# Infinity MR PRO Gimbal Manual



# H A R STUDIO

### Manual: v.01

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### 1. DISCLAIMER & WARNING

The disclaimer shall be read carefully before using the product – InfinityMR PRO THE PRODUCT IS NOT SUITABLE FOR PEOPLE UNDER THE AGE OF 18.

HD Air Studio is not liable for:

- 1. Damages caused by the misuse of the product.
- 2. Damages caused by users under the influence of intoxicants.
- 3. Health impairments caused by the misuse of the product.
- 4. Damages caused by using the product in severe weather conditions
- 5. Damages caused by the wrongful storage of the product.
- 6. Damages caused by gimbal modification
- 7. Damages caused by taking gimbal apart
- 8. Damages caused by changing gimbal software setup

InfinityMR PRO Gimbal warranty does not include damages caused by:

- 1. Not applying to the manual.
- 2. Improper usage of the device.
- 3. Improper storage of the device.
- 4. Device exploitation resulting from its improper usage.
- 5. Wear and tear.

# 2. TECHNICAL OVERVIEW

Gimbal weight	885g/1025g including/excluding Orbit damping system			
Supported cameras	Up to 1,3g weight			
	(GH5 <sup>1</sup> /GH4/GH3/A7S/A7RII/BMPCC/A6000/A6300			
	etc.)			
Maximum camera size	Height: 104mm; Width: 130-140mm (depending on			
	balancing); Length: approximately			
	100mm (camera body; depends on balancing and camera			
	lens weight)			
Motors	28 poles – built-in magnetic encoders			
Operating voltage	13.5-24V (4S LiPo recomended) <sup>2</sup>			
Rigid construction – carbon fiber & aluminum				
Different motors on all axes to provide the best torque an	d stabilization			
Camera IMU housing under the camera shelf				
12 channel Slip Ring with three free channels				
Gimbal comes ready to use out of the box				
Easy and fast balancing with thumbscrews				
Box-shape camera shelf allows to mount AV tx/ HDMI converters etc				
Adjustable multirotor mounting rails with 12mm tube clam	Z			
100% Europe-based production				

If you use bigger cameras with HDMI output you need to use 90 degrees angle connector.



<sup>&</sup>lt;sup>1</sup> For Panasonic Lumix GH5 Lens should be heavier then 100g

<sup>&</sup>lt;sup>2</sup> Using batteries different then 4S might require change of settings

You can order it from our store <u>http://store.hdairstudio.com/</u>

# **3. GIMBAL OUTPUTS AND CONNECTORS**



RC yaw :

- Brown GND
- Red +5V
- Yellow -Signal



### InfinityMR PRO – Universal 3 axis Gimbal www.hdairstudio.com



# 4. CONNECTION DIAGRAM



InfinityMR PRO – Universal 3 axis Gimbal www.hdairstudio.com

### 5. BOX CONTENTS

- 1. Gimbal
- 2. USB cable
- 3. "Orbit" damping plate
- 4. Upper camera support bracket (for smaller cameras)
- 5. External equipment mount plate
- 6. 3M dual lock tape
- 7. Camera bolt
- 8. JST cable
- 9. 2x RC cable
- 10. Wiring diagram



# 6. MECHANICS ASSEMBLING

For the final mechanics assembling, please connect the Orbit damping plate to the yaw motor.

**WARNING** I If you want to use gimbal without quick connector make sure screws are not too long – it may cause damage of the motor.

Use the allen key to tighten screws. Do not use too much pressure. Refer to the following picture.

After mounting the Orbit anti-vibration plate to the yaw motor, connect the gimbal to your multirotor frame. For this you can use 12mm aluminum tube clamps (recommended).

Infiniy MR PRO comes witch quick connector. Top part of quick connector is already screwed onto orbit damping plate.

If you want to use Gimbal on multirotor first install orbit damping plate on your multirotor using 12mm tube clamps. Once damping plate is mounted on multirotor make sure that release clamp is in open position. Slide quick connector (with gimbal) on mounting plate attached to orbit damping plate. Make sure that you slide it properly (both parts of quick connector should line up). Now you can close release clamp. - **Photo 1** 



Photol

Quick release system makes it easier to change from multirotor to hand held or stand (it takes less than a minute). Mounting plate has few fitting options with typical photo and metric threads see picture below – **Photo 2** 



Photo 2

Gimbal is supplied with only one connector but if you need more of them for your other devices you can order them from our store – link below:

#### http://store.hdairstudio.com/

Infinity MR PRD is equipped with extra plate which can be mounted under Yaw motor. This plate gives you more space to put battery and any additional equipment. **Photo 3** 



Photo 3

### 7. GIMBAL BALANCING

Satisfactory stabilization performance is possible only with a properly balanced gimbal. In order to balance your gimbal in all 3 axes, follow the rules below:

