

TK-RT90 4K phone mirror cast controller

I、Product Overview

The TK-RT90 is a versatile true 4K@60Hz mirror cast controller, integrating powerful functions such as 90° /180° /270° rotation, arbitrary screenshot capture, free scaling, left/right mirroring, up/down mirroring, signal switching, and line doubling.

With outstanding performance, the TK-RT90 is widely used in the following fields:

- Drone footage conversion from landscape to portrait display
- Smartphone/tablet screen projection in portrait mode
- LED large-screen image compression processing
- Free switching and compatibility between different signal formats
- Video signal format conversion and optimization

With its flexible and efficient image processing capabilities, the TK-RT90 provides professional and reliable solutions for various display applications.

II、Main Function

- ✓ Supports screen mirroring of smartphone signals to portrait displays without distortion or stretching, enabling full-screen display with multiple screenshot modes.
- ✓ Converts vertical drone footage into full-screen portrait display.
- ✓ Supports 90° , 180° , and 270° image rotation, as well as left/right and up/down mirroring, meeting diverse installation orientations and scenario requirements.
- ✓ Provides **2 HDMI 2.0, 2 HDMI 1.4, and 1 DP 1.2 input ports** (5 inputs in total), supporting arbitrary switching and line doubling.
- ✓ Supports multiple output resolutions, up to **3840×2160@60Hz**. Line doubling processes signals of different input resolutions to unify output resolution and refresh rate.
- ✓ Allows flexible screenshot capture of any input signal area, displaying it in full-screen landscape or portrait mode.
- ✓ Supports free adjustment of image scaling ratios, suitable for simple LED projects.
 - ✓ Automatic input signal recognition with One click switching.
- ✓ HDMI-embedded audio decoding, supporting **3.5mm independent audio output** for easy connection to external amplifiers or sound systems.
- ✓ Front-panel backlit buttons indicate the current input signal source status in real time.
- ✓ Supports quick rotation angle and screenshot mode switching via buttons.

III、 True 4K High-Speed Image Processing Chip

The TK-RT90 image mirror cast controller is equipped with a true **4K@60Hz image processing chip**, delivering ultra-high-resolution processing capabilities for sharper and more detailed image displays. It ensures accurate color reproduction and image optimization, guaranteeing smooth motion and rich detail. With powerful processing capabilities, it efficiently handles complex operations such as rotation and scaling, featuring low latency and high fluidity. It is widely used in demanding display scenarios such as advertising, entertainment, and medical fields.



IV、 Multiple Screenshot Modes

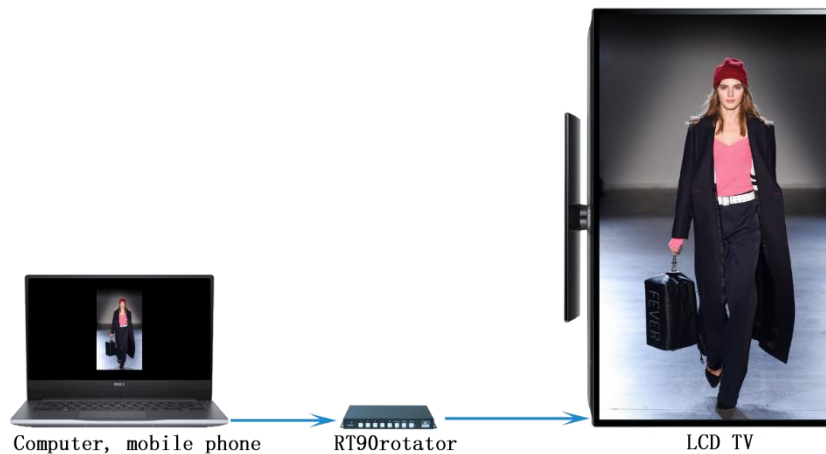
The TK-RT90 supports flexible rotation and screenshot modes to meet personalized display needs in different scenarios, including:

- ✓ **Automatic Black Bar Detection & Cropping:** Intelligently detects black bars in input signals and automatically crops the effective image area for full-screen display.
- ✓ **Standard Screenshot:** Captures the central area of the image at a preset ratio, maintaining the original aspect ratio.
- ✓ **Proportional Full Display After Rotation:** Preserves the full image proportionally after rotation, avoiding cropping.
- ✓ **Stretched Display:** Rotates the image by 90° without cropping or scaling, achieving full-screen display.

