



Configuring a Trimble Sps 461 using the Ethernet Connection

By Bob Glover

With most computers today, finding a serial port on board is a thing of the past. Increasingly, fewer and fewer computers even have PCMCIA slots and now it appears that the express slot is going away as well. This leaves us only the USB ports to which we must interface our hardware.

USB is great for the plug-and-play features that it offers (our headphones and a game controller works just fine); however USB has its limitations when it comes to hardware that needs to maintain a high level of reliability in its transfer of critical data. As system resources become overloaded, some computers will start to shut down the USB ports. This hardly matters when your mouse momentarily stops working, but it could be a real problem should your position device stop functioning. Almost all computers today have a port for an Ethernet connection (where you plug in your network cable) and this Ethernet port gives us a reliable high-speed connection for data transfer from a GPS device. In this example, we will be using a Trimble Sps 461 GPS unit which we will refer to as GPS or receiver.

GETTING THE GPS ON THE NETWORK

The receiver has an Ethernet port so that the receiver can connect to an Ethernet network. You can use the Ethernet network to access, configure, and monitor the receiver. No serial cable connection to the receiver is necessary.

The receiver requires the following Ethernet settings:

- HTTP port
- IP setup: Static or DHCP
- IP address
- Netmask (Submask)
- Broadcast IP address
- Gateway IP address
- DNS IP address

HTTP PORT

HTTP port: The default setting for the HTTP port is 80. The HTTP port is not assigned by the network. HTTP port 80 is the standard port for web servers. This allows you to connect to the receiver by entering only the IP address of the receiver in a web browser. If the receiver is set up to use a port other than 80, you will need to enter the IP address followed by the port number in a web browser.

Example of connecting to the receiver using port 80: `http://169.254.1.0`

Example of connecting to the receiver using port 4000: `http://169.254.1.0:4000`

IP SETUP

The default setting of the receiver is DHCP enabled. Using DHCP enables the receiver to automatically obtain the IP address, Netmask, Broadcast, Gateway, and DNS address from the network. When a receiver is connected to a network using DHCP, the network assigns an IP address to the receiver.

To verify the IP address, select the 'Up' button from the keypad on the face of the receiver when the Home screen is displayed. The Ethernet IP address appears.

FIGURE 1. Sample Home Screen

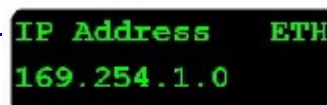


Figure 1 shows a receiver that has failed to get a network-assigned IP address. This would be the IP address that we would be using for peer-to-peer transfer between the receiver and computer without being on a network or using an Ethernet hub.

Important! Remember that for peer-to-peer transfer you *must* use an Ethernet cross-over cable. The computer requires a web browser; we will be using Microsoft Internet Explorer.

CONFIGURING THE GPS ON THE ETHERNET

In order to configure the GPS using the Ethernet, we must enter the IP address of the receiver into the web browser. This will give us access to the home screen of the Trimble receiver.

If security is enabled on the receiver, the web browser prompts you to enter a username and password. The default login values for the receiver are:

- Username= admin
- Password= password

I/O CONFIGURATION

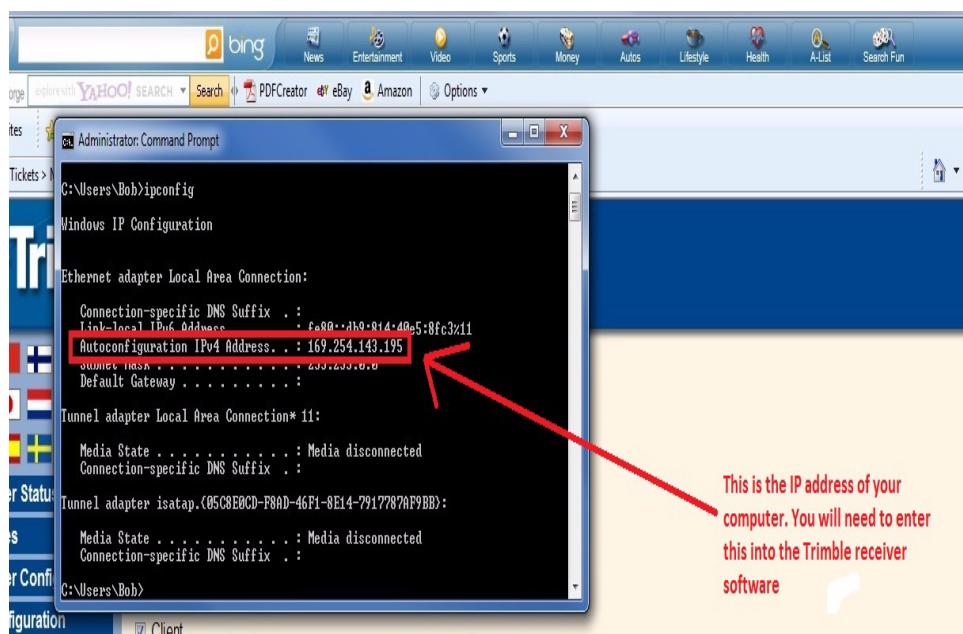
The I/O Configuration page is where we will enter our information to enable the receiver to communicate with the computer running HYPACK®. From this same page we will also configure the output messages and the rate of output.

