

TK-UD04 series 4K Splicing Matrix Processor

I. Product Overview

The TK-UD04 series is an integrated processor that combines 4K splicing and matrix switching functions. Its core feature is the one-click seamless switch between splicing mode and matrix mode, enabling "dual-purpose operation": it supports 5-channel 4K signal splicing while also functioning as a 4-in/16-out matrix switcher, significantly enhancing equipment utilization and scene adaptability.

The device interface configuration is comprehensive, supporting diverse signal requirements across multiple scenarios: the input side accommodates 4 HDMI signals and 1 DP signal, while the output side can handle up to 16 HDMI signals, with a 1U chassis capable of delivering a maximum of 9 HDMI outputs.

● Splicing Mode

Supports 1x2, 2x1, 2x2, 1x3, 3x1, 1x4, 4x1, 3x3, 2x3, $N \times M \leq 16$ layouts, with 5-way 4K input signal switching capability. All input signals can be routed to the large screen for display.

Multiple signals can also be displayed simultaneously on the wall-mounted display through four-way, left-right, or top-bottom split modes, supporting mouse-through functionality for seamless operation across four computers (KVM functionality is optional). Each split screen's signal source can be freely selected, with synchronized audio and video output, and the audio can be switched independently.

● Matrix Mode

Supports seamless switching between input and output, enables smooth transition of input signals, and achieves rapid switching without screen flickering.

The matrix also supports quad-view preview, displaying four inputs simultaneously on a single display.

Four of the five input channels can be selected for use.

● Application Scenarios

With its superior functions, the product is suitable for various video surveillance projects, splicing projects, exhibition halls, control centers and other scenarios.

II. Main Functions

- All-in-one splicing and matrix device, enabling free switching with one click.
- Supports key light display, allowing users to identify the current device status via the key lights.
- Supports 1-channel DP input and 4-channel HDMI input. HDMI 1 and HDMI 2 ports support 4K@30Hz output, while HDMI 3, HDMI 4 and DP ports support 4K@60Hz output, with downward compatibility.
- A single unit supports 4-channel HDMI output (5-channel HDMI output is optional). The output resolutions include 1024x768@60Hz, 1280x800@60Hz, 1280x720@60Hz, 1920x1080@60Hz and 1920*1200@60Hz (splicing mode only), and the output resolution is switchable.

- Support KVM function, one set of keyboard and mouse can control 4 computers, and the mouse can freely traverse (optional function, external device).
- Supports HDMI embedded audio and 1-channel independent 3.5mm audio, with flexible audio switching.
- Supports control via remote controller, RS232 and chassis keys.

Matrix Functions

- Matrix mode supports seamless switching and two-key quick switching functions.
- Matrix mode supports 4-screen split display for any single output.

Splicing Functions

- Supports 180° image rotation and left-right mirroring functions for any display unit, enabling upside-down placement of the upper-layer LCD screens.
- Supports adjustment of the overall picture brightness and contrast in splicing mode.
- Splicing mode supports custom conventional layouts including 1x2, 2x1, 2x2, 1x3, 3x1, 1x4 and 4x1,NxM.
- Any splicing mode supports quad-split, left-right dual-split, top-bottom dual-split and picture-in-picture (displayed at the top-left corner) to show multiple signal sources.
- Supports 90°, 180° and 270° rotation of the overall input picture.
- Features edge masking function; splicing mode supports horizontal and vertical splicing gap adjustment.

III. Detailed Introduction

1. Input and Output Signals

Input Parameters

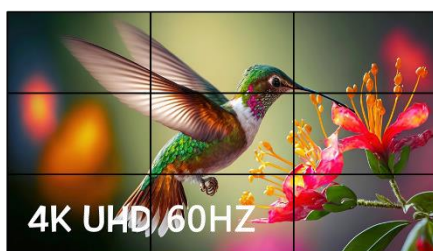
Supports 4-channel HDMI input and 1-channel DP input, with a maximum resolution of 4K@60Hz. HDMI 1 and HDMI 2 ports support 4K@30Hz, while HDMI 3, HDMI 4 and DP ports support 4K@60Hz. In matrix mode, any 4-channel signals can be selected for switching and display.

