

HDMI 2.0 Output Card for FLEX Modular Matrix

Model: FLEX-HDMI12OUT

Description: 12-Port 18Gbps HDMI Output Card with HDCP 2.2, HDR & 4K60 4:4:4 for FLEX Series Modular Matrix Switchers

1. Introduction

The FLEX-HDMI12OUT is a high-density, hot-swappable HDMI 2.0 output card for any KanexPro FLEX modular matrix chassis. This card provides 12× HDMI output ports, each supporting full 18Gbps bandwidth at up to 4K 3840×2160 @60Hz 4:4:4, with HDCP 2.2 content protection and HDR pass-through.

The FLEX-HDMI12OUT allows a single chassis to drive 12, 24, 36, or 48 HDMI displays (by installing 1, 2, 3, or 4 output cards respectively), making it ideal for large-scale display installations in hospitality, corporate, education, broadcast, security, and retail environments.

1.1 KEY FEATURES

- 12× HDMI Type A (female) output ports per card
- HDMI 2.0 standard at 18Gbps bandwidth
- 4K 3840×2160 @60Hz 4:4:4 video resolution support
- HDCP 2.2 and HDCP 1.x content protection
- HDR (High Dynamic Range) pass-through
- Deep color: 8-bit, 10-bit, and 12-bit per color channel
- Chroma sampling: RGB, YCbCr 4:4:4, YCbCr 4:2:2, YCbCr 4:2:0
- Hot-swappable design — field-replaceable without system downtime
- Automatic detection by FLEX matrix chassis
- Compatible with FLEX-MF8X10, FLEX-MF16X20, FLEX-MF24X36, and FLEX-MF24X60 chassis

2. Package Contents

Your FLEX-HDMI12OUT package includes:

- 1× FLEX-HDMI12OUT HDMI Output Card
- User Manual (this document)

Optional accessories (sold separately):

- FLEX-HDMI8IN Input Card (8-port HDMI 2.0 input)
- FLEX-CATOUT CAT output card for long-distance distribution
- FLEX-MFxxx matrix chassis

3. Specifications

3.1 PHYSICAL SPECIFICATIONS

Parameter	Specification
Card Type	Modular output card for FLEX matrix chassis
Dimensions	Standard FLEX module size (height and depth per FLEX chassis slot)
Weight	Approximately 300g
Mounting	Slide into available output card slot; secured with retaining screws

3.2 VIDEO SPECIFICATIONS

Parameter	Specification
HDMI Standard	HDMI 2.0
Maximum Data Rate	18 Gbps per port
Maximum Resolution	3840×2160 @60Hz 4:4:4 (8-bit)
Supported Resolutions	All HDMI 2.0 resolutions from 640×480 to 3840×2160
Color Depth	8, 10, and 12 bits per color channel
Chroma Sampling	RGB, YCbCr 4:4:4, YCbCr 4:2:2, YCbCr 4:2:0
HDR Support	HDR10, Dolby Vision, HDR10+ pass-through
HDCP	HDCP 2.2 and HDCP 1.x support

3.3 CONNECTIVITY

Parameter	Specification
Output Connectors	12× HDMI Type A (19-pin female)
Backplane Connector	High-speed backplane connector (internal to chassis)

3.4 OPERATIONAL SPECIFICATIONS

Parameter	Specification
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-10°C to 60°C (14°F to 140°F)
Humidity	10% to 90% RH (non-condensing)
Power Consumption	Powered by FLEX chassis (no external power required)
Max Cards per Chassis	4 output cards (48 total HDMI outputs)
Compatibility	FLEX-MF8X10, FLEX-MF16X20, FLEX-MF24X36, FLEX-MF24X60

4. Installation & Operation

4.1 INSTALLATION OVERVIEW

The FLEX-HDMI12OUT is designed for quick, tool-free installation into any available output card slot on a FLEX matrix chassis.

Installation Steps:

1. **Power Off:** Power off the FLEX matrix chassis before inserting or removing any cards.
2. **Locate Output Slot:** Identify an available output card slot on the rear of the FLEX chassis (refer to your chassis manual for slot locations).
3. **Insert Card:** Align the card's backplane connector with the slot and slide the card in until fully seated. You will feel a slight resistance, and the card will click into place.
4. **Secure:** Insert the two retaining screws (with washers) through the card bracket holes into the threaded chassis frame. Tighten firmly but do not over-tighten.
5. **Connect Displays:** Connect HDMI cables from the 12 output ports to your HDMI display devices (TVs, monitors, projectors, video walls, etc.).
6. **Power On:** Power on the FLEX chassis. The matrix will automatically detect the card and assign the 12 output ports to the matrix routing control.

