BVM-L230

Professional Master Monitor

SONY

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TRIMASTER

Fulfilling Your Master Monitoring Needs Even Further – the BVM-L230 TRIMASTER LCD Monitor

Responding to the continued demands for a true master monitor, Sony introduces the BVM-L230, a 23-inch* LCD master monitor that uses Sony exclusive TRIMASTER™ technology. Designed from the foundation of the market-acclaimed BVM CRT evaluation monitors, the BVM-L230 has been designed to inherit and surpass its CRT predecessors – in both image quality and operational performance.

The stunning quality of the BVM-L230 is only made possible by the use of three newly developed Sony technologies – a high-grade, 10 bit 23-inch* full resolution LCD panel, a new precision backlight system and an exclusive new display engine – all of which have been optimised for producing images at master monitor quality on a flat-panel platform. By combining such devices with sophisticated colour management algorithms and advanced feedback systems, the BVM-L230 achieves highly precise colour reproduction, image consistency and image uniformity to the same degree – or higher – as its CRT predecessors.

For monitor setup and control, the BVM-L230 retains the same operational convenience as the BVM CRT series, including its remote-control panel design and features such as Auto White Balance, Blue Channel Display, Monochrome Display, RGB Cut Off, H/V delay, Chroma Up and Safety Markers. The BVM-L230 also takes maximum advantage of its new signal processing technology, enabling unprecedented performance for today's new master monitoring needs. Such features include a newly developed colour gamut emulation function, a unique Picture & Picture display function, a wide variety of PC and A/V input capabilities from VGA to WUXGA and from composite to 2K XYZ 4:4:4 display, a Modular Control System and an Interlace Display Mode. Where top-quality monitoring is a necessity, the BVM-L230 is the ideal solution of choice from high-end acquisition, production, post-production and broadcast monitoring, right through to Telecine applications.

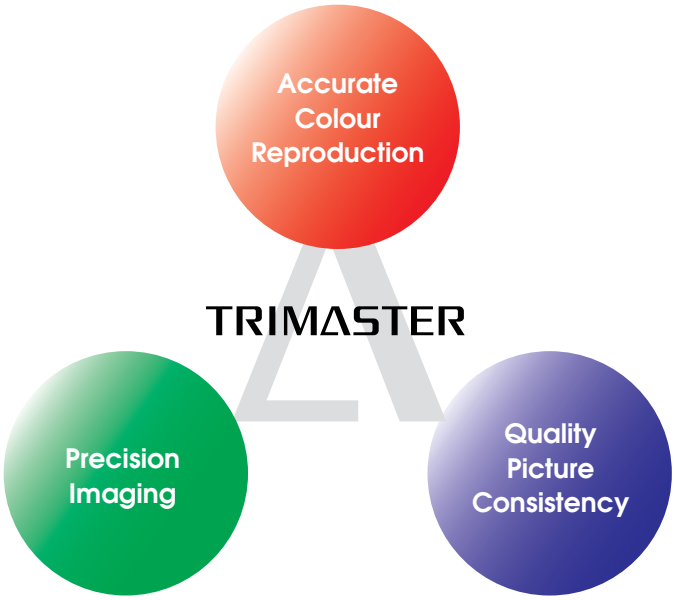
* 22.5-inch viewable area, measured diagonally.

TRIMASTER Technology

TRIMASTER technology is a design architecture used to bring out the full performance capabilities required for evaluation displays. It comprises the core technologies that enable the highest level of colour accuracy, precision imaging and quality picture consistency.

iabm peter wayne AWARD winner 2007

> Colour Management System
> Wide Colour Gamut
> Digital Uniformity Adjustment



> High Resolution & Wide Colour Gamut
> High Motion Picture Processing
> Accurate Pixel Mapping

> Accurate Signal Processing
> Precise Display Calibration System
> New Colour Feedback System

Main Features

The BVM-L230 incorporates three unique technologies that have been customised for exclusive use in this monitor: a high-grade 23-inch* full resolution LCD panel, a precision backlight system, and a unique professional display engine not found in any other monitor. This has resulted in the highly reliable BVM-L230, which offers the accurate colour reproduction, precision imaging and quality picture consistency required by today's most demanding master monitoring applications. Using these technologies, the BVM-L230 not only achieves the quality of its predecessor BVM-A and BVM-D Series CRT monitors, but also adds innovative features for today's new master monitoring needs.

* 22.5-inch viewable area, measured diagonally.

Superb Picture Quality and Stable Colour Temperature

Accurate Colour Reproduction

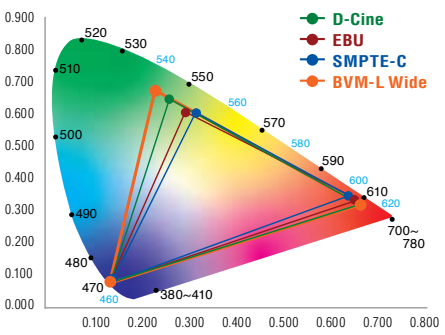
Nonlinear Cubic Conversion Colour Management System

The nonlinear cubic conversion colour management system of the BVM-L230 uses a unique 3-D LUT (look-up table) to reproduce an extremely wide colour gamut, thus offering more accurate colour reproduction. It offers highly accurate chromaticity throughout the entire grayscale. The combination of its high-purity LED backlight system, together with this colour management system, allows the BVM-L230 to accurately reproduce colour gamut that replicate broadcast standards such as ITU-R BT.709, and EBU and SMPTE-C phosphor standards. In addition, the BVM-L230 offers a unique "WIDE" gamut that reproduces a wider colour space. This can be used to monitor content intended for applications other than direct broadcast, and it can also emulate the D-Cine* colour gamut used in digital cinema production. Compared to past CRT monitors, which offer only one colour gamut per model, the BVM-L230 allows these colour gamuts to be selected and reproduced on the same monitor – a feature only made possible by the technologies used in the Sony BVM-L230 monitor.

