Connecting ADL Devices to a Starlink Antenna

ADL140, ADL150(B), ADL160, ADL165, ADL180(B), ADL190, ADL200

Version 1.00

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1 Version History

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2 Page Index

This manual contains numbered pages 1 to 12.

3 Emergency procedures

If you suspect any malfunction of the ADL device or interference with other aircraft systems, deactivate the device by switching if off or pulling / deactivating the aircraft circuit breaker for the device. If your aircraft installation uses nonstandard switches or similar please use those to deactivate the device. Do not reactivate the device until the problem has been investigated and resolved on the ground.

4 Warning

While we use great care to ensure quality, the ADL devices might not work at any time. In addition the system may display false information. **NEVER PENETRATE WEATHER BASED ON THE INFORMATION PROVIDED BY THE ADL SYSTEM** This information is for situational awareness only. The device features a GPS moving map system. This system is designed to display the aircraft position in relation to the weather data. **THE ADL DEVICES ARE NOT SUITABLE AS A MEANS OF PRIMARY NAVIGATION**. Especially the build in database is not updated in a regular aviation cycle. It is also not maintained to the standards of certified aviation databases

5 General Description

This manual explain how you can connect your ADL device, type ADL140 or higher, to a Starlink satellite internet antenna. The motivation to do so is to save on rather expensive Iridium satellite downloads, using the cheaper Starlink bandwidth instead. While pure weather display on the iPad can also be achieved with an iPad (or iPhone etc.) running the ADLConnect app and connected to the Starlink antenna without an ADL device, the advantage of using an ADL device is that all its interfaces to installed avionics and its features like traffic and AHRS can be used while relying on the Starlink internet connection.
Most users will likely have a Starlink subscription with some limitations. At the time of writing this is usually the “local priority” package which excludes usage above 350 mph (305kt) groundspeed and over the sea. In those cases it can make sense to have the Iridium satellite connection available as a backup.

6 Subscription Requirements

To be able to use the features described in this document, the ADL device must be on an active Iridium satellite service plan, which then also includes unlimited weather downloads via Starlink. Or you will have to buy a separate Starlink only subscription for the device from us.

7 ADL Device Firmware

Before staring the configuration, please make sure that your ADL device is running firmware version 9.90 or later. If you have an older version please update the firmware first by using the “Update Firmware” button on the Config page of the ADLConnect app when connected to the device by WiFi.

8 Verify the Starlink Connection

Before you start connecting your ADL device, we suggest that you verify the Starlink satellite antennas is switch on, connected to the Internet and working normally as shown below.

