

# Instruction Diagram





#### **Micro SD Card**

Capacity up to 128GB; U3 recommended (2.7K50/1080P120 requires U3 or above; other solutions require U1 or above)







Please push the shield a little bit up with one hand like showed in above step 1 and then press the SD card(step 2) with another hand to let the card pop out.

### **Basic Camera Operation**

Powering On/Off	Long press the Power/Shutter button					
Standby Mode	Camera Status Light: Blue is On					
Mode Switching	In Standby Mode, long press the Mode Switch button to cycle through the recording mode and the QR code setting mode.					
Video Mode	Camera Status Light: Blue LED blinks slowly, one second interval Press the Power/Shutter button to start/stop recording.					
QR Code Setting	Camera Status Light: Green is on Use RunCam App to access to RunCam Hybrid interface, set it and create the QR code. Under QR code setting mode, use camera to scan the QR code. Switch to standby mode automatically after scanning successfully. The status light is Blue.					
HD Recording Firmware Update	Camera Status Light: Green LED blinks slowly, one second interval					
SD Card Issues	Camera Status Light: Blue LED blinks quickly, 0.5 second interval					
Lens Module Bad Connection	Camera Status Light: Green LED blinks quickly, 0.5 second interval					

#### **Transmitter Connection Diagram**



Warning: Current Input ≥1A (Don't powered by VTx)

# FPV Flight Controller Setup

FPV camera supports Joystick Control and UART Control. The top left corner of the screen will shortly display the current control mode. The default is Joystick control mode. You can switch the mode via below way:

Short the two camera control pins (TX and RX on board as shown in below picture) (1)



Then power on, camera will auto switch between the two modes. The mode can be saved after power off.



JOYSTICK CTRL CARD ERROR 4K 30FPS



3 After switching to the desired mode, please unplug the short-circuit cable. UART Control works with Flight Controllers: BetaFlight 3.3 or above / ButterFlight 3.4 or above / CleanFlight 2.2 or above

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# Joystick Control





(Not Included)

# 

FFV OSD Menu	
JOYSTICK CTRL CARD ERROR 4K 30FPS	<ul> <li>JOYSTICK CTRL: Camera is under Joystick Control and the icon remains for 5 seconds.</li> </ul>
	• CARD ERROR: Card error or no SD card
	• CARD FULL: SD card is full
	<ul> <li>4K 30FPS: Current video resolution, remains for 10 seconds</li> </ul>
	J
0123456789ABCDEFGHIJ KLMNOPQRSTUVWXYZ&:=./ RUNCAM CLR	<ul> <li>Quick Setting (Long press the upper button to enter the menu)</li> <li>Press the middle button to switch ON / OFF</li> <li>CLR: Clear RUNCAM logo or pilot's name</li> <li>POS: Move to POS to adjust position</li> </ul>
PILOT : OFF POS ← SHARP VIEW : ON WIDESCREEN : 4:3 SYSTEM : NTSC	<ul> <li>SHARP VIEW: Turn on, it will increase the image details, but also noise</li> <li>WIDESCREEN: Switch image ratio between 16:9 and 4:3.</li> </ul>
EXIT	• <b>SYSTEM:</b> Press the middle button to switch NTSC/PAL. It will work only after you exit the menu and reboot.

• EXIT: Fxit and saved.

# **UART** Control

1. Flight controller wiring (Take UART3 for example)



### 2. Betaflight 3.3 or above setting

Just need to choose "Camera (RunCam Protocol)" on UART 3 as shown in below screenshot.

Identifier	Configuration/MS	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	115200 🗘		Disabled \$ AUTO \$	Disabled \$ AUTO \$	Disabled \$ AUTO \$
UART1	115200 🛊		Disabled  AUTO	Disabled \$ AUTO \$	Disabled \$ AUTO \$
UART2	115200 🗘		Disabled \$ AUTO \$	Disabled \$ AUTO \$	Disabled + AUTO +
UART3	115200 🗘		Disabled + AUTO +	Disabled \$ AUTO \$	Camera (RunC 🗘 AUTO 🛟
UART4	115200 🗘		Disabled  AUTO	Disabled \$ AUTO \$	Disabled \$ AUTO \$
UART5	115200 🛊		Disabled \$ AUTO \$	Disabled \$ AUTO \$	Disabled \$ AUTO \$

3. UART Control (Operate with your remote controller. Yellow icon to indicate bar operation direction. Black dot means centering control)

# **Mode-2 (American version)**





\* When connected, The buzzer on Flight Controller will beep for 3 times; When disconnected, The buzzer on Flight Controller will beep for 2 times only; If connected successfully, you can long press the up button to enter the OSD menu, right button to switch preset scenes, left button to calibrate voltage and down button to reset OSD.

## **Camera Menu**



• VIDEO STANDARD (PAL/NTSC) • IMAGE RATIO (4:3 /16:9)

• CONTRAST (MANUAL/AUTO) • SHARPNESS (MANUAL/AUTO)

• COLOR GAIN (MANUAL/AUTO)

#### **HD Flight Controller Set** Preparation

• Firmware: BetaFlight Firmware (≥3.2.0),CleanFlight Firmware(≥2.1.0),

KISS Firmware ( $\geq$ 1.3-RC30) or INAV Firmware ( $\geq$ 1.7.3).

• Any available UART interface on the Flight Controller 1. Connect the RunCam Hybrid with the UART interface of the Flight Controller

	$\bigcirc \bigcirc \bigcirc$
	FC
	GND
RX	ТХ
ТХ	RX

## 2. Make the Flight Controller recognize the RunCam Hybrid

For example, we connect the RunCam Hybrid to the UART 5 interface on the Flight Controller: connect the Flight Controller to the computer, then open the configurator software of the Flight Controller. (Open up the configurator that matches the firmware you are running, Betaflight Configurator for Betaflight, Cleanflight Configurator for Cleanflight). In the Peripherals column of the line UART 5 (on the Ports tab), select Camera (RunCam Protocol) and click Save And Reboot.

