AKK kc02

AKK KC02 FPV Transmitter and Camera User Manual

Model: KC02
Brand: AKK

1. Introduction

This user manual provides comprehensive instructions for the installation, operation, and maintenance of the AKK KC02 FPV Transmitter with 600TVL Sony CCD Camera. This integrated system is designed for First Person View (FPV) applications, particularly for multicopters, offering high-quality video transmission for an immersive flying experience. Please read this manual thoroughly before use to ensure proper setup and safe operation.

2. Product Overview

2.1 Package Contents

The AKK KC02 FPV system package typically includes the following components:

- 1x FPV Transmitter (VTX)
- 1x 600TVL Sony CCD Camera
- 1x Antenna (RP-SMA connector)
- 2x Connection Cables (for VTX and Camera)
- 1x Base Bracket
- 1x Set of Screws
- 1x User Manual

2.2 Key Features

- Integrated 600TVL Sony CCD Camera for high-quality picture.
- 600mW FPV Transmitter for reliable video signal.
- Wide operating voltage range: 7-20V (VTX) and 5-22V (Camera).
- Low power consumption design.

- Easy channel and frequency selection via two buttons and LED display.
- NTSC video format.

2.3 Product Components Visual Guide

Figure 1: The AKK KC02 FPV Transmitter and Camera system, fully assembled with antenna and connection cables.

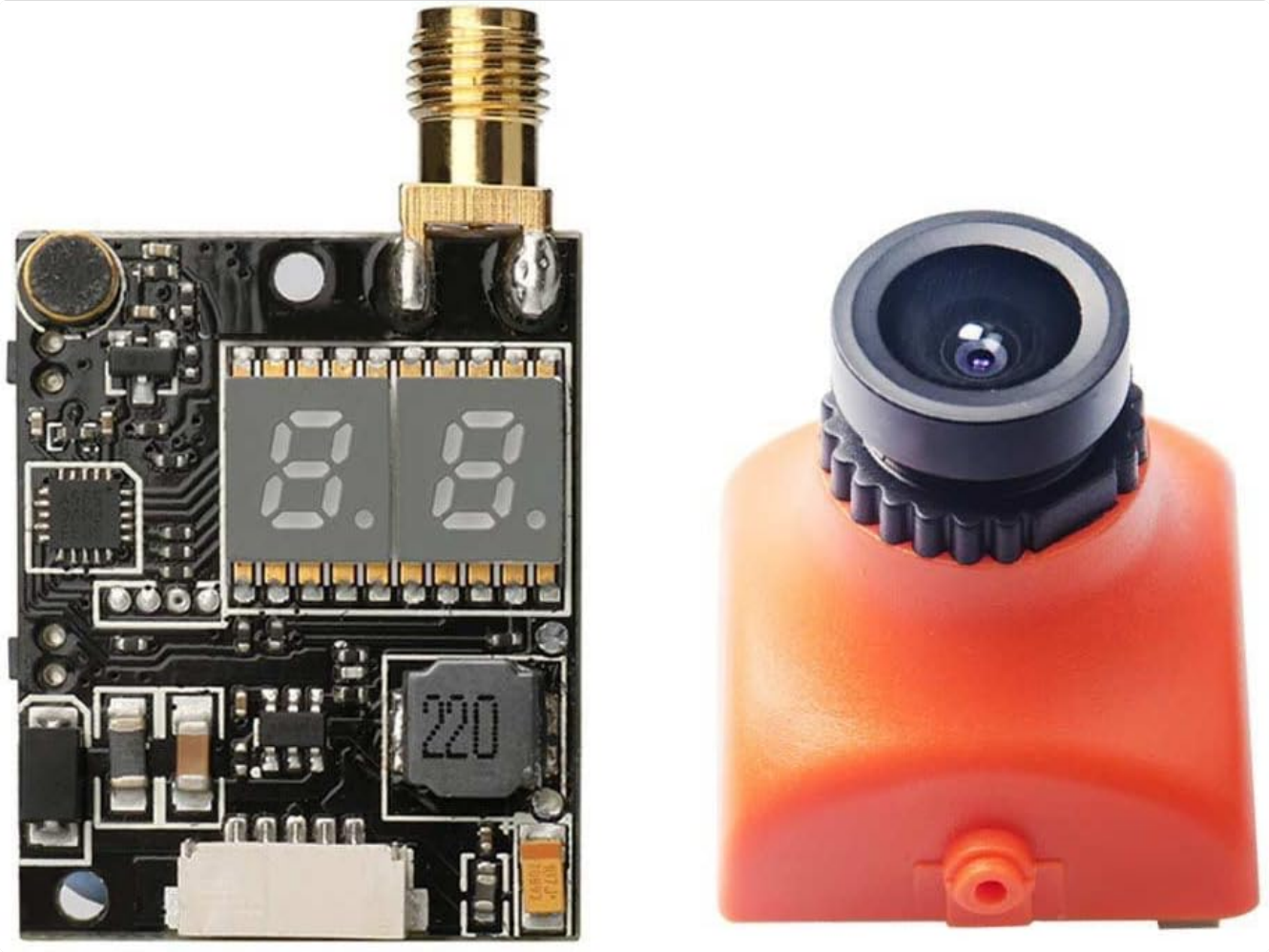

Figure 2: Individual components of the AKK KC02 system, showing the FPV transmitter module and the 600TVL Sony CCD camera.

Figure 3: All included accessories for the AKK KC02 FPV system, including the camera, VTX, various cables, mounting bracket, and screws.

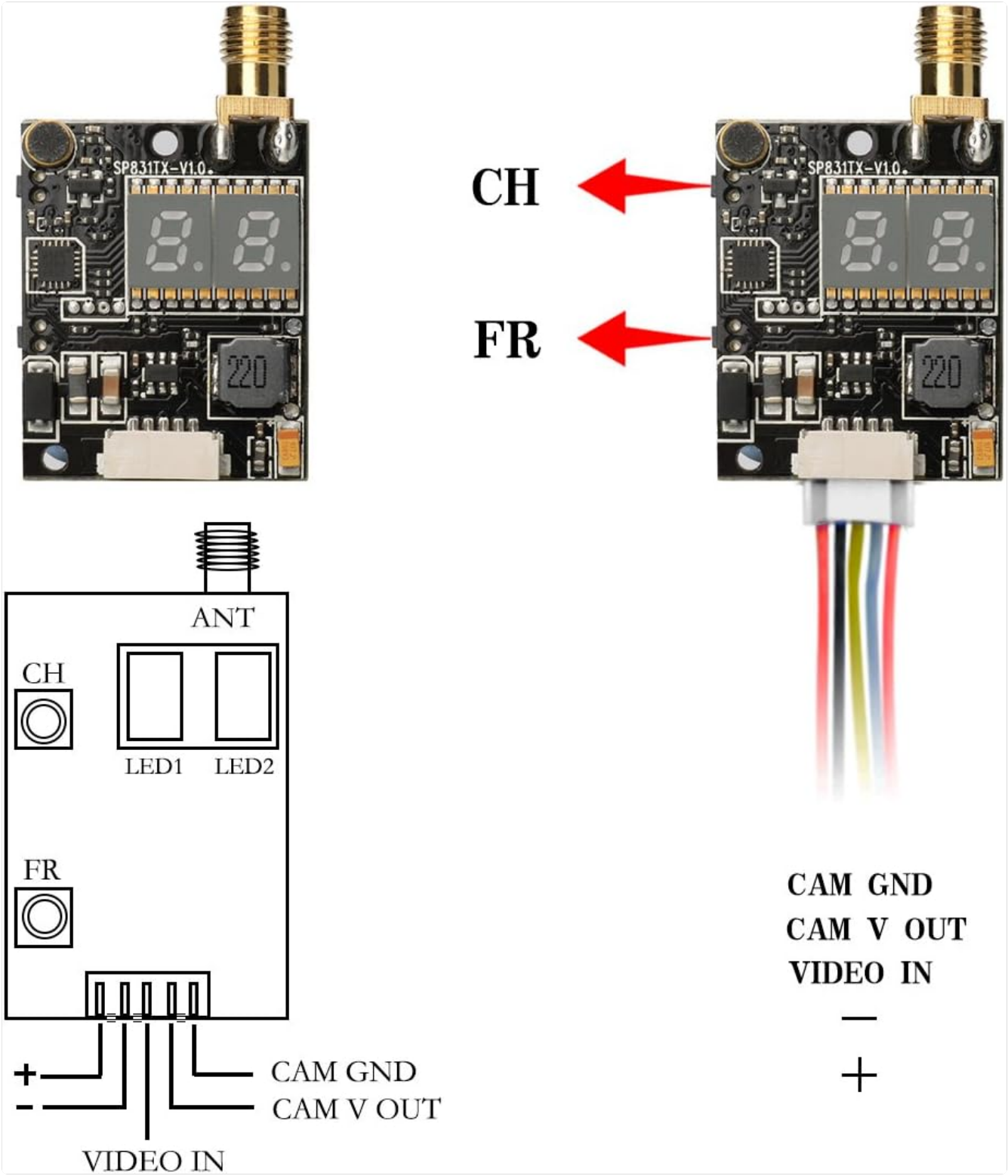

Figure 4: Detailed diagram of the FPV transmitter (VTX) showing the channel (CH) and frequency (FR) buttons, LED indicators, and the pinout for power and video connections.

3. Specifications

Feature	Specification
Video Format	NTSC
Output Impedance	50 Ohm

Feature	Specification
Antenna Connector	RP-SMA connector
Supply Current (VTX)	280 mA
Operating Temperature	-10°C to +85°C
Video Bandwidth	0-8.0 MHz
Audio Carrier Frequency	6.5 MHz
Video Input Level	0.8, 1.0, 1.2 Vp-p
Video Input Impedance	75 Ohm
Audio Input Level	0.5, 2.0 Vp-p
Audio Input Impedance	10K Ohm
Operating Voltage (VTX)	7-20 V (Supports 2S-4S batteries, not 6S)
VTX Size	31mm x 25mm x 8mm
Camera CCD	1/3” Sony SUPER HAD II CCD
Camera Pixel (NTSC)	768(H) × 494(V)
Camera Resolution	650TVL (B/W), 600TVL (Color)
Synchronization	Internal synchronize
Shutter Speed (CCD IRIS)	NTSC: 1/60~1/100000 sec
Noise	> 60 (AGC OFF)
Video Out	75ohm, synchronize
Min. Illumination	0.01Lux
Auto Gain	Off/Low/Mid/High
Back Light Compensation (BLC)	Off /Back light compensation/ Strong light suppression
Private Shading (PRIVACY)	1~8 private shading area
Motion Detection (MD)	On/ Off (Multi level sensitivity settable)
Auto White Balance	Manual / Auto / Auto track
Mirror	Horizontal Mirror optional
Negative	Positive / Negative optional
Color to B&W	Auto
DNR	2DNR
WDR	D-WDR
Day / Night Shift	Auto/ Color/ B&W
Menu (OSD)	English menu

Feature	Specification
White Dot Repair	Support
Image Adjustment	Support
Camera Title	Support
Power Requirement (Camera)	DC5V~22V
Working Humidity	20~80%
Storage Temperature	-40°C ~ +60°C
Storage Humidity	20~95%
Dimensions (Camera)	25mm x 25mm (W*L)
Power Consumption (Camera)	70mA

4. Setup and Installation

4.1 Wiring Connections

Proper wiring is critical for the functionality and longevity of your FPV system. Refer to Figure 4 for the VTX pinout diagram. The included cables are designed for connection between the VTX, camera, and power source.

- **Power Input (+):** Connect the positive power lead from your flight controller (FC) or power distribution board (PDB) to the VTX's positive input. The VTX supports 7-20V DC input.
- **Ground (-):** Connect the negative power lead (ground) from your FC or PDB to the VTX's ground input.
- **Video In (VTX):** Connect the video output from the camera to the Video In pin on the VTX.
- **Camera Power Output (CAM V OUT):** The VTX provides a 5V output for powering the camera. Connect this to the camera's positive power input.
- **Camera Ground (CAM GND):** Connect the camera's ground to the VTX's camera ground pin.

Important Note on Camera Power: While the VTX provides a 5V output for the camera, some users have reported issues with noise or instability when powering the camera directly from the VTX, especially if the VTX input voltage is high (e.g., 4S battery). For optimal performance and to prevent potential damage, it is recommended to power the camera directly from a filtered 12V or 5V source on your PDB or FC, if available, instead of using the VTX's camera power output. Ensure correct polarity (positive to positive, negative to ground) for all connections.

4.2 Antenna Connection

Carefully screw the provided RP-SMA antenna onto the RP-SMA connector on the FPV transmitter. Ensure it is finger-tight to establish a secure connection. Do not overtighten.

4.3 Mounting

Use the included base bracket and screws to securely mount the camera and VTX to your multicopter frame. Ensure the camera has a clear field of view and the VTX is positioned to minimize interference from other electronic components. Avoid placing the VTX directly against carbon fiber, which can block signal transmission.

5. Operating Instructions

5.1 Powering On

Once all connections are secure, connect your flight battery to power the system. The VTX's LED display will illuminate, indicating its current channel and frequency settings.

5.2 Changing Channels and Frequencies

The VTX features two buttons for adjusting settings:

- **"CH" Button:** Press this button briefly to cycle through the available channels (1-8) within the current frequency band. The LED display will show the selected channel.
- **"FR" Button:** Press this button briefly to cycle through the available frequency bands (A, B, E, F, R). The LED display will show the selected band.

Ensure your FPV receiver (goggles or monitor) is set to the same frequency band and channel as your VTX for proper video reception.

5.3 Camera OSD (On-Screen Display) Menu

The 600TVL Sony CCD camera supports an On-Screen Display (OSD) menu for advanced settings configuration. To access the OSD menu, you will typically need a small joystick controller (not included) that connects to the camera's OSD port. Once connected, you can navigate the menu to adjust settings such as:

- Exposure (Shutter, Brightness, AGC)
- White Balance
- Backlight Compensation (BLC)
- Motion Detection
- Image Adjustment (Mirror, Negative, Color to B&W)
- DNR (Digital Noise Reduction)
- WDR (Wide Dynamic Range)
- Day/Night Shift

Refer to the camera's specific OSD menu guide (if provided separately) for detailed navigation and parameter adjustments. Adjusting these settings can optimize picture quality for various lighting conditions.

6. Maintenance

To ensure the longevity and optimal performance of your AKK KC02 FPV system, follow these maintenance guidelines:

- **Cleaning:** Gently clean the camera lens with a soft, lint-free cloth. For the VTX, use a dry brush or compressed air to remove dust and debris from the circuit board and connectors. Avoid using liquid cleaners.
- **Connections:** Periodically inspect all wiring connections for signs of wear, fraying, or loose contacts. Ensure the antenna is securely attached before each use.
- **Storage:** Store the FPV system in a cool, dry place, away from direct sunlight, extreme temperatures, and high humidity.
- **Physical Damage:** Avoid dropping or subjecting the components to excessive physical shock, which can damage internal circuitry.

7. Troubleshooting

If you encounter issues with your AKK KC02 FPV system, refer to the following troubleshooting steps:

Problem	Possible Cause	Solution
No video signal / Black screen	◦ Incorrect frequency/channel on receiver. ◦ Loose or incorrect wiring connections. ◦ Insufficient power supply. ◦ Damaged camera or VTX.	◦ Verify receiver and VTX are on the same band and channel. ◦ Check all wiring according to Section 4.1. Ensure polarity is correct. ◦ Confirm power source provides adequate voltage (7-20V for VTX, 5-22V for camera). ◦ Inspect components for physical damage.
Poor video quality / Static / Lines	◦ Interference from other electronics. ◦ Weak signal due to distance or obstacles. ◦ Damaged or loose antenna. ◦ Unfiltered power supply to camera/VTX.	◦ Relocate VTX away from other noisy components (e.g., ESCs, motors). ◦ Ensure line of sight for optimal signal. ◦ Check antenna connection and condition. Replace if damaged. ◦ Consider adding LC filter to power lines or powering camera from a filtered source on PDB/FC.
VTX gets excessively hot	◦ Insufficient airflow. ◦ Operating without antenna connected (can damage VTX). ◦ Overvoltage.	◦ Ensure adequate ventilation around the VTX. ◦ **Always connect the antenna before powering on the VTX.** ◦ Verify input voltage is within the 7-20V range.
Camera image is too dark/bright	◦ Incorrect camera OSD settings.	◦ Access the camera OSD menu (if applicable) and adjust exposure, brightness, or WDR settings.

8. Safety Information

- **Power Supply:** Always ensure the power supply voltage is within the specified range (7-20V for VTX, 5-22V for camera). Exceeding these limits can cause permanent damage.
- **Antenna:** Never power on the FPV transmitter without its antenna connected. Doing so can severely damage the VTX.
- **Heat:** The VTX can generate heat during operation. Ensure adequate airflow and avoid touching it immediately after use.
- **Polarity:** Double-check all wiring connections for correct polarity before applying power. Incorrect polarity will damage the components.
- **Environment:** Operate FPV equipment responsibly and in accordance with local laws and regulations regarding radio frequencies and drone operation.

9. Warranty and Support

AKK products are manufactured to high quality standards. For warranty information, technical support, or service inquiries, please refer to the official AKK website or contact your retailer. Keep your purchase receipt as proof of purchase for warranty claims.

For further assistance, you may visit the AKK support page or contact their customer service directly. Contact information is typically available on the product packaging or the official AKK website.