

PVM-X2400

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



Overview

***Product update: See below for advanced information on the PVM-X2400 V2 upgrade model**

4K HDR picture monitor color-matches with the BVM-HX310 master monitor, ideal for 4K and HD 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 for on-set, studio, and truck applications, and in 19-inch 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.

Future HDR-SDR conversion support

With future V2.0* firmware and the optional PVML-HSX1, HDR-SDR conversion license, the PVM-X2400 will support

HDR-SDR conversion in live production environments. The license will activate: 4K to HD down-conversion, color space conversion, OETF conversion, Progressive to Interlace conversion, and Quad-link 3G to Single-link 12G conversion. It will also allow the output of converted pictures to other 4K or HD monitors via the Enhanced Monitor Output. This planned feature will facilitate local or remote monitoring of converted signals. The license activation will be field upgradeable via USB memory, providing conversion capabilities to a current PVM-X2400 monitor (upgraded to V2.0* firmware)

*A V2.0 firmware update will be available at a later date. V1.0 firmware will be upgradable to V2.0 or higher via the monitor's USB port.

Future User 3D look-up-table signal output support

The future V2.0* firmware and the optional PVML-HSX1 HDR-SDR conversion license will also support the output of signals with applied User 3D LUTs via the Enhanced Monitor Output to other 4K/HD devices further facilitating efficient workflows in live production, cinema, drama, commercial, music, and documentary production environments.

*A V2.0 firmware update will be available at a later date. V1.0 firmware will be upgradable to V2.0 or higher via the monitor's USB port.

SR Live metadata

Planned as a standard feature for V2.0* release will be support for SR Live metadata, which will enable the PVM-X2400 monitor settings to be matched to the incoming signal. You can also confirm the SR Live metadata parameters on an incoming SDI signal in the Status menu. This will help to streamline use of the monitor in

SR Live workflows.

*A V2.0 firmware update will be available at a later date. V1.0 firmware will be upgradeable to V2.0 or higher via the monitor's USB port.

Dynamic Contrast Drive and Black Detail High/Mid/Low

Dynamic Contrast Drive is a new backlight control system that dynamically changes the panel's backlight luminance to adapt to changing content enabling you to confirm the total balance of highlights and low lights at a glance. The feature can be used to reproduce black representation in dark content, such as night scenes and provide specular highlights in bright content such as snow field and summer beach scenes. The Dynamic Contrast Drive feature provides a dynamic contrast ratio of 1,000,000:1.

Due to the inherent nature of LCD panels, some backlight leakage is unavoidable. To compensate, Black Detail Mode High/Mid/Low facilitates more accurate monitoring of black detail in dark, low-APL (average picture level) images. The backlight level is reduced but gamma is maintained for correct color and gray scale. High luminance areas may be clipped due to the dynamic range of the monitor. Any clipped portions can be displayed as clipped or highlighted by a zebra pattern.

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

The PVM-X2400 provides 12G-SDI inputs and can accept quad-link 3G-SDI and a single HD-SDI from traditional devices. The monitor also supports an HDMI connection for display of inputs with signal formats ranging from 640 x 480/60P PC up to 4096 x 2160/60P 4:2:2 YCBCR 12 bit.

Various scopes

A waveform monitor and vector scope can be simultaneously displayed with scales for both HDR and SDR, supporting signal confirmation of both input signal level and output luminance. 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.

Furthermore, with future firmware,* a color gamut scope will be available that maps colors in the CIE1931 standard chart with the standard color space area display.

*This firmware update will be available at a later date. The schedule of it has not been determined yet and it will separately be informed. V1.0 firmware will be upgradable to V2.0 or higher via the monitor's USB port.

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.

With the future V2.0* firmware, this function will be enhanced to also support the display of scopes when monitoring in Triple or Dual picture modes.

*A V2.0 firmware update will be available at a later date. V1.0 firmware will be upgradable to V2.0 or higher via the monitor's USB port.

Enhanced user interface and Channel Select button

The monitor's OSD (On Screen Display) has been significantly enhanced to make operation faster and

more intuitive. The new design enables review and quick adjustment of settings. The Channel Select button protects users from making inadvertent setting errors.

Optimized features for field operation

The PVM-X2400 is specially designed for field operations, with a lightweight construction and handle (included) for portability. DC-24-V operation allows field-based operation, despite the monitor's large 24-inch screen size and very high 1,000-cd/m² luminance. An optional protection panel* protects the premium LCD screen from inadvertent shocks. Yoke-mounting is also supported. Field operation is further enhanced by false color and camera focus functions.** The false color feature assigns the incoming signal different colors for different exposure levels, providing a fast and effective tool for verifying exposure. The Focus Assist feature displays incoming images with sharpened edges to help determine camera focus. The sharpened edges can be displayed in user-selectable colors (white, red, green, blue, and yellow) for more precise focusing.

*The optional protection panel cannot be used during monitor operation to protect screen from backlight heat.

**This firmware update will be available at a later date. The schedule of it has not been determined yet and it will separately be informed. V1.0 firmware will be upgradable to V2.0 or higher via the monitor's USB port.

