Connecting to a P440 via Ethernet

PulsON® 440

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Introduction

Connecting to a P440 with Ethernet is more involved than connecting with Serial or USB. Unlike these other two protocols it is possible to connect to a P440 using either Static or Dynamic IP addresses. The user may also want to change the IP address of a unit, change Static IP operation to Dynamic assignment or vice versa, or determine the IP address and connection type of an unknown unit.

Additionally, if the P440 is ordered as part of a Development Kit or PulsON Lab, then the unit will arrive with Static IP addresses. In this case, the user will need to configure the Host PC such that it can communicate with the P440. In contrast, units ordered as individual modules will arrive configured for DHCP (Dynamic Host Configuration Protocol).

This document explains how to:
- Setup a PC so that it can connect to a P440 using a static IP address
- Change the static IP address of a P440
- Determine the IP address of a P440
- Connect a P440 such that it can use DHCP
- Change a P440 configured to DHCP such that it uses a static IP address

To determine or change the configuration of a P440, the user will use a special Ethernet utility console called the PulsON IP Utility (PIU) . This document will also explain how to install PIU and connect to a P440 via Serial, USB or Ethernet.

Connecting a PC to a P440 via static IP Address

Before establishing a link between your Host PC and the P440, you need to ensure that your PC is configured correctly. Time Domain strongly recommends that there be an unused Ethernet Network Interface Card (NIC) in the PC you intend to use with the P440. If you are using a desktop PC and are connected to a local area network (LAN), you should use a second NIC to connect to the P440. If you do not have a second NIC available, we recommend installing one at this time.

If you are using a laptop to connect to the P440, you should have both wireless and wired connection options. If the wired connection is unused, we suggest using it to connect to the P440.

Configuring an Ethernet Network Interface Card

The following steps configure the unused NIC to serve as the connection to the P440.

1. Log in to the computer by using the Administrator account.
2. On the taskbar at the bottom of the screen, right-click on the network icon in the right corner.
3. Click **Open Network and Sharing Center** and then click **Change Adapter Settings**.
4. Right-click **Local Area Connection** and then click **Properties** from the drop-down menu (**Figure 1**).
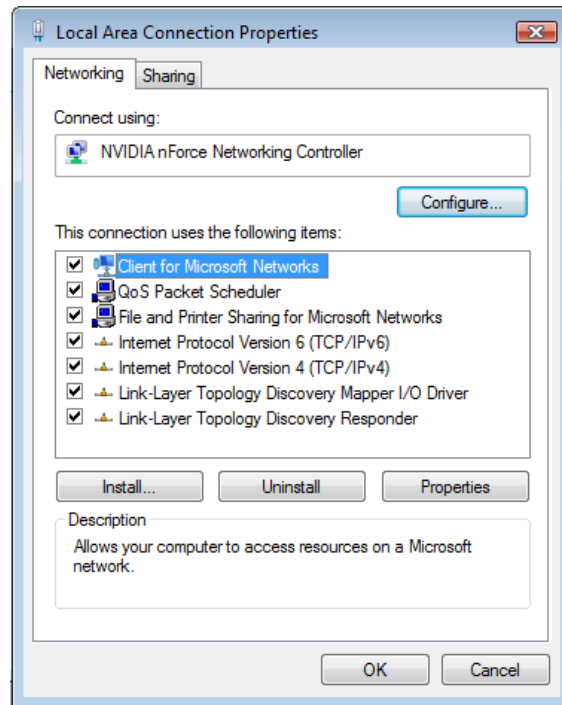
Fig. 1:   Selecting the Internet Protocol

5.   The **Local Area Connection Properties** dialog box will open. In the box labeled "This connection uses the following items," select **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

6.   When the **Internet Protocol (TCP/IP) Properties** dialog box appears, select **Use the following IP address** (**Figure 2**).
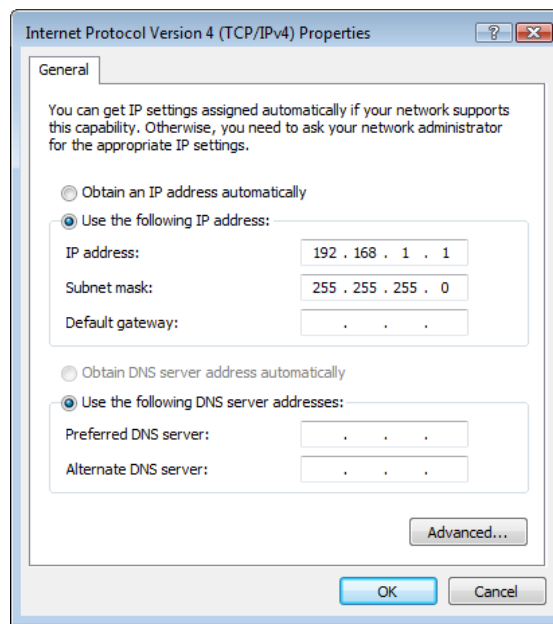

