**RunCam Hybrid 2**

# RunCam Hybrid 2 4K FPV and HD Recording Camera Instruction Manual

## INTRODUCTION

The RunCam Hybrid 2 is an advanced dual-lens camera system designed for FPV (First Person View) applications and high-definition (HD) video recording. It integrates a 4K HD recording lens with a dedicated analog Phoenix 2 sensor lens, providing both high-quality recorded footage and a clear, low-latency FPV feed. This manual provides essential information for the proper installation, operation, and maintenance of your RunCam Hybrid 2 camera.

## PRODUCT OVERVIEW

The RunCam Hybrid 2 features a compact, single-board design, making it suitable for micro FPV setups. Its dual-lens configuration ensures that the FPV view closely matches the recorded HD footage, enhancing the piloting experience.

### Key Features:

- **Dual Lens System:** Combines a 4K HD recording lens (SONY 8MP sensor) with an analog FPV lens (Phoenix 2, SONY 1.3MP sensor).
- **Single Board Design:** Achieves a compact form factor with both lenses mounted closely on a single PCB.
- **Easy Installation:** 19mm camera module width allows direct mounting in micro FPV frames without adapters.
- **QR Code Parameter Settings:** Configure camera settings conveniently via a smartphone app by scanning a generated QR code.
- **UART Control:** Connects to a flight controller's UART port for remote control of recording functions via your radio transmitter.
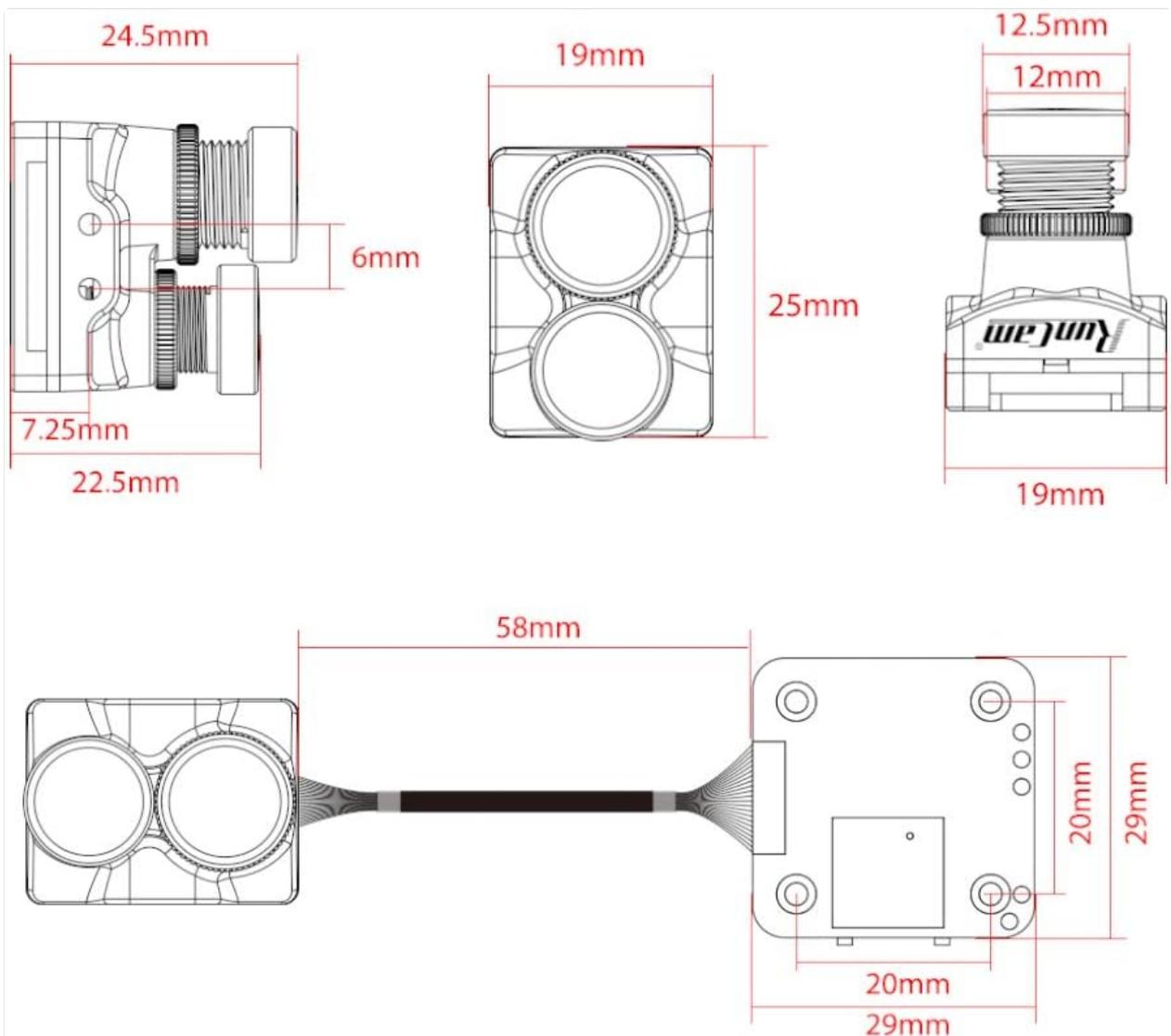
Image: Analog Output Upgraded to Phoenix 2. The camera provides an improved FPV image feed.