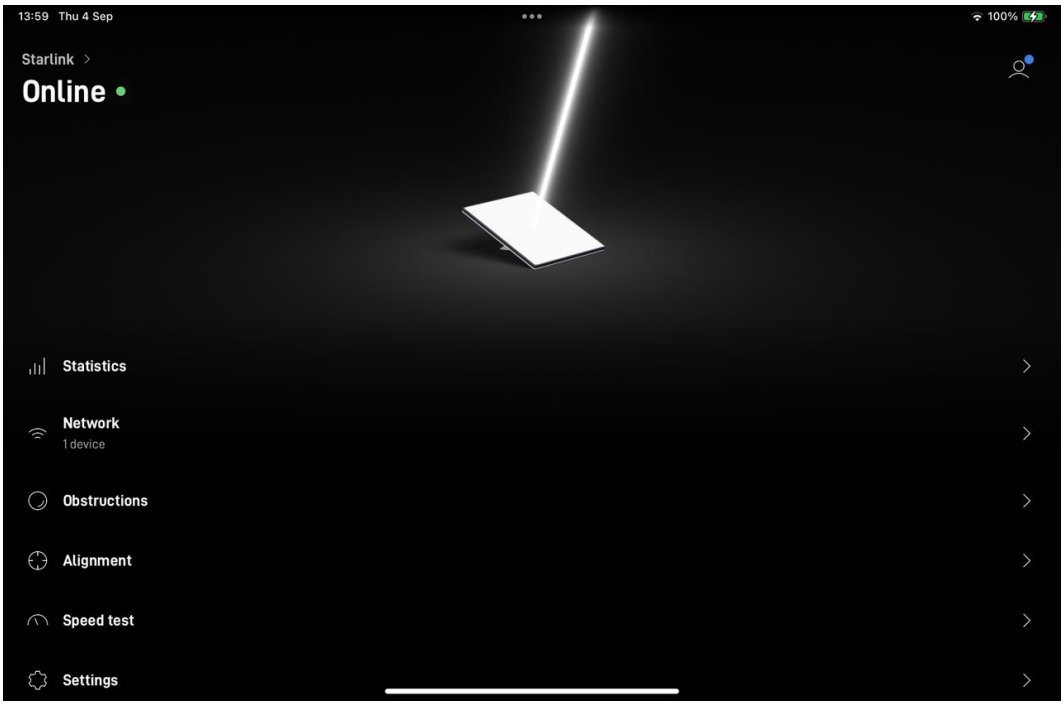

Figure 1 Starlink app showing a working Internet connection

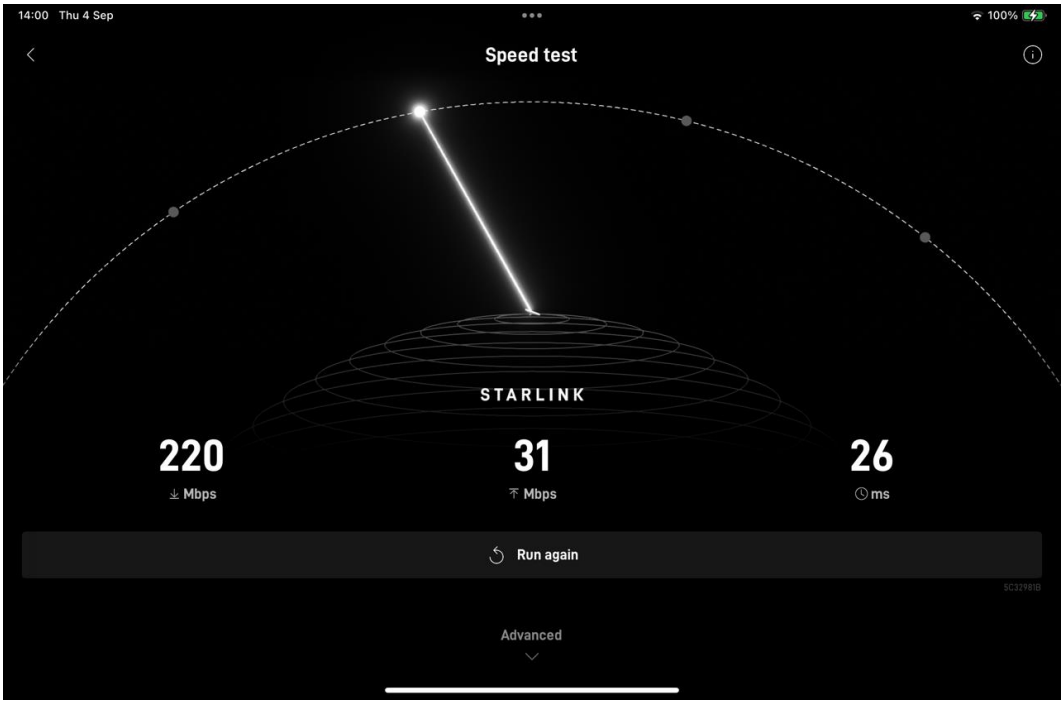

Figure 2 Starlink speed test with good results

9 ADL Device as a Client in the Starlink WiFi

In order to let the ADL device use the Starlink connection, the ADL device has to become a client in the Starlink WiFi. In order to achieve this, please follow the steps below precisely. Most reported issues result from configuration errors at this step.

9.1 Retrieving the Starlink WiFi Details

Connect your iPad (or iPhone etc. from here on we will just write iPad for simplicity) to the Starlink WiFi. We will later need the exact name of the Starlink Wifi. Often this is “Starlink” but it could have been changed .In case you use the split 2.4GHZ / 5GHz WiFi feature of the Starlink, we will need the name of the 2.4 GHz network. Further we will need the exact password for this WiFi network. We also suggest verifying the subnet mask. Usually this should be the default 255.255.255.0 but if you made any nonstandard changes, please note them at this stage.

