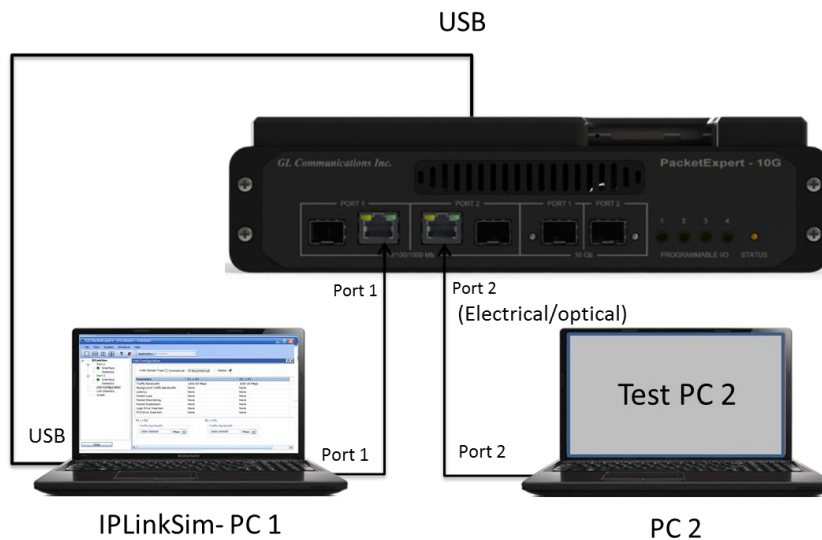


If this is your First-Time-Use of IPLinkSim™ 1G (IPN510), then we recommend you follow all the steps explained in [IPLinkSim-1G10G-IPN510-Quick-Install-Guide](#) before proceeding with the steps below.

Quick Checkout

The IPLinkSim™ 1G functional verification can be performed using a single IPLinkSim™ 1G/10G hardware unit.

‘IPLinkSim’ test scenario is demonstrated on PacketExpert™10G hardware unit and a Test PC, where Ethernet port of IPLinkSim™ PC is connected to Port 1 (1G) of PacketExpert™ hardware unit and Ethernet port of PC2 is connected to Port 2 (1G) of PacketExpert™ hardware unit using Ethernet CAT5 cables, as shown in the figure.



The test requires IPLinkSim™ (IPN510) license to be installed on PC1. After successful software installation, plug in the hardware unit to USB 2.0 port on PC1 as indicated in the figure above

Before we perform the actual test, perform the following changes in both the IPLinkSim PC and PC2. Disconnect PCs from the public or private networks and create a small isolated network. Turn-off windows firewall for both private and public networks on each PC. Assign Static IP address to each PC, subnet masks, and default gateway addresses.

The IPLinkSim™ acts as a transparent bi-directional link between PC1 and PC2, and they work as if connected directly, back-to-back.

This is the simplest possible network configuration, and helps configuring WAN conditions in a simple lab setup, emulating real world conditions without any elaborate setup.

We will conduct a simple Ping test between IPLinkSim™ PC1 and Test -PC2, and verify the WAN Emulation functionality.

Note: To use LC optical cables (for Optical Interface) in the following test, requires NIC card with optical ports on the PC.

Step 1: Note down the IP Addresses

Note down the IP addresses of PC1 and PC2 to conduct Ping test. Ensure that IP address of PC and Hardware are in the same subnet. In this example, we consider the PC IP Addresses as:

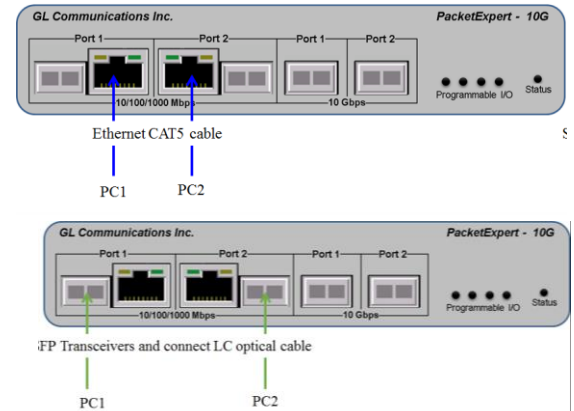
- PC1 – 192.168.1.43
- PC2 – 192.168.1.127

Step 2: Connect the cables


Perform Test on Port 1 and Port 2 (Electrical or Optical Interface)

- For Electrical Interface type, connect Port1 to PC1 using Ethernet cable as shown in the figure. Connect Port2 to PC2 using Ethernet cable
- For Optical Interface type, plug-in SFP Transceivers to the optical ports and connect Port1 and PC1, and connect Port2 and PC2 using LC optical cable (refer to figure).

