

PVM-2551MD
Medical OLED Monitor

SONY
make.believe



TRIMASTER EL

Innovating Clarity. Sony OLED – A New Higher Standard in Medical Imaging.

For over 20 years, Sony has been a trusted and reliable source for surgeons, offering high-quality monitors with exceptional picture quality for a variety of medical applications. Now, Sony is proud to introduce its much-anticipated 24.5 inch* OLED (Organic Light-Emitting Diode) medical-grade monitor, the PVM-2551MD.

The groundbreaking invention of Sony's original OLED panel together with a newly developed dedicated OLED processor establishes a new, improved standard of critical-image monitoring. Sony has incorporated this OLED technology into the new PVM-2551MD.

Sony's innovative OLED technology delivers deep black, high-contrast, accurate color reproduction and quick response times with virtually no motion blur. It also features a wide color gamut, not limited to the ITU-R.BT709 color space, that can deliver extremely accurate and natural color reproduction.

With its exceptional picture quality and medical-friendly design, the PVM-2551MD ushers in a new era of exceptional medical monitoring.

* Viewable area, measured diagonally.

TRIMASTER EL



Sony's OLED Panel

TRIMASTER™ is a design architecture used to elicit the full performance capabilities of professional flat-panel displays. It comprises the core technologies that enable the highest level of color accuracy, precision imaging, and picture-quality consistency.

EL (Electro-Luminescence) is an ideal self-emission display device with a high dynamic range and high picture quality. By refining TRIMASTER technology with the new EL device, Sony effectively boosts the performance expectations of the professional industry.



Advantages of Sony's OLED Technology

Self-emitting Display Device

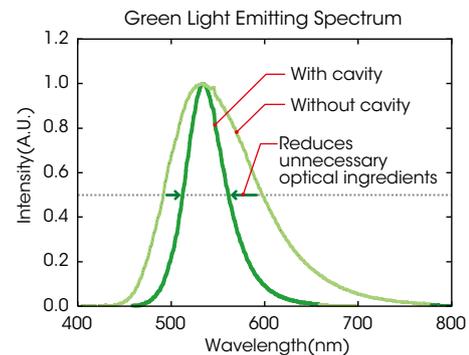
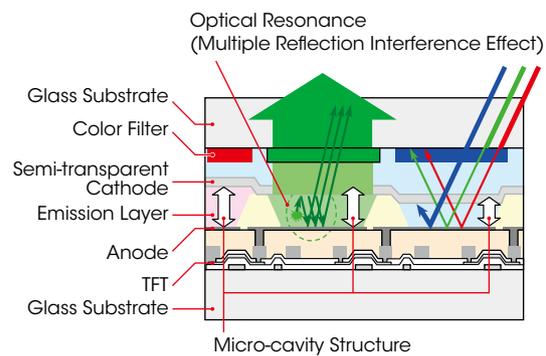
Sony's OLED technology creates light by recombining an electron and a hole within certain organic materials. The process of emitting light with this technology is extremely efficient when compared to other display technologies. Its organic materials react to the control of the electrical current immediately, and do not emit light in the absence of an electrical current. In this way, the OLED display panel features superb black performance and quick response times with virtually no motion blur even for fast-moving images. In addition, Sony's OLED display panel delivers an extremely wide color gamut.

Super Top Emission Technology

Sony's Super Top Emission OLED panel is designed to deliver light emission with the TFT layer on the rear side of the panel. The top emission structure offers more efficient light emission than is typical with bottom emission structures where TFT layers are placed on the front side of the panel, limiting the light-emission aperture.

This Super Top Emission technology has a micro-cavity structure which incorporates color filters. This cavity structure uses an optical resonance effect to enhance color purity and improve light-emission efficiency. In addition, the color filter of each RGB also enhances the color purity of emitted light, and reduces ambient light reflection.

Sony's Super Top Emission OLED panel is completely sealed by a glass substrate, and the electroluminescent layer is fully isolated from outside air and moisture. This contributes to stability and reliability.



