



## infobit 409R iWall 4K UHD 4×9 Video Wall Controller User Manual

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## infobit 409R iWall 4K UHD 4x9 Video Wall Controller



### Overview

The iWall 409R is a 4K Ultra HD video wall controller designed by INFOBIT AV. Supports 4x HDMI inputs (1x 4K@60Hz, 3x 4K@30Hz), 1x DP input (4K@60Hz), 9x HDMI outputs (1080p@60Hz), and 1x DP loop out.

A single device, 5 inputs and 9 outputs (compatible with 1 in 9 out), can be combined in any number of video wall layout modes of landscape or portrait installation, and large-scale video wall can be connected by cascading more 409R.

It supports 4 source windows on the whole wall in multiple displaying modes: single image, PIP (Picture in Picture), POP (Picture on Picture), PYP (Picture by Picture: Up-Down or Left-Right side by side) or Quad-view. It supports maximum input 3840×2160@60Hz and backwards compatible and maximum output 1920×1080@60Hz.

The source can be rotated 90°(only in single picture mode), and the upper image rotated 180°(only under picture by picture side by side by up-down mode).

- No stretching, deformation, or compression.
- Supports matrix model (single display mode 1×1).
- Support IR remote control and serial RS232 control.
- Fan-less design: Low power consumption fan-less design.
- Inputs can be PC, media player, blue ray, game console and other devices.
- Using 40nm high-end programmable FPGA chip, pure hardware real-time processing architecture without delay. Without Window blue screen, virus risks, OS vulnerability, and breakdown. Lower requirements of IT technology background, save your training cost.

### Application

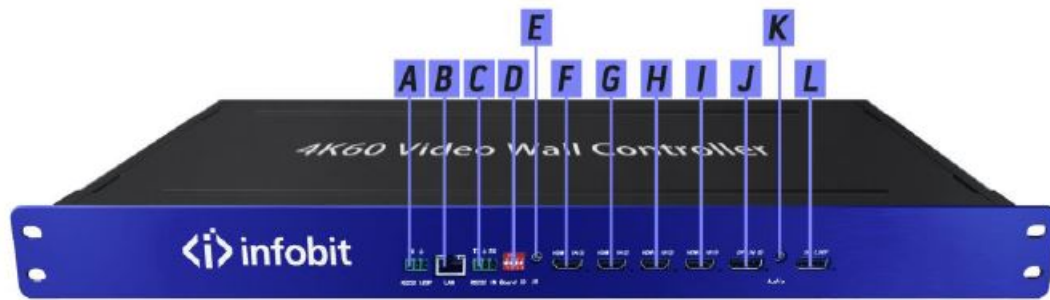
It is mainly used in industrial applications such as ultra-high-definition video surveillance, large-scale video walls, advertising, exhibitions, conference, and digital signage.

### Specifications

<b>Product name</b>	<b>iWall 409R</b>
Input Max. pixel FPS	600MHz
DisplayPort input	1x Display port 1.2 (3840×2160@60Hz)
HDMI inputs	3x HDMI 1.4 (3840×2160@30H)- HDMI IN 1-3 1x HDMI 2.0 (3840×2160@60H)- HDMI IN 4
Output Max. Pixel FPS	165MHz
HDMI outputs	9x HDMI 1.3 (1920*1080@60Hz)
Loop-out	1x Display port 1.2 (3840×2160@60Hz)
Audio output	1x 3.5mm
Control	Remote control, RS232
Factory default resolution	HDMI 3840*2160@30Hz DP 3840*2160@60Hz
Support custom resolution	Yes
Operating temperature	0°C-50°C
Power consumption	12W
Power supply	12V@2A AC-DC
Net Weight	840g
Size	270*122.5*20mm WDH
Package list	One DP Cable One 12V@2A AC-DC One remote control
Warranty	3 years

## Operation instructions

## Product panel description



A: RS232 loop out, used to loop out the RS232 commands to the next cascaded device.

