



HDS-402MV

**Seamless 4K@30Hz HDMI Matrix
Multiviewer Switch w/ RS-232 Control**

USER MANUAL

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Thank you for purchasing this product

Thank you for purchasing this product. For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

Surge protection device recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the service life of your equipment.

Please Activate your warranty by registering our product through the link below - www.orei.com/register

Technical Support

Need Help?

Our experienced Technical Support Team is here for you to answer your questions, give technical advice or help troubleshoot your project to get you installed on time and on budget. Call, email or chat with us now.

OREI Live Technical Support Hours

US team (US/Canada/Mexico): Monday-Friday, 9 a.m. - 6 p.m.

Central Time **Support Email** - info@orei.com | **Support Number** - 877-290-5530

Or

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Send us an instant message now. Our Technical Support Team will respond momentarily. Available during live support hours.

Introduction

The HDS-402MV HDMI Matrix features seamless switching between 4 Input sources and 2 output devices. Along with seamless switching, the device also features Multiview functionality. It is HDMI 1.4 & HDCP 1.4 compliant and supports resolutions up to 4K@30Hz. With 5 different Multiview modes, you can display any 2 or 4 sources at once on one of the outputs. The device supports PIP view with the ability to set the PIP window to any corner of the screen. The power-off memory function retains the last setup when the device is restarted. Features versatile control through the front panel, the included remote, or RS-232. The HDS-402MV is the perfect device for various security and multimedia applications.



Features & Package Contents

1. HDMI 1.4 & HDCP 1.4 Compliant
2. 4 In 2 Out Matrix w/ Multiviewer functionality
3. Video resolutions up to 4K@30Hz
4. Features seamless switching
5. Multi-resolution output
6. Built in Scaler to upscale and downscale resolution
7. Features Aspect ratio change and PIP functions
8. Control via front panel, IR Remote and RS-232

Package Contents

1.	HDS-402MV	1 pcs
2.	Remote Control	1 pcs
3.	Power Adapter	1 pcs
4.	User Manual	1 pcs

Specifications

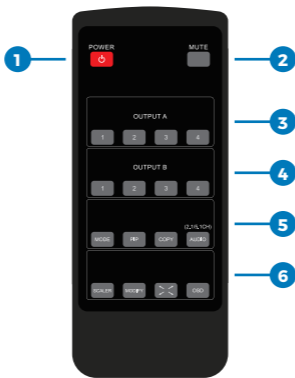
Technical	
HDMI Compliance	HDMI 1.4
HDCP Compliance	HDCP 1.4
Video Bandwidth	10.2Gbps
Video Resolution	4K@24/25/30Hz, 1080P@50/60Hz, 720P@50/60Hz up to 480p
Color Depth	Support 8/10/12/16 bits color depth
Color Space	RGB/YCbCr444/YCbCr422/yCbCr420(only support input)
Audio Formats	LPCM/AC3/DTS
ESD Protection	contact discharge ($\pm 4\text{KV}$), air discharge ($\pm 8\text{kv}$), Implementation of the standard: IEC61000-4-2

Connections	
Input	4 x HDMI IN [Type A, 19-pin female] 1 x Upgrade [Micro-USB] 1 x DC 5V [Power Input]
Output	2 x HDMI IN [Type A, 19-pin female] 1 x Stereo L/R [3.5MM Jack] 1 x TOSLNIK [S/PDIF]

Mechanical	
Housing	Metal Enclosure
Color	Black
Dimensions	215mm [L] x 90mm [W] x 18mm [H]
Weight	450g / 15.8oz
Power Supply	Input: AC 100-240V 50/60Hz, Output: DC 5V/2A (US/EU standards, CE/FCC/UL certified)
Power Consumption	≤ 2W
Operating Temperature	Operating Temperature: 0°C to 70°C
Storage Temperature	Storage Temperature: -10°C-80°C
Relative Humidity	5-90% RH (non-condensing)

