PowerBox Systems®
Industrial

for PX4

QUICK SETUP GUIDE

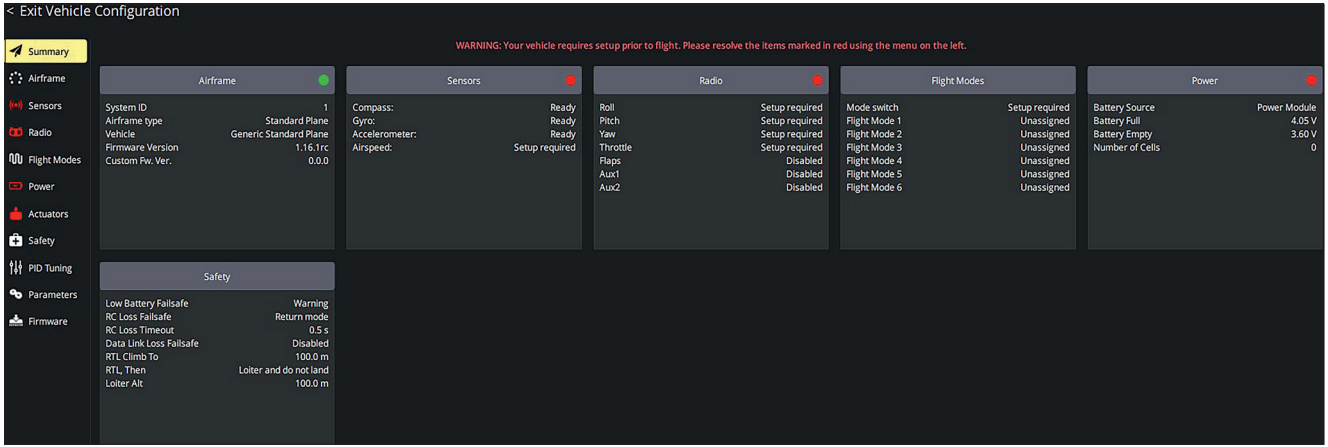
POWERCUBE ONE / POWERCUBE VR

This short manual shows the necessary steps to get our two carrier boards running with **QGroundControl** and **PX4**.

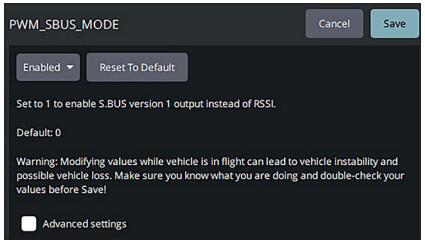
These steps must be completed before proceeding with the instructions:

- **Select the aircraft type**
- **Calibrate the accelerometers**

You will see this screen once these steps have been completed:

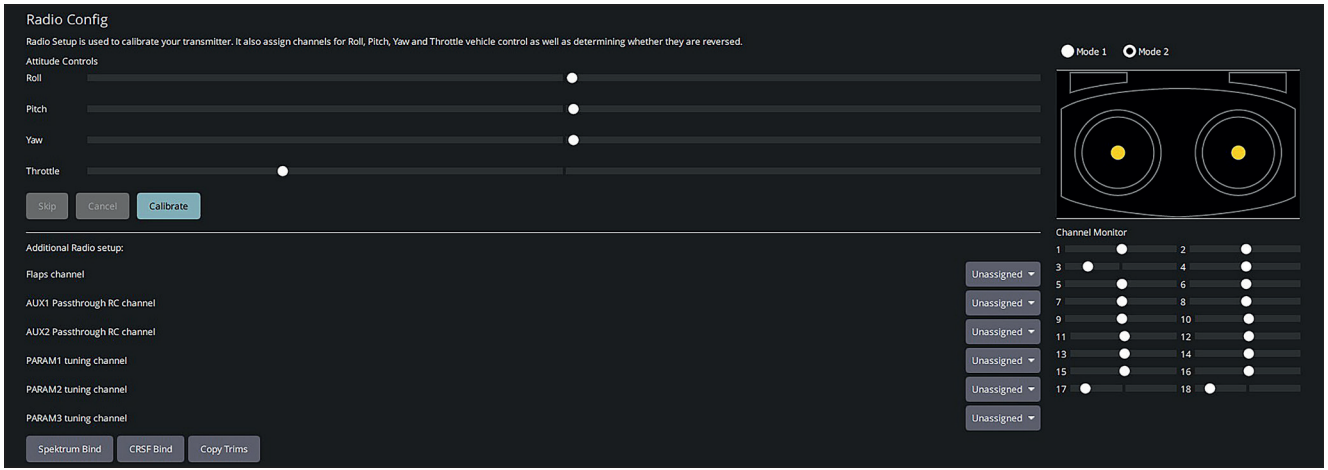


1. Activate the S.BUS output



2. Calibrate your radio

Depending on the selected aircraft type you have to learn your controls to the Flightcomputer. Example:



