BIT-VWC-409R

CATALOG

1. Product Overview

1.1. Product features

BIT-V409R is an ultra HD Rotary Splicer by Shenzhen Bitvisus Technology Limited. Support 4 channels HDMI input (1 channel 4K@60Hz, 3 channels 4K@60Hz), 1 channel DP input (4K@60Hz), 9 channels output HDMI (1080p@60Hz), 1 channel DP loop out.

A single device, 5 inputs and 9 outputs(Compatible with 1 in 9 out), can be combined in any number of splicing modes: horizontal screen / vertical screen / 2X2, and support large scale parallel operation in the form of loop out.

It can open 4 windows on the whole screen at most, and supports multiple window opening modes（Single screen、PIP double screen、double screen、Four picture segmentation）

The input supports a maximum of 3840x2160@ 60Hz and is backward compatible. The maximum single output supports 1920x1080 @ 60Hz.

The input supports full screen rotation of 90 °(only supported in single-picture mode), and the output supports 180 ° rotation of the first line (only supported when the stitching mode is two lines).

no stretching, no deformation, no need to compress the input source, the picture is clear.

Support single display mode (1x1).

Support infrared remote control, serial RS232 control.

Low power consumption, energy saving and environmental protection. Conductive heat dissipation is used internally without any external heat dissipation measures, and the reliability is extremely high.

Support Computers, Android boxs, game consoles and other devices as input source.

Using 40nm high-end programmable FPGA chip, full hardware real-time processing architecture, ultra-fast processing speed without delay.

1.2. Application scenarios

It is mainly used in industrial applications such as ultra-high-definition video surveillance, large screen walls, large advertising screens in stores, and large screens for exhibitions.

2. Specifications

Product name	BIT-VWC-409R
Input Max. Pixel FPS	600MHz
Input supports the highest resolution	3840*2160@60Hz
DP signal	Display port 1.2*1

HDMI signal	HDMI 2.0*1,, HDMI 1.4 *3
Output Max. Pixel FPS	165MHz
Output single screen support resolution	1920*1080@60Hz
HDMI output interface	HDMI 1.3 * 9
Loop out signal	Display port 1.2*1
Audio output	3.5mm Headphone
Control method	Remote control, RS232 serial port (can be looped out)
Factory default resolution	HDMI：3840*2160@60Hz DP：3840*2160@60Hz
Support custom resolution	Yes
Operating temperature	0℃-50℃
Power consumption	12W
Power supply	12V@2A AC-DC
Weight	840g
Size	270mm * 122.5mm * 20mm
Annex	One DP Cable One 12V@2A AC-DC One remote control
Power Supply	12V@2A AC-DC
Warranty	One year

3.Operation instructions

3.1. Product panel description

BIT_V409R front panel

A: Industrial seat, RS232 control loop out, used in cascade mode to loop out RS232 commands to the next device.

B：Network interface, TCP network protocol, is used for the control system to issue instructions to control the device.

C：Industrial seat, used for RS232 control, used to issue RS232 commands.

D： Dip switch (Board id): indicates the ID of the current device in cascade mode.V406 does not support this function, only V409 supports it.

E：IR is used for receiving remote control signals,Need external IR receiver.

F, G, H，I: 4 HDMI input ports, of which I port is 4K60, F/G/H port is 4K30, suitable for graphics card output on PC host or other devices. There is an LED light next to

each HDMI interface. The light indicates that the HDMI interface has a signal input.

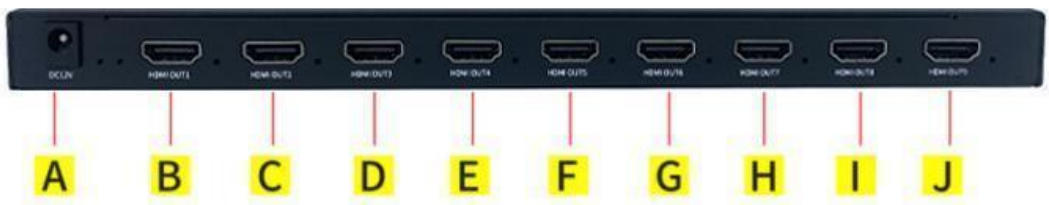
J: 1 DP input interface, 4K60 input, suitable for graphics card output on PC host or other devices.

K: Audio output interface, used for audio output devices: earphones, etc.

