PVM-X2400 V2

24-inch 4K HDR TRIMASTER high-grade picture monitor

Overview

4K HDR picture monitor color-matched with BVM-HX310 master monitor, ideal for various 4K productions

The PVM-X2400 is a 24-inch 4K HDR high-grade picture monitor, incorporating a Sony-specified premium LCD panel that offers 1,000-cd/m2 luminance and color matching with the BVM-HX310 4K HDR master monitor. This makes group monitoring easy in on-set, studio, and OB-van walls, and in 19-in EIA racks for editing, audio mixing etc.

TRIMASTER assures accurate color reproduction, precise imaging, and consistent picture quality

Sony's acclaimed TRIMASTER architecture delivers accurate picture reproduction, precise imaging and quality picture consistency. There are many advantages to the panel control and signal-processing system, such as fast processing, accurate linearizing of input signals with the Optical Electrical Transfer Function, accurate color reproduction, etc.

HDR-to-SDR conversion support

With V2.0 firmware and optional PVML-HSX1 HDR-to-SDR conversion license, the PVM-X2400 supports HDR-to-SDR conversion in live production environments. The license activates 4K-to-HD down-conversion, color space conversion and OETF conversion. It also allows output of converted pictures to another 4K or HD monitor from the Enhanced Monitor Output. This function can be used at a remote site fed only by a HDR signal.

Live production metadata*

The PVM-X2400 offers support for live production metadata, allowing confirmation if input source settings and monitor settings are matched.

*Supported with V2.0. Live production metadata includes SR Live metadata.

Dynamic Contrast Drive and Black Detail High/Mid/Low

Dynamic contrast drive adapts backlight luminance to suit the scene, achieving a 1,000,000:1 dynamic contrast ratio. Total balance of highlights and lowlights can be confirmed at a glance. Due to the mechanisms used in LCD panels, backlight leaking from the panel surface is unavoidable. Black Detail mode provides more accurate monitoring of black details in dark, low-APL (average picture level) images.

Inputs for 12G-SDI and Quad-Link 3G-SDI to HD-SDI, as well as HDMI

The PVM-X2400 can accept 12G-SDI from the latest sources, and can input quad-link 3G-SDI and a single HD-SDI from traditional devices. This input utility uses HDMI, and supports from 640 x 480/60P PC signal to 4096 x 2160/60P 4:2:2 YCBCR 12bit.

Various scopes

Waveform monitor and vector scope can be simultaneously displayed with scales for both HDR and SDR, allowing convenient checking of both input signal level and output luminance using the HDR scales of the waveform monitor. There are three different displays for luminance, RGB/YCBCR parade, or RGB overlay with the gamut error display. The waveform of a specified line can also be displayed.

Unique Quad View display with User 3D LUT

The PVM-X2400 provides a Quad View display, with individual settings for EOTF (SDR/HDR), color space, transfer matrix, color temperature, contrast, brightness, SDI/HDMI, and RGB/YCBCR, as well as User 3D look-up tables for each display view.

Enhanced user interface and Channel Select button

The monitor's OSD has been significantly enhanced to make operation even quicker and more intuitive. Design of the menu allow review and quick adjustment of settings. The Channel Select button protects users from making inadvertent setting errors.

Optimized features for field operation

DC 24 V operation allows field-based operation, despite the monitor's large 24-in screen size and very high 1,000-cd/m2 luminance. An optional protection panel* protects the premium LCD screen from inadvertent shocks. User 3D look-up tables and yoke-mounting are also supported. Dynamic Contrast Drive is particularly valuable when shooting night scenes. Field operation is further enhanced by false color and camera focus function.**

*Optional protection panel cannot be used during monitor operation to protect screen from backlight heat.
**Supported with V2.0.

Various mount capabilities

Despite its large 24-inch screen size, the PVM-X2400 can be installed onto a 19-inch EIA-standard rack in studio and OB-van environments. Yoke-mount and VESA mount options are also convenient for installation in a C stand for field use, or on a desktop arm for editing.

Powerful stereo sound with audio muting

The PVM-X2400 incorporates stereo speakers (2 W + 2 W) with audio muting.

