



PowerBox-
Systems GmbH
Industrial 2
Powercube One
Centralita
Powerbox



PowerBox-Systems GmbH Industrial 2 Powercube One Centralita Powerbox User Guide

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PowerBox-Systems GmbH Industrial 2 Powercube One Centralita Powerbox



Specifications

- Product Name: PowerCube ONE
- Power Input Range: 6V to 35V
- Connection: USB-C port

Product Usage Instructions

Connecting Cube Pilot to PowerCube ONE:

Secure the Cube Pilot to the PowerCube ONE using the provided screws.

Powering Up the System:

Ensure at least one battery is connected within the power input range of 6V to 35V. Press the SET button for one second to turn the system on.

Setting Up Parameters in Ardupilot Mission Planner:

1. Connect the USB-C port to your computer.
2. Press CONNECT in the Mission Planner.
3. Open the Full Parameter List and follow the recommended sequence for setting up parameters related to BATT, BATT2, CAN, and BRD.
4. After changing the settings, write the parameters and allow the Cube to restart.

Verifying Connection

Once the Cube has restarted, check for the status message "Cube o.k." in the PowerBox monitor to ensure correct data transmission.

Additional Control Systems:

You can use systems like MavLink, DroneCan, or S.BUS connected to the Cube or utilize the RX1 input for bypassing the Cube Flight computer.

FAQ

- **Q: How can I get detailed receiver data?**

A: You can use the provided Script by selecting PBS_MP_Script from the download section and executing it to view detailed receiver data like Fades, Lost frames, and Holds.

- **Q: How can I contact technical support?**

A: For technical questions, you can reach out to industrialsupport@powerbox-systems.com.

Setting Up Parameters in Ardupilot Mission Planner

This short manual shows how to get the Cube flight computer ready to use in the PowerCube ONE power supply unit.

The manual includes the parameters setup in Ardupilot Mission Planner for the communication between the Cube flight computer and the PowerCube ONE.

1. Connect the Cube Pilot to the PowerCube ONE and use the 4 screws included with the package to secure it in place.
2. Power up the system with at least one battery. The power input works in a range of 6V to 35V.
3. Turn the system on by pressing the SET button for one second. Once the red LED lights up, press button I and II, while continuing to hold the SET button.
4. Connect the USB-C port to your computer and press CONNECT in the Mission Planner.
5. Open the Full Parameter List and change the settings in the recommended sequence:

BATT and BATT2 Parameters

Command: BATT_MONITOR – Option: DroneCan-BatteryInfo

Komando	Δ	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	Δ	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	

