

Proteus Wi-Fi Sensors

Accessing your sensor remotely / Port forwarding

Introduction

This application note serves as a guide to setting up port-forwarding on your Wi-Fi router so that you can access your sensor through the internet from outside of your home/ office network.

To access the Proteus device remotely, you need to assign a static IP for your Proteus Sensor and set port forwarding on the wireless router to which Proteus is connected.

Important Note

Unless you have a static IP assigned to your internet connection, the chances are the external IP address will change once you repower / reset / restart the modem or router. This application note assumes that your modem/ router has either a static external IP or your modem/ router remains ON once you have identified the (dynamic) IP address.

If you wish to get a static IP, you need to enquire with your internet service provider.

Assign a Static IP Address for Proteus

First, assign a static IP address to your Proteus Sensor. A static IP address remains unchanged even on power ON/ OFF, identifying a device on your network. Then, provide your router the static IP address of the Sensor for which you are opening the port. Follow these steps.

1. From a Windows computer connected to your network, click Start, and then type 'cmd' into the search field. Press Enter. This will open a command prompt window.
2. Type 'ipconfig /all' in the command prompt window. Press Enter.

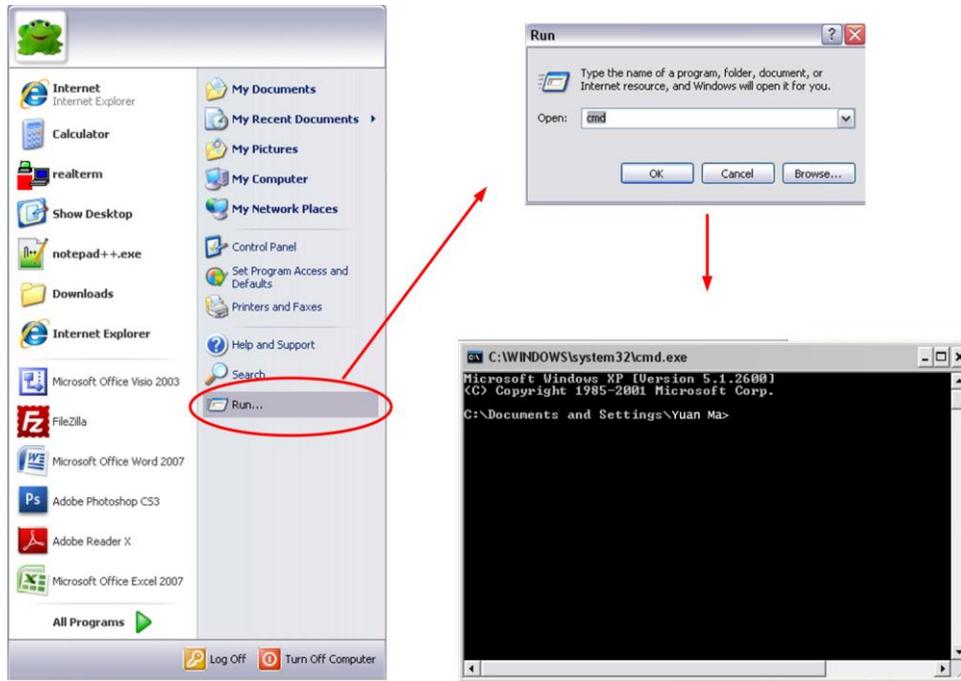


Fig 1. Open command prompt

```

C:\Users\Yuan Ma>ipconfig /all

Windows IP Configuration

Host Name . . . . . : YuanMa-Lenovo
Primary Dns Suffix . . . . . :
Node Type . . . . . : Mixed
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : home

Wireless LAN adapter Wireless Network Connection 3:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . :
Description . . . . . : Microsoft Uirtual WiFi Miniport Adapter #2
Physical Address. . . . . : 8C-A9-82-83-76-2B
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Wireless Network Connection 2:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . :
Description . . . . . : Microsoft Uirtual WiFi Miniport Adapter
Physical Address. . . . . : 8C-A9-82-83-76-2B
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Wireless Network Connection:

Connection-specific DNS Suffix . . : home
Description . . . . . : Intel(R) WiFi Link 1000 BGN
Physical Address. . . . . : 8C-A9-82-83-76-2A
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::3074:6ccc:22b6:2931%3(Preferred)
IPv4 Address. . . . . : 192.168.1.8(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Tuesday, January 14, 2014 2:47:24 AM
Lease Expires . . . . . : Wednesday, January 15, 2014 2:47:25 AM
Default Gateway . . . . . : 192.168.1.1
DHCP Server . . . . . : 192.168.1.1
DHCPv6 IAID . . . . . : 378317186
DHCPv6 Client DUID. . . . . : 00-01-00-01-15-5B-0C-7B-F0-DE-F1-5C-D5-1D
DNS Servers . . . . . : 192.168.1.1
NetBIOS over Tcpip. . . . . : Enabled