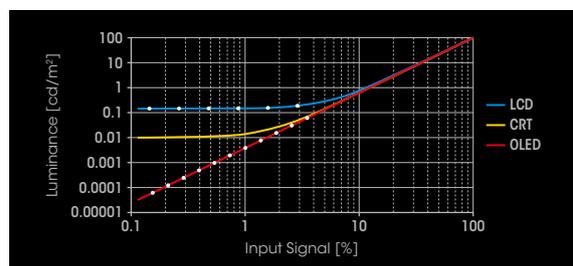
Dedicated OLED Processor

The PVM-2551MD monitor incorporates newly developed OLED-dedicated signal processors to elicit and maximize OLED panel performance. This technology allows this TRIMASTER EL™ monitor to provide the level of performance required for critical imaging. These processors accurately control gamma and uniformity, and deliver precision stability control.



Accurate Gamma Control

Sony's OLED panel can display a deeper black than any other display devices. The OLED processor controls gamma accuracy (black reproduction) by increasing the signal processing bit depth.



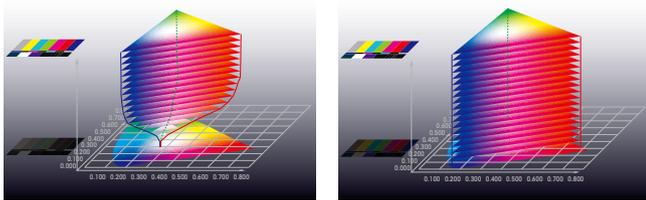


PVM-2551 MD Medical OLED Monitor

Key Features – Benefits of OLED Technology

Wide Dynamic Range– Accurate Color Reproduction in Dark Areas of the Displayed Image

Thanks to Sony's TRIMASTER EL technology, Sony's OLED monitor is capable of reproducing pure black, faithful to the source signal. It provides superb color reproduction, especially for dark images. This enables medical professionals to observe very subtle details in each image. For example, the faint color differences of tissue under low-light conditions such as blood vessels, membrane and fat, are correctly reproduced.

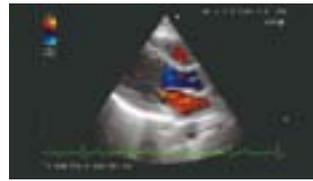
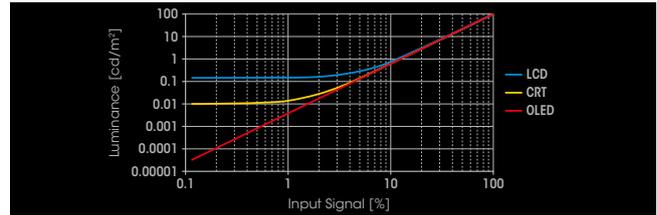


LCD screen image



Sony's OLED screen image

* Simulated images



LCD screen image

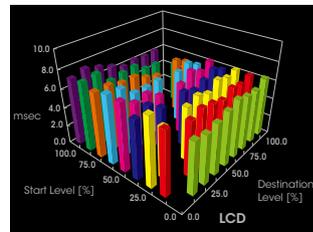


Sony's OLED screen image

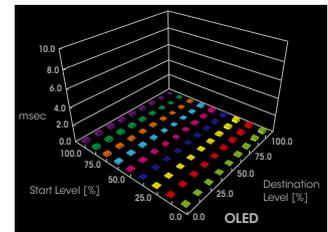
* Simulated images

Quick Response – Virtually No Motion Blur

Because the OLED electroluminescent layer inherently responds to any electrical current input, it emits light with virtually no delay. It therefore achieves superb quick response performance for fast moving images. This efficient blur-free, fast response time is beneficial for a variety of critical medical applications such as rigid endoscopic surgery and flexible endoscope investigation.



