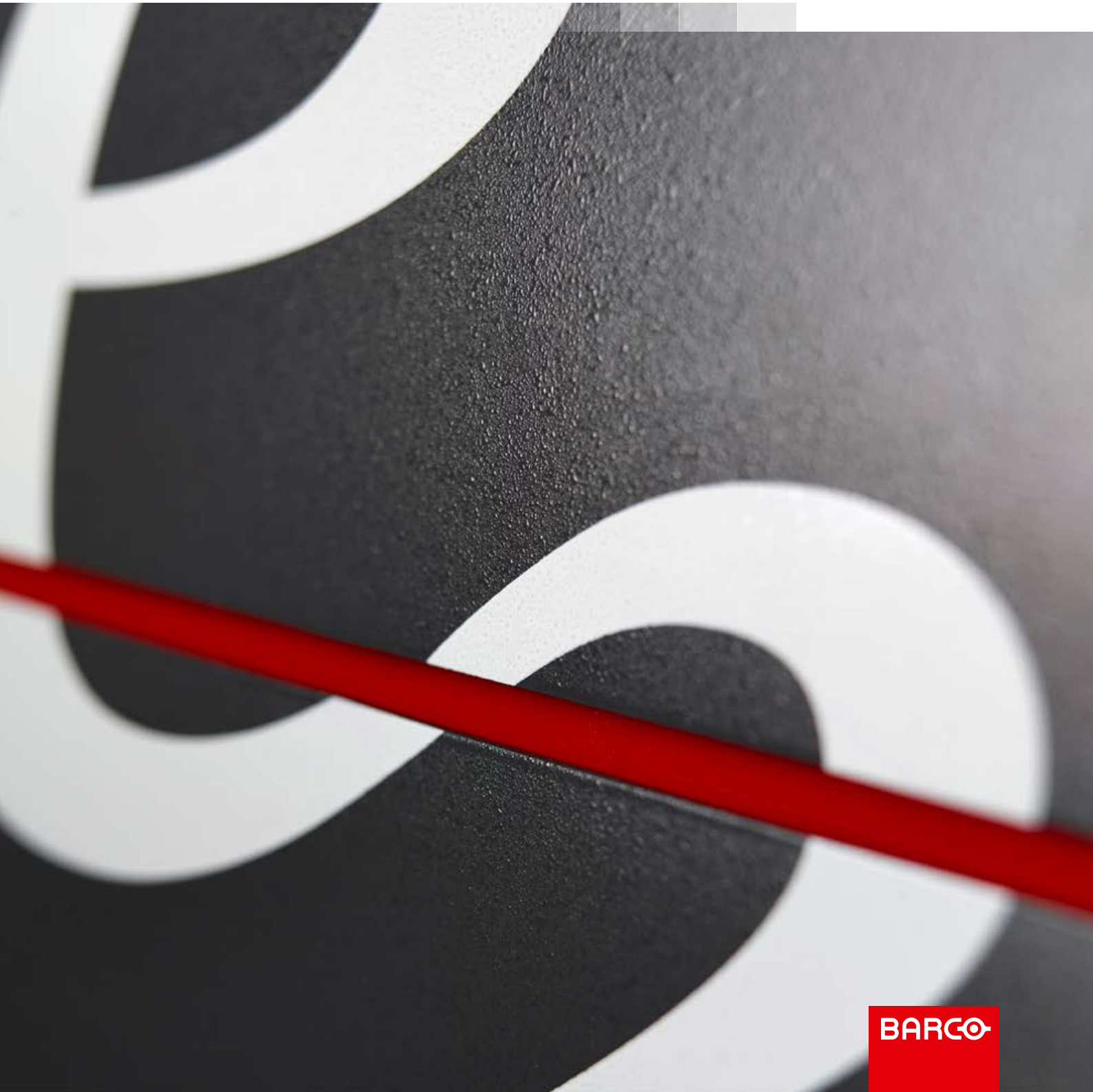
COMM-TEC

# Screen Management Systems

Reliable and modular video processing for ProAV



BARCO

# 4K video processing for your installation

There's a growing demand for extremely high-resolution, video-based installations to wow audiences with an exceptional experience. High-performance and reliable display technology is a major requirement for today's stadiums, houses of worship, corporate auditoriums and lobbies, hotels, casinos and broadcast studios.

Image processing, screen management, and control are key for video-based presentations. In this rapidly evolving market, you need reliable technology – both now and into the future. If you want to stay up-to-date with the latest and greatest, our screen management systems have you covered with modular solutions that scale with your requirements.

## Unmatched performance

Excelling in low latency image quality, high I/O density, expandability, and durability, the video processors manage all your 4K 60p requirements and beyond. They combine integrated distribution, switching, scaling, screen composition and management for all your projects. Barco's state-of-the-art Athena™ based image processing technology is renowned for its exceptional image quality and low processing latency. With native 4K 60p 4:4:4 input and output, the E2 and S3-4K processors provide impressive pixel processing power.

