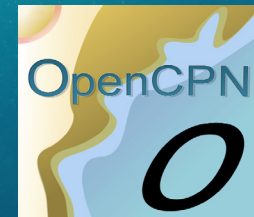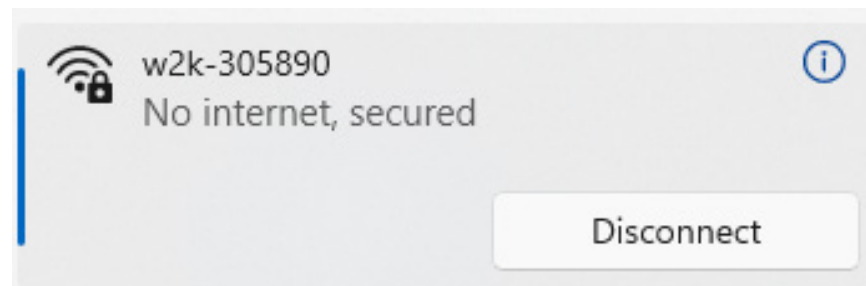# Using OpenCPN with the Actisense W2K-1 (NMEA 2000)

Using OpenCPN with the Actisense W2K-1

Wireless interfacing with marine electronics is now common on vessels, with a wide variety of applications available. For NMEA 2000 RX (Receive Transmission), OpenCPN v5.10 now supports the four standard Actisense N2K formats **(ASCII Raw, N2K ASCII, Actisense Raw & Actisense N2K).**
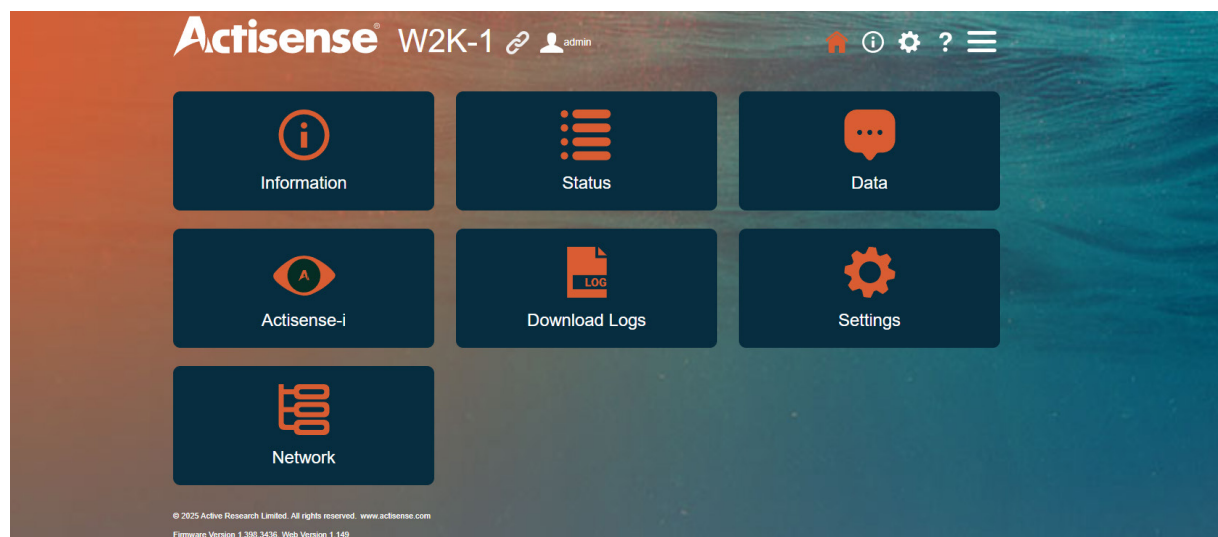
Here's the step-by-step guide for connecting to OpenCPN with your W2K-1 using the NMEA 2000 format.

