



# QUICK SETUP GUIDE



# ENGINE MANAGER PRO

This short manual explains how to prepare the Cube flight computer for operation with the **Engine Manager Pro**. It describes the required parameter settings in ArduPilot Mission Planner to enable communication between the Cube flight computer and the **Engine Manager Pro**.

1. Connect the **Engine Manager Pro** with a CAN-Bus wire (4-poles) to the flight computer carrier board.
2. Connect a USB cable between the Cube flight controller (FC) and your computer, then click **CONNECT** in Mission Planner.
3. Open the **Full Parameter List** and change the settings in the recommended sequence:

#### a) CAN Parameter

Command: **CAN\_P1\_DRIVER** – Option: **First driver**

CAN_P1_DRIVER	1	0		First driver
				Disabled
				First driver
				Second driver
				Third driver

#### b) BRD\_SAFETY\_DEFLT

To activate the CAN-Bus Servo output you have to set the **BRD\_SAFETY\_DEFLT** to **0**.

You will need to adjust this setting in your application.

BRD_SAFETY_DEFLT	0	1		Disabled
				Enabled

c) Activate the EFI Data support

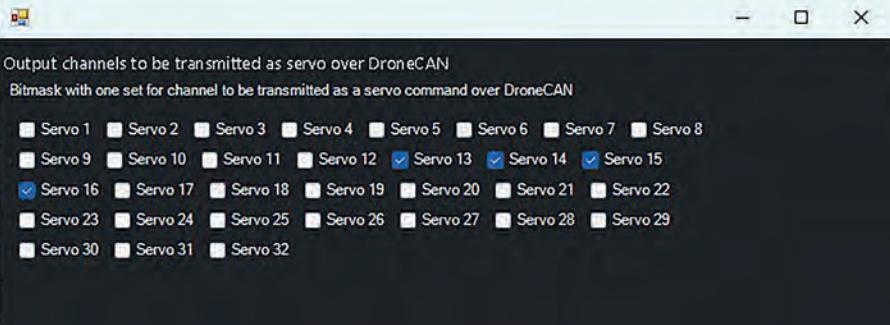
EFI_TYPE	5	0	DroneCAN	▼
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Save the parameters and **restart the flight computer before you proceed.**

d) Activate the Servo outputs at the CAN-Bus

Select the channels you want to use for:

- Switching the ignition (Standard Ch15)
- Servo outputs A / B / C
- Resetting the capacity counter

CAN_D1_UC_SRV_BM	61440	0		 <p>Output channels to be transmitted as servo over DroneCAN    Bitmask with one set for channel to be transmitted as a servo command over DroneCAN</p> <p>■ Servo 1 ■ Servo 2 ■ Servo 3 ■ Servo 4 ■ Servo 5 ■ Servo 6 ■ Servo 7 ■ Servo 8    ■ Servo 9 ■ Servo 10 ■ Servo 11 ■ Servo 12 ■ Servo 13 ■ Servo 14 ■ Servo 15    ■ Servo 16 ■ Servo 17 ■ Servo 18 ■ Servo 19 ■ Servo 20 ■ Servo 21 ■ Servo 22    ■ Servo 23 ■ Servo 24 ■ Servo 25 ■ Servo 26 ■ Servo 27 ■ Servo 28 ■ Servo 29    ■ Servo 30 ■ Servo 31 ■ Servo 32</p>
CAN_D1_UC_SRV_RT	50	50	Hz	
CAN_D2_PROTOCOL	1	1		
CAN_D2_PROTOCOL2	0	0		
CAN_LOGLEVEL	0	0		
CAN_P1_BITRATE	1000000	1000000		
CAN_P1_DRIVER	1	0		

## e) Telemetry

You will find the **Engine Manager Pro** in the CAN-Inspector with following messages:

```
[-] ID 13 - com.powerbox-systems.Engine_Manager ~570Bps
  [-] uavcan_equipment_device_Temperature (2,7 Hz, #1110) ~13Bps
  [-] uavcan_equipment_esc_Status (5,3 Hz, #1034) ~75Bps
  [-] uavcan_equipment_ice_reciprocating_Status (10,0 Hz, #1120) ~450Bps
  [-] uavcan_protocol_GetNodeInfo_res (0,3 Hz, #1) ~25Bps
  [-] uavcan_protocol_NodeStatus (1,0 Hz, #341) ~7Bps
```

**The Messages contain:**

**- *uavcan\_equipment\_device\_Temperature***

- 4x Temperature A – D

**- *uavcan\_equipment\_esc\_Status***

- 4x Temperature A – D
- Voltage of the ignition power supply
- Current of the ignition power supply
- Used capacity of the ignition power supply
- RPM

**- *uavcan\_equipment\_reciprocating\_Status***

- Exhaust gas temperature (Temp. input A)
- Cylinder head temperature (Temp. input B)
- Intake manifold temperature (Temp. input C)
- RPM
- Estimated consumed fuel\*
- Fuel consumption rate\* cm<sup>3</sup>

\* To get the fuel consumption and the fuel consumption rate

you have to connect a **Smoke-EL Fuel Sensor** to the P<sup>2</sup>-BUS output.  
No further settings are required.

## f) CAN-Settings

You can make all settings of the **Engine Manager Pro** in the CAN-BUS Menu:

Komando	Δ	Wert	Min	Max	Default	Fav
Channel.A		12	0	26	0	<input type="checkbox"/>
Channel.B		13	0	26	0	<input type="checkbox"/>
Channel.C		14	0	26	0	<input type="checkbox"/>
Channel.Ignition		15	0	26	0	<input type="checkbox"/>
Fuel.Tank.Size		50	5	500	0	<input type="checkbox"/>
Ign.Voltage		6.0V			6.0V 8.0V 12.0V	<input type="checkbox"/>
Reset.Cap		16	0	26	0	<input type="checkbox"/>
RPM.Factor		1 : 1			1:1 1:2 1:3 1:4 2:1 3:1 4:1	<input type="checkbox"/>
uavcan.node_id		13	1	127	13	<input type="checkbox"/>

- Channel A – C: Channel settings for the Servo outputs
- Channel Ignition: Switching channel for the Ignition power output. The threshold is at +50% throw
- Reset Cap: Channel to reset the capacity measurement for the ignition battery
- Fuel Tank Size, 50 means 5.0l
- Ign. Voltage, depending on your ignition type, select between 6.0V, 8.0V or 12.0V
- RPM Factor is a factor for the revolution calculation. For example if your engine has 2 magnets, select 2:1

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

## **PowerBox-Systems GmbH**

Dr.-Friedrich-Drechsler-Straße 35  
86609 Donauwörth  
Germany

 +49 906 99999-200

 [sales@powerbox-systems.com](mailto:sales@powerbox-systems.com)

**[www.powerbox-systems.com](http://www.powerbox-systems.com)**