## Future-proof and flexible

The screen management systems can be tuned to the configuration you need. You can start from one of the built-to-order boxes – such as the E2 and S3-4K – and link additional boxes, like the Ex, as your needs grow. The modular I/O cards make the systems future proof. You can simply swap or add a card as new signal interfaces such as HDMI 2.0 become available. The cards also make your systems scalable to support larger screens, a higher number of inputs and windows for your canvas or growing resolutions.

## The right box for your installation

Our screen management systems are based on a built-to-order design. In this way you can select the system that matches your requirements and only pay for what you really need. Based on your canvas size, input and output capability, and the necessary windows, you select the E2 or S3-4K chassis. This chassis can then be 'filled' with the capacity you need of inputs and output cards, Multiviewer or Auxiliary outputs. If your demands grow further, you can always link additional boxes. The possibilities are endless.

> We are blown away by the groundbreaking revolutionary features of the E2 system. Its modularity, ease of use and build quality – along with the future-proof, 4K native switching capability – are all reasons why we love it.
>
> **Clint Foweler,**
> Sound Stylists' Head of AV

## Did you know?

**Most of the world's installations can be managed with a single E2 processor.**

### Ultimate reliability

Critical setups need to run flawlessly 24/7. With our reliable screen management systems you avoid downtime, for more peace of mind. They also provide more situational awareness as all inputs and outputs are monitored in the Multiviewer. The user interface gives you a clear overview of all of your system resources. The products feature a reliable, rugged design with a steel chassis and are tested to withstand G-shock, vibration, and extreme temperatures.

### Easy to install and configure

As the screen management systems are very easy to use, setting up and executing video processing becomes effortless. Thanks to their compact form factor, our processors and controllers speed up installation time. Their modular cards and dual redundant power supplies ensure that the reliable systems are easy to service or upgrade in the field.

# Built to expand

The series of screen management systems excels in versatility and flexibility. Their link cards allow you to expand your system by linking E2 to E2, S3-4K to S3-4K, or E2 to S3-4K. If you only need to expand inputs or outputs, you can also link the Ex processor to the E2 or S3-4K, increasing inputs and outputs in even smaller increments. This enables easy expansion beyond the standard amount of inputs and layers, without additional external processing or routing to distribute the signals.

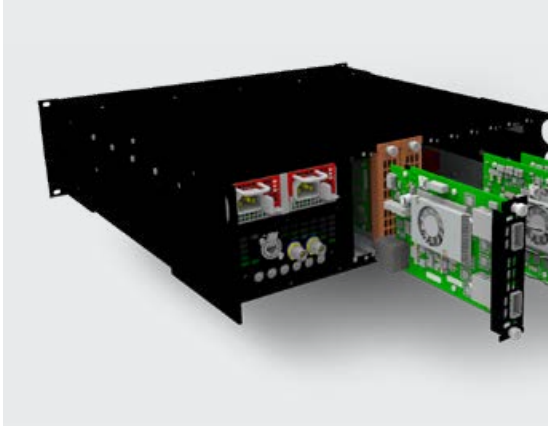
Photo: Hawthorn

## The choice is yours

Growing as you add, the systems offer all the tools you need to manage all your setups - even the most complex ones - with absolute ease. Future software releases will increase the combinations of linking to make the system even more powerful and flexible.

## Modularity for the future

The modular I/O cards can be used across the product family. The cards not only bring newer interfaces, but also new features. The portfolio provides all of the advanced features and future upgradeability you need. As new signal interfaces become reality, you simply add a new card to your E2 or S3-4K system.



**HDMI/DisplayPort input card**

**Dual link DVI input card**

**SDI input card**

**HDMI 1.4 output card**

**3G SDI output card**

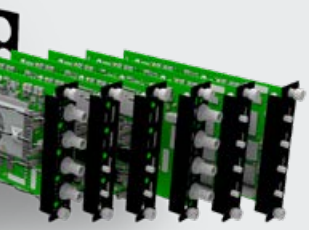
## Gen1 card specs

- HDMI 1.4a
- Displayport 1.1
- 3G SDI
- 4K/UHD @30p on a single cable, 4K/UHD@60p on either 2 cables or 4.
- 2Si SDI support
- EDID for VESA, CEA, or custom timings
- Automatic input/output acquisition and configuration.
- HDCP 1.4 compliant
- Custom Area of Interest (output)


#NoBarcoNoShow

We had a total of 26 HD inputs, and four at 4K, so the E2 was the natural choice for the project, as it could natively handle these large inputs without the need for additional external scaling.

