



HYPACK
a xylem brand

Sounding Better!

HYPACK® Technical Support: Configuring a GPS

By Caryn Zacharias

It still amazes me, after 4 years in HYPACK® Technical Support, how some days and even weeks we get the same issue over and over by different HYPACK® users all over the world. Sometimes it's a broad subject like Multibeam or Dredging. And then there are days where it's pretty specialized and everyone seems to be having issues with their GPS. Now one could say all the stars have aligned and caused this phenomenon or it's just a very crazy coincidence. Whatever it may be, it is pretty funny to hang up one call then for the next call to be the exact question you just had, or to hear another Tech on a call repeating what you just told someone over the phone or in an e-mail. There are times I do ask, "are you working with ____ (name) ____?" just to be sure, but it really is a new caller with their own issue.

Last week was one of those weeks. I, personally, had a number of calls on GPS configuring and integrating with HYPACK®. Like most calls we receive in Tech Support, they are not always HYPACK® issues. However, since all of our Tech Support personnel have worked in the field, and continue to keep up with so many of the various types of equipment, we usually know a thing or two about connecting and configuring most units. I have had to say maybe a handful of times, "I think I have done as much as I can here, it might be time to contact the manufacturer on this one." Sometimes we get the annoyed huff on the line, like "can't you just fix my problem?", but the reality is, it's not a HYPACK® issue and we did more than any other Technical Support team would have done.

An example from last week: A HYPACK® user contacted Support with a new Trimble SPS461 which needs to be configured and interfaced with HYPACK®. Below is a brief script on how the call went. As you will see the longest part of the call was setting up the GPS before HYPACK® was even opened. Our Technical Support staff helps the best we can with everyone that calls and is current on the HYPACK® Maintenance Plan.

Tech Support: *OK, have you connected the GPS to the computer and logged into it to configure it yet?*

HYPACK® User: *No, what do I need to do?*

Tech Support: *Are you connecting via serial or Ethernet?*

HYPACK® User: *I believe Ethernet; I have an internet cable connected from the GPS to my computer.*

Tech Support: *If this is a brand new unit the default IP address is 169.254.1.0 (Admin & Password). You should see an IP address on the GPS display. You will also need to configure your computer network to be on this same IP address example so you can connect to the GPS from your PC. Use 169.254.1.100 if you haven't done this already.*

HYPACK® User: *OK, how do I do this?*

Tech Support: *Go to your WINDOWS CONTROL PANEL – NETWORK AND SHARING CENTER – CHANGE ADAPTER SETTINGS. Select the correct connection, right-click on it*

and choose Properties. Select Internet Protocol Version 4 (TCP/IPv4) and Properties. Select use the following IP address and enter:

- IP address: 169.254.1.100
- Subnet Mask: 255.255.0:0
- Default Gateway: 169.254.1.1

Then click [OK].

You should now be able to go to an Internet browser and enter 169.254.1.0. Please try that now.

HYPACK® User: Yes, I now see where I enter the Username and Password. OK, I entered the default Admin and Password. Now what do I do?

Tech Support: Do you want to keep this IP address or change it to your own network?

HYPACK® User: I am not sure. Why do I need to change it?

Tech Support: Typically users will change it to a common IP Network they already use. However, if you do not have a current network to use, it is completely fine to use the default IP. If you choose to keep the current default IP we can continue configuring the GPS output.

HYPACK® User: Oh OK, well we do use 192.168.xxx.xxx, can we change it to be on the same network.

Tech Support: OK, let's change the IP address of the Trimble first. Within the Trimble Interface Go to Network Configuration – Ethernet. You will now enter:

- IP Setup: STATIC
- IP Address: 192.168.X.XXX (example: 192.168.1.133)
- Netmask: 255:255:0:0
- Gateway: 192.168.1.1
- DNS Address: 8.8.8.8
- Sec DNS Addr: 8.8.4.4

Click "Change Configuration".

