



iNav Settings used with Blueberry Controller

This information goes along with the YouTube video at <https://youtu.be/K5HfN2SJfUs>,

At the end of our first video on setting it up, I had the following iNav settings:

Mixer

Platform Configuration

Airplane

 Platform type

Motor direction

☒ Normal motor direction / Props-in configuration

☐ Control Profile will use same index as Mixer Profile index

Timer Outputs

AUTO

 Timer 1

AUTO

 Timer 2

AUTO

 Timer 3

AUTO

 Timer 4

AUTO

 Timer 8

AUTO

 Timer 12

AUTO

 Timer 13

Output Mapping

Output (timer)	S1 (Timer 8)	S2 (Timer 8)	S3 (Timer 1)	S4 (Timer 1)	S5 (Timer 2)	S6 (Timer 2)	S7 (Timer 2)	S8 (Timer 2)	S9
Function	Motor 1	-	Servo 1	Servo 2	Servo 3	Servo 4	-	-	S9

Mixer preset

S1

S4

S5

S6

S3

Airplane

Load and apply

Ports

Note: not all combinations are valid. When the flight controller firmware detects this the serial port configuration will be reset.
Note: Do NOT disable MSP on the first serial port unless you know what you are doing. You may have to reflash and erase your configuration if you do.

Identifier	Data	Telemetry	RX	Sensors	Peripherals
UART1	☒ MSP 115200	Disabled AUTO	☐ Serial RX	Disabled 115200	Disabled 115200
UART2	☐ MSP 115200	Disabled AUTO	☐ Serial RX	Disabled 115200	Disabled 115200
UART3	☐ MSP 115200	Disabled AUTO	☐ Serial RX	Disabled 115200	Disabled 115200
UART4	☐ MSP 115200	Disabled AUTO	☐ Serial RX	Disabled 115200	Disabled 115200
UART5	☐ MSP 115200	Disabled AUTO	☐ Serial RX	GPS 115200	Disabled 115200
UART6	☐ MSP 115200	Disabled AUTO	☒ Serial RX	Disabled 115200	Disabled 115200

Configuration

Note: Not all combinations of features are valid. When the flight controller firmware detects invalid feature combinations conflicting features will be disabled.

Note: Configure serial ports **before** enabling the features that will use the ports.

Sensors & Buses

ICM42605	Accelerometer
QMC5883	Magnetometer
SPL06	Barometer
VIRTUAL	Pitot tube
None	Rangefinder
None	Optical flow

Please switch to 800kHz if connected hardware allows for it

400KHZ	I2C Speed
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Other Features

☐	Enable CPU based serial ports
☒	GPS for navigation and telemetry
☒	Telemetry output
☐	Reversible motors mode (for use with reversible ESCs)
☐	Analog RSSI input
☐	Multi-color RGB LED strip support

☒	GPS for navigation and telemetry
☒	Telemetry output
☐	Reversible motors mode (for use with reversible ESCs)
☐	Analog RSSI input
☐	Multi-color RGB LED strip support
☐	OLED Screen Display
☒	Blackbox flight data recorder
☒	Enable motor and servo output
☐	CPU based SPI
☒	OSD
☒	Permanently enable AIRMODE
☐	Permanently enable Launch Mode for Fixed Wing
☒	Profile selection with TX stick command
☐	Throttle voltage compensation
☐	Automatic battery profile selection
☒	Continuously trim servos on Fixed Wing
☐	Geozone

Voltage & Current Sensors

☒	Battery voltage monitoring
ADC	Voltage Meter Type
Raw	Voltage source to use for alarms and telemetry
2100	Voltage Scale
4.54	Battery Voltage
☒	Battery current monitoring
ADC	Current Meter Type
150	Current Meter Scale
0	Offset in millivolt steps
0.11	Battery Current

Battery Settings

0	Number of cells (0 = auto)
4.25	Maximum cell voltage for cell count detection
3.3	Minimum Cell Voltage
4.2	Maximum Cell Voltage
3.5	Warning Cell Voltage

Battery Settings

0	Number of cells (0 = auto)
4.25	Maximum cell voltage for cell count detection
3.3	Minimum Cell Voltage
4.2	Maximum Cell Voltage
3.5	Warning Cell Voltage
mAh	Battery Capacity Unit
0	Capacity
	Warning Capacity (remaining %)
	Critical Capacity (remaining %)

Serial Gimbal

0	Gimbal sensitivity
0	Pan channel (yaw)
0	Tilt channel (pitch)
0	Roll channel

Headtracker

None	Head tracker type
1.00	Head tracker pan movement ratio
1.00	Head tracker tilt movement ratio
1.00	Head tracker roll movement ratio

Failsafe

Settings

ds Guard time for activation after signal lost [For deciseconds (ds): 1 = 0.1 sec.]

