# BrightEye™

# Mitto

## High Performance Scan Converters

3G/HD/SD SDI

Fiber
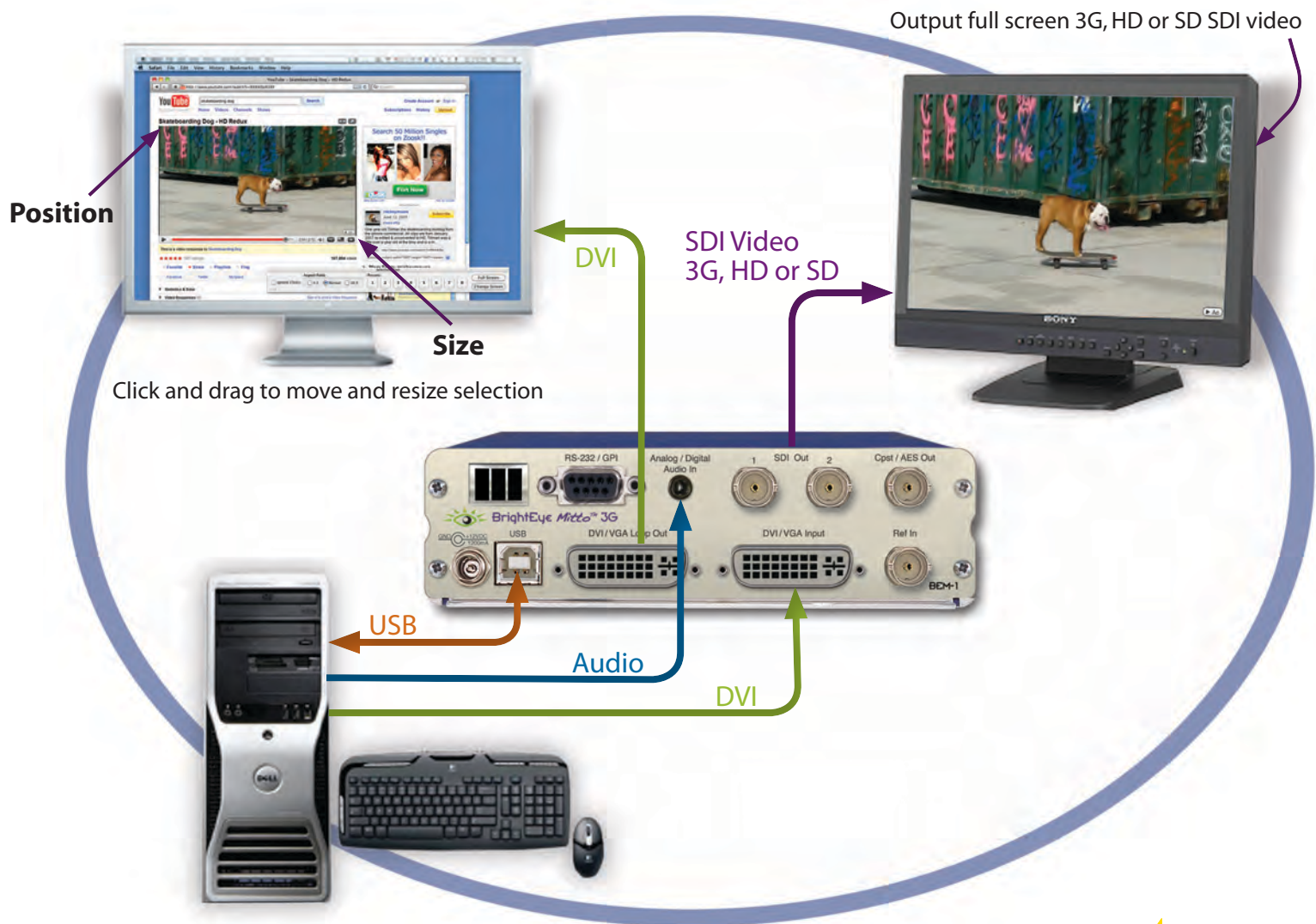
HDMI

DVI/VGA
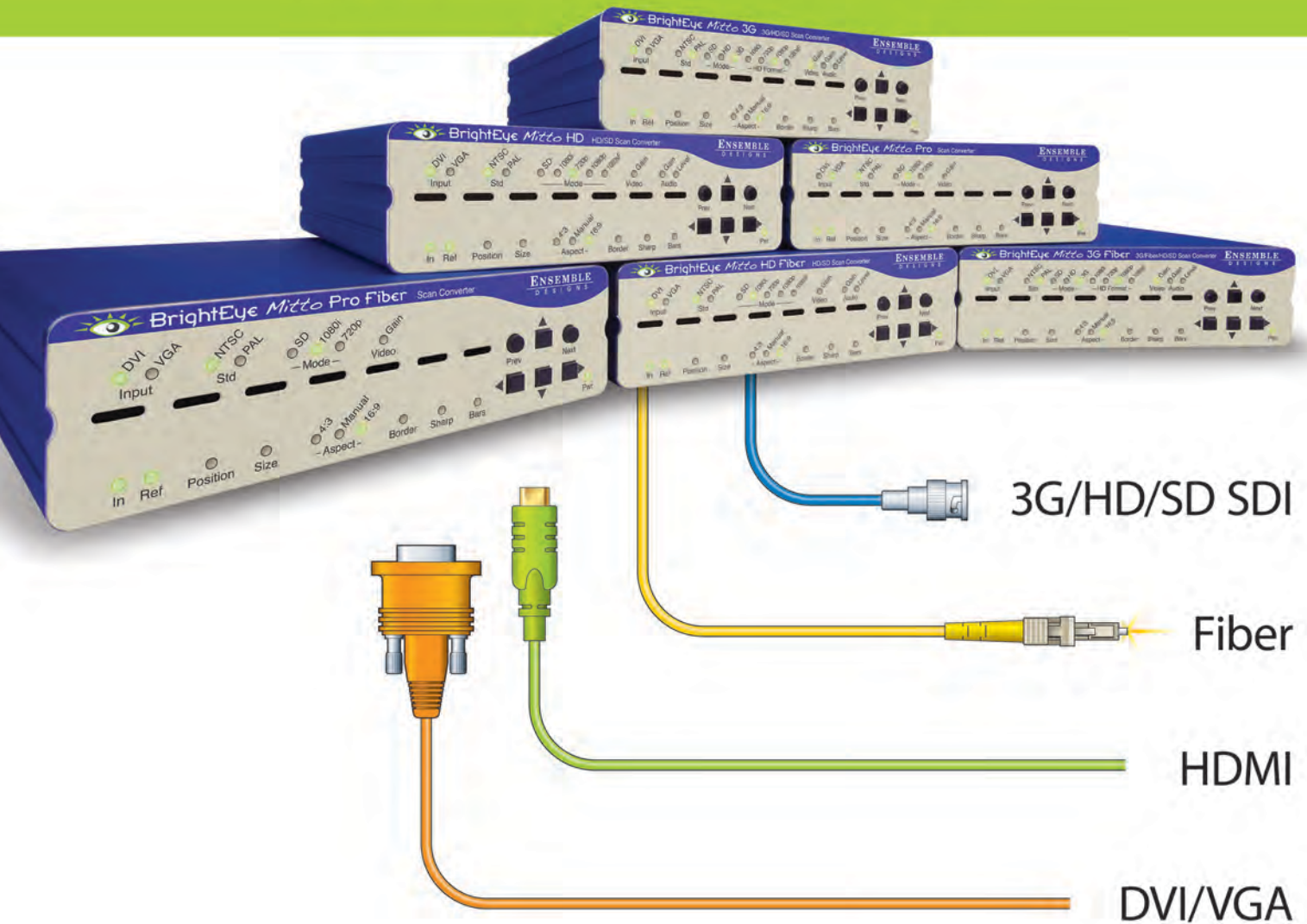
# ENSEMBLE
## D E S I G N S

## Uncompromised Images, Intuitive Control, and a Great Price

Use BrightEye Mitto™ Scan Converters to deliver DVI, HDMI, and VGA sources to 3G, HD and SD SDI video resolutions. Ensemble Designs' proprietary scaling and filtering technology ensures that Mitto always produces a pristine, detailed video output. Even the most demanding CGI material is faithfully rendered to television.

Eight different models offer great feature choices and competitive pricing.

Output full screen 3G, HD or SD SDI video

**Position**

DVI

SDI Video
3G, HD or SD

**Size**

Click and drag to move and resize selection

RS-232 / GPI   Analog / Digital Audio In   1   SDI Out   2   Cpst / AES Out

BrightEye *Mitto™* 3G

USB   DVI / VGA Loop Out   DVI / VGA Input   Ref In

BEM-1

USB

Audio

DVI

Designed and built in California

5 YEAR WARRANTY

## YouTube and Skype Video Made Easy

Take just about any source to 3G, HD or SD SDI video. Computer video can now be used for the most demanding applications including broadcast, high-end military, medical, classroom, church and corporate. Just a small part of the screen, such as a Skype window, can be selected with a mouse and converted to full screen HD. Mitto delivers the best looking video – compare Mitto to any other scan converter and see the difference!

## Choose the Functionality You Need

Choose the best combination of features and price for your application. Eight different Mitto units offer varying types of outputs and capabilities. All Mitto units accept VGA, DVI and HDMI input signals from PC and Mac computers.

### Features

- **High performance scan converters for PC and Mac**
- **Best way to bring YouTube™, Skype™, weather radar, maps and emails to video for production use**
- **Superior video output – flicker-free, fine detail**
- **Use with all types of Macs and PCs including laptops, tablets, iPhone® and iPad™**
- **Auto-senses DVI or VGA**
- **Use a mouse, or front panel controls, to select the part of the video you want to output**
- **HDCP support available on select models**
- **Choose a Mitto with adjustable audio delay for perfect lip sync with Skype and broadcast applications**
- **DVI, VGA and HDMI to 3G, HD, SD, and composite**
- **Easily adjust video parameters and select video output format**
- **Genlock and time to house reference, fully timeable**
- **Rackmountable**
- **Memory presets for your favorite settings**
- **5-Year warranty and free software upgrades forever**

*"Regardless of how quickly we need to take Mitto to air, it works famously every time. And it looks spectacular. When we covered the blizzards last winter, all of our user-generated content submissions and Skype came through Mitto."*