**David Barton,**
Group Head of Video at Hawthorn



## Custom-made models

Can't find an off-the-shelf model that suits your needs? A built-to-order (BTO) processor allows you to specify your exact system requirements. BTO allows you to:

- Choose layer capacity and number of pips/keys
- Decide whether you will link or not
- Select your input/output mix

**Expansion link card**

- Used for linking Event Master processors for expansion
- Uses CXP cable for connections
- Can be converted to MTP fiber optic cable to 100m
- More detailed info can be found on www.barco.com/mybarco

**4K60 Tri-combo input card**

**DisplayPort 1.2 output card**

**4K60 Tri-combo output card**

## Gen2 card specs

- HDMI 2.0
- Displayport 1.2
- 12/6/3G SDI
- 4K/UHD @60p on a single cable, 4K/UHD on 4 cables via Quad SDI or 2Si SDI formats.
- EDID for VESA, CEA, or custom timings
- Automatic input/output acquisition and configuration.
- HDCP 1.4 and 2.2 (hdmi 2.0 only) compliant
- Custom Area of Interest (output)
- Rotation (output)

# E2

## Pay only for what you need


*When less capacity is required, the E2 Jr brings the same performance and features as the E2. The Jr configuration is also upgradable to the fully loaded E2 configuration.*


**VFD screen**
Display menus and messages

**Adjust knob**
Navigation

**USB port**
Connect a flash drive to back up and restore logos and system configurations, as well as upgrade firmware

**SEL and ESC buttons**
Select an item, answer a query or exit a menu

**PWR button**

The E2 is a ground-breaking 4K screen management system that offers video professionals unparalleled flexibility to manage the most awe-inspiring visuals. Excelling in image quality, I/O density, expandability and durability, it is the most comprehensive system of its kind.

Due to the modular nature of the screen management systems, inputs, outputs, layers and linking can all be customized to suit your installation requirements.

## Key features - example configuration

- Up to 32 inputs and 16 outputs
- Optional Multiviewers
- Optional AUX outputs
- 4K 60p 4:4:4 scaling
- Each I/O card supports 4K
- Up to 16 mixers or up to 32 single layers
- HDCP 1.4 and 2.2 (with Gen2 cards) compliant
- EDID 1.3 compliant
- Hardware controllers available
- Live native resolution background mixer per destination
- Canvas size: up to 20 megapixel @60Hz or 40 megapixel @30Hz
- Front-to-back forced air cooling
- Dual redundant power supplies
- Field-installable cards
- Expansion via link cards
- Easy-to-use GUI control
- Widescreen blending support
- Seamless AUX switching
- Roadworthy design
- Luma, chroma, and alpha keying
- Independent scaling mode per layer
- PNG logo import
- Links with other E2(s), S3-4K, and Ex

## Typical applications

Stadiums and arenas - Large corporate auditoriums and corporate lobbies - Large higher education classrooms - Broadcast studios - Simulation - Houses of worship

*E2 Jr rear connectivity slots - example configuration*

*E2 rear connectivity slots - example configuration*

**Expansion cards**
- 2 high-speed CXP connectors per card

**SDI inputs**
- 4 SDI BNC connectors per card
- SD/HD/3G formats

**DVI inputs**
- 2 DVI-I connectors per card
- Single/Dual link formats
- HDCP 1.4 / EDID 1.3

**Genlock with loop-through**

**Dual redundant power supplies**

**Ethernet**
Connect to the PC/GUI via a ruggedized lockable RJ45 connector

**DisplayPort/HDMI inputs**
- 2 DisplayPort 1.1 and 2 HDMI 1.4a connectors per card (compatible with many locking adapters)
- Formats up to 2,048 x 2,160@60, 2,560 x 1,600@60, 3,840 x 1,200@60 and 3,840 x 2,160@30 (30 bits)
- HDCP 1.4 and EDID 1.3

**HDMI outputs**
- 2 HDMI connectors (compatible with many locking adapters)
- Formats up to 2,048 x 2,160@60, 2,560 x 1,600@60, 3,840 x 1,200@60 and 3,840 x 2,160@30 (30 bits)
- HDCP 1.4 and EDID 1.3

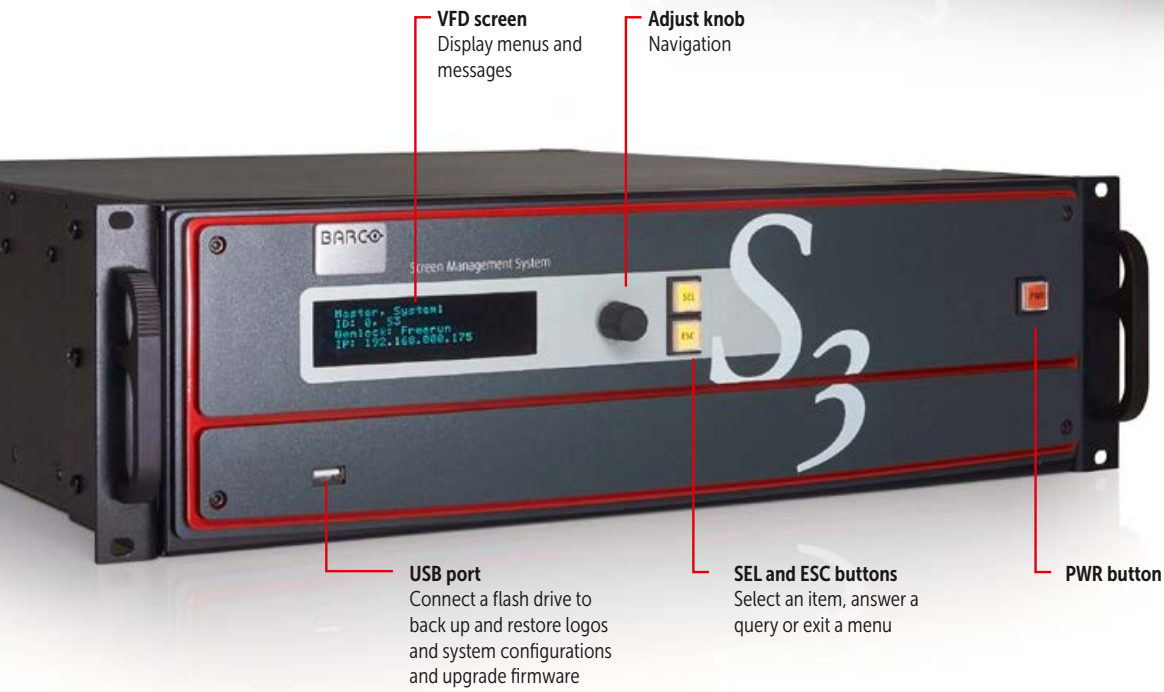
**Multiviewer outputs**
- 4 HDMI connectors
- Dual Output