LCD screen image



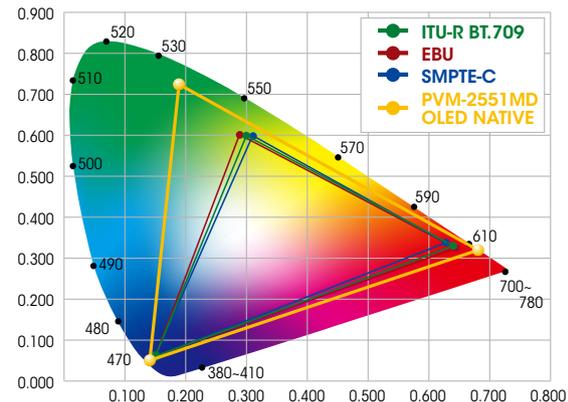
Sony's OLED screen image

* Simulated images

Wide Color Gamut – Reproduces Small Differences in Color

Sony's OLED technology displays the largest color range of any Sony monitor previously offered. Sony's micro-cavity structure uses an optical resonance effect in combination with accurate color filters to calibrate and stabilize RGB color accuracy. This combination is also effective in reducing ambient light reflection, and consequently deep color reproduction can be achieved with virtually no degradation, particularly in bright environments. It can reproduce a wider color range that OLED naturally offers*, and is not limited to correctly reproducing the color space of ITU-709, EBU, and SMPT-C standards. The OLED's wider color gamut and superb color reproduction, together with a 10-bit panel driver for each RGB color, provides smooth and accurate image reproduction. This superb color reproduction helps to more accurately and easily locate particular areas by revealing very small differences in color.

* When OFF is selected at the COLORSPACE setting in the MENU.



Features

Medical Compliances

The PVM-2551MD is UL 60601-1 listed and complies with CSA 22.2 No.60601 and EN 60601-1 safety regulations. It is therefore suitable for use in professional medical applications.

Variety of Scan and Display Modes

There are various image scan modes – such as NORMAL/ OVER scan, UNDER scan, FULL, ZOOM and NATIVE – allowing users to select the most suitable scan mode depending on the requirements. Furthermore, the PVM-2551MD provides a variety of display modes including Mirror Image, Side-by-Side, Picture-in-Picture, and Picture-out-Picture, which allow users to optimally view images according to each particular application.



Normal



Mirror Image

* Simulated images

Examples of multi-display



Side-by-Side (normal)



Side-by-Side (vertical full scan)



Picture-in-Picture



Picture-out-Picture

* Simulated images

Variety of Gamma Curve Settings

Users can choose from a variety of gamma settings – 1.8, 2.0, 2.2, 2.4, 2.6, and DICOM GSFD (Grayscale Standard Display Function) – depending on their requirements.

Noise Filter

The PVM-2551MD employs a high-performance noise filter which reduces effects on the monitor image that typically occur when an electrosurgical knife is used during surgery.

Rich User Memory

The PVM-2551MD is equipped with 20 memory presets which allow users to save and load settings such as color and gamma. This feature means users can instantly select optimum settings for each different application.

Direct Input Selection

This feature allows users to switch image sources during a procedure simply by pressing input select buttons on the front panel.



Front panel with buttons

Key-inhibit

Users can activate/deactivate control panel buttons with just one touch. Use of this feature helps prevent inadvertent operation of the control panel in a busy environment. When the menu item KEY-INHIBIT is set to ON, control panel buttons cannot be used – this prevents unauthorized alteration of settings.

Flat-surface Panel

The PVM-2551MD is designed to be easily wiped clean of liquids and gels, ensuring effective hygiene and safety in the operating environment. The monitor has front panel flat-surface buttons – users can simply wipe clean and disinfect these control buttons, along with the OLED panel. The flat-panel enclosure design also features ventilation holes that are located on the back of the monitor to help provide a higher level of protection* from liquid spills than ordinary displays that are designed with ventilation holes on top. In addition, the protection panel attached in front of the OLED panel helps to minimize damage from accidental impact and to reduce the effect of any reflected ambient light.

* IPX1 rated: Protection against vertically falling drops of water.



Installation-friendly Cabling

All the connectors face downwards, allowing for easy and organized cable connection.



Round Shaped Bezel

The PVM-2551MD features rounded corners, which is beneficial in a busy and space-limited environment such as an operating room.



VESA-mounting Compatibility

The PVM-2551MD complies with the 100 x 100 mm hole spacing VESA-mounting standard, making it ideal for use with a variety of medical installations.