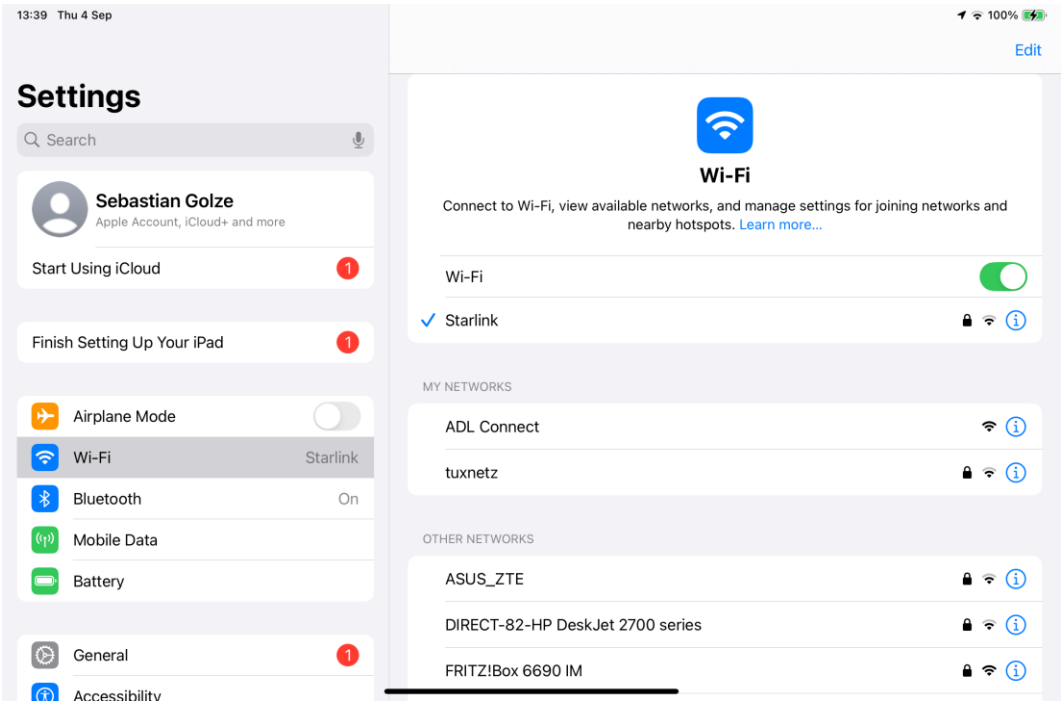

Figure 3 iPad is connect to the Starlink WiFi

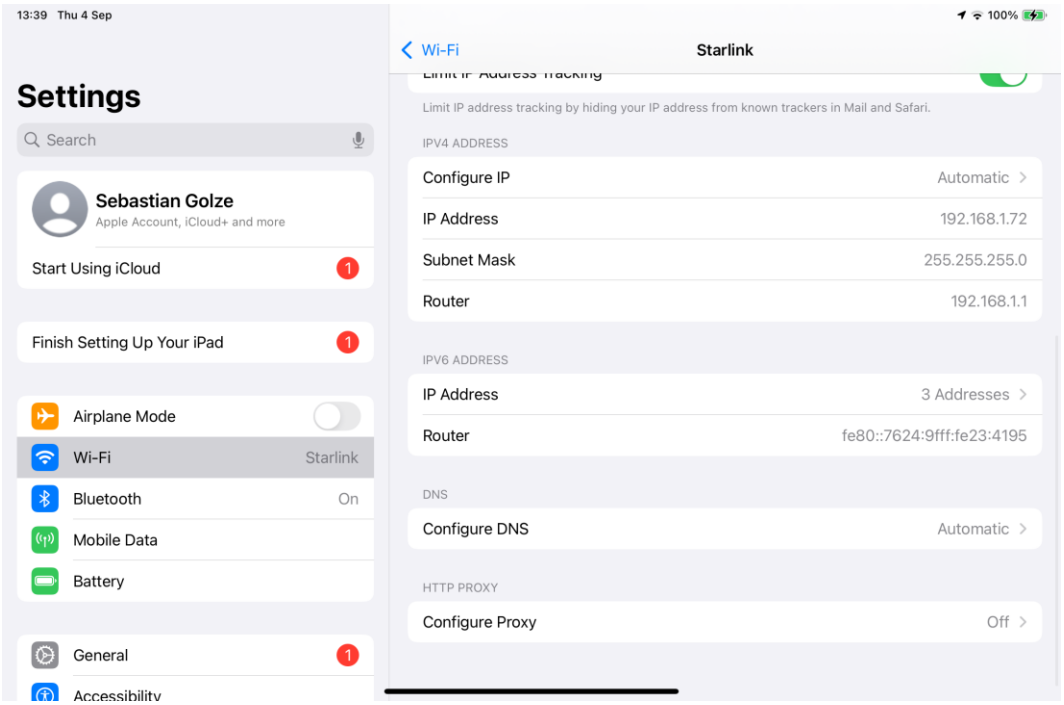

Figure 4 Starlink WiFi is using the default subnet mask of 255.255.255.0

9.2 Configuring the ADL Device

Start up your ADL device, connect to the normal ADL Connect WiFi as usual. Then open the Config page and got to the “Hardware Config” Section. Please note that the iPad can sometimes display a turning circle symbol next to the WiFi while it is actually already connected and everything works normally, do not get confused if this happens.