**SDI outputs**
- 4 SDI BNC connectors
- SD/HD/3G formats

# S3-4K

## Designed for small to medium-size setups


*When less capacity is required, the S3-4K Jr brings the same performance and features as the S3-4K. The Jr configuration is also upgradable to the fully loaded S3-4K configuration.*




The S3-4K is E2's more compact sidekick, but one that can hold its own in most situations. Unparallelled flexibility, excellent image quality, incredible I/O density and durability to create moments that last, all in a compact and road-worthy enclosure.

The S3-4K utilizes the same modular cards as the E2. In addition to being serviceable in the field, this feature makes the S3-4K ready for future signal interfaces.

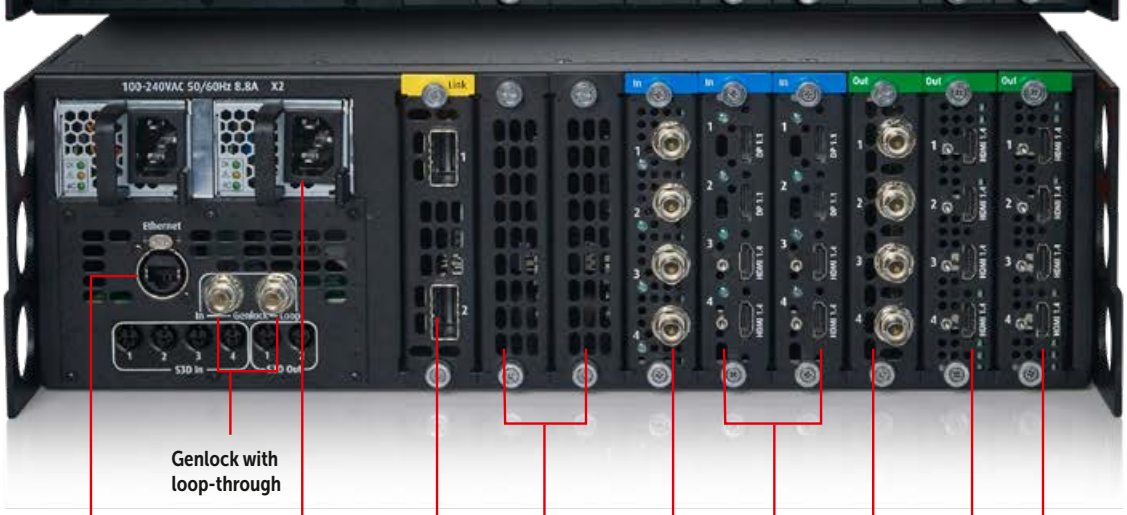
## Key features S3-4K - example configuration

- Up to 12 inputs
- Up to 12 outputs
- Optional Multiviewers
- Genlockable
- 4 mixable 2K PIPs
- Up to 4 mixing layers or up to 8 single layers
- HDCP 1.4 and 2.2 (with Gen2 cards) compliant
- EDID 1.3 compliant
- 4-projector blend from a single box
- Hardware controllers available
- Canvas size: up to 10 megapixel @60Hz or 20 megapixel @30Hz
- Live native resolution background mixer per destination
- Front-to-back forced air cooling
- Dual redundant power supplies
- Field-installable cards
- Expansion via integrated link cards
- Easy-to-use, cross platform GUI control
- Widescreen blending support
- Seamless AUX switching
- Roadworthy design
- Links with other S3-4K(s), E2, and Ex

## Typical applications

Stadiums and arenas - Corporate auditoriums and corporate lobbies - Higher education classrooms - Broadcast studios - Simulation - Houses of worship