L: DP ring output interface, when multiple devices are cascaded,It acts as a DP input source for other devices or displays. The LED light (loop) next to the interface indicates that there is a loop-out signal output.

(In single-screen mode, the loop-out follows the selection of the input source channel to switch. In non-single-screen mode, only the loop-out DP signal is supported).

M: Power switch



BIT_V409R rear panel

A: Power interface, connect to 12V@2AAC-DC power supply.

O: LED light (power) next to the interface.It is a power indicator. The LED lights when the device is normally powered.

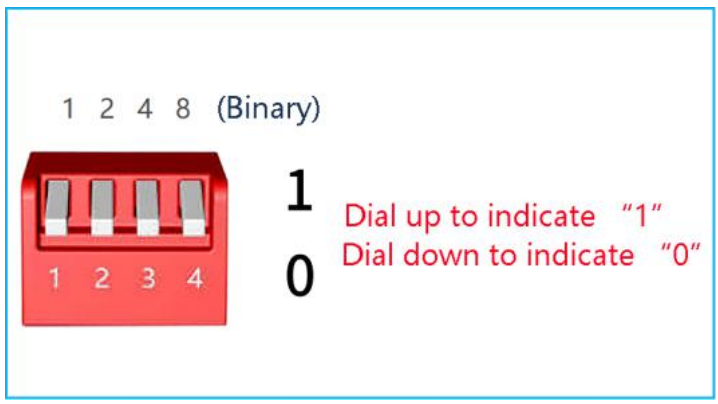
P: Connect the light, which means the video signal is connected normally.

B, C, D, E, F, G, H, I, J: 9 HDMI output interfaces, used to connect display devices such as monitors, televisions or monitors. There is an LED next to each HDMI

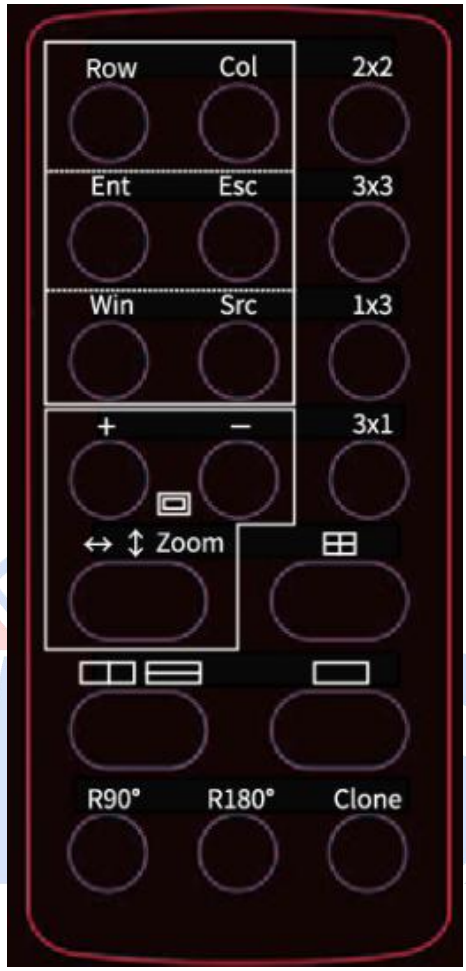
interface.The light is on, indicating that there is a signal output from the HDMI interface.

Note 1: DIP switch,when cascading, it indicates the ID number of the current device, which is set in binary.

ID number	Binary	ID number	Binary
Device 1	1000	Device 9	1001
Device 2	0100	Device 10	0101
Device 3	1100	Device 11	1101
Device 4	0010	Device 12	0011
Device 5	1010	Device 13	1011
Device 6	0110	Device 14	0111
Device 7	1110	Device 15	1111
Device 8	0001		



3.2. Remote control function description



Remote control panel

Remote control panel description(In the case of outputting a complete image, explain the keys)

[Full screen] The output screen, put together as a whole:

Remote button	Features
Ent	Confirm key

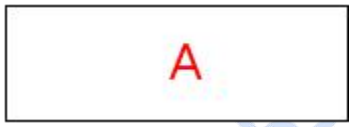
Esc	Escape key
Row	Set splicing mode: row (range: 1-16)
Col	Set splicing mode: column (range: 1-16)
Win	window: The number of each screen (window) in "whole screen", See Note 1 at the end of the form for details.
Src	source: Enter the number of the source, 1 for HDMI, 2 for DP.
+	Cooperation【 ↔ ↕ Zoom] to realize the function of "move left / right / zoom in / zoom out" of small window in picture
-	Cooperation【 ↔ ↕ Zoom] to realize the function of "move left / right / zoom in / zoom out" of small window in picture
↔ ↕ zoom	Picture in picture Small window move left and right menu --- small window move up and down menu --- small window zoom in and out menu
	Four picture (select the input source displayed on the screen through the [Win / Src] button)
	Double screen: left and right -- > up and down (select the input source displayed on the screen through the [Win / Src] button)
	Single screen rotation HDMI①--->HDMI②--->HDMI③--->HDMI④--->DP⑤
R90°	Rotate the whole input image 90 ° (only in the case of single image)

R180°	First line output image rotated 180 ° (only in case of 2 lines)
Clone	Clone mode: copy display (1x1) for each output port

Note 1:

[win] key meaning: window, the number of each screen (window) in the "whole screen", the corresponding screen position is as follows.

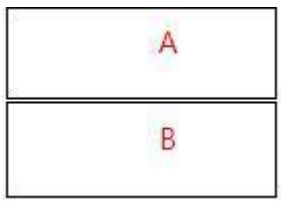
Single screen mode: there is only one screen, and the value is fixed as number 1, as shown below.



Double picture(picture in picture mode): The face value of the large picture is No. 1, and the value of the small picture is No. 2, as shown in the following figure.

Double picture(Left right mode): The left screen value is No. 1, and the right screen value is No. 2, as shown below.

Double picture(Up down mode): The upper screen value is No. 1, and the lower screen value is No. 2, as shown below.



Four screen mode:The value of the upper left screen is No. 1, the value of the lower left screen is No. 2, the value of the upper right screen is No. 3, and the value of the lower right screen is No. 4, as shown in the following figure.

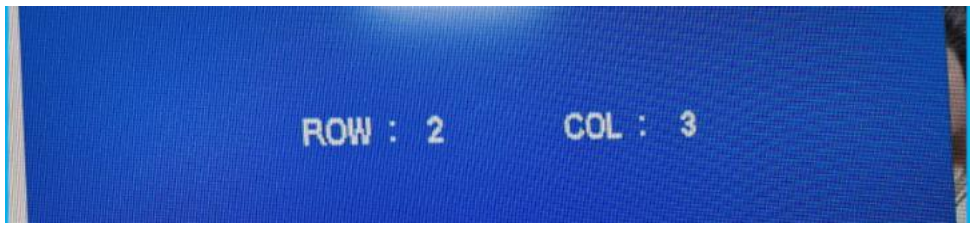
A	C
B	D

Remote control operation instructions

The adjustment of the following two groups of parameters needs to press the [Ent] confirmation key to take effect, and the [Esc] cancel key can be pressed when the parameter setting needs to be cancelled.

(1) [ROW, COL] is a group to adjust the output splicing mode. You can confirm the value by viewing the OSD display information in the upper left corner of the whole screen.

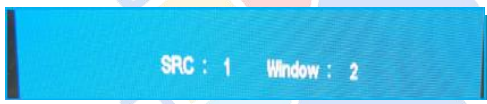
For example: if you need to adjust to 2x3 (two rows and three columns) splicing mode, you need to set [row] to 2, and [COL] to 3. Press [Ent] to confirm, and then the splicing mode will be changed to 2x3.



(2) [Src, Win] is a group. The purpose is to arbitrarily specify the input source channel of each screen (window) in the "whole screen". You can confirm the value by viewing the OSD display information in the "upper left corner of the whole

screen".

For example: Currently, it is [ ] PIP mode,HDMI is displayed in large screen window and DP is displayed in small screen window by default.If you need to adjust the large screen window to DP and the small screen window to HDMI,Then you need to set [Win] to "1" (window No. 1 means large screen window), [Src] is "2" (2 means DP input), After pressing the [Ent] confirmation key, The large screen window can be switched to DP signal source.Set【Win】to "2" (window No. 1 means small screen window), set【Src】to "1" (2 means HDMI input), After pressing the [Ent] confirmation key, The small screen window can be switched to HDMI signal source.