Output Parameters

The 1U chassis supports 9 HDMI signal outputs, while the 2U chassis supports 16 HDMI signal outputs with output resolution support 1920x1080@60HZ , 1024* 768@60HZ , 1280* 800@60HZ , 1280* 720@60HZ , 1920* 1080@60HZ , 1920* 1200@60HZ (Only supports splicing mode) 1920x1200@60hz) , can be freely switched.

2. Free Switching Between Matrix and Splicing Modes

The product integrates the functions of matrix and splicing into one, which can be used as a conventional 16 channel splicer or a 4-in multi out matrix switch. Users can freely switch to the desired mode through the remote control or chassis buttons.



or



3. Matrix Seamless Switching Function

The matrix function of the product is a 4-input 4-output seamless matrix. It supports selecting any 4-channel input signals from 4-channel HDMI and 1-channel DP signals for switching, and has a two-key quick switching function to realize free switching between any inputs and outputs. It also has a preview function that can display 4 input signals on a single monitor. In addition, the matrix supports seamless switching, achieving lag-free and black-screen-free switching with simple and quick operation.



4. Splicing Function

The integrated design of the product's splicing function enables a single machine to achieve 4-channel HDMI and 1-channel DP signal splicing output. A single machine can be set to various splicing modes such as 1x2, 2x1, 2x2, 1x3, 3x1, 1x4, 4x1, $N \times M \leq 16$, etc. At the same time, in various splicing modes, the splicing wall also supports overall quad screen, left-right split screen, top and bottom split screen, and picture in picture display in the upper left corner. Each split screen can freely select the signal source.



3x3 Splicing Quad-split Function



3x3 Splicing Side-by-side Split Function



3x3 Splicing Top-bottom Split Function



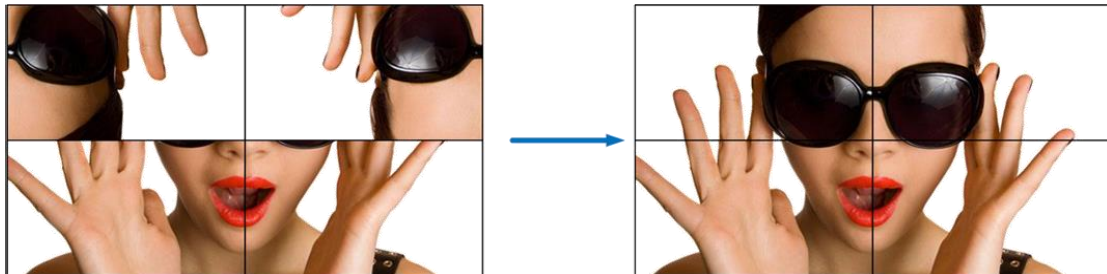
3x3 Splicing Picture-in-picture



Single Signal Source 3x3 Splicing

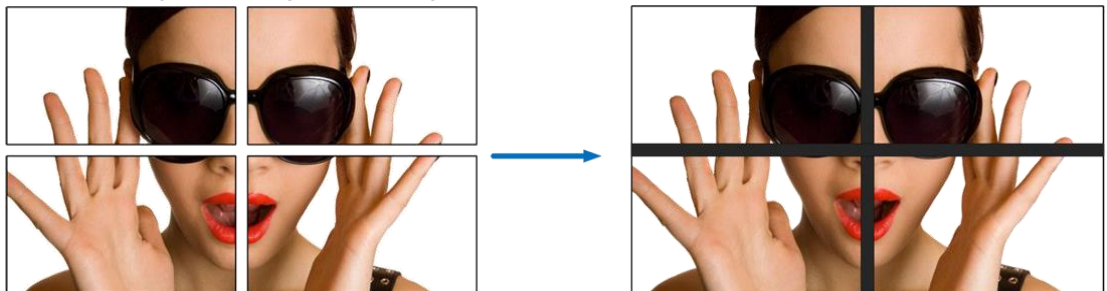
4.1 180° Image Rotation Function

Compared with ordinary splicing products, the TK-UD4P has a 180° mirror flip function for each individual display unit. When using ordinary LCD TVs for splicing, users can flip the upper row of LCD TVs 180°, which greatly reduces the splicing gaps of LCD screens and minimizes image distortion caused by excessive gaps.