- 1. Mount the gimbal on your multirotor it is crucial for a proper balancing and tuning process.
- 2. Put your multirotor on a stable, level surface.
- 3. Mount your camera with lens, battery, SD card etc. on the gimbal camera shelf -**Photo 1.**
- a) With your camera mounted on the shelf, find a place where a camera shelf remains levelled to the ground.
  4. Unscrew a little thumbscrews to balance the pitch axis Photo 2.
  - b) By moving a camera box up and down, find a place where a camera can stay put in every position of the pitch axis (e.g. rotate camera by 30 / 60/90 degrees, if it stays in every position, balancing is made properly).
  - c) Once camera is properly balanced place upper support above camera hot shoe. Remove blind/cover from hot shoe and in that place slide in bottom plate of support. Make sure that screws are properly tighten. – Photo 3
- 5. Unscrew little thumbscrew to balance the roll axis.
  - a) By moving camera box to the left and to the right, find a place where a camera can stay put in every position of the roll axis (e.g. rotate a camera by 10 / 20/30 degrees, if it stays in every position, balancing is made properly) Photo 4.
- 6. Unscrew a little thumbscrew to balance the yaw axis.
  - a) Tilt your multirotor frame by 20 degrees (left/right or forward/backward)
  - b) Hold the gimbal by thumbscrews under the yaw motor. By moving gimbal back and forth, find a place where a gimbal can stay put in every position of the yaw axis (e.g. rotate a camera by 20 / 30/45 degrees, if it remains put in every position, the balancing process was conducted properly) – Photo 5.
- 7. Make sure that all thumbscrews and screws are tighten properly.

Mount your camera on the camera shelf by using camera bolt. In the first step of ballancing camera make sure that you can easily move camera back and forth. Correct position of camera is set when camera remains parallel to the ground. Photo 1 Use thumb screws to move camera shelf up and down. Once you find the ballance point tighten thumb screws to correct position. anon FC



Photo 3



Photo 4



Photo 5



A properly balanced gimbal stays put in every position. The balancing process was conducted properly!

### 8. ALEXMOS CONTROLLER

InfinityMR PRO is equipped with a well-known AlexMos controller. It is advised that you will get to know AlexMos controller manual before using the InfinityMR PRO gimbal. HD Air Studio does not take responsibility for damages of a product caused by the ignorance of AlexMos manual.

Each InfinityMR PRD gimbal is running on a specially licensed firmware that enables the application of encoders. Every AlexMos board has its unique serial number. In case of damaging a AlexMos controller, it is possible to transfer your encoder license to another controller, but only after reporting the serial number to <u>www.basecamelectronics.com</u>.

All information about AlexMos controller can be found here: <u>www.basecamelectronics.com</u>

Manual for the latest AlexMos controller <u>https://www.basecamelectronics.com/files/v3/SimpleBGC\_32bit\_manual\_2\_6x\_en</u> <u>g.pdf</u>

Manual for Encoders and AlexMos: <u>https://www.basecamelectronics.com/files/SimpleBGC\_32bit\_Encoders.p</u> <u>df</u>

### 9. GETTING STARTED

- 1. With a camera installed on the gimbal, connect the battery to the gimbal (red JST power plug). HD Air Studio recommends to use a fully charged 4S LiPo battery as power source.<sup>1</sup>
- 2. Make sure that your gimbal can freely rotate in all axes.
- 3. Switch on the gimbal by using a power switch.
- 4. Gimbal will turn on within 1-2 seconds and it is ready to use.
- 5. Gimbal by default is set to follow mode in the yaw axis (it will follow multirotor move in yaw/pan axis). In order to change that, please refer to AlexMos Controller manual available at <a href="http://www.basecamelectronics.com">www.basecamelectronics.com</a>
- 6. Gimbal by default can be operated via a standard PWM signal in two axes: pitch/tilt and yaw/pan. To control those two axis, connect your radio control receiver by using two cables coming out the gimbal (RC\_PITCH and RC\_YAW). RC\_YAW cable has 3 wires: white signal; red 5V; black ground. You can use this cable to power your radio control receiver. RC\_PITCH cable is only one wire: white signal.

### 10. CHANGING ALEXMOS CONTROLLER DEAFAULT SETTINGS

- 1. Download AlexMos latest GUI configurator form <u>www.basecamelectronics.com</u> web site.
- 2. Make sure you have installed all necessary drivers on your PC/MAC.
- 3. Open AlexMos GUI configurator.
- 4. Make sure that a camera is properly installed on the gimbal. Gimbal has to be installed on a multirotor/drone frame or handheld.
- 5. Connect USB cable to InfinityMR PRO Gimbal.
- 6. Power on the gimbal.
- 7. Connect USB cable to PC/MAC
- 8. Choose proper USB port from the list available on GUI configurator and press "Connect" button.
- 9. Now you can change all settings of AlexMos controller.
- 10. NOTE: To change any setting of AlexMos controller refer to the manual available at <a href="http://www.basecamelectronics.com">www.basecamelectronics.com</a>
- 11. HD Air Studio recommends not to change any settings in "Encoders" tab without good knowledge of AlexMos controller manual.

<sup>&</sup>lt;sup>1</sup> 4S 1000mah Lipo battery allows to use a gimbal for 35-90min depending on the camera weight.

### 11. USING PPM-SUM, FUTABA S-BUS OR DSM2/DSMX RECEIVER

- To enable the operation of all 3 axes and launch additional features available on AlexMos controller, you can use PPM-SUM, Futaba S-BUS and DSM2/DSMX signal receivers. Connect your receiver using RC\_ROLL cable (white wire is a signal wire and should be connected to PPM-SUM, Futaba S-BUS, DSM2/DSMX signal port on your receiver). To power your receiver you can use RC\_YAW cable.
- 2. Open AlexMos GUI configurator and connect USB cable to the gimbal and PC/MAC.
- 3. Go to "RC Settings" tab in AlexMos GUI configurator.
- In "Input Mapping" section change "RC\_ROLL pin mode" to desired SUM PPM; Fustaba S-BUS or DSM2/DSMX connection type. – Photo 1
- 5. Now you can choose any radio control virtual channel for each feature you want to enable. Photo 2
  - E.g. If you use Futaba S-BUS, you need to select "Futaba s-bus RC\_ROLL pin mode". To operate the ROLL axis you can use RC\_VIRT\_CH\_9; to operate the PITCH axis you can use RC\_VIRT\_CH\_10 and to operate the YAW axis you can use RC\_VIRT\_CH\_11. To operate CMD you can use RC\_VIRT\_CH\_12.
- 6. After all changes are introduced, press "Write" to save the settings. Photo 3

