PowerBox Systems®
Industrial

POWERCUBE VR

This short manual explains how to prepare the Cube flight computer for operation in the **PowerCube VR** power supply unit.
It also describes the required parameter settings in ArduPilot Mission Planner to enable communication between the
Cube flight computer and the **PowerCube VR**.

1. Connect the Cube Pilot to the **PowerCube VR** and secure it using the four screws included in the package.
2. Power up the system using at least one battery. The power input supports a voltage range from 6V to 35V.
3. Turn on the system by pressing and holding the SET button for one second. When the red LED lights up,
   press buttons I and II while continuing to hold the SET button.
4. Connect a USB cable between the Cube flight controller (FC) and your computer, then click **CONNECT** in the Mission Planner.
5. Open the **Full Parameter List** and change the settings in the recommended sequence:

a) BATT and BATT2 Parameters

Command: **BATT_MONITOR** - Option: **DroneCan-BatteryInfo**

Komando	△	Wert	Default	Einheiten	Optionen	Desc
BATT_MONITOR		8	0		DroneCAN-BatteryInfo ⌄	Controls enabling monitoring of the battery's voltage and current
					Disabled	
					Analog Voltage Only	
					Analog Voltage and Current	
					Solo	
					Bebop	
					SMBus-Generic	
					DroneCAN-BatteryInfo	
					ESC	

Command: **BATT2_MONITOR** - Option: *DroneCan-BatteryInfo*

Komando △	Wert	Default	Einheiten	Optionen	Desc
BATT2_MONITOR	8	0		DroneCAN-BatteryInfo ▼	Controls enabling monitoring of the battery's voltage and current
				Disabled	
				Analog Voltage Only	
				Analog Voltage and Current	
				Solo	
				Bebop	
				SMBus-Generic	
				DroneCAN-BatteryInfo	
				ESC	

b) CAN Parameter
Command: **CAN_P1_DRIVER** - Option: *First driver*

CAN_P1_DRIVER	1	0		First driver ▼	Enabling this option enables use of CAN buses.
				Disabled	
				First driver	
CAN_P2_DRIVER	0	0		Second driver	Enabling this option enables use of CAN buses.
				Third driver	
				0:Disabled	
CAN_SLCAN_CPORT	0	0		1:First interface	CAN Interface ID to be routed to SLCAN, 0 means no routing
				2:Second interface	

c) *BRD* Parameter

Command: ***BRD_SAFETY_DEFLT –*** Option ***0: Disabled***
Command: ***BRD_SAFETYOPTION –*** Option ***0***
Command: ***BRD_SBUS_OUT –*** Option ***3: 100Hz***

d) Write parameters
After writing the parameters, the Cube will restart and more options are available for the **BRD** and **CAN** parameters.
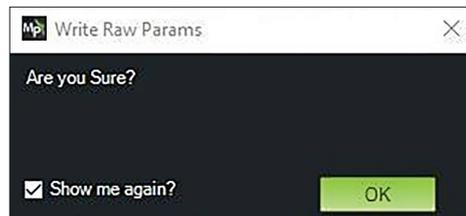
e) BATT and BATT2 Parameters

Command: *BATT_SERIAL_NUM* - Option: *0*

BATT_MONITOR	8	0		0:Disabled 3:Analog Voltage Only 4:Analog Voltage and Current	Controls enabling monitoring of the battery's voltage and current
BATT_OPTIONS	0	0			This sets options to change the behaviour of the battery monitor
BATT_SERIAL_NUM	0	-1			Battery serial number, automatically filled in for SMBus batteries, otherwise will be -1. With DroneCan it is the battery_id.