Setting up the W2K-1
1. Ensure your W2K-1 is connected to your NMEA 2000 network and is powered (LEDs indicate this). The device will also show on Actisense Toolkit in Network View via an Actisense NGT-1 or an Actisense NGX-1 (set to Transfer mode).
2. Connect your PC / Mobile device to the W2K-1's Wi-Fi access point.

3. Once connected, open your web browser and search for the W2K-1's AP (Access Point) IP (192.168.4.1)
4. When connected, you will be presented with the following home page:

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5. From here, enter Settings > Serial. You may need to log in, in which case the Username is 'admin' and the default password will be printed on the device sticker unless this has been changed by the owner/installer.
6. In the Serial menu, you will be presented with 3 data servers. At least one of these needs to be set up to one of the 4 NMEA 2000 formats (ASCII Raw, N2K ASCII, Actisense Raw or Actisense N2K). For this example, we will use N2K ASCII:

Serial Settings

Interface	Name	Mode	Speed	Direction	Load		Tx Format	Filter	
DS1 IP			500000	← →	0%	2%	N2K ASCII		
DS2 IP			500000	← →	0%	0%	NMEA 0183		
DS3 IP			500000	← →	0%	0%	NMEA 0183		
WS1			500000	→	0%		N2K ASCII JSON		

The Data direction is dependent on what you are using the W2K-1 with OpenCPN for, but this can be changed under Settings > Data Server:

Data Server Settings

Server		Direction	Protocol	Port
DS1	✔	Both	TCP	60001
DS2		Both	TCP	60002
DS3		Both	UDP	60003

If you are only using the W2K-1 to send data to OpenCPN, then the direction can be set to 'Transmit Only.' However, if you also want OpenCPN to send data such as waypoints back to the W2K-1, then set the direction to 'Both.'

7. With OpenCPN, you can use any Port number on the W2K-1, which means they can be left on the default numbers. For this example, data server 1 will be used with OpenCPN, with Port Number 60001.

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Setting up the connection in OpenCPN

1. If you do not already have OpenCPN installed, it can be downloaded from here.
2. With OpenCPN downloaded and installed, run the program. You will be presented with the following screen upon startup:
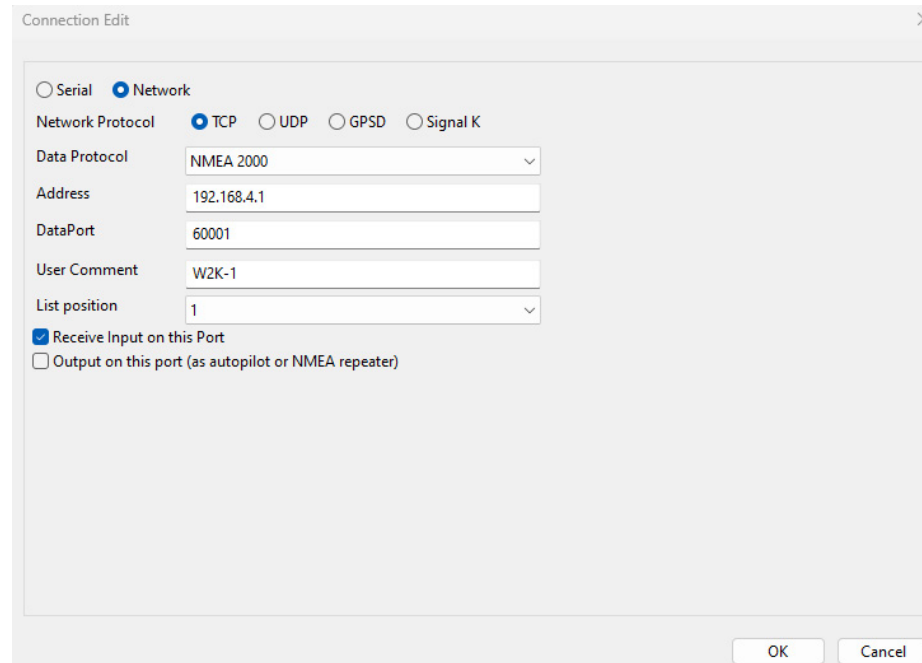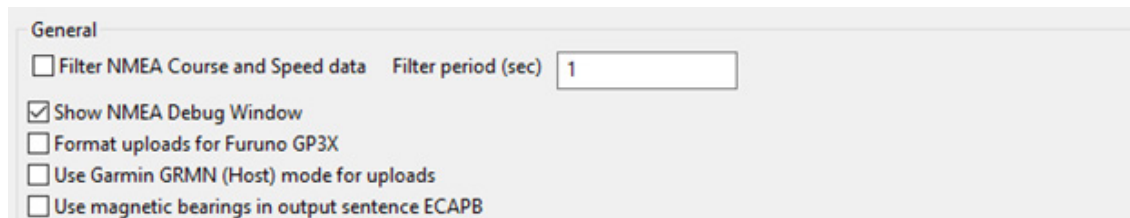

