Marvelmind and PX4 integration

v2022_09_16

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Version Changes

V2022_09_16

- Super-Beacon 2 and Super-Beacon 3 connection scheme updated

V2022_05_13

- Super-Beacon 2 and Super-Beacon 3 connection scheme added to section 3
- Connect Pixhawk4 to R8EF radiolink - scheme updated

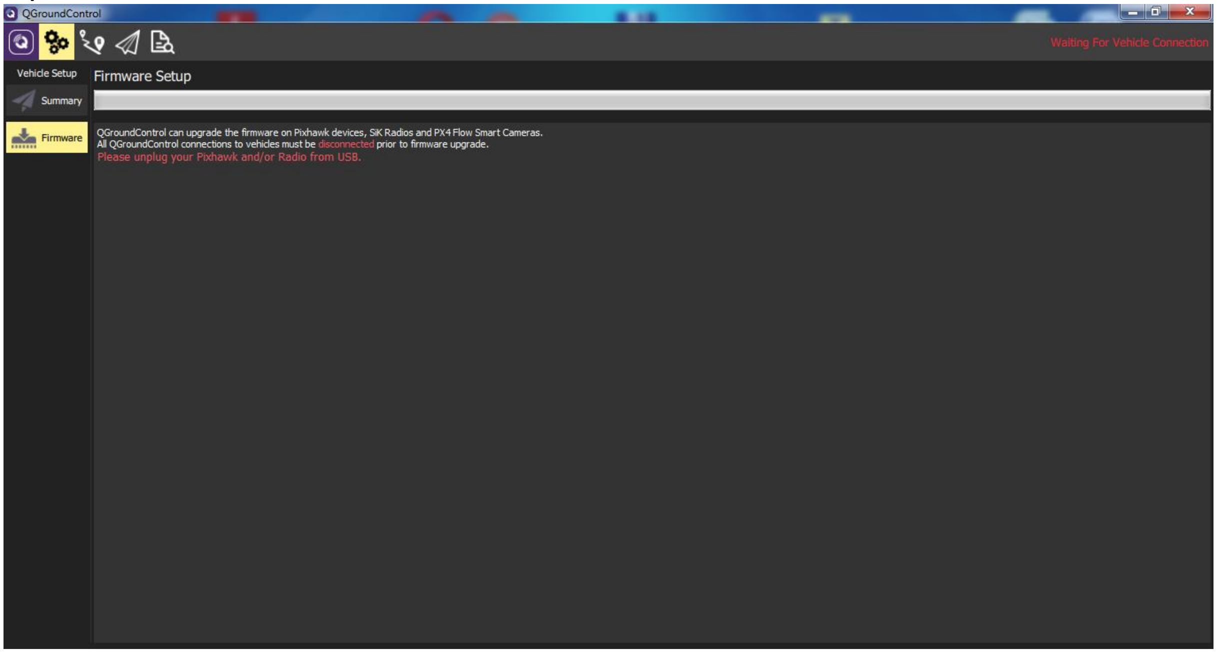
1. Used hardware and software

To integrate Marvelmind with PX4 you will need:

- 1 x Pixhawk4 flight controller, firmware PX4 v1.10.1, QGroundControl v4.0
- 1 x Holybro Pixhawk 4 Power Module (PM07)
- 1 x R8EF RadioLink
- 1 x T8FB FHSS system
- 1 x Drone with battery
- 8 x Marvelmind Super-Beacon (6 x stationary beacons, 2 x paired mobile beacons on the drone) - firmware V6.215+, NIA architecture, Dashboard v6.215+
- 1 x Modem HW v4.9 - firmware V6.215+, NIA architecture, Dashboard v6.215+

