



LMD-2451MD 24" Full HD Widescreen Medical LCD Monitor

Sony introduces the LMD-2451MD 24" full HD widescreen LCD monitor* to its comprehensive medical-grade display line-up. Built upon the same platform as the popular LMD-2450MD, it offers a superb quality WUXGA (1920 X 1200) LCD panel, 10-bit signal processing, Sony ChromaTRU™ color balance technology and new integration friendly features including enhanced DVI and multi-modality support capabilities.

The LMD-2451MD is equipped with two unique built-in option slots designed to accept a variety of option boards to easily expand, select, and change input/output signals for integration into virtually any system environment.

- Designed to be mounted on surgical carts, boom arms, walls or at a table top workstation
- Features two built-in option slots to easily expand, select, and change input/output signals via optional input adapter boards
- Can accept HD-SDI** , DVI-D, HD15, RGB, Y/C, composite, and 3G/HD/SD-SDI**
- Expanded DVI-D** capability to accept up to two DVI-D inputs and one DVI loop-through output
- Enhanced side-by-side functions for multi-modality performance

* Viewable area measured diagonally

**Optional input adapter board required

With Sony's Advanced Image Processing Technology, the LMD-2451MD Reproduces Accurate High-Definition Images for Critical Surgical Applications.

Safety Listing and Compliance

The LMD-2451MD monitor is UL60601-1 listed and complies with CSA C 22.2 No. 60601 and EN60 601-1 safety regulations, making it suitable for use in professional medical applications.

Excellent Picture Reproduction

ChromaTRU Color Processing

For an extra level of color reproduction accuracy, every LCD panel used in the LMD-2451MD is precisely color calibrated at the factory, providing consistent characteristics. The colorimetry of an LCD display, by nature, can exhibit inaccurate color characteristics and gamma curves, which can make precise color matching between multiple monitors a challenge. The LMD-2451MD solves this problem by precisely calibrating each LCD panel's light output so that the RGB color coordinates are consistent for every monitor. A second calibration is further applied so that white balance is maintained at a consistent color temperature throughout all grayscale levels. This technology is invaluable for applications such as simultaneous monitoring in operating rooms and monitoring rooms. The LMD-2451MD also provides high-brightness and high contrast images by utilizing super-wide aperture LCD panels.

Natural Gradation of Color Reproduction (10-Bit DSP)

The LMD-2451MD incorporates an advanced 10-bit digital video signal processor to produce accurate and lifelike images with smooth and natural gradation.

Sophisticated I/P (Interlace to Progressive) Conversion

The LMD-2451MD uses an advanced technology to perform sophisticated I/P conversion. I/P conversion is essential, enabling an interlaced video signal to display on the LCD progressive panel. Typically during this process, a second process — scaling — also occurs. Scaling adjusts the pixel count, but it can also degrade picture quality. With its sophisticated I/P conversion technology, the LMD-2451MD does not need a scaling process to deliver essential high-level accuracy when monitoring detailed images from full HD video sources.

Features:

- 1920 x1200 WUXGA HD Resolution and 10-Bit Signal Processing
- Sony ChromaTRU Color Balance
- 16:10 Widescreen Aspect Ratio
- Multi-Picture Display: picture-outside-picture (POP), and side-by-side with full scan for flexible multi-image viewing
- Touch-activated Picture Controls
- Two built-in option slots to easily expand, select, and change input/output signals for ultimate integration flexibility
- Multiple Preset Signal Configurations: designed to match various endoscopic camera system specifications for convenient and easy setup
- 20 User Memory settings: programmable to user preferences
- Selectable Color Temperature, Gamma and Scan Settings
- Key Lock Control Button: helps prevent unintentional setting changes from occurring during procedures
- Vesa™ Mounting: for standard compatibility with stands and mounting brackets
- Flat Surface LCD for easy cleaning
- 7 Language On Screen Display
- Serial RS232C or Ethernet Remote
- 24V DC Operation Capability

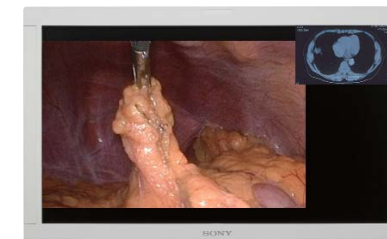
Expanded Signal Input Flexibility

The LMD-2451MD is equipped with two unique built-in option slots designed to accept a variety of option boards to easily expand, select, and change input/output signals for integration into virtually any system environment. Installation of the new BKM-256DD option board expands the monitor's capability to accept up to two DVI-D inputs and one DVI loop-through output in a standard configuration. For optical fiber transmission, the 5V power required to power a DVI-D to fiber optic converter is supplied from both DVI-D input and output connectors of the BKM-256 DD option board. Installation of the new BKM-250TG enables the LM-2451MD to accept a 3G input signal and transfer a 1080/60p signal via a single SDI cable.