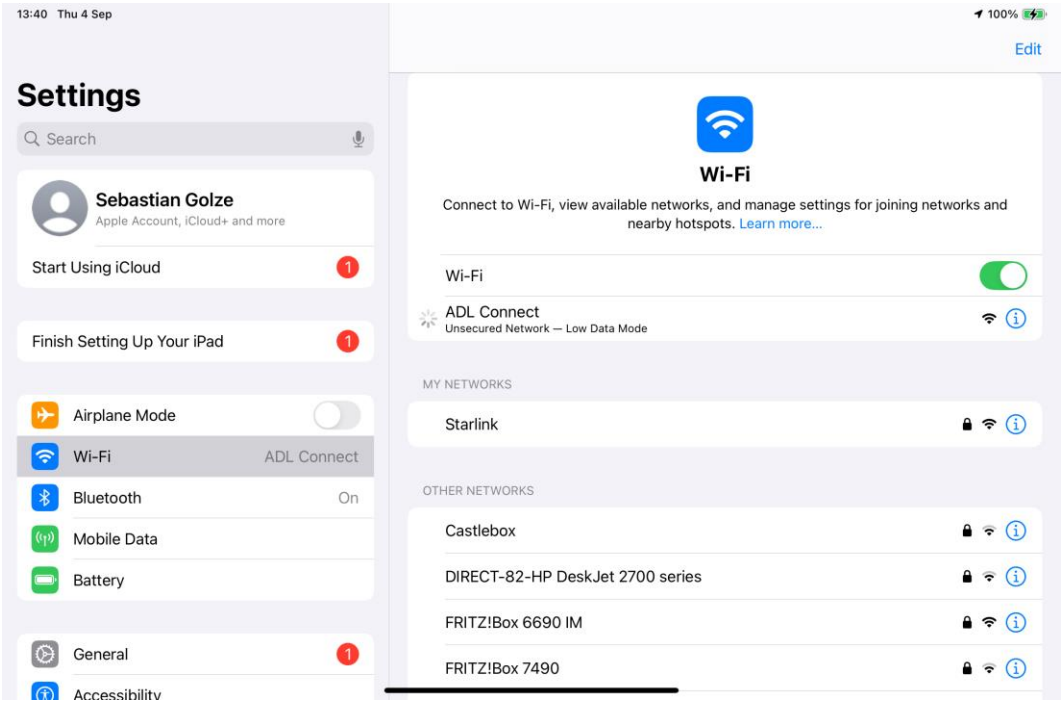

Figure 5 Connecting the iPad to the ADL Connect WiFi. The turning circle is not a problem

There is a line “WiFi Mode”. Usually this is set to “Accees Point (Default)” This means the ADL device creates its own WiFi access point called “ADL Connect”. Now switch this to “Client”. Below you now see the line “WiFi SSID”. There you have to enter the exact name of the Starlink WiFi. This includes proper upper and lower case spelling and if you used space in your WiFi name, those spaces must also be entered exactly as configured on the Starlink system.

Then below please enter the password for your Starlink WiFi. Again proper spelling, upper and lower case letters etc. are important.

Below please verify the subnet mask of your Starlink WiFi. In nearly all cases this will be 255.255.255.0

Finally Press the “Save” button below and confirm the restart of your ADL device.