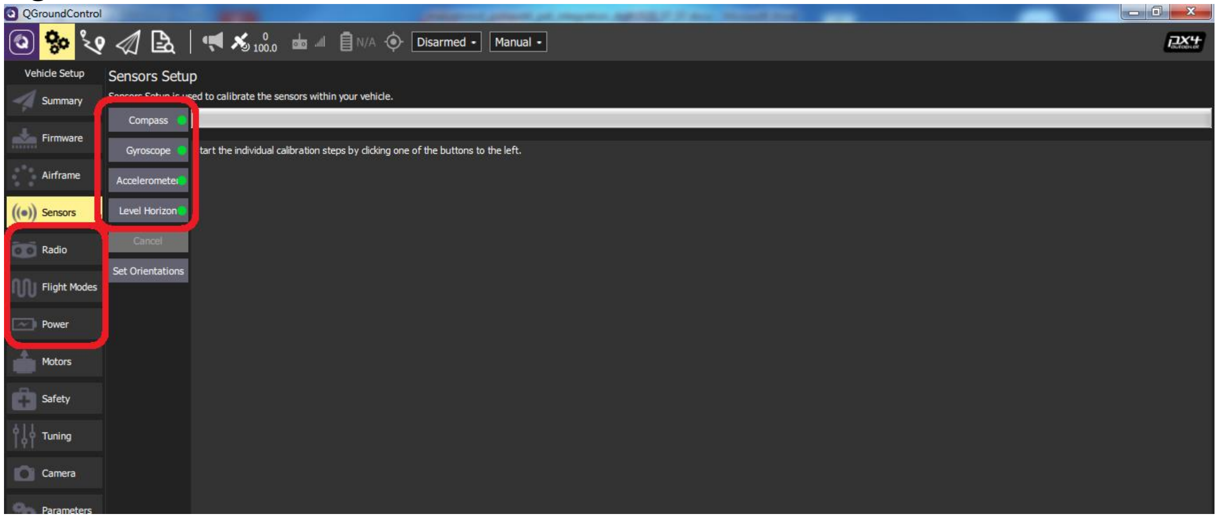
2. Pixhawk4 setup:

- Update firmware on PX4 v1.10.1

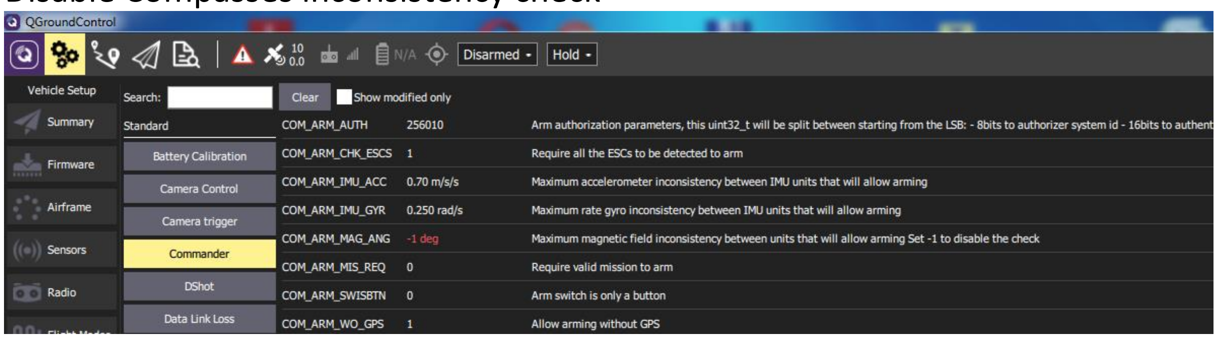


- Choose your drone airframe

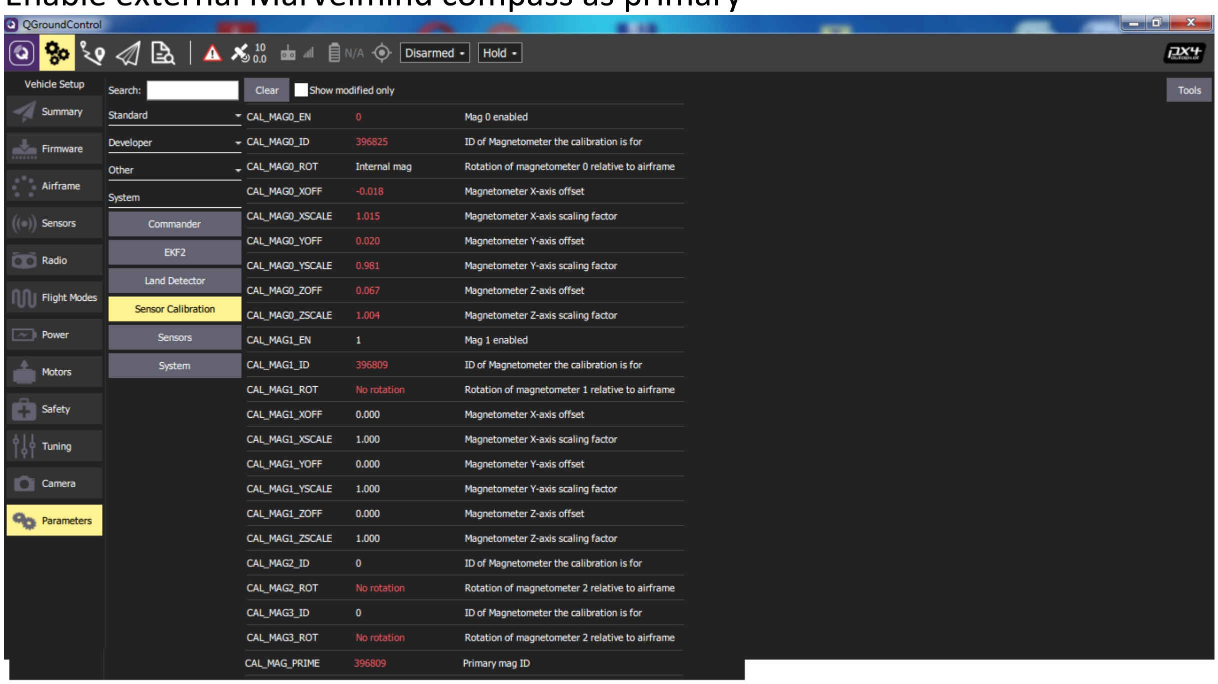
- Carry out the necessary calibrations according to the instructions of Qgroundcontrol:



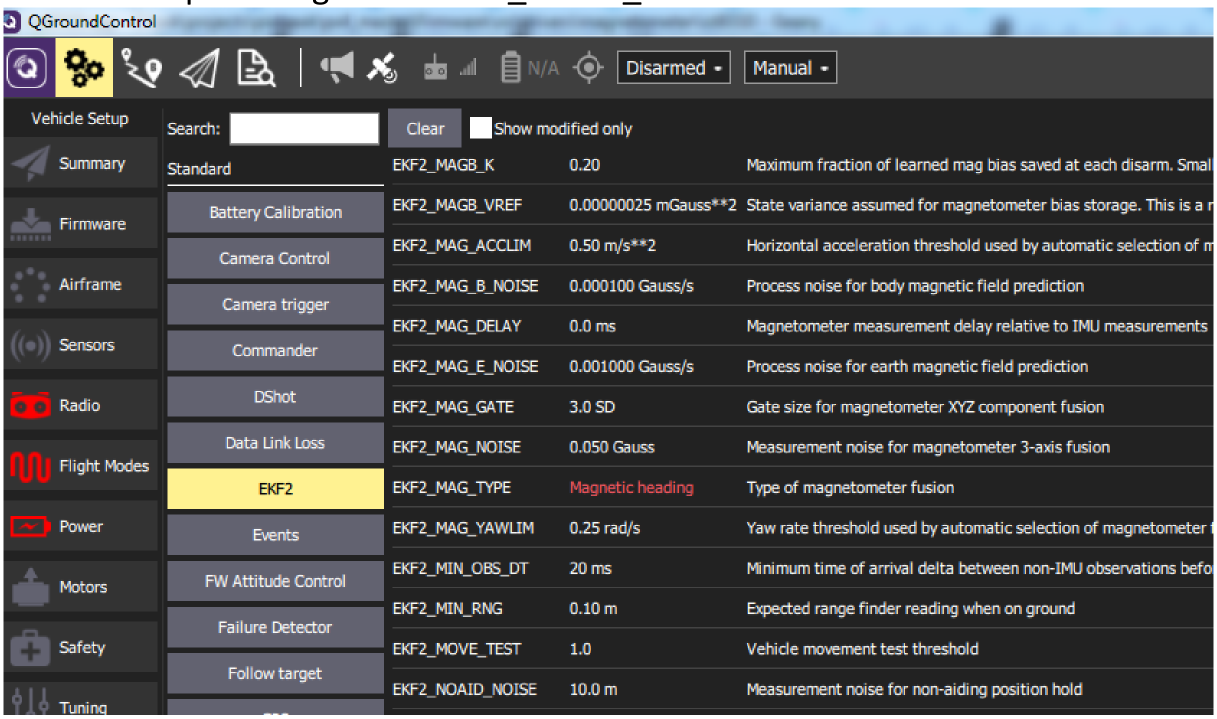
- Disable Compasses inconsistency check



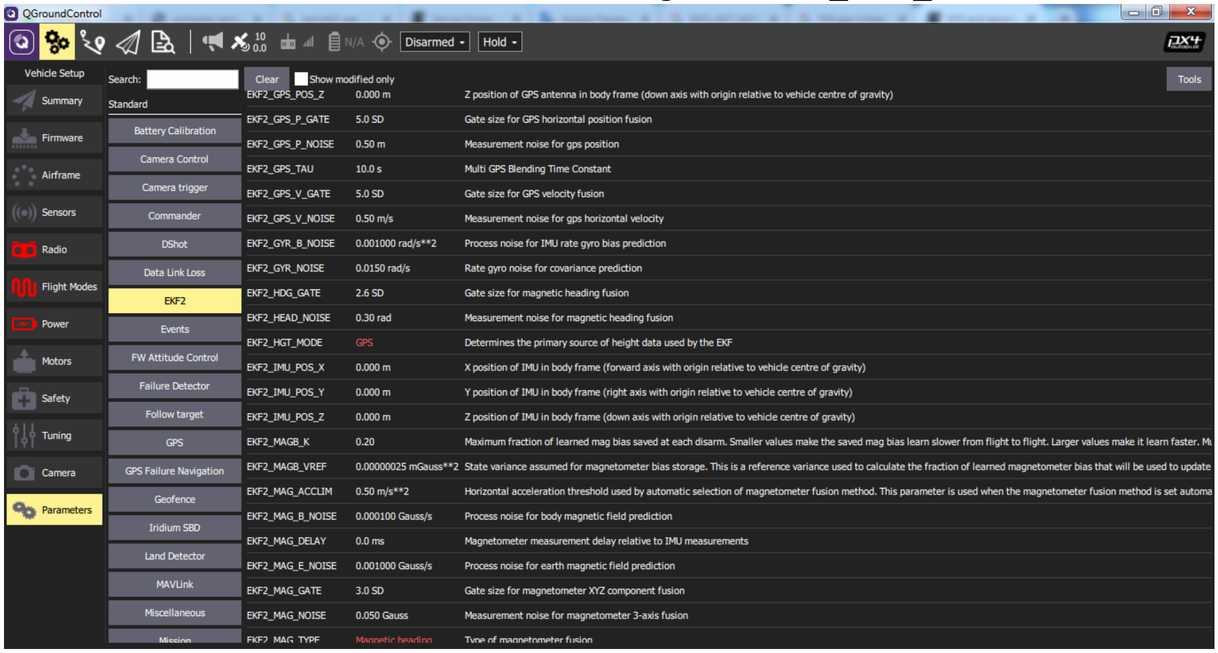
- Enable external Marvelmind compass as primary