Enhanced Display Modes for Multi-Modality Applications

The LMD-2451MD incorporates multiple display modes such as Picture-outside-Picture (POP) and Side-by-Side for flexible multi-image viewing with full scan capability. The full scan improvement increases image size/viewing distance and provides a more efficient use of the real estate.

With the optional BKM-256DD board, the LMD 2451MD can display two images of DVI input signals at the same time.



New Full Scan Picture-out-Picture



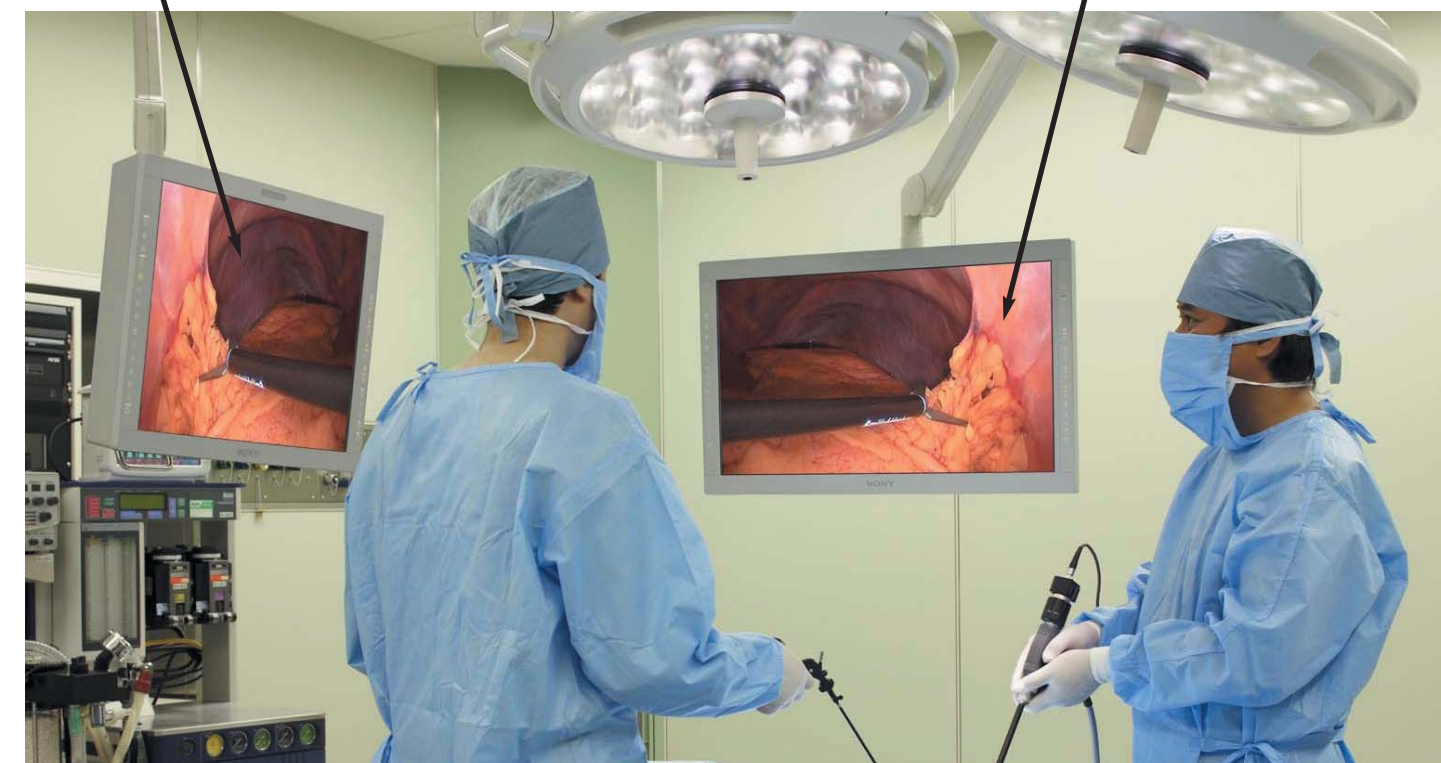
New Full Scan Side-by-Side Pictures

Mirror Image Feature

This convenient feature of the LMD-2451MD is ideal for procedures where two surgeons work at opposite points of orientation to the patient. With this feature surgeons no longer have to stand side by side and share a single display as in a conventional operating room.