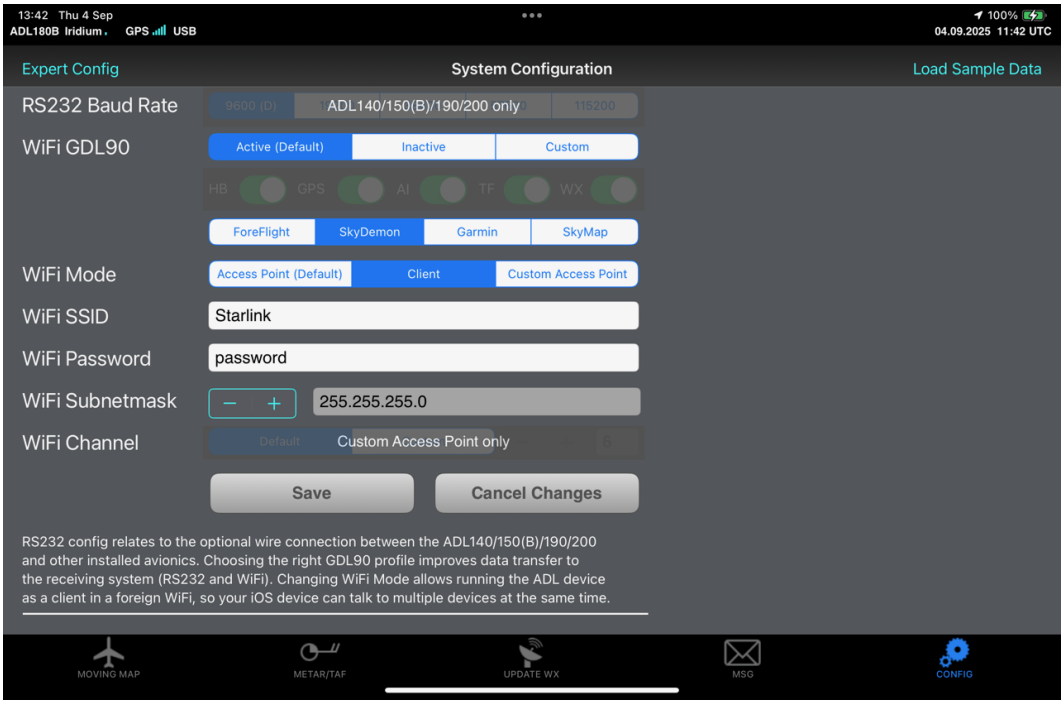

Figure 6 Hardware configuration and “WiFi Mode” - “Client” settings

9.3 The ADL Device Connects to the Starlink WiFi

Now the ADL device will reboot and initially it will again create the “ADL Connect” WiFi access point. But after a period of 90 seconds, which you can use to make any changes to the configuration we did configure above, the “ADL Connect” WiFi will disappear and the ADL device will try to join the Starlink WiFi.

Remember that the ADL device must be within range of the Starlink WiFi. The ADL WiFi reception can be weaker than your iPad WiFi reception, so it might not be sufficient that your iPad can see the Starlink WiFi but also your ADL devices must be able to do so. In an aircraft cockpit this should not be an issue but for ground tests we have seen cases where this was an issue. In doubt please place the ADL device right next to the Starlink antenna.

You can use the Starlink app to monitor which devices are connected to your Starlink WiFi. Initially this should only be your iPad. Once the ADL device connects, you should see a device called “WiFi DHCP Client Wiznet” appear.

