CATx Output Card for FLEX Modular Matrix

Model: FLEX-CAT12OUT

Description: 12-Port CATx Output Card with HDR, PoC & 4K60 4:4:4 for FLEX Series Modular Matrix Switchers

1. Introduction

The FLEX-CAT12OUT is a high-density, hot-swappable CATx output card for any KanexPro FLEX modular matrix chassis. This card provides 12× RJ45 CATx output ports, each transmitting HDMI video over standard CAT5e/6/6A cabling at up to 4K 3840×2160 @60Hz 4:4:4, with HDR pass-through and Power-Over-Cable (PoC) to eliminate separate power supplies at remote receivers.

The FLEX-CAT12OUT allows a single chassis to drive 12, 24, 36, or 48 remote displays (by installing 1, 2, 3, or 4 output cards respectively) at distances up to 70m, making it ideal for large-scale AV distribution in hospitality, corporate, education, broadcast, security, and retail environments where long cable runs are required.

1.1 KEY FEATURES

- 12× CATx (RJ45) output ports per card for HDMI over CAT5e/6/6A
- Long-distance signal extension — up to 70m (CAT5e/6) or 100m (CAT6A)
- 4K 3840×2160 @60Hz 4:4:4 video resolution support
- HDR (High Dynamic Range) pass-through
- Power-Over-Cable (PoC) — 5V power delivery to remote receivers
- 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-CAT12OUT package includes:

- 1× FLEX-CAT12OUT CATx Output Card
- User Manual (this document)

Optional accessories (sold separately):

- FLEX-CATRX CATx Receiver (one per remote display)
- FLEX-HDMI8IN Input Card (8-port HDMI 2.0 input)
- CAT5e/CAT6/CAT6A Ethernet cables (for CATx output connections)
- FLEX-MFxxx matrix chassis

3. Specifications

3.1 PHYSICAL SPECIFICATIONS

Parameter	Specification
Card Type	Modular CATx 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
Maximum Data Rate	18 Gbps
Maximum Resolution	3840×2160 @60Hz 4:4:4 (8-bit)
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	HDR pass-through

3.3 CONNECTIVITY

Parameter	Specification
Output Connectors	12× RJ45 (Category 5e/6/6A compatible)
Backplane Connector	High-speed backplane connector (internal to chassis)
Transmission Distance (4K60)	Up to 70m (CAT5e/6), up to 100m (CAT6A)
Power-Over-Cable (PoC)	5V power delivery to remote FLEX-CATRX receivers

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 CATx outputs)
Compatibility	FLEX-MF8X10, FLEX-MF16X20, FLEX-MF24X36, FLEX-MF24X60

4. Installation & Operation

4.1 INSTALLATION OVERVIEW

The FLEX-CAT12OUT 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 CATx Cables:** Connect CAT5e/6/6A cables from the 12 RJ45 output ports to your FLEX-CATRX receivers at each display location (up to 70m per run).
6. **Connect Receivers to Displays:** At each remote location, connect the FLEX-CATRX receiver to the display via HDMI. The receiver is powered automatically via PoC — no separate power supply needed.
7. **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.