Image: Single board design for simple installation.

## PACKAGE CONTENTS

Verify that all items listed below are included in your package:

- 1x RunCam Hybrid 2 Camera
- 1x Plastic cover
- 1x 3PIN FPV silicone cable (male)
- 1x 3PIN FPV silicone cable (female)
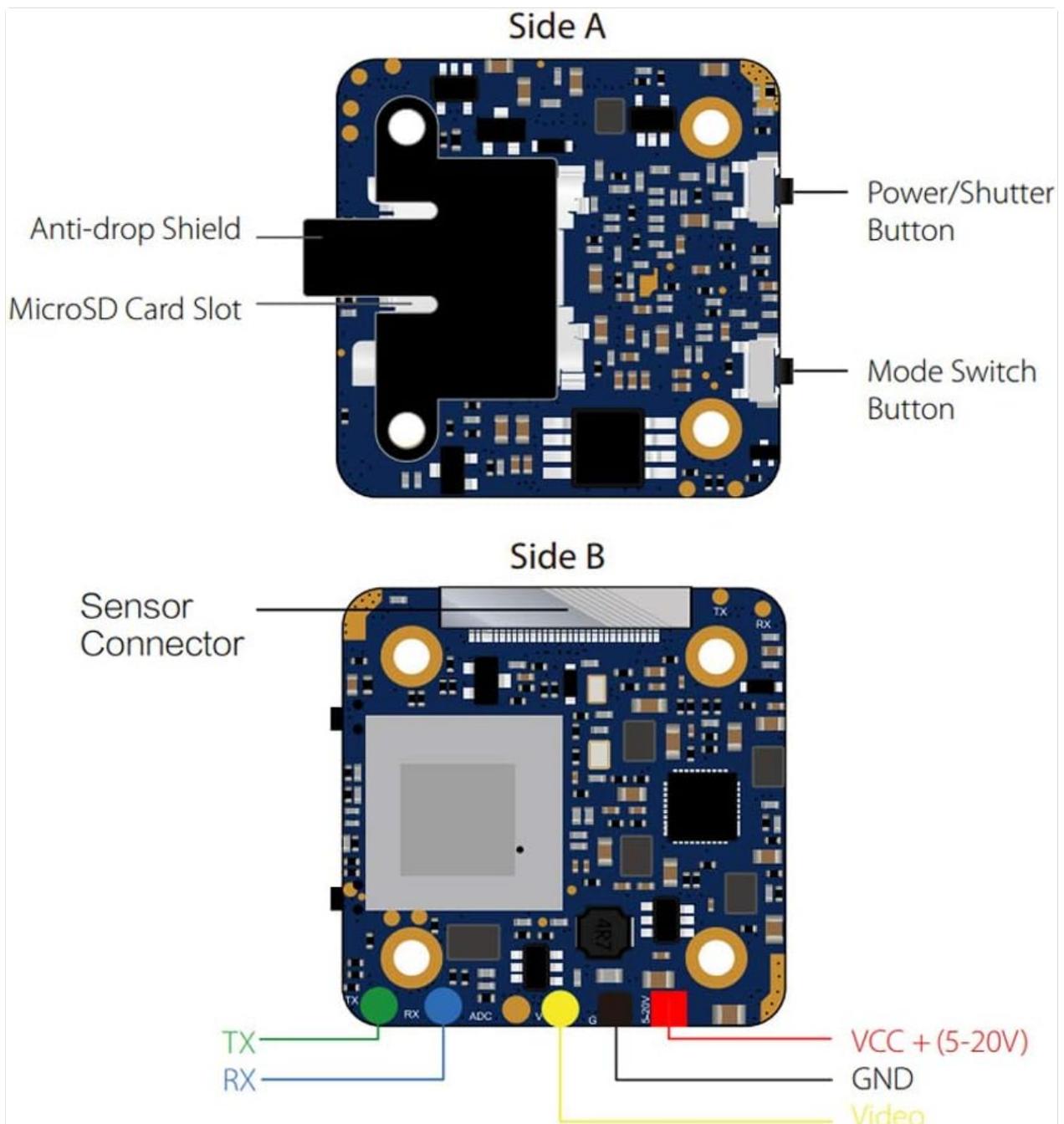- 1x Set of M2 screws
- 1x Manual