Features

24-inch 4K premium LCD panel for faithful color matching with BVM-HX310
The PVM-X2400 features a 24-inch 4K premium LCD panel (3840 x 2160 pixel resolution) with a wide color gamut, high luminance, high contrast, fine grayscale, wide viewing angle and excellent uniformity. The Sony-specified panel achieves 1,000-cd/m2 luminance and 100% color gamut, corresponding to the industry-leading Sony BVM-HX310 Master Monitor. This provides an accurate color-matching value in the entire production workflow from camera shooting to finishing in applications, including live productions, TV shows, documentaries, music videos, movies, drama, and commercials. All personnel working on a project can reliably share the same accurate view of colors and tones, even if they are working at different locations and times.

TRIMASTER assures accurate color reproduction, precise imaging, and consistent picture quality
Sony's TRIMASTER architecture offers accurate picture reproduction, precise imaging, and quality picture consistency. The panel's control and signal processing system offers significant advantages, including fast processing, accurate color reproduction, and accurate linearizing of input signals with Optical Electrical Transfer Function.

HDR-to-SDR conversion support*
With V2.0 firmware and the optional PVML-HSX1 HDR-to-SDR conversion license,** the PVM-X2400 supports HDR-to-SDR conversion in a live production system. The HDR license activates 4K-to-HD down-conversion, color space conversion from ITU-R BT.2020 to ITU-R BT.709, and OETF conversion from HDR EOTF S-Log3(HDR), ITU-R BT.2100(HLG), SMPTE ST2084 to SDR EOTF 2.4. It also allows output of converted pictures to another 4K or HD monitor from the Enhanced Monitor Output that supports 12G- or 3G-SDI, even though an original 4K source is quad-link 3G-SDI. This function can be used at a remote site that can only be fed a HDR signal.

*Supported with V2.0.
**PVML-HSX1 HDR-to-SDR conversion license available separately. Monitor must be updated to V2.0 firmware or later. HDR-to-SDR conversion is activated via the USB port on the front control panel of the monitor.

Live production metadata*
The PVM-X2400 offers support for live production metadata, allowing easy comparison if settings of an input source and monitor settings are matched to each other. This feature enables faster, smoother on-site preparation of live production projects.

*Supported with V2.0. Live production metadata includes SR Live metadata.
[V2 firmware will be available at a later date. V1 firmware is updatable via the monitor's USB port].

Dynamic Contrast Drive
Sony's Dynamic Contrast Drive backlight driving system dynamically changes backlight luminance according to the scene to achieve a dynamic 1,000,000:1 contrast ratio. This allows at-a-glance checking of the total balance of highlights and lowlights. As a further advantage, there is no artificial halo effect, and each signal level is displayed as the same display luminance.

Black Detail High/Mid/Low
Backlight leaking from the panel surface is a consequence of LCD panel designs. Black Detail mode provides more accurate monitoring of black details in dark, low-APL (average picture level) images. Black level is reduced, but gamma is maintained for correct color and grayscale. However, high-luminance areas are clipped due to the dynamic range of the monitor. The portions to be clipped can be displayed either by zebra patterns or clipped image.

Versatile 4K video input capability
The PVM-X2400 is equipped with built-in standard input interfaces: (12G/6G/3G/HD-SDI) BNC (x2), (3G/HD-SDI) BNC (x2) and HDMI (HDCP2.3/1.4) (x1). 12G simplifies wiring, from simple to large-scale field systems. Quad-link 3G-SDI is highly convenient for systems configured with 'traditional' devices. HDMI simplifies interfacing with devices including rasterizer, multi-viewer, digital camera, set-top box, UHD Blu-ray, PC, etc.

Various signal settings and automatic setting by Video Payload ID
Manual signal settings include ITU-R BT.2020, ITU-R BT.709, DCI-P3, S-Gamut/S-Gamut3, S-Gamut3.Cine as color space and ITU-R BT.2100(HLG), SMPTE ST 2084, S-Log3 and S-Log3(Live HDR) as EOTF. In addition, support for VPID (Video Payload ID) can identify EOTF, color space and RGB source information embedded in the SDI signal. Monitor settings are adjusted automatically, cutting the risk of human error in high-pressure live production environments.

