



# 1. Specifications

Item Name: Lizard 105S Micro FPV RACING DRONES BNF

Size:130mm\*130mm\*53mm

Weight: 80g( battery not include)

Flight controller: F4 Flight controller built-in OSD with

Damping box IMU

Motor: Eachine 1104 KV6000 brushless motor

ESC:BS-28A 4IN1 ESC DSHOT600 Ready

Propeller: 60mm 4-blades propeller

Camera: 130Degree 720P Camera

DVR: 1280\*720 Real HD Video recorder

VTX: 5.8g 25MW/200MW Switchable 48CH Video transmitter

Battery: 14.8V 550mah 60C lipo battery

OSD: Betaflight OSD

Firmware of Flight controller :Betaflight 3.2

Rear LED Ready( LED\_Strip function)

**Buzzer Ready** 





2. Components	QTY	Part NO 🛛
Lizard 105S Frame	1	L105SF
Omnibus F4 corner Nano flight controller with MPU6000	1	L105S15
BS-28A 4IN1 ESC	1	L105S16
2.4G Receiver(Option: Frsky XM+/Flysky Flit10/SPEKTRUM DSMX)	1	L105S17FR/FL/DX
720p HD CMOS 1/4 Camera+720P DVR	1	L105S18+L105S19
5.8g 25MW/200MW Adjustable 48CH VTX+UXII Antenna	1	L105S20+L105S21
Eachine 1104 KV6000 brushless motor	4	L105S14
2435PRO Propellers+Propeller guarder	4	L105S24
14.8v 550mah 60C Lipo battery	1	L105S22
WS2812 LED Board+Buzzer	1	L105S23

# 3. Flight controller connection diagram



#### 4. ESC Connection diagram and Frame type



Notes: If you want to USE current sensor, please use 14AWG Silicone wire and change the power wire connection order as bellowing



# 5. VTX connection diagram



# Band and channel

/	FR	FR					
СН		А	В	С	D	Е	F
	CH1	5740MHz	5705MHz	5865MHz	5658MHz	5733MHz	5362MHz
	CH2	5760MHz	5685MHz	5845MHz	5695MHz	5752MHz	5399MHz
	CH3	5780MHz	5665MHz	5825MHz	5732MHz	5771MHz	5436MHz
сц	CH4	5800MHz	5645MHz	5805MHz	5769MHz	5790MHz	5473MHz
СП	CH5	5820MHz	5885MHz	5785MHz	5806MHz	5809MHz	5510MHz
	CH6	5840MHz	5905MHz	5765MHz	5843MHz	5828MHz	5547MHz
	CH7	5860MHz	5925MHz	5745MHz	5880MHz	5847MHz	5584MHz
	CH8	5880MHz	5945MHz	5725MHz	5917MHz	5866MHz	5621MHz

#### 6. DVR connection diagram and Operating instructions









#### Notes:

The DVR will auto starting to record video when power on

#### 7. 2.4G Receiver connection diagram





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#### 8. Lizard 105S Frsky BNF Version binding procedue

1.Connect the battery while holding the bind button in the Frsky receiver, the green and red LED on the receiver will getting to be solid, this indicates the Lizard105S is ready to bind with the transmitter, then release the bind button.



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2. Turn on the transmitter and select D16 mode from the Model SETUP Tab, then go to the Receiver [Bind] tab and Enter to binding with the Lizard105S. The Green LED on the receiver should get to be solid and the Red LED starts to blinking, this indicates binding successful.







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3. The Default channel map for Lizard1055 Frsky version is "TAER1234", Please ensure your transmitter is matched with it , otherwise it can't be armed.

Receiver		WIKI
Please read receiver d receiver, set channel n 1500, configure stick d IMPORTANT: Before fit	hapter of the documentation. Configure nap, configure channel endpoints/range leadband, verify behaviour when TX is of /ing read failsafe chapter of documentat	serial port (if required), receiver mode (serial/ppm/pwm), provider (for serial receivers), bind on TX so that all channels go from ~1000 to ~2000. Set midpoint (default 1500), trim channels to ff or out of range. tion and configure failsafe.
Roll [A]	1500	Channel Map RSSI Channel
Pitch [E]	1500	TAER1234 Disabled
Yaw [R]	1500	
Throttle [T]	987	Stick Low Thrashold Stick Cantar Stick High Thrashold
AUX 1	987	SACK LOW THE SALID SACK CETTER STARK THE THE SALID
AUX 2	987	
AUX 3	987	
AUX 4	1500	RC Deadband Yaw Deadband 3D Throttle Deadband
AUX 5	1500	
AUX 6	1500	0,
AUX 7	1500	
AUX 8	1500	RC Interpolation
AUX 9	1500	
AUX 10	1500	Auto  RC Interpolation

#### Notes:

Please pay attention to the min Throttle of your transmitter, it should be less than the "Stick Low", so that you can arm the Quadcopter (For Example 987<1050)

#### 9. Arm/Disarm Lizard 105S Frsky BNF

1. The Default Arm/Disarm switch for Lizard 105S is AUX1(Channel 5), and you can also customize it with Betaflight Configurator. We also set the AUX2(Channel 6) for change flight mode and AUX3(Channel 7) for activate the buzzer which you can customize them too.



