Marvelmind与PX4集成

v2022_09_16

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版本变更

V2022_09_16

- Super-Beacon 2和Super-Beacon 3的连接示意图已更新

V2022_05_13

- 第3节新增Super-Beacon 2和Super-Beacon 3的连接示意图
- Pixhawk4连接R8EF RadioLink接收机的示意图已更新

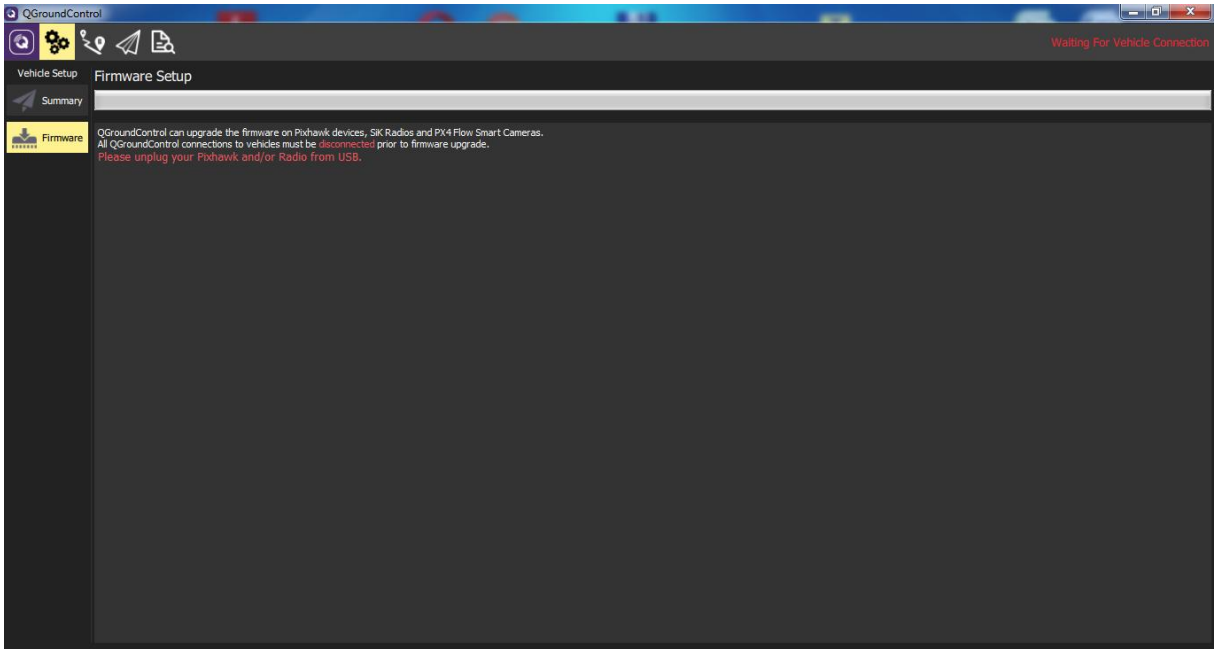
1. 所用硬件和软件

将Marvelmind与PX4集成需要：

