

## LMD-3251MT Full HD Medical Grade 3D Monitor



3D imaging is an increasingly important tool in today's operating rooms. It's a practical alternative to conventional 2D imaging, giving surgeons a stereoscopic view of high-resolution video captured with endoscopes, surgical microscopes and robotic surgery systems.

3D offers an accurate, lifelike visual experience, with improved depth perception and spatial orientation, which provides a more realistic visualization of complex procedures.

The LMD-3251MT is a high-performance 32"\* full HD monitor featuring **LED backlight technology** that's designed for use in medical environments. Connected to a 3D camera system, it displays smooth, flicker-free high-resolution images that are viewed by surgeons and staff with the use of light, comfortable passive polarizing glasses.

The monitor is fully compliant with medical safety standards for hospital operating room use. It's also ideal for other environments where high-quality 3D viewing is desired, from consulting rooms and clinics to conference halls and training suites.

## Key Features

### See high-impact, detail-packed 3D images in Full HD 1920 x 1080 resolution

Add an extra dimension of detail and realism when viewing images captured with today's 3D endoscopic and surgical microscopy camera systems. Advanced polarizing filter technology delivers smooth, flicker-free, easy-on-the-eye stereoscopic images in full HD that are viewed by surgeons and operating room staff wearing light, comfortable passive glasses.

### View with light, easy-to-wear 3D glasses

Stereoscopic full HD images can be viewed with a choice of passive 3D glasses that require no power source and can be worn with minimum fatigue over extended periods of time. The BKM-30G glasses comfortably fit most facial shapes, and feature a specially designed nose pad and temple tips that hold the glasses securely in place. The super-lightweight BKM-31G "clip-on" model attaches to normal glasses and features a convenient flip-up design.



**BKM-30G**



**BKM-31G**

Clip-on BKM-31G glasses are worn with the user's own corrective glasses.

### LED backlight technology

The panel's energy-efficient LED backlight offers high image brightness as well as lower power consumption and a longer service life than conventional CCFL designs. The mercury-free backlight also reduces potential environmental impact at end-of-life disposal.

### 3D/2D switchable

As well as high-resolution 3D images, the LMD-3251MT monitor can also display images from conventional 2D surgical camera systems in full HD resolution.

### Clear, consistent images with a wide viewing angle

The 32" Active Matrix TFT panel ensures a clear, reliable 3D experience with a wide viewing angle.

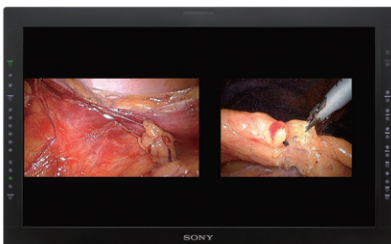
### Coated panel protected from scratches and light reflection

The panel's tough multi-layer AR-coated protection minimizes the risk of damage from scratches. The AR coating also minimizes reflections from ambient light, ensuring high contrast even when used in bright lighting conditions.

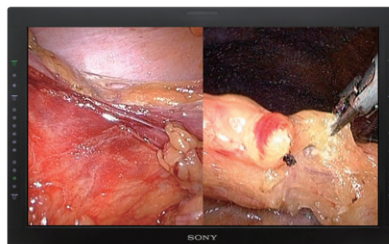
### Natural gradation and accurate color reproduction

An advanced 10-bit digital video signal processor delivers smooth, natural tonal gradations for extremely lifelike, accurate image reproduction.

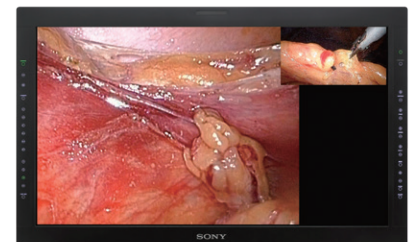
### Display Mode Examples



**SBS (normal)\***



**SBS (V-full scan)\***



**POP (V-full scan)\***

\* Simulated images

## ChromaTRU™ color matching for accurate, dependable colors



The LMD-3251MT ensures that colors seen by the surgeon are an accurate representation of the subject. Precise factory calibration of RGB coordinates for each panel ensures the highest levels of true, consistent color reproduction across multiple monitors. Further calibration maintains white balance at a uniform color temperature throughout all grayscale levels.

## Color temperature and gamma curve selection

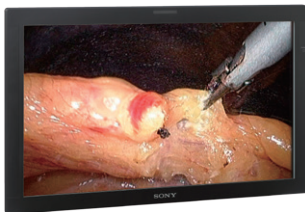
Display color temperature can be selected with three preset color temperature modes (D93, D65, D56) and five user-defined settings. There's also a choice of CRT 2.2 and DICOM gamma curve settings to meet the needs of different modalities.