Image: Package contents of the RunCam Hybrid 2.

## SPECIFICATIONS

| Parameter | Value |
| --- | --- |
| HD Sensor | SONY 8MP |
| Analog Sensor | SONY 1.3MP (Phoenix 2) |
| 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 x 480) / PAL (720 x 576) (Switchable) |

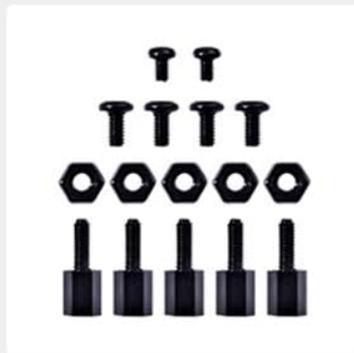| Interface | HD supports UART remote control; FPV (analog) supports UART firmware upgrade. |
|---|---|
| Max Micro SD Card Supported | Up to 128GB (U3 recommended for 2.7K60/1080P120; U1 for others). Must be FAT32 format. |
| Mounting Holes | 20 x 20 mm |
| PCB Size | 29 x 29 mm |
| Lens Module Size | 19 x 25 mm |
| Lens Specifications | M10 HD Lens and M8 FPV Lens |
| Input Power | DC 5-20V (Do not directly power with 4S battery or higher to avoid overvoltage). |
| Working Current | 480mA @ 5V / 140mA @ 12V |
| Weight | 18g |

## Package

| | | |
|---|---|---|
| 1x Camera | 1x Plastic cover | 1x 3PIN FPV silicone cable(male) |
| 1x 3PIN FPV silicone cable(female) | 1x Set of M2 screws | Manual*1 |

Image: RunCam Hybrid 2 Dimensions.

## Setup

Follow these steps to properly set up your RunCam Hybrid 2 camera:

1. **Physical Installation:** Mount the 19mm camera module into your drone or vehicle frame. The compact design allows for direct integration into micro FPV setups.