* "D-Cine" is a colour gamut emulating the colour gamut described in SMPTE 431-2 Table A1. However, the chromaticity of the green-red region is not covered in full.

Ultra-high precision Uniformity Correction

Typically, LCD monitors exhibit poor uniformity performance. With the BVM-L230, white can be reproduced uniformly at every point of the screen. This is due to the use of two advanced technologies: precise adjustment of the LCD panel characteristics and sophisticated LED backlight control. At the factory, grayscale levels are precisely measured at each area of the panel and if differences are detected between areas, they are accurately corrected by electrical means. Secondly, the sophisticated LED backlight system also contributes to the BVM-L230's high level of uniformity. This is because RGB sensors are aligned together with the R, G and B LEDs of the backlight to constantly monitor and control the luminance level of each backlight colour. When inconsistent luminance is detected, the colour feedback system adjusts the light intensity of the corresponding LEDs – red, green, or blue –in that specific area to maintain accurate luminance uniformity of the backlight. These two technologies combined together allow the BVM-L230 monitor to provide an extra level of uniformity.



Precision Imaging

Full HD Panel with 10-bit Driver

The BVM-L230 achieves both high resolution and stunning colour depth using a full 1920 x 1080 HD LCD panel and precise 10-bit driver.

Newly Developed I/P Conversion Technology

The BVM-L230 uses a sophisticated I/P conversion technique that keeps artefacts that are often seen in typical LCD monitors to a minimum, such as edge jaggedness, conversion errors, and a picture delay that is less than one field.

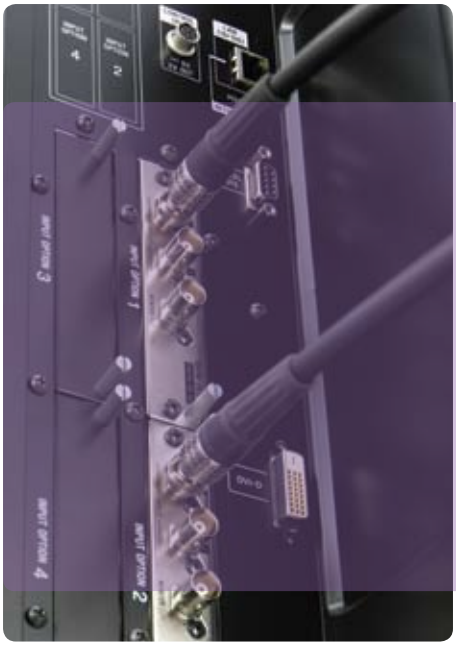
Quality Picture Consistency

High Accuracy Display Engine

Each and every BVM-L230 monitor is carefully calibrated at the factory on an individual basis, providing a high level of accuracy and stability for characteristics such as gamma and uniformity.

Colour Feedback System

Using a colour feedback system, the BVM-L230 achieves the stability called for with master monitor applications.



Dual-Link HD-SDI Interface

Multi-format Signal Support

Input Versatility

The BVM-L230 can accept almost any SD or HD video format, both analogue and digital, plus PC signals from VGA to WUXGA (1920 x 1200). In addition to a DVI-D interface equipped as standard, four option board slots are offered to configure the BVM-L230 according to different user needs. The optional analogue interfaces accept composite, Y/C, Y/PB/PR, RGB. Digital interfaces accept SD-SDI, HD-SDI, and Dual-Link HD-SDI inputs. Acceptable signal formats include: 525/60i, 625/50i, 525/60P, 625/50P, 720/50P and 720/60P, 10-bit/12-bit RGB 4:4:4 1080/24PsF, 1080/24P, 1080/25PsF, 1080/25P, 1080/50i, 1080/30PsF, 1080/30P and 1080/60i, 10-bit 4:2:2 1080/50P and 1080/60P and the digital cinema formats of 12-bit 4:4:4 XYZ/RGB 2048 x1080/24PsF and 2048x1080/24P.