CAN Parameter

Command: CAN_P1_DRIVER – Option: First driver

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

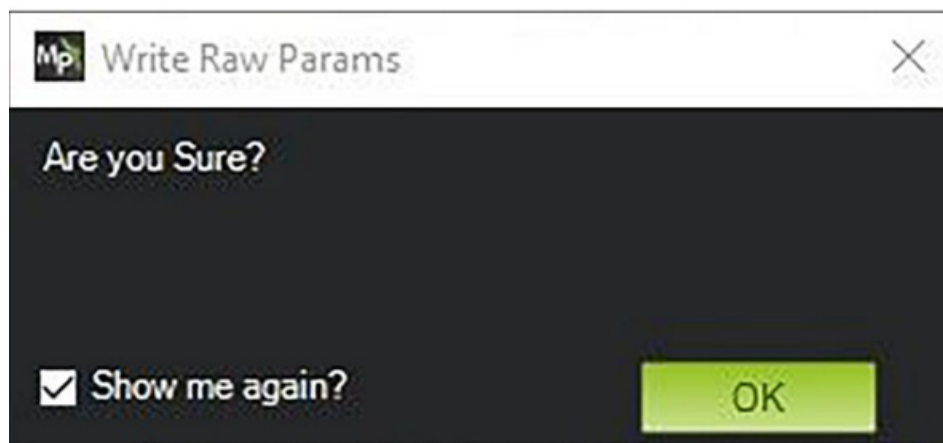
BRD Parameter

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

BRD_IO_ENABLE			0: Disabled	This parameter controls if the IOMCU is enabled. Setting to 2 will enable the IOMCU but not attempt to update firmware on startup	
BRD_OPTIONS				Options for safety button behavior	
BRD_PWM_VOLT_SEL				This controls the activation of the safety button. It allows you to control if the safety button can be used for safety enable and/or disable, and whether the button is only active when disarmed	5V output. On boards with an IOMCU that support this parameter this option only affects the 8 main outputs, not the 6 ESC noise interference computing signals to the ESCs.
BRD_RTC_TYPES				<input type="checkbox"/> ActiveForSafetyDisable <input type="checkbox"/> ActiveForSafetyEnable <input type="checkbox"/> ActiveWhenArmed <input type="checkbox"/> Force safety on when the aircraft disarms	
BRD_RTC_TZ_MIN					
BRD_SAFETY_DEFLT	0	1		0: Disabled 1: Enabled	This controls the default state of the safety switch at startup. When set to 1 the safety switch will start in the safe state (flashing) at boot. When set to zero the safety switch will start in the unsafe state (solid) at startup. Note that if a safety switch is fitted the user can still control the safety state after startup using the switch. The safety state can also be controlled in software via MAVLink messages.
BRD_SAFETY_MASK	0	0			A bitmask which controls what outputs can move while the safety switch has not been pressed
BRD_SAFETYOPTION	0	3		Set Bitmask	This controls the activation of the safety button. It allows you to control if the safety button can be used for safety enable and/or disable, and whether the button is only active when disarmed
BRD_SBUS_OUT	3	0		0: Disabled 1: 50Hz 2: 100Hz	This sets the SBUS output frame rate in Hz

Write parameters

After writing the parameters, the Cube will restart and more options are available for the BRD and CAN parameters.



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.

CAN Parameters

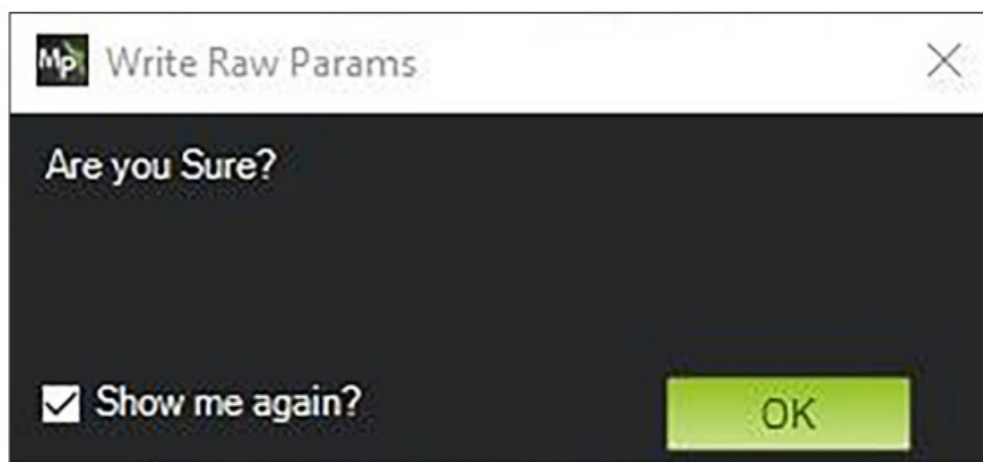
Command: CAN_P1_FDBITRATE – Option 1: 1M

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.