*S3-4K Jr rear connectivity slots - example configuration*




*S3-4K rear connectivity slots - example configuration*

**Genlock with loop-through**

**Ethernet**
Connect to the PC/GUI via a ruggedized lockable RJ45 connector

**Dual redundant power supplies**

**Expansion card**
- 2 high-speed CXP connectors

**Video processing cards**

**SDI inputs**
- 4 SDI BNC connectors
- SD/HD/3G formats

**SDI outputs**
- 4 SDI BNC connectors
- SD/HD/3G formats

**Multiviewer outputs**
- 4 HDMI connectors
- Dual output

**DisplayPort/HDMI inputs**
- 2 DisplayPort and 2 HDMI connectors (compatible with many locking adapters)
- Formats up to 2,048 x 2,160@60, 2,560 x 1,600@60, 3,840 x 1,200@60 and 3,840 x 2,160@30 (30 bits)
- HDCP 1.4 and EDID 1.3

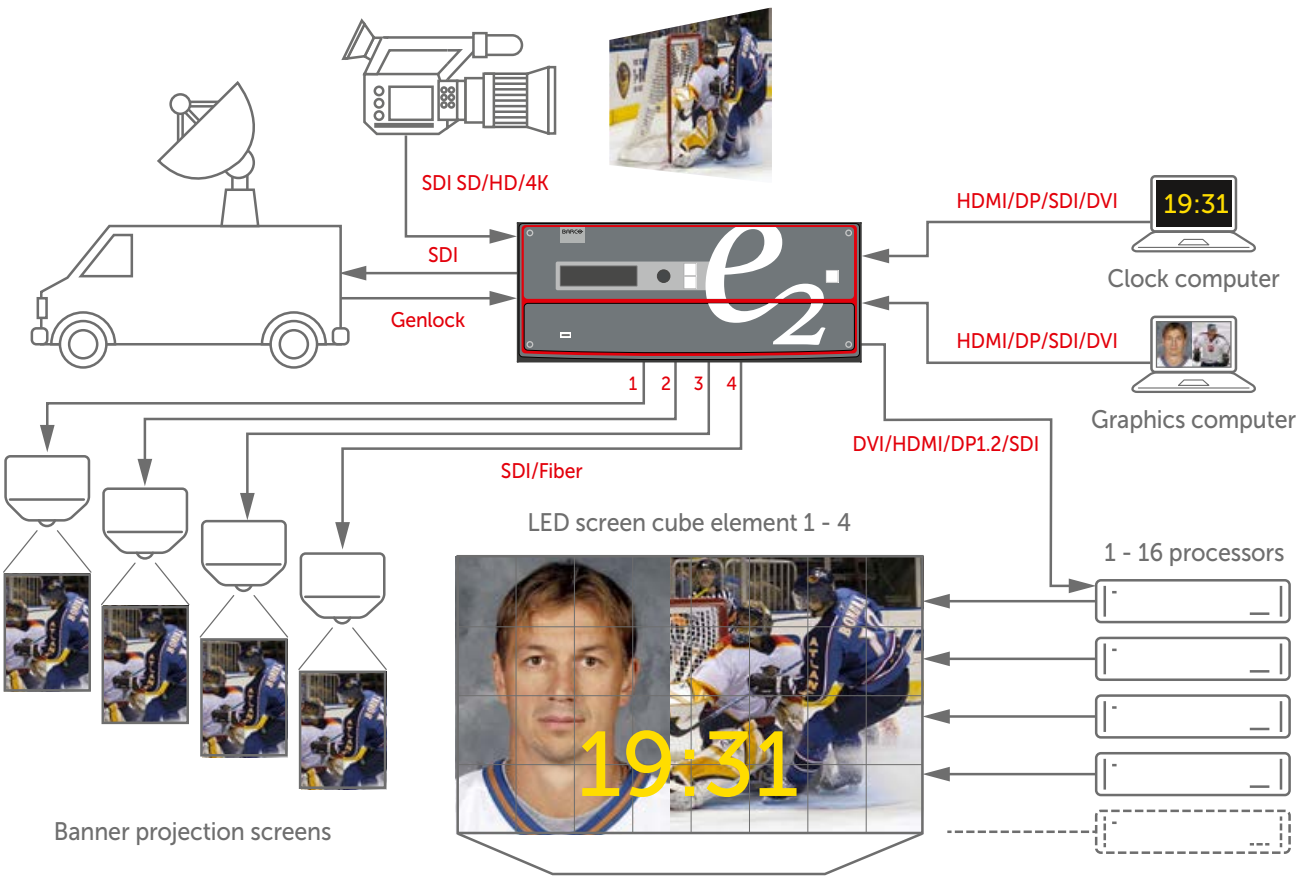
**HDMI outputs**
- 4 HDMI connectors (compatible with many locking adapters)
- Formats up to 2,048 x 2,160@60, 2,560 x 1,600@60, 3,840 x 1,200@60 and 3,840 x 2,160@30 (30 bits)
- HDCP 1.4 and EDID 1.3