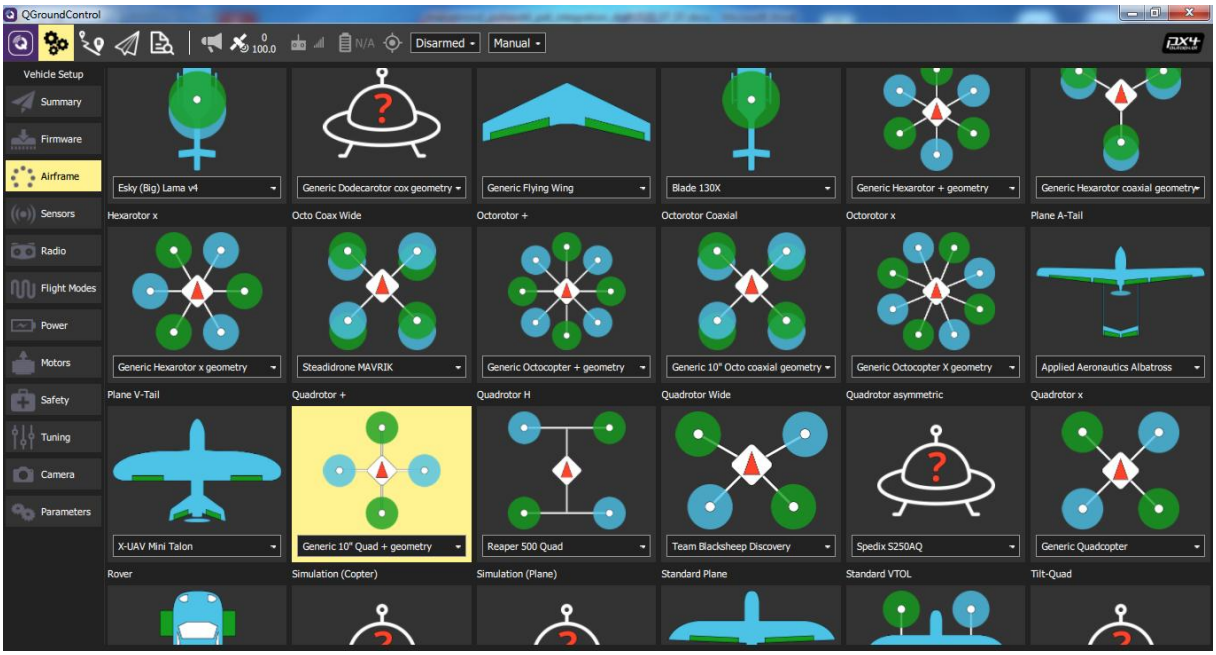
- 1 x Pixhawk4飞控，固件PX4 v1.10.1，QGroundControl v4.0
- 1 x Holybro Pixhawk 4电源模块（PM07）
- 1 x R8EF RadioLink
- 1 x T8FB FHSS系统
- 1 x 无人机（含电池）
- 8 x Marvelmind Super-Beacon（6个固定信标，2个安装在无人机上的配对移动信标）：固件V6.215+，NIA架构，Dashboard v6.215+
- 1 x Modem HW v4.9：固件V6.215+，NIA架构，Dashboard v6.215+