B TCP/IP control

C RS232 control

D DIP switch (Board ID): indicates the ID of the current device in cascading mode. For detailed settings, see below DIP list.

E IR control

F, G, H and I: HDMI inputs 1-4, of which I (#4) port supports 4K60, F/G/H port (#1-3) supports 4K30. With LED indicators showing input status.

J: 1 DP input interface, maximum 4K60Hz.

K: Audio output

L: DP Loop-out for cascading

(In single picture mode, the loop-out follows the selection of the input source channel. In other modes, only the DP input source can be loop-out).



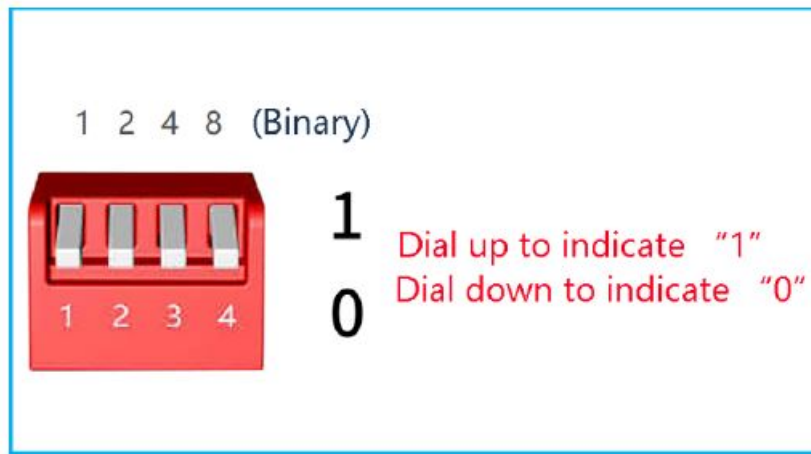
O, P, Q, R, S, T, U, V W: HDMI outputs 1-9

M: Switch ON/OFF

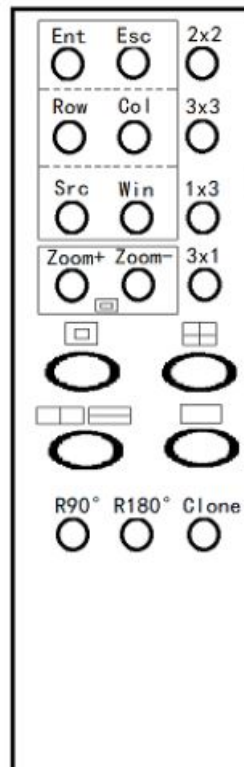
N: Power supply.

List 1: DIP switch (When cascading, it indicates the current device ID, set in binary.)

Device #	ID	Device #	ID
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		












## Remote control



*Remote control panel*

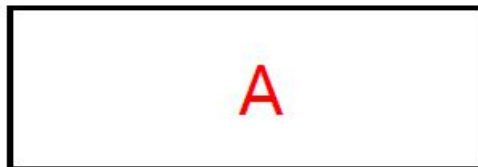
Buttons	Features
Ent	Confirm key
Esc	Escape key
Row	Set layouts mode: row (range: 1-16)
Col	Set layouts mode: column (range: 1-16)
Src	Source Enter the number of the source, 1 for HDMI #1, 2 for HDMI #2, 3 for HDMI #3, 4 for HDMI #4, 5 for DP IN #5.