Ports and Interfaces

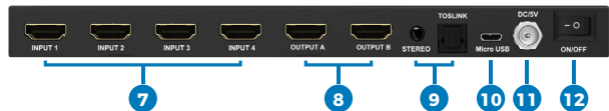
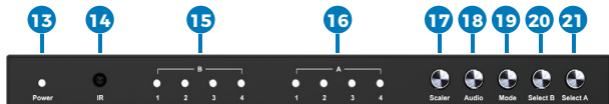
Remote Control



No.	Name	Function Description
1.	Power	Power standby/power on
2.	Mute	Mute the audio output
3.	Output A	Press the button 1~4 to select the appropriate source for Output A

No.	Name	Function Description
4.	Output B	Press the button 1~4 to select the appropriate source for Output B
5.	Mode	Press the button to switch between different Multiview modes
	PIP	When in PIP mode, press this button to cycle between different positions of the PIP window
	COPY	Press this button to copy the Output A display model to Output B
	Audio	Press the button to select from which source the audio is played. Long press the button to switch between 2.1CH & 5.1CH mode.
6.	Scaler	Press the button to downscale or upscale the output resolution
	Modify	Press this button to switch between different sources in the current display mode
	Full Screen	Press to select full-screen mode or keep the original ratio of the video
	OSD	Press to show the OSD

Ports and Interfaces




No.	Name	Function Description
7.	INPUT 1-4	HDMI Input1-4 port
8.	OUTPUT A-B	HDMI Output A/B port
9.	STEREO	Stereo Audio Output
	TOSLINK	Toslink Digital Audio Output
10.	MICRO USB	Firmware Update port for factory reset and RS-232 control
11.	DC/5V	DC 5V IN
12.	ON/OFF	Power on/off button
13.	Power	Power LED Indicator
14.	IR	IR Receiver


No.	Name	Function Description
15.	B 1-4	Input1-4 LED Indicator for OUTPUT B
16.	A 1-4	Input1-4 LED Indicator for OUTPUT A
17.	SCALER	HDMI output resolution 1080p/1600P/4K@30Hz switch button
18.	AUDIO	Audio channel output select button
19.	MODE	Press the button to change display mode as 2x2 four equal picture-IN1/IN2 left/right picture - IN1/IN2 up/down picture-one big three small up/down picture mode-PIP(one big one small picture)
20.	OUTPUT B	Press IN1 ~ IN4 button will select the corresponding channel to output B as a seamless switcher
21.	OUTPUT A	Press IN1 ~ IN4 button will select the corresponding channel to output A as a seamless switcher


Special Function Description

1. For 2x2 four equal picture mode, the four HDMI input sources are displayed in 2x2 on one screen, press mode key once and it will be displayed with the below in default:

IN1	IN2
IN3	IN4


Press  (modify key) + numerical key N (N=1, 2, 3, 4), these different numbers means different mode (The user can choose the mode he desires within 5s after pressing the 'modify' key, if no operation was made after 5s, the program will restore in default).

Note: If in current mode, customer only need to press  (modify key) + numerical key N (N=1, 2, 3, 4), and save pressing one key to change different mode. If the current mode is in other display mode, customers need press mode button to change to 2x2 four equal picture mode firstly and press key combinations as below.


Press  (modify key) + numerical key 1, then the output pictures will be:

IN1	IN2
IN3	IN4


Special Function Description

Press  (modify key) + numerical key 2, then the output pictures will be:

IN2	IN1
IN4	IN3

Press  (modify key) + numerical key 3, then the output pictures will be:

IN3	IN4
IN1	IN2


Press  (modify key) + numerical key 4, then the output pictures will be:


IN4	IN3
IN2	IN1


2. For left /right picture mode, press the mode key twice and it will display the below picture in default:

IN1	IN2
-----	-----

Special Function Description


Press  (modify key) + numerical key N (N=1, 2, 3, 4) + numerical key M (N=1, 2, 3, 4, N≠M), these different numbers means different input source, N means to choose the left output picture input source, M means to choose the right output picture input source (The user can choose the mode he desires within 5s after pressing the 'modify' key, if no operation was made after 5s, the program will restore in default).