2. Pixhawk4设置：

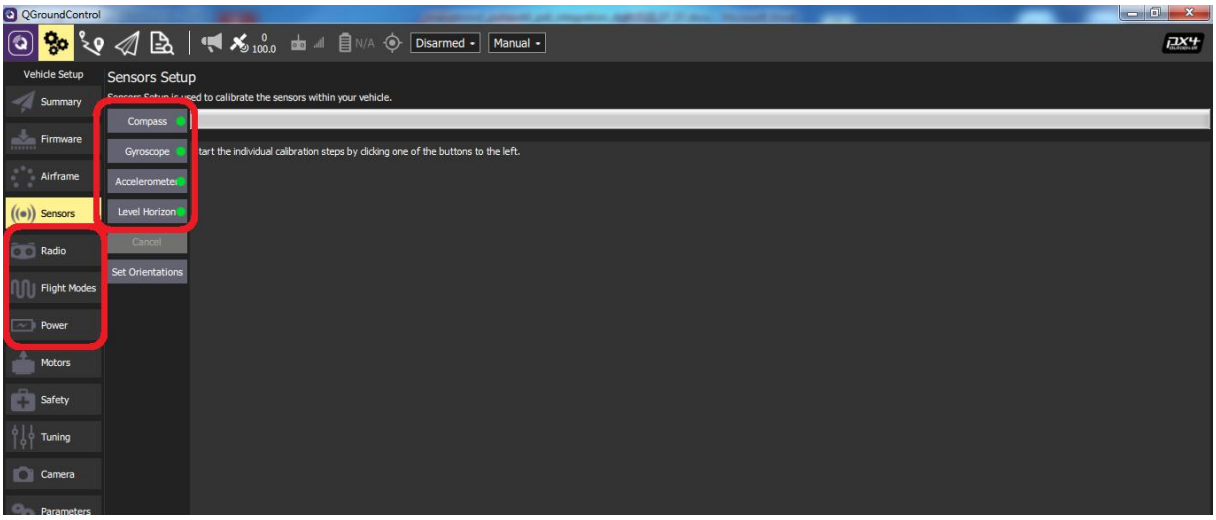
- 将固件更新为PX4 v1.10.1



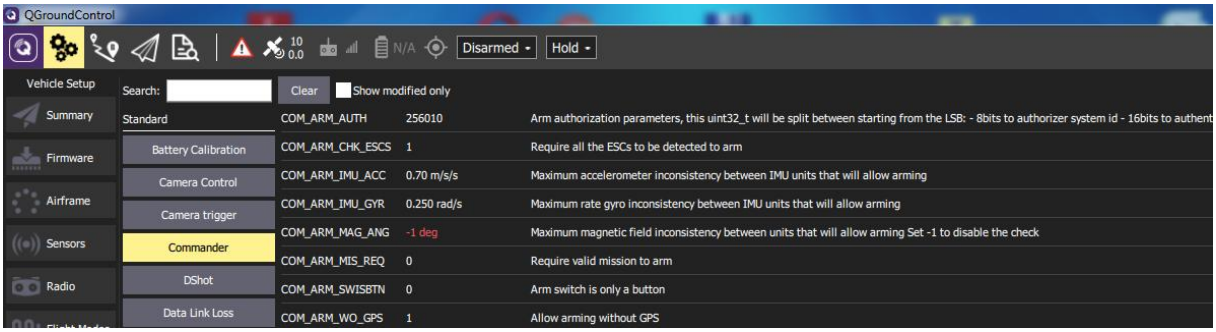
- 选择无人机机架类型（Airframe）