Enhanced user interface
The OSD (On-Screen Display) menu structure is significantly enhanced from existing

Sony 4K monitors. It features a shallow layered structure for quick, easy review and adjustment of setting values. Status-menu position is changed from the monitor's top to lower side. 4K/2K settings and input settings/user presets are integrated to a single channel. 30 channels can be created and renamed as desired. There's a new channel button on the front control panel—simply select a channel from the list showing the channel name, color space, EOTF, and input, etc. Channels can also be assigned to a Fn key. When multiple users share the same monitor, each user can memorize their own setting data to a channel and retrieve it whenever required, thus reducing consuming and repetitive setting tasks. When multiple users share the same monitor, all monitor data can be saved and locked using a password. Users can freely change stored values, but data cannot be overwritten or saved to memory by a user who does not know the password. For improving speed of Fn key configuration, users can take a shortcut to the settings menu screen by simply pressing the Fn key repeatedly. Function key preset allows creation, storage, and quick recall of different key combinations. Channel, function key preset, color temperature, and marker name can also be named from the monitor's OSD keyboard.

4K/HD scopes with HDR/SDR scale and audio level meter display
Both the waveform monitor and the vector scope can be displayed simultaneously, with scales for either HDR or SDR. Scales are automatically changed according to a selected EOTF setting of the monitor. You can conveniently check both input signal level and output luminance with the HDR scale of the waveform monitor. Various modes include a zoom function (in an area of either 0–20% or 0–30%) with the waveform monitor, and a zoom function in the central black area with the vector scope, for adjusting camera white balance. The waveform has three different displays of either luminance, RGB/YCBCR parade, or RGB/YCBCR overlay with the gamut error display. The waveform of a specified line can also be displayed. In addition, an audio level meter can display embedded audio signals from the SDI or HDMI input. It can display on screen either Ch 1–8 or Ch 9–16.

User 3D LUT
User 3D LUT files can be loaded to the internal memory via the USB port on the monitor's front. Either 33-grid-point or 17-grid-point .cube files are supported. Different user look-up tables can be easily selected and compared in Quad View display.

Unique Quad View display
The PVM-X2400 provides a Quad View display mode with individual settings for EOTF (SDR/HDR), color space, transfer matrix, color temperature, contrast, brightness, user look-up table, SDI/HDMI and RGB/YCBCR for each display view. Different HD input sources can be compared as a part of a HD wall system.

False color function*
The monitor can display false color according to the camera's signal level. As the whole picture is changed, it is easy to see levels for over-, under-, or appropriate exposure.

*Supported with V2.0.

Camera focus function*
The monitor can control the aperture level of a video signal and display images on the screen with sharpened edges to help camera focus operation. The sharpened edges can be displayed in user-selectable colors (white, red, green, blue, and yellow) for more precise focusing.

*Supported with V2.0.

DC operation
The PVM-X2400 can be powered by a DC 22–32 V source, providing more flexibility and mobility for users who want a larger-size screen for on-set and field applications.

Highly reliable mechanical design, optional protection panel, and 19-inch EIA-standard-rack-mount capability
For long-term reliability, Sony made multiple thermal simulations to find the most efficient cooling system and mechanical structure. Long-term heat load tests were also conducted to meet stringent specifications.

The optional PVMK-PX24 protection panel safeguards the screen of the PVM-X2400 from inadvertent scratches and impacts during transportation and preparation.* It can be easily and quickly attached or detached without tools. This protection panel can be mounted together with the rack-mount bracket PVMK-RX24, and it can be used with the PVM-X2400 installed in a 19-inch EIA-standard rack.

*Optional protection panel cannot be used with the monitor in operation to protect screen from LCD backlight heat.

Yoke-mount and wall-mount capability
The PVM-X2400 has screw holes on its side bezels for yoke mounting. This type of mounting is convenient when installing a monitor on a camera crane or monitor stand in the field. There are also 3.94-in pitch wall-mount holes on the monitor's rear panel.

Room clearance connector panel design
The rear connector panel allows adequate cord clearance. This design protects connectors, saves space and offers cabling flexibility with easy identification of connectors for system integration and maintenance.

4K (4096 x 2160) and 2K (2048 x 1080) input
The PVM-X2400 can display 4K and 2K input signals. The 4K/2K signal is displayed in two ways: as a full 4K/2K image scaled into a Quad Full High Definition (3840 x 2160) screen, or as a 4K/2K native display with side cut.

Flexible and variable area markers, aspect marker, and center marker
It's easy to set two flexible area markers, or variable area markers and aspect marker on the screen. Line colors and thickness can be changed for easy identification. This second marker enables easier checking of the center portion's focus. The flexible area marker can be used as a screen layout guide for shopping shows.

Power-on setting
Ideal for rental applications, power-on setting quickly loads data at start-up, including last memory, user-preset, and factory-preset settings.