2. Set Arm/Disarm switch for your TARANIS X9D: Move to the MIXER interface, Set "SA" or "SB" switch etc. for Ch5 to ARM/DISARM the motor. Suggest use a 3-steps switch to change flight mode.



3.Toggle the AUX1 Switch, the buzzer starts beeps one time and the Green LED on the flight controller turned off, this indicates the motor was armed. And also you can found "Armed" shows on your FPV Goggles or the FPV Monitor. Please make sure keep the Lizard105S level before arming .Be careful and enjoy your flight now !



#### 10. Lizard 105S Frsky BNF version receiver configuration

We have configured the frsky receiver before shipping. If you flashed the new firmware, please set up as the following steps: Enable Serial RX for UART3, then choose Serial\_based receiver from the Receiver Mode tab, and set the Serial Receiver Provider to SBUS Mode in Betaflight Configurator

toenuner	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	115200 🔻		Disabled • AUTO •	Disabled • AUTO •	Disabled • AUTO •
UART1	115200 •		Disabled • AUTO •	Disabled V AUTO V	Disabled • AUTO •
UART3	115200 •		Disabled • AUTO •	Disabled • AUTO •	Disabled • AUTO •
UART6	115200 •	0	Disabled • AUTO •	Disabled • AUTO •	Disabled • AUTO •
Receiver Serial-b	r ased receiver (SP	EKSAT, S	<ul> <li>Receiver Mode</li> </ul>		

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#### 11. Lizard 105S Flysky BNF Version binding procedue

1.Connect the battery to Lizard105S while holding the bind button on the Flysky receiver, the Green LED on the receiver will getting to be blinking fast, this indicates the Lizard105S is ready to bind with the transmitter, then release the bind button.





2.Please Ensure the RX setup of your transmitter is in AFHDS 2A Mode. Then get your transmitter into binding mode, Use Flysky I6 for an example: Turn on the transmitter while holding the bind button. The Green LED in the receiver will getting to be solid, this indicates binding successfully.





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3. The Default channel map for Lizard1055 Flysky version is "AETR1234", Please ensure your transmitter is matched with it, otherwise it can't be armed.

Notes: Please pay attention to the min Throttle of your transmitter, it should be less than the "Stick low", so that you can arm the Quadcopter (For Example 1000 < 1050)

Receiver		WIKI
Please read receiver of receiver, set channel n 1500, configure stick o IMPORTANT: Before fig	hapter of the documentation. Configure nap, configure channel endpoints/range leadband, verify behaviour when TX is o ring read failsafe chapter of documents	serial port (if required), receiver mode (serial/ppm/pwm), provider (for serial receivers), bind on TX so that all channels go from ~1000 to ~2000. Set midpoint (default 1500), trim channels to ff or out of range. tion and configure falisafe.
Roll [A]	1501	Channel Map RSSI Channel
Pitch [E]	1499	AETR1234 V Disabled V
Yaw [R]	1500	
Throttle [T]	1000	Stick Low Throchold Stick Contac Stick High' Throchold
AUX 1	1000	aduk caw minasiola aduk center aduk nigri minasiola
AUX 2	1000	1050 Ç V 1500 Ç V 1900 Ç V
AUX 3	1000	
AUX 4	1500	RC Deadband Yaw Deadband 3D Throttle Deadband
AUX 5	1500	
AUX 6	1500	0,0,0
AUX 7	1500	
AUX 8	1500	RC Interpolation
AUX 9	1500	
AUX10	1500	Auto Y RC Interpolation

# 12. Arm/Disarm Lizard 105S Flysky BNF Version

1. The Default Arm/Disarm switch for Lizard 105S is AUX1(Channel 5), and you can also customize it with Betaflight Configurator. We also set the AUX2(Channel 6) for change flight mode and AUX3(Channel 7) for activate the buzzer which you can customize them too.