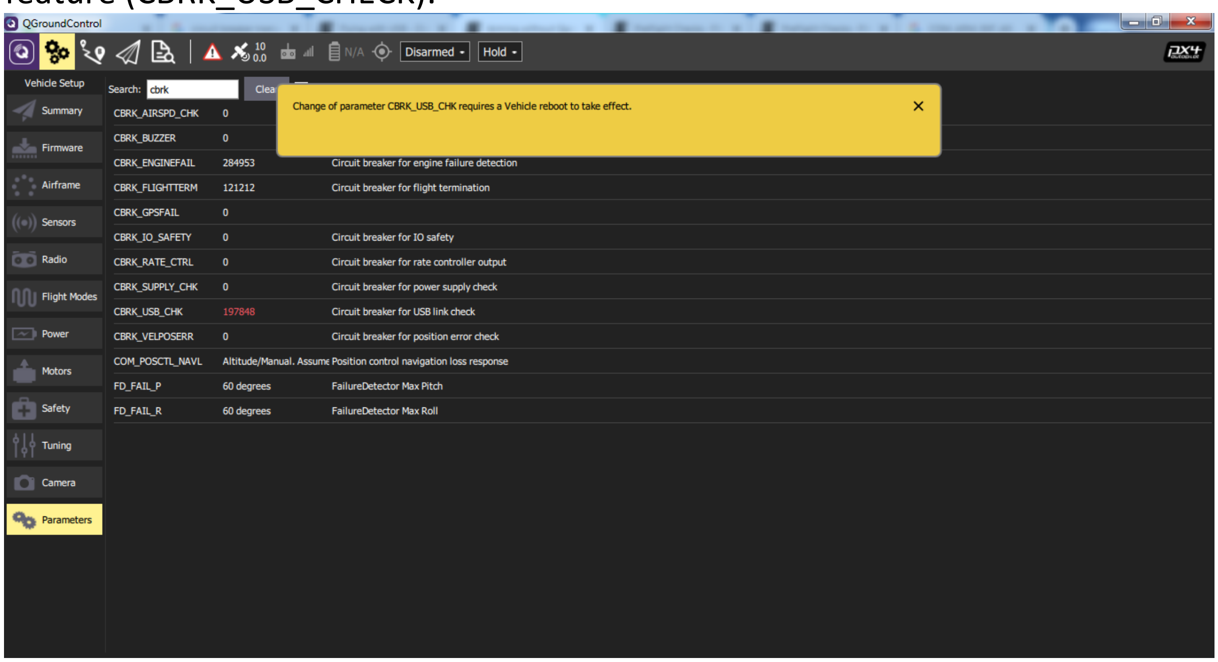
- Set the compass usage mode EKF_MAG2_TYPE:



- Enable the use of GPS to determine the height of EKF2_HGT_MODE:

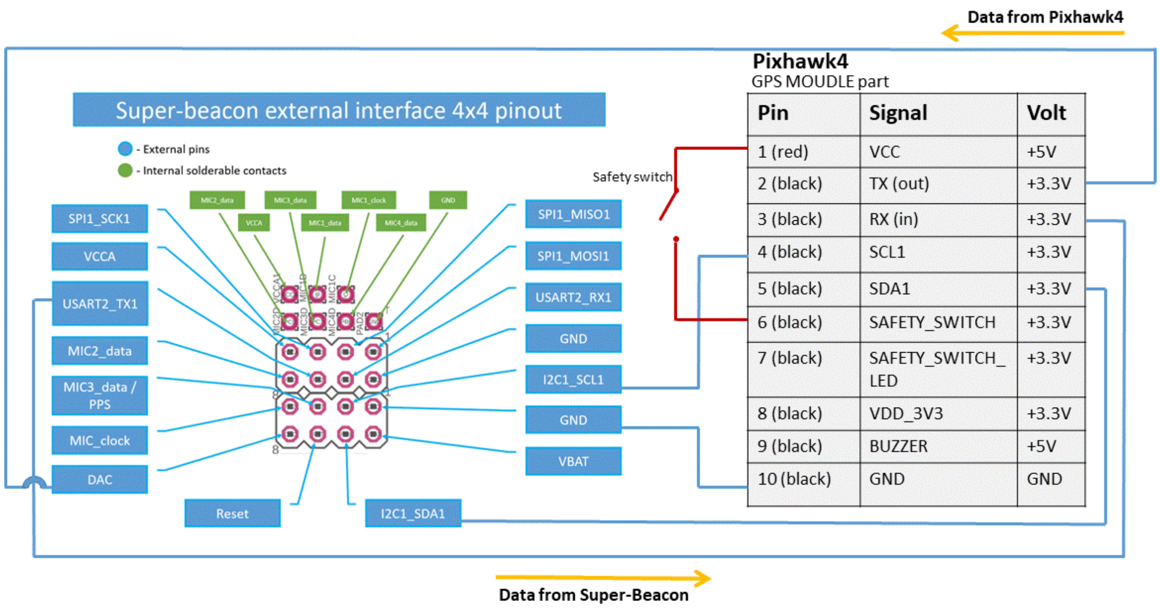


- If you need to test arming with a USB-connected Pixhawk, enable this feature (CBRK_USB_CHECK):