4.2 Edge Masking Function

All splicing display units have certain physical bezel gaps. Without edge masking processing, the image will appear visually stretched and unnatural. After edge masking processing, the image will be free from deformation and stretching, presenting a more natural and realistic visual effect. See the following comparison pictures of images before and after edge masking processing:



4.3 90°, 180° and 270° Image Rotation Functions

Compared with ordinary splicing products, the TK-UD4P supports 90° and 270° rotation of the entire signal source, enabling vertical screen splicing.



Vertical Screen 1x3 Mode

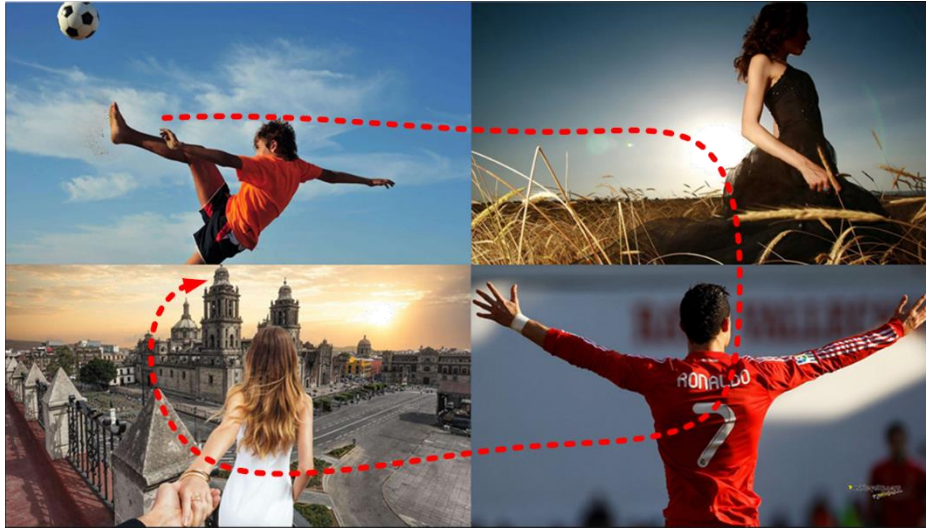
4.4 Left-right Mirroring Function

Through settings, the image can be flipped left and right without vertical flipping, which is the left-right mirroring function, as shown in the following figure:



5 Mouse Traverse Function

The machine also supports screen traversal function, combined with external devices. In the splicing mode of four screens, the mouse can be moved to the edge of the screen to traverse to another computer, and the keyboard will also switch to another computer synchronously, without the need for keyboard hotkeys to switch separately. This feature will be widely used in places such as healthcare, education, and stocks that require real-time operation of multiple windows



6. Control Methods

Remote Control: Users can set any splicing mode or realize arbitrary input-output switching in matrix mode via the remote controller, which is simple and convenient.

Chassis Key Control: Through chassis keys, users can quickly switch between matrix mode and splicing mode, set any splicing mode, or realize arbitrary input-output switching in matrix mode.

Serial Port Control: By connecting to upper computer software via serial port, users can set any splicing mode or realize arbitrary input-output switching in matrix mode with one click.

Central Control: The TK-UD4P all-in-one matrix-splicing processor provides common control codes. Users can write the control codes into the central control system as needed to achieve centralized control via central control.

