

Making your Spinneret Internet Accessible.

By Jeff Ledger

This instructional is designed to take those with limited networking knowledge through making their Spinneret accessible to the world via the Internet. I'll take you through the basics of networking and internet networking easily and soon the world will be beating a path to your Propeller powered Spinneret.

Understanding IP addressing: (local/global)

All devices connecting to any Internet network identify themselves with a series of numbers called an IP address. (Internet Protocol Address) There are two different types of IP address which may be assigned to internet devices, "local" and "global." A global IP address is assigned by an internet service provider and can be communicated with anywhere on the internet. Global IP addresses are unique and are assigned to only a single computer or device. A local IP address is private address which is assigned by your router. Local IP addresses can only be used to communicate within a private, or "local" network.

You can tell the difference between a "global" or "local" IP address by being able to identify the local IP addresses.

Local IP addresses:

10.0.0.0 = 10.255.255.255
172.16.0.0 = 172.31.255.255
192.168.0.0 = 192.168.255.255

Generally, home routers use addresses which begin with 192.168.X.X.

Typical Home Internet Configurations:

Typical home configurations generally fall into one of two categories:

- 1) A cable modem or DSL adapter connected directly to a single computer.
- 2) A cable modem or DSL adapter connected to a router, which shares the connection between multiple computers.

In configuration #1, the global IP address is usually assigned to the computer. The firewall on that computer protects the computer from outside access.

In configuration #2, the global IP address is assigned to the router. The router in turn, assigns local IP addresses to any connected computer or device.

An example of a router based configuration would look like this:

Ken's house has three computers and a router.

Ken's router is assigned a global IP address of 205.117.207.6 from his ISP.

All of Ken's computers are connected to the router.

The routers IP addresses:

Global: 205.117.207.6

Local: 192.168.0.1

Computer #1 IP address: 192.168.0.100

Computer #2 IP address: 192.168.0.101

Computer #3 IP address: 192.168.0.102

When Ken uses any of the computers for the Internet, the traffic to sent to the router which in turn is passes the information onto the Internet through its global IP address. The router is acting as the "gateway" for all connected computers regardless if they are physically plugged into the router, or are connected to it by wireless link.

Looking at configuration #1, where the Internet is connected directly to a single computer, you have probably deduced that a router will be required to connect your Spinneret to your network or the Internet. (Some cable modem or DSL adapters can actually fill this role, providing they have more than one network jack allowing for multiple computers or devices to be connected. Check with your service provider.)

Looking back at our example, if Ken adds a Spinneret to his network, it would look something like this:

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The routers IP addresses:

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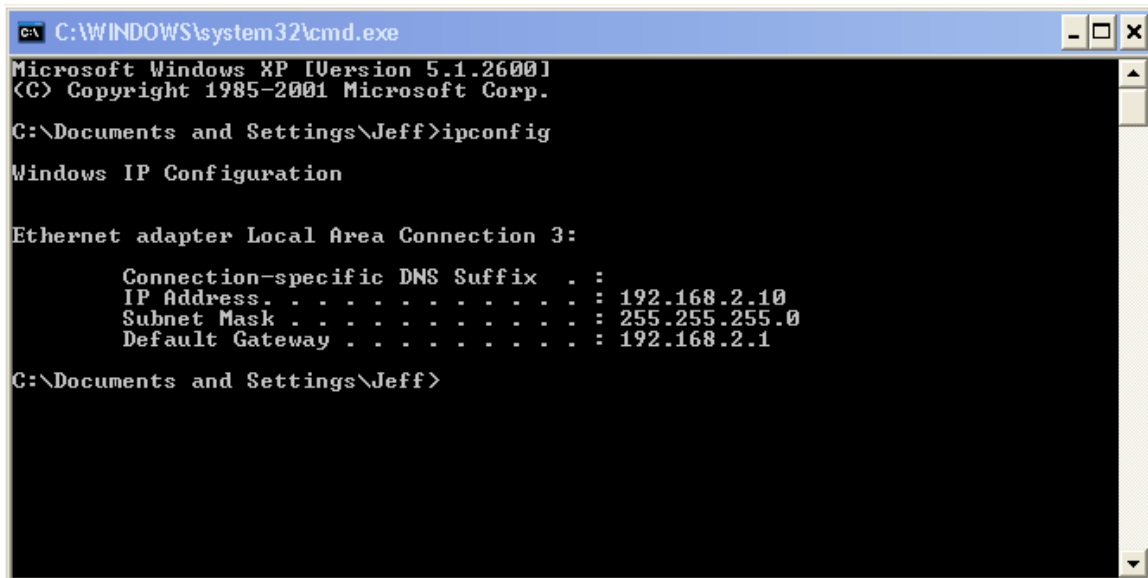
Spinneret IP address: 192.168.0.103