Command: *BATT2_ SERIAL_NUM* - Option: *1*

BATT2_MONITOR	8	0		0:Disabled 3:Analog Voltage Only 4:Analog Voltage and Current	Controls enabling monitoring of the battery's voltage and current
BATT2_OPTIONS	0	0			This sets options to change the behaviour of the battery monitor
BATT2_SERIAL_NUM	1	-1			Battery serial number, automatically filled in for SMBus batteries, otherwise will be -1. With DroneCan it is the battery_id.

f) CAN Parameters
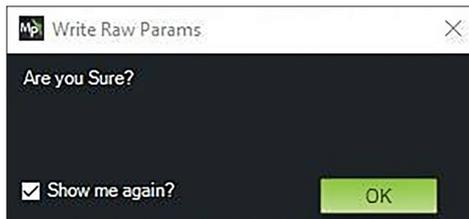
Command: *CAN_P1_FDBITRATE* – Option *1: 1M*

CAN_P1_DRIVER	1	0		0:Disabled 1:First driver 2:Second driver	Enabling this option enables use of CAN buses.
CAN_P1_FDBITRATE	1	8		1M ⌄ 1M 2M 4M 5M	Bit rate can be set up to from 1000000 to 8000000
CAN_P2_DRIVER	0	0			Enabling this option enables use of CAN buses.

Command: **CAN_LOGLEVEL** – Option **1: Log Error**

CAN_LOGLEVEL	1	0	Log Error ⌄	Loglevel for recording initialisation and debug information from CAN Interface
			Log None	
			Log Error	
CAN_P1_BITRATE	1000000	1000000	Log Warning and below	Bit rate can be set up to from 10000 to 1000000
			Log Info and below	
			Log Everything	
CAN_P1_DRIVER	1	0	1:First driver	Enabling this option enables use of CAN buses.
			2:Second driver	

g) Safe settings and restart the system

Write Raw Params ✕

Are you Sure?

☑ Show me again?   OK

When the Cube has booted up again you will see the status message: ***Cube o.k.*** in the PowerBox monitor.
This means that the servo data from the Cube is correctly received in the **PowerCube VR**.
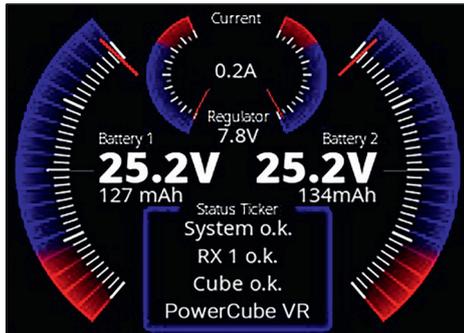
In the Mission Planner, the battery data from the **PowerCube VR** is found in the left lower corner.
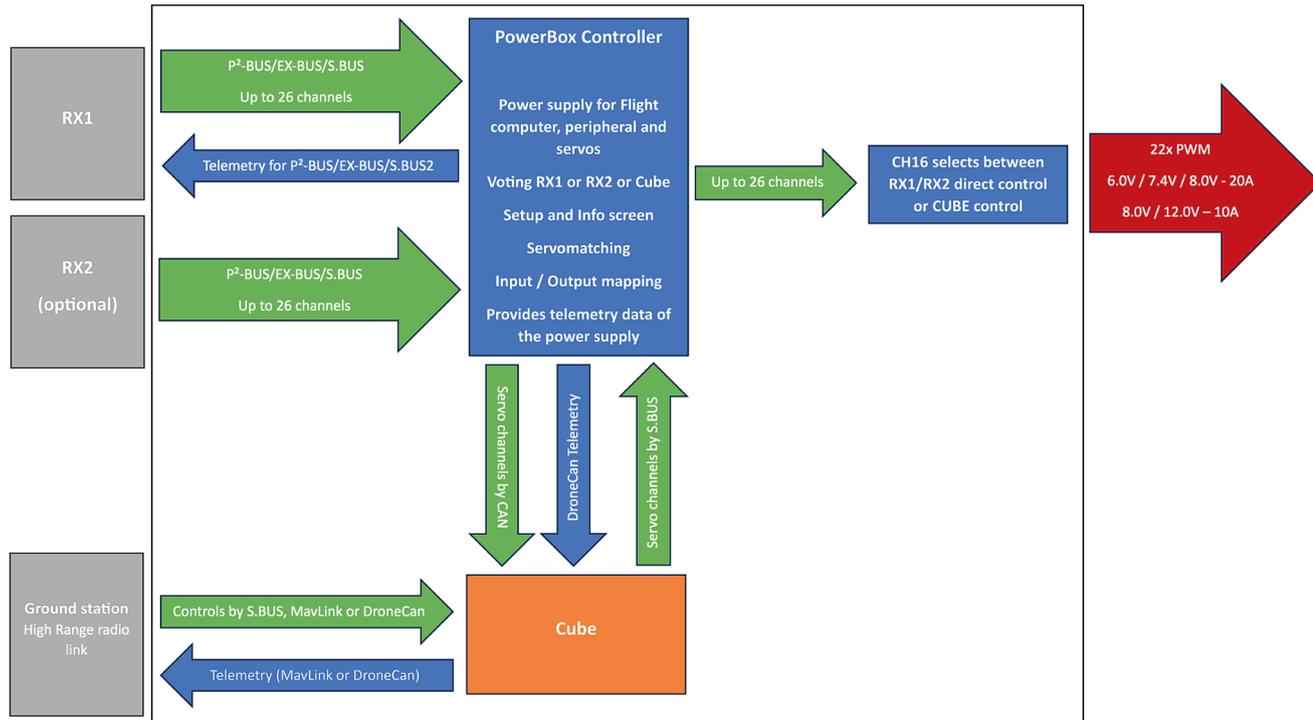
Multiple input architectures are supported for commanding the aircraft. **RX1** and **RX2** serve as the primary redundant control inputs when operating with **P² BUS, EX BUS,** or **S.BUS protocols**. The **PowerCube VR** performs input arbitration by continuously comparing both receiver streams and forwarding the validated command signal either to the Cube Flight Controller (FC) or directly to the servo output stage.