RS232 control

Serial port instruction: (parameter setting: baud rate: 9600 bps, data bit: 8 bits, stop bit: 1 bit, no parity bit)

Function	Byte 1 cmd_head	Byte 2 cmd_type	Byte 3 cmd_data1	Byte 4 cmd_data2	Byte 5 Check_sum
Splicing mode	0x66	0x01	Row	Col	byte 1 + byte 2 + byte 3 + byte 4
Rotate 90 °	0x66	0x02	Rotate90	0x00	byte 1 + byte 2 + byte 3 + byte 4
Rotate 180 °	0x66	0x03	Rotate180	0x00	byte 1 + byte 2

					+ byte 3 + byte 4
Multi pictures mode	0x66	0x04	Mode	0x00	byte 1 + byte 2 + byte 3 + byte 4
Multi pictures window specify input source	0x66	0x05	Window Sel	Source Channel	byte 1 + byte 2 + byte 3 + byte 4
PIP Small window position	0x66	0x06	Position	0x00	byte 1 + byte 2 + byte 3 + byte 4
PIP Small window size	0x66	0x07	Size	0x00	byte 1 + byte 2 + byte 3 + byte 4

Description of serial port instruction set:

l [Row]: Stitching mode: row [Col]: Stitching mode: column

l [Rotate90]: Rotate 90°, 0: do not rotate, 1: rotate (only supported in single-screen mode)

l [Rotate180]: Rotate 180°, 0: do not rotate, 1: rotate (only supported in stitching mode behavior 2)

l [Mode]: Multi-picture mode: 0: single screen, 1: around double screen, 2: four picture segmentation, 3: PIP double screen, 4: double screen up and down

l [WindowSel]: Window selection, the value depends on the setting of multi-screen

mode:

[Mode]=0, WindowSel=0 (current screen)

[Mode]=1, WindowSel=0 (left picture), WindowSel=1 (right picture)

[Mode]=2, WindowSel=0 (upper left screen), WindowSel=1 (lower left screen)

WindowSel=2 (upper right screen), WindowSel=3 (lower right screen)

[Mode]=3, WindowSel=0 (large picture), WindowSel=1 (small picture)

[Mode]=4, WindowSel=0 (upper screen), WindowSel=1 (lower screen)

[SourceChannel]: Input source channel selection: 0 is HDM I, 1 is HDMI 2, 2 is HDMI 3,3 is HDMI 4,4 is DP 5.

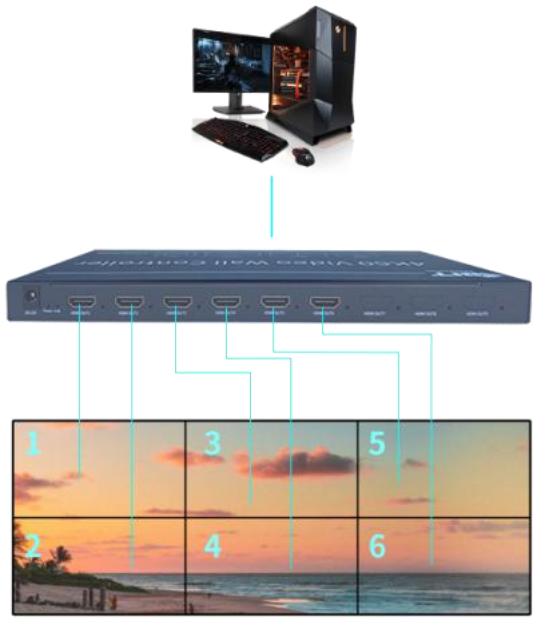
l [Position]: Choose the position of the small window in the picture-in-picture mode: 0: center, 1: upper left corner, 2: upper right corner, 3bottom left corner, 4: Bottom right corner (only supported in PIP double screen mode)

l [Size]: Choose the size of the small window in the picture-in-picture mode: 0~10, the larger the value, the larger the window supported in PIP double screen mode).