Variety of Inputs and Easy Expandability



* The connector panel with the BKM-243HS and BKM-256DD installed.

The PVM-2551MD is equipped with a variety of inputs including Composite, Y/C, RGB/Component, HD15, and DVI-D as standard. Furthermore, two built-in option ports greatly expand the range of input signals this monitor can accept. These ports allow users to easily select and change input/output signals for ultimate flexibility via a variety of available option boards.

Input Signals / Input Adaptors

Video Signal Formats	Interfaces				
	Composite Y/C	RGB Component	SDI 4:2:2	HD-SDI SD-SDI	3G/HD/SD-SDI
	Standard				
	Options				
	BKM-227W	BKM-229X	BKM-220D	BKM-243HS	BKM-250TG
575/50i (PAL)	○	○	○	○	○
480/60i (NTSC)*1	○	○	○	○	○
576/50p	–	○	–	–	–
480/60p	–	○	–	–	–
1080/24PsF ¹	–	○*2	–	○	○
1080/25PsF	–	○*2	–	○	○
1080/24p ¹	–	○*2	–	○	○
1080/25p	–	○*2	–	○	○
1080/30p ¹	–	○*2	–	○	○
1080/50i	–	○	–	○	○
1080/60i ¹	–	○	–	○	○
720/50p	–	○*2	–	○	○
720/60p ¹	–	○	–	○	○
1080/50p	–	–	–	–	○
1080/60p	–	–	–	–	○

*1 Compatible with 1/1.001 *2 For component input only

DVI/BKM-256DD

Range of DVI input signal (available to 1920 x 1080/60 Hz)

Vertical frequency: 50.0 kHz to 85.1 kHz

Dot clock: 25.175 MHz to 148.500 MHz

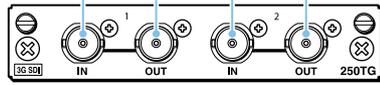
Horizontal frequency: 31.5 kHz to 77.0 kHz

Picture size, phase: automatic discrimination by the DE (Data Enable) signal

Optional Input Adaptors

BKM-250TG, 3G/HD/SD-SDI Input Adaptor*

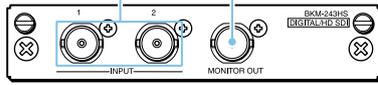
3G/HD/SD-SDI signal input (x2)
3G/HD/SD-SDI monitor output (x2)



*3G-SDI, HD-SDI and SD-SDI signals are detected automatically

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

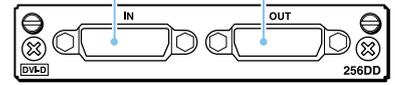
HD-SDI/SD-SDI signal input (x2)
HD-SDI/SD-SDI monitor output (x1)



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

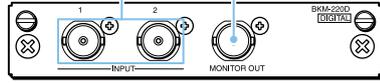
BKM-256DD, DVI-D Input Adaptor

DVI-D signal input
DVI-D signal output



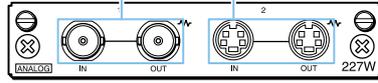
BKM-220D, SD-SDI 4:2:2 Input Adaptor

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



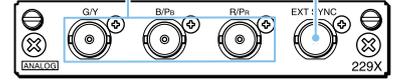
BKM-227W, NTSC/PAL Input Adaptor

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



BKM-229X, Analog Component Adaptor

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



Compatible with a Variety of Input Signal Formats

The PVM-2551MD supports a variety of video formats from 525i/50 (NTSC), and 625i/60 (PAL) up to 1080p/50, and 1080p/60.* In addition, a variety of computer signal formats are supported in Preset 1, and other computer signal formats are additionally supported in Presets 2-8.

* To support 1080p/50 and 1080p/60 input other than input from DVI-D requires an optional BKM-250TG 3G/HD/SD-SDI input adaptor.