Note: Make sure SFP is properly locked and the optical cable is properly plugged-in



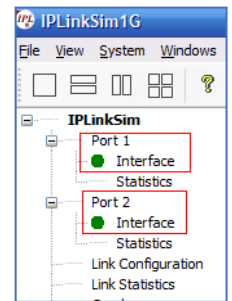
Step 3: Launch IPLinkSim 1G Application

- Right-click on the IPLinkSim 1G shortcut icon  on the desktop and select "**Run as administrator**" to launch IPLinkSim 1G application.

Note: The application may take some time to get started due to hardware and software initializations.

Step 4: Verify Links

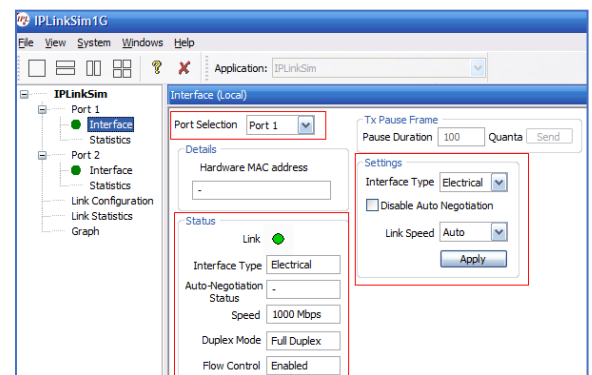
- Verify that the Link Status is UP on both ports, that is, the LHS tree should display port 1 and port 2 with green LEDs link status (refer to figure). If the LED shows red (refer to the figure), then link is down. If links are not up, refer to the next section on how to bring the links up.



Step 5: Configure Interface parameters

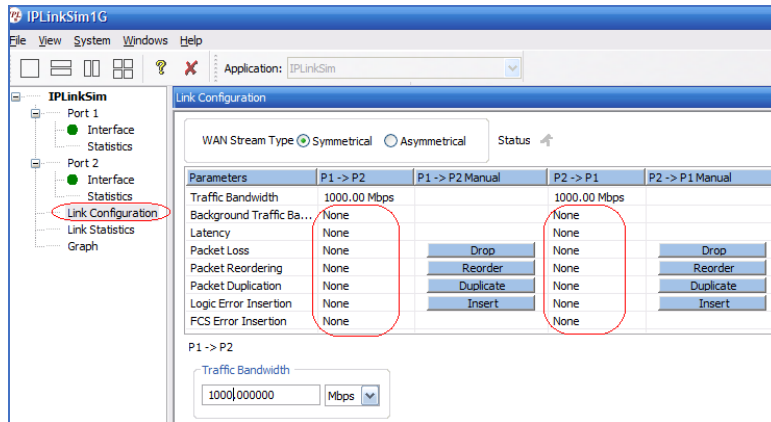
From IPLinkSim function tree, double click on the **Interface** option, to open "**Interface**" in one of the window on the RHS panes, select the ports from the **Port Selection** drop-down list and do the following for Port1 and Port2:

- Interface Type = **Electrical (for Electrical test, else Optical)**
- Link Speed = **Auto**
- Click on the **Apply** button (this will set the Interface Type in the hardware)
- Wait for some time as the port auto-negotiates with its link partner. Verify the following:
 - Link LED shows Green, indicating link is up
 - Auto Negotiation Status = Complete
 - Speed = 1000 Mbps (if connected PC's NIC card operates in 1G mode, else 100 Mbps or 10 Mbps)



Step 6: Link Configuration

On the RHS side, double click on **Link Configuration** to check the Impairments. Initially impairments are not configured, and the screen appears as shown here.



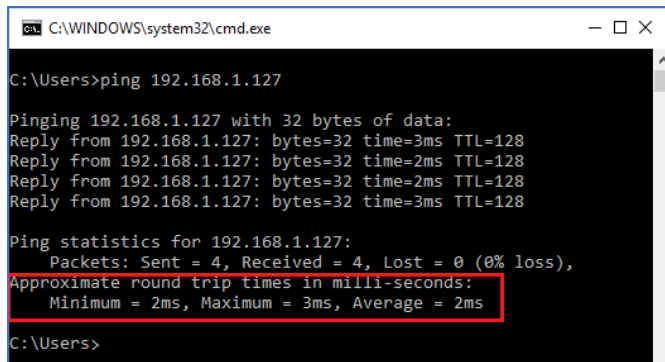
Step 7: Start IPLinkSim

- Click **Start** button available in the Function tree and start the **IPLinkSim** application.