No	System Nomenclature	Samples per active line	Active lines per frame	Frame Rate fV (Hz)	Interface sampling freq (MHz)	Samples per active line	Total lines per frame	Line Frequency fH (kHz)	Standard
1	525/59.94i	720	487	59.94	13.5	858	525	15.73	Rec.ITU-R BT.601
2	625/50i	720	576	50	13.5	864	525	15.63	Rec.ITU-R BT.601
3	525/59.94P	720	483	59.94	27	858	625	31.47	SMPTE 293M/Rec.ITU-R BT.1358
4	625/50P	720	576	50	27	864	525	31.25	Rec.ITU-R BT.1358
5	1920 x 1080/24PsF*	1920	1080	48/47.95	74.25 - 74.25/1.001	2750 - 2750	625	27.00	SMPTE RP 211
6	1920 x 1080/24P*	1920	1080	24/23.97	74.25 - 74.25/1.001	2750	1125	27.00	SMPTE 274M
7	1920 x 1080/25PsF	1920	1080	50			1125	28.13	RP 211
8	1920 x 1080/25P	1920	1080	25	74.25	2640	1125	28.13	SMPTE 274M
9	1920 x 1080/50i	1920	1080	50	74.25	2640	1125	28.13	SMPTE 274M
10	1920 x 1080/30PsF*	1920	1080	60/59.94			1125	33.75	RP 211
11	1920 x 1080/30P*	1920	1080	30/29.97	74.25 - 74.25/1.001	2200	1125	33.75	SMPTE 274M
12	1920 x 1080/60i*	1920	1080	6/59.94	74.25 - 74.25/1.001	2200 - 2200	1125	33.75	SMPTE 274M
13	1280 x 720/24P*	1280	720	24/23.97	74.25 - 74.25/1.001	4125	1125	18.00	SMPTE 296M
14	1280 x 720/25P	1280	720	25	74.25	3960	750	18.75	SMPTE 296M
15	1280 x 720/30P*	1280	720	30/29.97	74.25 - 74.25/1.001	3300	750	22.50	SMPTE 296M
16	1280 x 720/50P	1280	720	50	74.25	1980	750	37.50	SMPTE 296M
17	1280 x 720/60P*	1280	720	60/59.94	74.25 - 74.25/1.001	1650 - 1650	750	45.00	SMPTE 296M
18	1920 x 1080/50P	1920	1080	50	148.5	2640	750	56.25	SMPTE 274M
19	1920 x 1080/60P*	1920	1080	60/59.94	148.5 - 148.5/1.001	2200	1125	67.50	SMPTE 274M
20	2048 x 1080/24PsF*	2048	1080	48/47.95	74.25 - 74.25/1.001	2750	1125	27.00	
21	2048 x 1080/24P*	2048	1080	24/23.97	74.25 - 74.25/1.001	2750	1125	27.00	

* Also compatible with 1/1.001 frame rates.

Input Board Slots

Flexible Input Configuration

Like the BVM-A Series CRT monitors, the BVM-L230 uses a modular slot design, so inputs can be configured according to individual needs. Four input board slots are available. Optional input boards* can be installed in any board slot, and in any combination, allowing easier configuration and better cost-per-input value. These option boards utilise only one slot each, so up to four cards can be installed for maximum flexibility.

* The BVM-L230 input boards are not compatible with other earlier BVM-A Series CRT monitors. They are compatible with the LMD Series.

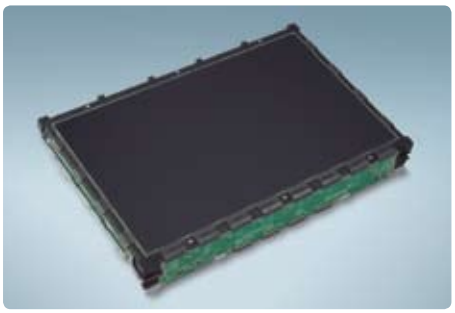
Interface chart by Input Boards

Input Signal	System Nomenclature	Signal Format	BKM-220D	BKM-227W	BKM-229X	BKM-243HS***
Analogue Input	525/59.94i	Composite,Y/C (NTSC/PAL/PAL-M/SECAM)		•		
	625/50i	Composite,Y/C (NTSC/PAL/PAL-M/SECAM)		•		
	525/59.94i	Y/PB/PR, GBR			•	
	625/50i	Y/PB/PR, GBR			•	
	1080/24Psf	Y/PB/PR, GBR			•	
	1080/24P	Y/PB/PR, GBR			•	
	1080/50i (25PsF)	Y/PB/PR, GBR			•	
	1080/25P	Y/PB/PR, GBR			•	
	625/50P	Y/PB/PR, GBR			•	
	525/59.94P	Y/PB/PR, GBR			•	
	1080/60i (30PsF)**	Y/PB/PR, GBR			•	
	1080/30P**	Y/PB/PR, GBR			•	
	720/50P	Y/PB/PR, GBR			•	
	720/60P**	Y/PB/PR, GBR			•	
SD-SDI	525/59.94i	Y/PB/PR	•			•
	625/50i	Y/PB/PR	•			•
HD-SDI	1080/24PsF**	10bit 4:2:2 Y/PB/PR				•
	1080/25PsF	10bit 4:2:2 Y/PB/PR				•
	1080/30PsF**	10bit 4:2:2 Y/PB/PR				•
	1080/50i	10bit 4:2:2 Y/PB/PR				•
	1080/60i**	10bit 4:2:2 Y/PB/PR				•
	1280 x 720/60P**	10bit 4:2:2 Y/PB/PR				•
	1280 x 720/50P	10bit 4:2:2 Y/PB/PR				•
Dual-Link HD-SDI	1080/24PsF**	10bit 4:4:4 Y/PB/PR, GBR 12bit 4:4:4 GBR				•*
	1080/24P**	10bit 4:4:4 Y/PB/PR, GBR 12bit 4:4:4 GBR				•*
	1080/25PsF	10bit 4:4:4 Y/PB/PR, GBR				•*
	1080/25P	12bit 4:4:4 GBR				•*
	1080/30PsF**	10bit 4:4:4 Y/PB/PR, GBR 12bit 4:4:4 GBR				•*
	1080/30P**	10bit 4:4:4 Y/PB/PR, GBR				•*
	1080/50i	10bit 4:4:4 Y/PB/PR, GBR 12bit 4:4:4 GBR				•*
	1080/60i**	10bit 4:4:4 Y/PB/PR, GBR 12bit 4:4:4 GBR				•*
	1080/50P	10bit 4:2:2 Y/PB/PR				•*
	1080/60P**	10bit 4:2:2 Y/PB/PR				•*
	2048 x 1080/24PsF**	10bit 4:4:4 Y/PB/PR, GBR 12bit 4:4:4 GBR				•*
	2048 x 1080/24P**	10bit 4:4:4 Y/PB/PR, GBR 12bit 4:4:4 GBR				•*
Number of digital inputs			2	-	-	2
Number of analogue inputs			-	1	1	-