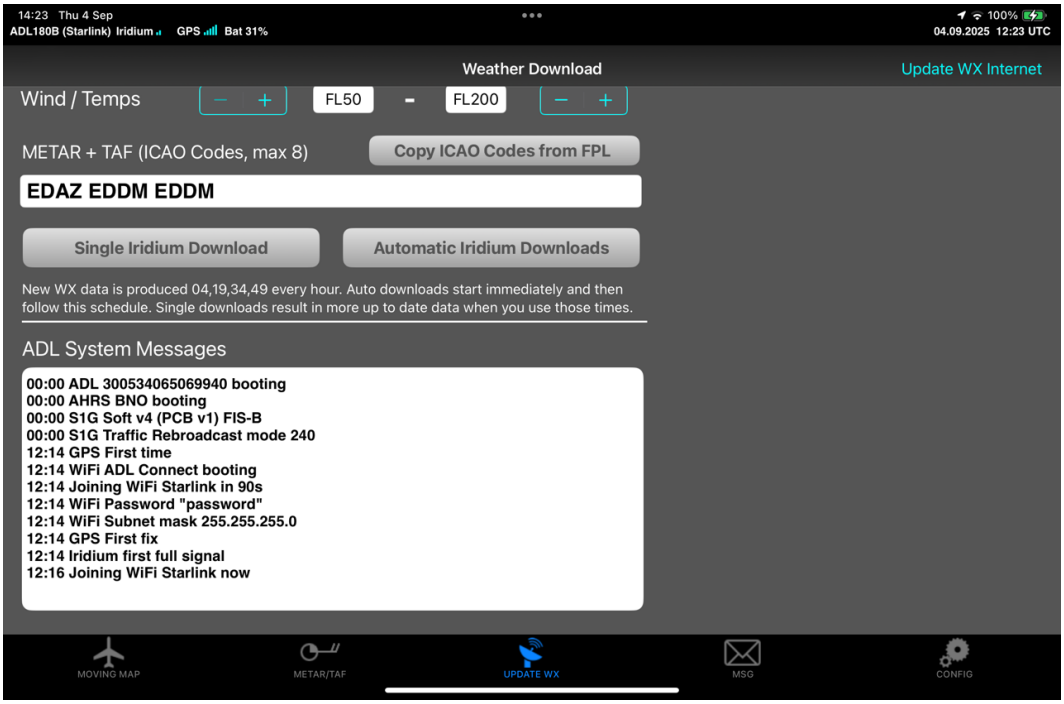

Figure 7 ADL Device system messages just before connecting to the Starlink WiFi

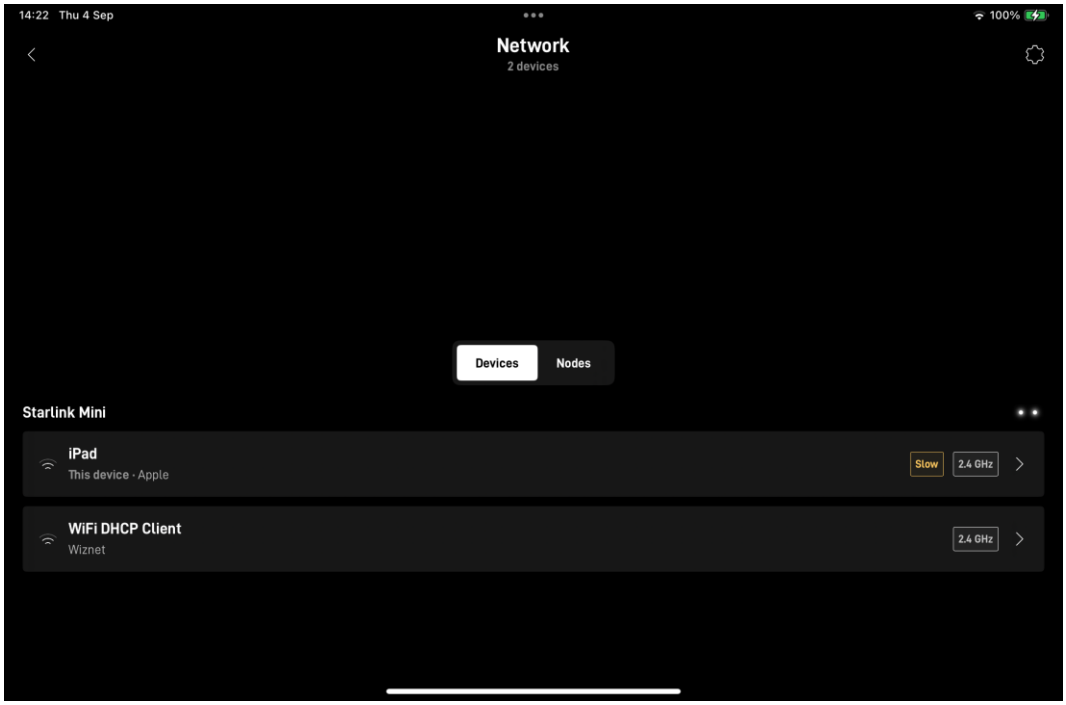

Figure 8 The ADL device appears in the list of connected device shown in the Starlink app

9.4 Troubleshooting the WiFi Connection

In case of any WiFi connection issues remember that you can power down and again power up your ADL device and then you have 90 seconds to reset the “WiFi Mode” to “Access Point (Default)” or make other changes.

10 Using the ADL Device on the Starlink WiFi

Open the ADLConnect app and initially you should see at the top left corner of the screen “Internet mode (Starlink)” where “Starlink” is the name of your Starlink WiFi. Then after a few seconds this should change and the type of ADL device connected should be displayed. So for example “ADL150B (Starlink)”. This means that the ADLconnect app is able to communicate with the ADL device via the Starlink WiFi.
Now you are able to use your ADL device in a similar way than before running as its own WiFi.access point. This includes Iridium satellite weather downloads etc.