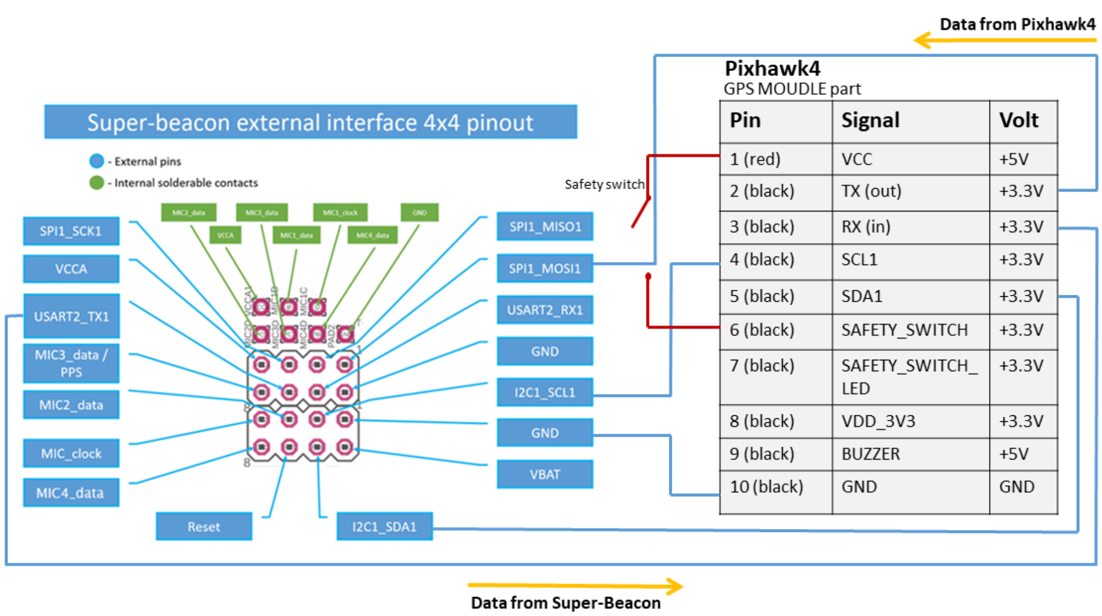


3. Wiring connections (disconnect USB from Pixhawk4 before doing this).

- Connect Pixhawk4 to Super-Beacon hedgehog:

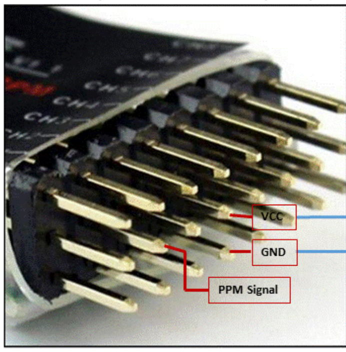


- Connect Pixhawk4 to Super-Beacon 2 and Super-Beacon 3 hedgehog:



- Connect Pixhawk4 to R8EF radio link

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

- Connect Pyxhawk4 to Holybro Pixhawk 4 Power Module (PM07):
    - Connect Power1 port on Pixhawk4 to **Pwr1** port on PM07 by 6-wires pin-to-pin cable
    - Connect **I/O PWM OUT** port on Pixhawk4 to I/O-PWM-in port on PM07 by 10-wires pin-to-pin cable

- Connect PWM inputs of SCM motor controllers on drone to FMU-PWM-out connector on PM07 board

- Adjust Marvelmind hedgehog streaming output as shown on the picture:

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

- Place stationary beacons and build map as shown in section 7.7 of operating manual (use vertical submap for precise height)

- Place two mobile beacons on drone (one connected to Pixhawk4 and second not connected) and enable paired beacons feature as shown in section 7.10 of operating manual

- Connect battery power to PM07 board. Make sure Pixhawk4 is powered after waking the Marvelmind hedgehog connected to it
- Arm the motors and try to fly