```

Fig 2. ipconfig output

- Record the following numbers listed under your network connection (labeled "Ethernet adapter Local Area Connection" or "Wireless LAN adapter Wireless Network Connection"):

Subnet Mask
Default Gateway
DNS Servers

- Pick an unused IP address for Proteus. This must be an IP in the same subnet (first 3 octets the same as your PC's IP address) with a different 4th octet. If your PC's address is 192.168.1.8, you can pick for e.g.192.168.1.10. To ensure this newly picked IP address is NOT used by other device or computer, type ping IP address in the same command window with step 2

```
C:\Users\Yuan Ma>ping 192.168.1.10

Pinging 192.168.1.10 with 32 bytes of data:
Reply from 192.168.1.8: Destination host unreachable.

Ping statistics for 192.168.1.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

Fig 3. ping output

For an unused IP address, ping should return message like "Destination host unreachable".
For IP address in use, the return message will be "Reply from ... bytes=32 time=xx ms..."

5. Now that we have an unused IP, we are ready to assign this (static) IP address for Proteus.
 - a. Open a web browser, go to Network Configuration page on Proteus.
 - b. Make sure 'Enable DHCP' box is unchecked.
 - c. Enter the network information. The IP address should be the unused IP you picked and tested in step 4, say 192.168.1.10 in this example. The Gateway, Subnet Mask and Primary DNS should be the same with what we collected in step 3.

Network Configuration

NOTE: This page allows the configuration of the device's network settings. Please read the [Instructions](#) before changing settings.

Enter the configuration details

MAC Address	<input type="text" value="00:1E:C0:0E:AF:7E"/>	
Host Name	<input type="text" value="PROTEUSDEV"/>	Must be Less than 16 bytes
Enable DHCP	<input type="checkbox"/>	
IP Address	<input type="text" value="192.168.1.10"/>	
Gateway	<input type="text" value="192.168.1.1"/>	
Subnet Mask	<input type="text" value="255.255.255.0"/>	
Primary DNS	<input type="text" value="192.168.1.1"/>	
Secondary DNS	<input type="text" value="4.2.2.1"/>	
HTTP Port #	<input type="text" value="80"/>	

Fig 4. Network Setting for Proteus

Forward Port on the Router

Now that you have a static IP assigned to Proteus device, log in to your router's interface and open a HTTP port.

1. Open a Web browser, type your Default Gateway number (it is 192.168.1.1 in this example) into the address bar, and press Enter.

2. Enter your username and password to access your router's interface. The default username and password should be listed in your router's documentation, on a sticker on the side of your router, or on the Port Forward website. If the username and password have been changed from the defaults and you don't remember them, you'll need to reset your router.
3. To forward ports on your router, look for a tab or menu labeled "Applications & Gaming", "Advanced", "Firewall Settings", "Port Forwarding/Port Triggering", "NAT/QoS" or something similar.