*~ John Schilberg, VP of Technology, Griffin Communications KWTV, KOTV and KQCW*
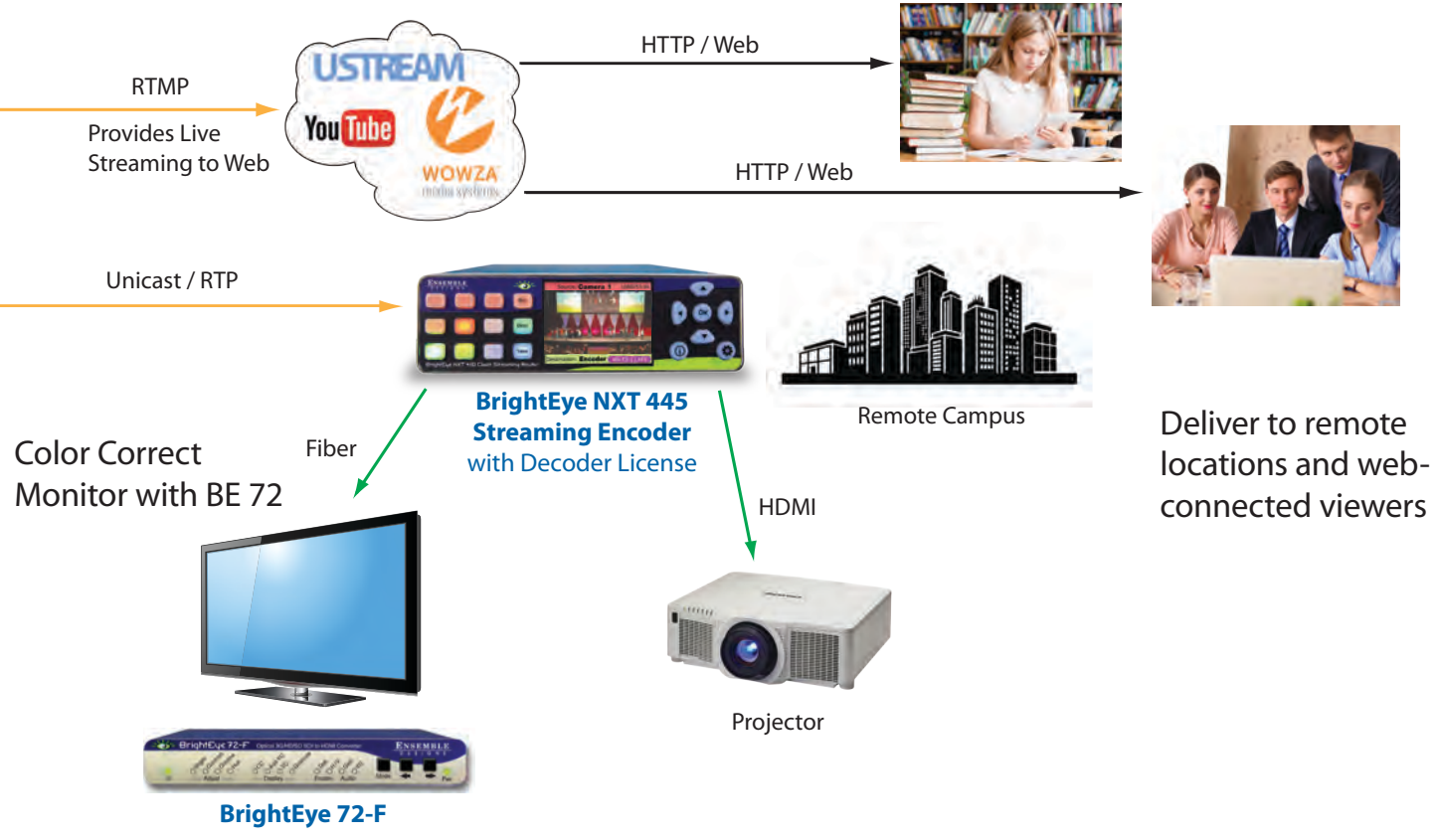
# Take Your Presentation Live to Web

Deliver all of the detail
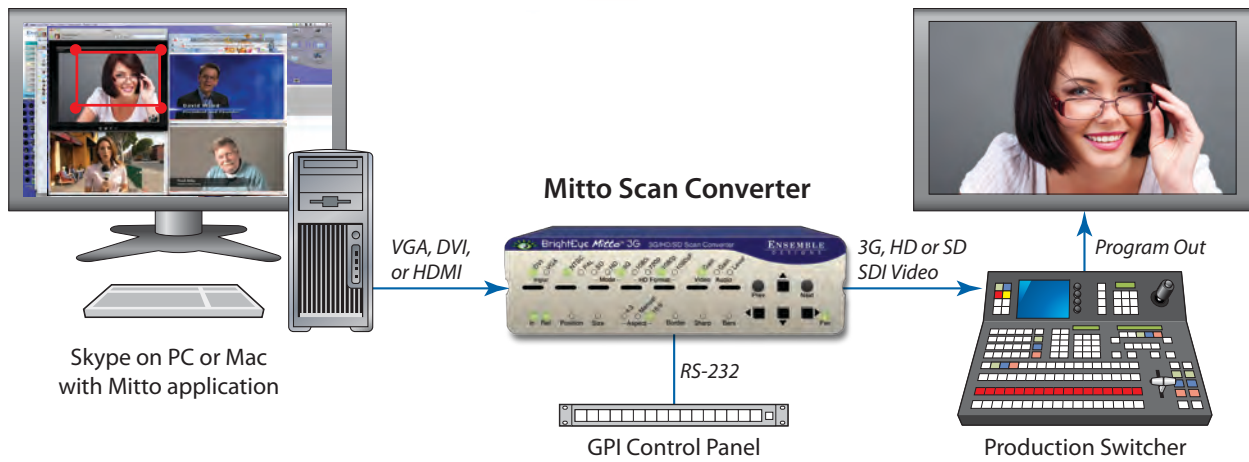from computer to video

Laptop for PowerPoint™, Skype™,
YouTube™, iChat™, Keynote™, etc.

