ELP ELP-USB4KCAM01H-LH4

ELP 4K USB HDMI Camera Module (Model ELP-USB4KCAM01H-LH4) User Manual

Comprehensive instructions for setup, operation, and maintenance.

1. Introduction

This user manual provides essential information for the proper installation, operation, and maintenance of your ELP 4K USB HDMI Camera Module, model ELP-USB4KCAM01H-LH4. Please read this manual thoroughly before using the product to ensure optimal performance and longevity.

2. Product Overview

2.1 Key Features

- 4K USB & HDMI Camera with simultaneous Type-C and HDMI output. Maximum resolution: 3840x2160.
- 2X digital zoom capability with a high-quality 1/2.8” IMX415 Color CMOS image sensor.
- Equipped with a 4mm black light lens, offering a minimum illumination of 0.001 lux, suitable for day and low-light conditions.
- Supports H.265/H.264/MJPEG/YUY2 video compression formats. Achieves 3840x2160 at 30fps with MJPEG, H.264, and H.265.
- High-speed USB 2.0 interface camera module with low power consumption, compact size, and thin profile for embedded applications.

2.2 What's in the Box

- 1 x ELP 4K USB HDMI Camera Module
- 1 x 1.2m USB Type-C Cable
- 1 x 1.5m HDMI Cable
- 1 x User Manual (this document)

3. Setup Instructions

The ELP 4K USB HDMI Camera Module is designed for plug-and-play operation, requiring no additional driver installations for most operating systems (UVC compliant).

3.1 Connecting the Camera

The camera offers flexible connectivity options via USB and HDMI. You can use either or both simultaneously.

Figure 3.1: The ELP 4K USB HDMI Camera Module with its USB Type-C and HDMI cables connected.

3.1.1 USB Mode Connection

1. Connect the USB Type-C cable to the camera module's Type-C port.
2. Connect the other end of the USB cable to an available USB 2.0 port on your computer, laptop, or compatible device.
3. The camera should be automatically recognized by your operating system (Windows, Linux, Mac, Android) as a UVC device.

Figure 3.2: Camera module connected to a laptop via USB for computer-based applications.

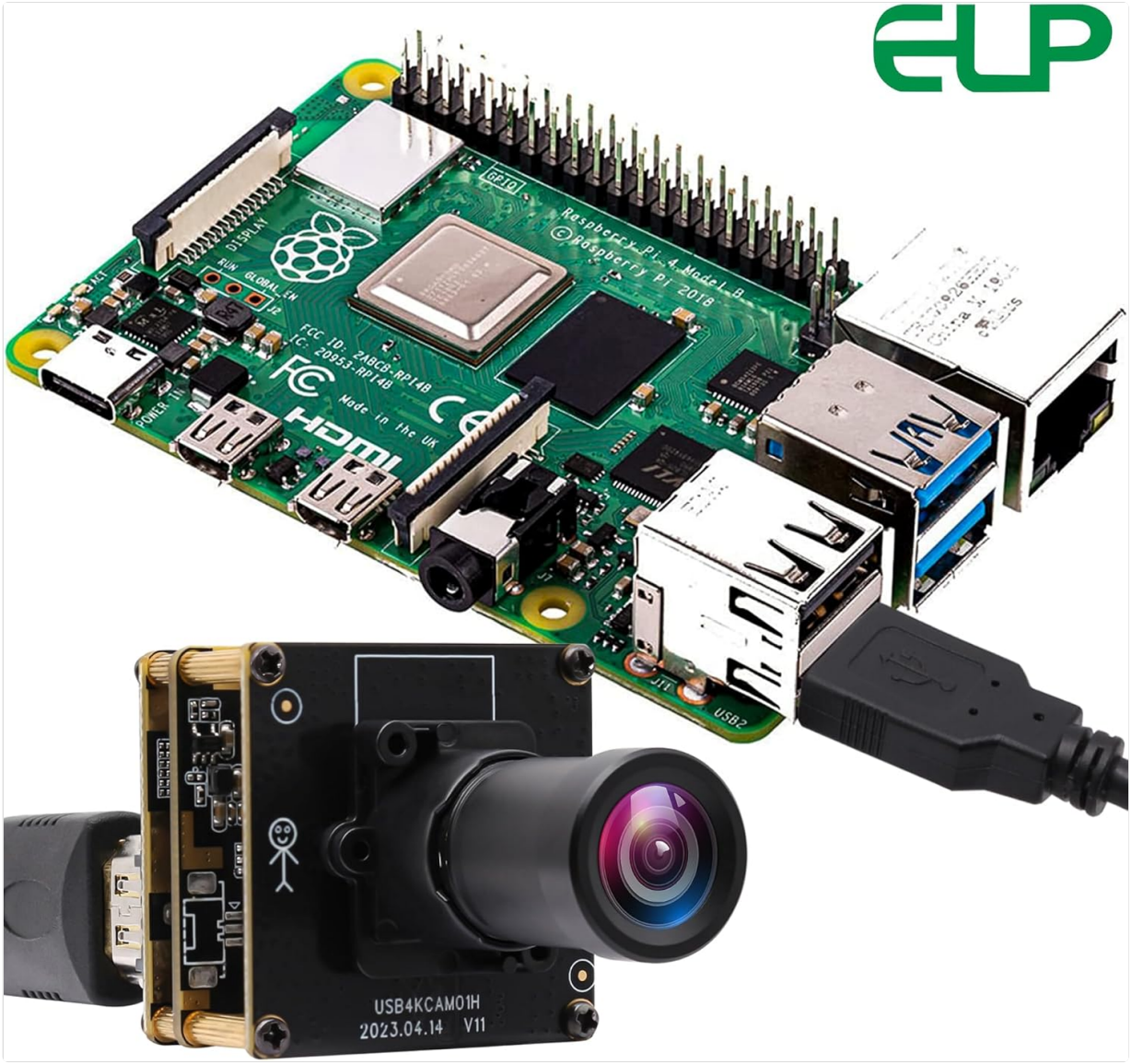

Figure 3.3: Camera module connected to a Raspberry Pi, demonstrating compatibility with embedded systems.

3.1.2 HDMI Mode Connection

1. Connect the HDMI cable to the camera module's HDMI port.
2. Connect the other end of the HDMI cable to an HDMI input on a monitor, TV, or projector.
3. Ensure the camera module is powered. For HDMI output, the camera requires external power, typically supplied via the USB Type-C port from a 5V 2A power source (e.g., power bank, USB adapter).

3.1.3 Simultaneous USB + HDMI Output

The camera supports simultaneous output to both USB and HDMI. This allows for flexible monitoring and recording setups.

1. Connect the USB Type-C cable to a computer.
2. Connect the HDMI cable to a monitor.
3. The camera will output video to both devices concurrently.