If the software which is running on your Spinneret is capable of auto configuring its IP address, then 192.168.0.103 would be assigned from the router. If you

are configuring the IP address by hand, then it would be wise to assign it an address outside of the addresses being handed out by the router. Instead of 192.168.0.103, configure it to 192.168.0.200. This will insure that your router will never duplicate the address to another computer in the future creating an "IP address conflict".

Determining your IP address information:

Windows users can easily determine their IP address configuration using the "Command Prompt" icon. Click on "Command Prompt" and type **ipconfig** and press enter. You should see a screen that looks something like this:



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
C:\Documents and Settings\Jeff>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection 3:

    Connection-specific DNS Suffix  . :
    IP Address. . . . .                : 192.168.2.10
    Subnet Mask . . . . .              : 255.255.255.0
    Default Gateway . . . . .          : 192.168.2.1

C:\Documents and Settings\Jeff>
```

The IP address **192.168.2.10** is the local number assigned to my computer. The default gateway **192.168.2.1** is the local address assigned to my router.

Configuring the Spinneret to **192.168.2.200** should allow me to access it on my local network through a web browser pointed at that address providing the Spinneret is running web server software.

There are five pieces of information required when configuring the Spinneret for Internet access. We already have three of them.

- 1) A local IP address. In my case 192.168.2.200 would be a good choice.
- 2) A subnet mask: Match what the computer is using. 255.255.255.0
- 3) The default gateway: Again match the computer. Mine is 192.168.2.1
- 4) The global IP address assigned from the Internet Service Provider.
- 5) The port which the Spinneret software is configured to answer to.

The global IP address can be found by going to <http://www.whatismyip.com> using any computer connected to your network. This address is the one which you would use to access your Spinneret from outside of your network.

All about port addresses:

Imagine that the Internet is a radio. The port addresses are the station numbers on the dial. On my radio, 99.3 is rock, while 104.7 is easy listening. Port addresses are the like the "station" numbers for the internet. They can range from 1 up into the thousands. Fortunately, you don't have to memorize them, and only a handful of port numbers are used commonly for typical Internet access.

Here's a few of the common port addresses:

Web access: port 80

FTP access: port 21

Email access: ports 25 & 110

If you are configuring the Spinneret to act as a web server, it would be easy to assume that you would use port 80. This will work fine on your local network. My own Spinneret would answer to <http://192.168.2.200:80> from my web browser. Because most web browsers assume all web access is on port 80, I can even use <http://192.168.2.200> and it works just fine. There is a catch.

Many Internet service providers do not allow these common ports incoming access from the outside world. This is done in the name of safety for typical Internet customers, but we aren't typical internet customers now. My own experience is that DSL providers generally allow these ports to access, while cable providers do not. To overcome this limitation, we simply pick a higher port number and assign it to the Spinneret. Instead of using port 80, (<http://192.168.2.200:80>) assigning it port 5555 (<http://192.168.2.200:5555>) takes care of the issue.

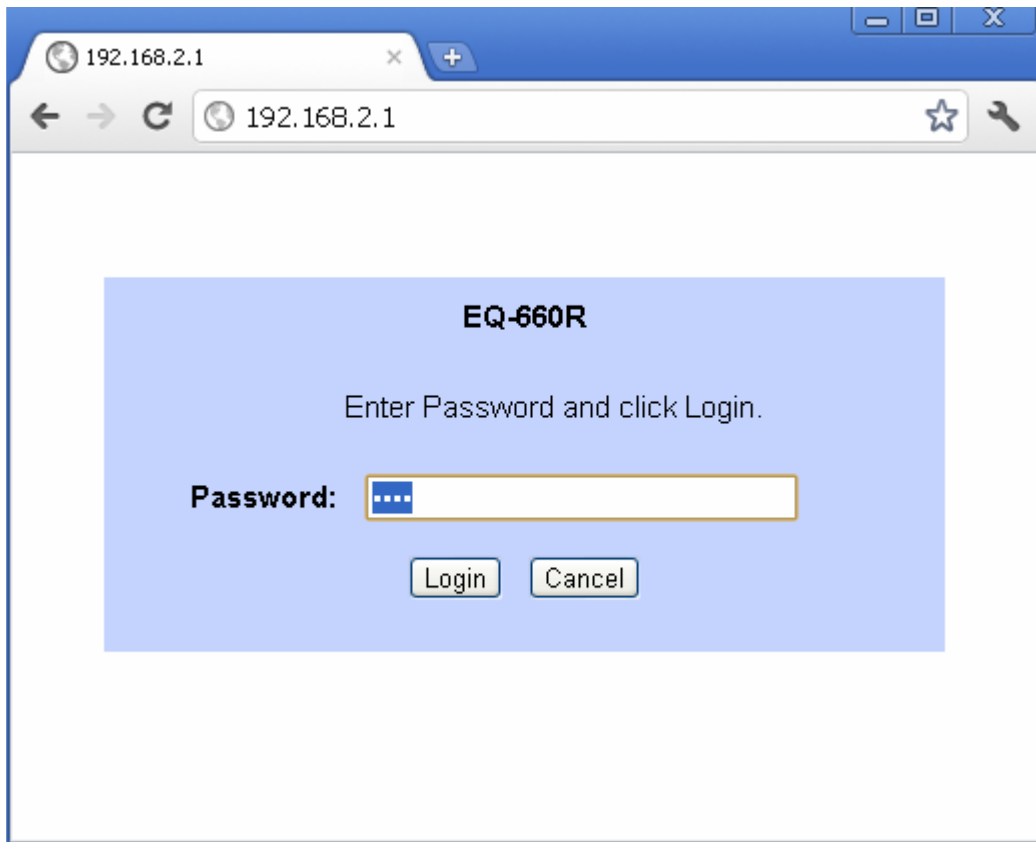
Providing access to the outside world

At this point, if you have been experimenting with the Spinneret, you may have a web server which is working fine on your computer, but are ready to take the next step, opening it to the outside world.

Remember that the router is the gateway device between your Spinneret and the outside world. By adding some simple instructions, it can direct traffic from the outside Internet to your Spinneret.

There are literally thousands of routers, all of which have variations between their configuration screens. I will give you an overview of how to program your router, but you can count on minor variations between my examples and yours.

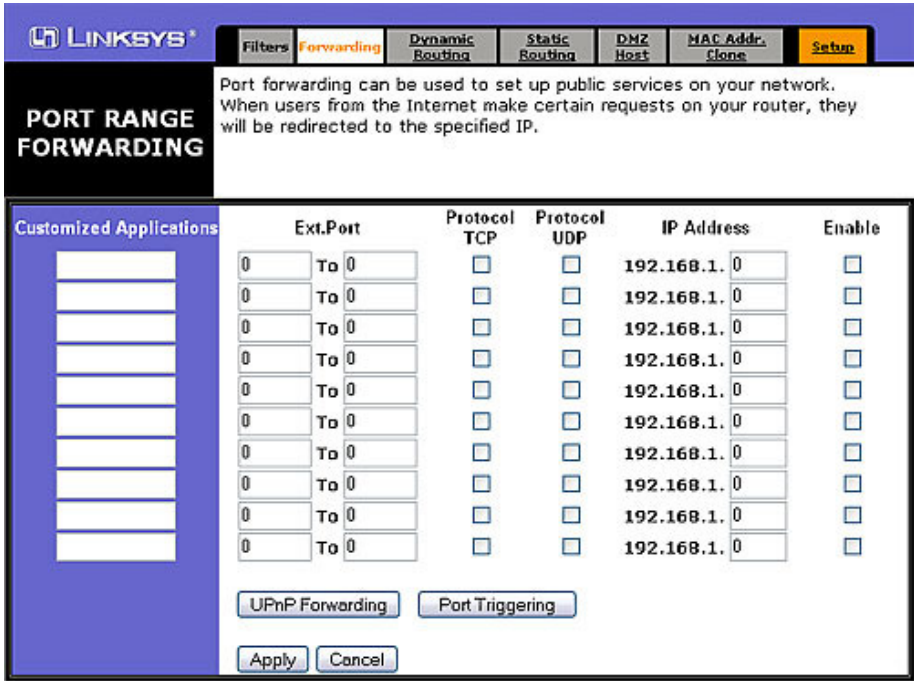
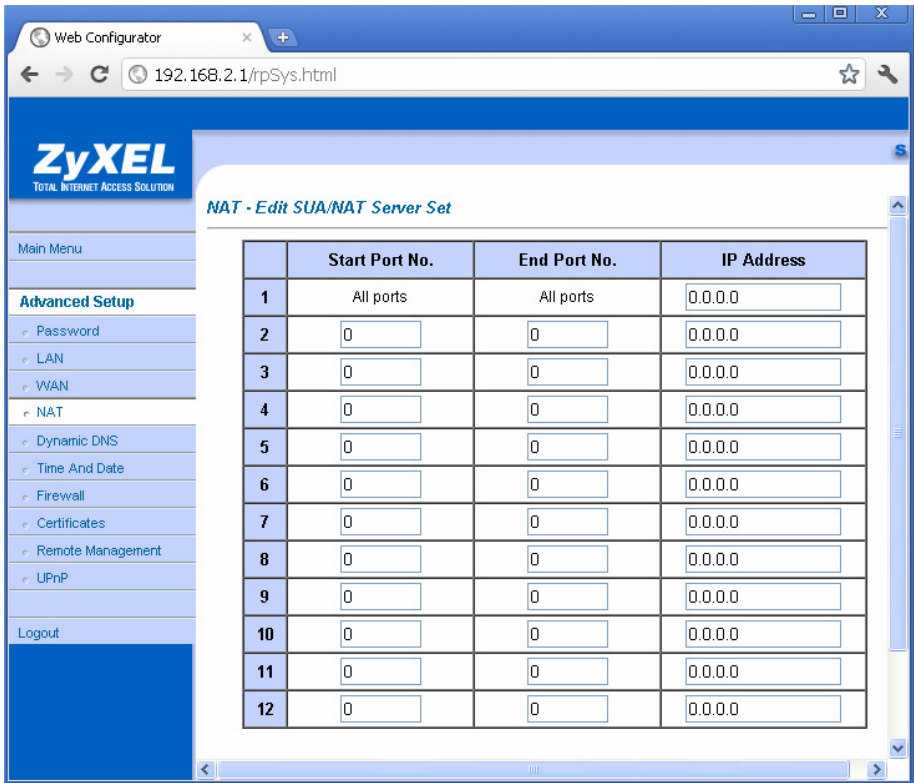
First of all, most routers can be configured using your web browser. Open your favorite browser and type the gateway address into the address bar. In my case the gateway address was 192.168.2.1.