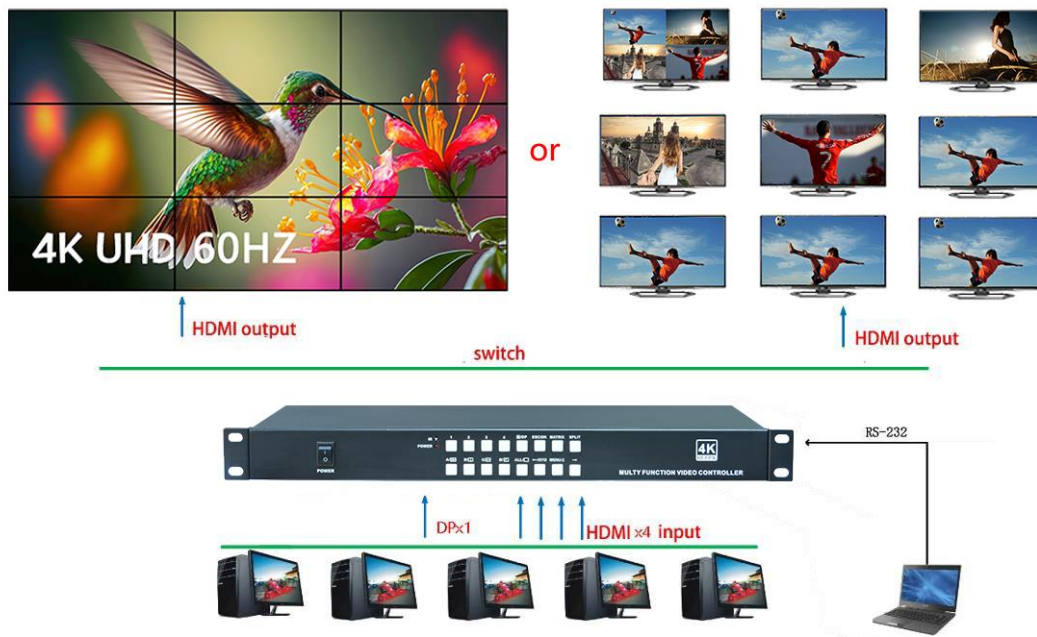
7. Audio Output

The product supports 1-channel 3.5mm independent audio output, and each HDMI output supports embedded audio, realizing synchronized audio and video output with free switching of input audio.

8. Key Light Status Recognition Function

Through the on/off status of the LED lights, users can intuitively identify the current working mode (matrix/splicing), input signal source connection status and corresponding output ports, grasp the device operation status in real time, and achieve more efficient operation.

IV. Product Topology Diagram



V. Product Pictures and Dimension Drawings



Front Panel



Rear Panel

VI. Technical Parameters of TK-UD4P All-in-one Matrix-splicing Controller

Name	Specifications
Signal Input	
Input Interfaces	4-channel HDMI input, 1-channel DP input
Resolution	DP supports 4K@60Hz; HDMI 1/2 support 4K@30Hz; HDMI 3/4 support 4K@60Hz, with downward compatibility
Output	
Output Interfaces	Up to 16 HDMI ports output, supporting synchronous audio and video output; A 1U chassis can support up to 9 HDMI outputs; 1 3.5mm audio left and right stereo, used for connecting stereo speakers
Output Resolution	1024x768@60Hz, 1280x800@60Hz, 1280x720@60Hz, 1920x1080@60Hz, 1920*1200@60Hz (splicing mode only); switchable resolution
Color Format	RGB 4:4:4、YCbCr4: 4: 4、YCbCr4: 2: 0
Control Methods	Chassis keys, remote controller, RS232
Input Voltage	AC100~240V
Display Modes	1x2, 2x1, 2x2, 1x3, 3x1, 1x4, 4x1, NXM<=16,etc.
Chassis	Device Dimension: 440mm (L) x 240mm (W) x 44mm (H); Weight: 2.80KG Packaging Dimension: 565mm (L) x 350mm (W) x 140mm (H); Weight: 3.8KG
Power Consumption	Max. 45W