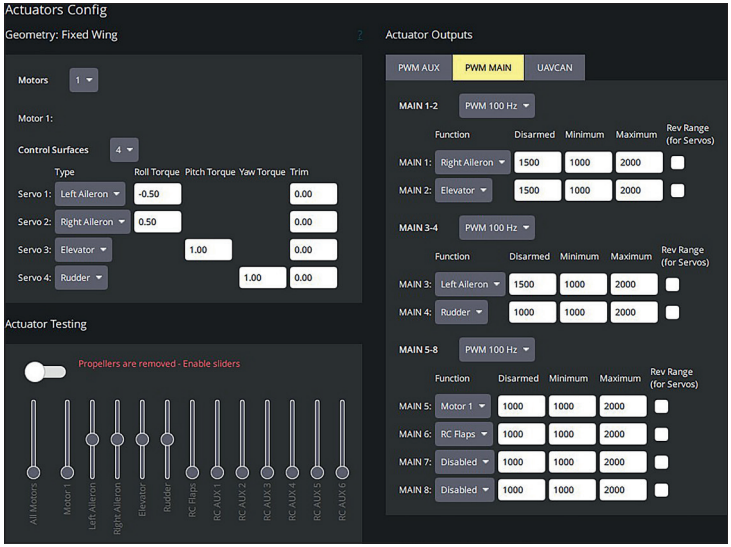
Once finished you should be able to control the outputs already in the Bypass mode.

Note: If the PowerCube is in standard configuration the channels will show up in following pattern:

1 = Output A
2 = Output B
3 = Output C ...

3. Set your Control functions

Depending on your aircraft type and your radio control channel assignment you have to set the controls in the flight computer.



4. Set the battery monitor

Unfortunately, PX4 doesn´t support the full DroneCan messages for battery status.
Only one of the two batteries can be seen in the telemetry fields on the main screen.
Using the analog inputs from the Cube shows the correct analog data in the MavLink console ***[board_adc test]*** but doesn´t show them in the telemetry fields on the main screen.

To show at least one of the two batteries activate the CAN-Bus function:

UAVCAN_BITRATE	1000000 bit/s	UAVCAN CAN bus bitrate
UAVCAN_ENABLE	Sensors Automatic ...	UAVCAN mode
UAVCAN_LGT_ANTCL	When autopilot is p...	UAVCAN ANTI_COLLISION light operating mode
UAVCAN_LGT_LAND	Always off	UAVCAN LIGHT_ID_LANDING light operating mode
UAVCAN_LGT_NAV	Always on	UAVCAN RIGHT_OF_WAY light operating mode
UAVCAN_LGT_STROB	When autopilot is a...	UAVCAN STROBE light operating mode
UAVCAN_NODE_ID	1	UAVCAN Node ID
UAVCAN_PUB_ARM	Disabled	publish Arming Status stream
UAVCAN_PUB_MBD	Disabled	publish moving baseline data RTCM stream
UAVCAN_PUB_RTCM	Disabled	publish RTCM stream
UAVCAN_SUB_ASPD	Enabled	subscription airspeed
UAVCAN_SUB_BARO	Disabled	subscription barometer
UAVCAN_SUB_BAT	Raw data	subscription battery
UAVCAN_SUB_BTN	Disabled	subscription button
UAVCAN_SUB_DPRES	Disabled	subscription differential pressure
UAVCAN_SUB_FLOW	Disabled	subscription flow
UAVCAN_SUB_FUEL	Disabled	subscription fuel tank
UAVCAN_SUB_GPS	Enabled	subscription GPS
UAVCAN_SUB_GPS_R	Enabled	subscription GPS Relative
UAVCAN_SUB_HYGRO	Disabled	subscription hygrometer
UAVCAN_SUB_ICE	Disabled	subscription ICE
UAVCAN_SUB_IMU	Disabled	subscription IMU
UAVCAN_SUB_MAG	Enabled	subscription magnetometer
UAVCAN_SUB_RNG	Disabled	subscription range finder

In this example we use the CAN-ASA as an airspeed sensor, for this we activate ***UAVCAN_SUB_ASPD.***

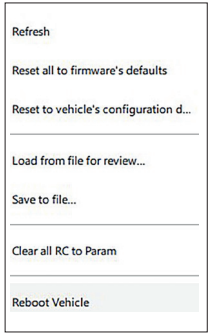
Note: Without an airspeed sensor, the flight computer cannot be activated unless the airspeed measurement is completely deactivated.