You will now lose connection with the GPS and you will have to go back to your Windows Network Connections and set your IP address to the same IP Network (example: 192.168.1.100)

HYPACK® User: Yes, I lost connection to the GPS. OK, going to my Control Panel again to set the computer IP to 192.168.1.100

Tech Support: OK, once that is done. Go ahead and reconnect to the GPS using the IP address of 192.168.1.133 and use the same default username and password.

HYPACK® User: OK, I am back in and connected to the GPS via 192.168.1.133.

Tech Support: OK, now go to the I/O Configuration. Do you see UDP and /or TCP/IP listed under Type? Choose which one you want to use.

HYPACK® User: Which one should I use though?

Tech Support: It is your call, I have been setting users up with UDP lately. They both work. TCP is known as the more reliable protocol as it does an error-check where as UDP is known to be a little faster as it does not do this error-check. However, if packets are lost they are lost when using UDP.

HYPACK® User: OK, we will setup with UDP.

Tech Support: OK, what do you see in the I/O configuration page? Do you have TCP/IP or UDP listed under type?

HYPACK® User: I only see TCP/IP.

Tech Support: OK, click on TCP that is listed and then configure to output NMEA, select UDP Mode and enter the Remote IP of the PC you are connecting to: 192.168.1.100 and enter a Port number example 5656. Choose the NMEA sentences you want to output. Typically GGA (positioning) is set to 1Hz (for dredging) and 5 -10Hz (for Multibeam surveys), ZDA (timing) set to 1 Hz, and if it's a dual head Antenna with heading you can select HDT for heading set to 5Hz..

HYPACK® User: OK all entered. I will now click [OK].

Tech Support: Sounds good. If everything is entered correctly, we can now go into HYPACK® and configure your HYPACK® HARDWARE.

HYPACK® User: OK, I am opening HYPACK®. I have my Geodesy already set.

Tech Support: Please open HYPACK® HARDWARE. Find the GPS.DLL (GPS NMEA-0183 Driver) and install it.

Select the functions you want: Record raw message, position, heading, speed, tide and Record device specific messages.

Now go to the Survey Connect tab. Under Device Connection choose Network, select UDP, and enter IP and Port.

Now Test the Device.

HYPACK® User: Awesome I see all my Latitudes and Longitudes now and it says Fixed RTK.

Tech Support: Great! Also remember to measure the offsets and enter them into the offsets tab.

HYPACK® User: Oh OK, I will do. Thank you

Tech Support: Is there anything else I can assist you with today?

HYPACK® User: No, I think that is it.

Tech Support: OK, have a great rest of your day and please let us know if you need anything else.

HYPACK® User: Will do, thank you again. Bye!

QUICK GUIDE FOR CONFIGURING A TRIMBLE SPS461 GPS

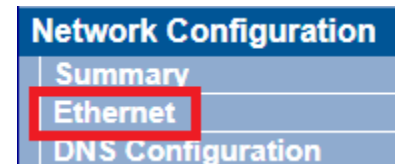
Default Trimble IP: 169.254.1.0 (Admin & Password)

Computer IP needed: 169.254.1.XXX (Example used: 169.254.1.100)

NEED TO CHANGE THE GPS IP?

If yes...

1. Go to **NETWORK CONFIGURATION – ETHERNET**.
2. Change the IP Setup to Static and enter the following:
 - IP Address: XXX.XXX.XXX.XXX (Example used: 192.168.1.133)
 - Netmask: 255:255:0:0
 - Gateway: XXX.XXX.XXX.XXX (Example used: 192.168.1.1)
 - DNS Address: 8.8.8.8
 - Sec DNS Addr: 8.8.4.4
3. Click **“Change Configuration”**. You will lose connection to the GPS at this time.
4. Change the Computer IP to within the same network (Example used: 192.168.1.100).
5. Connect to the GPS using the new IP address (192.168.1.133).



Ethernet Configuration?

