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Article applies to - All Digital Yacht AIS, GPS and Interfacing products with USB

ISSUE: Using Digital Yacht USB Products with OpenCPN V3.2 and above

We know that many of our AIS, GPS and Interfacing products are used with the popular open source navigation software OpenCPN and we have published a couple of Tech Notes on how to configure OpenCPN for Windows/Mac OSX/LINUX.

When version 3.2 of OpenCPN was released at the end of 2012, a number of improvements were made including a completely new data “Connections” module, which featured new menus for configuring NMEA serial ports and also added support for wired or wireless network connections.

Although we have posted notes about this on our blog <http://digitalyacht.net>, we have never released a Tech Note that explains exactly how to configure OpenCPN V3.2 (or higher) to work with Digital Yacht products. This Tech Note will focus on connecting our products via USB to OpenCPN. If you wish to connect one of our Wireless NMEA products to OpenCPN please refer to Tech Note 00061-2014.

SOLUTION:

The Tech Note assumes that the relevant USB driver for your Digital Yacht product, is installed on the computer.

All USB devices require a suitable driver to be installed as the driver tells the computer what the device is capable of doing and how to talk to it. All Digital Yacht products that have a USB interface are supplied with the “Digital Yacht Software and Driver CD-Rom” and on this CD are the drivers for all popular operating systems.

The table below shows which operating systems need drivers to be installed from the CD, which can automatically download them from the internet (if connected) and which ones already have the relevant driver pre-installed.

Products	Win XP	Win Vista/7/8	Mac OSX	LINUX
AIS Receivers		 		
AIT250 + AIT1000 Transponders		 		
AIT1500 + AIT2000 + AIT3000 Transponders		 		
USB to NMEA Adaptor		 		

Key to Icons: CD Install  Download from Internet  Pre-Installed 

For more information on installing the USB drivers, please refer to the User Manual for your Digital Yacht product, or the other Tech Notes that are on the “Digital Yacht Software and Driver CD-Rom” supplied with your product.

Assuming that the USB driver is installed correctly, please plug in the USB plug of the Digital Yacht product. Even if the product needs an external 12v/24v DC supply to operate correctly, plugging in the USB cable with no other power connected to the product will still initiate the discovery process with the computer’s operating system. As you plug the USB plug in, you should see some hard disk activity and on a Windows PC you will hear a distinctive “bing bong” noise to indicate that a new USB device has been plugged in.

During the “Discovery” process, the operating system will allocate a device name to the USB connection. On Windows PCs these are always “Virtual COM Ports” and will be numbered COM1 through to COM256, while on MACs and LINUX PCs these will be device names “tty.usb1”. Before you can setup OpenCPN, you need to know what device name has been allocated to your Digital Yacht Product and this varies between operating systems.

Windows PCs

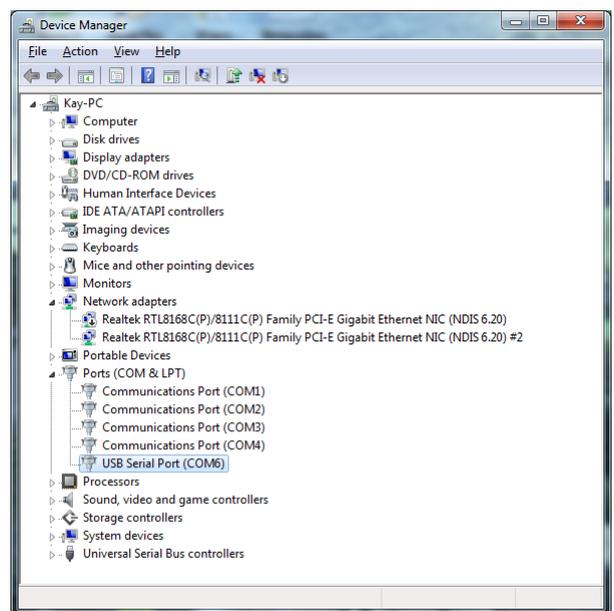
To find out what COM Port number has been allocated on a Windows PC, you will need to run the “Device Manager”. On Windows Vista/7/8 you can just search for “Device Manager” from the **START** Menu/Screen, or on older WinXP machines, you run “System” in **Control Panel**, click on the “Hardware” tab and you will see a “Device Manager” button.

When you run Device Manager, you will see a screen similar to the one below and assuming the driver is installed correctly and the Digital Yacht product plugged in, you will find an entry in the “Ports (COM & LPT)” section, as shown below.

The Digital Yacht unit will be displayed as “USB Serial Port (COMxx)” and it is the number (in this example 6) that we are interested in. If there are multiple USB Serial Ports and you are not sure which is Digital Yacht, just unplug the USB cable from our product and watch to see which device disappears from the list.

Please note that our latest AIT1500/AIT2000/AIT3000 transponders will appear in the list as “AIS Class B Transceiver COMxx” and as you are unlikely to have more than one connected they are easier to identify.