1. Intelligent Black Bar Detection

The TK-RT90 supports intelligent black bar detection, automatically identifying black areas around the main image and precisely extracting the effective content for full-screen display on TVs or other devices, ensuring a complete and distortion-free image.

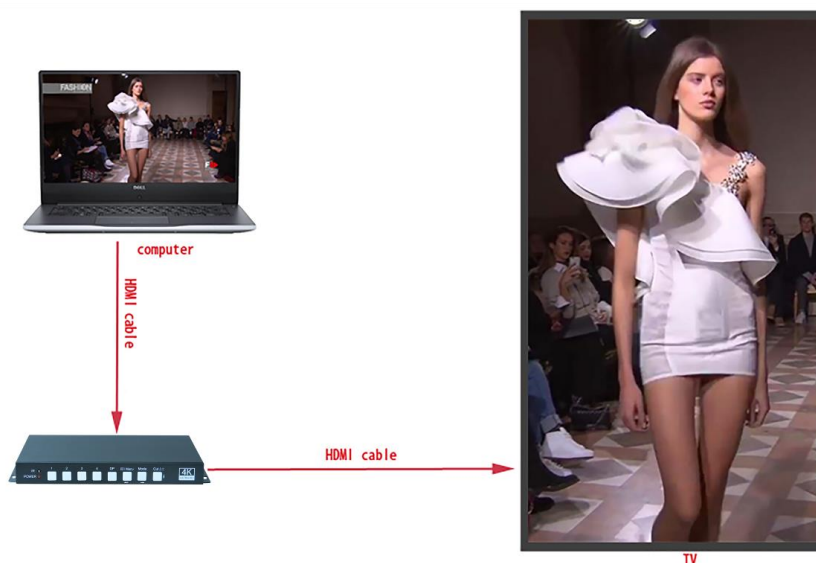
This feature is compatible with various input sources, including smartphones, tablets, computers, and Android TV boxes, requiring no manual adjustments for a true plug-and-play experience.



2. Standard Screenshot

When black bar detection is disabled, the TK-RT90 defaults to capturing a **9:16 ratio** area from the center of the input image and displays it fully on TVs, projectors, or other devices.

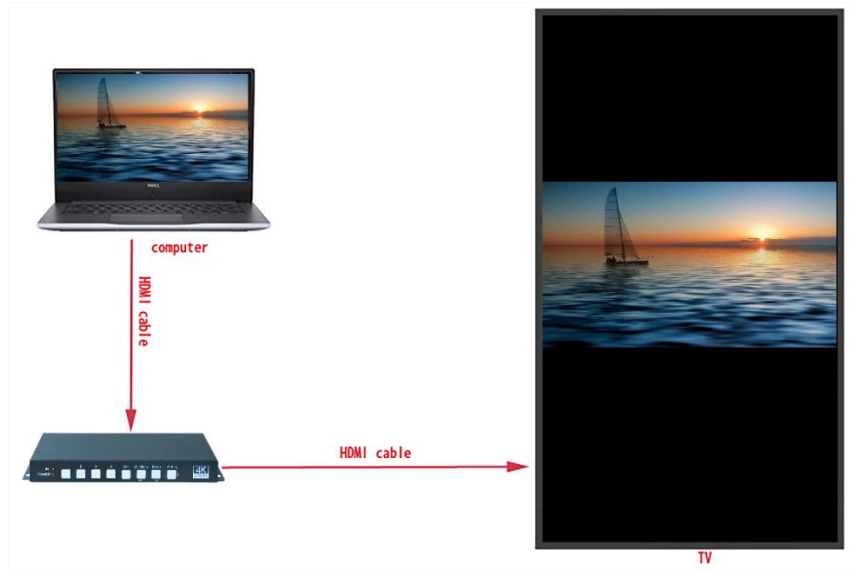
The image maintains its original proportions without stretching or distortion, ensuring natural and smooth visuals.



