Application of TF-Luna IIC in PixHawk (ArduPilot Firmware)

TF-Luna can be used with PixHawk for the purpose of obstacle avoidance.

1   TF-Luna Settings:

The firmware version of TF-Luna should be at least V3.0.0 to support IIC connection to PixHawk. So please check the firmware version first. See detail commands in product manual.

We take two TF-Luna as an example in this passage and set the address 0x10 and 0x11 separately.

2   PixHawk Connection:

See the connection details in PixHawk manual and TF-Luna manual, we take example for connecting PixHawk flight controller:
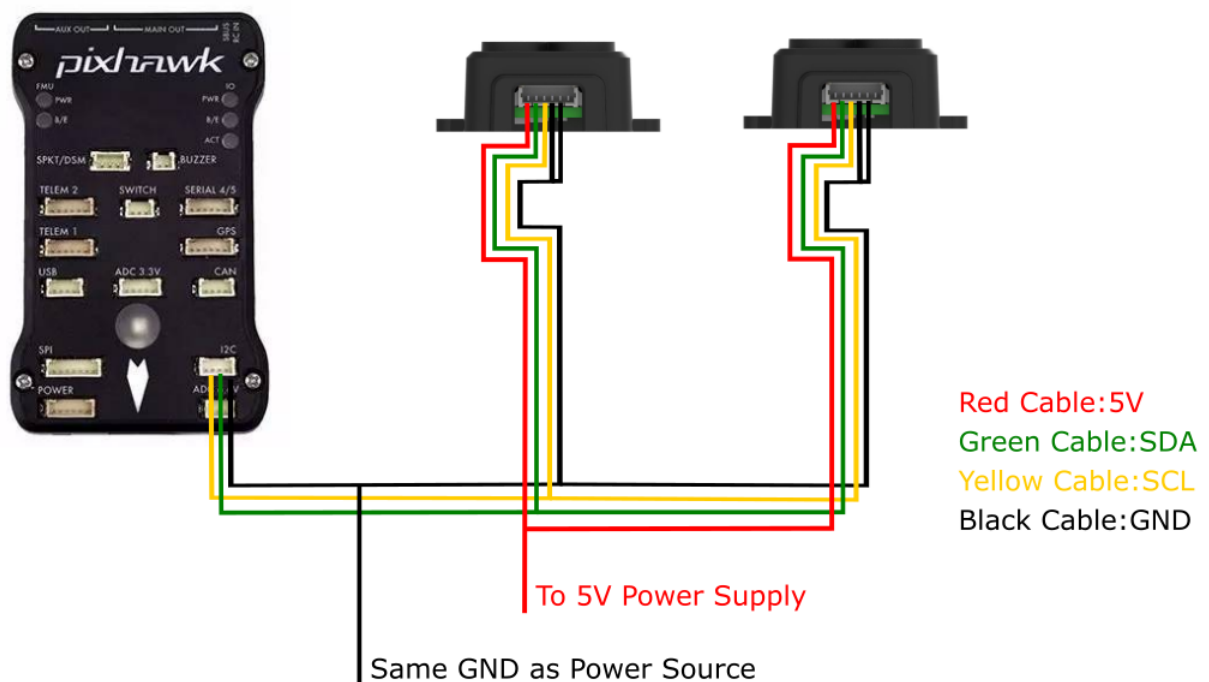
Figure 1: Schematic Diagram of Connecting TF-Luna to I2C Interface of PixHawk

Note：

1. Default cable sequence of TF-Luna and PixHawk are different, please change it accordingly (SDA and SCL wires need to be interchanged). Look at the pinout of controller, pin configurations are **starting from left to right**:

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (blk)	SCL	+3.3 (pullups)
3 (blk)	SDA	+3.3 (pullups)
4 (blk)	GND	GND

2. IIC connector should be purchased by user.
3. If TF-Luna faces down, please take care the distance between lens and ground should be larger than TF-Luna's blind zone (20cm).
4. If more TF-Luna need to be connected (10 LiDARs can be connected), the method is same.
5. Power source should meet the product manual demands:3.7V-5.2V, larger than 150mA*number of TF-Luna.