DVI or
VGA

**BrightEye Mitto
Scan Converter**

HD SDI / 1080i

Media
Network

HDMI / 720p

Wide Shot Cam

HD SDI / 1080i

Tight Shot Cam

Automatically convert
incoming standards

**BrightEye NXT 450
Clean Streaming Router**

Control
Network

Switch and Mix
between sources,
Encode and Deliver
across the Internet

Control from
Web-Enabled
Devices

## Order Info

| | |
|---|---|
| BEM-1 | BrightEye Mitto 3G |
| BEM-1F | BrightEye Mitto 3G Fiber |
| BEM-1-H | BrightEye Mitto 3G with HDCP |
| BEM-2 | BrightEye Mitto HD |
| BEM-2F | BrightEye Mitto HD Fiber |
| BEM-2-H | BrightEye Mitto HD with HDCP |
| BEM-4 | BrightEye Mitto Pro 2 |
| BEM-4-H | BrightEye Mitto Pro 2 with HDCP |

Each unit comes with 1 USB cable, 2 VGA to DVI adapters,
1 modular power supply and BrightEye Software for Mac and PC

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Designed and built in California
5 YEAR
WARRANTY

RTMP

Provides Live Streaming to Web

HTTP / Web

HTTP / Web

Unicast / RTP

**BrightEye NXT 445 Streaming Encoder** with Decoder License

Remote Campus

Deliver to remote locations and web-connected viewers

Color Correct Monitor with BE 72

Fiber

HDMI

Projector

**BrightEye 72-F**

## Choose the perfect combination of features and price for your facility

| | BEM-1 | BEM-1F | BEM-1-H | BEM-2 | BEM-2F | BEM-2-H | BEM-4 | BEM-4-H |
|---|---|---|---|---|---|---|---|---|
| DVI, VGA, or HDMI inputs | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| HD or SD video outputs | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| 3Gb/s video output | ✦ | ✦ | ✦ | | | | | |
| Fiber Optic output | | ✦ | | | ✦ | | | |
| Analog or embedded audio input | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| AES audio input and output | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | | |
| Full control of audio levels, channel mixing | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | | |
| Adjustable audio delay | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | | |
| RS-232/GPI control | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | | |
| HDCP | | | ✦ | | | ✦ | | ✦ |

**Mitto Scan Converter**

Skype on PC or Mac
with Mitto application

VGA, DVI,
or HDMI

3G, HD or SD
SDI Video

Program Out

RS-232

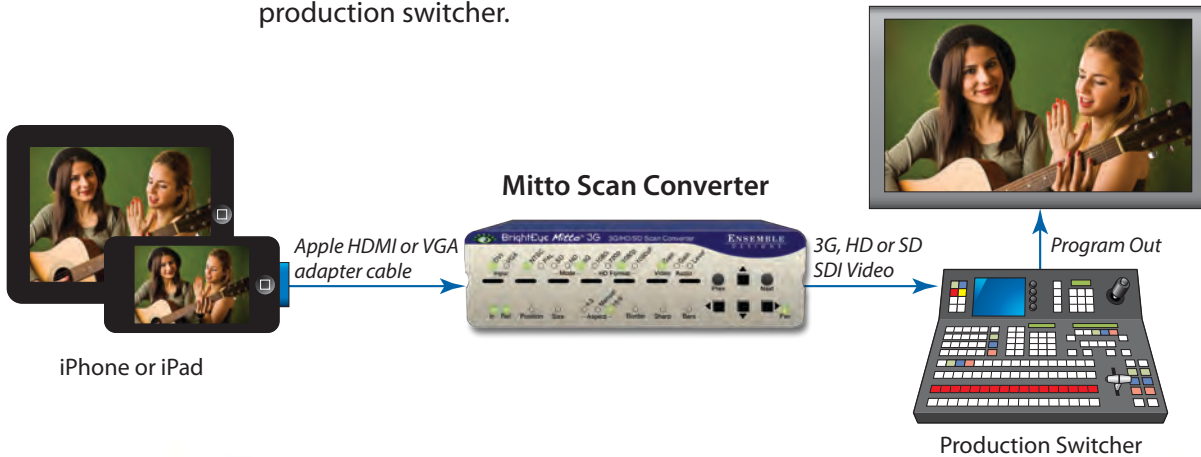GPI Control Panel

Production Switcher

## Use Skype, YouTube, iChat and Keynote in Your Production or Live Show

Conduct live interviews with Skype or playback YouTube video segments. Have multiple video windows open on your computer desktop and output only the selected area. Pre-set different selections and recall them with memory registers. Mitto's audio delay controls let you adjust the audio stream with respect to the video in order to get the lip sync right.

## Convert Video from Your Mobile Device into SDI Digital Video

Great for use in video production applications, Mitto converts iPhone or computer material to 3G, HD and SD SDI video for input to a router or production switcher.



**Mitto Scan Converter**

iPhone or iPad

Apple HDMI or VGA
adapter cable

3G, HD or SD
SDI Video

Program Out

Production Switcher

Designed and built in California

5 YEAR WARRANTY

# ENSEMBLE
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**Mitto Scan Converter**

High Resolution Image
on PC or Mac
with Mitto application

*VGA, DVI,
or HDMI*

*3G SDI Video*

Video Server

## Amazing Picture Quality

Ideal for military applications. Use Mitto to output detailed
maps to 3G video. Connect your PC or Mac to the BrightEye
Mitto through the VGA, DVI or HDMI port on your computer.
Mitto outputs full 1080p HD video at 3G for maximum detail.

## Extremely Detailed Video Output for Medical Use

Mitto's high quality 1080p 3G video output is perfect for
distributing signals from medical devices such as MRI
machines, Endoscopes, and X-ray machines. Use the fiber
output on BEM-1F for imagery traveling great distances to
classrooms and supporting hospitals for evaluation.