Note: If in current mode, customer only need to press  (modify key) + numerical key N (N=1, 2, 3, 4) + numerical key M (N=1, 2, 3, 4, N≠M), and save pressing one key to change different mode. If the current mode is in other display mode, customers need press mode button to change to left /right picture mode firstly and press key combinations as below.


Press  (modify key) + numerical key 1+ numerical key 2/3/4, then the output pictures will be:




Special Function Description

Press  (modify key) + numerical key 2+ numerical key 1/3/4,
then the output pictures will be:



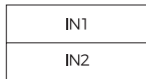
Press  (modify key) + numerical key 3+ numerical key 1/2/4,
then the output pictures will be:




Press  (modify key) + numerical key 4+ numerical key 1/2/3,
then the output pictures will be:





**3. For up /down picture mode, press the mode key three times
and it will display the below picture in default:**



Special Function Description


Press  (modify key) + numerical key N+ numerical key M (N, M=1, 2, 3, 4, N≠M), these different numbers means different input source, N means to choose the up output picture input source, M means to choose the down output picture input source (The user can choose the mode he desires within 5s after pressing the 'modify' key, if no operation was made after 5s, the program will restore in default).

If in current mode, customer only need to press  (modify key) + numerical key N (N=1, 2, 3, 4) + numerical key M (N=1, 2, 3, 4, N≠M), and save pressing one key to change different mode. If the current mode is in other display mode, customers need press mode button to change to up /down picture mode firstly and press key combinations as below.


Press  (modify key) + numerical key 1 and numerical key 2/3/4, then the output pictures will be:

IN1	IN1	IN1
IN2	IN3	IN4


Special Function Description

Press  (modify key) + numerical key 2 and numerical key 1/3/4, then the output pictures will be:

IN2	IN2	IN2
IN1	IN3	IN4

Press  (modify key) + numerical key 3 and numerical key 1/2/4, then the output pictures will be:

IN3	IN3	IN3
IN1	IN2	IN4


Press  (modify key) + numerical key 4 and numerical key 1/2/3, then the output pictures will be:


IN4	IN4	IN4
IN1	IN2	IN3


4. For one big three small up/down picture mode, the mode key four times and it will be displayed with the below in default:

IN1		
IN2	IN3	IN4


Special Function Description

Press  (modify key) + numerical key N (N=1, 2, 3, 4), these different numbers means different mode, N means to choose the up output picture, M means to choose the down output picture (The user can choose the mode he desires within 5s after pressing the 'modify' key, if no operation was made after 5s, the program will restore in default).

Note: If in current mode, customer only need to press  (modify key) + numerical key N (N=1, 2, 3, 4), and save pressing one key to change different mode. If the current mode is in other display mode, customers need press mode button to change to one big three small up /down picture mode firstly and press key combinations as below.


Press  (modify key) + numerical key 1, the output picture will be:

IN1		
IN2	IN3	IN4


Press  (modify key) + numerical key 2, the output picture will be:

IN2		
IN1	IN3	IN4

Special Function Description

Press  (modify key) + numerical key 3, the output picture will be:


IN3		
IN1	IN2	IN4

Press  (modify key) + numerical key 4, the output picture will be:


IN4		
IN1	IN2	IN3


5. For PIP mode, press PIP and it will be displayed with the below pictures in default:

IN1
IN2


Press PIP+  (modify key) + numerical key N+ numerical key M (N, M=1, 2, 3, 4, N≠M), these different numbers means different input source, N means to choose the main output picture input source, M means to choose the small output picture input source (The user can choose the mode he desires within 5s after pressing the 'modify' key, if no operation was made after 5s, the program will restore in default).

Special Function Description


Note: If in current mode, customer only need to press  (modify key) + numerical key N (N=1, 2, 3, 4) + numerical key M (N=1, 2, 3, 4, N≠M), and save pressing one key to change different mode. If the current mode is in other display mode customers need press full key button combination as below.