You must know the IP address of the computer that is running HYPACK®.

To find the IP address for the HYPACK® computer:

1. **Access the command prompt.**
 - a. **Click the Windows® Start button and select 'Run'.**
 - b. **Enter `cmd` and click [OK].** The command prompt window will appear.
2. **Enter `ipconfig` and press the Enter key.** Your computer's IP address will be displayed. With this information we can now setup the receiver to communicate with the computer.

FIGURE 2. Finding your IP Address



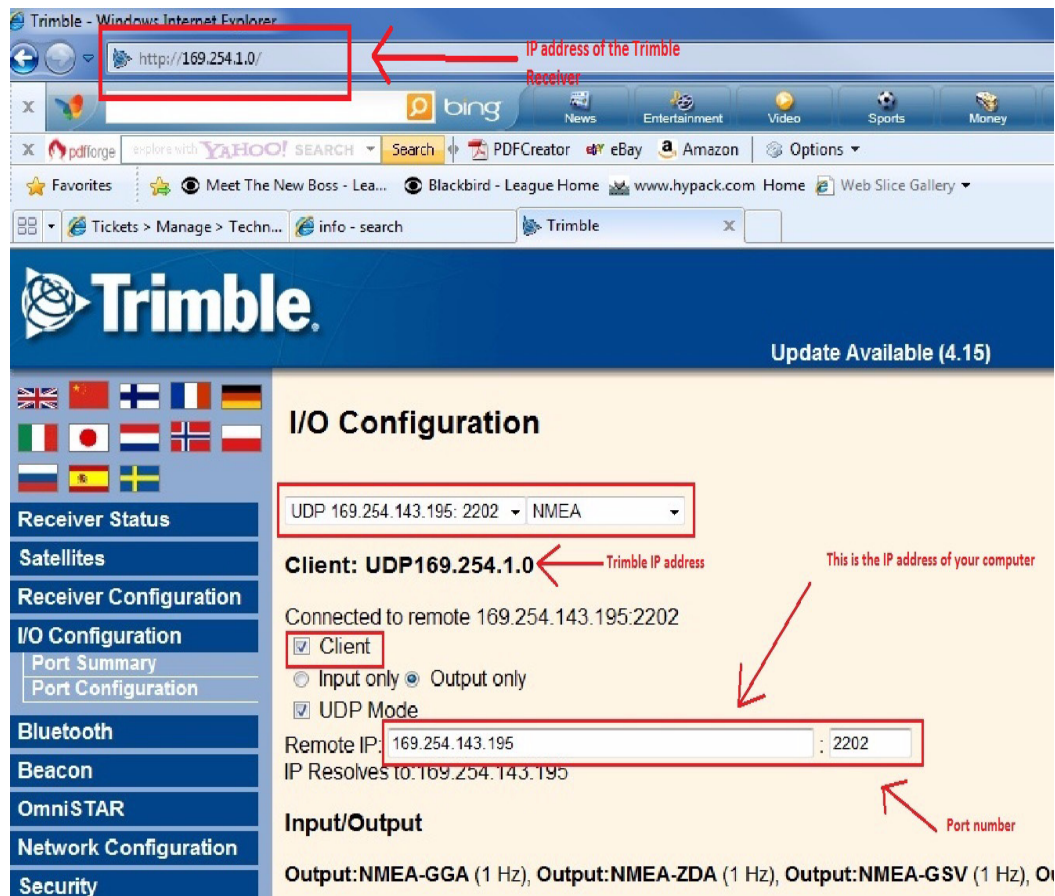
On the I/O Configuration page (See Figure 3) we will enter to following:

- Our IP address,
- Role of the receiver,
- Choose to send NMEA messages
- Set which NMEA messages to send and at what rate at which we would like to have them sent.