• • •				Botanight bonngalator		
BETAFL Configurator: 10.00 Firmware: BTFL 3.2.	. <b>IGHT</b> 3 (Target: OB72)				Image: Non-State     Image: Non-State <th>No dataflash chip found Enable Expert Mode Disconnect</th>	No dataflash chip found Enable Expert Mode Disconnect
2019-09-16 @ 11:22:53 Running f 2019-09-16 @ 11:22:53 Board: SF 2019-09-16 @ 11:22:53 Unique d 2019-09-16 @ 11:22:53 Craft nam 2019-09-16 @ 11:22:53 Arming D	irmware released on: 5 PEEDYBEEF7, version evice ID: 0x470023323 ie: sabled	Sep 3 2019 12:26:08 : 0 7511631313935				Hide Log Scroll
✓ Setup ✓ Ports	Ports					WIKI
<ul> <li>Configuration</li> <li>Power &amp; Battery</li> </ul>	Note: not all comb Note: Do NOT dis	pinations are valid. When the flight able Msp on the first serial port unl	controller firmware o ess you know what	letects this the serial port configurator will you are doing. You may have to reflash an	be reset. d erase your configuration if you do.	
음 PID Tuning	Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
	USBVCP	115200 🗘		Disabled 🗘 AUTO 🛟	Disabled \$ AUTO \$	Disabled
R Modes	UART1	115200 🛟		Disabled	Disabled \$ AUTO \$	Disabled
La Motors	UART2	115200 🖨		Disabled	Disabled \$ AUTO \$	Disabled  t AUTO  t
🚥 OSD	UART3	119200 🖨		Disabled	Disabled \$ AUTO \$	Disabled
Blackbox	UART4	115200 🖨		Disabled	Disabled \$ AUTO \$	Disabled  t AUTO
CLI	UART5	115200 \$		Disabled \$ AUTO \$	Disabled \$ AUTO \$	Camera (RunCan \$ AUTO \$
	SOFTSERIAL1	115200 \$		SmartPort \$ AUTO \$	Disabled \$ AUTO \$	Disabled  t AUTO  t
						Save and Peheet

## 3. Instructions of the functions of the camera and assigning transmitter channels to them

In the Flight Controller Configurator, navigate to the Modes tab. There are new

CAMERA WI-FI, CAMERA POWER and CAMERA CHANGE modes

Packet error: 0 I2C error: 0 Cycle Time: 128 CPU Load: 6%

- CAMERA POWER: start/stop the video. When in the OSD of the camera, this is used to move to the next menu item.
- CAMERA CHANGE MODE: Switch between the recording mode and the QR code setting mode.
- Assign any available channel to the function you need, for example: • Assign the AUX2 to the CAMERA POWER, range 1900-2100

#### • Assign the AUX3 to the CAMERA CHANGE MODE, range 1900-2100

						Detailing	ni oonng	urator											
BETAFL Configurator: 10.0.0 Firmware: BTFL 3.2	.3 (Target: OB72)							0.1 V	/ >	<b>X</b> Gyro	Accel	N Mag	Baro	GPS	))) Sonar		lo datafiash chip found nable Expert Mode	e Discor	nnect .
2019-09-16 @ 11:23:25 Board: S 2019-09-16 @ 11:23:25 Unique c 2019-09-16 @ 11:23:25 Craft nar 2019-09-16 @ 11:23:25 Arming E 2019-09-16 @ 11:23:59 EEPROM	PEEDYBEEF7, version: 0 levice ID: 0x47002332375 ne: Disabled <i>I</i> / saved	11631313935																	
Setup  Setup  Configuration	BLACKBOX ERASE (>30s) Add Link Add Range																		
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	FLIP OVER AFTER CRASH Add Link																		Save

### 4. Assign the channel to the switch of the controller

Please choose your Model on the controller, then access to the MIXER interface and assign the channel to the switch of the controller. Take opentx 2.2.0 for example, assign the channels CH5, CH6 and CH7 to SA, SB and SD respectively



#### 5. Test

#### Power the Flight Controller and the RunCam Hybrid

- Set the SA to the bottom, the camera starts/stops the video
- Set the SD to the bottom, the camera switches among the two modes: video and OSD setting mode

## • Technical Support

Please visit: <u>https://support.runcam.com</u>

#### **Parameter**

HD sensor	SONY 8MP							
Analog sensor	SONY 1.3MP							
Field of View(FOV)	HD Recording FOV 145°; (FPV FOV 150 ° @4:3)							
Video Resolution	4K@30fps / 2.7K@60fps / 2.7K@50fps / 1080P@120fps / 1080P@100fps / 1080P@60fps / 1080P@50fps							
Video File Format	MP4							
TV Mode	NTSC (720*480)/PAL (720*576) Switchable							
Interface	HD supports UART remote control; FPV (Analog) supports UART fimrware update.							
Max Micro SD Card Supported	Up to 128G. Samsung's U3 card is recommended (2.7K60/1080P120 requires U3 or above; other solutions require U1 or above) Please make sure that the file format of the SD card is FAT32, otherwise, it will easily cause errors.							
Mounting Holes Distance	20*20mm							
PCB Size	29*29mm							
Lens Module Size	19*25mm							
Lens Specs	HD Lens: M10 FPV Lens: M8							
Power Input	DC 5-20V (Non-direct power supply from 4s battery or above. Powered directly with battery will generate surges and burn the camera.)							
Working Current	480mA @5V / 140mA @12V							
Weight	18g							