Fig. 2: IP Address Menu

7. Enter the following information in the appropriate fields and click OK:

    - IP address: 192.168.1.1

    - Subnet mask: 255.255.255.0

8. If the NIC used for communicating with the radio is also part of an established network, contact the network administrator to obtain a list of valid IP addresses for your network.
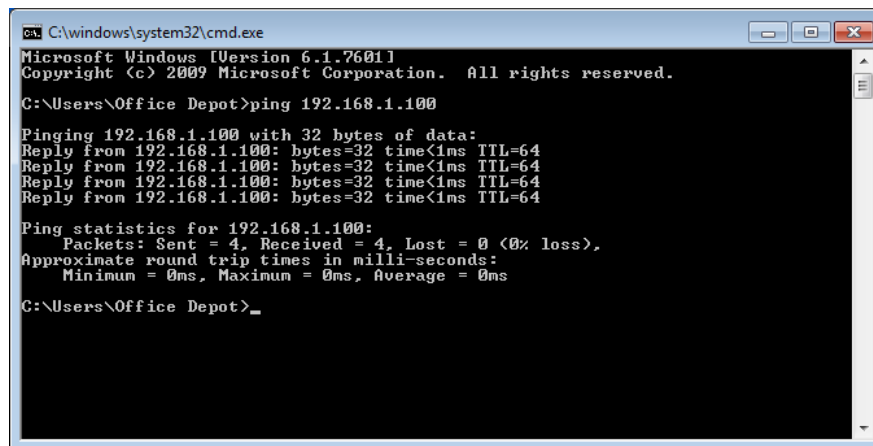
Once this is complete, you should be able to connect to the P440 either directly with an Ethernet cable or through an Ethernet hub.

Testing Connection to the MRM

A simple test will confirm that the NIC is configured properly, that the Ethernet cabling is correct, and that the PC is connected to an operational P440.

1. Click **Start** and type "cmd" (no quotation marks) in the search box to open a command window.

2. Type "ping 192.168.1.100" (the IP address of the radio, no quotation marks) and hit **Enter**.

If the connection is good and the IP address of your PC was configured correctly, you will receive a confirmation that the number of packets sent equals the number of packets received. This is shown in **Figure 3**.

Fig. 3: Successful response to Ping command confirms that Ethernet is operating properly

Installing PulsON IP Utility (PIU)

The PulsON IP Utility (PIU) installer can be found in the delivery disk in the subdirectory entitled "2-Host & Sample Code." To launch the installer, double-click on the program

PulsON_IP_Util_Setup.msi and follow the instructions.   The program will install as "piu" and when complete, the icon shown in **Figure 4** will appear on your desktop.

Fig. 4: PulsON IP Utility (PIU) icon

Changing the Static IP Address of a P440

To change the Static IP address of a P440, double-click on the icon shown in **Figure 4**.   The console command shown in **Figure 5** will appear. If not present, then return to the section entitled "Installing PulsON IP Utility (PIU)" and follow the installation instructions.

Fig. 5: PulsON IP Utility (PIU) entry screen

The figure shown is a command line utility that lists the version number of the program and provides instructions on use. The user can connect to the unit through Serial (-s command), through USB (-u command), or Ethernet (-i address). If you use either the Serial or USB protocols then you will need to enter the COM port number with which you are connected to the P440.

If you don't know the COM port number, then bring up any of the Host-based GUIs (MRM, RangeNet, CAT) and connect the cable to the P440.   Within a few moments the assigned COM port number will appear.   Use this COM port number when connecting through the PIU program.

For example, assume that you wish to change the P440 IP address from 192.168.1.100 to 192.168.1.126 using the Ethernet connection.   In this case, connect with an Ethernet cable, type the following and click the Enter key:

piu –I 192.168.1.100

The status display shown in **Figure 6** will appear.