SimpleBGC32 GUI v2.62 b6		1 1 marcon	-	Adding memory	Aatti	
File Board Language Vi	ew Help					
Connection				Profile		
COM5		Disconnect	🔄 BLE	Profile1		✓ Rename
Board: version 3.0		Firmware:	2.60 b4	Load	Save	basecamelectronics.com
Firmware Upgrade Stabilization RC S	Encoders Settings	MavLink Follow mode	Scripting Hardware	Analyze Debu Service d	ug Monitoring Adjustable Variables	
RC Signal						
RC_ROLL		RC_PITCH		RC_YAW		
RC_CMD		EXT_FC_ROLL		EXT_FC_PITCH		W E
Input Configuration						0.00 0.00
RC_ROLL pin mode:	Futaba s-bus	$\sim$	Spel	trum data and bind mod	le:	
ROLL	Normal (PWM	or Analog)	Aut	o-detection (default)		NY PP
РІТСН	Sum-PPM Futaba s-bus		Anal	og joystick auto-detectior		
YAW	Spektrum DSI SBGC Serial A	M2/DSMX API 2nd UART		ADC1 ADC2	ADC3	
CMD	no input		Mix s	ignal from FC_ROLL, F(	C_PITCH inputs:	
FC_ROLL	no input		nor	ie 🗸 🗸	0 🗘 %	0.00 0.00
FC_PITCH	no input		nor	ie 🗸 🗸	0 🗘 %	addi AM
						N N PP
MOTORS ON/OFF				READ	WRITE	
Sensor is not connected; A	ccelerometer i	s not calibrated		Cycle time (us):	801 I2C errors: 0	
Turn off power and check I2	C sensor conne	ction. NEVER CONNE	ECT SENSOR	WHEN BOARD IS POWE	RED!; Simple	PITCH -
calibration: Level sensor ho calibration see instruction n	rizontally as pre	cise as possible, and	then press "C	ALIB_ACC". For more pr	ecise six-point	
						Carl Martin
Parameters successfully load	led from board.					BAT 0.0



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SimpleBGC32 GUI v2.62 b6						
File Board Language View	/ Help					
Connection				Profile		
COM5		Disconnect	🔄 BLE	Profile1		Rename
Board: version 3.0		Firmware:	2.60 b4	Load	Save	basecamelectronics.com
Firmware Upgrade Stabilization RC Set	Encoders ttings	MavLink Follow mode	Scripting Hardware	Analyze Debug Service Adju:	Monitoring stable Variables	
RC Signal						
RC_ROLL		RC_PITCH		RC_YAW		
RC_CMD		EXT_FC_ROLL		EXT_FC_PITCH		W E
Input Configuration			Onaldr	um data and bind mode:		0.00 0.00
RO_ROLL pin mode.	Futaba s-bus	$\sim$	Бреки	um data and bind mode.		
ROLL	RC_VIRT_CH	_3 🗸 🗸	Auto-	detection (default)		NY PPI
РІТСН	RC_VIRT_CH	_3	Analog	joystick auto-detection:		
YAW		_4	🗌 A	DC1ADC2	ADC3	
CMD F	RC_VIRT_CH	_6				BOLL
F	RC_VIRT_CH	_7	Mix sig	nal from FC_ROLL, FC_PI	TCH inputs:	
FC_ROLL F	RC_VIRT_CH_	_8 9	none		0 🗘 🎋	0.00 0.00
FC_PITCH	RC_VIRT_CH	_10	none		0 🗘 %	1.1.1.1.N
	_					NIT PPD
MOTORS ON/OFF				READ	WRITE	
Sensor is not connected; Acc	celerometer is	not calibrated		Cycle time (us): 801	I2C errors: 0	
Turn off nower and check I2C s	sensor conne		ECT SENSOR W		01: Simple	E PITCH E
calibration: Level sensor horizo	ontally as pred	cise as possible, and	then press "CAL	IB_ACC". For more precise	e six-point	
calibration see instruction mar	nual					
Parameters successfully loaded	d from board.					BAT 0.0

### Photo 2

File Board Language View Help Connection Profile	
Connection	
COM5	
Board: version 3.0 Firmware: 2.60 b4 Load Save basecamelectronics.c	<u>om</u>
Firmware Upgrade Encoders MavLink Scripting Analyze Debug Monitoring Stabilization RC Settings Follow mode Hardware Service Adjustable Variables	
RC Signal	
RC_ROLL RC_PITCH RC_YAW	
RC_CMD EXT_FC_ROLL EXT_FC_PITCH W	E
Input Contiguration  RC ROLL pin mode:  0.00 0.00  0.00 0.00  0.00	
Futaba s-bus	
PITCH RC_VIRT_CH_1  Analog joystick auto-detection:	
YAW no input V ADC1 ADC2 ADC3	-
CMD no input V Mix signal from FC_ROLL, FC_PITCH inputs:	
FC_ROLL no input 🗸 none 🗸 0 🗘 % 0.00 0.00 (	<b>5</b> 7
FC_PITCH no input v none v 0 %	
MOTORS ON/OFF READ WRITE	
Sensor is not connected; Accelerometer is not calibrated Cycle time (us): 800 I2C errors: 0	1.1
	H.
calibration: Level sensor horizontally as precise as possible, and then press "CALIB_ACC". For more precise six-point	5
calibration see instruction manual	
Parameters successfully loaded from board. BAT	0.0