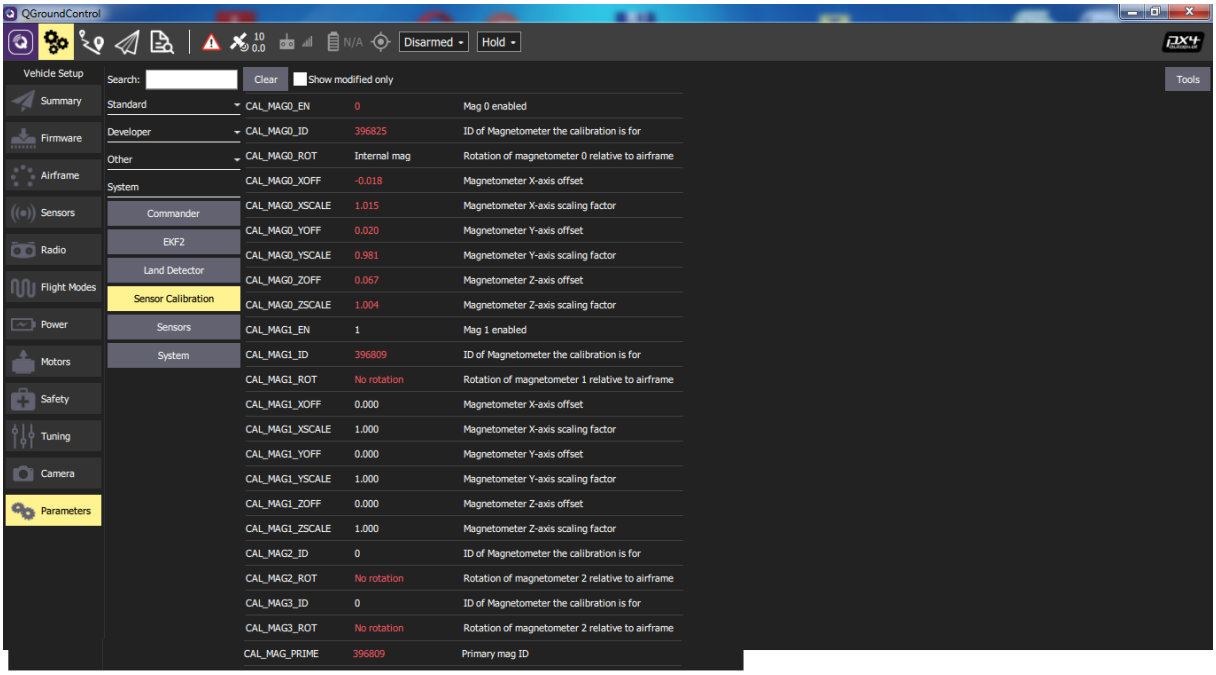
- 按照QGroundControl的说明完成必要的校准：



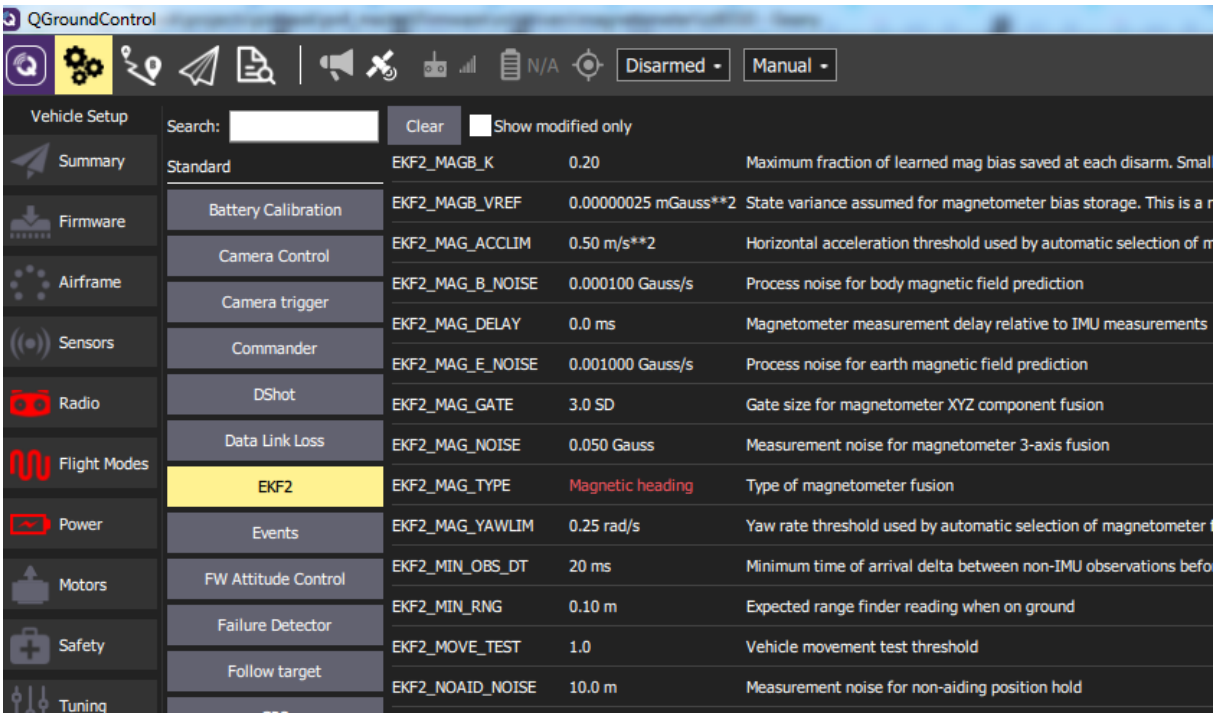
- 禁用罗盘一致性检查（Compasses inconsistency check）