3.3. Product connection diagram

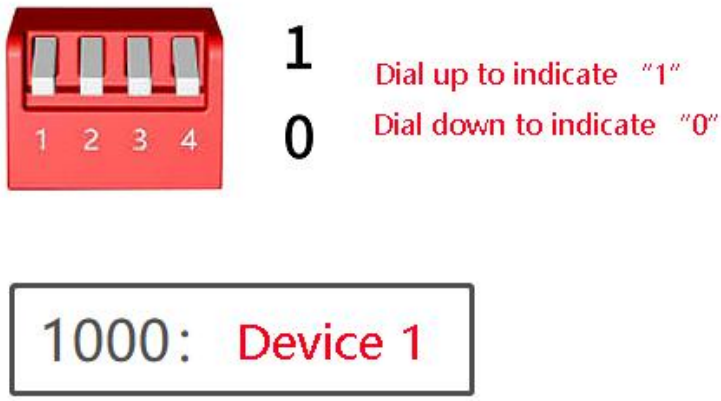
1. Instructions for single unit

Take 2x3 as an example: Front panel wiring diagram



2x3 mode front panel wiring diagram

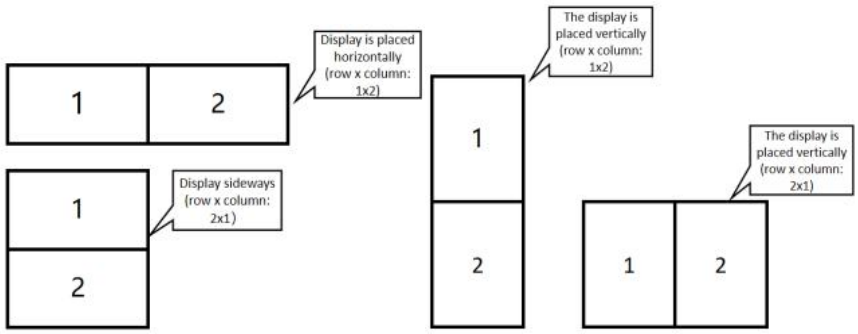
The board ID of the dial switch on the front panel of the current device needs to be set.



2x3 mode front panel dial switch dial method

3.4. Definition of rows and columns

Definition of row and column mode based on screen dimensions



3.5. Supported resolution

Note 1: if you need to customize special single screen output resolution, please contact the company.

Note 2: the support of equal scale mode and resolution is not limited to the following tables. For details, please contact the company.

Form 1 BIT-V406R Equal proportion mode supported by video card application

Mode	Full screen input resolution	Full screen output resolution	Single screen resolution
1x2	3840x1080@30Hz	3840x1080@60HZ	1920x1080@60HZ
1x3	3840x720@30HZ	5760x1080@60HZ	1920x1080@60HZ
1x4	3840x540@60HZ	7680x1080@60HZ	1920x1080@60HZ
1x5	3840x432@60HZ	9600x1080@30HZ	1920x1080@60HZ
1x6	3840x360@60HZ	11520x1080@60HZ	1920x1080@60HZ

2x1	1920x2160@30HZ	1920x2160@60HZ	1920x1080@60HZ
2x2	3840x2160@30HZ	3840x2160@60HZ	1920x1080@60HZ
2x3	3840x1440@30HZ	5760x2160@60HZ	1920x1080@60HZ
3x1	1920x3240@30HZ	1920x3240@60HZ	1920x1080@60HZ
3x2	2816x2376@30HZ	3840x3240@60HZ	1920x1080@60HZ
4x1	1776x3996@30HZ	1920x4320@60HZ	1920x1080@60HZ
5x1	1408x3960@30HZ	1920x5400@60HZ	1920x1080@60HZ
6x1	1184x3996@30HZ	1920x6480@60HZ	1920x1080@60HZ

4. Common problems

(1) What is the output resolution of the loop-out interface?

Answer: if the input interface of the device is 3840x2160 resolution, the ring out DP

interface resolution is 3840x2160 resolution.

(2) Does it support cascading mode?

Answer: cascade mode is not supported.

(3) Sometimes the dial code or remote control switch does not respond?

Answer: Because it involves resolution switching, it takes a certain time (1s). If the display does not meet the expectations, it can be restored by power off again.

(4) Image rotation, image does not rotate, is there the simplest way to remember the number of output screen?

Answer: yes , we have.The number follows "from top to bottom, left to right",it's just that your head looks at the image 90 degrees to the right.Rotation and non rotation of BIT-V406R, only 3 cases. (1 No rotation); (2 rotation 90 °);(3 rotation 180 °).

5. Appendix

5.1 Appendix 1: Arrangement of output interface

When the image is not rotated: the output interface is first up then down, first left then right. As shown in the following 2x3 mode:

When the image is rotated 90°: The output interface is first up then down, first left then right. As shown in Figure 3x2 mode: