

# 24G 雷达与 Pixhawk V3 飞控安装说明

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## 一、硬件安装与连接

### Hardware installation and connection.

1. 准备一个 6 Pin 连接线（如下图所示）与 Pixhawk v3 连接。

Prepare a 6 pin wire for the connection use with Pixhawk v3.



2. 检查雷达连接线针脚（如下图）

Check the radar connection wire(as shown below).



3. 将 6 Pin 线与雷达连接线焊接，并将接口整理干净，以防短路烧毁设备（如下图）

Solder the 6 Pin wire to the radar wire and clean the interface to prevent short-circuiting of the device (as shown below).



4. 将 6 Pin 线插入飞控的 Telem 1/Telem 2/GPS 2 中的任意一个接口

Insert the 6 Pin wire into any one of the flight controller ports: Telem 1/Telem 2/GPS 2.



## 二、软件调试 Software Debugging

1. 打开 Mission Planner 软件 → 配置 / 调试 → 全部参数表

Open the Mission Planner → Configuration/debugging → All parameter list

2. 根据雷达所插入插槽 Telem 1/Telem 2/GPS 2 对应搜索 serial 1/serial 2/serial 4。更改协议类型为 9-Lidar、波特率为 115200。（图例为插入 Telem 2 的参数修改）

Search for serial 1/serial 2/serial 4 according to the slot in which the radar is inserted Telem 1/Telem 2/GPS 2. Change the protocol type to 9-Lidar and the baud rate to 115200.(Take Telem 2 as example.)

命令	Δ	值	单位	选项
SERIAL2_BAUD		115		1:1200 2:2400 4:4800 9:9600 19:19200 38:38400 57:57600 111:111100 115:115200 500:500000 921:921600 1500:1500000
SERIAL2_PROTOCOL		9		-1:None 1:MAVLink1 2:MAVLink2 3:Frsky D 4:Frsky SPort 5:GPS 7:Alexmos Gimbal Serial 8:SToRM32 Gimbal Serial 9:Lidar 10:FrSky SPort Passthrough (OpenTX) 11:Lidar360 12:Aerotenna uLanding 13:Beacon

3. 雷达参数设置：搜索 RNGFND\_

Radar parameter setting: search RNGFND\_

RNGFND\_ORIENT 参数根据雷达作业方式选择  
25: Down (定高雷达) 0: Forward (避障雷达)  
Parameters are selected according to radar  
operation mode: 25 Down (fixed height); 0:  
Forward (Obstacle Avoidance)

RNGFND\_TYPE 参数选择 11: ulanding

RNGFND\_TYPE select 11: ulanding

RNGFND\_GNDCLEAR 若雷达用作高度计 (定  
高雷达) 参数请根据实际安装离地高度填写, 单位  
cm。

If the radar is used as an altimeter (fixed  
height radar), please fill in the  
parameter according to the actual installation  
height, the unit is cm.

命令	Δ	值	单位	选项
EK2_RNG_USE_HGT		-1	%	-1 70
RNGFND_ADDR		0		0 127
RNGFND_FUNCTION		0		0:Linear 1:Inverted 2:Hyperbolic
RNGFND_GAIN		0.8		0.01 2.0
RNGFND_GNDCLEAR		10	centimeters	5 127
RNGFND_MAX_CM		700	centimeters	
RNGFND_MIN_CM		20	centimeters	
RNGFND_OFFSET		0	Volts	
RNGFND_ORIENT		25		0:Forward 1:Forward-Right 2:Right 3:Back-Right 4:Back 5:Back-Left 6:Left 7:Forward-Left 24:Up 25:Down
RNGFND_PIN		-1		-1:Not Used 0:APM2-A0 1:APM2-A1 2:APM2-A2 3:APM2-A3 4:APM2-A4 5:APM2-A5 6:APM2-A6 7:APM2-A7 8:APM2-A8 9:APM2-A9 11:PX4-airspeed port 15:Pxhawk-airspeed port 64:APM1-airspeed port
RNGFND_POS_X		0	m	
RNGFND_POS_Y		0	m	
RNGFND_POS_Z		0	m	
RNGFND_PWRRNG		0	meters	0 32767
RNGFND_RMTRIC		1		0:No 1:Yes
RNGFND_SCALING		3	meters/Volt	
RNGFND_SETTLE		0	milliseconds	
RNGFND_STOP_PIN		-1		-1:Not Used 50:Pxhawk AUXOUT1 51:Pxhawk AUXOUT2 52:Pxhawk AUXOUT3 53:Pxhawk AUXOUT4 54:Pxhawk AUXOUT5 55:Pxhawk AUXOUT6 111:PX4 FMU Relay1 112:PX4 FMU Relay2 113:PX4IO Relay1 114:PX4IO Relay2 115:PX4IO ACC1 116:PX4IO ACC2
RNGFND_TYPE		11		0:None 1:Analog 2:MaxbotixI2C 3:LidarLiteV2-I2C 5:PX4-PWM 6:BBB-PRU 7:LightWareI2C 8:LightWareSerial 9:Bebop 10:MAVLink 11:uLanding 12:LeddarOne 13:MaxbotixSerial 14:TrOneI2C 15:LidarLiteV3-I2C

若同时连接两个 24G 雷达，一个作为定高、一个作为避障雷达，请参照上诉参数，修改 RNGFND2\_ORIENT 参数。

If two 24G radars are connected at the same time, one as the fixed height and one as the obstacle avoidance radar, please refer to the appeal parameters and modify the RNGFND2\_ORIENT parameter.