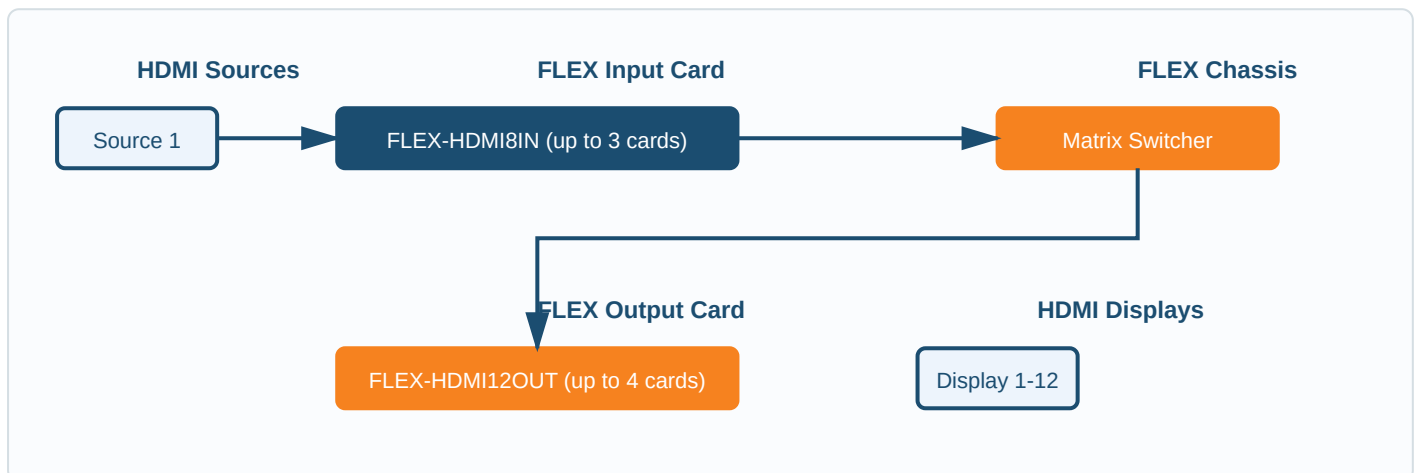
Hot-Swap Replacement:

The FLEX-HDMI12OUT is hot-swappable, meaning you can replace a card without powering off the matrix (though this is not recommended for mission-critical installations). If you must replace the card while powered:

1. Disconnect all HDMI cables from the card being replaced.
2. Remove the two retaining screws carefully.
3. Slide the card straight out of its slot.
4. Quickly insert the replacement card and secure with retaining screws.
5. Reconnect HDMI cables.
6. The matrix will re-detect the card within seconds.

4.2 CONNECTION DIAGRAM

The following diagram shows a typical FLEX matrix system with HDMI input and output cards:



4.3 OUTPUT PORT ASSIGNMENT

Each FLEX-HDMI12OUT output card has 12 HDMI Type A (female) connectors labeled OUT 1 through OUT 12 on the card face. When installed in the FLEX matrix, these 12 ports are automatically assigned to the matrix output routing

control, typically as outputs 1–12 (for the first card), 13–24 (for the second card), etc.

The actual output numbering depends on the order and position of card installation. Refer to your FLEX matrix chassis control interface (front panel buttons, web GUI, or API) to confirm output numbering.

5. Troubleshooting

5.1 CARD NOT DETECTED

Problem: The FLEX-HDMI12OUT output ports do not appear in the matrix control interface.

- **Solution 1:** Verify the card is fully seated in its slot. Power off the chassis, reseal the card, and power back on.
- **Solution 2:** Check that the card is installed in an output card slot (not an input slot). Refer to your chassis manual for slot identification.
- **Solution 3:** Inspect the backplane connector on the card for dust or debris. Clean gently with a dry, lint-free cloth.

5.2 NO VIDEO OUTPUT

Problem: Video is not appearing on connected HDMI displays.

- **Solution 1:** Verify that the matrix is actively routing a source to the output port. Use the FLEX matrix control interface to confirm the routing assignment.
- **Solution 2:** Check the HDMI cable connections. Reseat the cables on both the output card and the display device.
- **Solution 3:** Test with a different HDMI cable or different display to isolate the issue.
- **Solution 4:** Verify that the connected source is providing a valid video signal to an input card or other matrix input.

5.3 INTERMITTENT VIDEO LOSS

Problem: Video cuts out or freezes periodically on one or more output ports.

- **Solution 1:** Check all HDMI cable connections for loose contacts. Remove and reconnect cables firmly.
- **Solution 2:** Move HDMI cables away from high-EMI sources (power cables, radio transmitters, wireless devices).
- **Solution 3:** Replace the HDMI cable. Long runs (> 25 meters) may require active HDMI extenders or FLEX-CATOUT CAT cards.
- **Solution 4:** Power-cycle the FLEX chassis to reset the matrix switching fabric.

5.4 HDCP OR COPY PROTECTION ISSUES

Problem: Protected content (4K Netflix, Blu-ray, etc.) is not displaying.

- **Solution 1:** Verify that all cables and connectors (source to input card, output card to display) support HDCP 2.2. Older HDMI cables may not support HDCP 2.2.
- **Solution 2:** Check that the connected display supports HDCP 2.2. Some older displays only support HDCP 1.x and will not display protected 4K content.
- **Solution 3:** Power-cycle the source device, input card, and display device in sequence to reset HDCP negotiation.

5.5 LIMITED RESOLUTION

Problem: The output is locked at 1080p or lower, not 4K.

- **Solution 1:** Check the source device video output settings. The source must be configured to output 4K video.
- **Solution 2:** Verify that all HDMI cables and connectors support 18Gbps bandwidth. Use high-speed HDMI 2.0 cables certified for 4K60 4:4:4.
- **Solution 3:** Verify that the connected display supports 4K resolution and HDMI 2.0. Some older displays are limited to Full HD.
- **Solution 4:** Check the FLEX matrix input card (FLEX-HDMI8IN or similar) to ensure it is receiving and passing 4K video from the source.

6. Technical Support & Warranty

Technical Support: For technical assistance, feature requests, or bug reports, contact KanexPro support:

- Email: support@kanexpro.com
- Phone: (available on www.kanexpro.com)
- Web: www.kanexpro.com/support

Warranty: The FLEX-HDMI12OUT includes a [X]-year limited hardware warranty covering manufacturing defects. Warranty details are available on the product page at www.kanexpro.com/item/FLEX-HDMI12OUT.

7. Safety & Compliance

The FLEX-HDMI12OUT meets international safety and electromagnetic compliance standards including CE, FCC, and RoHS directives.

Warning: Do not attempt to disassemble the card or modify its internal components. Doing so may void the warranty and create electrical hazards. For repairs, contact KanexPro technical support.