3. Select the settings icon:

4. Go to the Connections tab. This is where you will set up your IP connection with the W2K-1. Select 'add connection'.

5. Tick the 'Network' box, select NMEA 2000 as the data protocol and enter the IP and Port Number of the W2K-1 + Data Server you are using:

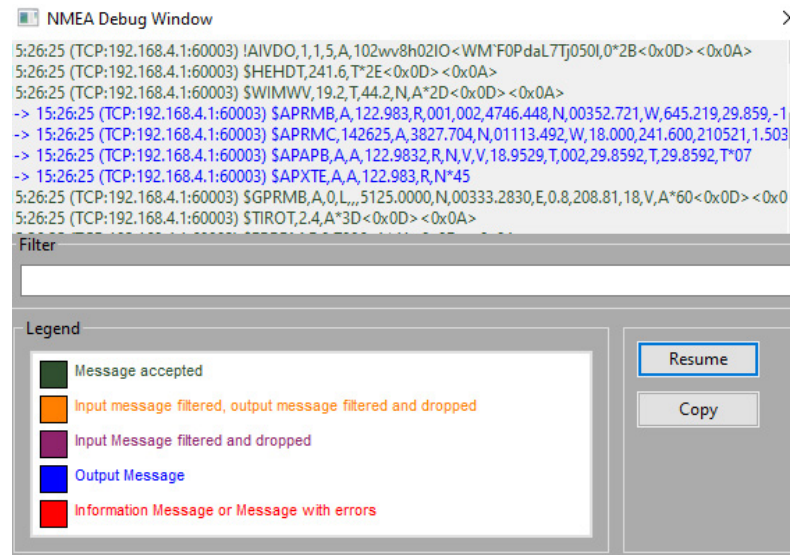6. If you want the connection to operate on both Transmit to the W2K-1 and Receive from the W2K-1, then the 'Receive Input on this port' and 'Output on this port' must both be ticked.

7. One very useful tip we recommend is that you enable the NMEA Debug Window. This window will indicate the data that is being sent and received, and whether there are any errors, thanks to OpenCPN's easy to use sentence colour scheme.

8. The debug window will show every PGN being sent and recieved and highlight any sentences in red if there is an error. Green is recieved sentences, and blue is transmitted sentences by OpenCPN:

(Please be aware that not all NMEA PGNs are supported by OpenCPN. You can find a list of supported PGNs on their wiki).

In summary...
The steps above detail how to connect your W2K-1 to OpenCPN when using the Access Point (AP) connection, however, this can also be done via the Client connection option on the W2K-1.

The same principles apply, but when you connect the W2K-1 to a Client, it will be assigned or claim an IP address. In OpenCPN, rather than using 192.168.4.1 as the connection IP address, enter the new IP address for the client connection, but use the same Port Number as before.