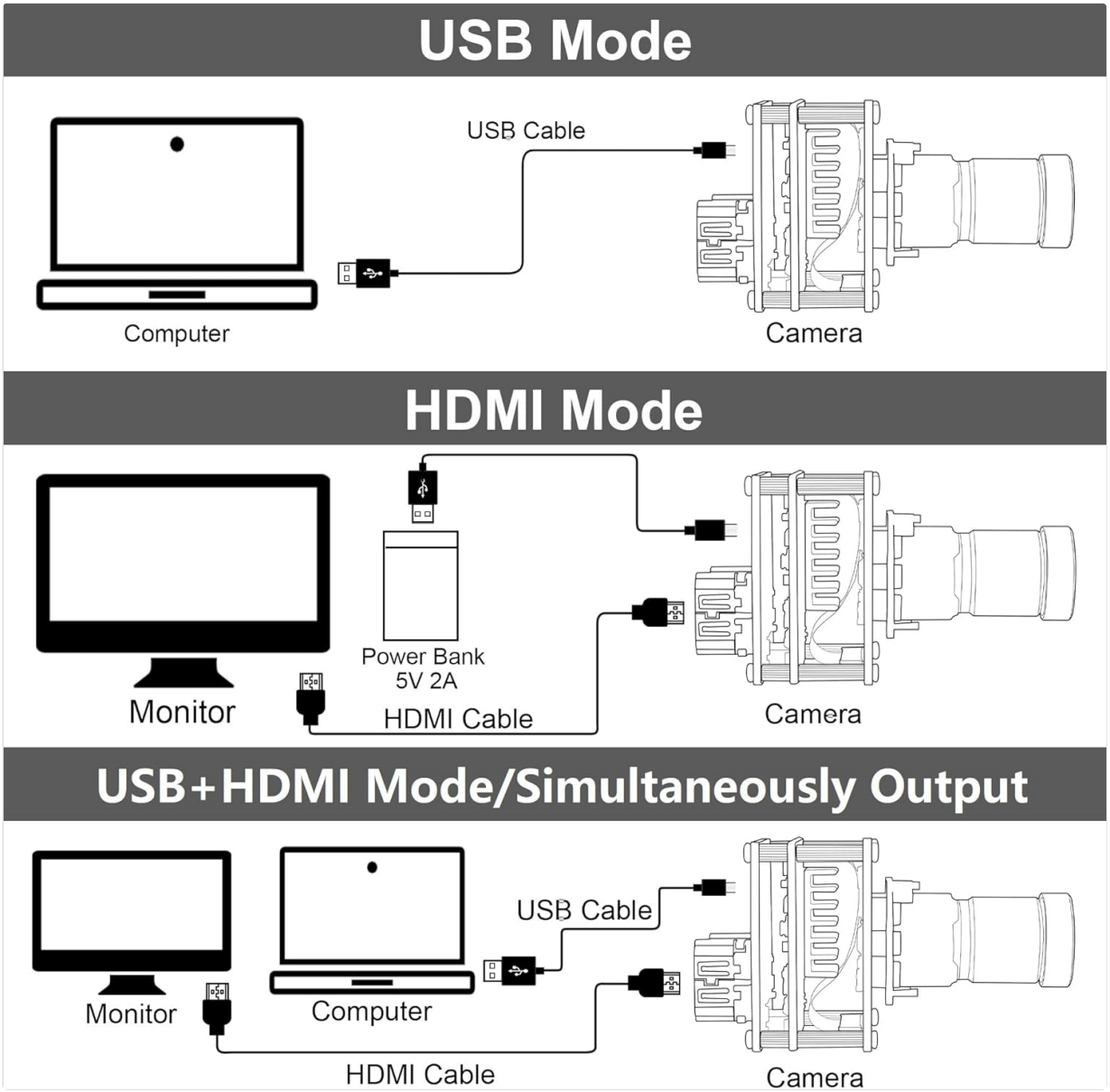

Figure 3.4: Connection diagrams illustrating USB, HDMI, and simultaneous output configurations.

4. Operating Instructions

4.1 Video Output and Resolution

The camera module supports a maximum resolution of 3840x2160 (4K). When connected via USB, you can select the desired resolution and frame rate through your video capture software or application settings. For HDMI output, the resolution will typically be automatically detected by the connected display.

Figure 4.1: Demonstrating simultaneous 4K display on a monitor and laptop.

Figure 4.2: Visual comparison highlighting the enhanced detail of 4K resolution over 1080p.

4.2 Digital Zoom Functionality

The camera features a 2X digital zoom. This function allows you to magnify a portion of the image digitally. The availability and control of digital zoom depend on the software or application used with the camera.

Figure 4.3: Illustration of the 2X digital zoom feature, focusing on a specific area of interest.

4.3 Low Light Performance (Black Light Lens)

Equipped with a 4mm black light lens, the camera module is designed to perform effectively in low-light environments, with a minimum illumination requirement of 0.001 lux. This feature makes it suitable for monitoring in dimly lit conditions without requiring additional infrared illumination.

Figure 4.4: The camera's black light lens enables clear imaging in both bright and low-light conditions.

5. Maintenance

To ensure the longevity and optimal performance of your ELP 4K USB HDMI Camera Module, follow these maintenance guidelines:

- **Cleaning the Lens:** Use a soft, lint-free cloth specifically designed for optical lenses to gently clean the camera lens. Avoid abrasive materials or harsh chemicals.
- **Dust and Debris:** Keep the camera module free from dust and debris. Use a can of compressed air to remove particles from the circuit board and lens area.
- **Storage:** When not in use, store the camera module in a dry, cool environment, away from direct sunlight and extreme temperatures.
- **Handling:** Handle the camera module with care. Avoid dropping it or subjecting it to strong impacts, as this can damage internal components.

6. Troubleshooting

If you encounter issues with your ELP 4K USB HDMI Camera Module, refer to the following troubleshooting

steps:

6.1 No Image or Signal

- **Check Connections:** Ensure all USB and HDMI cables are securely connected to both the camera module and the host device/display.
- **Power Supply (HDMI Mode):** Verify that the camera module is receiving adequate power (5V 2A) when using HDMI output.
- **USB Port:** Try connecting to a different USB port on your computer.
- **Software Selection:** Ensure the correct camera device is selected in your video capture software or application settings.

6.2 Image Quality Issues

- **Resolution Settings:** Confirm that your software or display settings are configured for the desired resolution (e.g., 4K). Note that some systems or software may have limitations on displaying resolutions higher than 2K (2560x1440) or may show partial signals if not properly configured.
- **Lighting Conditions:** While the camera has good low-light performance, extreme darkness can still affect image quality. Ensure sufficient ambient light for optimal results.
- **Lens Cleanliness:** Clean the camera lens as described in the Maintenance section.

6.3 Overheating

The camera module is designed for efficient operation. If you notice excessive heat during prolonged use, ensure it is in a well-ventilated area and not enclosed in a confined space without airflow. While some warmth is normal, persistent excessive heat could indicate an issue or environmental factor.