Win	Window : The number of each video window. See below details following this list.
+	Used with   zoom , adjust the size of small window in PIP mode, range (0-10).
-	Used with   zoom , adjust the size of small window in PIP mode, range (0-10).
  zoom	Move source window left-right or up-down. Or zoom in/out the window.
2x2	4 displays, 2 rows and 2 columns
3x3	9 displays, 3 rows and 3 columns
1x3	3 displays, 1 row and 3 columns
3x1	3 displays, 3 rows and 1 column
	Quad view: AABB (A for HDMI, B for DP) <div data-bbox="877 795 989 884" data-label="Diagram"> </div> By "Win + Scr" to select source for each window.
	Picture by Picture: Left- Right or Up- Down: AB (A for HDMI, B for DP) <div data-bbox="782 1019 1093 1097" data-label="Diagram"> </div> By "Win + Scr" to select source for each window.
	Single picture: A -> B (A for HDMI, B for DP) <div data-bbox="782 1232 1093 1321" data-label="Diagram"> </div> By "Win + Scr" to select source for each window.
R90°	Rotate the whole input image 90° (only in single image model)
R180°	The upper image rotated 180° (only in Up-Down PYP model)
Clone	Clone mode: Duplicate source (1x1) for each output port

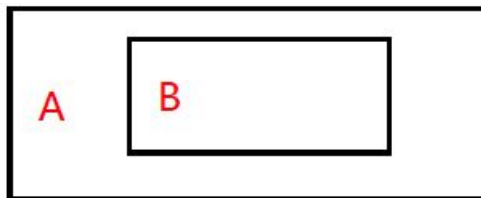
**Note 1:**

[win] key meaning: image window, the number of each screen (window) on the whole video wall, the corresponding position is as follows.

Single screen mode: there is only one image, and the value is fixed as No. A, as shown below.



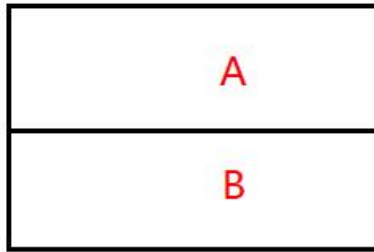
Picture in Picture mode: The value of the large picture is No. A, and the value of the small picture is No. B, as shown in the following figure.



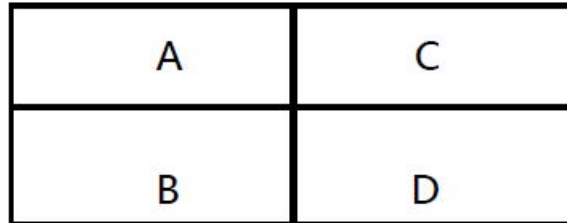
Picture by Picture (Left right mode): The left screen value is No. A, and the right screen value is No. B, as shown below.



Picture by Picture (Up down mode): The upper screen value is No. A, and the lower screen value is No. B, as shown below.



**Quad view mode:** The value of the upper left screen is No. A, the value of the bottom left screen is No. B, the value of the upper right screen is No. C, and the value of the bottom right screen is No. D, as shown in the following figure.



### 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] key to cancel.

**[ROW, COL]** is a group to adjust the output layouts mode. You can confirm the value by viewing the OSD display information in the top left corner of the whole wall.

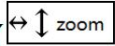
For example: If you need to adjust to 2×3 (two rows and three columns) video wall, you need to set [row] to 2, and [COL] to 3. Press [Ent] to confirm.



**[Src, Win]** is a group. The purpose is to arbitrarily specify the input source channel for each image window. You can confirm the value by viewing the OSD display information in the top left corner of the whole video wall.

For example: Currently, it is in [  ] PIP mode, HDMI #1 is displayed in the larger window and HDMI #2 is displayed in the smaller window by default. If you need to adjust the large window to show HDMI #2 and the small window to show HDMI #1. Then you need to set

[Win] to "1" (window No. 1 means larger window), [Src] is "2" (2 means HDMI#2 input) After pressing the [Ent] to confirm the selection. Do the same operation for the smaller window.

[  , +, - ] are one group, used to adjust position and size of the smaller image window when under Picture in Picture mode.