注意：雷达参数设置顺序特别重要，必须跟串口参数设置顺序对应起来，如：serial1 对应 RNGFND\_，serial2 对应 RNGFND2\_；

Note: The order of radar parameter setting is particularly important and must be related to the serial parameter setting order. For example, serial1 corresponds to RNGFND\_ and serial2 corresponds to RNGFND2\_；

#### 4. 避障参数调节：搜索 PRX\_TYPE 、 AVOID\_ 、 ；

Obstacle avoidance parameter setting: search PRX\_TYPE 、 AVOID\_ 、

PRX_TYPE	3		0:None 1:LightWareSF40C 2:MAVLink 3:TeraRangerTower 4:RangeFinder
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PRX\_TYPE=3 选择避障雷达类型

PRX\_TYPE=3 Select the obstacle avoidance radar type

AVOID_ENABLE	3		0:None 1:StopAtFence 2:UseProximitySensor 3:All
AVOID_MARGIN	2	meters	1 10

AVOID\_ENABLE 避障停止方式

AVOID\_ENABLE Obstacle avoidance stop mode

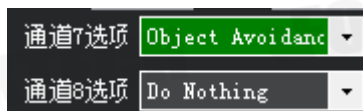
AVOID\_MARGIN 避障触发距离（根据飞行器情况设定）

AVOID\_MARGIN Obstacle avoidance trigger distance (set according to the situation of aircraft)

#### 5. 设置一个通道控制避障功能开启 / 关闭，进入扩展调参，找到第七或第八通道选项

Set a channel to control obstacle avoidance function 'on/off'

Enter the interface of "extended tuning" , find the seventh or eighth channel option.

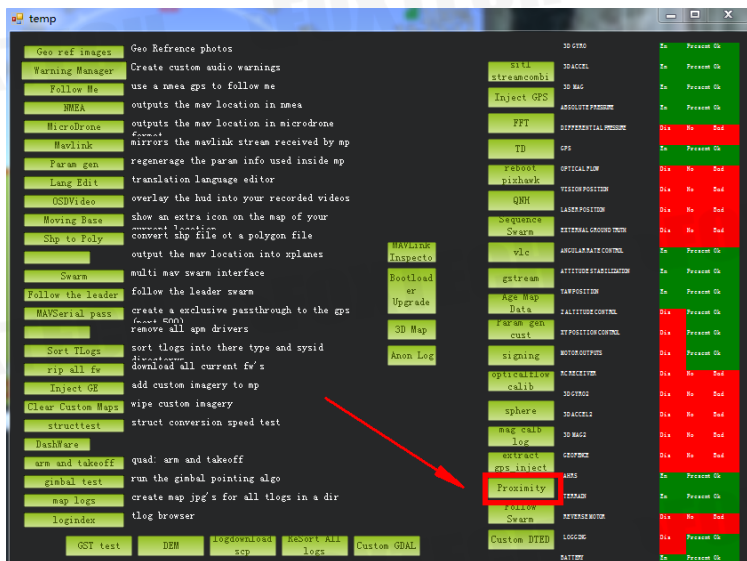


选择 Object Avoidance 作为避障功能开关。

Choose 'Object Avoidance' as avoidance function switch

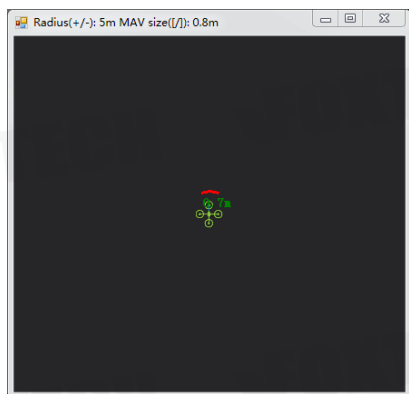
## 6. 返回 Mission Planner 首界面 按下 Ctrl+F 调入菜单 (如下图)

Return to the first interface of Mission Planner, press Ctrl+F to enter the menu.(as shown below)



单击 Proximity 按钮, 进入雷达预览界面。(如下图)

Click the 'Proximity' button to enter the radar preview interface.(as shown below)



检查雷达扇区内移动物体侦测情况, 确认雷达工作正常, 前方红色弧线代表前方物体侦测情况。若无数据请检查 6 Pin 线与雷达 TX/RX 线序, 交叉连接雷达的 TX 与 6 Pin 线的 RX, 雷达 RX 与 6 Pin 线 TX 连接。Check the detection status of moving objects in the radar sector to confirm that the radar is working normally. The red arc represents that radar detected the object and works well. If there is no data, please check the 6 pin wire and radar TX/RX wire sequence, connect the radar TX with 6 pin wire RX, and the radar RX with 6 pin wire TX.

注意: 软件调试每一步需要点击写入参数!

Note: Please click to write parameters in every step of software debugging!