# 12. TIPS FOR TUNING THE ALEXMOS CONTROLLER WITH ENCODERS

- 1. For a proper tuning of InfinityMR PRO gimbal please refer to the AlexMos controller manual.
- 2. Make sure that encoders are calibrated properly. Remember for tuning encoders you don't need a very good stabilization, big precision is not required. When gimbal is balanced, encoders calibrated, power source connected and powers for motors set, you can enable auto-tuning. Firstly, run auto-tuning for all axes together (the slider should be placed in the middle of scale). After that you can run auto-tuning for each axis separately (start with the pitch, than roll, at the end yaw axis).
- 3. Any tuning of a gimbal should be conducted with a gimbal mounted to your multirotor with full equipment installed on the gimbal (camera, battery, video, RC).
- 4. If after auto-tuning, you can still see some small jitters or buzzing it means you might need some manual tweaks of PID values. It is good to refer to AlexMos manual. Notch filters might help to get rid of vibrations.
- If you notice some problems with a drifting horizon, it is advisable to calibrate the temperature for IMUs. Again, refer to the AlexMos manual. You can also try to set "gyro trust" to 140-160 (that will work just with encoders enabled).
- 6. If is recommended to use lens support. If you have an option to use a lens that can be clamped with lens support that will make the whole camera shelf even more rigid and will help in the tuning process.

### HD AIR STUDIO SUPPORT: support@hdairstudio.com

### 13. PROFILE SETUP

InfinityMR PRO is equipped with button that allows you to change profiles. You can save up to 5 profiles. Each profile allows to set different follow mode or assign any other action from menu. Each profile is applied by number of clicks. Gimbal has 3 profiles set up as Default:

Profile 1 – follow YAW Profile 2 –follow YAW & PITCH movement (limited angles) Profile 3 – fixed stabilization (gimbal keeps pointing in one direction)

How to set up profile

- 1. Connect InfinityMR PRO to GUI using USB cable supplied with the gimbal (see chapter 9)
- 2. Go to "service" tab on GUI and from menu (picture below fig. 1) choose what action you want to assign to the button (ie. 3 clicks Use profile 3)
- 3. Press "save" button and write current settings (picture below fig. 2)
- 4. From profile selection window, choose desired profile ( Profile 3)
- 5. Press "load" button and choose backup profile that you made in step 3 (picture below fig. 2)
- 6. Now you can change settings as you wish (do not change encoder calibration values !)
- 7. After all changes press "WRITE" button now your profile is ready to use

SimpleBGC32 GUI v2.62 b6		
File Board Language View Help		
Connection	Profile	
COM5 V Disconnect	BLE Profile1	Rename
Board: version 3.0 Firmwa	rre: 2.60 b4 Load Save	basecamelectronics.com
Firmware Upgrade Encoders MavLink Stabilization RC Settings Follow mode	Scripting Analyze Debug Monitoring Hardware Service Adjustable Variables	2
Menu Button Assian actions to menu butto	n:	
2 dicks:		E .
3 dicks:		0.00 0.00
4 clicks: Use profile Profile3		
5 clicks:		NYPPPPP
long proces		
Restart system (make a full	reset) 🗸	
Startup Behavior	Working positions	ROLL
Center YAW axis relative to frame at start-up	Frame upside-down auto-detection	0.00 0.00
Remember last used profile     Search and move motors to home position at startum:	Upside-down PITCH auto-rotate	A. A. A. M.
	Set to normal position on profile switch	N STPPP
MOTORS ON/OFF	READ WRITE	
Sensor is not connected; Accelerometer is not calibrate	d Cycle time (us): 801 I2C errors: 0	
Turn off power and check I2C sensor connection. NEVER ( calibration: Level sensor horizontally as precise as possib calibration see instruction manual	CONNECT SENSOR WHEN BOARD IS POWERED!; Simple le, and then press "CALIB_ACC". For more precise six-point	PITCH
Parameters successfully loaded from board.		BAT 0.0

# 14. ALARMS AND BATTERY MONITORING SETTINGS

- 1. Connect InfinityMR PRO to GUI using USB cable supplied with gimbal (see chapter 9)
- 2. Measure voltage level of your battery using multimeter or battery monitor (not supplied)
- 3. Go to service tab on GUI
- 4. Turn on InfinityMR PRO and turn off motors by pressing "MOTORS ON/OFF" button (picture below )
- 5. Choose battery type
- 6. Compare previously measured voltage to the one that is indicated in the GUI if it is different press "calibrate" button (picture below fig 1)and type in value that you measured (using "." as a separator). Press "WRITE" button.
- Now you can set up voltage level for each action (picture below ) low voltage alarm and low voltage stop Motors
- 8. After each adjustment press "WRITE" button