3. Proportional Display Mode

When performing 90° / 180° / 270° rotation, the TK-RT90 retains the full input signal content, ensuring proportional scaling without distortion or stretching.

To match the display device's aspect ratio, slight black bars may appear at the top and bottom, preserving image integrity and natural appearance.



4. Stretched Display

The TK-RT90 supports direct 90° rotation of input images for portrait display without cropping or scaling, ensuring the original image is fully presented.

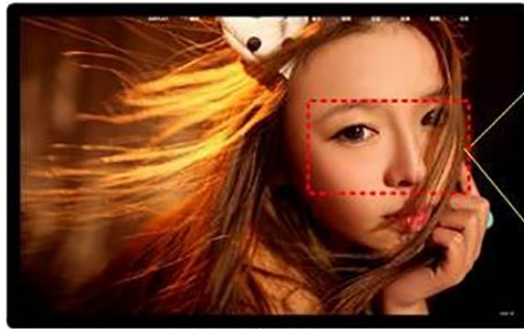
This feature is ideal for vertical LCD splicing projects, enabling precise image rotation and display in single or multi-screen setups, enhancing overall display quality and system stability.



5. Custom Screenshot

Using the remote control, users can capture **any area** of the input signal before or after rotation and display it in full-screen mode on TVs or other devices.

Both landscape and portrait modes allow flexible screenshot selection while maintaining clarity and natural proportions.



Before extracting the image



After extracting the image

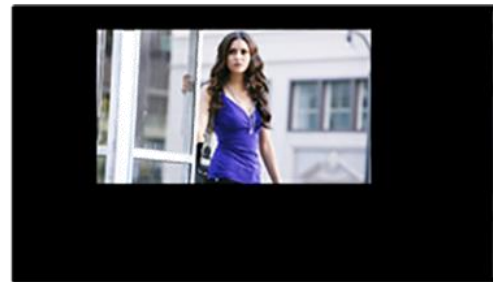
V. Image Scaling Function

The TK-RT90 allows users to set the **coordinates (position) and size (scaling)** of the input signal's display area, enabling flexible adjustments for any layout.

This feature is widely used in **LED display systems**, facilitating screen layout and adjustments in coordination with sending cards.



