

# Network Loopback Tester Software Users Guide



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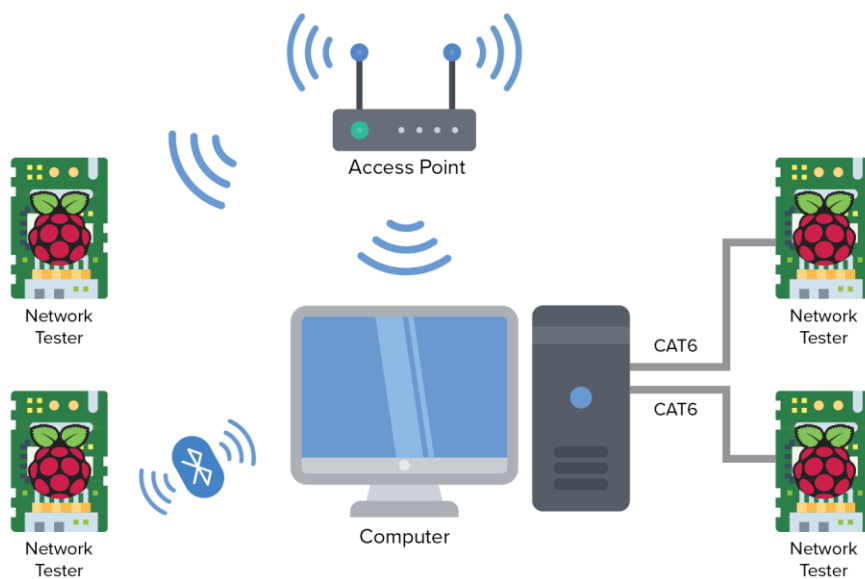
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## Introduction

Passmark's Network Loopback Tester is software that runs on Raspberry Pi hardware. It works with our BurnInTest software. The Network Loopback Tester software sets up an endpoint that allows network loopback testing across Ethernet, WiFi and Bluetooth networks. In conjunction with the BurnInTest software it allows end to end testing of the network link with bulk data over an extended period of time. It provides a much more effective network test than traditional methods, like Ping, or electrical conductivity test plugs. With the Network Tester, you can:

- Diagnose, troubleshoot and load test network ports of your PC
- Verify that the network ports are working correctly.
- Verify that the network ports remain stable under long periods of load.



The above diagram shows how a PC with network interfaces can be tested via multiple network testers.

## Hardware Needed

Note that you will need to provide your own hardware. The hardware required is the,

### ***Raspberry Pi 4 Model B, 4GB***



Raspberry Pi is a single-board computer made by the Raspberry Pi Foundation.

The product can be ordered Online from the manufacturer  
This product is available world-wide.  
<https://www.raspberrypi.org/products/raspberry-pi-4-model-b/>

### ***Raspberry Pi 15.3W USB-C Power Supply***



This provides power to the Raspberry Pi board.  
The product can be ordered Online from the manufacturer  
This product is available world-wide.  
<https://www.raspberrypi.org/products/type-c-power-supply/>

### ***Raspberry Pi 4 Case with Fan***



To avoid the bare Pi board accidentally touching a piece of metal and shorting out, a case is needed. Furthermore, once in a case, having a heatsink and fan is necessary to keep the CPU cooler and therefore avoid throttling.  
<https://raspberrypi.iaustralia.com.au/collections/raspberry-pi-4-cases/products/raspberry-pi-4-black-case-with-fan>

### ***Micro SD card reader***

A Micro SD card reader is needed to load the network tester image file into the Raspberry Pi SD card.

## **Software Needed**

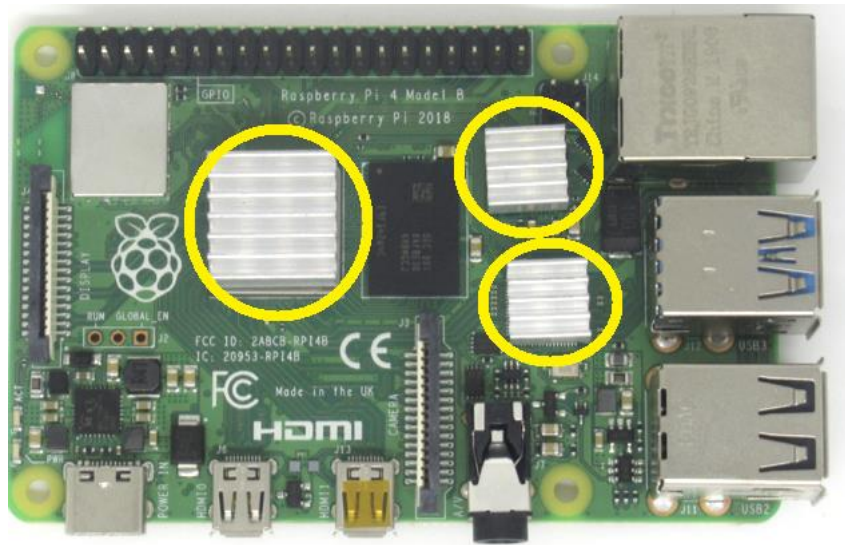
In addition to the Network testing software, BurnInTest Professional Edition is also required.  
<https://www.passmark.com/products/burnintest/index.php>

## **Setting up the Raspberry Pi**

Here's what to do to setup your raspberry pi for the first time.