Stored settings

IP Setup: static

IP Address: 192 . 168 . 1 . 133

Netmask: 255 . 255 . 0 . 0

Gateway: 192 . 168 . 1 . 1

Hostname:

MTU:

Force DNS Address: ☐

DNS Address: 8 . 8 . 8 . 8

Sec DNS Addr: 8 . 8 . 4 . 4

DNS Domain:

DNS Proxy: ☒

Change Configuration Cancel

CONFIGURING THE GPS TO OUTPUT WHAT IS NEEDED:

FIGURE 1. Configuring GPS Output

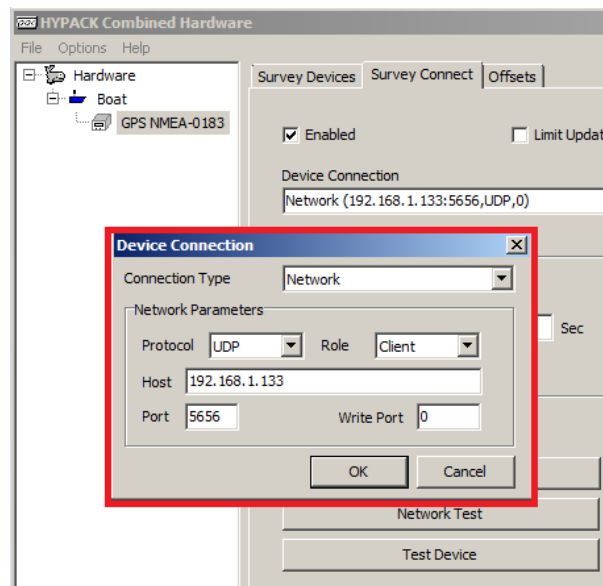
1. Enter the **REMOTE IP** – this is the Computer IP (192.168.1.100)
2. Set the **Port**: example used 5656
3. Choose the **NMEA Message** need and select the **Hz**:
 - GGA – 1Hz for Dredging, 5-10Hz for Multibeam Surveys
 - ZDA – 1 Hz only for timing
 - HDT – 5Hz for heading

A screenshot of the 'I/O Configuration' screen. The left sidebar shows a menu with options: Receiver Status, Satellites, Receiver Configuration, I/O Configuration (selected), Port Summary, Port Configuration, Bluetooth, Network Configuration, Wi-Fi, Security, Firmware, and Help. The main area is titled 'I/O Configuration?'. It shows 'Client: UDP 192.168.1.133' and 'Connected to remote 192.168.1.100:5656'. Under 'NMEA', there are checkboxes for various messages: AVR, BPQ, DP, DTM, GBS, GGA (set to 5 Hz), GSK, GLL, GNS, GRS, GSA, GST, GSV, HDT, LLQ, PJK, PVT, RMC, ROT, VGR, VHD, VTG, and ZDA (set to 1 Hz). At the bottom, there are checkboxes for 'Standard' (NMEA selected), 'Variations from standard' (Report max DQI=2 in NMEA GGA string, Report max correction age 9 sec in NMEA GGA string, Report extended information in NMEA GGA and RMC strings, Report GST message always as GPGST), and 'OK' and 'Cancel' buttons.

COMBINED HYPACK® HARDWARE CONFIGURATION:

1. Use **GPS NMEA-0183 Driver** (gps.dll) .
2. In the **Survey Connect** Tab, enter device connection information like Figure 2.

FIGURE 2. Device Connection Settings for the GPS in **HARDWARE**



3. Click **[Test Device]** and ensure data is streaming.

FIGURE 3. Device Test in **HARDWARE**

It's that easy!

The screenshot shows a 'Test Window' titled 'GPS NMEA-0183'. It displays a list of GPS data fields and their values, indicating that data is streaming.

HDOP	1.3
Number of Satellites	7
Mode	Fixed RTK
WGS84 Latitude	32°16.8605 N
WGS84 Longitude	087°56.4426 W
WGS84 Height	-15.57 m
Lat	32°16.8605 N
Lon	087°56.4426 W
Ell Height	-15.57 m
Easting	-1879823.73
Northing	3859430.33
Sigma N	0.00
Sigma E	0.00
Sigma Z	0.00
A= WGS84 height	-15.57 m
H= Z offset	0.00 m
D= Draft	0.00 m
K-N= Ellipsoid Ht above CD	N/A
Heave	0.00 m
Tide Corr	-0.00 m
Time source	computer
Corr age	2
Heading	N/A