Original Image

Mirror Image (reverse orientation)



Operational Convenience

The LMD-2451MD allows for multiple preset signal configurations designed to match various endoscope camera system specifications for convenient and easy setup. The User Memory Function allows the LMD-2451MD to file up to 20 types of picture settings such as contrast, brightness, and scan to accommodate various end-user preferences. The monitor also features a Key Lock Control button that helps prevent unintentional setting changes from occurring during procedures.

Smooth Surface Design and Fluid-resistant Structure

The LMD-2451MD is specially designed for medical environments. Touch activated tactile controls on the bezel and an AR (anti-reflection) layered protection panel over the LCD panel have together achieved a seamless surface design architecture, making the unit easy and convenient to clean.

Input Versatility

The LMD-2451MD monitor can accept almost any signal ranging from SD to HD, as well as PC signals, via its DVI-D and HD 15 Connectors. In addition to standard inputs, 6 different optional input adapters are offered for use in the monitor's two expansion slots.

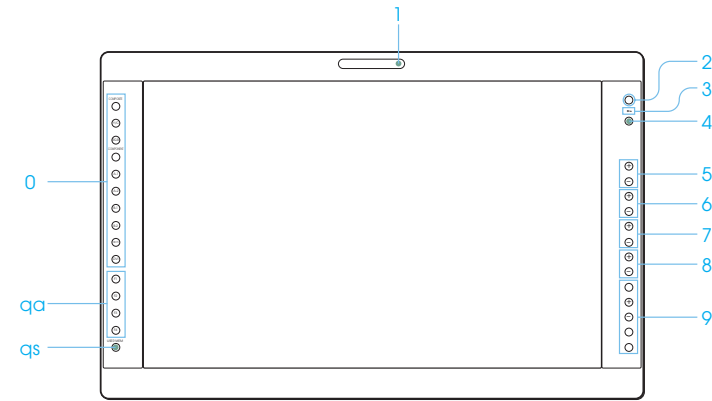
Mounting Flexibility (VESA)

The LMD-2451MD complies with the 100 mm hole spacing VESA mounting standard making it ideal for use with surgical equipment arms.

AC Adaptor

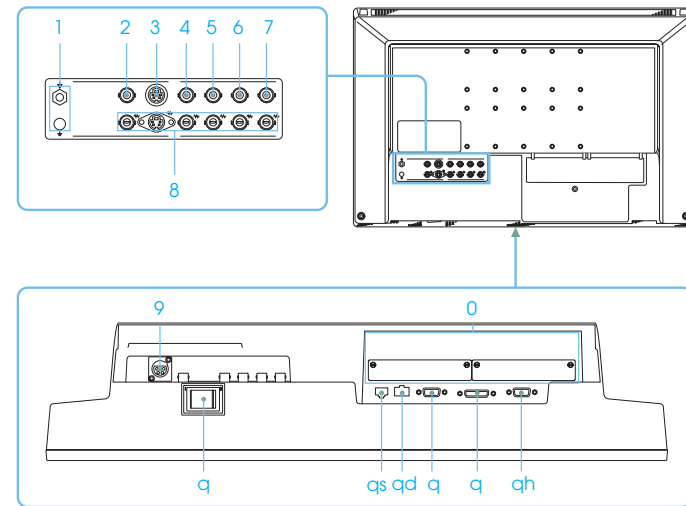
A small-sized AC adaptor enables easier installation of the LMD-2451MD where space is limited.

Front Panel



- | | |
|-----------------------------|----------------------------------|
| 1 Tally lamp | 7 CHROMA buttons |
| 2 Power indicator | 8 BRIGHT (brightness) buttons |
| 3 - (key inhibit) indicator | 9 Menu operation buttons |
| 4 CONTROL button | 0 Input select buttons |
| 5 CONTRAST buttons | qa Function buttons |
| 6 PHASE buttons | qs USER MEM (user memory) button |

Connector Panel



- | | |
|---|--|
| 1 ⚡/I (Equipotential/Function Earth) terminal | 0 Optional input slot |
| 2 COMPOSITE IN connector (BNC) | qa ⏻/⏪ (power) switch |
| 3 Y/C IN connector (4-pin mini-DIN) | qs PARALLEL REMOTE connector (modular connector, 8-pin) |
| 4 G/Y IN connector (BNC) | qd SERIAL REMOTE connector (RJ-45) |
| 5 B/PR IN connector (BNC) | qf SERIAL REMOTE RS-232C connector (D-sub 9-pin, female) |
| 6 R/PR IN connector (BNC) | qg DVI-D input connector (DVI-D) |
| 7 EXT SYNC IN (external sync input) connector (BNC) | qh HD15 input connector (D-sub 15 pin, female) |
| 8 Loop-through output connectors | |
| 9 DC 5V/24V IN connector | |