* Two BKM-243HS optional boards are used.
** Also compatible with 1/1.001 frame rates.
*** BKM-243HS automatically detects SD-SDI and HD-SDI input signals.

Three Key Devices Enabling Master Monitor Picture Quality

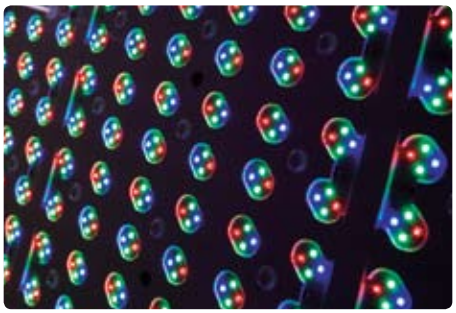
Customised LCD Panel – 23-inch* Full HD Resolution



The LCD panel has been developed exclusively for use on the BVM-L230, based on strict master monitor criteria. It offers a 10-bit driver and other high-level specifications such as high operating frame rates and high-speed response.

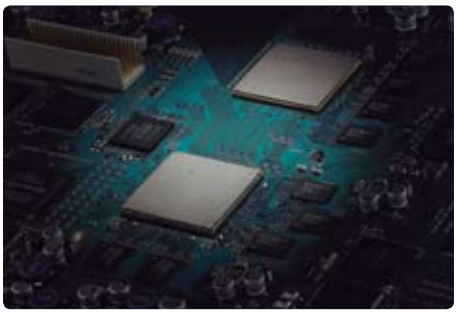
* 22.5-inch viewable area, measured diagonally.

Precision Backlight System



Using Sony-designed high-purity LEDs, the precision backlight system is also a development used exclusively in the BVM-L230. This enables the widest colour gamut ever offered in a Sony monitor and fully covers broadcast-standard colour spaces. The precision backlight system also incorporates a uniformity control function and a colour feedback system.

Professional Display Engine

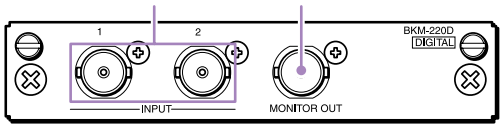


The high-precision signal processing engine has been developed to fulfill master monitor criteria and is optimised for use on the BVM-L230. This engine incorporates 12-bit output accuracy at each process and provides a high-quality I/P conversion algorithm and a highly accurate colour management system.

Signal-interface Options

BKM-220D, SD-SDI 4:2:2 Input Adaptor

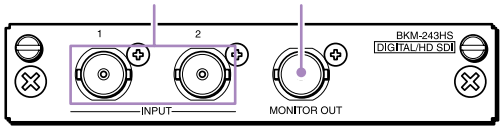
SD-SDI signal input (x2) SD-SDI monitor output (x1)



> SD-SDI signal input (x2)
> SD-SDI monitor output (x1)
> Power consumption: 1.5 W

BKM-243HS, HD-SDI/SD-SDI Input Adaptor

HD-SDI/SD-SDI signal input (x2) HD-SDI/SD-SDI monitor output (x1)

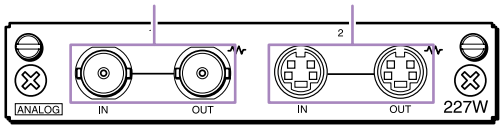


> HD-SDI/SD-SDI signal input (x2)
> HD-SDI/SD-SDI monitor output (x1)
> Power consumption: 2.0 W

* HD-SDI and SD-SDI signals are automatically detected

BKM-227W, NTSC/PAL* Input Adaptor

Composite input/output (x1) Y/C input/output (x1)

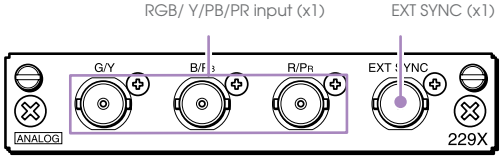


> Composite input/output (x1)
> Y/C input/output (x1)
> Power consumption: 1.8 W

* NTSC, PAL, PAL-M, and SECAM are accepted.