Procedure

☐ Drop

☐ Land

uS Throttle value used while landing

ds Delay for turning off the Motors during Failsafe [For deciseconds (ds): 1 = 0.1 sec.]

☒ RTH

☐ Do nothing

☐ Use alternate Minimum Distance Failsafe Procedure when close to Home

Main PID Gains

Additional PID Gains

Rates & Expo

Filters

Mechanics

When enabled, **Ez Tune** will override multiple INAV setting to simplify the tuning process. Instead of setting each PID and filtering setting independently, you can set them all at once. Ez Tune is a great starting point for new users and a great way to quickly tune a new UAV. It is not recommended to use Ez Tune on advanced built UAVs. If Ez Tune is enabled, settings from the **PID tuning** tab will be overridden by EzTune.

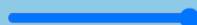
Enabled



Roll

Proportional

15



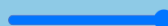
Integral

3



Derivative

7



FeedForward

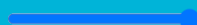
50



Pitch

Proportional

15



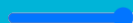
Integral

5



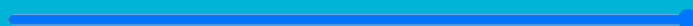
Derivative

5



FeedForward

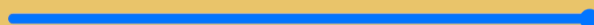
80



Yaw

Proportional

50



Integral

0



Derivative

20



Yaw

Proportional

50



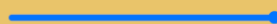
Integral

0



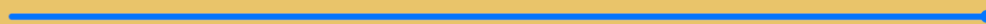
Derivative

20



FeedForward

255



Advanced Tuning: Fixed Wing

Fixed Wing Auto Launch Settings

1000 uS

Idle Throttle



0 ms

Idle Throttle Delay



0

Wiggle to Wake Idle



45 °

Max Throw Angle



100 ms

Motor Delay



0 ms

Minimum Launch Time



100 ms

Motor Spinup Time



1700 uS

Launch Throttle



25 °

Climb Angle



5000 ms

Launch Timeout



5000 cm

Maximum Altitude



3000 ms

End Transition Time



Fixed Wing Landing Settings

35000 cm

Final approach length



100 %

Modifier for pitch to throttle ratio at final approach



200 cm

Initial altitude of the glide phase



150 cm

Initial altitude of the flare phase



Fixed Wing Navigation Settings

1200 uS

Min. throttle

1700 uS

Max. throttle

1400 uS

Cruise throttle

☐

Allow manual throttle increase

0 deci°

Min Throttle Down Pitch

10 uS

Pitch to throttle ratio

6

Throttle smoothing

50 deci°

Instantaneous throttle adjustment threshold

35 °

Max. navigation bank angle

300 cm/s

Max. Alt-hold climb rate

20 °

Max. navigation climb angle

15 °

Max. navigation dive angle

60

Cruise Yaw Rate

7500 cm

Loiter radius

RIGHT

Loiter direction

2

Control Smoothness

☐

Soaring Mode Motor Stop

5 °

Soaring Mode Pitch Deadband

0	Pitch value for glide phase	?
8	Pitch value for flare phase	?
140 cm/s	Max. tailwind	?

0	Soaring Mode Pitch Deadband
40	Altitude Control Response Factor

Battery Estimation Settings		
0	cW	Idle power
0	cW	Cruise power
0	cm/s	Cruise speed
5	%	RTH energy margin

Generic settings

RTH Settings		
AT_LEAST	RTH altitude mode	?
5000	cm	RTH altitude
1000	cm	RTH Home altitude
ON	Climb before RTH	?
AT_LEAST	Climb First Stage Method	?
0	cm	Climb First Stage Altitude
☒	Use Linear Descent	?
100	m	Linear Descent Start Distance

General Navigation Settings		
0	cm	Max Altitude for Navigation
ALL_NAV	Navigation Motor Stop Override	

Waypoint Navigation Settings		
800	cm	Waypoint radius
500	m	Waypoint safe distance
☐	Load Waypoints on Boot	
0	cm	Enforce Altitude at Waypoint

100	m	Linear Descent Start Distance	?
☐	Climb regardless of position sensors health		
☒	Override RTH altitude and climb setting with roll/pitch stick	?	
OFF	RTH Track Back Mode	?	
500	m	RTH Track Back Distance	?
RTH	Safe Home Mode	?	
20000	cm	Safe Home Max Distance	?
FS_ONLY	Land after RTH		
5000	cm	Min. RTH distance	?
50000	cm	RTH abort threshold	?
0	s	Failsafe Mission Delay	?