Input Signals

Video Signal Formats	Input Signal				Interface			Optional Interface					
	Total Lines	Active Lines	Aspect Ratio	Frame Rate ^{*1}	Composite Y/C	RGB/Component	DVI-D	SD-SDI	HD/SD-SDI	Composite Y/C	RGB/Component	3G/HD/SD-SDI	DVI-D
								BKM-220D	BKM-243HS	BKM-227W	BKM-229X	BKM-250TG	BKM-256DD
575/50i (PAL)	625	575	16:9 & 4:3	25	●	●	-	●	●	●	●	●	-
480/60i (NTSC)	525	483	16:9 & 4:3	30	●	●	-	●	●	●	●	● ^{*1}	-
576/50p	625	576	16:9 & 4:3	50	-	●	●	-	-	-	●	-	●
480/60p	525	483	16:9 & 4:3	60	-	●	●	-	-	-	●	-	●
1080/24PsF	1125	1080	16:9	24	-	● ^{*2}	-	-	●	-	● ^{*2}	●	-
1080/25PsF	1125	1080	16:9	25	-	● ^{*2}	-	-	●	-	● ^{*2}	●	-
1080/24P	1125	1080	16:9	24	-	● ^{*2}	-	-	●	-	● ^{*2}	●	-
1080/25P	1125	1080	16:9	25	-	● ^{*2}	-	-	●	-	● ^{*2}	●	-
1080/30P	1125	1080	16:9	30	-	● ^{*2}	-	-	●	-	● ^{*2}	●	-
1080/50i	1125	1080	16:9	25	-	●	●	-	●	-	●	●	●
1080/60i	1125	1080	16:9	30	-	●	●	-	●	-	●	●	●
720/50p	750	720	16:9	50	-	● ^{*2}	●	-	●	-	● ^{*2}	●	●
720/60p	750	720	16:9	60	-	●	●	-	●	-	●	●	●
1080/50p	1125	1080	16:9	50	-	-	●	-	-	-	-	●	●
1080/60p	1125	1080	16:9	60	-	-	●	-	-	-	-	●	●

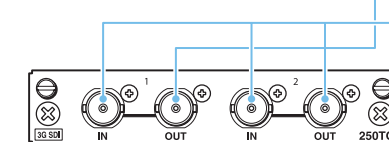
*1 Compatible with 1/1.001

*2 For component input only

Flexible Input Configurations

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

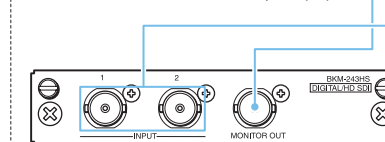
3G/HD/SD-SDI signal input (x2)
3G/HD/SD-SDI monitor output (x2)



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

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

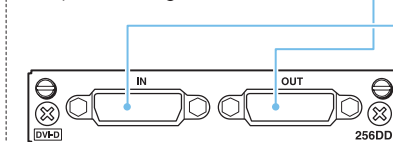
HD-SDI/SD-SDI signal input (x2)
HD-SDI/SD-SDI monitor output (x1)



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

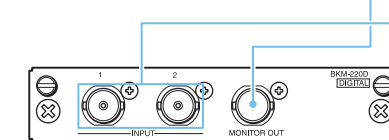
BKM-256DD, DVI-D Input Adaptor

Input DVI-D signal
Output DVI-D signal



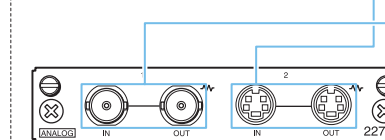
BKM-220D, SD-SDI 4:2:2 Input Adaptor

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



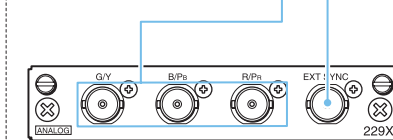
BKM-227W, NTSC/PAL Input Adaptor

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



BKM-229X, Analog Component Adaptor

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



Specifications

Picture Performance

LCD Panel Type	A-Si TFT Active Matrix
Resolution	Full HD (1920 x 1200)
Effective Picture Size (W x H)	Approx. 27 1/2 x 15 1/2 inches (698mm x 392mm) Diagonal 31 5/8 inches (802mm)
Aspect	16:10
Colors	Approx. 1,073,700,000 colors (10-bits)
Viewing Angle	178°/178° (typical, contrast >10:1)

