Configuring Benewake TF Series LiDARs on PX4 Firmware

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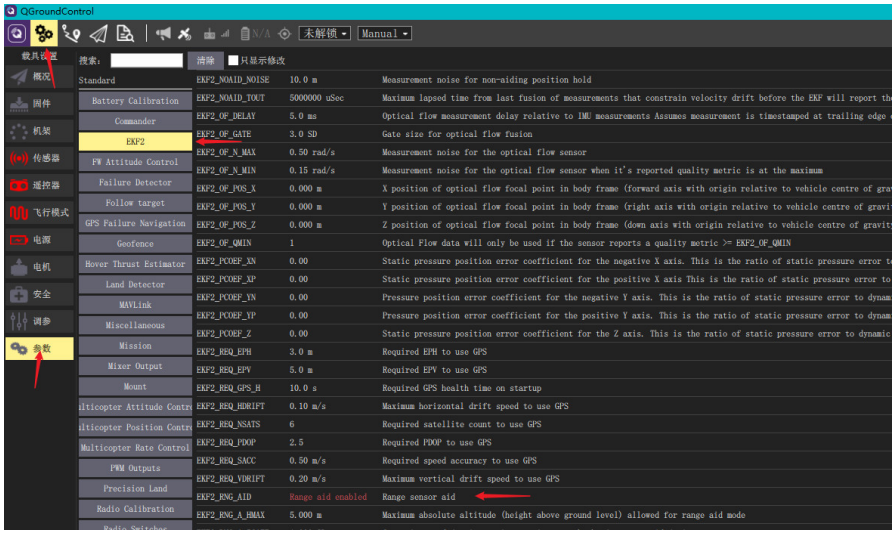
PX4 has its own unique advantages; it is preferred and liked by the majority of users. The TF series is a highly cost-effective LiDAR launched by Benewake, which is sought after by the majority of drone users. This tutorial introduces the connection method of TF series PixHawk and configuring over the PX4 firmware. The same procedure can be followed for other flight controllers as long as the right physical port is used. This document is based on QGroundControl v4.0.6 and firmware PX4 v1.11.0. If the ground station or firmware is not fully functional, please upgrade。

1 Hardware Connection

This article uses Pixhawk as an example to illustrate the connection, as shown below：

Please install the TF Series LiDAR on the multi-rotor, vertically downwards, and ensure that there are no obstacles in front of the lens. Then configure the software settings:

1） Under **Settings--Parameters--EKF2--EKF2_RNG_AID**, select *Range aid enabled*, as shown below：



User-defined settings：

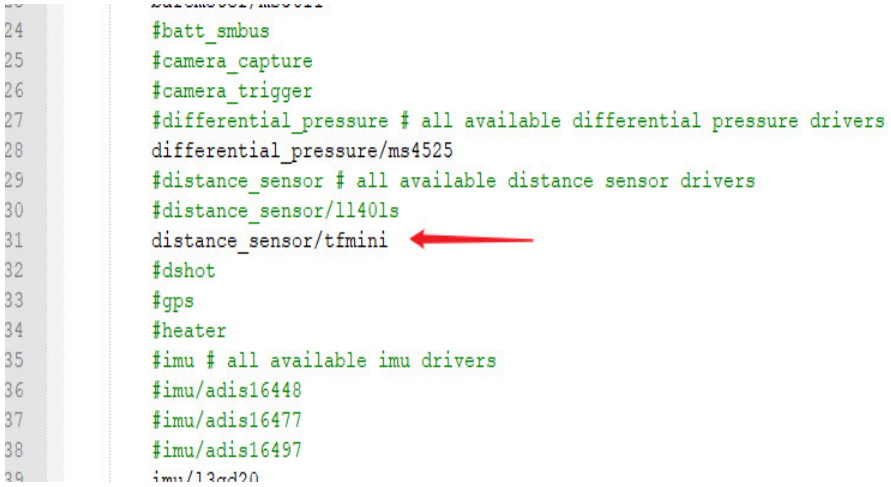
- EKF2_RNG_A_VMAX：The maximum horizontal speed trigger value of multi-rotor using TF series as range finder, it means that TF series LiDAR will become active only when the flight speed is lower than this value. The default value is 1m/s, the minimum value is 0.1m/s, and the maximum value is 2m/s.
- EKF2_RNG_A_HMAX：The maximum altitude trigger value of TF series based multi-rotor, which means that TF series will become active only when the flying altitude is less than this value. The default value is 5m, the minimum value is 1m, and the maximum value is 10m.
- **Turn on LiDAR options：** Under **Setting--Sensors--SENS TFMINI CFG**, select *TELEM2* (this port can be changed if you are using another serial port), as shown below：

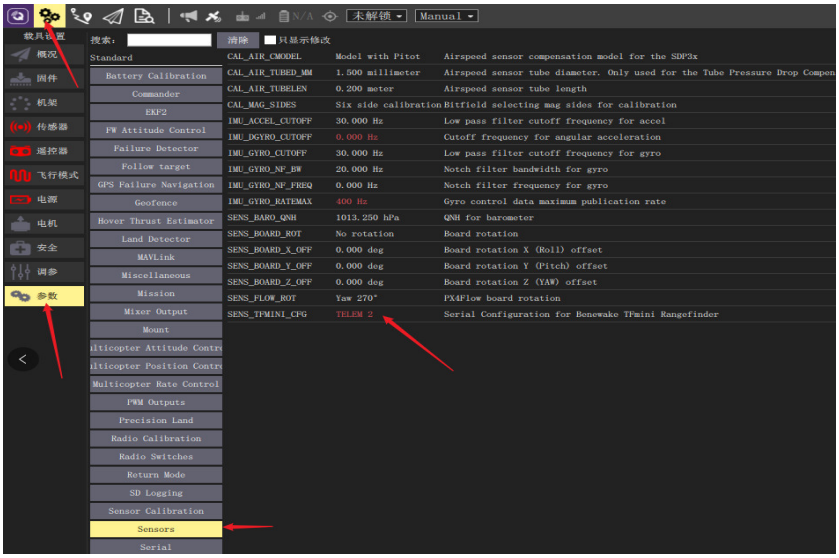
  Note：If this option is not available, you need to download the source program from the official website and change the default.cmake file of the corresponding board.

  https://dev.px4.io/master/en/

  File location： *PX4\Firmware\boards\px4\fmu-v2\default.cmake*, fmu-v2 is the corresponding flight control board; please refer to the official tutorial link below for details.

  Change the content： Need to add distance_sensor/tfmini





After completing the above steps, please restart the flight controller and QGroundControl. There is a LiDAR value display on the main interface, as shown below：