SimpleBGC32 GUI v2.62 b6				
File Board Language View Help				
Connection		Profile		
COM5 V Disconnect	🗌 🔲 BLE	Profile1		Rename
Board: version 3.0 Firmware:	2.60 b4	Load	Save	basecamelectronics.com
Firmware Upgrade Encoders MavLink Stabilization RC Settings Follow mode Calibration Volume: Errors Valarms	Scripting Hardware	Analiyze Debug Service Adju Innai (aiways Oiv)	Monitoring stable Variables	
Battery Monitoring 0.00 V Calibrate				0.00 0.00
Low voltage - alarm     Threshold, V:     10.8      Low voltage - stop motors     Threshold V:     9.9				STITUTE TO THE
Compensate voltage drop Full battery, V:  Set defaults for:				ROLL
MOTORS ON/OFF		READ	WRITE	STRUTTURE .
Sensor is not connected; Accelerometer is not calibrated		Cycle time (us): 801	I I2C errors: 0	
Turn off power and check I2C sensor connection. NEVER CONN calibration: Level sensor horizontally as precise as possible, an calibration see instruction manual	ECT SENSOR V d then press "C/	WHEN BOARD IS POWERED ALIB_ACC". For more precis	D!; Simple e six-point	PITCH
Parameters successfully loaded from board.				BAT 0.0

In BUZZER and LED section (picture below) you can adjust volume level of alarm and choose which action has to be announced by buzzer.

SimpleBGC32 GUI v2.62 b6				
File Board Language View Help				
Connection		Profile		
COM5 V Disconnect	🔄 BLE	Profile1		Rename
Board: version 3.0 Firmware:	2.60 b4	Load	Save	basecamelectronics.com
Firmware Upgrade     Encoders     MavLink     Sc       Stabilization     RC Settings     Follow mode     MavLink       MISCSeturings     Emergency stop     Restart system after a delay, ms:     0 \$       Log real-time data to file     Image: Rewrite on reconnection	cripting Hardware	Analvze Debug Service Adjusta	Monitoring ble Variables	W 0.00 0.00
Buzzer and LED Command confirmation Calibration Frors Alarms	LED Nor	indicator: mal (always ON)		THE PARTY OF THE P
Battery Monitoring 0.00 V Calibrate				
Cow voitage - alarm			$\checkmark$	NY PPIC
MOTORS ON/OFF		READ	WRITE	
Sensor is not connected; Accelerometer is not calibrated Turn off power and check I2C sensor connection. NEVER CONNEC calibration: Level sensor horizontally as precise as possible, and th calibration see instruction manual	T SENSOR W en press "CA	Cycle time (us): 801 HEN BOARD IS POWEREDI; ( LIB_ACC". For more precise s	I2C errors: 0 Simple ix-point	PITCH
Parameters successfully loaded from board.				BAT 0.0

# 15. OFFSET ADJUSTMENT

If You need to change initial position of camera you can do it in 3 ways:

### CHANGING OFFSET BY CALIBRATION

Connect InfinityMR PRO to GUI (chapter9). Go to Encoders tab, make sure that motors are switched off. Put camera in desired position and press "2. CALIB. OFFSET" button (picture below). Press "WRITE" button. Your Gimbal will remember this position only for current profile.

O SimpleBGC32 GUI v2.62 b6	
File Board Language View Help	
Connection	
COM5 V Disconnect BLE Profile1 V	Rename
Board: version 3.0 Firmware: 2.60 b4 Load Save	basecamelectronics.com
Stabilization     RC Settings     Follow mode     Hardware     Service     Adjustable Variables       Firmware Upgrade     Encoders     MavLink     Scripting     Analyze     Debug     Monitoring       Encoder type:     AS5048A.B (PWM)     AS5048A.B (PWM)     AS5048A.B (PWM)     Image: Comparison of the second	
Skip autodetection Skip autodetection Skip autodetection	W E
Motor/encoder gearing ratio:	SST PPP
Calibrations       ROLL       PITCH       YAW         EL field offset:       0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
MOTORS ON/OFF READ WRITE Sensor is not connected; Accelerometer is not calibrated Cycle time (us): a01 I2C errors: 0 Turn off power and check I2C sensor connection. NEVER CONNECT SENSOR WHEN BOARD IS POWEREDI; Simple calibration: Level sensor horizontally as precise as possible, and then press "CALIB_ACC". For more precise six-point calibration see instruction manual	PITCH PITCH
Device goes to reset.	BAT 0.0

### CHANGING OFFSET BY SETTING ANGLE IN FOLLOW TAB

You can set up different offset for each profile that you use. Simply connect lfinityMR PRD to GUI. Go to follow mode tab and in window offset type in angle (degrees) for each axis. Press "WRITE" button. Dperation has to be repeated for each profile.

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SimpleBGC32 GUI v2.62 b6		_			-	
File Board Language View Help			Profile			
СОМ5	Disconnect	🔲 BLE	Profile1			Rename
Board: version 3.0	Firmware:	2.60 b4	Load	Save	based	amelectronics.com
Firmware Upgrade Encoders Stabilization RC Settings	MavLink Follow mode	Scripting Hardware	Analyze Debu Service d	ug Monitoring Adjustable Variables		
Basic Settings Dead-band: Expo curve: SPEED LPF ROLL 10 0 30 PITCH 10 0 30 YAW 10 0 30	500 500 RANGE	Advanced Sett Use Fr Apply of Follow rate i ROLL PITCH YAW	ings rame IMU, if possible offset correction when a inside deadband: tome position offset 0 0 0 0 0 0 0 0 0 0 0	xis is not following 50 \$ EXT.FC GAINS 0 \$ 0 \$ AUTO		
MOTORS ON/OFF Sensor is not connected; Accelerometer	is not calibrated	ed from an exte	READ Cycle time (us): mal flight controller to th	WRITE 801 I2C errors: 0 he internal range of		PITCH
tilting. Device goes to reset.	peny, it neips to keep t	me camera pen	leculy leveled even in the	case or last frame	BAT	0.00 0.00 <i>1</i> .1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.