0	cm	Waypoint Tracking Accuracy
60	°	Waypoint Tracking Angle
OFF	Waypoint Turn Smoothing	
RESUME	Restart Waypoint Mission	

Automatic Landing Settings		
200	cm/s	The craft will start to descend at this speed, once it reaches the Home location.
2000	cm	When the craft has descended to this altitude, it will begin to slow down for landing.
500	cm	When the craft has descended to this altitude, it will have slowed to the touch down speed.
50	cm/s	This is the touch down speed.
500	cm/s	Emergency landing speed

Advanced Tuning: Fixed Wing

Fixed Wing Auto Launch Settings		
1000	uS	Idle Throttle
0	ms	Idle Throttle Delay
0	Wiggle to Wake Idle	?
45	°	Max Throw Angle
100	ms	Motor Delay
0	ms	Minimum Launch Time
100	ms	Motor Spinup Time
1700	uS	Launch Throttle
25	°	Climb Angle
5000	ms	Launch Timeout
5000	cm	Maximum Altitude
3000	ms	End Transition Time

Fixed Wing Landing Settings		
35000	cm	Final approach length
100	%	Modifier for pitch to throttle ratio at final approach
200	cm	Initial altitude of the glide phase
150	cm	Initial altitude of the flare phase
0	°	Pitch value for glide phase

Fixed Wing Navigation Settings		
1200	uS	Min. throttle
1700	uS	Max. throttle
1400	uS	Cruise throttle
☐	Allow manual throttle increase	
0	deci°	Min Throttle Down Pitch
10	uS	Pitch to throttle ratio
6	Throttle smoothing	
50	deci°	Instantaneous throttle adjustment threshold
35	°	Max. navigation bank angle
300	cm/s	Max. Alt-hold climb rate
20	°	Max. navigation climb angle
15	°	Max. navigation dive angle
60	Cruise Yaw Rate	
7500	cm	Loiter radius
RIGHT	Loiter direction	
2	Control Smoothness	
☐	Soaring Mode Motor Stop	
5	°	Soaring Mode Pitch Deadband

Receiver

[DOCUMENTATION](#)

Please read receiver chapter of the documentation. Configure serial port (if required), receiver mode (serial/ppm/pwm), provider (for serial receivers), bind receiver, set channel map, configure channel endpoints/range on TX so that all channels go from -1000 to -2000. Set midpoint (default: 1500), trim channels to 1500, configure stick deadband, verify behaviour when TX is off or out of range. Make sure that the channel values all increase when you push the sticks up and to the right. If not, reverse the channel in the TX. Do not apply any other mixing in the TX.
IMPORTANT: Before flying read failsafe chapter of documentation and configure failsafe.

Channel Map	RSSI Source	RSSI Channel
AETR	AUTO	Disabled

Roll [A]	1500
Pitch [E]	1500
Yaw [R]	1502
Throttle [T]	988
CH 5	1000
CH 6	1000
CH 7	1000
CH 8	988
CH 9	1500
CH 10	1500
CH 11	1500
CH 12	1500
CH 13	1500
CH 14	1000
CH 15	2012
CH 16	2012
CH 17	1500

Receiver Mode
SERIAL Receiver type
Note: Remember to configure a Serial Port (via Ports tab) for the serial receiver
CRSF Serial Receiver Provider
OFF Serial Port Inverted (comparing to protocol default)
AUTO Serial receiver half-duplex

RC Smoothing
30 Auto Smoothing Factor

Throttle MID	0.50	Throttle EXPO	0.00
RC Deadband	2	Yaw Deadband	2

GPS

Configuration	
☒	GPS for navigation and telemetry
UART5	Serial Port
115200	Baud Rate
UBLOX	Protocol
SouthPAN (AL	Ground Assistance Type
☒	Gps use Galileo Satellites (EU)
☐	Gps use BeiDou Satellites (CN)
☐	Gps use Glonass Satellites (RU)
00:00 hh:mm	Timezone Offset
OFF	Automatic Daylight Savings Time

Position	
Fix type:	None
Altitude:	-17 m
Latitude:	-33.1157 deg
Longitude:	151.5453 deg
Speed:	28 cm/s
Sats:	0
Dist to Home:	0 m

Statistics	
HDOP:	99.99
EPH:	99.99 m
EPV:	99.99 m
Update time:	9.9 Hz
Total messages:	10806
Errors:	0
Timeouts:	0

Modified values

Following the installation of the controller in the plane, I modified the settings as follows.

Output Mapping

Output (timer)	S1 (Timer 8)	S2 (Timer 8)	S3 (Timer 1)	S4 (Timer 1)	S5 (Timer 2)	S6 (Timer 2)	S7 (Timer 2)	S8 (Timer 2)	S9 (Timer 12)	S10 (Timer 13)	S11 (Timer 4)	S12/LED (Timer 3)
Function	Motor 1	-	Servo 1	Servo 2	Servo 3	Servo 4	Servo 5	-	-	-	-	-