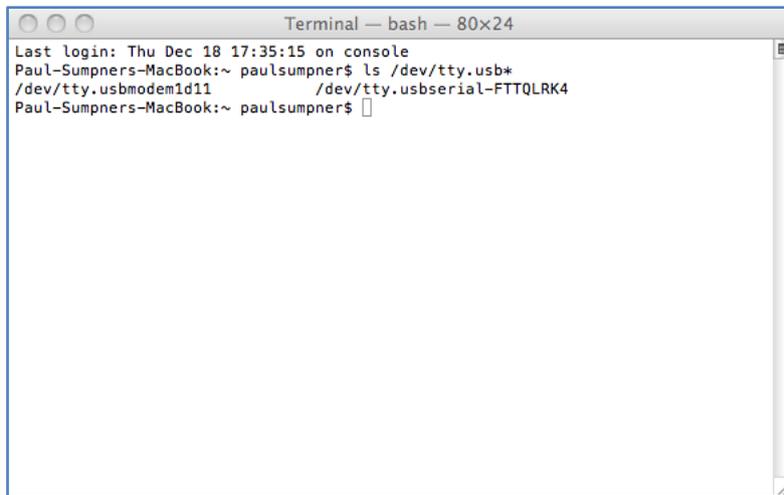
Make a note of the COM port number, skip the following section and go to the section titled “OpenCPN Connections Menu”.



MACs and LINUX PCs

The Mac operating system and LINUX are both based on UNIX and so the procedure for the two is similar but not exactly the same. To avoid confusion, it is best if you unplug all USB devices except the Digital Yacht product when you do the following checks.

For Macs, in Finder, click GO>Utilities and run the Terminal.app program. Then type “ls /dev/tty.usb*” which will then display the device name given to the Digital Yacht product, in this example “/dev/tty.usbmodem1d11” is our AIT2000 and “/dev/tty.usbserial-FTTQLRK4” is one of our NMEA to USB adaptor cables (see Fig.1). Make a note of the device name(s) as we will need to enter this in OpenCPN.



```
Terminal — bash — 80x24
Last login: Thu Dec 18 17:35:15 on console
Paul-Sumpners-MacBook:~ paulsumpner$ ls /dev/tty.usb*
/dev/tty.usbmodem1d11      /dev/tty.usbserial-FTTQLRK4
Paul-Sumpners-MacBook:~ paulsumpner$
```

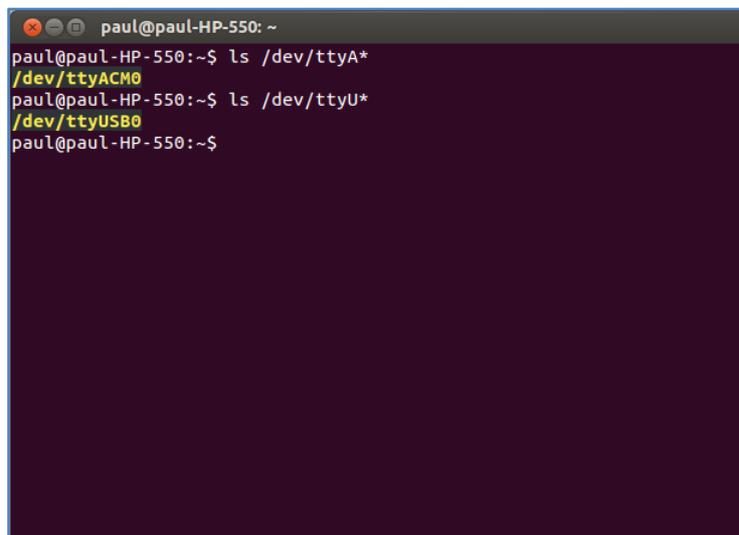
Figure 1

For LINUX PCs, the exact command you use will depend upon which LINUX distribution you are using but for Ubuntu, click “Applications>Accessories>Terminal”. At the command prompt, enter the command;

ls /dev/ttyA* for AIT1500/AIT2000/AIT3000 products

ls /dev/ttyU* for all other products

Which will display the device name given to the Digital Yacht product. In the Fig.2 example below we have an AIT2000 connected that is given the device name “/dev/ttyACM0” and a GPS150USB that was given “dev/ttyUSB0”. Make a note of the device name(s) as we will need to enter this in OpenCPN.



```
paul@paul-HP-550: ~
paul@paul-HP-550:~$ ls /dev/ttyA*
/dev/ttyACM0
paul@paul-HP-550:~$ ls /dev/ttyU*
/dev/ttyUSB0
paul@paul-HP-550:~$
```

Figure 2

Important Note for Ubuntu Users

When Ubuntu released V12.04, they tightened up the security and changed the default permissions set for users. COM ports use to be available to all users but now you have to add your username to the LINUX dialout group in order to access COM ports. To do this, open a terminal window as you did before and type the following command;

sudo usermod -a -G dialout \$LOGNAME

You should note that \$LOGNAME is a shell variable and will automatically get the name of the currently logged on user, so now your username has been added to the dialout group and once you have logged out and in again the changes will take affect and you should be able to read data from COM ports.