2. **Wiring Connections:** Refer to the wiring diagram below for correct connections.

- **VCC+ (5-20V):** Connect to a stable DC power source within the specified voltage range.*Warning: Do not directly power with a 4S battery or higher, as this can cause overvoltage and damage the camera.*
- **GND:** Connect to ground.
- **Video:** Connect to your FPV video transmitter (VTX) for analog video output.
- **TX/RX:** Connect to a UART port on your flight controller for remote control functionality and firmware updates.

3. **Micro SD Card Insertion:** Insert a formatted Micro SD card (FAT32 format, U3 speed class recommended for 2.7K60/1080P120, U1 for other resolutions) into the designated slot. Ensure the card is inserted correctly to avoid data corruption.



Image: RunCam Hybrid 2 PCB Layout and Wiring Diagram.

## OPERATING

Once the camera is installed and powered, you can begin operation:

1. **Power On:** Apply power to the camera. The FPV feed should appear on your goggles or monitor.

2. **Recording Control:**

- **Manual Control:** Use the Power/Shutter Button on Side A of the PCB to start and stop HD recording.
- **UART Remote Control:** If connected to a flight controller's UART, configure your Betaflight (or similar) settings to assign a switch on your radio to control recording start/stop.

3. **Mode Switching:** Use the Mode Switch Button on Side A to cycle through different camera modes or settings if available.

4. **QR Code Parameter Settings:** For advanced configuration, download the RunCam app on your smartphone. Adjust desired settings within the app, generate a QR code, and then scan this QR code with the RunCam Hybrid 2 camera. The camera will automatically apply the new settings.
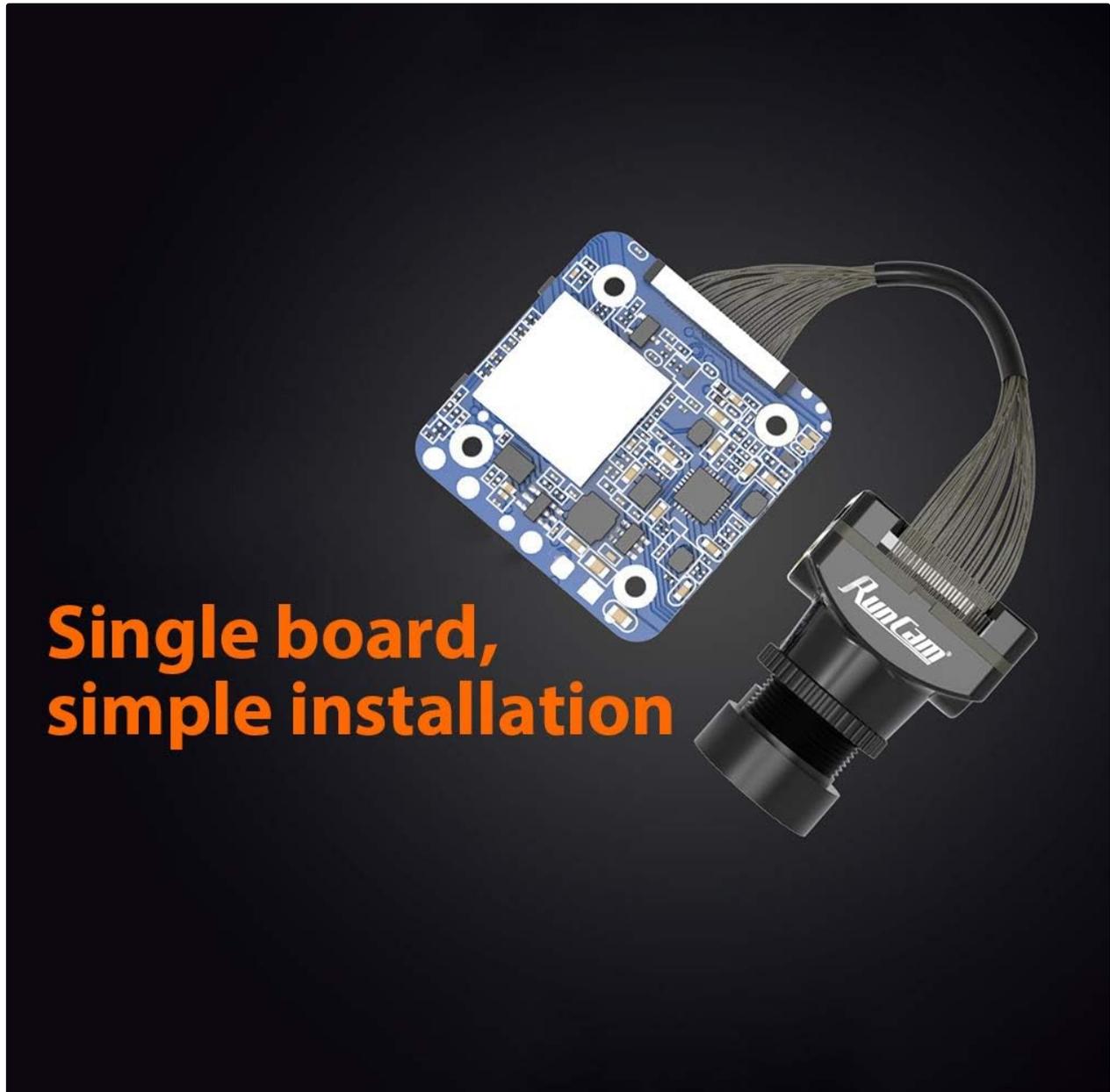