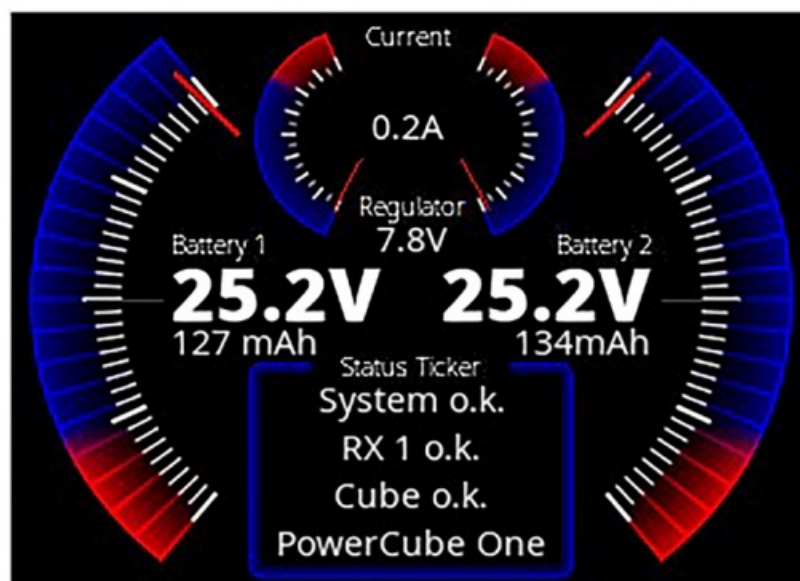
Command: CAN_LOGLEVEL – Option 1: Log Error

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

Safe settings and restart the system



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 ONE.

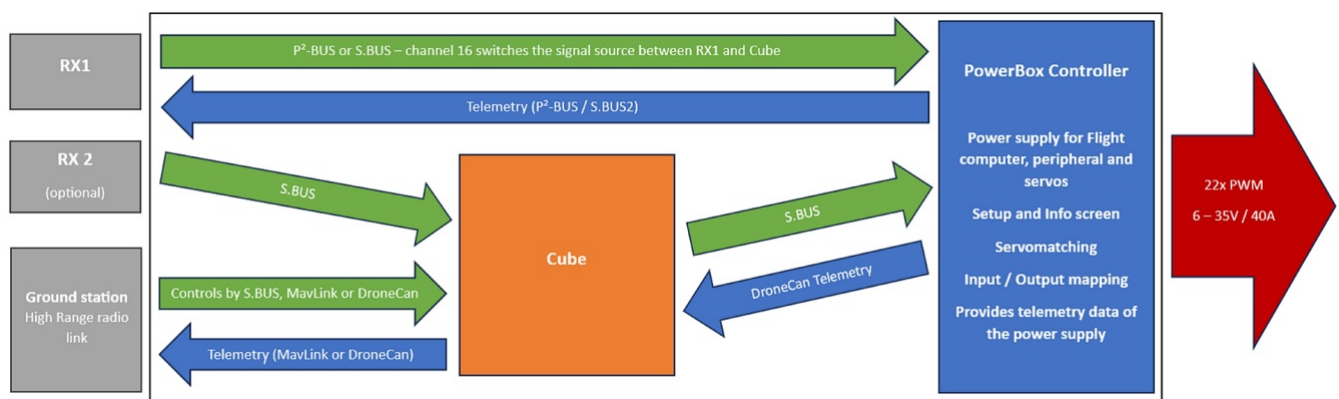


In the Mission Planner, the battery data from the PowerCube ONE is found in the left lower corner.

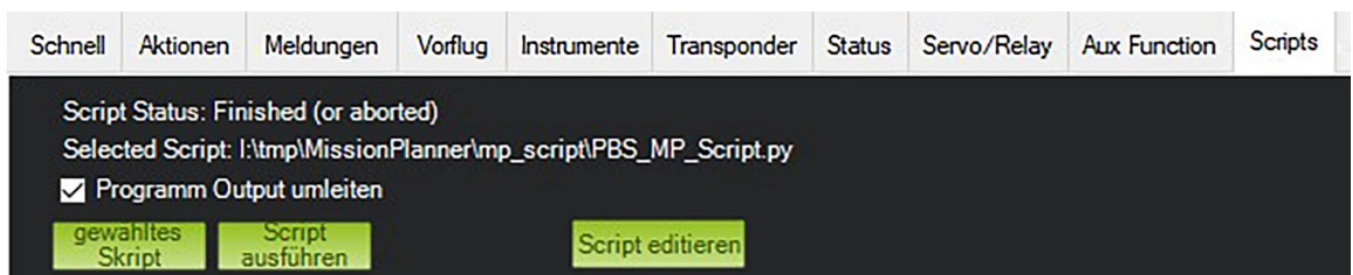


There are different systems which can be used to control the aircraft. For example, with MavLink, DroneCan or S.BUS connected to the Cube or using the RX1 input for bypassing the Cube Flight computer.