## Wide range of display modes

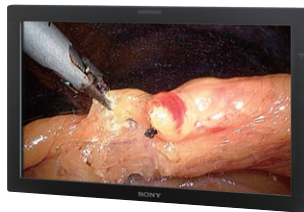
The LMD-3251MT supports a variety of 2D display modes, including Side-by-Side (SBS), Picture-out-Picture (POP) and Picture-in-Picture (PIP). It allows display of images from multiple sources on a single monitor. Adding the optional BKM-256DD DVI-D input adaptor supports display of images from two simultaneous DVI input signals.

## Mirror image

Mirror imaging allows for an assistant to view a "flipped" mirror image of the surgeon's own display. This convenient feature 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.



Normal image\*



Mirror image\*

\* Simulated images

## Protected controls

Inadvertent operation of the control panel can be prevented by the display's key inhibit function. Pushing the control button on the control panel turns off LED switch lights and overrides switch functions.

## Extensive 2D and 3D input capabilities

The monitor accepts a wide range of input signals as standard, including composite, Y/C, RGB/component, HD15 and DVI-D. Dual expansion slots for up to two optional input boards allow the LMD-3251MT to be used as a multi-format monitor, including support for 3G/HD-SDI.

## Black bezel for optimized 3D viewing

The display's unique black bezel design provides an excellent viewing background and gives surgeons a clear, optimized view of 3D images that are being displayed.

## Mounting flexibility (VESA)

The LMD-3251MT complies with the VESA 300 standard (100 x 300 mm hole-spacing mounting), for simple integration with most surgical equipment arms and tabletop stands. It can also be used as a desktop monitor with the optional SU-32FW monitor stand.

## Fully compliant for safe operation in medical environments

The LMD-3251MT is fully compliant and certified for use in most professional medical environments. The display is UL60601-1 listed and complies with CSA C 22.2 No. 60601 and EN60 601-1 safety regulations.

## Optional Accessories

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

**BKM-243HS**, HD-SDI/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

**BKM-30G**, Circular-polarizer 3D Glasses

**BKM-31G**, Clip-on type Circular-polarizer 3D Glasses

**SU-32FW**, Monitor stand

## Specifications

### Picture Performance

Panel	a-Si TFT Active Matrix LCD
Picture Size (Diagonal)	31 5/8 inches 801.3 mm
Effective Picture Size (H x V)	27 1/2 x 15 1/2 inches 698.4 x 392.9 mm
Resolution (H x V)	1920 x 1080 pixels (Full HD)
Aspect	16:9
Pixel Efficiency	0.9999
Backlight	LED
Viewing Angle (Panel Specification)	89°/89°/89°/89° (typical) (up/down/left/right contrast > 10:1)
Vertical Viewing Angle (3D Mode)	35° at a viewing distance more than 24 1/2" (620 mm), crosstalk less than 7% (typical)

### Input

Composite Input	BNC (x1), 1 Vp-p ±3dB sync negative
Y/C Input	Mini-DIN 4-pin (x1), Y: 1 Vp-p ±3dB sync negative, C: 0.286 Vp-p ±3dB (NTSC burst signal level), 0.3 Vp-p ±3dB (PAL burst signal level)
RGB, Component Input	BNC (x3), RGB: 0.7 Vp-p ±3dB (Sync On Green, 0.3 Vp-p sync negative) Component: 0.7 Vp-p ±3dB (75% chrominance standard color bar signal)
DVI-D Input	DVI-D (x1), TMDS single link
HDMI Input	D-sub 15-pin (x1), R/G/B: 0.7 Vp-p sync positive (Sync On Green, 0.3 Vp-p sync negative), Sync: Total level (polarity free, H/V separate sync) Plug & Play function: corresponds to DDC2B
External Sync Input	BNC (x1), 0.3 to 4.0 Vp-p ±bipolarity ternary or negative polarity binary
Option Port	Two (2) ports, Signal format: H: 15 kHz to 45 kHz, V: 48 Hz to 60 Hz
Parallel Remote	Modular connector 8-pin (x1) (Pin-assignable)
Serial Remote (LAN)	D-sub 9-pin (RS-232C) (x1), RJ-45 (x1) (Ethernet, 10BASE-T/100BASE-TX)
DC Input	XLR-type 4-pin (male) (x1), 5V/24V DC (output impedance 0.05 ohms or less)