- Press Zoom at the first time, press + – buttons to adjust the position ( + to move to right, – to move to left)
- Press at the second time, press + – buttons to adjust the position ( + to move down, – to move up)



- Press at the third time, press + – buttons to adjust the size ( + to zoom out, – to zoom in)



## RS232 control

- Baud Rate: 9600
- Data bit: 8 bits
- Stop bit: 1 bit, no parity

Function	Byte 1 cmd_head	Byte 2 cmd_type	Byte 3 cmd_data1	Byte 4 cmd_data2	Byte 5 Check_sum
Video wall mode	0x66	0x01	Row	Col	byte 1 + byte 2

					+ byte 3 + byte 4
Rotate 90 °	0x66	0x02	Rotate9 0	0x00	byte 1 + byte 2 + byte 3 + byte 4
Rotate 180 °	0x66	0x03	Rotate1 80	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 Channe l	byte 1 + byte 2 + byte 3 + byte 4
PIP Small window po sition	0x66	0x06	Position	0x00	byte 1 + byte 2 + byte 3 + byte 4
PIP Small window siz e	0x66	0x07	Size	0x00	byte 1 + byte 2 + byte 3 + byte 4

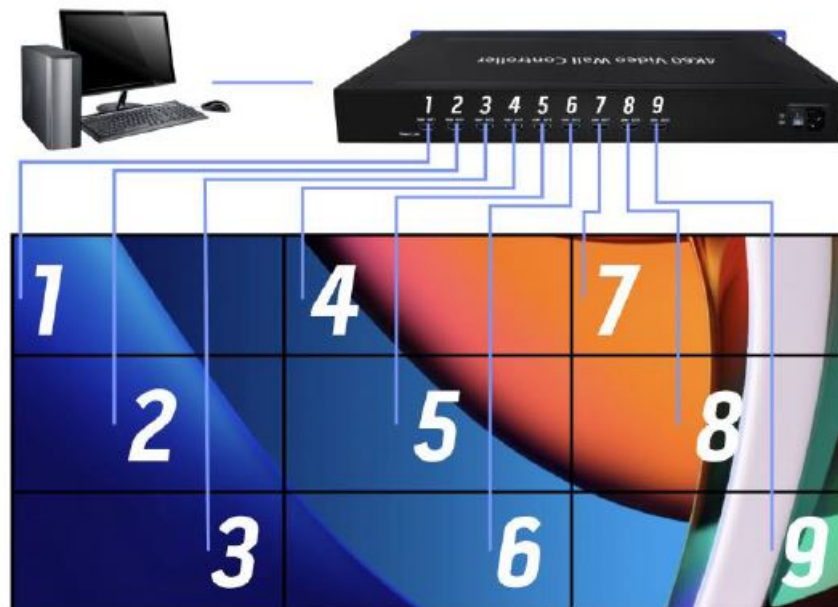
### Description:

- [Row]: Video Wall mode: Row
- [Col]: Video Wall mode: Column
- [Rotate90]: Rotate 90°:
  - 0: rotate
  - 1: do not rotate (only supported in single-screen mode)
- [Rotate180]: Rotate 180°:
  - 0: rotate,
  - 1: not rotate (only supported in stitching mode behavior 2)