3   Parameters settings:

Common settings:

AVOID_ENABLE= 2 [if 3 = UseFence and UseProximitySensor doesn't work in IIC then choose **2 = UseProximitySensor**]

AVOID_MARGIN=4

PRX_TYPE=4

Settings for first TF-Luna:

RNGFND1_ADDR=16 [Address of #1 TF-Luna in decimal]

RNGFND1_GNDCLEAR=15 [Unit: cm, depending upon mounting height of the module and should be larger LiDAR than non-detection zone]

RNGFND1_MAX_CM=400 [It could be changed according to real demands but should be smaller than effective measure range of LiDAR, unit is cm]

RNGFND1_MIN_CM=30 [It could be changed according to real demands and should be larger than LiDAR non-detection zone, unit is cm]

RNGFND1_ORIENT=0 [#1 TF-Luna real orientation]

RNGFND1_TYPE = 25 [TF-Luna IIC same as TFmini-Plus IIC]

Settings for second TF-Luna:

RNGFND2_ADDR=17 [Address of #2 TF-Luna in decimal]
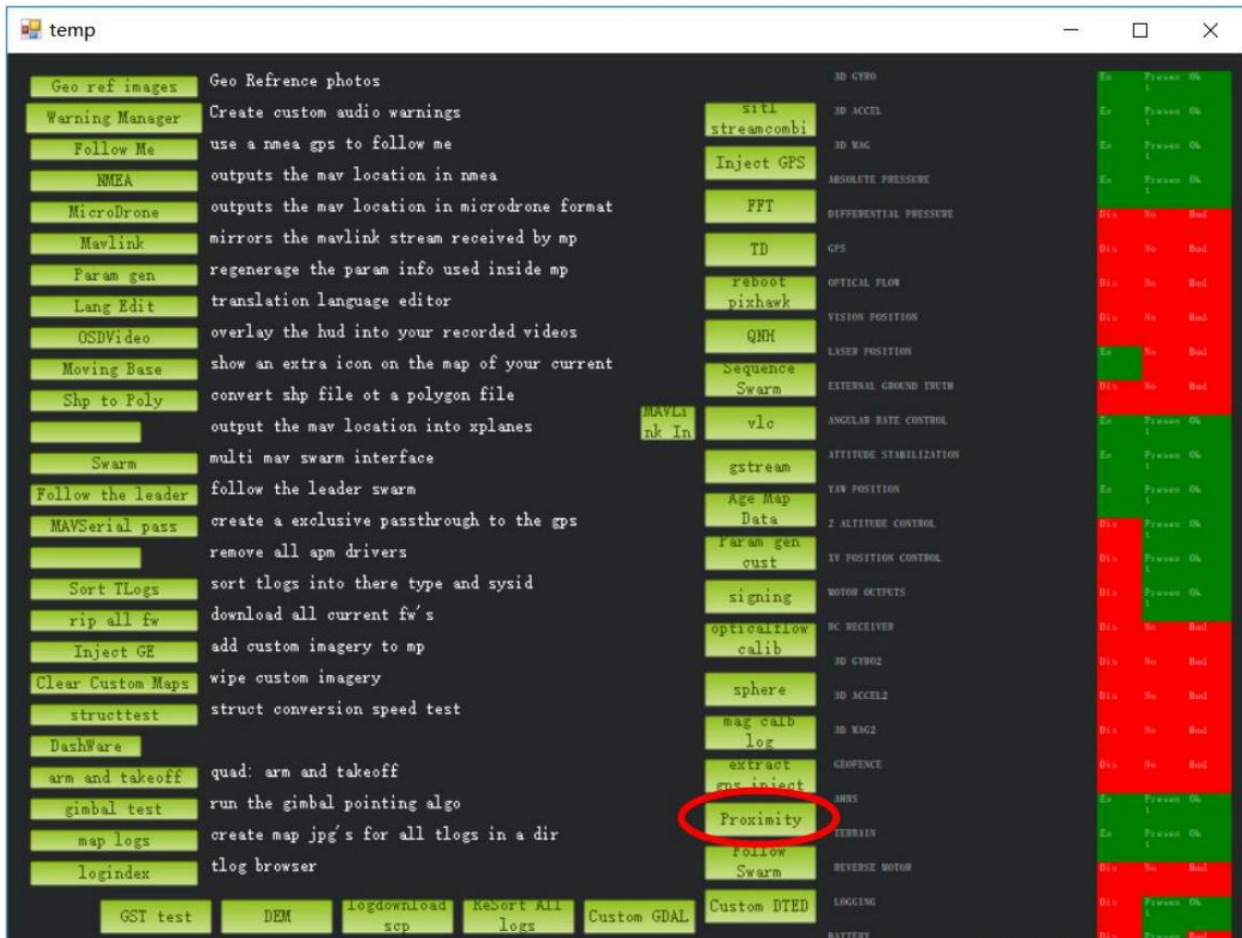
RNGFND2_GNDCLEAR=15