3Gb/s
Progressive
DVI

**Mitto Scan Converter**

HD SDI

Remote
Classrooms
& Students

Medical
Instrument

**NXT 445
Streaming Encoder**

HDMI

RTMP

Camera

Local Theater Monitor

Physician Mic

Archive

Medically Approved
Power Supply (ITE Standard)
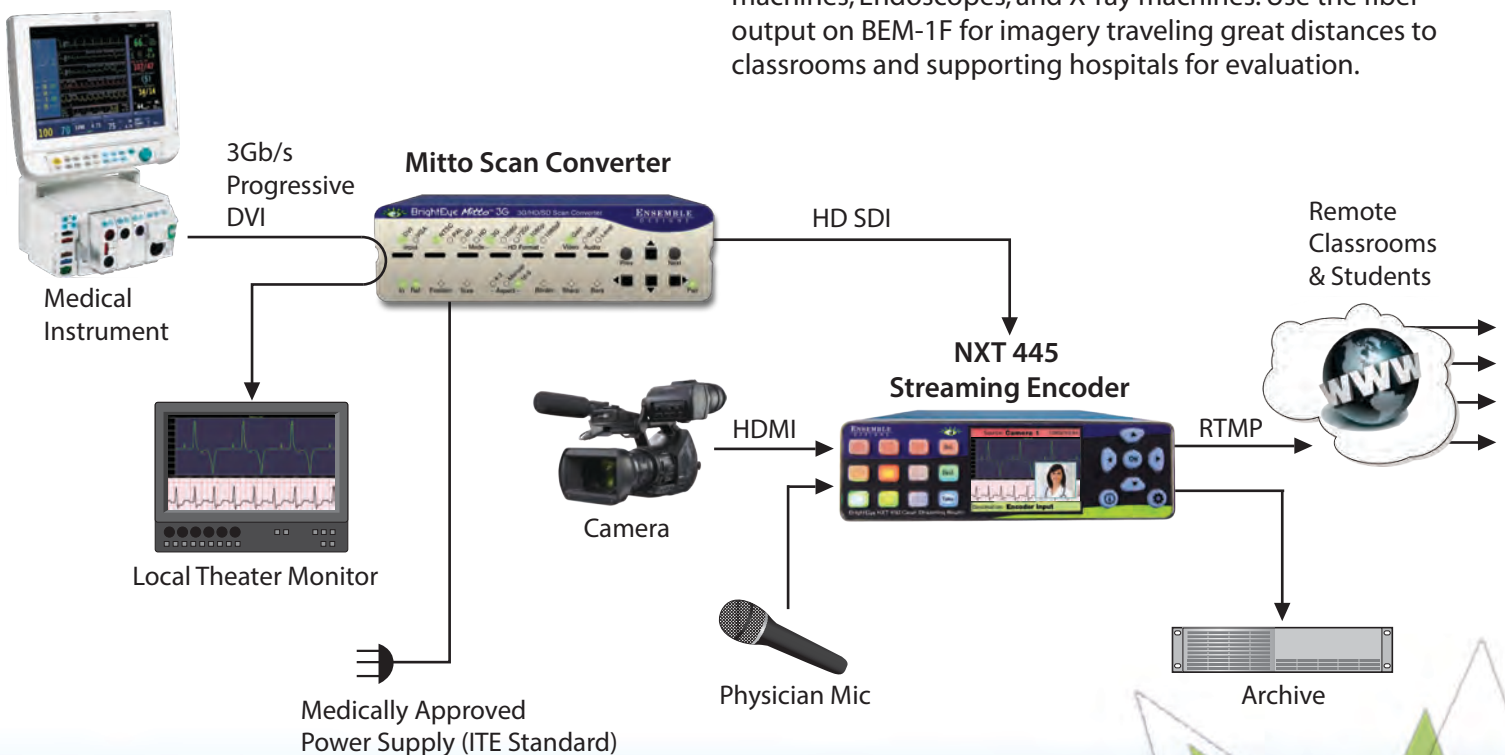
## BrightEye Mac and PC Software

Using BrightEye control software, you can easily time BrightEye Mitto into a video production switcher or router. From your desktop, you have complete and intuitive control of video format, video levels, output timing, mixing audio channels, and audio delay.

## Easy To Use

BrightEye Mac and PC software runs overtop of any video, website or software. The Selection Tool displays as a colored box around your selection, showing the portion of the video that will be output from BrightEye Mitto.

Click the ⊡ Selection Tool button in BrightEye Mac or PC to bring up the Selection Tool.
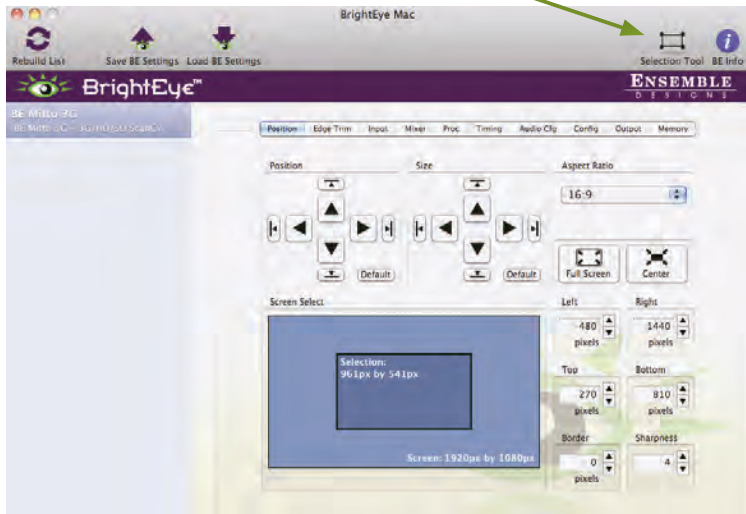


## Pristine, Detailed Video Output

A superior quality scan converter, BrightEye Mitto has the advantage of proprietary scaling technology and exclusive multi-tap filtering. Even a small part of the computer screen, such as a YouTube video, will be upconverted to full screen HD. The region selected for output determines if Mitto acts as an upconverter or downconverter. The output looks as good, or better, than the original and passes the most stringent testing.