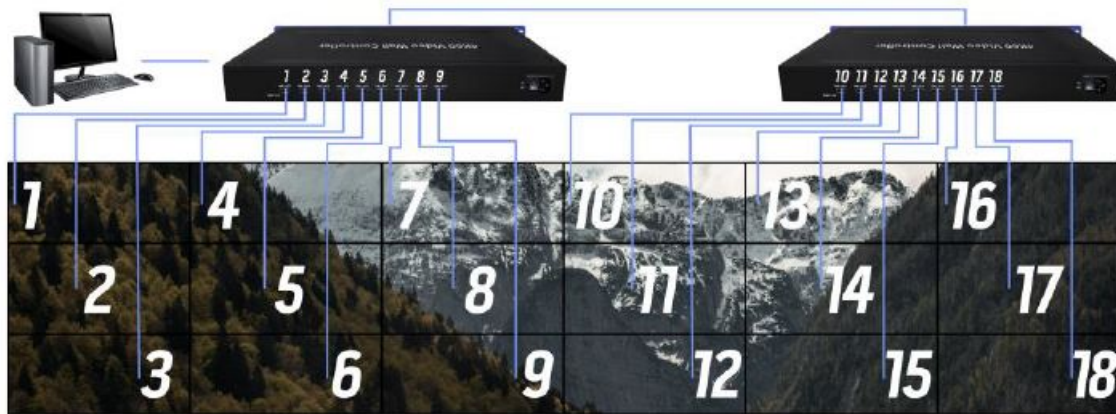
- [Mode]: Multi-picture mode:
  - 0: single screen
  - 1: left-right PYP
  - 2: four pictures quad-view
  - 3: PIP double screen
  - 4: up-down PYP
- [WindowSel]: Window selection, the value depends on the setting of multi-screen mode:
  - [Mode]=0, WindowSel=0 (current screen)
  - [Mode]=1, WindowSel=0 (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 HDMI 1, 1 is HDMI 2, 2 is HDMI 3, 3 is HDMI 4, 4 is DP 5.
- [Position]: Choose the position of the small window in the picture-in-picture mode: 0: center, 1: upper left corner, 2: upper right corner, 3: bottom left corner, 4: Bottom right corner (only supported in PIP double screen mode)
- [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).

## Diagram

3×3 video wall



3×6 Video Wall



When cascading, the board ID of the 1/2 devices needs to be set:



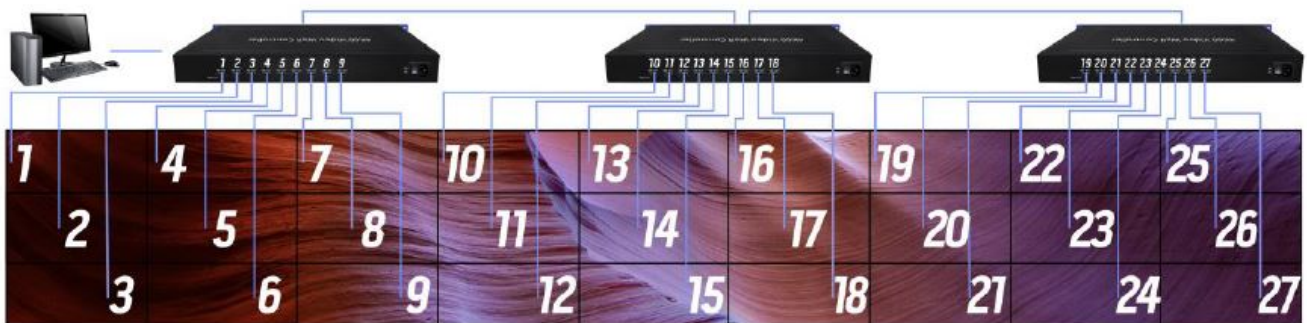
1  
0

Dial up to indicate "1"

Dial down to indicate "0"

1000: Device 1  
0100: Device 2

**Note:** When the devices are cascaded, the image rank (MxN rank) must be the same. 3x9 Video Wall



When cascading, the board ID of the 1 / 2 / 3 devices needs to be set:



1  
0

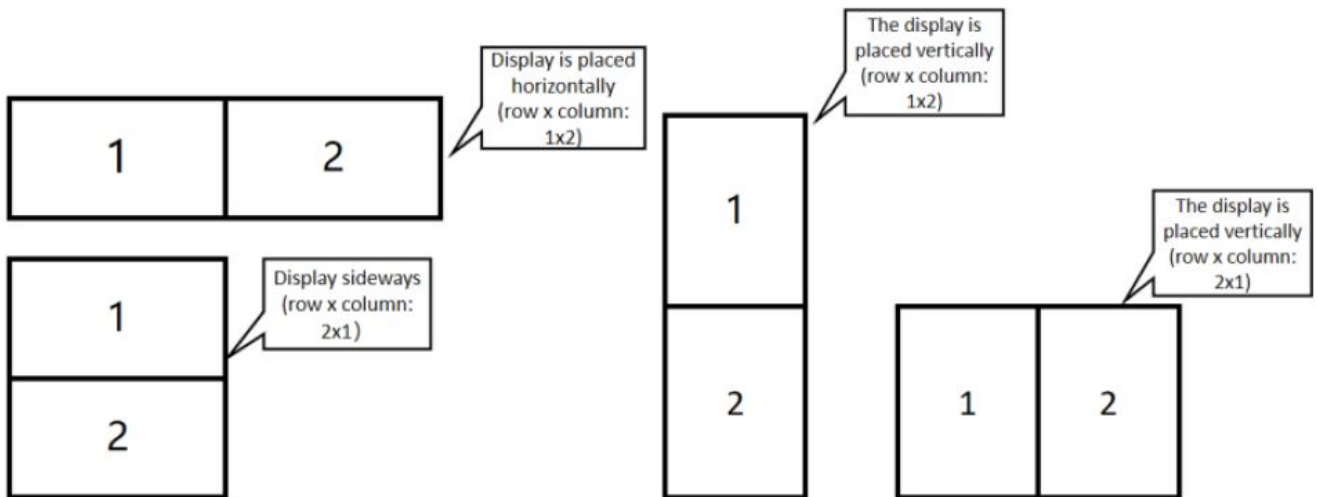
Dial up to indicate "1"

Dial down to indicate "0"

1000:	Device 1
0100:	Device 2
1100:	Device 3

**Note:** The device cascade setting image (NxM image) must be the same.

Definition of row and column mode:



## Supported resolution

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
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1×4	4096×576@30HZ	7680×1080@60HZ	1920×1080@60HZ
1×5	4080×459@30HZ	9600×1080@30HZ	1920×1080@60HZ
1×6	4032×378@30HZ	11520×1080@60HZ	1920×1080@60HZ
1×7	4032×324@30HZ	13440×1080@60HZ	1920×1080@60HZ
1×8	3968×279@30HZ	15360×1080@60HZ	1920×1080@60HZ
1×9	4032×252@30HZ	17280×1080@60HZ	1920×1080@60HZ
9×1	784×3969@30HZ	1920×9720@60HZ	1920×1080@60HZ
8×1	888×3996@30HZ	1920×8640@60HZ	1920×1080@60HZ

7×1	992×3906@30HZ	1920×7560@60HZ	1920×1080@60HZ
6×1	1184×3996@30HZ	1920×6480@60HZ	1920×1080@60HZ
5×1	1408×3960@30HZ	1920×5400@60HZ	1920×1080@60HZ
4×1	1776×3996@30HZ	1920×4320@60HZ	1920×1080@60HZ
3×1	1920×3240@30HZ	1920×3240@60HZ	1920×1080@60HZ
2×1	1920×2160@30HZ	1920×2160@60HZ	1920×1080@60HZ

2×2	3840×2160@30HZ	3840×2160@60HZ	1920×1080@60HZ
2×3	3840×1440@30HZ	5760×2160@60HZ	1920×1080@60HZ
2×4	4096×1152@30HZ	7680×2160@60HZ	1920×1080@60HZ
3×2	2816×2376@30HZ	3840×3240@60HZ	1920×1080@60HZ
3×3	3840×2160@30HZ	5760×3240@60HZ	1920×1080@60HZ
4×2	2688×3024@30HZ	3840×4320@60HZ	1920×1080@60HZ