BKM-229X, Analogue Component Adaptor

RGB/ Y/PB/PR input (x1) EXT SYNC (x1)



> RGB,Y/PB/PR input (x1)
> EXT SYNC (x1)
> Power consumption: 4.0 W

Operational Convenience

The BVM-L230 is equipped with the same acclaimed functions and operational conveniences of its predecessors, the BVM-A Series and BVM-D Series CRT master monitors. However, it also has some additional unique features, which are only made possible by Sony flat-panel technology.

The BVM-L230 monitor and the BKM-16R controller attached with the BKM-37H attachment stand.

Modular Monitor Control Unit (BKM-16R)

Like the earlier BVM Series, the monitor and control panel are provided as separate units, allowing greater flexibility in system integration. The BVM-L230 incorporates a new Monitor Control Unit, the BKM-16R, which can be attached below the monitor using the optional Controller Attachment Stand, the BKM-37H, or connected remotely via an Ethernet cable.

Ethernet-based Remote Control

Like the BVM-A* Series monitors and controller, the BVM-L230 monitor and the BKM-16R Monitor Control Unit are equipped with an Ethernet port, allowing remote control of display parameters across a standard Ethernet connection. One BKM-16R Monitor Control Unit can control up to thirty-two (32) BVM monitors.

* The BKM-16R Monitor Control Unit can also control the BVM-A Series CRT monitors.

BKM-16R Monitor Control Unit

Front Panel

Rear Panel

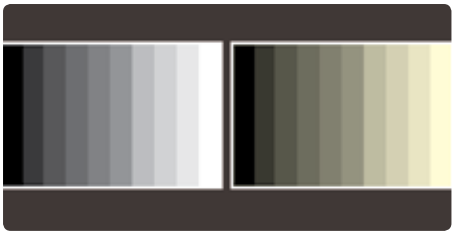
Picture & Picture (Side by Side, Butterfly, Wipe and Blending)*

* A Future Feature (by spring 2008)

The unique Picture & Picture function of the BVM-L230 allows simultaneous display of two input signals on its LCD screen. This function is extremely convenient for making instant adjustments between two input sources, since there is no need to individually adjust the different characteristics of two monitors. This function comes in handy for adjustments between two cameras, special effects creation, time-lapse shooting and computer-generated graphics work. The BVM-L230 offers four Picture & Picture modes:

Side by Side

The two picture images are downscaled using a digital filter and displayed side by side. This feature is convenient when making white balance adjustments and/or determining shooting angles between two cameras.



Butterfly

The two inputs are displayed as line-symmetric images on the left and right halves of the screen. By controlling the H position, the two images can be moved inward to the middle of the screen. Instant comparisons can be made without having to move one's eyes. This makes comparison of moving images very easy.

WIPE

The area of the two pictures to be displayed is selected using a vertical WIPE pattern, which is controlled from the BKM-16R. This function is useful when picture details of the two images must be examined on a pixel basis. This is normally used when looking at still images.

Blending

The two picture images are overlapped for display. The mix ratio is adjustable. This function is useful when verifying whether a foreground signal is accurately keyed into the background signal, or when combining shoots with live action and computer-generated effects.

Native Scan (pixel to pixel display)

Conventional flat-panel monitors reproduce images using scaling and I/P conversion due to their fixed pixel counts and progressive scanning processes. The Native Scan function equipped on the BVM-L230 is a unique display mode that reproduces images without changing the input signal's pixel count. For example, when an SD signal is input, the BVM-L230 will reproduce the image at a picture size of 720 x 487* pixels, and when an interlace signal is input, the BVM-L230 will reproduce interlace fields**. For SD input in particular, the Native Scan function also allows the image's display size to be doubled to 1440 x 974*, by duplicating and doubling each pixel both horizontally and vertically.

* 525/59.94i signal specified by Rec. ITU-R BT.601
** The brightness of the picture remains unchanged due to the precision backlight system

1920 x 1080 Native Scan

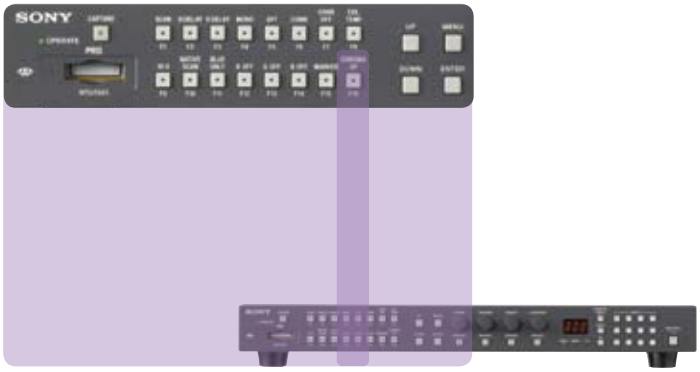
720 x 487 Native Scan

1440 x 974 Native Scan
(720 x 487) x 2

Scan Switch

The Scan Switch allows switching between 5% blanking (or 95% area display) and conventional 0% and -3% Under Scan mode.

Variety of Display Modes



Most flat-panel monitors can only display progressive images at the input signal's frame rate. In addition to this conventional display method, the BVM-L230 has two unique display modes: Black Frame Insertion Display and Interlace Display.