**Position**

## Use a Mouse to Select What's Output to Video

Use your mouse to click and drag over the specific portion of computer video that you want to output. The perspective of seeing the whole screen relative to your selection gives you the ability to choose exactly which portion of the video you want to scan convert for output.
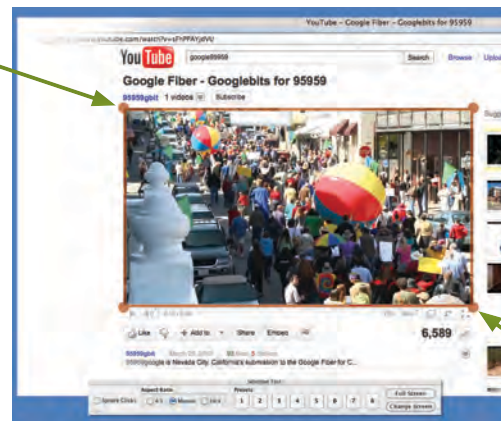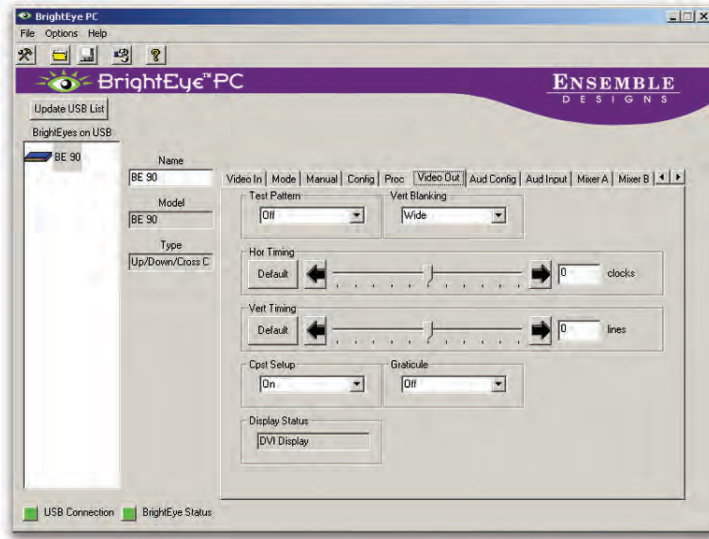
**Size**

Click and drag to move and resize selection



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Designed and built in California
5 YEAR WARRANTY

User Interface



## Used Worldwide

Mitto's compact size lets you put conversion right where it's needed: in a remote truck, at a live venue, on a helicopter, in a production, or in a TV station. Reliable and easy to install, and they're affordable, too!

## Digital and Analog Video and Audio

The intuitive front panel interface makes it easy to choose the desired video output format. The genlock reference input allows the video outputs to be timed to house.

The audio input accepts analog audio. AES is optional. Audio is embedded into the SDI outputs – which is required for many high end applications. Audio delay controls let you adjust audio timing with respect to video for perfect lip sync, which is crucial when using Skype video in a production environment.

## Free Software Upgrades Forever

Use BrightEye Mac or PC software to control a single BrightEye unit or any number of units connected to a USB hub. BrightEye Mac and PC software are included with each unit at no charge.

BrightEye Mitto's software is easily upgraded through the unit's USB port. Software upgrades are conveniently downloadable from the Ensemble Designs web site. Updates are free, forever. Every unit comes with a five-year warranty.

