

## UxV/35<sup>™</sup> Flight Controller Parameters and Calibration

## Introduction

This document is instructions on how to load parameters and then calibrate a flight controller in order to prepare the unit for UAV use.

- **1.** Connect a GPS module on top of the flight controller (FC).
- **2.** Power the stack with either the USB connector on the FC or use a power base board
- **3.** Connect the flight controller to the computer through the **USB mini-B** connector.
- **4.** Connect to the Flight controller through Mission Planner (top right drop down, select the COMxxx-Ardupilot options, then select "connect").
- 5. Once you have connected to mission planner, at the top of the window select Config. On the left menu that appears select Full parameter list. Then on the right of the window there will be an option to "Load from file". Click on the button and a directory window will appear. Next choose the current parameter file for the intended drone which can be found at Kairos82nd.com/downloads

Mission Planner 1.3.80 build 1.3.8479.20539 ArduCopter V4.3.3 (34e8e02c)							_		
DATA PLAN SETUP CONF							• 57600 •		
Full Parameter List	Name $\Delta$	Value	Units	Options	Desc	Fav	^	Load from file	
Full Parameter Tree	ACRO_BAL_PITCH			0 3	rate at which pitch angle returns to level in acro and sport mode. A higher value causes the vehicle to return to level faster. For helicopter sets the decay rate of the virtual flybar in the pitch axis. A higher value causes faster decay of desired to actual attlude.			Save to file	
Planner	ACRO_BAL_ROLL			0 3	rate at which roll angle returns to level in acro and sport mode. A higher value causes the vehicle to return to level faster. For helicopter sets the decay rate of the virtual flybar in the roll axis. A higher value cause faster decay of desired to actual attitude.			Write Params Refresh Params	
	ACRO_OPTIONS				A range of options that can be applied to change acro mode behaviour. Air-mode enables ATC_THR_MIX_MAN at all times (air-mode has no effect on helicopters). Rate Loop Only disables the use of angle stabilization and uses angular rate stabilization only.			Compare Params	
	ACRO_RP_EXPO	-0.05		-0.5 0.950:Disabled 0.1:Very Low 0.2:Low 0.3:Medium 0.4:High 0.5:Very High	Acro roll/pitch Expo to allow faster rotation when stick at edges			All Units are in raw	
	ACRO_RP_RATE	360	deg/s	1 1080	Acro mode maximum roll and pitch rate. Higher values mean faster rate of rotation		f	ormat with no scaling	
	ACRO_RP_RATE_TC	0	s	0 10.5:Very Soft 0.2:Soft 0.15:Medium 0.1:Crisp 0.05:Very Crisp	Acro roll and pitch rate control input time constant. Low numbers lead to sharper response, higher numbers to softer response		3	DR_lris+_AC34. 👻	
	ACRO_THR_MID			01	Acro Throttle Mid			Load Presaved	
	ACRO_TRAINER	0		0:Disabled 1:Leveling 2:Leveling and Limited	Type of trainer used in acro mode			Reset to Default	
	ACRO_Y_EXPO	0		-1.0 0.950:Disabled 0.1:Very Low 0.2:Low 0.3:Medium 0.4:High 0.5:Very High	Acro yaw expo to allow faster rotation when stick at edges		S	earch	
	ACRO_Y_RATE	1	deg/s	1 360	Acro mode maximum yaw rate. Higher value means faster rate of rotation				
		0		0 10.5:Very Soft 0.2:Soft 0.15:Medium	Acro yaw rate control input time constant. Low numbers lead to sharper response, higher			Modified	

- 6. Click write params button.
- 7. Power cycle the Flight Stack.
- **8.** Parameters are now updated and flight controller can now be calibrated.
- **9.** Before calibration make sure 3D, GPS fix is acquired.
- **10.** In mission planner at the top, select **setup** then **Mandatory Hardware**. Select **Accelerometer Calibration**.
- **11.** Set the Flight Stack to the level position and follow the steps for both **level** calibration and Accelerometer calibration.





**12.** On the left menu select **compass calibration**. Hit start and rotate the Flight Stack until test is complete and the prompt stating to restart the flight controller pops up.



- **13.** Once the prompt shows up be sure to restart the Flight Controller.
- **14.** Re-connect the Flight controller to the computer and select data at the top left of the window. Ensure the flight controller shows correct telemetry data when rolled in the respective direction.
- **15.** The Flight Stack is ready for use.