Before scaling

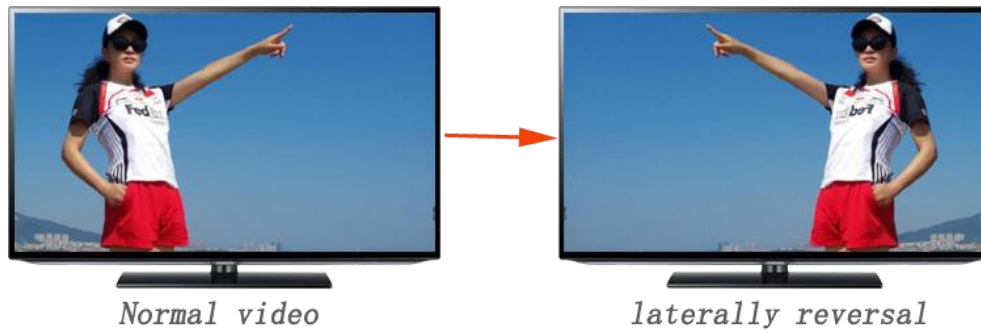


After scaling

VI. Mirroring Function

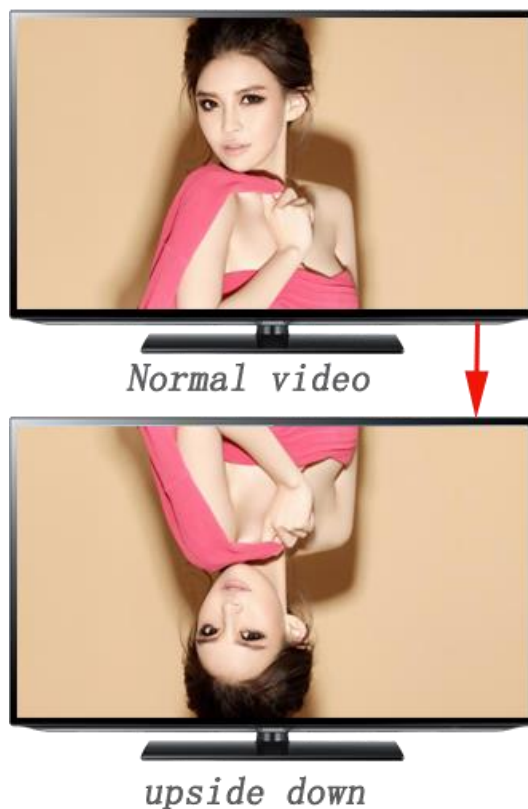
6.1 Left/Right Mirroring

The TK-RT90 supports **left/right mirroring**, flipping the image horizontally without vertical inversion.



6.2 Up/Down Mirroring

The TK-RT90 supports **up/down mirroring**, flipping the image vertically without horizontal inversion.



VII. Signal Switching & Format Conversion

The TK-RT90 supports multiple input interfaces, including:

- 2 × HDMI 2.0 ports
- 2 × HDMI 1.4 ports
- 1 × DP 1.2 port

Maximum input resolution: 4K@60Hz, with backward compatibility for lower resolutions.

Supported output resolutions:

- 3840×2160@60Hz
- 3840×2160@30Hz
- 3840×1080@60Hz
- 2560×1440@60Hz
- 1920×1080@60Hz
- 1280×720@60Hz

Additional features:

- **Signal switching** between 5 input sources, unifying different resolutions and refresh rates to the selected output.
- **Line doubling** to convert low-resolution signals to high-resolution outputs (or vice versa).
- **Automatic signal detection & switching** ensures seamless transitions when signals are inserted/removed.

VIII. Independent Audio Output

Supports 1 × 3.5mm audio output for connecting speakers or amplifiers.

IX. Control Methods

- **Remote control** for convenient operation.
- **Front-panel buttons** for one-touch switching of input sources, rotation angles, and screenshot modes.
- **Serial port code:** External control is performed through serial port code, and automation operations are integrated with the system.

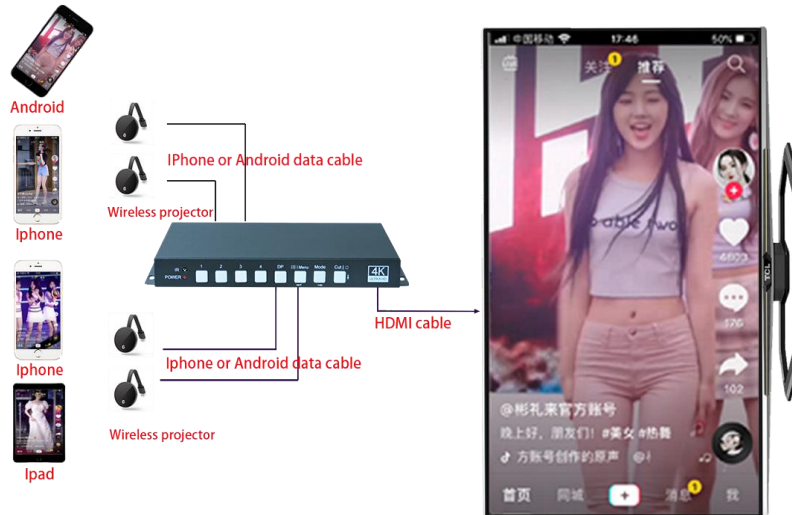
X. Backlit Buttons

The TK-RT90 features **backlit buttons** that visually indicate the current input source. Each button's LED corresponds to a specific input channel, enhancing operational clarity.