Optional Accessories



BKM-250TG
3G/HD/SD-SDI Input Adaptor



BKM-243HS
HD/SD-SDI Input Adaptor



BKM-256DD
DVI-D Input Adaptor



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



BKM-227W
NTSC/PAL Input Adaptor



BKM-229X
Analog Component Adaptor

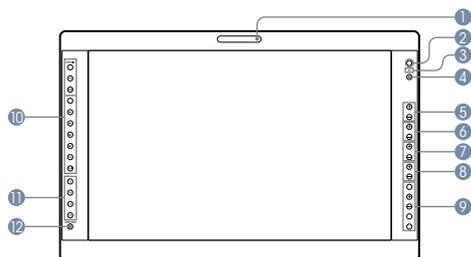


AC-110MD
AC Adaptor



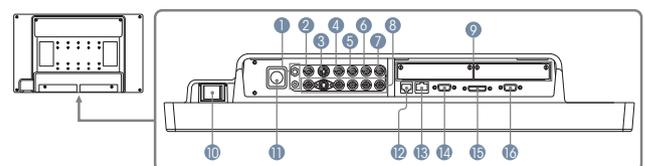
SU-560
Monitor Stand

Front Panel



- ① Tally lamp
- ② Power indicator
- ③ ← (key inhibit) indicator
- ④ CONTROL button
- ⑤ CONTRAST buttons
- ⑥ PHASE buttons
- ⑦ CHROMA buttons
- ⑧ BRIGHT (brightness) buttons
- ⑨ Menu operation buttons
- ⑩ Input select buttons
- ⑪ Function buttons
- ⑫ USER MEM (user memory) button

Connector Panel



- ① ⚡/⊕ (Equipotential/Function Earth) terminal
- ② COMPOSITE IN connector (BNC)
- ③ Y/C IN connector (4-pin mini-DIN)
- ④ G/Y IN connector (BNC)
- ⑤ B/Pb IN connector (BNC)
- ⑥ R/Pr IN connector (BNC)
- ⑦ EXT SYNC IN (external sync input) connector (BNC)
- ⑧ Loop-through output connectors
- ⑨ Optional input port
- ⑩ ⏻/⏹ (power) switch
- ⑪ DC 5V/24V IN connector
- ⑫ PARALLEL REMOTE connector (modular connector, 8-pin)
- ⑬ SERIAL REMOTE connector (RJ-45)
- ⑭ SERIAL REMOTE RS-232C connector (D-sub 9-pin, female)
- ⑮ DVI-D input connector (DVI-D)
- ⑯ HD15 input connector (D-sub 15-pin, female)