But besides the known feature you can switch to the Config page. Find the section called Iridium / 4G / WiFi. Here you will now see additional options not available before. Those are: “WiFi,” “WiFi -> Iridium” and “WiFi Auto”

If you switch to WiFi instead of Iridium, you will notice the names of the buttons on the “Update WX” page will change and now you can start a WiFi based weather download instead of an Iridium download. “WiFi -> Iridium” will automatically use Iridium as a fallback if the WiFi download fails. Finally “WiFi Auto” will behave like “WiFi” with the exception that when powering up the ADL device it will always directly start automatic downloads every 15 minutes in WiFi mode without user interaction. This means that your ADL will downloads the weather automatically and deliver it directly to whatever avionics or apps you have connected, without you having to start a download by hand.

This option is not available for Iridium downloads to avoid unwanted cost overruns. As the Starlink airtime has negligible cost, this can be a very convenient option.

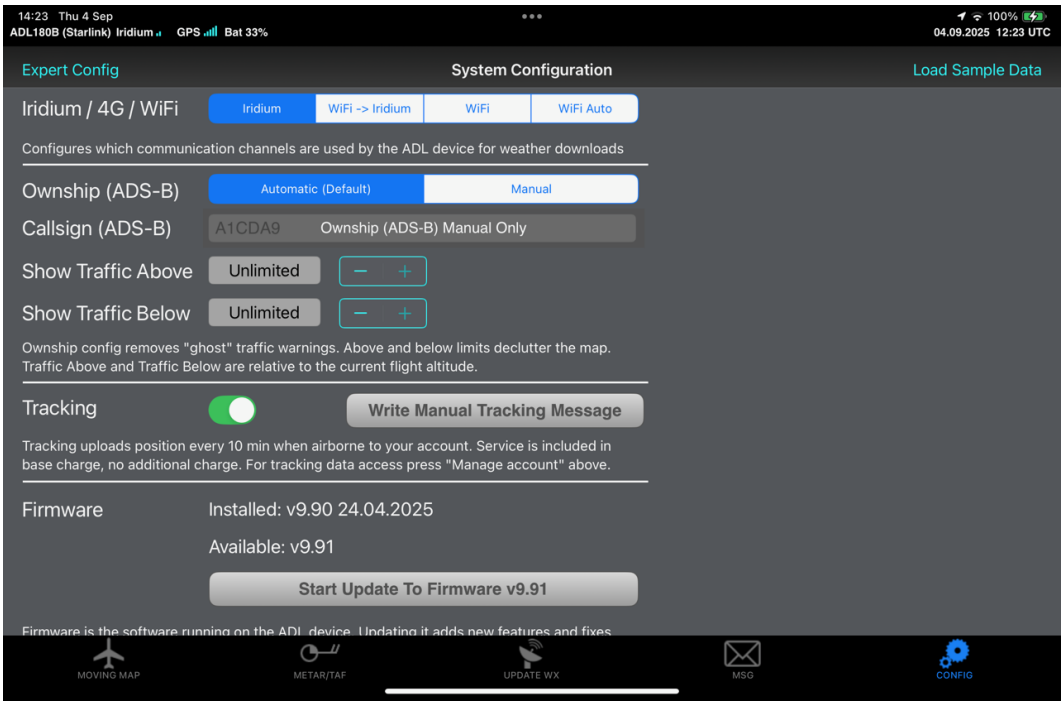

Figure 9 Config page of the ADLConnect app when connected to Starlink. Note the “Iridium / 4G / WiFi” line changed