**Table 2** iWall 409R Cascade Mode Supported Resolution



Mode	Full screen input resolution	Full screen output resolution	Single screen resolution
5×2	2336×3285@30HZ	3840×5400@60HZ	1920×1080@60HZ
6×2	1920×3240@30HZ	3840×6480@60HZ	1920×1080@60HZ
7×2	2016×3969@30HZ	3840×7560@60HZ	1920×1080@60HZ
8×2	1776×3996@30HZ	3840×8640@60HZ	1920×1080@60HZ
9×2	1568×3969@30HZ	3840×9720@60HZ	1920×1080@60HZ
2×5	4080×918@30HZ	9600×2160@60HZ	1920×1080@60HZ
2×6	4080×765@30HZ	11520×2160@60HZ	1920×1080@60HZ
2×7	4088×657@30HZ	13440×2160@60HZ	1920×1080@60HZ
2×8	4096×576@30HZ	15360×2160@60HZ	1920×1080@60HZ
2×9	4032×504@30HZ	17280×2160@60HZ	1920×1080@60HZ
3×4	4096×1728@30HZ	7680×3240@60HZ	1920×1080@60HZ
3×5	4080×1377@30HZ	9600×3240@60HZ	1920×1080@60HZ
3×6	4032×1134@30HZ	11520×3240@60HZ	1920×1080@60HZ
3×7	4032×972@30HZ	13440×3240@60HZ	1920×1080@60HZ
3×8	4096×864@30HZ	15360×3240@60HZ	1920×1080@60HZ

3×9	4032×756@30HZ	17280×3240@60HZ	1920×1080@60HZ
6×3	2640×2970@30HZ	5760×6480@60HZ	1920×1080@60HZ
7×3	2112×2772@30HZ	5760×7560@60HZ	1920×1080@60HZ
8×3	2160×3240@30HZ	5760×8640@60HZ	1920×1080@60HZ
9×3	1728×2916@30HZ	5760×9720@60HZ	1920×1080@60HZ
4×4	4096×2304@30HZ	7680×4320@60HZ	1920×1080@60HZ
4×5	4080×1836@30HZ	9600×4320@60HZ	1920×1080@60HZ
4×6	4032×1512@30HZ	11520×4320@60HZ	1920×1080@60HZ
5×5	4080×2295@30HZ	9600×5400@60HZ	1920×1080@60HZ
2×11	4048×414@30HZ	21120×2160@60HZ	1920×1080@60HZ
2×12	4032×378@30HZ	23040×2160@60HZ	1920×1080@60HZ
2×13	3952×342@30HZ	24960×2160@60HZ	1920×1080@60HZ

### Common problem

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

Answer: Same as the DisplayPort input resolution of the first device.

2. 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.

3. Is there a flash line on screen in cascade mode?

Answer: Please use the DP cable provided by the manufacturer to connect the cascaded DP ports.

4. There are errors in remote control when cascading: some devices respond to remote control commands normally, and some devices do not respond to remote control commands?

Answer: It is recommended to put the equipment together when using remote control in cascade.

5. How to recover when an error occurs?

Press the [clone] key, press the ☐ key, Return to [output copy mode, input single picture] status, when the cascade device settings are synchronized, continue with other settings.

## Appendix: Outputs order

1. When the image is not rotated: the output order is from up then down, then from left to right. As shown in the following 2×4 (Row\*Col) mode: see below



2. When the content is rotated 90° (anticlockwise): The outputs order is from right to left and then from up to down. As shown in Figure 4×2 mode (Row\*Col). see right




**Note\*:** Please make sure your display direction right the same as the picture shown. The content is rotated by 90° (anticlockwise), and the video wall is installed by 90° clockwise. The “Samsung” logo on the picture is showing the right display direction.

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## Documents / Resources

	<p><a href="#">infobit 409R iWall 4K UHD 4x9 Video Wall Controller</a> [pdf] User Manual 409R, iWall 4K UHD 4x9 Video Wall Controller</p>
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## References

- <i> [infobit AV- 4K Matrix Switchers, Wireless Presentation, Active Optical Cable and Conference Camera- Meeting Room Solutions](#)
- <i> [infobit AV- 4K Matrix Switchers, Wireless Presentation, Active Optical Cable and Conference Camera- Meeting Room Solutions](#)

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