7. Specifications

Feature	Detail
Brand	ELP
Model Number	ELP-USB4KCAM01H-LH4
Image Sensor	1/2.8” IMX415 Color CMOS
Video Capture Resolution	4K (3840x2160)
Lens Type	4mm Black Light Lens
Minimum Illumination	0.001 lux
Digital Zoom	2X
Connectivity Technology	USB 2.0, HDMI
Output Formats	H.265/H.264/MJPEG/YUY2
Dimensions	1.49 x 1.49 x 1.85 inches (approx. 38 x 38 x 47 mm)
Item Weight	7.8 ounces
Operating System Support	Windows, Linux, Mac, Android (UVC compliant)

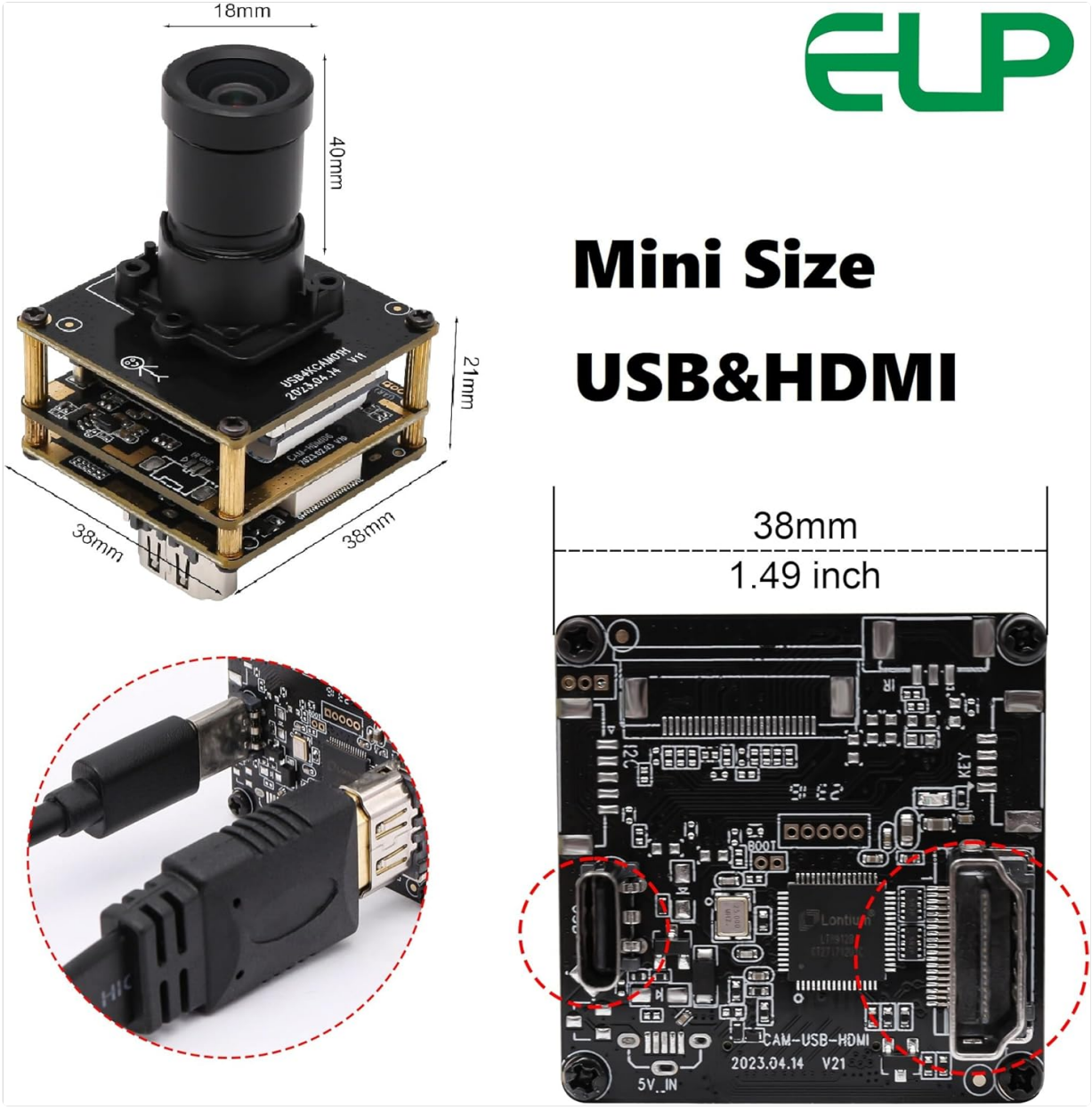

Figure 7.1: Physical dimensions of the camera module.

8. Safety Information

Please adhere to the following safety guidelines:

- Use the product only as described in this user manual.
- Avoid exposing the camera module to water or excessive moisture.
- Do not attempt to disassemble or modify the camera module. Unauthorized modifications can void the warranty and pose safety risks.
- Keep the device away from strong magnetic fields.
- Ensure proper ventilation when operating the camera to prevent overheating.

9. Warranty and Support

ELP offers the following warranty and support for this product:

- **Return and Replacement:** 30 days free return and replacements.
- **Repair Service:** 90 days free repair.

- **Guarantee:** 1-year guarantee from the date of purchase.

For technical support or warranty claims, please contact ELP customer service through your purchase platform or the official ELP website.