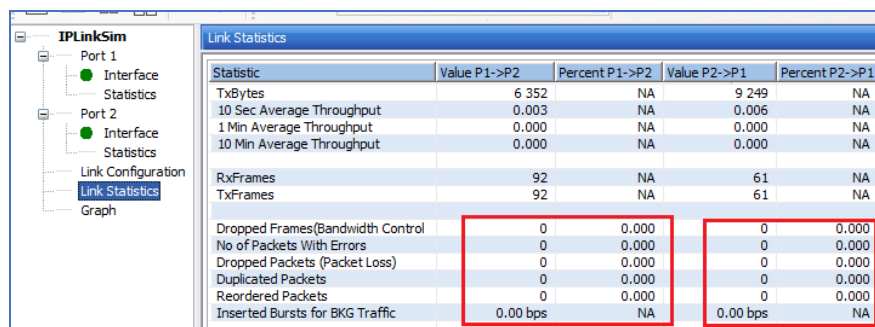
Step 8: Conduct Ping Test (without impairments)

- On PC1, open a command prompt, and Ping PC2's IP Address, as shown in the figure.
- Verify that Ping works fine.

Note that all 4 Ping trials have succeeded, with no impairments. Note that the Round trip time average is around 2 milliseconds.

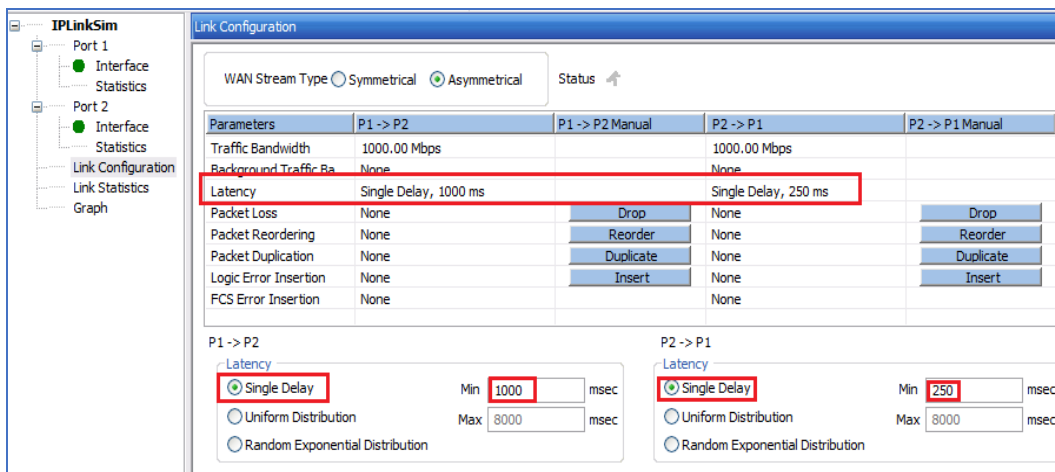


- From IPLinkSim function tree, double click on the **Link Statistics** option, to open “**Link Statistics**” in one of the window on the RHS panes. Verify that no impairments have been introduced.



Step 9: Configure Impairments – 1000ms Latency in one direction (P1 → P2) and 250 msec in the reverse direction (P2 →P1)

- Stop IPLinkSim by clicking on the **Stop** button.
- From IPLinkSim function tree, double click on the **Link Configuration** option, to open “**Link Configuration**” in one of the window on the RHS panes.
- Select **Asymmetrical** WAN Stream Type, select **Latency** in the Parameters list. Enter the value of ‘1000msec’ in the “**Latency**” edit box at the bottom, below “**P1 → P2**”. This means that in the P1 →P2 direction, every packet is delayed by 1000 msec. Similarly, enter “250 msec” in the “**Latency**” edit box at the bottom, below “**P2 →P1**”. This means that in the P2 →P1 direction, every packet is delayed by 250 msec. So, total Round Trip delay for the ping packet should be around 1000 msec (P1 →P2 delay) + 250 msec (P2 → P1 delay) + normal Ping delay of 1 to 2 msec = 1251 to 1252 msec.



- Click “**Start**” again to restart IPLinkSim with impairments.

Step 10: Conduct Ping Test (with Impairments – 1250 msec Round Trip Latency)

- On PC1, conduct the Ping test again, and verify that this time, the results shows 1251 - 1252ms delay.

This shows that the 1250 msec delay impairment introduced between PC1 and PC2 and reflects how IPLinkSim can be used to introduce impairments between two end points. of the network.

```

C:\WINDOWS\system32\cmd.exe

C:\Users>ping 192.168.1.127

Pinging 192.168.1.127 with 32 bytes of data:
Reply from 192.168.1.127: bytes=32 time=1251ms TTL=128
Reply from 192.168.1.127: bytes=32 time=1251ms TTL=128
Reply from 192.168.1.127: bytes=32 time=1251ms TTL=128
Reply from 192.168.1.127: bytes=32 time=1251ms TTL=128

Ping statistics for 192.168.1.127:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1251ms, Maximum = 1251ms, Average = 1251ms

C:\Users>
  
```