Various mount capabilities

Despite its large 24-inch screen size, the PVM-X2400 can be installed in a 19-inch EIA standard rack in studio and OB van environments. Yoke-mount and wall mount options are also available 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 the 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 supports a 1,000 cd/m² luminance and offers the same color gamut as Sony's flagship BVM-HX310 Master Monitor. This provides accurate color matching within the production workflow from acquisition to finishing for live productions, TV programs, documentaries, music videos, movies, dramas, 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

Our 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-SDR Conversion support

With the future V2.0* firmware and the optional PVML-HSX1, HDR-SDR conversion license,** the PVM-X2400 will

also support HDR-SDR conversion in a live production environment. The HDR license will support any of the following:

- 4K to HD down-conversion
- Color space conversion from ITU-R BT.2020 to ITU-R BT.709,
- OETF conversion from HDR OETF S-Log3 (HDR), ITU-R BT.2100 (HLG), SMPTE ST2084 to SDR EOTF 2.4 and OETF 0.45.
- Progressive to interlace conversion
- Quad-link 3G to single-link 12G conversion

It will also allow the output of converted signals to other 4K or HD monitors via the Enhanced Monitor Output that supports 12G/6G /3G/HD-SDI, even if an original 4K source is Quad link 3G-SDI. This planned feature will enable local or remote monitoring of converted signals. The license activation will be field upgradeable via USB memory, providing conversion capabilities to current PVM-X1800/2400 monitors.

*A V2.0 firmware update will be available at a later date. V1.0 firmware will be upgradeable to V2.0 or higher via the monitor's USB port.

**The PVML-HSX1, HDR-SDR conversion license will be sold separately. The 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.

SR Live metadata

Planned as a standard feature for the V2.0* release will be support for SR Live metadata, which will enable the PVM-X2400 monitor settings to be matched to the incoming signal. You can also confirm the SR Live metadata parameters on an incoming SDI signal in the Status menu. This will help to streamline use of the monitor in SR Live workflows.

*A V2.0 firmware update will be available at a later date. V1.0 firmware will be upgradeable to V2.0 or higher via the monitor's USB port.

Dynamic Contrast Drive

Dynamic Contrast Drive is a new backlight control system that dynamically changes the panel's backlight luminance to adapt to changing content enabling you to confirm the total balance of highlights and low lights at a glance. The feature can be used to reproduce black representation in dark content, such as night scenes and provide specular highlights in bright content such as snow field and summer beach scenes. The Dynamic Contrast Drive feature provides a dynamic contrast ratio of 1,000,000:1.

Black Detail High/Mid/Low

Due to the inherent nature of LCD panels, some backlight leakage is unavoidable. To compensate, Black Detail Mode High/Mid/Low facilitates more accurate monitoring of black detail in dark, low-APL (average picture level) images. The backlight level is reduced but gamma is maintained for correct color and gray scale. High-luminance areas may clip due to the dynamic range of the monitor. Any clipped portions can be highlighted by zebra patterns or simply displayed as clipped.

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 rasterizers, multi-viewers, digital

cameras, set top boxes, UHD Blu-ray players, PCs etc.

Various signal settings and automatic setting via Video payload ID

Though the PVM-X2400 monitor supports manual input signal settings, the monitor also supports VPID (Video Payload ID). This support means that the monitor can auto detect and identify incoming video signals and automatically adjust the monitor settings (EOTF, color space, RGB source information, etc.) to the input signal, reducing 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. The status menu position has changed from the monitor's top to lower side. 4K/2K settings and input settings/user presets have been streamlined to a single channel. 30 custom channels can be created and renamed as needed. A new channel button on the front control panel facilitates fast setting changes—simply select a channel from the list showing the channel name, color space, EOTF, and input, etc. Channels can also be assigned to a Function key. When multiple users share the same monitor, each user can save their own setting data to a channel and retrieve it whenever required, thus reducing consuming and repetitive setting tasks. All monitor data can be saved and locked by a password. Users can freely change stored values, but data cannot be overwritten or saved to memory by a user without the password. For improving Function key configuration setup, users can take a short-cut to the settings menu screen by simply pressing the Function key repeatedly. Function key preset allows the creation, storage, and quick recall of different

key combinations. Channel, function key preset, color temperature, and marker parameters can be assigned custom names from the monitor's OSD keyboard.

4K/HD scopes with HDR/SDR scale and audio level meter display

Both the waveform monitor and vector scope can be simultaneously displayed with scales for either HDR or SDR. Scales are automatically changed according to the selected EOTF setting of the monitor. You can easily check both input-signal level and output luminance using the HDR scale of the waveform monitor. The waveform vector scope offers two zoom modes: one in an area of either 0–20% or 0–30% within the waveform monitor, and a second in the central black area of the vector scope, for adjusting camera white balance. The waveform has three different displays of either luminance, RGB/YCBCR parade, or RGB overlay with gamut error display. The waveform of a specified line can also be displayed. In addition, an audio level meter can display eight channels of embedded audio from the SDI or HDMI input. (Ch1–8 or Ch9–16).