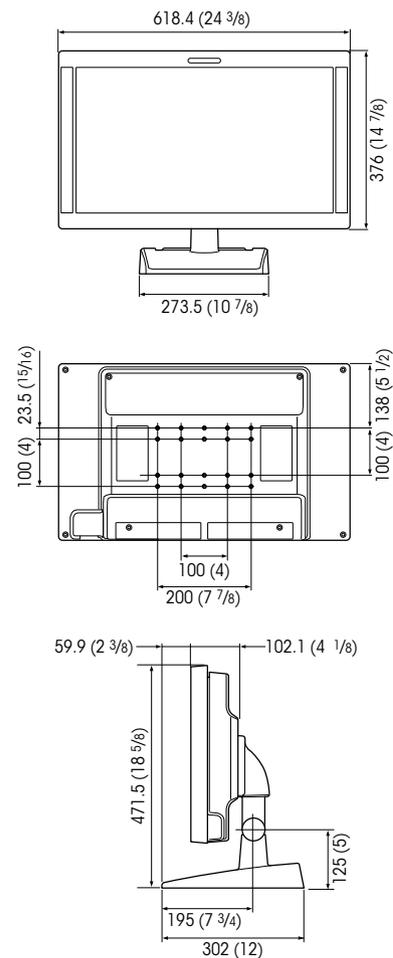
Specifications

Picture performance		
Panel	OLED panel	
Picture size (diagonal)	623.4 mm (24 5/8 inches)	
Effective picture size (H x V)	543.4 x 305.6 mm (21 1/2 x 12 1/8 inches)	
Resolution (H x V)	1920 x 1080 pixels (Full HD)	
Aspect	16:9	
Pixel efficiency	99.99%	
Panel drive	RGB 10-bit	
Viewing angle (panel specification)	89°/89°/89°/89° (typical) (up/down/left/right, contrast > 10:1)	
Input		
Composite input (NTSC/PAL) connector	BNC type (x1), 1 Vp-p ±3 dB sync negative	
Y/C input connector	Mini-DIN 4-pin (x1) 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)	
RGB/component input connectors	BNC type (x3), RGB: 0.7 Vp-p ±3 dB (Sync On Green, 0.3 Vp-p sync negative) Component: 0.7 Vp-p ±3 dB (75% chrominance standard color bar signal)	
External synchronized input connector	BNC type (x1) 0.3 Vp-p to 4.0 Vp-p ± bipolarity ternary or negative polarity binary	
HD15 input connector	D-sub 15-pin (x1) R/G/B: 0.7 Vp-p, sync positive (Sync On Green, 0.3 Vp-p sync negative) Sync: TTL level (polarity free, H/V separate sync) Plug & Play function: corresponds to DDC2B	
DVI-D input connector	DVI-D (x1), TMDS single link	
Parallel remote	Modular connector 8-pin (x1)	
Serial remote (LAN)	D-sub 9-pin (RS-232C) (x1) RJ-45 modular connector (x1) (Ethernet, 10BASE-T/100BASE-TX)	
Optional input port	2 ports, Signal format: H: 15 kHz to 45 kHz, V: 48 Hz to 60 Hz	
DC IN connector	XLR-type 4-pin (male) (x1), DC 5 V/24 V (output impedance 0.05 ohms or less)	
Output		
Composite output connector	BNC type (x1), Loop-through, with 75 ohms automatic terminal function	
Y/C output connector	Mini-DIN 4-pin (x1), Loop-through, with 75 ohms automatic terminal function	
RGB/component output connectors	BNC type (x3), Loop-through, with 75 ohms automatic terminal function	
External synchronized output connector	BNC type (x1), Loop-through, with 75 ohms automatic terminal function	
General		
Power	OLED monitor (PVM-2551MD)	DC IN: 24 V/5.0 A, 5 V/0.030 A (Supplied from AC adaptor)
	AC Adaptor (Sony, AC-110MD)	AC IN: 100 V to 240 V, 50/60 Hz, 1.53 A to 0.58 A DC OUT: 24 V/5.0 A, 5 V/0.060 A
Power consumption	Approx. 135 W (max.) Approx. 80 W (average power consumption in the default status)	
Operating conditions	Temperature	0°C to 35°C (32°F to 95°F)
	Recommended temperature	20°C to 30°C (68°F to 86°F)
	Humidity	30% to 85% (no condensation)
	Pressure	700 hPa to 1060 hPa
Storage and transport temperature	-20°C to +60°C (-4°F to +140°F)	
Storage and transport humidity	0% to 90% (no condensation allowed)	
Storage and transport pressure	700 hPa to 1060 hPa	
Dimensions (W x H x D)	618.4 x 376 x 102.1 mm (24 3/8 x 14 7/8 x 4 1/8 inches) (without a stand) 618.4 x 471.5 x 302 mm (24 3/8 x 18 5/8 x 12 inches) (with SU-560 optional stand)	
Mass	8.1 kg (17 lb 14 oz) (when the optional stand and the input adaptor are not installed) 8.5 kg (18 lb 12 oz) (when the optional stand is not installed and two BKM-229X are installed)	
Accessories supplied	AC adaptor (AC-110MD) (1), AC power cord (1), AC plug holder (2), Instructions for Use (1), CD-ROM (1), Using the CD-ROM Manual (1), Quick Reference (1), When you First Use the Monitor (1), Sales Companies Guide (1)	

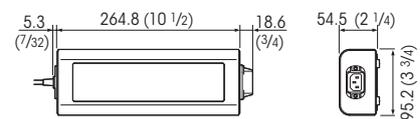
Dimensions

Unit: mm (inches)

When an optional stand SU-560 is attached



AC adaptor



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