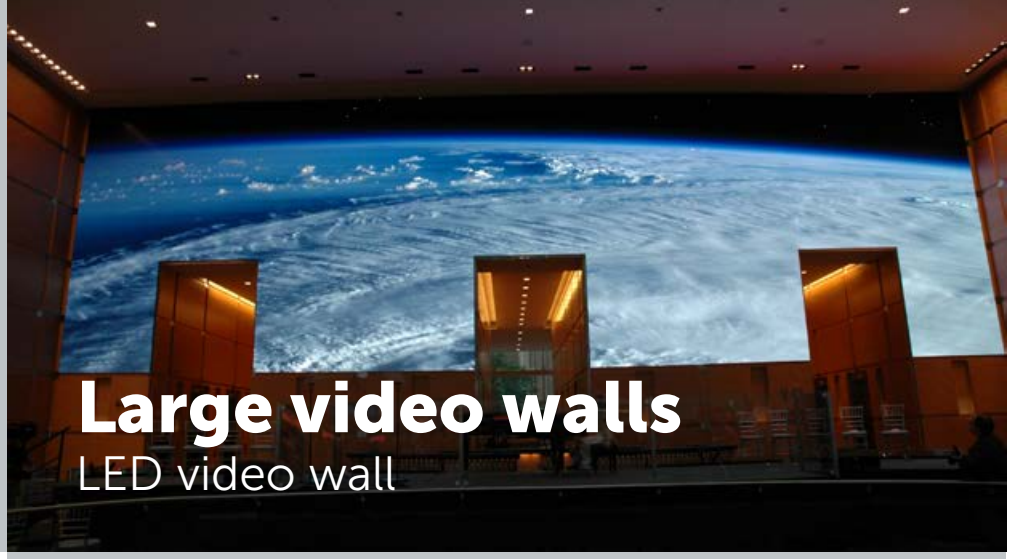

# Arena screen controller

## Cube and support screens

The video processors can tie up the install of an arena system by accommodating many of the special requirements.

Several sources can effortlessly be combined into an image. Once this is done, the image message can be distributed to LED displays, projectors, and multi-flat-panel walls, including all the necessary scaling and conversions. The screen management systems support broadcast functionality such as SDI, downconversion and Genlock.





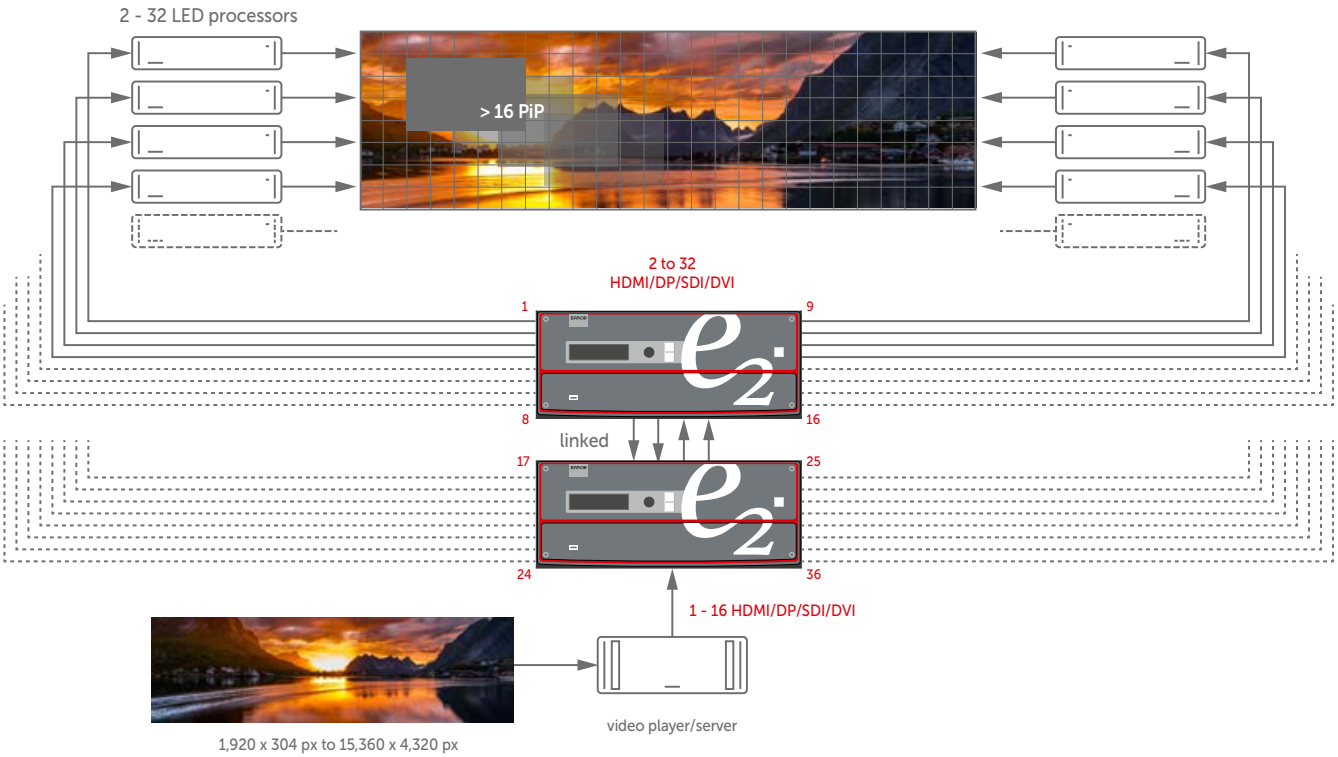
# Large video walls

## LED video wall

Capable of handling multiple flat-panel setups, the video processors provide superior scaling. Athena™ scaling ensures that the upscaling is done in the best possible quality, also for standard screens.

