding is working correctly.

Step 13.

To use this website you just need to enter the port that was forwarded into the text box labelled “What Port?” You can then click **Check Your Port** and the service will test your port forwarding and confirm if it is working on your router. If the port is configured and opened correctly then you will get the image to the right from the canyouseeme.org service.



If there is a problem or configuration is not done correctly then an error will appear. We recommend to first restart your device and router if this happens. Alternatively you can call your Internet Service Provider (ISP) and see if they can check the ports.

Please note that this website also displays your external IP address. This external IP address will be used to access your CCTV devices remotely when all the port-forwarding is finished. This external IP address can't be changed. An example of an external IP address (173.194.34.67).

Please be aware that your external IP address may change as your ISP will usually give you a dynamic address. You will need to check with your ISP to see if they can offer you a static IP. If they do not offer a static IP service you can obtain a DDNS name from a DNS service such as <http://www.no-ip.com/>.

With this service you create a host, for example, **myhomecctv**. Because this is a no-ip service the host will end with a domain such as **no-ip.biz** at the end of the address. For example the full hostname will be: <http://myhomecctv.no-ip.biz>.

So instead of typing in your external IP address (example <http://173.194.34.67>) you can just type <http://myhomecctv.no-ip.biz> in the Internet explorer address bar instead. This DDNS service will always refresh your external IP address (because if it's dynamic it will keep changing) so it can be used on the chosen host name.

Some of our DVR's support their own built in DDNS feature, please check the support section on <http://www.y3k.com> or the DVR/NVR/IP camera manual for more information on this.

Please note that only products purchased from Y3K are supported. We can support our DVR/NVR/IP cameras but if you have any issues with ports, you may be required to contact your ISP for technical support.

Did you know we can do this for you remotely? For a small charge, one of our qualified after sales technicians can setup your router and one device for £25.00 + VAT per device. Please note PC/Mac/Mobile device would equal 3 devices.

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