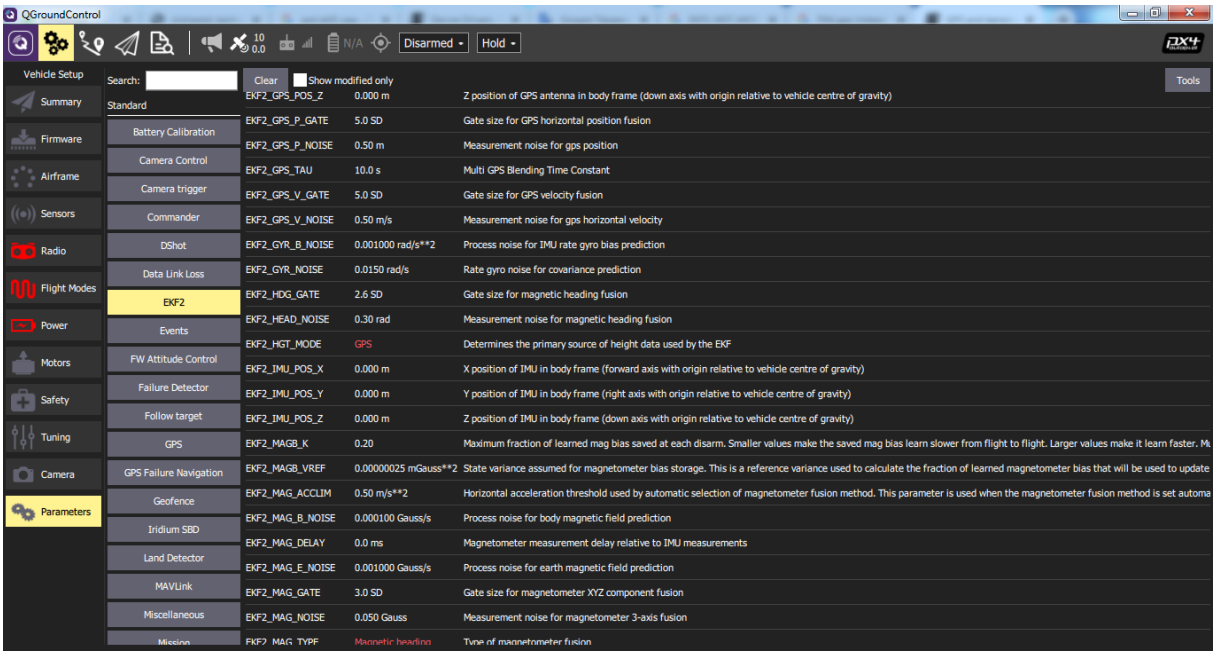
- 启用外部Marvelmind罗盘作为主罗盘



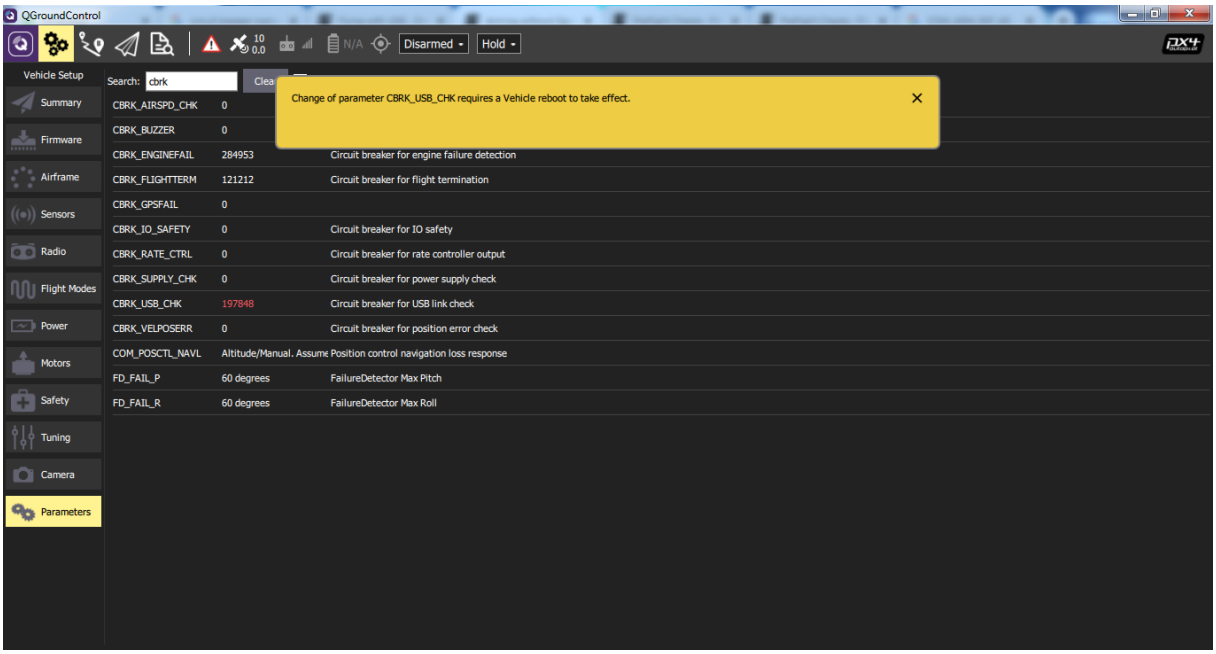
- 设置罗盘使用模式EKF_MAG2_TYPE：



- 通过EKF2_HGT_MODE启用GPS测高：

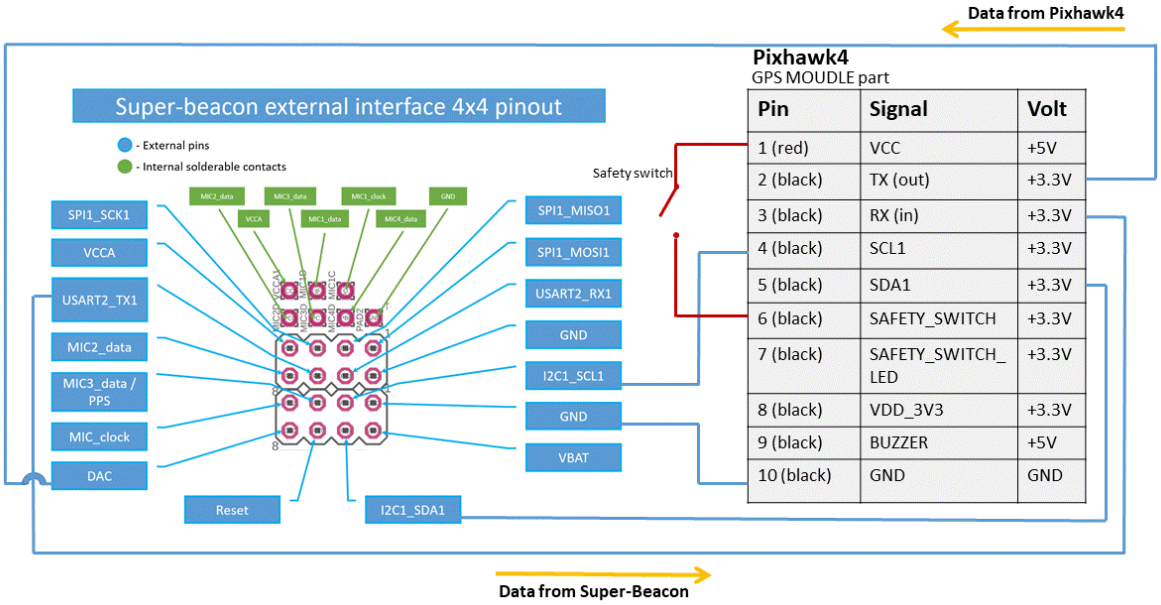


- 如需在Pixhawk连接USB时测试解锁（arming），请启用此功能（CBRK_USB_CHECK）：



3. 接线（接线前请先断开Pixhawk4的USB连接）。

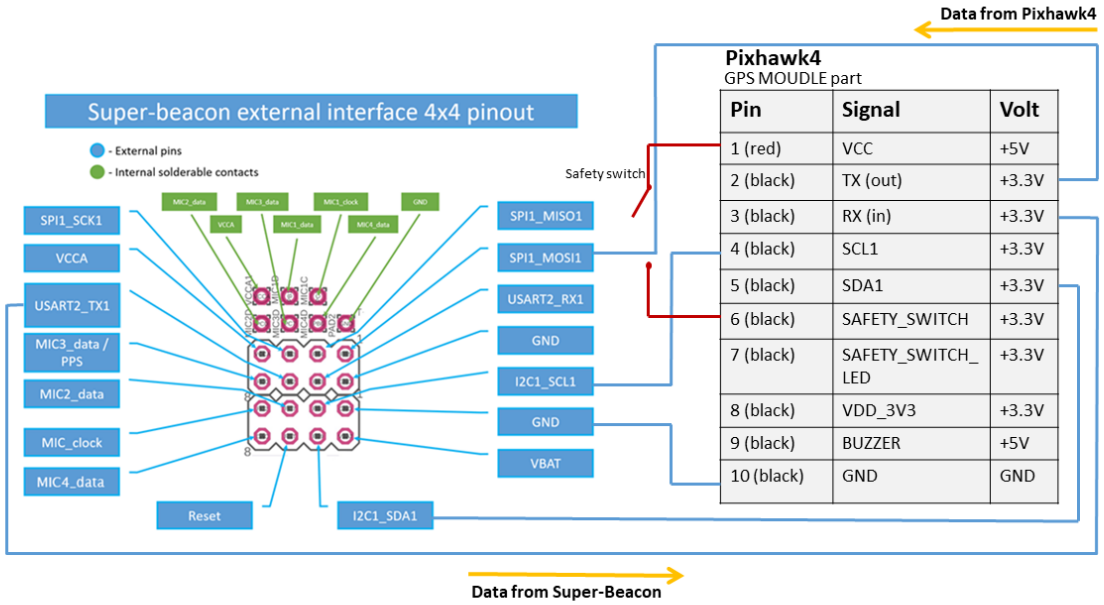
- 将Pixhawk4连接到Super-Beacon移动信标：



Pixhawk4
GPS MOUDLE part

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (black)	TX (out)	+3.3V
3 (black)	RX (in)	+3.3V
4 (black)	SCL1	+3.3V
5 (black)	SDA1	+3.3V
6 (black)	SAFETY_SWITCH	+3.3V
7 (black)	SAFETY_SWITCH_LED	+3.3V
8 (black)	VDD_3V3	+3.3V
9 (black)	BUZZER	+5V
10 (black)	GND	GND

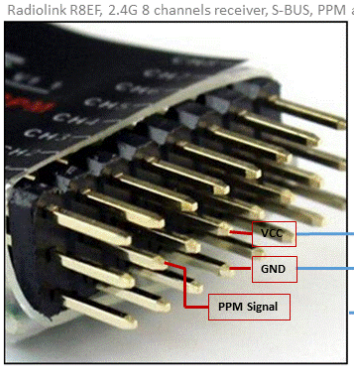