Black Frame Insertion Display*

Combining its high frame-rate operation with a unique Black Frame Insertion technology, the BVM-L230 dramatically reduces motion blur, an artefact that is inherent to LCD devices. Black Frame Insertion technology generates a "black" frame and inserts this in every other picture frame. As a result, all of the panel's LCD molecules are reset to their default alignments, before the next picture frame is displayed. This effectively eliminates the image lag caused by inconsistencies in the speed at which LCD molecules are realigned in accordance with the video signal change. Because the number of frames is doubled, Black Frame Insertion Display reproduces the combined picture content at twice the speed of the input signal's frame rate**.

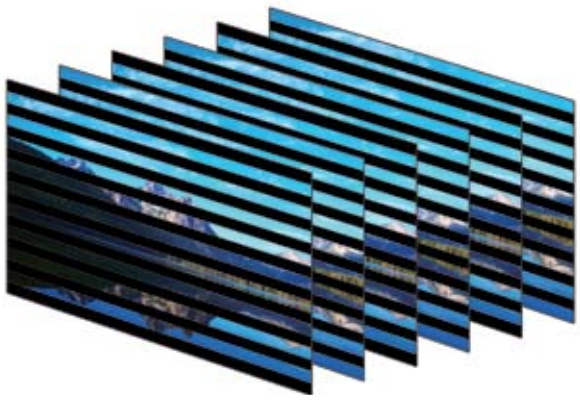
Interlace Display*

The Interlace Display mode of the BVM-L230 can display interlace input signals as interlace fields. As with the Native Scan function, the Interlace Display mode offers faithful reproduction of the input signal and the displayed interlace fields are free from picture degradation.

* The brightness of the picture can be maintained by the precision backlight system.
** The frame rates of 120 Hz and 100 Hz are supported.

+12dB Chroma Up function

A "Chroma UP" button located on the BKM-16R front panel allows the Chroma Level to be boosted by +12 dB. This is a convenient feature for adjusting camera white balance with a higher degree of accuracy.



100/120Hz
Interlace Display

100/120Hz
Black Frame Insertion Display

BVM-L230 with the 16:9 Mask

16:10 Mask

16:9 Mask

Marker Settings

Like the earlier BVM Series CRT monitors, the BVM-L230 monitor can display various markers, including an aspect marker, safe area marker, and centre marker. In addition to this flexible selection of marker types, detailed display settings of each marker are offered. For example, the colour, the brightness, horizontal/ vertical position and width of aspect markers can all be controlled, while the height and width of safe area markers can be adjusted. What's more, users can also choose to display two safe area markers, each selectable between three marker variations. These flexible marker controls, together with the choice of many different marker types such as aspect marker types (lines or aspect blanking) and centre marker types (long or short), make the BVM-L230 monitor the perfect all-round display device for a variety of shooting scenarios – from SD/ HD video acquisition to digtal cinematography.

Marker Examples

Screen Size: 16:9
Aspect Mode: 2.35:1
Aspect Marker Colour : Magenta
Marker Brightness: 90IRE
Width: Thick
Safe Area: Shape A
Area Size: 80%
Centre Marker: Short
Aspect Blanking: Off

Screen Size: 16:9
Aspect Mode: 14:9
Aspect Marker Colour: Yellow
Marker Brightness: 40IRE
Width: Thin
Safe Area: Shape B
Area Size: 80%
Centre Marker: Short
Aspect Blanking: Half

Screen Size: 16:9
Aspect Mode: 4:3
Aspect Marker Colour: Green
Marker Brightness: 90IRE
Width: Thick
Safe Area: Sape C
Area Size: 80%
Centre Marker: Long
Aspect Blanking: Black

Marker Variation

	Safe Area Marker		Aspect Marker
	%	Dot (Pixel)	
Selectable Markers	80%, 88%, 90%, 93%, or variable	Flexible	16:9, 15:9, 14:9, 13:9, 4:3, 2.39:1, 2.35:1, 1.896:1. 1.85:1, or 1.66:1
Line Colours	White, Red, Green, Blue,Yellow, Cyan, or Magenta		
Line Width	Thick or Thin		
Line Luminance	90 IRE or 40 IRE		

Easy Setup and Adjustment

Auto White Balance

The colour temperature and white balance of the BVM-L230 monitor can be automatically adjusted by the Auto White Balance function using the specified colour temperature probes*, such as the Konica Minolta CA-210, DK-Technologies PM5639/06 and X-Rite Eye-One Pro.

* Requires a connector to connect each of the colour analysers.

Auto Chroma/Phase Adjustment

An Auto Chroma/Phase/Matrix setup function is provided which automatically adjusts the monitor's chroma, phase and matrix using external colour bars.

Colour Temperature Selection

The Colour Temperature can be selected from D65, D93, D61, D56, D-Cine*, or User1 to User5. A "Colour Temp" (Colour Temperature) button located on the BKM-16R front panel enables instant access to the "Colour Temp menu" without using the On-Screen menu.

* D-Cine: x=0.314, y=0.351

Aspect Switch

The aspect ratio can be switched between 4:3, 16:9, 2.39: 1, and 1.869:1 depending on the input signal.