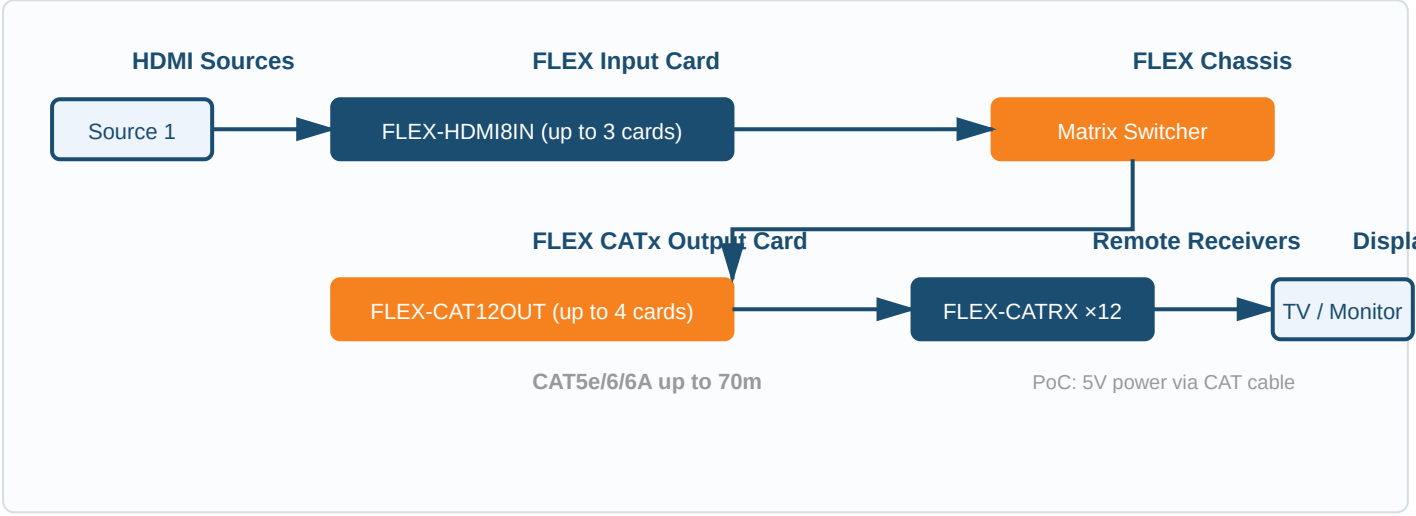
Hot-Swap Replacement:

The FLEX-CAT12OUT 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 CATx 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 CATx 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 CATx output distribution:



4.3 OUTPUT PORT ASSIGNMENT

Each FLEX-CAT12OUT output card has 12 RJ45 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.

4.4 POWER-OVER-CABLE (POC)

The FLEX-CAT12OUT supplies 5V power to each connected FLEX-CATRX receiver over the same CAT cable used for video signal transmission. This eliminates the need for separate power supplies, power outlets, or power infrastructure at each remote display location.

> **Important:** Use only FLEX-CATRX receivers with the FLEX-CAT12OUT. Third-party HDBaseT receivers may not be compatible with the PoC implementation and could be damaged by the power delivery.

5. Troubleshooting

5.1 CARD NOT DETECTED

Problem: The FLEX-CAT12OUT 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, reseat 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 AT REMOTE DISPLAY

Problem: Video is not appearing on a display connected via FLEX-CATRX receiver.

- **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 CATx cable connections at both the output card and the receiver. Reseat both ends.
- **Solution 3:** Verify the FLEX-CATRX receiver LED is lit (indicating PoC power is active). If the LED is off, the cable may be faulty.
- **Solution 4:** Verify cable length does not exceed 70m (CAT5e/6) or 100m (CAT6A).
- **Solution 5:** Test with a different CATx cable or a different receiver to isolate the issue.

5.3 INTERMITTENT VIDEO OR ARTIFACTS

Problem: Video cuts out, freezes, or shows artifacts at a remote display.

- **Solution 1:** Check all CATx cable connections for loose contacts. Remove and reconnect cables firmly.
- **Solution 2:** Verify cable quality — use solid-core CAT6 or CAT6A for runs over 50m. Avoid CCA (copper-clad aluminum) cables.
- **Solution 3:** Route CATx cables away from high-EMI sources (power cables, fluorescent lights, motors). Use shielded (STP) cable in high-EMI environments.
- **Solution 4:** Reduce cable length or upgrade from CAT5e to CAT6A for better signal integrity.

5.4 RECEIVER NOT POWERING ON (POC)

Problem: The FLEX-CATRX receiver LED is off and the receiver has no power.

- **Solution 1:** Verify the FLEX-CAT12OUT card is fully seated and detected by the chassis.
- **Solution 2:** Test the CATx cable with a cable tester to confirm all 8 wires have continuity.
- **Solution 3:** Try a different output port on the FLEX-CAT12OUT card.
- **Solution 4:** Try a different CATx cable (some cables may have internal breaks that pass data but not PoC power).

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 cable grade — 4K60 requires CAT6 or higher. CAT5e may limit resolution at longer distances.
- **Solution 3:** Verify the connected display supports 4K resolution.
- **Solution 4:** Reduce cable length. 4K60 4:4:4 requires shorter runs than 1080p.

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-CAT12OUT includes a limited hardware warranty covering manufacturing defects. Warranty details are available on the product page at www.kanexpro.com/item/FLEX-CAT12OUT.

7. Safety & Compliance

The FLEX-CAT12OUT 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.