The selection between FC controlled mode and direct receiver passthrough is assigned to a dedicated switching channel; **by default, this is channel 16**, but it can be reassigned as required by the integration.

In addition to manual mode switching, the system incorporates automatic failover logic. If the Cube FC becomes unavailable or fails, control authority is immediately transferred to one of the two receivers. Conversely, if both receiver inputs are lost or invalid, the Cube FC assumes control and maintains command output based on its configured fallback behavior.

The system can also be commanded via **MavLink** or **DroneCAN** interfaces connected directly to the Cube, providing an alternative control path when RX1/RX2 inputs are not used.

You can refer to the **PowerCube VR's internal signal path architecture** to analyze how control inputs are acquired, validated, prioritized, and routed through the system:

RX1

P²-BUS/EX-BUS/S.BUS
Up to 26 channels

Telemetry for P²-BUS/EX-BUS/S.BUS2

RX2
(optional)

P²-BUS/EX-BUS/S.BUS
Up to 26 channels

PowerBox Controller

Power supply for Flight computer, peripheral and servos

Voting RX1 or RX2 or Cube

Setup and Info screen

Servomatching

Input / Output mapping

Provides telemetry data of the power supply

Up to 26 channels

CH16 selects between RX1/RX2 direct control or CUBE control

22x PWM
6.0V / 7.4V / 8.0V - 20A
8.0V / 12.0V – 10A

Servo channels by CAN

DroneCan Telemetry

Servo channels by S.BUS

Ground station
High Range radio link

Controls by S.BUS, MavLink or DroneCan

Telemetry (MavLink or DroneCan)

Cube

h) ADSB

To use the built-in ADSB, use the following settings:

ADSB_TYPE	1	1		uAvionix-MAVLink
				Disabled
				uAvionix-MAVLink
				Sagetech
				uAvionix-UCP
				Sagetech MX Series

The built-in ADSB is connected internally to serial port 5:

SERIAL5_BAUD	115	57		1 20000000 1:1200 2:2400
SERIAL5_OPTIONS	0	0		
SERIAL5_PROTOCOL	1	1		MAVLink 1

For technical questions you can contact us here:
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