4:3	16:9
16:9	2.39:1
2.39:1	1.869:1

Other Features

5° Tilt Forward

10° Tilt Backward

- S-LOG GAMMA
- VESA™ Mounting (200 x 100 mm pitch)
- Blue Only
- Mono
- H Delay/V Delay
- NTSC Setup Level (0%, 7.5%)
- Component Level (SMPTE/EBU-N10 or Betacam)
- Aperture
- Serial Remote (Ethernet)
- Parallel Remote (D-sub 9-pin)
- Tally Lamp (Amber)
- EXT Sync (for RGB/YUV)

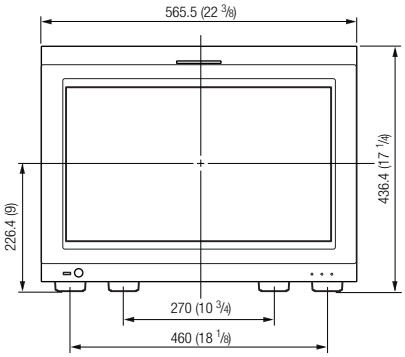
Specifications

BVM-L230

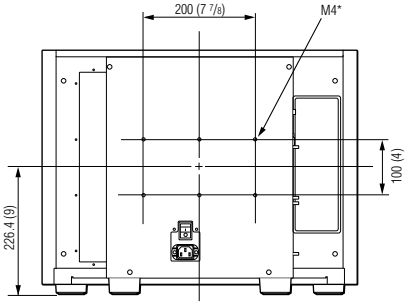
Picture Performance		
Type		α-Si TFT Active Matrix LCD
Picture Size (Viewable Area) (H x V) (Diagonal)		Approx. 483.8 x 302.4 mm (Approx. 19 1/8 x 12 inches) 570.6 mm (22 1/2 inches)
Aspect		16:10
Resolution (H x V)		1920 x 1200 pixels (WUXGA)
Pixel Efficiency		99.99%
Backlight		High-purity LEDs
Preset Brightness		100 cd/m2 (D-Cine: 48 cd/m2) (when 100% white signal is input)
Panel drive		RGB 10 bit
Panel frame rate		96/100/120 Hz
Viewing angle		85°/85°/85°/85° (typical) (up/down/left/right contrast > 10:1)
Input / Output		
Video Input/Output		Four (4) slots
PC input		DVI-D (HDCP correspondence) x 1
Control	LAN	Ethernet (10 BASE-T/100 BASE-TX), RJ-45 x 1
	Parallel Remote	D-sub 9-pin (female) x 1
	Option A	Mini-DIN 8-pin (female) x 1
	Option B	USB (Type A) x 1 (used for future expansion)
DC 5V Out		Circle 4-pin (female) x 1
General		
Power Requirements		100 to 240 V AC, 2.0 to 0.9 A, 50/60 Hz
Power consumption		Approx. 180 W (at maximum load, the luminance compensation due to the aged deterioration of the LED is included.)
Operating Temperature		0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20°C to 30°C (68°F to 86°F))
Operating Humidity		0% to 90% (no condensation)
Operating Pressure		700 hPa to 1060 hPa
Storage and Trans. Temperature		-20 °C to +60 °C (-4 °F to +140 °F)
Storage and Trans. Humidity		0% to 90%
Storage and Trans. Pressure		700 hPa to 1060 hPa
Dimensions (W x H x D)		565.5 x 436.4 x 243.1 mm (22 3/8 x 17 1/4 x 9 5/8 inches)
Mass.		Approx. 22 kg (48 lb 8 oz)
Supplied Accessories		AC power cord (Parts number: 1-782-929-1x) (1), AC plug holder (1), Cable holder (1), Bracket (1), Operation Manual (Japanese, English, each 1), Connection Cable for Colour Temperature Probe (1), CD-ROM (1), Using the CD-ROM Manual (1)

BVM-L230

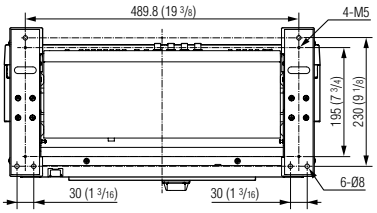
Front



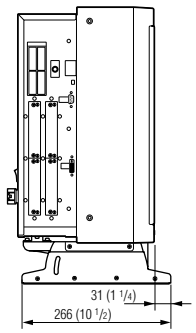
Rear



Bottom



Side

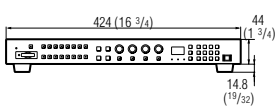


BKM-16R

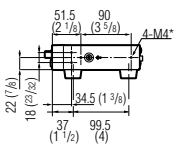
Input / Output		
LAN		10BASE-T/100BASE-TX connector: RJ-45 x 1
DC 5V/12V IN		Circle 4-pin (male) x 1
General		
Power Requirements		DC IN: 5V, 1.1A (supplied by the connected monitor) DC IN: 12V, 0.5A (supplied by the connectod AC adaptor) AC adaptor: AC IN: 100 to 240 V, 50/60 Hz, DC OUT: 12V, 3A
Current Consumption		5V DC, 1.1 A/12 V DC, 0.5A
Power Consumption		Approx. 6 W
Operating Temperature		0 °C to 35°C (32 °F to 95 °F) (Recommended operating temprature 20 °C to 30 °C (68°F to 86°F))
Operating Humidity		0 % to 90% (no condensation)
Operating Pressure		700 hPa to 1060 hPa
Storage and Trans. Temperature		-10 °C to + 40 °C (14°F to 104°F)
Storage and Trans. Humidity		0 % to 90 %
Storage and Trans. Pressure		700 hPa to 1060 hPa
Dimensions (W x H x D)		424 x 58.8 x 174.9 mm (16 3/4 x 2 3/8 x 7 inches)
Mass		Approx. 2.1 kg (4 lb 10 oz)
Supplied Accessories		AC adaptor (1),AC power cord (parts number: 1-575-131-8x (1), Rack mount brackets (2), Rack mount attachment screws (4), Function labels (2), Operation manual (1)