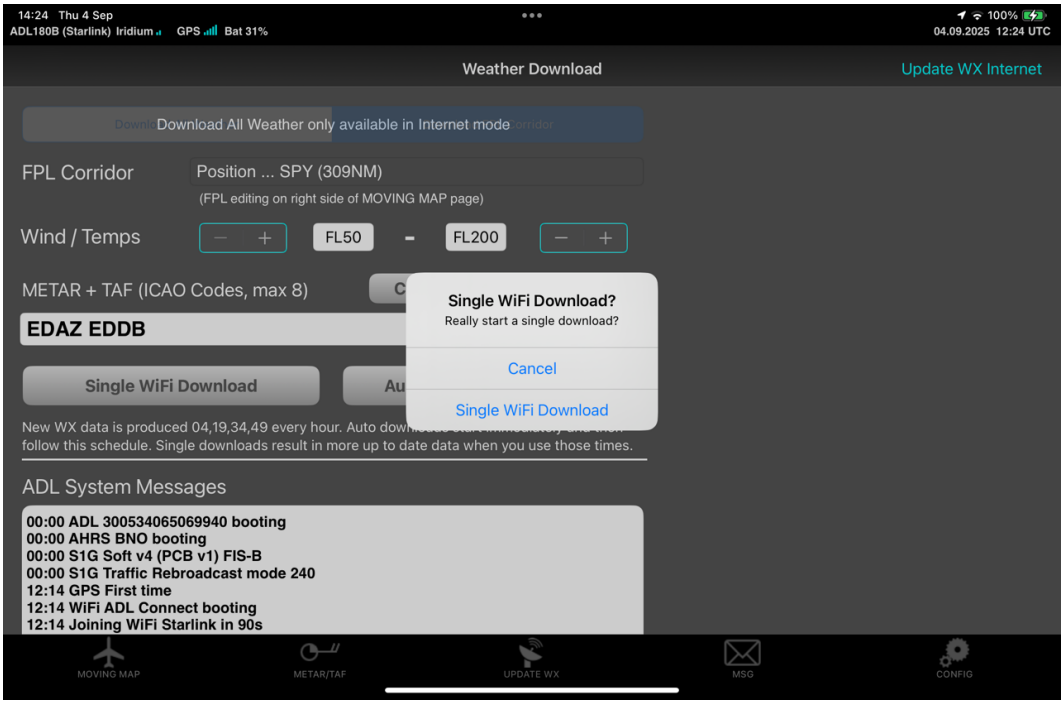

Figure 10 Staring a download via Starlink instead of Iridium

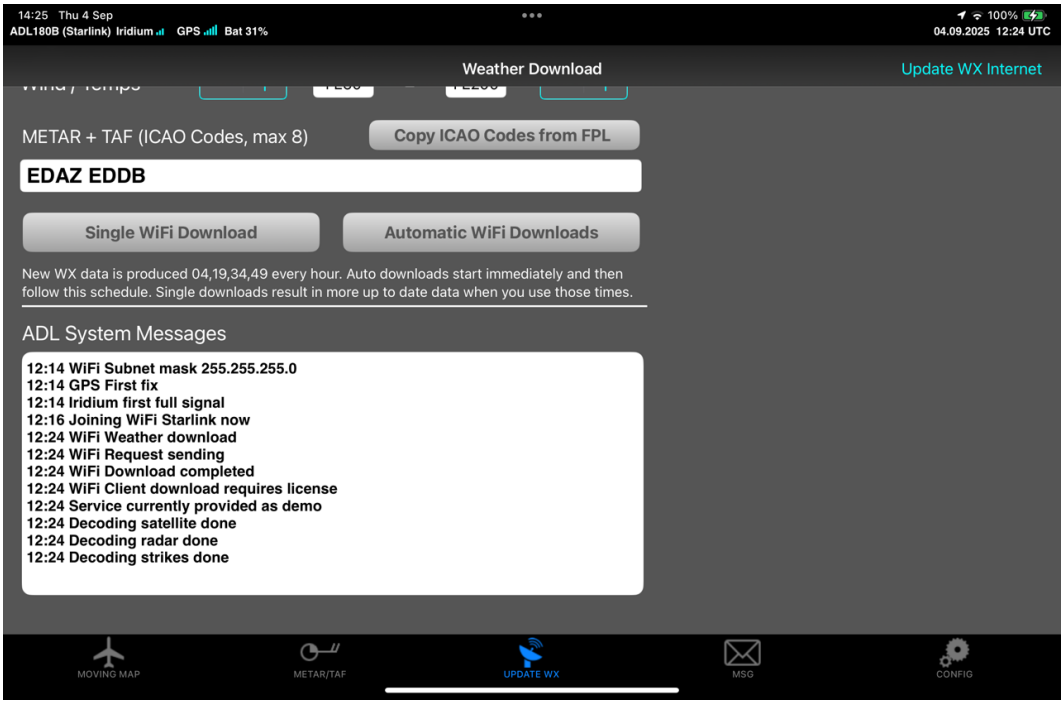

Figure 11 System messages for a successful weather download via Starlink

Figure 12 Maving map showing weather data downloaded via Starlink

11 Using Other Connections Than Starlink

While this documents described the procedure for Starlink, as this option is the most popular one, you can use the same procedure for other WiFi networks which you might have available on board and which feature an internet connection like Inmarsat etc.

Only the Iridium GO an Iridium GO Exec devices are different as those do not offer a full Internet connection. For those devices we adapted special solutions, please contact us if require any of those.

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