OpenCPN Connections Menu

With the latest V3.2 and higher versions of OpenCPN you can have multiple data connections and to create a new connection you must click on the “Settings” icon (spanner) and then click on the “Connections” tab. As you can see in Fig.3, we currently have no Data Connections setup and so we click on the “Add Connection” button. Now we click on the “DataPort” drop down list and see what serial ports are available. Find the device name that matches the name noted earlier for your Digital Yacht product and select that device (Fig.4).



Figure 3

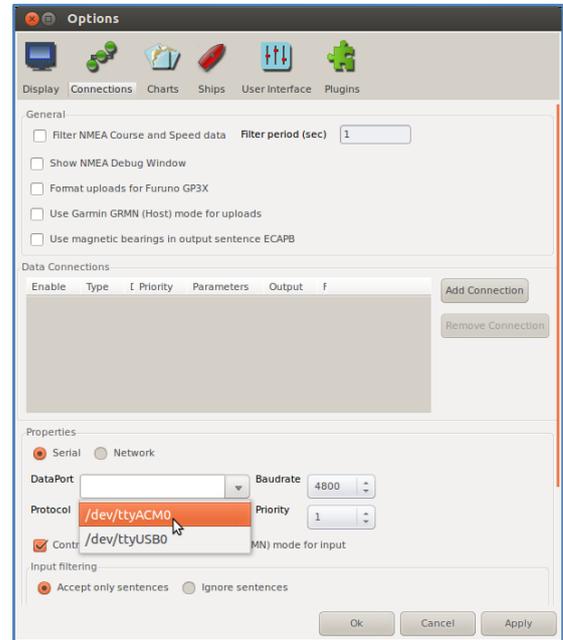


Figure 4

The default baud rate (data speed) is 4800baud which is the standard speed for most NMEA0183 devices, but if you are connecting one of our AIS products, you will need to change the Baudrate to 38400baud.

None of the other settings usually need to be changed and once you are happy that everything is correct, click on the “Apply” button to save the settings and you will see the new connection now in the list. If you wish to test the connection, click on the “Show NMEA Debug Window” tick box and a new window will appear with the raw NMEA data scrolling down the page, showing the time it was received and the connection it came in on (see Fig.6).



Figure 5

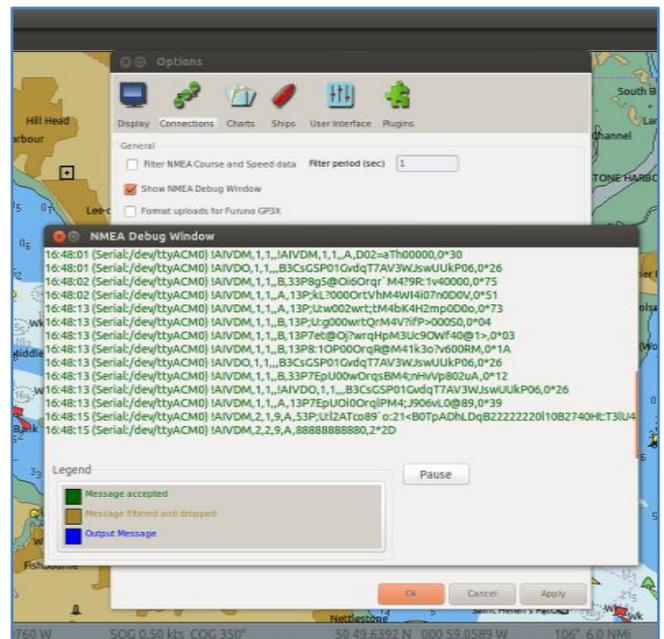


Figure 6

You can continue to add more data connections i.e. GPS, AIS, Instruments, etc. and once all connections are setup just click "OK" to exit and return to the Chart screen. Assuming that all of the connections are powered up and active, you should now see the Boat displayed accurately on the chart, if an AIS is connected then a series of AIS targets should be displayed on the chart and if you have the Dashboard Instrument Plugin installed, you should be able to display instrument data as well.

Important Notes

- 1) We have had some reports of customers having to go in to the Input Filtering "Accept Only" options and clicking the "Select All" Sentences button. There does not seem to be any rhyme or reason for this and we recommend only changing the Input Filtering if no data is being displayed and you are sure everything else is set and working correctly.
- 2) For Mac and LINUX users, if when you click on the drop down "DataPort" menu you do not see the device name that you had found previously in the Terminal program, you will need to manually type the name in to the box. We have seen this on some Macs and LINUX distributions with our AIT1500/AIT2000/AIT3000 products that appear as a USB Modem rather than a USB Serial Port. Make sure you include the full device name for example; **`/dev/tty.usbmodem1d11`**