5. Set the battery type

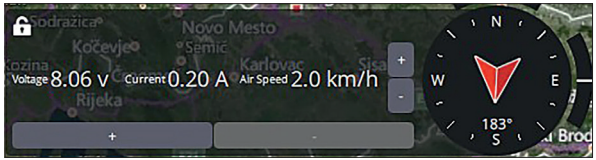
As a next step – set the battery type:

BAT1_A_PER_V	-1.00000000	Battery 1 current per volt (A/V)
BAT1_CAPACITY	-1 mAh	Battery 1 capacity
BAT1_N_CELLS	2S Battery	Number of cells for battery 1
BAT1_R_INTERNAL	-1.0000 Ohm	Explicitly defines the per cell internal resistance for battery 1
BAT1_SOURCE	External	Battery 1 monitoring source
BAT1_V_CHARGED	4.05 V	Full cell voltage
BAT1_V_DIV	-1.00000000	Battery 1 voltage divider (V divider)
BAT1_V_EMPTY	3.60 V	Empty cell voltage
BAT2_A_PER_V	-1.00000000	Battery 2 current per volt (A/V)
BAT2_CAPACITY	-1 mAh	Battery 2 capacity
BAT2_N_CELLS	Unknown	Number of cells for battery 2
BAT2_R_INTERNAL	-1.0000 Ohm	Explicitly defines the per cell internal resistance for battery 2
BAT2_SOURCE	Disabled	Battery 2 monitoring source
BAT2_V_CHARGED	4.05 V	Full cell voltage
BAT2_V_DIV	-1.00000000	Battery 2 voltage divider (V divider)
BAT2_V_EMPTY	3.60 V	Empty cell voltage
BAT3_CAPACITY	-1 mAh	Battery 3 capacity
BAT3_N_CELLS	Unknown	Number of cells for battery 3
BAT3_R_INTERNAL	-1.0000 Ohm	Explicitly defines the per cell internal resistance for battery 3
BAT3_SOURCE	Disabled	Battery 3 monitoring source
BAT3_V_CHARGED	4.05 V	Full cell voltage
BAT3_V_EMPTY	3.60 V	Empty cell voltage
BAT_AVRG_CURRENT	15.00 A	Expected battery current in flight
BAT_CRIT_THR	7.00 %	Critical threshold
BAT_EMERGEN_THR	5.00 %	Emergency threshold
BAT_LOW_THR	15.00 %	Low threshold

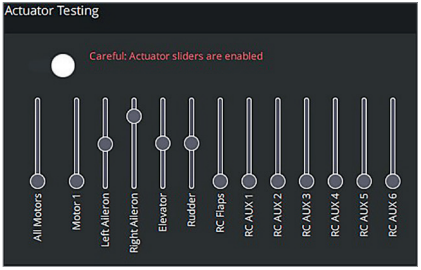
Restart the flight computer now:



You can see the battery voltage here and in the Log-Data:



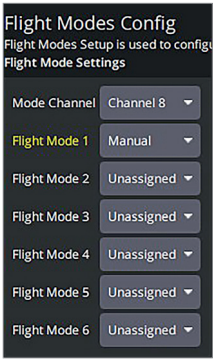
Also, you can manually check the servo outputs here:



6. Set a Flight mode

To control the outputs from the radio through the flight computer, two more things are necessary.

At least one flight mode (manual control) is necessary:



7. Arm the aircraft

Last but not least **ARM** the aircraft. If the default settings have not been changed, the model is **armed** using the rudder stick. Hold the rudder stick to the **right** for 2 seconds to arm the outputs. Hold it to the **left** for 2 seconds to **disarm** the outputs again.

Ensure that no propellers are mounted during the setup phase if electric motors are used!

Your PowerCube is now set up and ready for use. You can now adjust all other settings to suit your aircraft.

For technical questions you can contact us here:
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