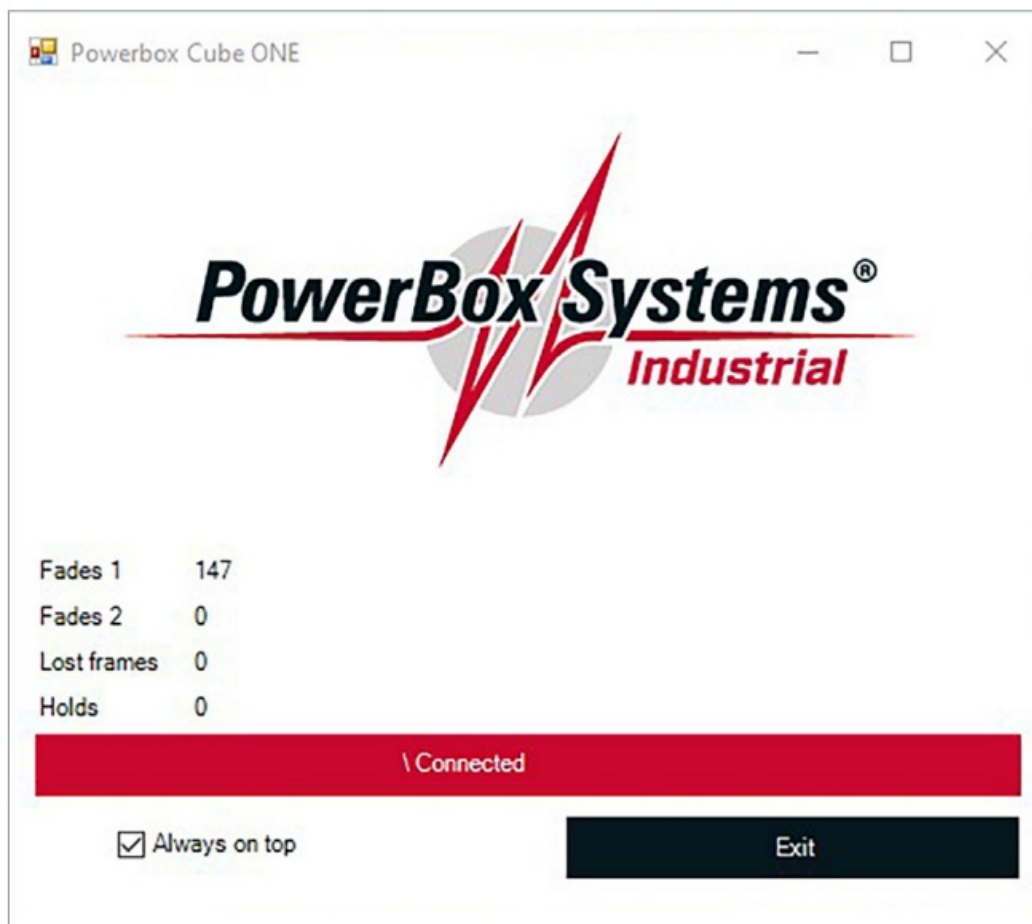
You can see the internal signal path of the PowerCube ONE to understand how it works:



For detailed receiver data like Fades, Lost frames and Holds you can use our Script. Open the Scripts tab:



Select the Script from our download section PBS_MP_Script and execute it. You will see following screen:



For technical questions you can contact us here: industrialsupport@powerbox-systems.com

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Documents / Resources



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References

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