XI. Application Examples

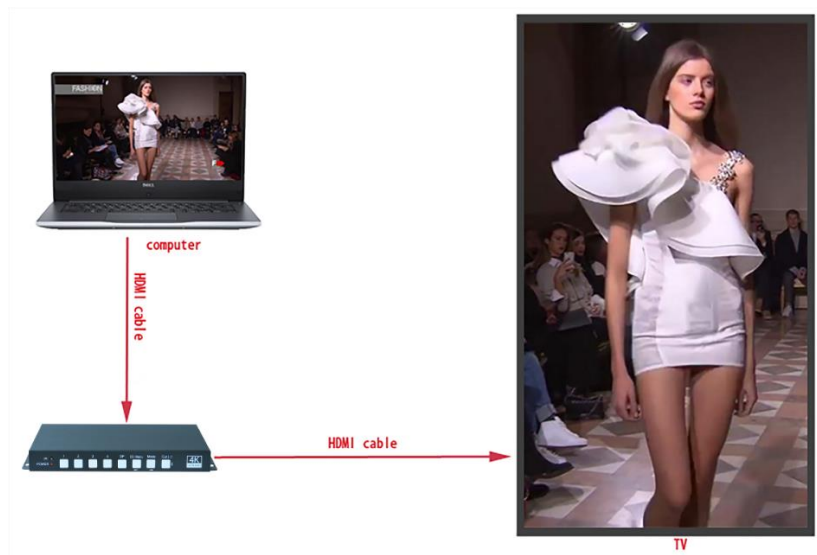
1. Smartphone/Tablet Portrait Projection

The TK-RT90 supports wired/wireless projection of smartphone/tablet screens onto vertically placed displays, ensuring **no black bars, stretching, or distortion** for a flawless viewing experience.



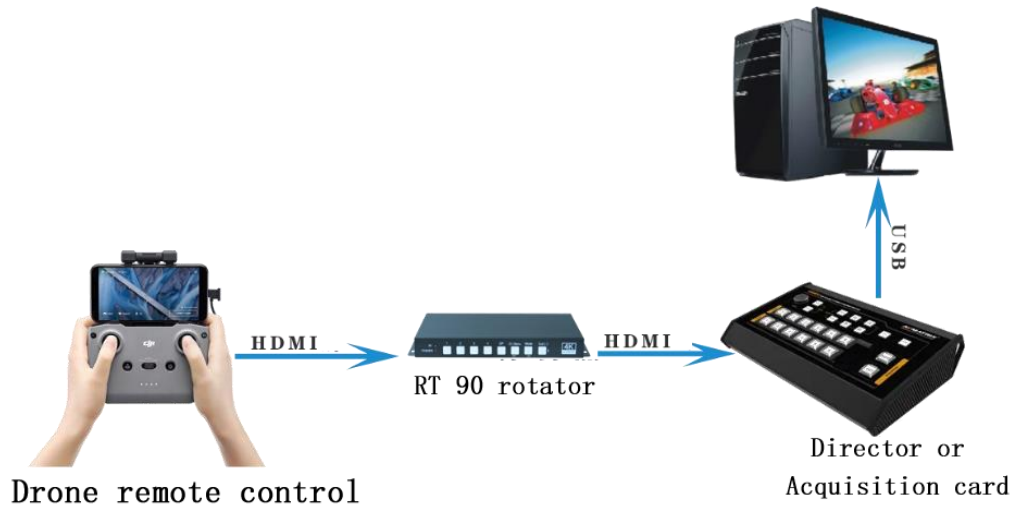
2. Center Cropping

Users can capture the **central portion** of any input signal (e.g., a model runway video) and display it in portrait mode without distortion, ideal for advertising or content playback.