- Place heatsinks on main chips. the large heatsink will be placed on the Broadcom BCM 2711 SoC. Another heatsink will also be placed on the Broadcom BCM54213

Gigabit ethernet controller. Each heatsink comes with some adhesive, simply peel back the tape on the flat side of the heatsink.



- Put your Raspberry Pi in its case.
- Download the latest image file from your order confirmation email. The software is only available for download after purchase.
- Download the latest version of Raspberry Pi Imager and install it from here, <https://www.raspberrypi.org/downloads/>
- Connect an SD card reader with the SD card inside.
- Open Raspberry Pi Imager and click on “CHOOSE OS” and then select “Use custom”.
- Browse to the Network Tester image file.
- Choose the SD card you wish to write your image to.
- Review your selections and click 'WRITE' to begin writing data to the SD card. Wait for the process to complete.
- Remove the SD card and slide the SD card into the underside of the Raspberry Pi, and make sure it's oriented correctly.
- Connect it to the power supply and wait for approximately one minute for the operating system to boot.

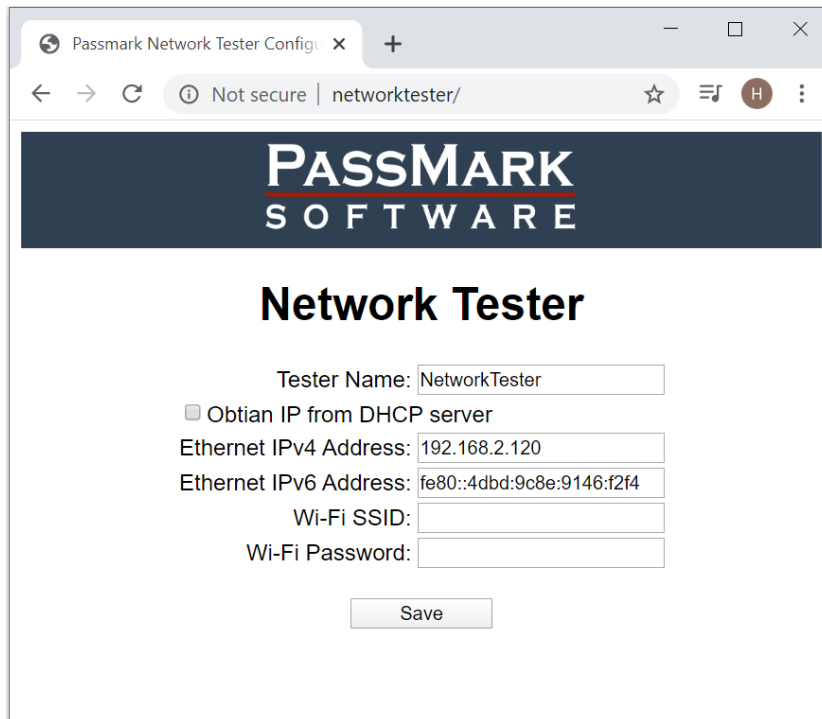
## Preparing device for test

### ***Testing Ethernet ports***

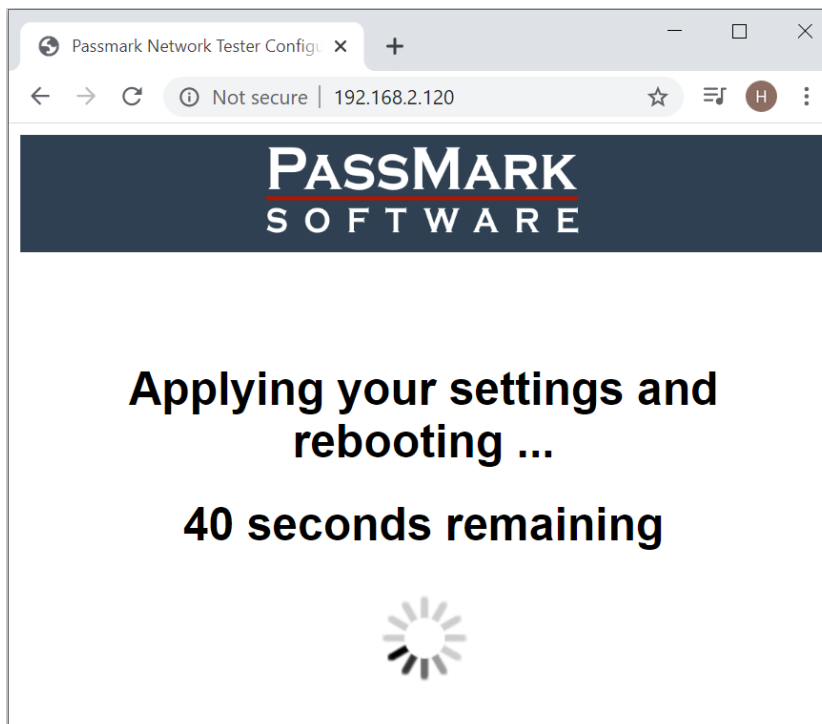
To test a network port, you should first make sure that the tester is connected to the same network. The DHCP option is enabled by default, so by connecting the tester to a DHCP network, it will obtain an IP address automatically from the DHCP server.