Press PIP+  (modify key) + numerical key 1+ number 2/3/4, the output picture will be:




Press PIP+  (modify key) + numerical key 2+ number 1/3/4, the output picture will be:

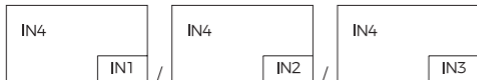


Press PIP+  (modify key) + numerical key 3+ number 1/2/4, the output picture will be:



Special Function Description

Press PIP +  (modify key) + numerical key 4+ number 1/2/3, the output picture will be:



Note: Press the key PIP to cycle control the location of the PIP small windows shown as below:



When the PIP small picture location is changed, the modify input function is remain working as upon combination key control.

RS-232 Connection Protocol

Baud Rate = 57,600 bits per second as default

Data Bits = 8

Stop Bits = 1

Parity = None

Flow Control = None

Notes:

1. Carriage Return is required at end of each string
2. Commands are not case-sensitive Spaces are shown for clarity : commands should NOT have any spaces
3. After a new command is received , a prompt should be sent back
4. HDMI Input selections via front button , IR remote , serial IR In , USB service port , trigger in , or RS-232 respond with the following message `x = the currently selected input (1-4)`
5. The response terminates with a carriage return followed by a line feed

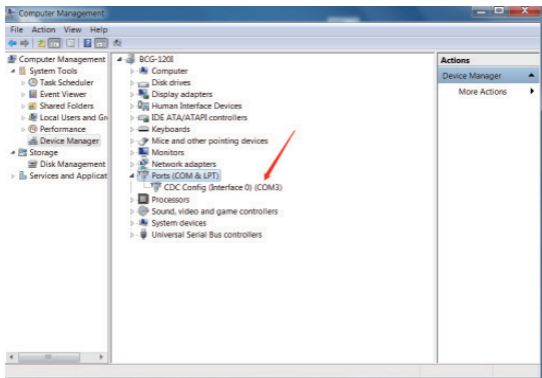
Micro USB port used for configuration and control from third-party control terminals

Used for firmware updates

Supports USB driver for Windows 8.1/10/11 , Mac OS 10.10 above Will register as CDC Config Series Port in Device Manager. If the operation system of the PC is too old, the customer need to install the driver for CDC manually

Can be used as RS-232 control port

Baud rate is 115200



Help Command (H) . Returns Entire API in Readable Format

Help Command (H) . Returns entire API in readable format :

```
-----  
--                               Systems HELP                               --  
-----  
-- 4PET0401QMS                               F/W Version : 1.00 --  
--  
-- H: Help --  
-- PF: Power Off --  
-- PN: Power ON --  
-- STA: Show Global System Status --  
--  
-- Video Output Setup Commands: yy = [01-04,U,D] --  
-- SPO SI yy: Set Output to Video Input yy --  
-- SPO ON/OFF: Set Output ON/OFF --  
-- Set the Four Same Size Picture Mode for Four Combinations, --  
-- x=[1,2,3,4] --  
-- SPOA 2x2 x:Set Output A to Four Video Input 2x2 mode x --  
-- Set the Two Picture Left/right Mode to x for Left Picture and y --  
-- for Right Picture: x=[1,2,3,4], y=[1,2,3,4] --  
-- SPOA 2PLR x y: Set Output A to two Video Input Left x/right y mode --  
-- Set the Two Picture Up/down Mode to x for Up Picture and y for Down --  
-- Picture: x=[1,2,3,4], y=[1,2,3,4] --  
-- SPOA 2PUD x y: Set Output A to two Video Input Up x/down y mode --  
-- Set the One Big Up Three Small Down Picture Mode for Four --  
-- Combinations, x=[1,2,3,4] --  
-- SPOA 1B3S x : Set Output A to Four Video Input 1B3S mode x --  
-- Set the Two Picture PIP Mode to x for Main Picture and y for Small --
```