## Perfect Aspect Ratio

Mitto's video output automatically selects pillar or letterbox as needed. Mitto always guarantees perfect aspect ratio.
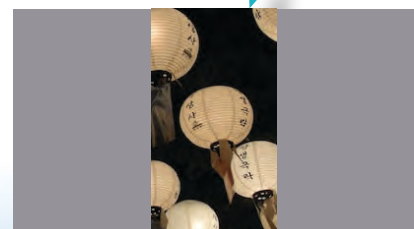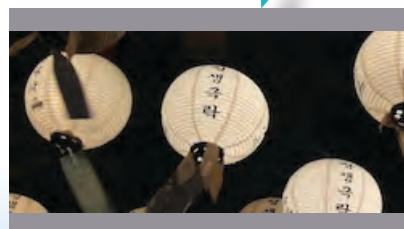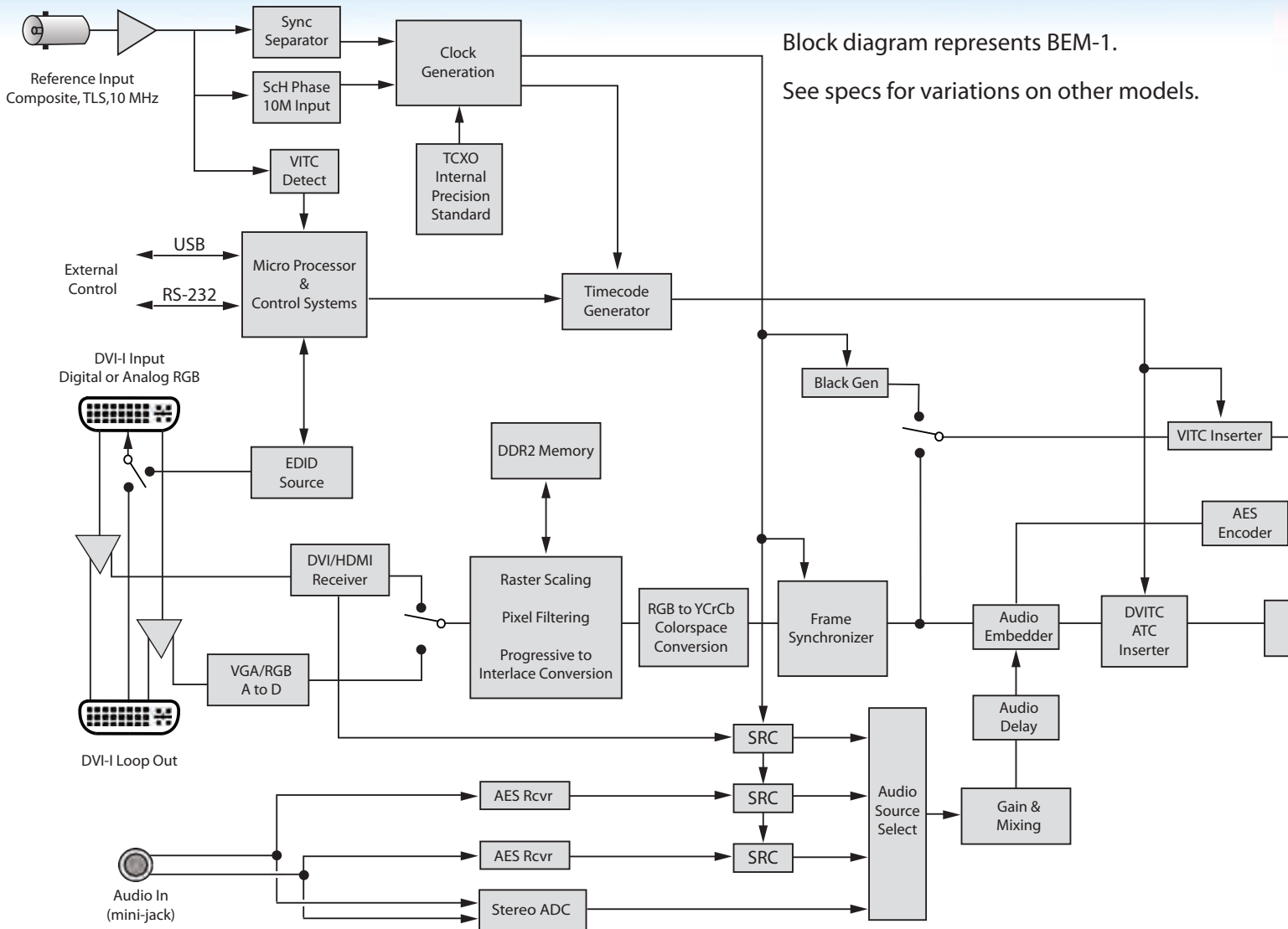
Block diagram represents BEM-1.

See specs for variations on other models.

## Computer Input

| | |
|---|---|
| Number | One |
| Type | DVI (Supports HDMI or VGA with adapter) |
| Connector | DVI-I |
| Resolution | Up to 1920 x 1200 |

## Reference Input

| | |
|---|---|
| Number | One, BNC |
| Type | 1 V P-P Composite Video |
| | PAL, NTSC, Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

Note: When no reference is provided, Mitto runs from an internal "sync gen grade" precision frequency reference.

## Analog Audio Inputs

| | |
|---|---|
| Number | One stereo pair |
| Connector | 1/8" mini jack |
| Impedance | >15K Ω |
| Max Input Level | 24 dBu |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

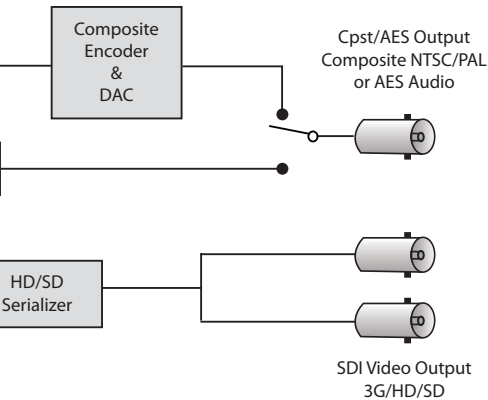## AES/EBU Digital Inputs (BEM-1, 1F, 2, 2F)

| | |
|---|---|
| Number | Two (four channels) |
| Type | AES3id, S/PDIF |
| Connector | 1/8" mini jack |
| Bit Depth | 20 and 24 Bit |
| Sample Rate | 30 KHz to 192 KHz (Sample Rate Converted Internally to 48 KHz) |

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## Mitto Defined:
- **Comes from the Latin root for** *transmit* **or** *send*
- **It's also the root word of** *uncompromising*

Composite
Encoder
&
DAC

Cpst/AES Output
Composite NTSC/PAL
or AES Audio

HD/SD
Serializer

SDI Video Output
3G/HD/SD

## Output Standards Supported

1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
525i, 625i (SMPTE 259M)
1080p (SMPTE 424M, 425M), 50, 59.94, 60, Level A (BEM-1 and BEM-1F only)

## Optical Output (BEM-1F, 2F)

| | |
|---|---|
| Number | One, LC/UPC |
| Type | Follows SDI configuration |
| Wavelength | 1310 nm (non-CWDM) |
| | Wavelengths 170 nm –1610 nm |
| | at 20 nm CWDM spacing available. |
| | Call factory for price and details. |
| Power | -7 dBm |
| Max Cable Length | 20 km (For greater distances, or higher |
| | power and larger loss budgets, |
| | please contact the factory) |
| Fiber Type | Single Mode |
| | Multi-mode compatible with |
| | attenuation at transmit end |