BKM-16R

Front



Side



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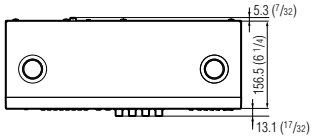

Unit : mm(inch)

Optional Accessories

BKM-16R
Monitor Control Unit

BKM-243HS
HD-SDI/SD-SDI Input Adaptor

BKM-220D
SD-SDI 4:2:2 Input Adaptor

BKM-229X
Analogue Component Adaptor

BKM-227W
NTSC/PAL Input Adaptor

BKM-37H
Controller Attachment Stand

SMF-700
Monitor Interface Cable

BKM-220D

Input / Output	
Serial Digital Interface	BNC x 2, Digital Component Signals Sampling Frequency: Y/R-Y/B-Y: 13.5 MHz Quantisation: 10 bits/sample
Monitor Out	BNC x 1, Output signal amplitude: 800 mVp-p ±10 % Output impedance: 75 Ω unbalanced
Transmission Distance	200 m (approx. 656 ft) max. (when using 5C-2V coaxial cables (Fujikura) or equivalent)
General	
Voltage	+5 V (supplied from the main unit)
Power Consumption	Approx. 1.5 W
Operating Temperature	0 °C to 35 °C (68 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-10 °C to 40 °C (14 °F to 104 °F)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	100 x 20 x 162 mm (4 x 13/16 x 6 1/2 inches)
Mass	Approx. 250 g (9 oz)
Supplied Accessories	Operating Instructions (1)

BKM-243HS

Input / Output	
Serial Digital Interface	BNC x 2, Digital Component Signals Sampling Frequency: SD-SDI: Y/R-Y/B-Y: 13.5 MHz, HD-SDI: Y/Pb/Pr: 74.25 MHz Quantization: 10 bits/sample
Monitor Out	BNC x 1, Output signal amplitude: 800 mVp-p ± 10 % Output impedance: 75 Ω unbalanced
Transmission Distance	SD-SDI: 200 m (approx. 656 ft) max. (when using 5C-2V coaxial cables (Fujikura) or equivalent) HD-SDI: 100 m (approx. 328 ft) max. (when using 5C-FB coaxial cables (Fujikura) or equivalent)
General	
Voltage	+3.3 V (supplied from the main unit)
Power Consumption	Approx. 2 W
Operating Temperature	0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-10 °C to 40 °C (14 °F to 104 °F)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	100 x 20 x 162 mm (4 x 13/16 x 6 1/2 inches)
Mass	Approx. 250 g (9 oz)
Supplied Accessories	Operating Instructions (1)

BKM-227W

Input / Output	
Composite Input	BNC x 1, 1 Vp-p ± 3 dB sync negative
Y/C Input	4-pin mini DIN x 1 Y: 1 Vp-p ± 3 dB sync negative C: 0.286 Vp-p ± 3 dB (NTSC burst signal level), 0.3 Vp-p ± 3 dB (PAL burst signal level) (SECAM, PAL-M)
Monitor Out	BNC x 1, Loop-through, with 75 Ω automatic termination 4-pin mini DIN x 1, Loop-through, with 75 Ω automatic termination
General	
Voltage	+3.3 V (supplied from the main unit)
Power Consumption	Approx. 1.8 W
Operating Temperature	0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20°C to 30 °C (68 °F to 86 °F))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-10 °C to 40 °C (14 °F to 104 °F)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	100 x 20 x 162 mm (4 x 13/16 x 6 1/2 inches)
Mass	Approx. 240 g (8 oz)
Supplied Accessories	Operating Instructions (1)

BKM-229X

Input / Output	
BNC x 3	RGB Input 0.7 Vp-p ± 3 dB (Sync on Green, 0.3 Vp-p sync negative)
	Component Input 0.7 Vp-p ± 3 dB
External Sync Input	BNC x 1, 0.3 to 4 Vp-p ± bipolarity ternary or negative polarity binary
	4-pin mini DIN x 1, Loop-through, with 75 Ω automatic termination
General	
Voltage	+3.3 V, +5 V (supplied from the main unit)
Power Consumption	Approx. 4 W
Operating Temperature	0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 20 °C to 30 °C (68 °F to 86 °F))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-10 °C to 40 °C (14 °F to 104 °F)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	100 x 20 x 162 mm (4 x 13/16 x 6 1/2 inches)
Mass	Approx. 250 g (9 oz)
Supplied Accessories	Operating Instructions (1)

SONY

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