### CHANGING POSITION OF CAMERA BY MANUAL SET

InfinityMR PRD is pre-set to remember position of camera after one second for PITCH and YAW axis, and two seconds for RDLL axis. You can adjust those values by connecting to GUI and changing "Manual set time, sec." for each axis. After each adjustment press "WRITE" button.

#### InfinityMR PRD – Universal 3 axis Gimbal www.hdairstudio.com

🚱 SimpleBGC32 GUI v2.62 b6		
File Board Language View Help		
Connection	Profile	
COM5 V Disconnect BLE	Profile1	Rename
Board: version 3.0 Firmware: 2.60 b4	Load Save	basecamelectronics.com
Stabilization     RC Settings     Follow mode     Hardware       Firmware Upgrade     Encoders     MavLink     Scripting       Angle to move at calibration:     0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Service Adjustable Variables Analyze Debug Monitoring 0 1. CALIB. EL. FIELD 0 2. CALIB. OFFSET	w
Settings     ROLL     PITCH       Manual set time, sec:     0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	YAW 0 🗘 0 🗘 0 🗘	
Motor over-temperature protection by heating/cooling model ROLL PITCH	YAW	
Heating factor: 0 0 0 0 0	0 0 0 0	
Over-heat action (above 80 degrees): Cradually limit pow	er 🗸	
MOTORS ON/OFF	READ WRITE	
Sensor is not connected; Accelerometer is not calibrated Turn off power and check I2C sensor connection. NEVER CONNECT SENSOR W calibration: Level sensor horizontally as precise as possible, and then press "CAL calibration see instruction manual	Cycle time (us): 801 I2C errors: 0 HEN BOARD IS POWERED!; Simple JB_ACC". For more precise six-point	PITCH PITCH
Device goes to reset.		BAT 0.0

### 16. SOFTWARE VERSION CHECK AND UPGRADE

Connect InfinityMR PRO to GUI and go to upgrade tab, make sure that you are in automatic sub tab. You can find there your current version. Press "CHECK" to check if there is newer version of software (higher number). Press "UPGRADE" button and update will run automatically.

It is not recommended to make manual upgrade of software without reading instruction for AlexMos controller.

After upgrade InfinityMR PRO will be disconnected from GUI automatically - For further work with GUI disconnect USB cable for few seconds and then reconnect.

SimpleBGC32 GUI v2.62 b6	
File Board Language View Help	
Connection Profile COM5 V Disconnect BLE Profile1 V	Rename
Board: version 3.0 Firmware: 2.60 b4 Load Save	basecamelectronics.com
Stabilization RC Settings Follow mode Hardware Service Adjustable Variables Firmware Upgrade Encoders MavLink Scripting Analyze Debug Monitoring	
Automatic       Manual         Device SN:       01235589e58fe23eee       READ       Copy to clipboard         Current version:       2.60 b4       Check at startup	W
Latest version: - CHECK	0.00 0.00
Upgrade to version:	ROLL ROLL
MOTORS ON/OFF READ WRITE	STRUCT CONTRACT
Sensor is not connected; Accelerometer is not calibrated Cycle time (us): 801 [2C errors: 0 Turn off power and check I2C sensor connection. NEVER CONNECT SENSOR WHEN BOARD IS POWERED!; Simple calibration: Level sensor horizontally as precise as possible, and then press "CALIB_ACC". For more precise six-point calibration see instruction manual	PITCH
Device goes to reset.	BAT 0.0

### 17. ADVANCED GYRO CALLIBRATION

- 1. To perform advanced gyro calibration you need to put camera on gimbal and balance it (it`s easier with camera).
- 2. Connect gimbal to GUI (chapter 9)
- 3. Go to Hardware tab on GUI and press "Calibrate IMU sensors" button.
- 4. Calibration of accelerometer by six points you have to start from +Z axis camera is leveled and axis +Z is highlighted (pic. 1).
- 5. To calibrate gyroscope, gimbal must be fixed on stable surface you can check stability on peak meter.
- 6. Once gimbal is stable and peak meter is on green field press calibrate button (the one on the left side of window).
- 7. When calibration is done 'ok' marks will appear next to each axis.
- 8. Repeat this operation for each axis (6 positions from Photo 1)
- 9. Close "sensor calibration helper" window and press "WRITE" button.

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SimpleBGC32 GUI v2.62 b6	1 - 1 - 1 - M M	i i umora	samon kathir	MINICE AUD						
File Board Language View Help										
Connection			Profile							
COM5	Disconnect		Profile1		Rename					
Board: version 3.0	Firmwa	re: 2.60 b4	Load	Save	basecamelectronics.com					
Firmware Upgrade Stabilization RC	Encoders MavLink Settings Follow mode	Scripting Hardware	Analyze Debug Service Adjus	Monitoring stable Variables						
ROLL	50 🗘 0 🗘	Camera - F	Camera - PITCH - ROLL - YAW (default)							
PITCH	50 🗘 0 🗘	[] 12C hig	h speed							
YAW	50 🗘 🛛 0 🗘	Don't p	Don't power ON motors at system start							
Main IMU Sensor		IMU Sensors (	Calibrations		0.00 0.00					
Axis TOP: -Y			alibrate IMU sensors							
Axis RIGHT: X		Automotic a	rra calibration:		SN'I PPIL					
L C		Try to calib	rate or use previous values							
Frame IMI L sensor		- IMI I Sensors S	Settings							
Avia TOP:		Gyro trust:	Joango	100 🗘						
Adis TOP. Z	AUTO	_ A	daptive gyro trust	0.00 0.00						
Axis RIGHT: X		Gyro deadba	and:	0	(1.1. I.V.)					
Mounting position: Dia	ashlad V				STATEPP.					
MOTORS ON/OFF			READ	WRITE						
Sensor is not connected; A	Accelerometer is not calibrated		Cycle time (us): 801	I2C errors: 0						
Turn off power and check I2C sensor connection. NEVER CONNECT SENSOR WHEN BOARD IS POWEREDI; Simple										
calibration see instruction r	0.00 0.00									
					(deline)					
Device goes to reset.					BAT 0.0					
		_								