You can expect to be greeted by a login and password prompt, or just a password prompt like mine. When initially installing the router on the network, this login and password were assigned. (Hopefully, you recorded that information.) It is common for this password to be left as "factory default" and the entries, "admin" for either login, password, or both tend to go a long way on most routers which never had their access passwords configured.

If at first your login/password doesn't work, there is no harm to keep trying combinations until you get access. A quick Google search for "default" login/name and password for your router can also be profitable.

Once you have obtained access, you'll be presented with a webpage-like group options. This is where routers will differ from brand to brand, but you are looking for a screen like these examples.



These two examples share important similarities. Both ask for started and ending port numbers. With my Spinneret, I would put 5555 in both boxes. The final bit of information is the IP address of the Spinneret. This is where I would put the 192.168.2.200, and in the case of the second example, there are a few checkboxes to enable to get things working. Don't forget to Hit "Apply" before closing your connection to the router.

This configuration tells the router that any incoming Internet data directed at port 5555 should be *forwarded* to 192.168.2.200. We call this "Port Forwarding."

Here's final check list to see if your Spinneret should work on the Internet.

- 1) First, obtain the local IP address data from a computer on your network, making note of the first part of the IP address, the subnet mask, and the default gateway.
- 2) Assign a local IP address and port number to your Spinneret. If you are running webserver software on the Spinneret. You can check to see it is working from your web browser at that address and port number.
- 3) Discover your global IP address by going to <http://whatismyip.com> with your computer. This is the address you would give someone else attempting to access your Spinneret from the outside world. For example, if you used 192.168.2.200:5555 on your end, they might use 204.117.207.5:5555 from outside of your network.
- 4) Configuring your router to "forward" incoming traffic based on the port assigned to your Spinneret's software.

Post your global address and port number to the Spinneret forums! There is always someone ready to help test out your Spinneret server.

Spin On!

Jeff Ledger

<http://www.propellerpowered.com>