Optimized low-latency I/P conversion
The monitor's low-latency I/P conversion system optimizes signal processing according to input signals. This helps with the editing and monitoring of fast-moving images, and with the synchronizing of audio for lip sync.

Zoom function
The PVM-X2400 can magnify a center of the screen for checking camera focus.

Stereo speakers (2 W + 2 W) with audio muting
Use on-set or in a machine room requires high sound-pressure levels due to environmental noise. 2 W + 2 W front stereo speakers offer powerful sound with a true stereophonic effect. Pressing an assigned Function key instantly mutes audio when required.

Extensive basic functions

The monitor has basic functions such as contrast, brightness, chroma, aperture, audio volume, blue only, mono, scan, marker, timecode display, RGB cutoff, on-screen tally, BKM-17R control, and parallel remote (fixed pin assignment).

Specifications

Picture Performance

Panel	α-Si TFT Active Matrix LCD
Picture Size (Diagonal)	24 inches (609.6 mm)
Effective Picture Size (H x V)	21 x 11 7/8 inches (531.6 x 299.1 mm)
Resolution (H x V)	3840 x 2160 pixels
Aspect	16:9
Display colors	Approx. 1.07 billion colors
Panel frame rate	48 Hz / 50 Hz / 60 Hz (48 Hz and 60 Hz are also compatible with 1/1.001 frame rates)
Viewing angle (panel specification)	89°/89°/89°/89° (up/down/left/right contrast > 10:1)
Color temperature	D60, D65, D93, DCI*1, and user 1–10 (5,000 K to 10,000 K adjustable)
Luminance (panel specification) (typical)	1000 cd/m2
Color space (Color gamut)	ITU-R BT.2020*2, ITU-R BT.709, DCI-P3*2, S-GAMUT3*2, S-GAMUT3.Cine*2
Transmission Matrix	ITU-R BT.2020 (Non-constant luminance is supported), ITU-R BT.709
EOTF	2.2, 2.4, 2.6, 2.4 (HDR), S-Log3, S-Log3 (Live HDR), SMPTE ST 2084, ITU-R BT.2100 (HLG)

Input

SDI	(12G/6G/3G/HD-SDI) BNC (x2), (3G/HD-SDI) BNC (x2), Input impedance: 75 Ω unbalanced
HDMI Input	HDMI (HDCP2.3/1.4) (x1)
Parallel Remote	RJ-45 8-pin (x1) (Fixed pin assignment)
Serial Remote (LAN)	Ethernet, 10BASE-T/100BASE-TX RJ-45 (x1)
DC Input	XLR-type 3-pin (male) (x1), DC 22 to 32 V (output impedance 0.05 Ω or less)

Output

SDI Output	(12G/6G/3G/HD-SDI) BNC (x2), (3G/HD-SDI) BNC (x2), Output impedance: 75 Ω

	unbalanced
Audio Monitor Output	Stereo mini jack (x1)
Speaker (Built-in) Output	2.0 W+2.0W (Stereo)
Headphone Output	Stereo mini jack (x1)

General

Power Requirements	AC 100 to 240 V, 2.6 to 1.0 A, 50/60 Hz DC 22 to 32 V, 9.9 to 6.3 A
Power consumption	Approx. 225 W (Maximum at AC operation) Approx. 205 W (Maximum at DC operation)
Operating Temperature	0°C to 35°C (32°F to 95°F) Recommended: 20°C to 30°C (68°F to 86°F)
Operating Humidity	30% to 85% (no condensation)
Storage / Transport Temperature	-20°C to +60°C (-4°F to +140°F)
Storage / Transport Humidity	0% to 90%
Operating / Storage / Transport Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	22 3/8 x 15 1/8 x 6 1/4 inches (568 x 382 x 158.5 mm*3) (without monitor stand) 22 3/8 x 16 x 7 1/8 inches (568 x 403.5 x 178.5 mm*3) (with monitor stand)
Mass	23 lb 2 oz (approx. 10.5 kg)
Supplied Accessories	AC power cord (1), AC plug holder (1), CD-ROM (1), Before Using This Unit (1)
Optional Accessories	PVMK-RX24 Rack-mounting bracket PVMK-PX24 Protection Panel BKM-17R

Notes

*1	DCI: x=0.314, y=0.351
*2	The PVM-X2400 does not cover selected color space in full.
*3	Without projection parts.

Related products

PVML-HSX1

HDR-to-SDR conversion license
for PVM-X2400/X1800

Gallery