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Photo 1

# 18. TIME-LAPSE SETTINGS (NEW FEATURE !)

To make TIME-LAPSE motion you need to:

- 1. Connect gimbal to GUI (chapter 9)
- 2. Go to Firmware Upgrade tab and make sure you have firmware version 2,61 or higher. If you can`t see newer version check for beta version too.
- 3. Go to Service tab and assign Time lapse motion to menu / profile button Photo 1
- 4. In Service tab in Time-lapse settings window you can set parameters of time-lapse (time and acceleration). You can set different parameters of time-lapse for each profile. Choose profile than change time-lapse parameters and Write settings for each profile – Photo2
- 5. Once setting are done mount gimbal on stand or handheld (in upside down position).
- 6. Turn on gimbal and choose Profile with required parameters
- 7. Set up camera in position that will be final for time lapse
- 8. With menu/profile button activate time-lapse as assigned in point 3
- 9. Gimbal starts to beep point camera in start position You have only 10 seconds. After that interval timelaps will start automatically.

O SimpleBGC32 GUI v2.62 b6										
File Board Language View Help										
Connection										
COM5 V Disconnect BLE Profile2	✓ Rename									
Board: version 3.6 Firmware: 2.63 b0 Los	ad Save <u>basecamelectronics.com</u>									
Firmware Upgrade Encoders MavLink Scripting Analyze Stabilization RC Settings Follow mode Hardware Service	Debug Monitoring Adjustable Variables									
Menu Button Assign actions to menu button:										
1 click: Use profile Profile1	IV E									
2 clicks: Use profile Profile2										
3 clicks: Use profile Profile3	167.67 0.13									
4 clicks: Setup and start time-lapse motion										
5 clicks: Calibrate magnetometer	Calibrate magnetometer									
Long press: Rotate YAW ±180 from current position										
Rotate YAW 180 from home position Startup Behavior Switch YAW 0/180 from home position	ROL B									
Switch portrait mode (ROLL=90/0)	etection									
Remember last us Calibrate momentum of inertia	tion 0.00 0.57 S									
Search and move motors to home position at startup:	n auto-iotate									
Social data consultad										
Senai data corrupted Cycle un										
Try to re-connect board. Ensure correct serial port is selected. Check firmware/GUI version compatibility.										
	-5.98 0.21									
Current profile successfully written to board.	366 mA BAT 15.4									



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SimpleBGC32 GUI v2.62 b6	*  umo	(see a	1002	< Aats					
File Board Language View Help									
Connection	Profile								
COM5 💙 Disconnect		Profile2			Rename				
Board: version 3.6 Firmware:	2.63 b0	Load	£	Save	basecamelectronics.com				
Firmware Upgrade Encoders MavLink Stabilization RC Settings Follow mode	Scripting Hardware	Analvze E Service	Debug Mor Adjustable Vari	nitoring ables					
Startup Behavior	Working positions				$\{ f \mid f \}$				
Center YAW axis relative to frame at start-up     Remember last used profile     Search and move motors to home position at startup:     ROLL PITCH YAW	<ul> <li>Frame upside-down auto-detection</li> <li>Briefcase mode auto-detection</li> <li>Upside-down PITCH auto-rotate</li> <li>Set to normal position on profile switch</li> </ul>				W E 167.67 0.13				
Automated motion tasks	Time-lapse pa	-lapse parameters			NT PRO				
Speed: 120 C Acceleration: 300 C	Time-lapse Acceleration 🗹 Frame	time, sec: n in and out time, %: n angles are fixed - a	60 10 apply gyro drfit corre	) 🗘 ection	ROLL				
Misc settings									
Sector Stop									
Restart system after a delay, ms: VV					SSPT TPP				
MOTORS ON/OFF		READ	V	VRITE					
Serial data corrupted Cycle time (us): 800 I2C errors: 0 Try to re-connect board. Ensure correct serial port is selected. Check firmware/GUI version compatibility.									
Current profile successfully written to board.				366 mA	BAT 15.4				

#### Photo 2

Here you can find link for instructing movies : (coming soon)

### **19. MAINTENANCE**

InfinityMR PRO gimbal is almost maintenance-free, you don't have to do anything else then keeping it clean and dry. There is few tips how can you prevent it from damage.