Fig. 6: PIU status

Type the letter n and click Enter. You will receive a prompt to change the IP address. Enter 192.168.1.126 and click the Enter key. Unless you have received specific instructions from your IT manager, please use the Netmask and Gateway addresses as shown in **Figure 6**. You may change the last 3 digits of the IP address to any value you wish as long as the number is greater than 0 and less than 255.
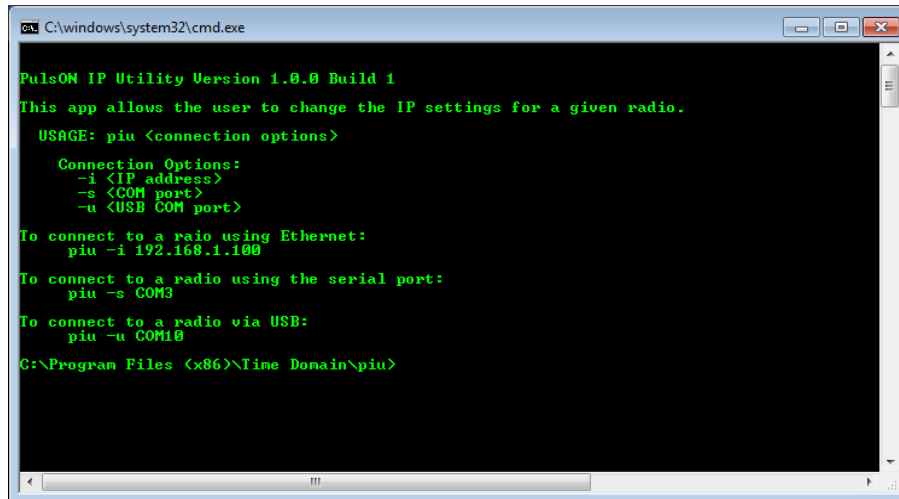

Fig. 7: Final confirmation of IP Address, Netmask and Gateway values

If correct, enter y and click the Enter key. The program will then load the new IP address. This change will take effect after the P440 is rebooted or when the P440 is powered off and on.

Note that changing the IP address will NOT change the node ID.

Determining the IP address/connection type of a P440

To determine the IP address of a P440 and whether the Ethernet connection is with Static or Dynamic IP addressing, double-click on the icon shown in **Figure 4**. The console command shown in **Figure 8** will appear. If the icon is not present, then return to the section entitled "Installing PulsON IP Utility (PIU)" and follow the installation instructions.
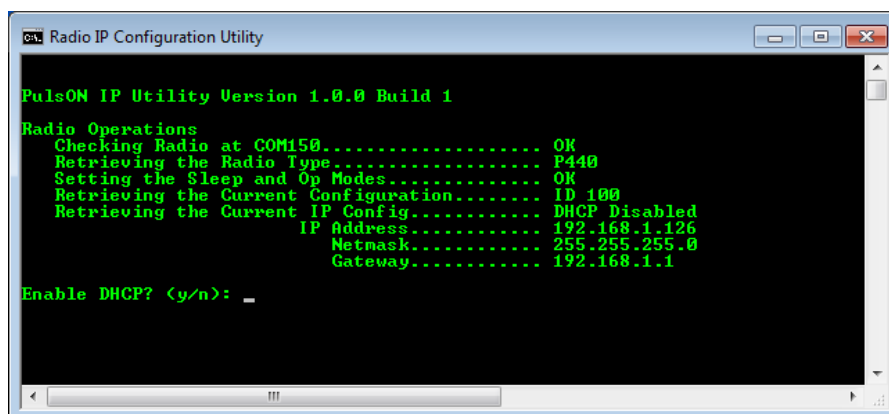
Fig. 8: PulsON IP Utility (PIU) entry screen

The figure shown is a command line utility that lists the version number of the program and provides instructions on use. The user can connect to the unit through Serial (-s command), through USB (-u command), or Ethernet (-i address). Since you don't know the IP address and protocol, you will need to connect to the P440 with either Serial or USB. To do so you will need to know the COM port number. If you don't know the COM port number, then bring up any of the Host-based GUIs (MRM, RangeNet, or CAT) and connect the cable to the P440. Within a few moments the assigned COM port number will appear. Use this COM port number when connecting through the PIU program.