Help Command (H) . Returns Entire API in Readable Format

```
-- Picture: x=[1,2,3,4], y=[1,2,3,4] --
-- SPOA PIP x y: Set Output A to two Video Input Main x/small y PIP --
-- mode --
-- SPOA PIP ROTATE: Set the PIP Mode Small Picture Location from Right --
-- Down Corner-Left Down corner- Left Up Corner-Right Up Corner --
-- SPOA SCALER ROTATE: Set the OutputA Resolution from --
-- 4K30/2560x1600p/1080p circularly --
-- SPOA RATIO ROTATE: Set the OutputA RATIO Between Full Screen and --
-- Keep the Original --
--
-- Audio Output Setup Commands: [E=Enable, D=Disable] --
-- SPO A E/D: Enable/Disable External Optical and Analog Audio Output --
-- SPO AM 2.1/5.1: Set the Output Defaul Audio Mode to 2.1CH/5.1CH --
-- Mode --
-- Set the Output Multi Picture Mode Audio Channel Selected Input x, --
-- x=[1,2,3,4] --
-- SPOA x: Set the Output Audio Channel to Input x --
--
-- System Control Setup Commands: --
-- SHOW OSD: Show the OSD Information and Disappear after 5s --
-- SPC FB E/D: Enable/Disable Front Panel Buttons --
-- SPC RSB z: Set RS232 Baud Rate to z bps, z=[0-4] --
-- [0:57600, 1:38400, 2:19200, 3:9600, 4:4800] --
-- SPC DF: Reset to Factory Defaults --
```

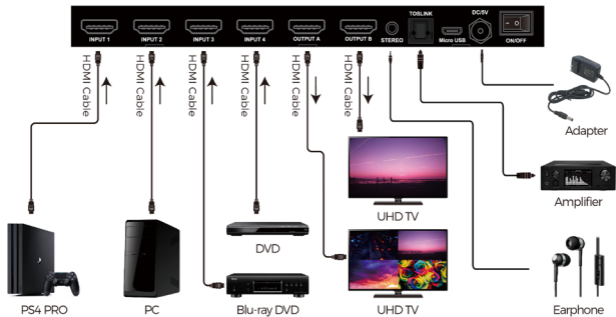
Status Command (STA). Returns Unit Status and Settings in Readable Format

Status Command (STA). Returns unit status and settings in readable format:

#if HDMI input 2 is disconnected.

```
-----  
--                               Systems STATUS                               --  
-----  
-- 4PET0401QMS,                               Device Name: 4PET0401QMS_0001 --  
-- F/W Version: 1.00                               --  
-- Power: ON --  
-- Front Panel Button : Enabled --  
-- RS232: Baud Rate=57600bps, Data=8bit, Parity=None, Stop=1bit --  
-- --  
-- Video Input 01: LINK = ON --  
-- Video Input 02: LINK = OFF --  
-- Video Input 03: LINK = ON --  
-- Video Input 04: LINK = OFF --  
-- --  
-- Video Output: Output = ON ,DBG = OFF --  
-- Output Video Mode: 2x2 1 , RES = 4K30 --  
-- --  
-- Audio Output: Enabled --  
-- Audio Mode: 2.1CH --  
-- Audio Input Channel: Input 1 --  
-----
```

Connection Diagram



HDMI Cable



3.5mm Cable



DC Power Cable

→ HDMI signal flow



Toslink Cable

Troubleshooting

Problems	Causes	Solutions
Power light is off and product is not working; Signal light is off and no picture output, black screen.	Is the power adapter properly connected and the power on/off button is on turn on state? Maybe the input and output is connected in the wrong way; or the HDMI cable quality issue cause the HDMI signal can't transmit to the product or output display normally	Please check if the power adapter is connected properly and turn on the power on/off button; Please connect the player, product, and display devices according to the instructions; if not, please replace the input and output connections with new HDMI cables
Screen splash or pink screen	HDMI cable may not be good quality or the cable is too long	Please use the standard HDMI cable, the input/output cable length at 1080p can't exceed 10M to 10M, 4K@30Hz can't exceed 5M to 5M



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Multiviewer Switch w/ RS-232 Control**

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