3. Drone Footage (Landscape → Portrait)

The TK-RT90 eliminates the need for additional computers or capture cards, reducing hardware costs while delivering smooth, high-quality drone footage conversion.

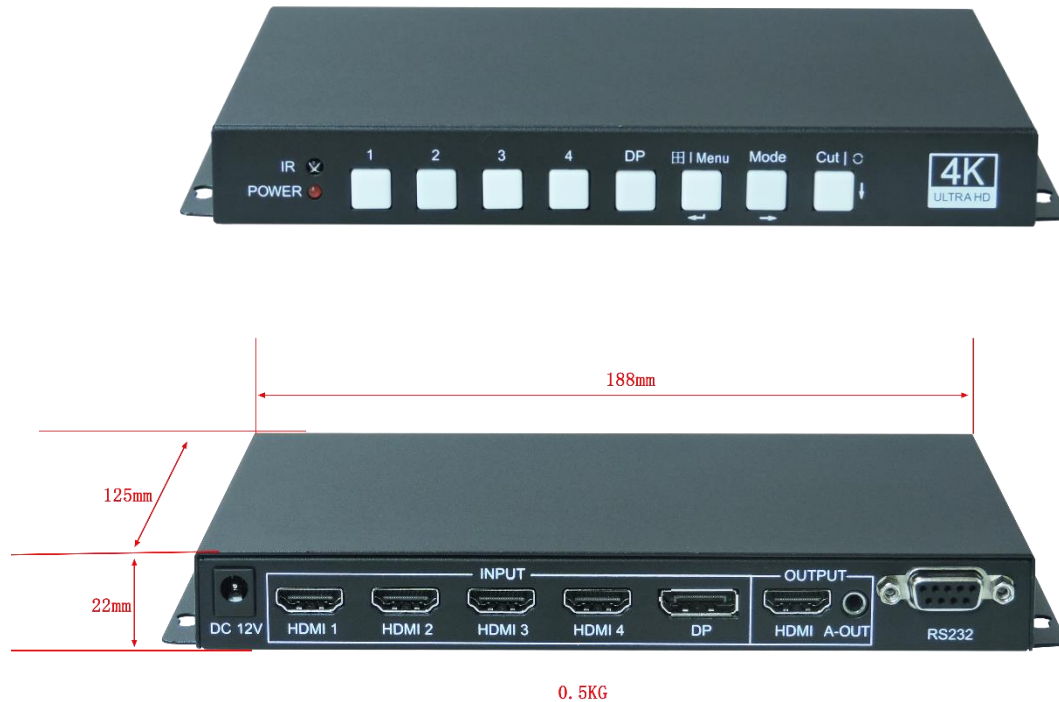


4. Vertical Screen Splicing

The TK-RT90 transforms standard splicers into **vertical screen-compatible devices**, enhancing flexibility and cost-efficiency without hardware replacement.



XII. Product Images & Dimensions



XIII. Technical parameters

| name | specifications |
|----------------------------|--|
| HDMI input | |
| Input Interface | 4 HDMI (embedded audio) and 1 DP |
| resolution | The 3rd and 4th HDMI and DP channels support 3840* 2160@60HZ Other supports 4K30HZ and is backward compatible with various resolutions |
| color depth | 24bit, 16.77 million colors |
| output | |
| output interface | 1 HDMI (embedded audio) output; |
| Output Resolution | 3840*2160@60HZ, 3840*2160@30HZ, 3840*1080@60hz, 2560*1440@60Hz, 1920*1080@60HZ, 1280*720@60HZ , optional; |
| control mode | Chassis buttons, infrared remote control; RS232 control |
| Electrical characteristics | DC12V |
| Product size | 188mm (length) x 125mm (width) x 22mm (height) |
| weight | 0.5KG |
| power consumption | Maximum 10W |