## Analog Video Output

| | |
|---|---|
| Number | One, BNC |
| Type | Composite PAL or NTSC |
| | (when SD is selected on the SDI output) |
| Return Loss | >40 dB |
| Output DC | <100 mV |

## Computer Monitor Output

| | |
|---|---|
| Number | *One, looping |

*Loop through to computer monitor is not functional when computer source is HDCP encrypted

| | |
|---|---|
| Type | DVI (Supports HDMI or VGA with adapter) |
| Connector | DVI-I |
| Format | Follows input |

## Control (BEM-1, 1F, 2, 2F)

| | |
|---|---|
| Number | One |
| Connector | 9 pin D |
| Type | RS-232, GPI |

## General Specifications

| | |
|---|---|
| Size | 5.63"W x 1.65"H x 6.01"D |
| | (143 mm x 42 mm x 153 mm) |
| | including connectors and flange |
| Weight | 1 lb 6 oz |
| Power | 12 volts, 12 watts |
| | (100-230 VAC modular power supply) |
| Temperature Range | 0 to 40° C ambient (all specs met) |
| Relative Humidity | 0 to 95° non-condensing |
| Altitude | 0 to 10,000 ft. |

## Serial Digital Output

| | |
|---|---|
| Number | Two, BNC |
| | One for BEM-1F and 2F |
| Signal Type | 270 Mb/s SD SDI, SMPTE 259M |
| | 1.485 Gb/s HD SDI, SMPTE 274M, 292M, 296M |
| | 2.97 Gb/s HD SDI (BEM-1 and BEM-1F only) |
| | SMPTE 424M, 425M |
| Processing | 16 bit processing |
| | 12 and 14 bit upconversion |
| Delay | Adjustable from 16 msec to 40 msec |

Note: Output is fully timeable with respect to the reference input.

| | |
|---|---|
| Audio | Embedded |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz |
| | >10 dB to 2.97 GHz |
| Output DC | None (AC coupled) |

Due to ongoing development, prices and specifications subject to change without notice s

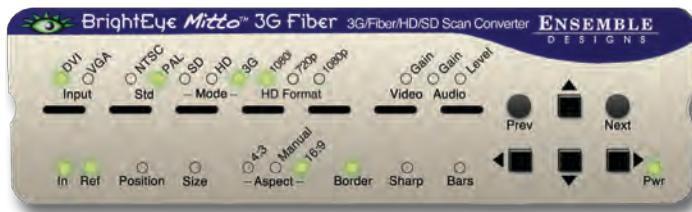# BrightEye Mitto Family of High Performance Scan Converters

## BEM-1, BEM-1-H

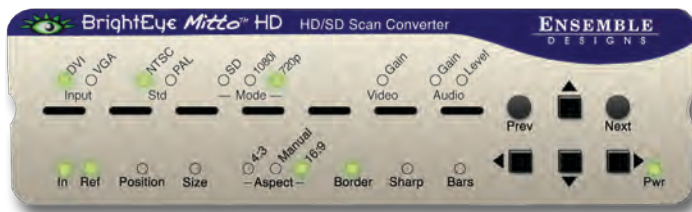■ VGA/DVI/HDMI In   ■ 3G/HD/SD SDI Out   ■ Audio Mix/Delay   ■ HDCP (BEM-1-H)
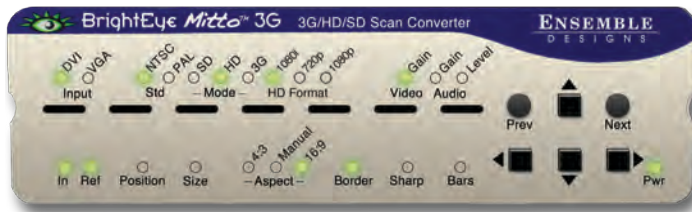


## BEM-1F

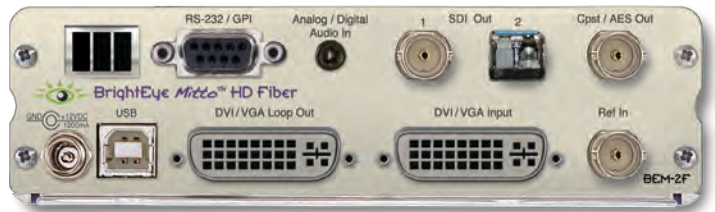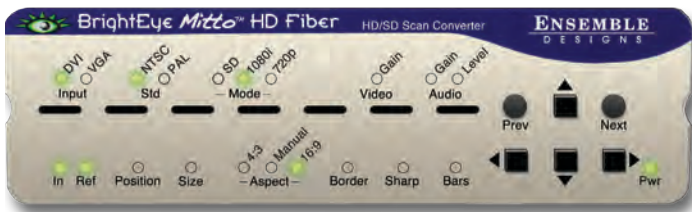■ VGA/DVI/HDMI In   ■ 3G/HD/SD SDI Out   ■ Audio Mix/Delay   ■ Fiber Optic Out



## BEM-2, BEM-2-H

■ VGA/DVI/HDMI In   ■ HD/SD SDI Out   ■ Audio Mix/Delay   ■ HDCP (BEM-2-H)



## BEM-2F

■ VGA/DVI/HDMI In   ■ HD/SD SDI Out   ■ Audio Mix/Delay   ■ Fiber Optic Out



## BEM-4, BEM-4-H

■ VGA/DVI/HDMI In   ■ HD/SD SDI Out   ■ HDCP (BEM-4-H)