

QUICK SETUP GUIDE



PowerBox Systems[®]
Industrial

for
PX4



ENGINE MANAGER PRO

First, **UAVCAN_ENABLE** and **UAVCAN_SUB_ICE** must be set:

Show modified only		
UAVCAN_BITRATE	1000000 bit/s	UAVCAN CAN bus bitrate
UAVCAN_ENABLE	Sensors and Actuat...	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	Disabled	subscription airspeed
UAVCAN_SUB_BARO	Disabled	subscription barometer
UAVCAN_SUB_BAT	Raw data	subscription battery
UAVCAN_SUB_BTN	Disabled	subscription button
UAVCAN_SUB_DPRES	Enabled	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	Enabled	subscription ICE
UAVCAN_SUB_IMU	Disabled	subscription IMU
UAVCAN_SUB_MAG	Enabled	subscription magnetometer
UAVCAN_SUB_RNG	Disabled	subscription range finder

A reboot is then required.

To operate the servo outputs on the **Engine Manager** and control the ignition, the AUX channels on the CAN bus must be enabled. In this example, 4 AUX outputs are enabled to control the ignition and use all 3 servo outputs.

Actuator Outputs

PWM AUX
PWM MAIN
UAVCAN

Configure: Sensors and Actuators (ESCs) Automatic Config ▼

ESCs

	Function	Minimum	Maximum	Rev Range (for Servos)
ESC 1:	Disabled ▼	1	8191	<input type="checkbox"/>
ESC 2:	Disabled ▼	1	8191	<input type="checkbox"/>
ESC 3:	Disabled ▼	1	8191	<input type="checkbox"/>
ESC 4:	Disabled ▼	1	8191	<input type="checkbox"/>
ESC 5:	Disabled ▼	1	8191	<input type="checkbox"/>
ESC 6:	Disabled ▼	1	8191	<input type="checkbox"/>
ESC 7:	Disabled ▼	1	8191	<input type="checkbox"/>
ESC 8:	Disabled ▼	1	8191	<input type="checkbox"/>

Servos

	Function	Disarmed	Minimum	Maximum	Rev Range (for Servos)
Servo 1:	RC AUX 1 ▼	500	0	1000	<input type="checkbox"/>
Servo 2:	RC AUX 2 ▼	500	0	1000	<input type="checkbox"/>
Servo 3:	RC AUX 3 ▼	500	0	1000	<input type="checkbox"/>
Servo 4:	RC AUX 4 ▼	500	0	1000	<input type="checkbox"/>
Servo 5:	Disabled ▼	500	0	1000	<input type="checkbox"/>
Servo 6:	Disabled ▼	500	0	1000	<input type="checkbox"/>
Servo 7:	Disabled ▼	500	0	1000	<input type="checkbox"/>
Servo 8:	Disabled ▼	500	0	1000	<input type="checkbox"/>

Bitrate: 1000000

The channels from the RC transmitter must now be assigned to the AUX outputs. It is important to note that the DroneCan protocol starts at AUX0, whereas PX4 starts at AUX1.

Therefore, if channel 10 of the RC transmitter is to be used, channel 9 must be selected here, as shown in the example.

RC_MAP_AUX1	Channel 9	AUX1 Passthrough RC channel
RC_MAP_AUX2	Channel 10	AUX2 Passthrough RC channel
RC_MAP_AUX3	Channel 11	AUX3 Passthrough RC channel
RC_MAP_AUX4	Channel 12	AUX4 Passthrough RC channel

In **Engine Manager** itself, the channels for the ignition switch and the servo outputs are set either via the P²-BUS connection and a receiver, or simply using the Mobile Terminal. AUX1 corresponds to channel 1 here.

The screenshot shows the 'Standard' menu of the Engine Manager. At the top, there are battery level indicators, the time 11:05, and a 'Standard' mode selector. Below this is a 'Main Menu' with a 'Prev.' button on the left and a 'Next' button on the right. The menu items are:

Item	Value	Navigation
Ign. Voltage	6.0V	<< >>
Channel Ignition	1	<< >>
Channel Out A	2	<< >>
Channel Out B	3	<< >>
Channel Out C	4	<< >>
Reset Cap.	16	<< >>

The telemetry data for three temperatures, RPM and fuel consumption (only in conjunction with the Smoke-EL Fuel Sensor) can be obtained from the **EFI_STATUS** message.

Message:	EFI_STATUS (225)
Component:	1
Count:	86
Actual Rate:	2.0Hz
Set Rate:	Default ▼

Name	Value
health	2
ecu_index	0
rpm	2486
fuel_consumed	5000
fuel_flow	0
engine_load	0
throttle_position	0
spark_dwell_time	nan
barometric_pressure	nan
intake_manifold_pressure	nan
intake_manifold_temperature	273.25
cylinder_head_temperature	297.25
ignition_timing	nan
injection_time	nan
exhaust_gas_temperature	273.25
throttle_out	0
pt_compensation	nan
ignition_voltage	0
fuel_pressure	0

To also obtain the data for the voltage and current of the ignition power supply, as well as all four temperature sensors, the ESC messages must be used:

UAVCAN_EC_FUNC1	Motor 1	UAVCAN ESC 1 Output Function
UAVCAN_EC_FUNC2	Motor 1	UAVCAN ESC 2 Output Function
UAVCAN_EC_FUNC3	Motor 1	UAVCAN ESC 3 Output Function
UAVCAN_EC_FUNC4	Motor 1	UAVCAN ESC 4 Output Function

In the **ESC_STATUS** message, you can now see the RPM, voltage and current of the ignition.

Message:	ESC_STATUS (291)
Component:	1
Count:	78
Actual Rate:	2.3Hz
Set Rate:	Default ▾
Name	Value
index	0
time_usec	301078100
rpm	2486, 2486, 2486, 2486
voltage	6.96875, 6.96875, 6.96875, 6.96875
current	0, 0, 0, 0

In the **ESC_INFO** message, all four temperatures are transmitted:

Message:	ESC_INFO (290)
Component:	1
Count:	158
Actual Rate:	3.6Hz
Set Rate:	<input type="button" value="Default"/>
Name	Value
index	0
time_usec	333078461
counter	1659
count	4
connection_type	4
info	15
failure_flags	0, 0, 0, 0
error_count	0, 0, 0, 0
temperature	2410, 10, 10, 10

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