Furthermore, with future firmware,* a color gamut scope will be available that maps colors in the CIE1931 standard chart with the standard color space area display. The color space area display is automatically set and displayed according to the selected color space setting from ITU-R BT.2020, DCI-P3, S-Gamut3, S-Gamut3.Cine to ITU-R BT.709. It can also be displayed with the other scopes at the same time.

* This firmware update will be available at a later date. The schedule of it has not been determined yet and it will separately be informed. V1.0 firmware will be upgradeable to V2.0 or higher via the monitor's USB port.

User 3D LUT

User 3D look-up-table files can be loaded to internal memory via the USB port at the front of the monitor. 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.

The future V2.0* firmware and the optional PVML-HSX1, HDR-SDR conversion license, will also support the output of signals with applied User 3D LUTs via the Enhanced Monitor Output to other 4K/HD devices further facilitating efficient workflows in live production, cinema, drama, commercial, music, and documentary production environments.

*A V2.0 firmware update will be available at a later date. V1.0 firmware will be upgradeable to V2.0 or higher via the monitor's USB port.

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.

With the future V2.0* firmware, this function will be enhanced to also support the display of scopes when monitoring in Triple or Dual picture modes.

For example, you could monitor two HD videos on the upper quadrants and the corresponding waveform monitors, vector scopes, and color gamut scopes** on the lower quadrants at the same time.

*A V2.0 firmware update will be available at a later date. V1.0 firmware will be upgradeable to V2.0 or higher via the monitor's USB port.

** This firmware update for the color gamut scope will be available later date. The schedule of it has not been determined yet and it will separately be informed. V2.0 firmware is upgradeable via the monitor's USB port.

False color function

One of the features planned for future firmware* is False Color, whereby the incoming signal is assigned different colors for different exposure levels, providing a fast and effective tool for verifying exposure.

*This firmware update will be available at a later date. The schedule of it has not been determined yet and it will separately be informed. V1.0 firmware will be upgradeable to V2.0 or higher via the monitor's USB port.

Camera focus function

A Focus Assist feature (also planned for future firmware*) displays incoming images with sharpened edges to help determine camera focus. The sharpened edges can be displayed in user-selectable colors (white, red, green, blue, and yellow) for more precise focusing.

*This firmware update will be available at a later date. The schedule of it has not been determined yet and it will separately be informed. V1.0 firmware will be upgradeable to V2.0 or higher via the monitor's USB port.

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 conducted 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 PVM-X2400 screen from inadvertent scratches and impacts during transportation and preparation.* The protection panel can be easily attached or detached without tools. This protection panel can be mounted together with the rack-mount bracket PVMK-RX24, for installation in a 19-inch EIA standard rack.

*Optional protection panel cannot be used with the monitor in operation in order 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 can be 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 an aspect marker on the screen. Line colors and thickness are customizable. This second marker enables checking of center focus. Flexible area markers can be used as a screen layout guide for shopping programs or as guides for programs requiring different aspect ratios for distribution.

Power-on setting

Ideal for rental applications, the power-on setting quickly loads data at start-up including last memory, user preset 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 editing and monitoring fast-moving images, and with synchronizing audio with lip sync.

Zoom function

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

Stereo speakers (2 W + 2 W) with audio muting

Monitor 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 can instantly mute 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)	610.0 mm (24 inches)
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
Pixel efficiency	99.99%
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)
Normal scan	0% scan
Underscan	3% underscan
	D60, D65, D93, DCI*1, and

Color temperature	user 1-10 (5,000 K to 10,000 K adjustable)
Luminance (panel specification) (typical)	1,000 cd/m2*2
Color space (Color gamut)	ITU-R BT.2020*3, ITU-R BT.709, DCI-P3*3, S-GAMUT3*3, S-GAMUT3.Cine*3
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)
Warm-up time	Approx. 30 minutes To provide stable picture quality, turn on the power of the monitor and leave it in this state for more than 30 minutes.

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)
USB input	USB (USB2.0) connector (x1)

Output

Enhanced Monitor Output*4	(12G/6G/3G/HD-SDI) BNC (x1), Output impedance: 75 Ω unbalanced
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
	Approx. 225 W (Maximum at AC operation) Approx. 205 W (Maximum at

Power consumption	DC operation) 0.3 W in off-mode (When the Power switch is off)
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)	568 x 382 x 158.5 mm*5 (22.36 x 15.04 x 6.24 inches) (without monitor stand) 568 x 398 x 178.5 mm*5 (22.36 x 15.67 x 7.03 inches) (with monitor stand)
Mass	Approx. 10.5 kg (23 lb 2.4 oz)
Supplied Accessories	AC power cord (1), AC plug holder (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 luminance value is typical at D65 ($x=0.313$, $y=0.329$) and not guaranteed.
*3	The PVM-X2400 does not cover selected color space in full.
*4	A V2.0 firmware update will be available at a later date. V1.0 firmware will be upgradeable to V2.0 or higher via the monitor's USB port. Embedded Audio signals and timecode data are not output with V2.0.
*5	Without projecting parts.

Related products



PVM- X3200

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



PVML- HSX1

HDR-SDR
conversion license
for PVM-
X3200/X2400/X1800

Gallery

