

Setting up the laser sensor

When using TOPODRONE laser scanners for ALS, the laser sensor viewing angles are limited to 106 degrees due to the design feature of the applied drones (chassis). At the same time, the full view of the laser sensor (360 degrees) should be used to perform MLS. To change the angle of view of the laser scanner it is necessary to perform the procedure of connecting the TOPODRONE laser scanner to the Internet using a mobile phone and the web-interface of the laser sensor.

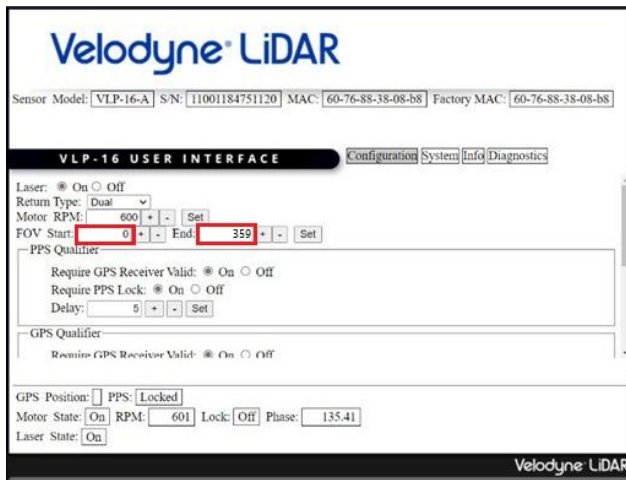
Operating Angle Adjustment Procedure:

1. Android mobile device (Only Samsung, Honor, Xiaomi phones are tested, other manufacturers' mobile devices may not work correctly);
2. 3G/4G/5G mobile internet or Wi-Fi network with internet connection;
3. USB Type-C OTG adapter (supplied with the package);
4. TOPODRONE LiDAR;
5. Power supply (supplied with the kit) or power from the aircraft via a cable with LEMO 6 pin connector or power cable from Li-Po battery (supplied with the mobile kit);
6. Computer or other mobile device with any internet connection.

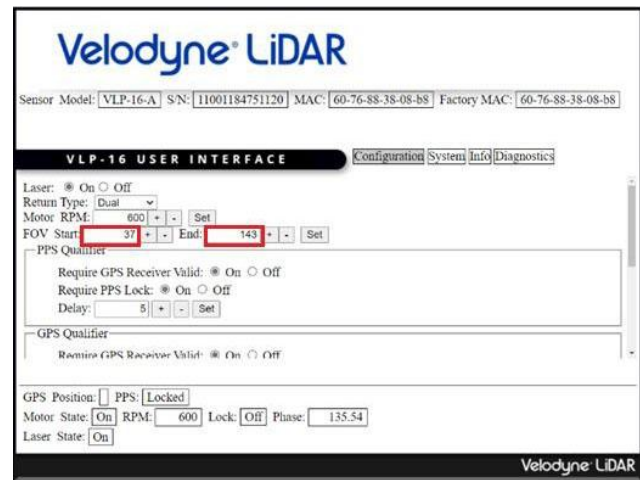
Connecting to the web interface of the laser scanner

1. Make sure that the TOPODRONE LiDAR is securely located on the back cover on a flat, stable horizontal surface or attached to the drone / mobile vehicle mount on a standard mount. Due to the gyroscopic torque, the TOPODRONE LiDAR may start to move if it is not securely positioned and fall down after it is turned on. Never place the TOPODRONE LiDAR on an uneven, slippery surface or on its side with the lens touching the surface.
2. Power up the TOPODRONE laser scanner by connecting it to the power supply or drone or to a Li-Po battery. To power the TOPODRONE laser scanner from the Li-Po battery, you need to turn it on with one short and one long press;
3. Wait for the TOPODRONE LiDAR to turn on and boot up (once the TOPODRONE LiDAR has finished booting up, the LED should be solid green and the yellow LED should turn off).
4. Connect the USB Type-C OTG adapter and USB cable to connect to your mobile device together to the USB Type-A connector:
5. Connect the USB Type-C OTG adapter to the USB Type-C connector of the TOPODRONE laser scanner;
6. Connect a USB cable to connect to a mobile device (smartphone or tablet) running Android;
7. Make sure your mobile device has an active 3G/4G/5G Internet connection or Wi-Fi;
8. In your mobile device, go to the menu: **settings / connections / mobile hotspot and modem / USB modem mode**;
9. Open the link <http://node.gnss.cloud:10977/> using your computer or mobile phone;

10. In the web interface that opens, find the line with FOV values or the Azimuth FOV Start XXX / End YYY tab, where XXX is the scan area start angle in degrees and YYY is the scan area end angle in degrees.
For ALS, set the FOV Start: 037 End: 143. Thus the angle of view will be 106 degrees (53 degrees to the left and right of the nadir). After entering the desired values, click the **Set** button and then, scrolling through the web interface below **Save**;
11. For MLS, set the FOV Start: 000 End: 359. Thus the angle of view will be 360 degrees in all directions of the TOPODRONE laser scanner. After entering the desired values, click the **Set** button and then, scrolling through the web interface below **Save**;
12. Make sure that all other settings except the recording start and end angles match those in the screenshots below:



Adjusting the parameters of the laser scanning sensor for ALS on the example of TOPODRONE 100 LITE, HI-RES, 200 ULTRA



Adjusting the parameters of the laser scanning sensor for MLS on the example of TOPODRONE 100 LITE, HI-RES, 200 ULTRA

13. Setting of TOPODRONE laser sensor parameters is completed.
14. The TOPODRONE laser sensor settings are saved until the next time you change them. It is strongly recommended to memorize or make a note of the currently set laser sensor angles.
In case of incorrect initial settings, e.g. setting of the ALS at the time of performing an MLS, the data from the excluded angles are not saved and cannot be retrieved in any way. On the contrary, if the TOPODRONE laser sensor is set to 360 degrees when performing ALS, the data from TOPODRONE will be more than 3 times redundant.
15. The procedure of connecting TOPODRONE to the Internet (points 1-8) can also be used by the technical support service for remote diagnostics of the equipment.

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