You can build a wall with 2 to 32 HD screens while the content's resolution remains in lower - and thus easily manageable - resolutions. If higher detail is needed, you can simply upgrade by adding a more powerful playback system.
When the setup is done, displaying of single or multiple sources can be controlled in detail or integrated into existing control systems.

As they're built-to-order, the screen management systems allow you to scale the installation according to your budget.



# Expansion simplified

With the screen management systems, expanding your system is as simple as connecting a few cables and an additional processor. If you only need a little, use a single link cable and the Ex expansion unit. If you need more, you can add an extra E2 with four link cables or an S3-4K with two cables. No additional routers or splitters are required.


## Affordable scaler

As a stand-alone processor, the Ex is an affordable scaler with the same processing power as four ImagePROs. The system can be configured to provide a 4x4 scaling matrix of HD sources. And you can link two processors for up to an 8x8 scaling matrix.

## Ex expansion unit

The Ex processor provides more possibilities to expand the scaling and switching power of your screen management system. The Ex extends I/Os for applications up to 100 meters away. By linking the Ex with other processors (E2 or S3-4K), you add extra inputs, outputs and/or layers. For standalone applications, two Ex processors can be linked to each other without another processor.

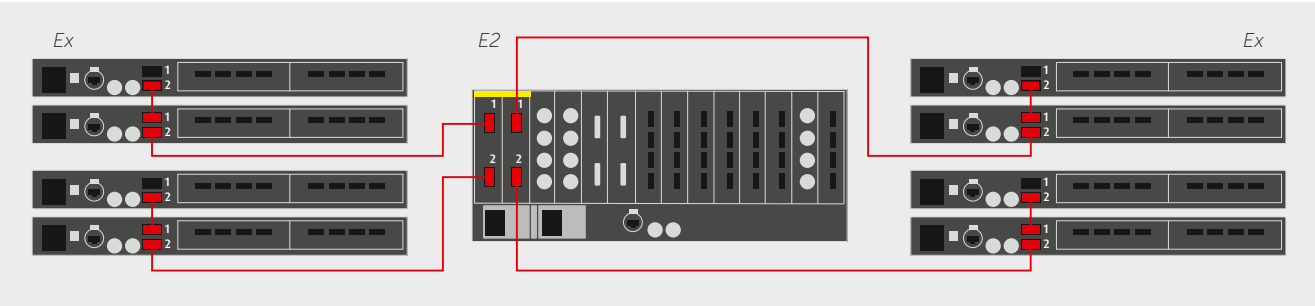
## Flexible and simple

Because the Ex shares its modular cards and software with the other products, you can flexibly configure your systems and service your units in the field. This also makes your cabling and systems simpler – replacing up to eight fiber extenders between remote devices and boxes.

## Expand your inputs and outputs

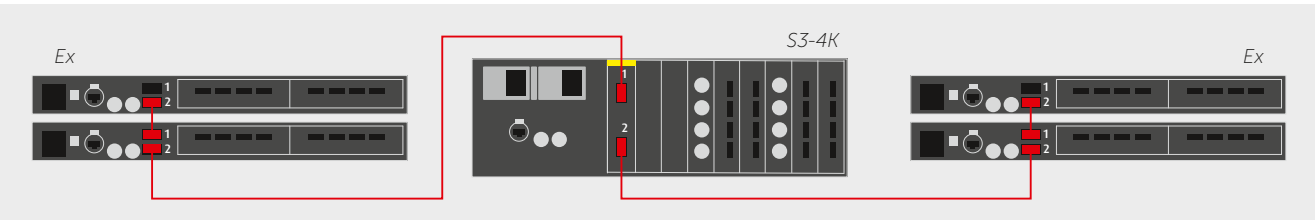
Two Ex processors with a total of two input cards and two output cards, can be connected to each E2/S3-4K link connection. This enables 8 inputs and 8 outputs per link connection. For the E2, this means up to 32 additional inputs and outputs; and for the S3-4K, this adds up to 16 inputs and outputs – all without adding a full-sized processing chassis.

# Linking examples



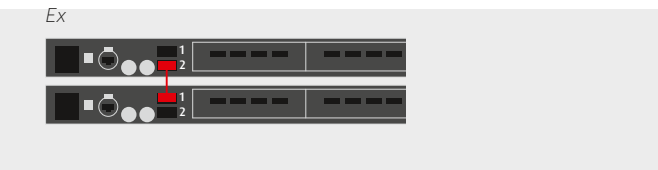

## Ex to E2

- Up to 8 Ex processors
- Adds up to 32 inputs and 32 outputs to the E2
- Inputs and outputs viewed in the main processor's MVR
- Ex processors can be up to 100 meters away from the E2 via fiber extensions.
- Outputs create additional scaled AUX outputs or follow a screen destination from main processor.