For example, let us assume a USB connection through COM port 150. In this case, type the following and click the Enter key:

piu –u com150

The status display shown in **Figure 9** will appear.
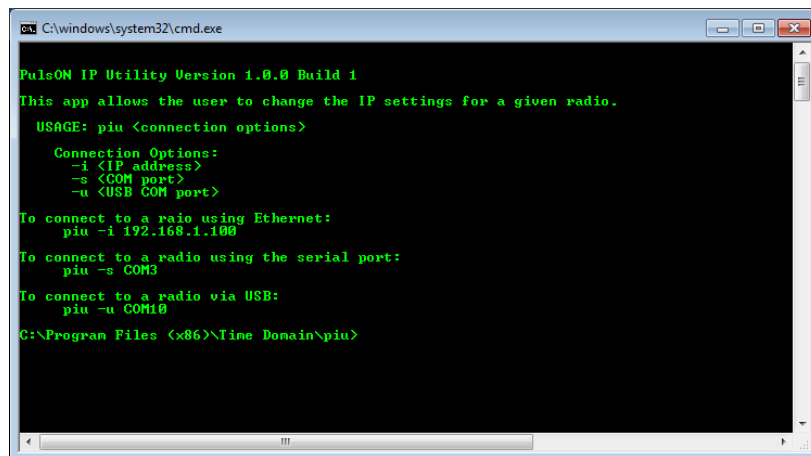

Fig. 9: PIU status

This displays the unit's IP address and communications protocol. In this example, DHCP has been disabled (so Static Addressing will be used) and the unit's IP address is 192.168.1.126.

At this point you can exit the exit the program or change the IP address or set communications to DHCP.

Changing from Static to DHCP

To change from Static to Dynamic (DHCP) IP addresses, double-click on the icon shown in **Figure 4**. The console command shown in **Figure 10** will appear. If the icon is not present, then return to the section entitled "Installing PulsON IP Utility (PIU)" and follow the installation instructions.

Fig. 10: PulsON IP Utility (PIU) entry screen

The figure shown is a command line utility that lists the version number of the program and provides instructions on use. The user can connect to the unit through Serial (-s command), through USB (-u command), or Ethernet (-i address). To interface with Serial or USB you will need to know the COM port number. If you don't know the COM port number, then bring up any of the Host-based GUIs (MRM, RangeNet, CAT) and connect the cable to the P440. Within a few moments the assigned COM port number will appear. Use this COM port number when connecting through the PIU program.

For example, let us assume a USB connection through COM port 150. In this case, type the following and click the Enter key.

piu –u com150

The status display shown in **Figure 11** will appear.

Fig. 11: PIU status

Respond to the prompt "Enable DHCP? (y/n)" by typing the letter y and then clicking the Enter key.

Answering "y" to the subsequent prompt will complete operation. The change will take effect the next time the unit is booted or the power is turned off and then on.

Changing from DHCP to Static

To change from Dynamic (DHCP) to Static IP addresses, double-click on the icon shown in **Figure 4**. The console command shown in **Figure 12** will appear. If the icon is not present, then return to the section entitled "Installing PulsON IP Utility (PIU)" and follow the installation instructions.

Fig. 12: PulsON IP Utility (PIU) entry screen

The figure shown is a command line utility that lists the version number of the program and provides instructions on use. The user can connect to the unit through Serial (-s command) or through USB (-u command). To do so will require that you know the COM port number.   If you don't know the COM port number, then bring up any of the Host-based GUIs (MRM, RangeNet, CAT) and connect the cable to the P440.   Within a few moments the assigned COM port number will appear.   Use this COM port number when connecting through the PIU program.

For example, let us assume a USB connection through COM port 150. In this case, type the following and click the Enter key.

<p style="text-align:center">piu –u com150</p>

The status display shown in **Figure 11** will appear.

Fig. 11: PIU status

Respond to the prompt "Enable DHCP? (y/n)" by typing the letter n and then clicking the Enter key. You will then be prompted to enter the new IP address, Netmask, and Gateway.   If you are connecting to the unit through your laptop then the proper entries are as follows:

IP address: 192.168.1.xxx   (where $0 < x < 255$)
Netmask: 255.255.255.0
Gateway: 192.168.1.1

Answering "y" to the subsequent prompt will complete operation. The change will take effect the next time the unit is booted or the power is turned off and then on.