Motor Mixer

Motor	Throttle [T]	Roll [A]	Pitch [E]	Yaw [R]	
1	1	0	0	0	Delete

Add new mixer rule

Servo Mixer

Servo	Input	Weight (%)	Speed (10µs/s)	Active	
1	Stabilized Pitch	100	0	Always	Delete
2	Stabilized Roll	100	0	Always	Delete
3	Stabilized Roll	100	0	Always	Delete
4	Stabilized Yaw	100	0	Always	Delete
5	RC Yaw	-100	0	Always	Delete

Advanced Tuning: Fixed Wing

Fixed Wing Auto Launch Settings

1000	µs	Idle Throttle	?
0	ms	Idle Throttle Delay	?
0	°	Wiggle to Wake Idle	?
45	°	Max Throw Angle	?
100	ms	Motor Delay	?
0	ms	Minimum Launch Time	?
100	ms	Motor Spinup Time	?
1800	µs	Launch Throttle	?
25	°	Climb Angle	?
5000	ms	Launch Timeout	?
5000	cm	Maximum Altitude	?
3000	ms	End Transition Time	?

Fixed Wing Landing Settings

25000	cm	Final approach length	?
100	%	Modifier for pitch to throttle ratio at final approach	?
200	cm	Initial altitude of the glide phase	?
150	cm	Initial altitude of the flare phase	?

Fixed Wing Navigation Settings

1200	µs	Min. throttle
1700	µs	Max. throttle
1400	µs	Cruise throttle
☐		Allow manual throttle increase
0	deci°	Min Throttle Down Pitch
10	µs	Pitch to throttle ratio
6		Throttle smoothing
50	deci°	Instantaneous throttle adjustment threshold
35	°	Max. navigation bank angle
300	cm/s	Max. Alt-hold climb rate
20	°	Max. navigation climb angle
15	°	Max. navigation dive angle
60		Cruise Yaw Rate
7500	cm	Loiter radius
RIGHT		Loiter direction
2		Control Smoothness
☐		Soaring Mode Motor Stop
5	°	Soaring Mode Pitch Deadband

150	cm	Initial altitude of the flare phase	?
0	°	Pitch value for glide phase	?
8	°	Pitch value for flare phase	?
140	cm/s	Max. tailwind	?

Battery Estimation Settings			
0	cW	Idle power	?
0	cW	Cruise power	?
0	cm/s	Cruise speed	?
5	%	RTH energy margin	?

5	°	Soaring Mode Pitch Deadband
40	°	Altitude Control Response Factor

Generic settings

RTH Settings			
AT_LEAST	▼	RTH altitude mode	
5000	cm	RTH altitude	?
1000	cm	RTH Home altitude	?
ON	▼	Climb before RTH	?
AT_LEAST	▼	Climb First Stage Method	?
0	cm	Climb First Stage Altitude	?
☒		Use Linear Descent	?
100	m	Linear Descent Start Distance	?

General Navigation Settings		
0	cm	Max Altitude for Navigation
ALL_NAV	▼	Navigation Motor Stop Override
Waypoint Navigation Settings		
800	cm	Waypoint radius
500	m	Waypoint safe distance
☐		Load Waypoints on Boot
0	cm	Enforce Altitude at Waypoint

Modes

Use ranges to define the switches on your t

☐ Hide unused modes

Arming

ARM	CH 5 ▼	Min: 1300 Max: 2100
Add Range		
PREARM		
Add Range		

ANGLE HOLD	CH 8 ▼	Min: 1300 Max: 1700
Add Range		

Navigation Modes

NAV COURSE HOLD	
Add Range	

NAV CRUISE	
Add Range	

NAV LOITER	
Add Range	

NAV RTH	CH 10 ▼	Min: 1700 Max: 2100
Add Range		

Flight Modes

ANGLE	
Add Range	

HORIZON	CH 8 ▼	Min: 1775 Max: 2100
Add Range		

MANUAL	CH 8 ▼	Min: 900 Max: 1175
Add Range		

Beeper

BEEPER	CH 7 ▼	Min: 1300 Max: 2100
Add Range		

Fixed Wing

AUTO TUNE	CH 9 ▼	Min: 1300 Max: 1700
Add Range		

AUTO LEVEL TRIM	CH 9 ▼	Min: 1750 Max: 2100
Add Range		

100	m	Linear Descent Start Distance	?
☐		Climb regardless of position sensors health	
☒		Override RTH altitude and climb setting with roll/pitch stick	?
OFF		RTH Track Back Mode	?
500	m	RTH Track Back Distance	?
RTH		Safe Home Mode	?
20000	cm	Safe Home Max Distance	?
FS_ONLY		Land after RTH	
5000	cm	Min. RTH distance	?
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500	cm/s	Emergency landing speed

Given that the manual mode allows me to control the plane without any automatic changes, I think I will enable the Ez Tune option. There are lots of gains to be adjusted, and I really don't know what does what, so that sounds like a reasonable thing to do.

Main PID Gains	Additional PID Gains	Rates & Expo	Filters	Mechanics
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