## Ex to S3-4K

- Up to 4 Ex processors
- Adds up to 16 inputs and 16 outputs to the S3-4K
- Inputs and outputs viewed in the main processor's MVR
- Ex processors can be up to 100 meters away from the S3-4K via fiber extensions.
- Outputs can either follow a screen destination in the main processor or create additional scaled AUX outputs.




## Ex to Ex

- Up to 2 Ex processors
- 8x8 HD, 4x4 4K@30p, 2x2 4K60p scaling matrix switcher
- Outputs are configured as AUXes.
- Uses same software and external commands as E2 and S3-4K
- Ex processors can be up to 100 meters away from the each other.

> As early adopters of Encore and E2, we have enjoyed the high performance, scalability, and modularity of this technology platform.

**Stephen Gray,**
Chief Operating Officer for Creative Technology

# Take control...

The screen management systems come with a cross-platform GUI-based user interface that provides touchscreen ergonomics and ease-of-use. With the toolset you can interface with E2 or S3-4K from a PC or Mac via an Ethernet connection. The program provides a step-by-step approach to configuring, programming presets, setting up the dedicated Multiviewer, and managing system functions.

# ...in 3 easy steps

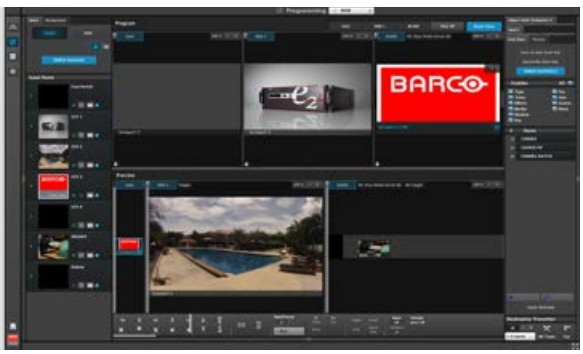
The 3 key screens of the GUI include:

### 1. System configuration

The System configuration screen is the first to appear when you launch the GUI software. Here you can add or remove devices to the selected systems and modify their parameters (inputs, backgrounds, outputs and destinations).

### 2. Programming screen

Use the Programming screen to bring the different elements together and build your show. Define sources for inputs, modify layer attributes like size and border, and create user keys and presets.




### 3. Multiviewer

In the Multiviewer screen, you can configure the dedicated Multiviewer, which enables multiple sources (inputs, backgrounds and destinations) to be displayed on one or two monitors. Up to 4 custom layouts can be created for the Multiviewer.

# Controllers

## Full control at your fingertips

An innovative take on the classic video controllers, these controllers give operators instant access to resources and great situational awareness for a wide range of applications. Running the same toolset as the Mac or PC, the EC200, that runs on Linux, adds a syntax-based programmer that dramatically speeds up the creation of large presentation layouts. The EC-200 provides the operator with everything needed to program and execute the biggest presentations possible. The smaller footprints of the EC-50 and EC-30 make them a perfect fit for smaller setups.


## EC-30 / 50 / 200 Common features

- Finger-tip control
- 12 user-programmable destination selection buttons with multi-page support
- High-resolution T-bar for manual transitions
- 9 layer selection buttons with multi-page support
- 2 multiple function Assign busses for source/background selection, preset recall, and user keys.
- User-programmable custom function buttons

## Extra features for EC-50

- Internal 15.6 inch full HD (1,920 x 1,080) touchscreen display
- Additional 2 user-programmable custom function buttons
- One additional row of Assign buttons
- Built-in script lamp
- White work lights on front of console
- Red work lights on rear of console
- USB hub

## Extra features for EC-200

- Enhanced situational awareness due to an additional full HD display
- Stand-alone operation
- Dedicated buttons for instant access to commonly used functions and selections
- Syntax-based programming section
- Track ball, additional script light and number pad for direct numeric entry
- 4 position buttons (up, down, left, right)
- 5 rotary encoder wheels for layer adjustments
- 12 context sensitive displays with selection buttons


Photo: Hawthorn

**Order numbers:**

| | | | |
|---|---|---|---|
| • E2 | R9004698 | • DVI input card | R9004740 |
| • E2 Jr | R9004777 | • SDI input card | R9004742 |
| • S3-4K | R9004757 | • HDMI-DP input card | R9004744 |
| • S3-4K Jr | R9004778 | • SDI output card | R9004741 |
| • Ex | R9004776 | • HDMI output card | R9004743 |
| • EC-30 | R9004783 | • DVI output card | R9004745 |
| • EC-50 | R9004772 | • DisplayPort 1.2 output card | R9004765 |
| • EC-200 | R9004771 | • 4K Tri-combo input card | R9004785 |
| | | • 4K Tri-combo output card | R9004786 |
| | | • Link card | R9004746 |
| | | • S3-4K/Ex VPU | R9004758 |

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**ENABLING BRIGHT OUTCOMES**

BARCO