RNGFND2_MAX_CM=400

RNGFND2_MIN_CM=30

RNGFND2_ORIENT=25 [#2 TF-Luna real orientation]

RNGFND2_TYPE=25 [TF-Luna IIC same as TFmini-Plus IIC]

Upon setting of these parameters, click [Write Params] on the right of the software to finish.

If the error message "Bad LiDAR Health" appears, please check if the connection is correct and the power supply is normal.

How to see the target distance from the LiDAR: press *Ctrl+F* button in keyboard, the following window will pop out:

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Click button ***Proximity***, the following window will appear:
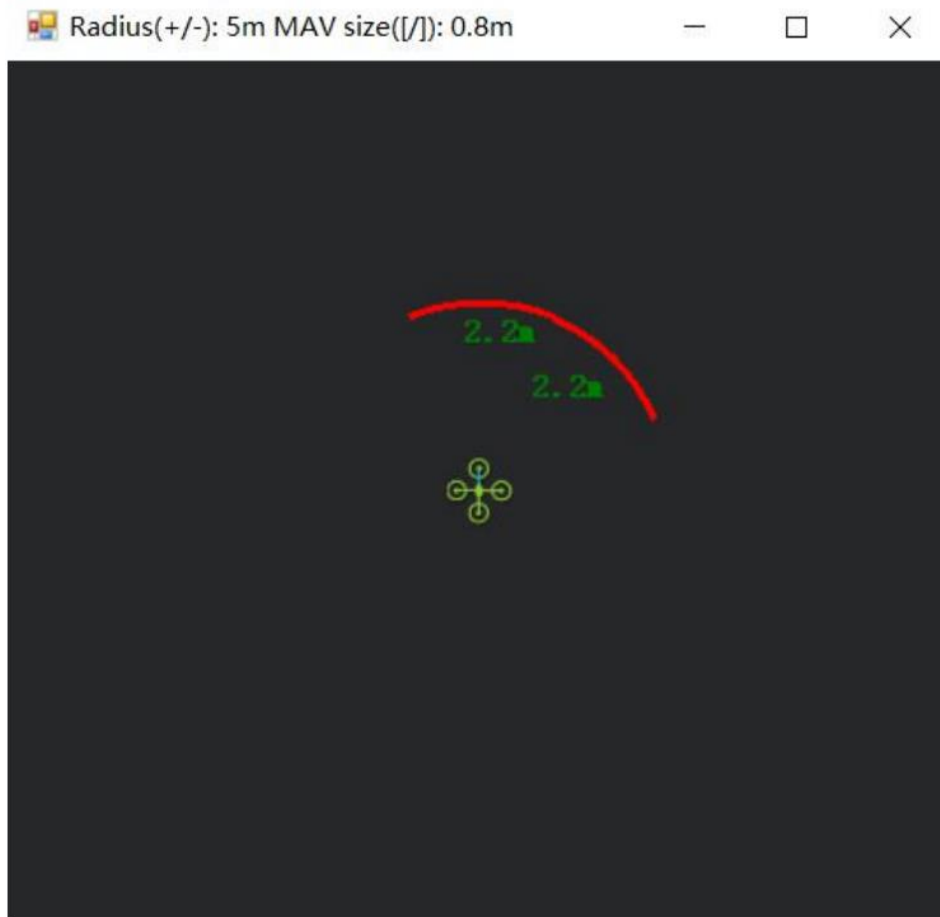
The number in green color means the distance from LiDAR in obstacle avoidance mode（the number only refresh when this window opens, closes, zooms in or zooms out, it does not mean the real time distance from LiDAR and will not be influenced in Mission Planner version under v1.3.48, the problem could be solved by updating Mission Planner.