Note: The port number entered will be the same as the one used in the HYPACK® GPS.dll connection dialog box which is port 2202. *This is the port number that must be used.*

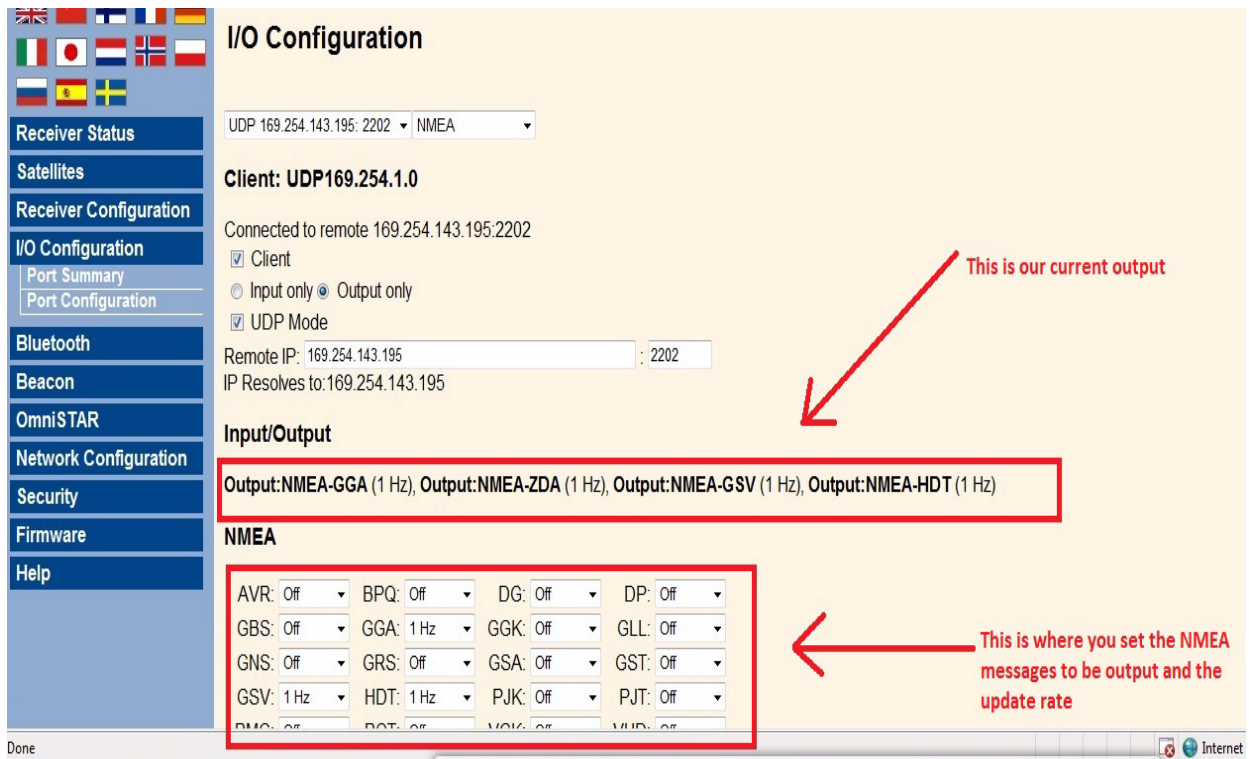
1. **Access the I/O Configuration page** using the Navigation bar in the Home Page.
1. **Set the mode of communication to UDP** by adding a check in the UDP mode box
2. **Set the role of the receiver to client.**
3. **Click [OK]** (not shown) to save your selections and we can now move on to choosing which messages will be sent to the HYPACK®. computer.

FIGURE 3. Configuring the Trimble Input/Output Through the Browser Interface - Communication Settings



4. **Select your NMEA messages** by clicking on the ones that you would like to have sent and select the speed from the drop down box. In Figure 4. we are sending NMEA GGA, ZDA, GSV and HDT all of which are output at 1Hz.
5. **Click on [OK]** at the bottom of the screen (not shown in the capture). You can verify your selections in the Input/Output box. The receiver is now configured to communicate with the computer running HYPACK®.

FIGURE 4. Configuring the Trimble Input/Output Through the Browser Interface - Choosing NMEA Messages



CONFIGURING THE GPS DRIVER IN HYPACK® HARDWARE

To configure the connection settings for the GPS.dll in HYPACK® HARDWARE, you must choose Network port for your connection and enter the network parameters.

- The **protocol** must be UDP which is the same as the setting we used in the web interface of the GPS.
- The HYPACK® computer will assume the **role** of server
- The **port** used must be 2202.
- The **write port** will be left as 0.

This finishes the connection between the GPS and the HYPACK® computer . You can now move on to the specific device setup of the GPS.dll. When finished, test your setup in hardware and you should now see your GPS, which is coming in through the Ethernet connection to your computer.

FIGURE 5. Configuring GPS with Network Connections