- 1. After work in dusty (pollen) conditions clean your gimbal with compressed air and soft cloth
- 2. Do not try to lubricate bearings and do not try to replace them if you have problem please contact us on <a href="support@hdairstudio.com">support@hdairstudio.com</a>
- 3. Do not use your gimbal in wet conditions. If gimbal gets wet IMMIDIETLY disconnect battery, dry it with compressed air and leave it for several hours in warm, dry place
- 4. Remember to check regularly condition of the gimbal (damages, untighten bolts, looses, etc.)
- 5. It is recommended to run gyro calibration from time to time (especially when you notice horizon drift, or you use the gimbal in different pressure and temperature conditions)
- 6. Store your gimbal in clean and dry conditions
- 7. Do not expose your gimbal to extreme temperatures.
- 8. Keep gimbal away from children

### 20. FREQUENTLY ASKED QUESTIONS AND TROUBLESHOOTING

- 1. Horizon drifting camera slowly turns in roll axis
  - it is advisable to proceed with temperature calibration of the IMU (it is described in AlexMos manual). You can also try to set "gyro trust" to 140-160 (that will work just with encoders enabled).
  - Run advanced gyro calibration (Chapter 16)
  - Switch on gyro calibration at startup (you will find it on basic tab in GUI)
- 2. Engine buzzing In some positions you can hear buzzing noise form engines
  - check camera balancing in all axis
  - check if camera lens support is properly applied
  - check movement of camera cage and set it up properly so it can move freely in any angle
     Gimbal goes crazy after switching on Try to restart it and make sure that gimbal doesn't move when you turning it on
- 3. Gimbal goes "crazy" after powering on
  - Try to restart gimbal and make sure that gimbal doesn't move when you turning it on
  - Check if there is no damage to cables
- 4. When I use different cameras do I have to change PID values for each one of them ?
  - Many of our customers use Infinity MR PRO without any PID change so it is not necessary
  - We have developed adjusted PIDs for the most popular camera on the market so if you let us know what camera you use we might be able to send you PID values for this camera
- 5. I have a problem with camera balancing
  - Please follow instruction step by step method is developed for our gimbals and it should help
  - If there is problem with balancing PITCH axis you might need loosen screws of the clamp holding PITCH motor on carbon fiber pipe. After that try to correct angle of the motor. Once corrected tighten screw and try to balance it again.
- 6. How Can I change PIDs on my Infinity MR PRO ?
  - Before changing any values or running PID Auto tuning it is highly advised to make backup of your EPROM
    or jus writing original settings
  - This procedure is described in chapter 10
- 7. When I try to turn on InfininityMR PRO I can hear single beep (similar to sound confirming profile change) and gimbal is not switching on
  - Check profile change button it might stay in on (pressed) position. Try to release it once you press it should click and go up after releasing
- 8. Gimbal is not switching on (no signal or light on controller)
  - Check voltage of your battery
  - Check correct of JST connector +/-
  - Check Pins in JST connector, they might be bend or pressed in
  - Connect you gimbal to GUI (Chapter8) make sure battery is connected too then turn on "ON/OFF" switch.
     Go to service tab and check what voltage is indicated. If voltage displayed on GUI is different to measured (by multimeter) on battery You have to Calibrate it.

- 9. Gimbal suddenly changes angle of camera (receiver is not connected)
  - When you have your gimbal set up to be controlled with S-Bus receiver it is important to have receiver connected. If you have to use it without receiver change RC settings to PWM or set up no input
- 10. During movement on yaw axis picture from camera is not smooth
  - Tight thumb screws mounting yaw motor
  - Check if there is any loose screws mounting yaw motor
- 11. How can I make backup of my software ?
  - Connect gimbal to GUI (Chapter 8) click board tab from this menu choose backup EPROM to file
- 12. When gimbal is powered on it doesn`t work and only beep sound can be heard
  - Check if your battery is fully charged
  - If battery is ok connect Gimbal to GUI (Chapter8) turn on gimbal, go to service tab and compare voltage (measured on battery with multimeter and indicated by GUI) if it is different calibrate voltage sensor.
  - Connect the gimbal to GUI (Chapter 8) Turn on the gimbal, go to service tab and check what voltage level is set up – if it is too high you can adjust it. Check what is minimum voltage recommended for the battery you use.
- 13. After switching on the gimbal it doesn't go to level position
  - Try calibrate the offset (Chapter13)
  - Try to calibrate Gyroscope
  - Check if you have similar behavior on each profile if not you will have to set up this profile again or try to calibrate gyro on this profile (Chapter11)
- 14. Gimbal suddenly starts spinning in yaw axis
  - Connect the gimbal to GUI (Chapter 8) go to basic tab and check NUM. POLES values it should be 16/16/28 for ROLL and PITCH engines with red ring or 22/22/28 for ROLL and PITCH whole black engines if it is different on GUI correct it
  - Connect gimbal to GUI (Chapter 8) go to encoders tab and check if in cooling factor and heating factor you have "O"
- 15. When turning the gimbal in the YAW axis it also tilts in ROLL axis
  - Run gyro calibration
- 16. How can I load configuration file ?
  - Connect gimbal to GUI (Chapter 8) go to Board menu and choose "restore EPROM from backup file". Choose your configuration file and load it
- 17. I tried to change settings and now gimbal is not working.
  - Send us serial number of your gimbal and we will send you backup file then follow instructions from previous point
- 18. I took gimbal out of the box, connected battery turned it on and it went mad
  - Before turning on the gimbal always mount camera first
  - Gimbal will not work without camera mounted and balanced properly
  - Turning on the gimbal without camera my cause serious damage to the gimbal which will not be covered by guarantee
- 19. Sometimes gimbal takes long time to start up, beep sound can be heard and is not powering on

- When powering on, gimbal should be placed on stable surface then it should turn on normally
- When gimbal starts up it beeps for 3 to 5 seconds it means that gyro calibration is running at every startup.
- There is possibility to switch off calibration at every startup to do it you need to connect to GUI (Chapter 9) go to basic tab and mark option "skip gyro calibration at startup".
- When option "skip gyro calibration at startup" option is activated it is important to run this calibration manually.