Modes			WIKI
Use ranges to de activate the mod	fine the switch le. Remember t	tes on your transmitter and corresponding mode assignments. A receiver channel that gives a reading between a range min/m to save your settings using the Save button.	iax will
ARM Add Range	AUX 1 V Min: 1400 Max: 2100	I I I I I I I I I I I I I I I I I I I	0
AIR MODE	AUX 2 ¥ Min: 1525 Max: 2050		0
ANGLE Add Range	AUX 2 • Min: 1150 Max: 1500	900 1000 1200 1400 1505 1609 1600 2000 210	0

2. Set Arm/Disarm switch for your Flysky Radio: Move to the Aux.channels interface, Set "SWA" or "SWB" or "SWC" switch etc. for Ch5 to ARM/DISARM the motor. Suggest use a 3-steps switch (like "SWC" of the Flysky I6) to change flight mode.



3.Toggle the AUX1 Switch, the buzzer starts beeps one time and the Green LED on the flight controller turned off, this indicates the motor was armed. And also you can found "Armed" shows on your FPV Goggles or the FPV Monitor. Please make sure keep the Lizard105S level before arming .Be careful and enjoy your flight now !



#### 13. Lizard 105S Flysky version receiver configuration

We have configured the Flysky receiver before shipping. If you flashed the new firmware, please set up as the following steps: Enable Serial RX for UART3, then choose Serial\_based receiver from the Receiver Mode tab, and set the Serial Receiver Provider to IBUS Mode in Betaflight Configurator

ldentifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	115200 🔻		Disabled • AUTO •	Disabled • AUTO •	Disabled • AUTO •
UART1	115200 •		Disabled • AUTO •	Disabled V AUTO V	Disabled • AUTO •
UART3	115200 •	-	Disabled • AUTO •	Disabled • AUTO •	Disabled • AUTO •
UART6	115200 •	0	Disabled • AUTO •	Disabled V AUTO V	Disabled • AUTO •
Receive Serial-ł	r based receiver (SF	PEKSAT, S	Receiver Mode		

#### 14. Lizard 105S DSM2/DSMX BNF Version binding procedure and Satellite receiver setup

The Lizard 105S DSM2/X version comes with a BM01 binding module, the binding step is:

1.First remove the Receiver from Lizard 105S

2.Connect the binding module and the receiver of the Lizard 105S

3.For the DSMX Protocol Transmitter like DX9/DX8/DX7S/DX6, please just plug the USB of the binding module to computer or 5V power bank, the orange LED on the receiver will blinking fast, this indicates the receiver is in the DSMX protocol bind mode, turn on your transmitter and enter into binding mode, the orange LED should be solid once binding successful. If failed ,please Repeat the above steps



4.For the DSM2 Protocol Transmitter like DX7/DX6I, please plug the USB of the binding module to computer or 5V power bank while holding the button, the orange LED on the receiver will blinking fast, this indicates the receiver is in the DSM2 protocol bind mode, then release the button and turn on your transmitter and enter into binding mode, the orange LED should be solid once binding successful. If failed ,please Repeat the above steps



5.Reconnect the receiver to Lizard 105S after binding successfully

6.The Default channel map for Lizard 105S DSMX version is "TAER1234", Please ensure your transmitter is matched with it , otherwise it can't be armed.

Notes: Please pay attention to the min Throttle of your transmitter, it should be less than the "Stick min", so that you can arm the Quadcopter (For Example 1048<1050)

Receiver		wa
Please read receiver of receiver, set channel r 1500, configure stick of IMPORTANT: Before th	apter of the documentation. Configure nap, configure charinel endpoints/range eadband, verify behaviour when TX is of ing read failsafe chapter of documentat	erial port (if required), receiver mode (serial/ppm/pwm), provider (for serial receivers), bind on TX so that all channels go from -1000 to -2000. Set midpoint (default 1500), trim channels to or out of range on and configure failsafe.
Roll [A]	1500	Channel Map RSSI Channel
Pitch [E]	1497	TAER1234 Disabled
Yaw [R]	1502	
hrottle [1]	1048	Stick Low' Thrachold Stick Cantar Stick Migh' Thrachold
AUX 1	1159	JUCK CON THE SHORE SHORE SHORE THE SHORE
AUX 2	1159	1050 C W 1500 C W 1900 C V
AUX 3	1159	
AUX 4	1159	RC Deadband Yaw Deadband 3D Throttle Deadband
AUX 5	1159	0.0
AUX 6	1500	0 - 0 - 0 - 50 - 10
AUX 7	1500	
AUX 8	1500	RC Interpolation

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## 15. Arm/Disarm Lizard 105S DSM2/DSMX BNF version

1. The Default Arm/Disarm switch for Lizard 105S DSM2/DSMX BNF Version is AUX1(Channel 5), for most of Spektrum radio the default channel 5 is Gear switch and you can also customize it with Betaflight Configurator. We also set the AUX2(Channel 6) for change flight mode and AUX3(Channel 7) for activate the buzzer which you can customize them too . Suggest use a 3-steps switch to change flight mode.