Input / Output

Input	
Composite	BNC (x1), 1.0Vp-p ±3dB, sync negative
Y/C	4pin Mini DIN (x 1) Y: 1.0 Vp-p ±3dB sync negative C: 0.286 Vp-p ±3dB (NTSC), 0.3 Vp-p ±3dB (PAL)
Component/RGB	BNC (x 3) Component: 0.7 Vp-p ±3dB (75% chrominance standard color bar signal) RGB: 0.7 Vp-p ±3dB (Sync On Green, 0.3 Vp-p, sync negative)
Ext. Sync	BNC (x 1) 0.3 to 4.0 Vp-p ±bipolarity ternary or negative polarity binary
Computer	DVI-D (x 1): TMDS single link
HD15	D-sub 15pin (x 1) 0.7 Vp-p0nc positive (Sync On Green, 0.3 Vp-p, sync negative) Sync: TTL level (polarity free, H/V separate sync) Plug & Play function: corresponds to DDC-2B
Optional	2 slots Signal format: H 15 to 45 kHz, V 48 to 60 Hz
DC IN	DC 5 V/24 V (output impedance 0.05 Ω or less)
Remote	Parallel
	Modular 8-pin (x 1)
	Serial
	D-sub 9-pin (RS-232C) (x 1) RJ-45 modular (ETHERNET) (x 1)
Output	
Composite	BNC (x 1), Loop-through, 75 Ω automatic termination
Y/C	4-pin mini-DIN (x 1), Loop-through, 75 Ω automatic termination
Component/RGB	BNC (x 3), Loop-through, 75 Ω automatic termination
Ext. Sync	BNC (x 1), Loop-through, 75 Ω automatic termination

General

Power Consumption	Maximum: Approx. 115 W (with 2 x BKM-229X)
Power Requirements	AC 100 to 240 V, 50/60 Hz, 1.53 A, DC 24 V 5.0 A, 5 V 0.060 A
Operating Temperature	32 to 95° F (0 to 35° C), Recommended: 20 to 30° C (68 to 86° F)
Operating Humidity	30 to 85 % (no condensation)
Storage & Transport Temperature	-4 to 140° F (-20 to 60° C)
Storage & Transport Humidity	0 to 90 % (no condensation)
Operating, Storage, and Transport Pressure	700 to 1060 hPa
Dimensions (W x H x D)	Approx. 23 3/4 x 15 1/4 x 4 3/8 inches (602 x 386 x 110mm)
Weight	Approx. 18 lb. 5 oz (8.3 kg)
Supplied Accessories	AC adaptor, AC power cord, AC plug holder, Instructions for Use, CD-ROM (Operating instructions), Using the CD-ROM manual, Quick Reference, When You First Use The Monitor booklet, Sales Company Guide, Warranty card

Optional Accessories

SU-560 – Desktop Stand for LMD-2451MD

BKM-220D – SDI 4:2:2 Input Adapter for LMD Series Monitors

BKM-243HS – HD/D1-SDI Input Adapter for LMD Series Monitors

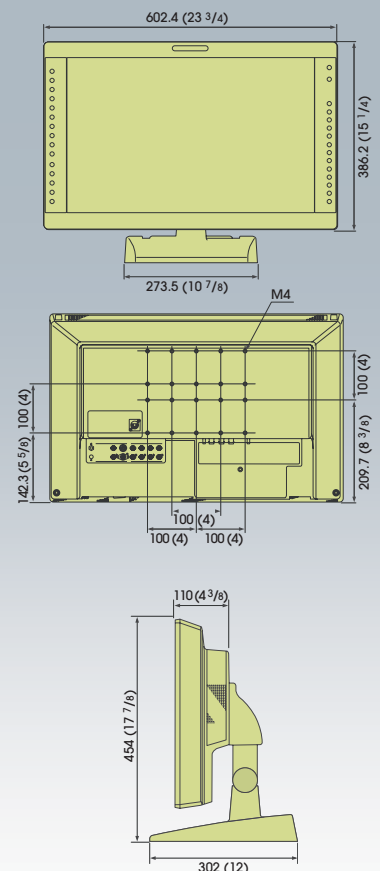
BKM-227W – NTSC/PAL Input Adapter for LMD Series Monitors

BKM-229X – Analog Component Input Adapter for LMD Series Monitors

BKM-250TG – 3G/HD/SDI Input Adapter for LMD-2451MD

BKM-256DD – DVI-D Input Adapter for LMD-2451MD

Dimensions*



*With SU-560 optional monitor stand

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Caution: See product labeling for indications, contraindications, warnings, cautions and directions for use.

ME-LMD2451MD