Image: QR Code Parameter Settings via RunCam App.

## MAINTENANCE

To ensure optimal performance and longevity of your RunCam Hybrid 2 camera, follow these maintenance guidelines:

- **Lens Cleaning:** Regularly clean both the HD and FPV lenses with a soft, lint-free cloth and lens cleaning solution. Avoid abrasive materials that could scratch the lenses.
- **Power Supply:** Always ensure the camera receives power within the specified DC 5-20V range.

Incorrect voltage can cause irreversible damage.

- **SD Card Management:** Periodically back up your recorded footage and format the Micro SD card to maintain optimal recording performance and prevent file corruption. Use a high-quality, recommended speed class SD card.
- **Physical Inspection:** Regularly check for any loose connections, damaged cables, or physical damage to the camera module.

## TROUBLESHOOTING

If you encounter issues with your RunCam Hybrid 2, refer to the following common problems and solutions:

- **No Power/Camera Not Turning On:**

  - Check all power connections (VCC+, GND) for proper wiring and secure contact.
  - Verify that the input voltage is within the DC 5-20V range.
  - Ensure no short circuits are present in the wiring.

- **No FPV Video Output:**

  - Check the video signal cable connection from the camera to your VTX and from the VTX to your goggles/monitor.
  - Confirm that the TV mode (NTSC/PAL) setting on the camera matches your display device. This can be adjusted via QR code settings.
  - Ensure the VTX is powered and functioning correctly.

- **Recording Errors / Corrupted Files:**

  - Ensure the Micro SD card is formatted to FAT32.
  - Use a high-speed Micro SD card (U3 or higher for 4K/high frame rate recording).
  - Try formatting the SD card again or using a different, known-good SD card.
  - Check the SD card slot for any debris or damage.

- **QR Code Settings Not Applying:**

  - Ensure the QR code is clearly visible and well-lit when scanning.
  - Hold the QR code steady in front of the camera lens until the settings are confirmed.
  - Verify that you are using the official RunCam app for generating QR codes.

- **UART Control Not Working:**

  - Check TX/RX wiring between the camera and the flight controller.
  - Verify UART settings in your flight controller firmware (e.g., Betaflight) are correctly configured for camera control.
  - Ensure the correct protocol is selected in the flight controller software.