Modes											8	WIKI
Use ranges to de activate the mod	efine the switche 36. Remember to	rs on you o save yo	ur transmitt our settings	er and corr using the 5	esponding m ave button.	node assignmen	its. A receiver c	hannel trut g	gives a reading b	stweets a range	min/max	will
ARM	AUX 1 •		1.54.54		4.4.4							0
Add Range	Mai: 2100	000	1000		1200	\$400	1500 16	00	100	2000	2100	
AIR MODE	AUX 2 •	10	2011-04		7.87		12		10 10 20		10	0
Add Range	Min: 1525 Max: 2050	500	1000		1290	1400	1000 10	00	1800	2000	2100	

2. Turn on the transmitter and set a switch for Ch5 to ARM/DISARM the motor, some transmitter ink SPECKTRUM DX6/DX6I, the default Ch5 is GEAR Switch.

	9-CHANNEL DSMX® T	ELEMETRY SYSTEM		
	Channel In	put Config LIST	52	m
×	1 THRO: N/A 2 ATLE: N/A 3 ELEV: N/A 4 DECOMMAN 5 GEAR: (A) 10 GEAR: (A)	6 AUXE D 7 AUXE E 8 AUXE C 9 AUXE C 9 AUXE H	N N N	
	3 MODEL TYPES WIRELESS	TRAINER VOICE ALERTS	and the second second	and the second

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3.Toggle the AUX1 Switch, the buzzer starts beeps one time and the Green LED on the flight controller turned off, this indicates the motor was armed. And also you can found "Armed" shows on your FPV Goggles or the FPV Monitor. Please make sure keep the Lizard105S level before arming .Be careful and enjoy your flight now !





#### 16. Lizard 105S DSM2/DSMX BNF version receiver configuration

We have configured the DSM2/DSMX before shipping. If you flashed the new firmware, please set up as the following steps: Enable Serial RX for UART3, then choose Serial\_based receiver from the Receiver Mode tab, and set the Serial Receiver Provider to SPEKTRUM2048 for DSMX Protocol and SPEKTRUM1024 for DSM2 Protocol in Betaflight Configurator

dentifier	Configuration/MSP	Scrial Rx	Telemetry Output	Sensor Input	Peripherals
JSB VCP	115200 🔻		Disabled • AUTO •	Disabled • AUTO •	Disabled • AUTO •
ART1	115200 •		Disabled • AUTO •	Disabled • AUTO •	Disabled • AUTO •
JART3	115200 •		Disabled • AUTO •	Disabled • AUTO •	Disabled • AUTO •
JART6	115200 •	0	Disabled • AUTO •	Disabled V AUTO V	Disabled • AUTO •
Receiv	er				
Receive Serial-	er based receiver (Si	PEKSAT, S	Receiver Mode	d character a Cavial Decolution	
Receive Serial- Note: RX_SE	er based receiver (Sl Remember to conf RIAL feature.	PEKSAT, S Igure a Seri	Receiver Mode al Port (via Ports tab) and	d choose a Serial Receive	r Provider when using

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#### 17. OSD configuration

1. Connect the Lizard 105S to the computer , open Betaflight Configurator , move to the OSD option, then you can configure the layout of the OSD.



2. OSD change font layout



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#### 18. Flight controller firmware update

Firmware update:

1.Install latest STM32 Virtual COM Port Driverhttp://www.st.com/web/en/catalog/tools/PF2579382

2.Install STM BOOTLOAD Driver (STM Devicein DFU MODE)

 $3.0 pen \ Betaflight \ configurator \ and \ choose firmware \ target \ \ "OMNIBUS \ F4SD" \ , then \ select \ the firmware \ version.$ 

4.There are 2 ways to get in DFU Mode: 1).solder the boot pad and then plug USB to comuper 2).loading betaflight firmware and hit "flash", then it will getting into DFU Mode automatically.

5. Open Zadig tools to replace the drivers from STM32 Bootloader to WINUSB Driver .

Device Options Help STM32 BOOTLOADER Driver STTub30 (v3.0.4.0)	
STM32_BOOTLOADER           Driver         STTub30 (v3.0.4.0)           WinUSB (v6.1.7600.16385)	Î
Driver STTub30 (v3.0.4.0)	T Edit
	fore Information
USB ID 0483 DF11 Replace Driver	busb-win32 busbK
8 devices found	VinUSB (Microsoft)

6.Reconnect the flight controller to the computer after done the driver replacement , and open Betaflight configurator, loading firmware and click flash.



# www.eachine.com

\*User manual is subject to change without prior notice.