- 将Pixhawk4连接到Super-Beacon 2和Super-Beacon 3移动信标：



Pixhawk4
GPS MOUDLE part

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (black)	TX (out)	+3.3V
3 (black)	RX (in)	+3.3V
4 (black)	SCL1	+3.3V
5 (black)	SDA1	+3.3V
6 (black)	SAFETY_SWITCH	+3.3V
7 (black)	SAFETY_SWITCH_LED	+3.3V
8 (black)	VDD_3V3	+3.3V
9 (black)	BUZZER	+5V
10 (black)	GND	GND

Radiolink R8EF, 2.4G 8 channels receiver, S-BUS, PPM and PWM signal support, use for radiolink transmitter T8FB



Pixhawk4
PPM RC port

Pin	Signal	Volt
1 (red)	VCC	+5V
2 (yellow)	PPM	+3.3V
3 (black)	GND	GND

- 将Pixhawk4连接到R8EF RadioLink接收机

- 将Pixhawk4连接到Holybro Pixhawk 4电源模块（PM07）：
  - 用6芯直连线（pin-to-pin）将Pixhawk4的Power1端口连接到PM07的Pwr1端口
  - 用10芯直连线（pin-to-pin）将Pixhawk4的I/O PWM OUT端口连接到PM07的I/O-PWM-in端口

- 将无人机上SCM电机控制器的PWM输入连接到PM07板上的FMU-PWM-out接口

- 按图示设置Marvelmind移动信标的数据流输出：

Interfaces	(-) collapse
UART speed, bps	115200
Streaming output	USB+UART
Protocol on UART/USB output	UBX (u-blox)
External device control	No control
Raw inertial sensors data	disabled
Processed IMU data	disabled
Raw distances data	disabled
Quality data stream	disabled
Telemetry stream	disabled
Locations of other hedgehogs	enabled
IMU via modem	(+) expand
User payload data size (0..32)	0

- 按操作手册第7.7节所示放置固定信标并构建地图（使用垂直子地图以获得精确高度）
- 在无人机上安装两个移动信标（一个连接Pixhawk4，另一个不连接），并按操作手册第7.10节所示启用配对信标功能
- 将电池电源接到PM07板。务必先唤醒与Pixhawk4相连的Marvelmind移动信标，再给Pixhawk4上电
- 解锁电机并试飞