4. No matter what the router or interface, you'll need to enter the same basic information. Enter the port you want to open under Internal and External, or enter a range of ports to open under Start and End. For Proteus, the port number should be 80 for Internal and External, Start and End.
5. Choose the Protocol (TCP).
6. Enter the static IP address you created for Proteus.
7. Be sure Enable is selected if available. Enter a name, like HTTP, under Application if you want, then save the changes.

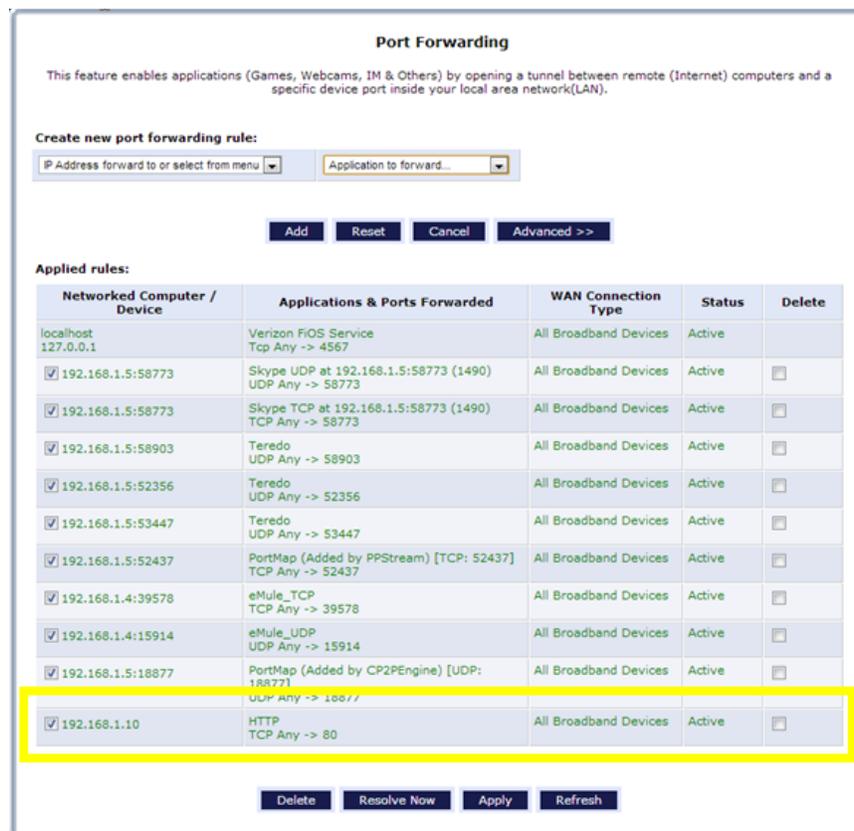


Fig 5. Port Forwarding on Verizon FiOS Router

The screenshot shows the Linksys router's configuration interface. The top navigation bar includes 'Applications & Gaming' and 'Wireless-G ADSL'. Below this, there are tabs for 'Setup', 'Wireless', 'Security', 'Access Restrictions', and 'Applications & Gaming'. Under 'Applications & Gaming', there are sub-tabs for 'Single Port Forwarding', 'Port Range Forwarding', 'Port Range Triggering', and 'DMZ'. The 'Single Port Forwarding' tab is active, displaying a table of port forwarding rules.

Application	External Port	Internal Port	Protocol	IP Address	Enabled
HTTP	80	80	TCP	192.168.1.10	<input type="checkbox"/>
FTP	21	21	TCP	192.168.1.0	<input type="checkbox"/>
FTP-Data	20	20	TCP	192.168.1.0	<input type="checkbox"/>
Telnet	23	23	TCP	192.168.1.0	<input type="checkbox"/>
SMTP	25	25	TCP	192.168.1.0	<input type="checkbox"/>
TFTP	69	69	UDP	192.168.1.0	<input type="checkbox"/>
finger	79	79	TCP	192.168.1.0	<input type="checkbox"/>
NTP	123	123	UDP	192.168.1.0	<input type="checkbox"/>
POP3	110	110	TCP	192.168.1.0	<input type="checkbox"/>
NNTP	119	119	TCP	192.168.1.0	<input type="checkbox"/>
SNMP	161	161	UDP	192.168.1.0	<input type="checkbox"/>
CVS	2401	2401	TCP	192.168.1.0	<input type="checkbox"/>

Fig 6. Port Forwarding on Linksys Router

8. Now, if you want to check and be sure your router's port is open and functioning, you can try with this web-based tool – the You Get Signal Port Forwarding Tester, or type <http://www.yougetsignal.com/tools/open-ports/> in a web browser, see Fig 7. All you have to do is enter port number 80 in the box. Your external IP should be provided already, but if not, just click the "Use Current IP" link, then hit the "Check" button. This will check if your router has the port open and if it's getting to a place on your network that can handle it. If everything's good, you'll see a green flag icon and a message that says that your port is open, Fig 7. Ultimately, though, you can try to access your forwarded service by using your external IP address. Record the "Remote Address" or "external address" shown on the webpage of Port Forwarding Tester, this is your router's external IP address.

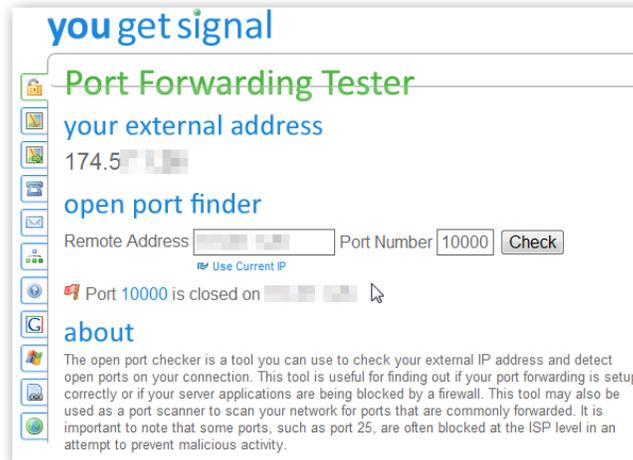


Fig 7. Port Forwarding Tester



Fig 8. Report from Port Forwarding Tester

9. Go to other place outside of you router like using your cell phone with data service, open a web browser, type your router's external IP address, you should see the web interface of Proteus!

References:

1. <http://portforward.com/>
2. http://www.pcworld.com/article/244314/how_to_forward_ports_on_your_router.html
3. <http://www.howtogeek.com/66214/how-to-forward-ports-on-your-router/>