### ***Testing Wi-Fi***

For testing Wi-Fi, you need to set SSID and Password for the Wi-Fi network, so that the tester can connect to the Wi-Fi network. This is done via the tester’s web interface. Connect your tester to a DHCP network and open a web browser. Type “<http://NetworkTester>” to get access to the web interface.



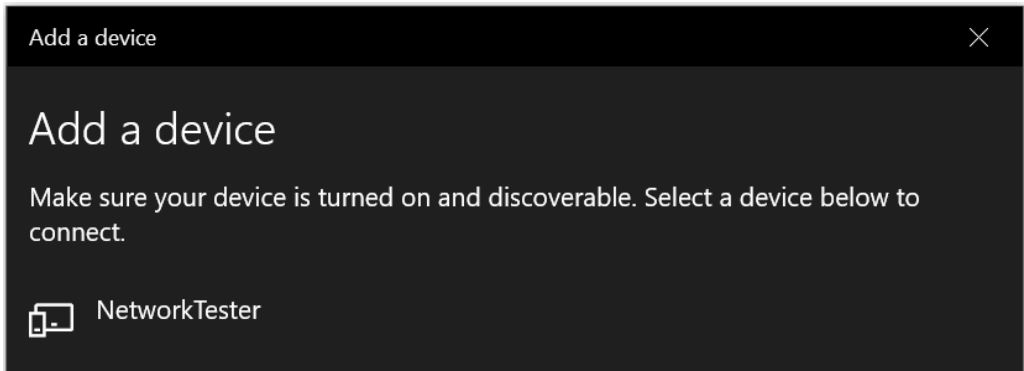
Using the web interface, you can set the SSID and password. By clicking “Save” the new settings will be applied and device will reboot.



### ***Testing Bluetooth***

The Network Tester device must be paired beforehand to be tested. Turn on Bluetooth on your PC if it's not on already. To do this, select the Start button, then select Settings > Devices > Bluetooth & other devices and turn on Bluetooth. Select “Add

Bluetooth or other device” > Bluetooth. Choose the device and follow additional instructions if they appear, then select Done.



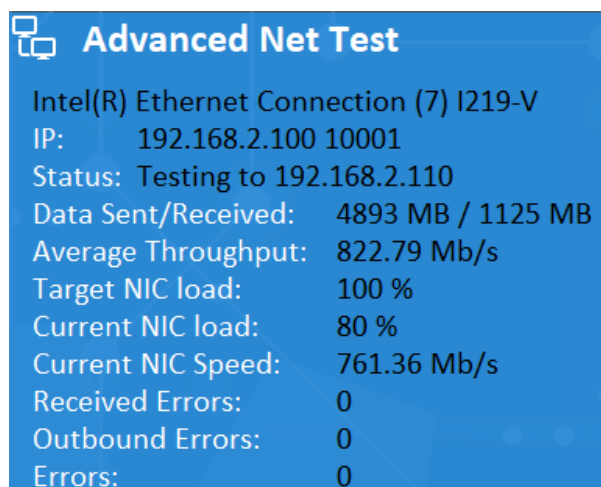
## How to test a network interface

### ***Ethernet/Wi-Fi Testing***

To perform network testing on Ethernet or Wi-Fi interfaces, you need to run Advanced Network Test using BurnInTest software. We recommend testing one interface at a time due to performance limitation of the Raspberry Pi board. This can be done by enabling one interface at a time via the “Test Preferences”.

At the start of testing, BurnInTest broadcasts a request to the Network Testers on the local LAN segment. Each Network Tester will respond to this request. This provides BurnInTest with a list of all available Network Testers. A test will be started for the selected NIC and BurnInTest will send a control message to its designated Network Tester to request it to start testing, on receiving a 'Ready to test' response from the EP, BurnInTest will setup test TCP sockets (WinSock) on the user specified port (+ the test number) and start sending test data to the EP. If full duplex is configured for that NIC, then the EP will also send test data back to its allocated BurnInTest system NIC.

Example: The Advanced network test window for a test of an IPv4 NIC on the BurnInTest system.



### ***Bluetooth Testing***

To perform network testing on Bluetooth adapters, you need to run Advanced Bluetooth Test using BurnInTest software. The Bluetooth test will connect to the Network Tester software and perform a half or full duplex data transmission test with option to verify the data sent from one computer is the same as the data received on the other computer. The Network Tester device must be paired and authenticated beforehand to be tested.