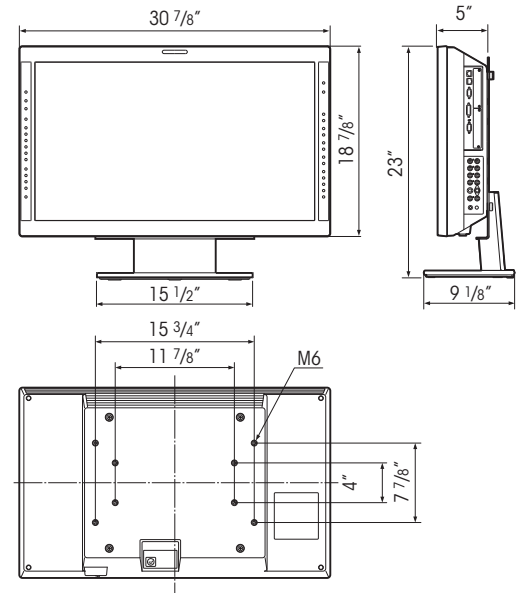
### Output

Composite Output	BNC (x1), Loop-through, with 75 Ω automatic terminal function
Y/C Output	Mini-DIN 4-pin (x1), Loop-through, with 75 Ω automatic terminal function
RGB, Component Output	BNC (x3), Loop-through, with 75 Ω automatic terminal function
External Sync Output	BNC (x1), Loop-through, with 75 Ω automatic terminal function

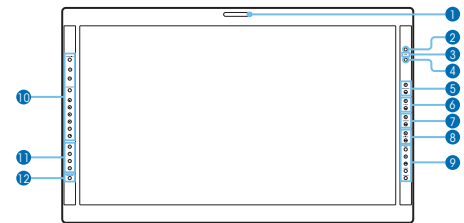
### General

Power Requirements	LCD monitor (LMD-3251MT): - DC Input: 24 V 5.0 A 5 V 0.060 A (Supplied from AC adaptor) AC adaptor (Sony, AC-110MD): - AC Input: 100 V - 240 V AC, 50/60 Hz, 1.53 A - 0.58 A - DC Output: 24 V 5.0 A 5 V 0.060 A	
Power Consumption	Approx. 100 W (max.) (with 2 x BKM-229X)	
Operating Temperature	32°F to 95°F (Recommended: 68°F to 86°F) 0°C to 35°C (Recommended: 20°C to 30°C)	
Operating Humidity	30% to 85% (no condensation)	
Storage / Transport Temperature	-4°F to +140°F -20°C to +60°C	
Storage / Transport Humidity	0% to 90%	
Operating / Storage / Transport Pressure	700 hPa to 1060 hPa	
Dimensions (W x H x D)	30 7/8 x 18 7/8 x 5 inches 783 x 479.2 x 124.3 mm 30 7/8 x 23 x 9 1/8 inches (with SU-32FW optional stand) 783 x 582.8 x 229 mm (with SU-32FW optional stand)	
Mass (with options)	30 lb 7 oz (when 2x BKM-229X installed) 13.8 kg (when 2x BKM-229X installed)	
Mass	29 lb 5 oz (when no input adaptor installed) 13.3 kg (when no input adaptor installed)	
Supplied Accessories	AC adaptor (AC-110MD) (1), AC power cord (1), AC plug holder (2), 3D glasses (glasses-type) (1), 3D glasses (clip-on-type) (1), L/R labels (1), 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), Warranty book (1)	
Certification and Standards	Safety	US/CA: UL 60601-1, CAN/CSA-C22.2 No. 60601-1, EU: EN 60601-1
	EMC	US/CA: FCC Part 15 Class A, ICES-003 Class A, EU: EN 60601-1-2 AU: EN 55011 Class B, J: VCCI Class A
	CB Certification	IEC 60601-1, IEC 60065
Medical Compliances	FD&C Act (FDA)	Class II Medical Device
	MDD (EC)	Class I Medical Device

## Dimensions

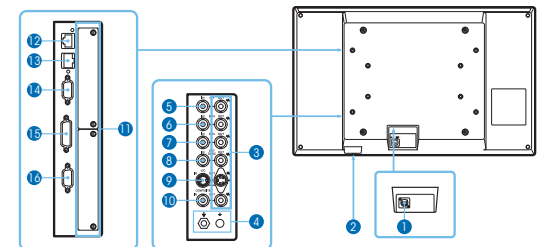


## Front Panel



- 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 DC 5V/24V IN connector
- 2 Power switch
- 3 Loop-through output connectors
- 4 Equipotential/Function Earth terminal
- 5 G/Y IN connector (BNC)
- 6 B/Ps IN connector (BNC)
- 7 R/Pr IN connector (BNC)
- 8 EXT SYNC IN (external sync input) connector (BNC)
- 9 Y/C IN connector (4-pin mini-DIN)
- 10 COMPOSITE IN connector (BNC)
- 11 Optional input port
- 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) connector (BNC)
- 16 HD15 input connector (D-sub 15-pin, female)

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