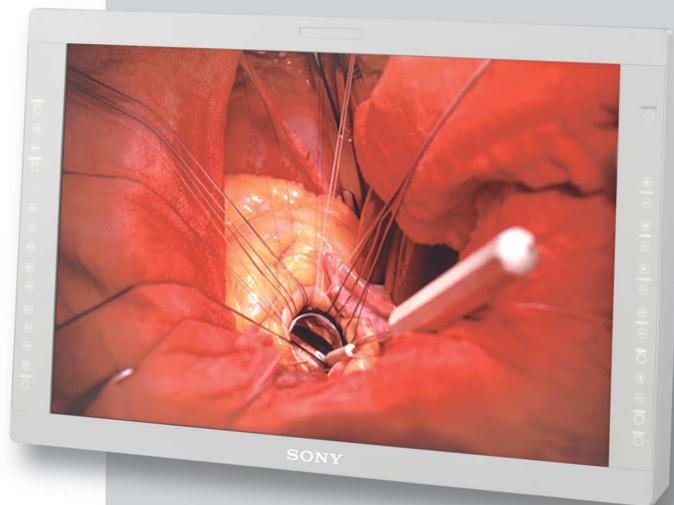


# SONY®

Medical LCD Monitor

## LMD-2450MD



# With Sony Advanced Image Processing Technology, the LMD-2450MD Reproduces Accurate High-Definition Images for Critical Endoscopic Applications

*Sony introduces an exceptional High Definition 24-inch\*1 medical monitor – the LMD-2450MD. This monitor incorporates a superb-quality WUXGA (1920 x 1200) panel, delivering extremely high levels of brightness and high-contrast images to the surgical theater. In addition, the LMD-2450MD accepts almost any SD and HD video signal in both analog and digital, allowing doctors to view images from multiple sources. For accurate image reproduction, the LMD-2450MD incorporates advanced Sony ChromaTRU color processing technology, providing consistent color images across multiple monitors.*

*What's more, the LMD-2450MD complies with the 100-mm VESA mounting standard so it can be attached to a surgical mount arm, making it ideal for use in operating theaters. With other convenient features such as Flexible Display Modes, Selectable Gamma Curves, and a Key-inhibit function, the LMD-2450MD is an ideal choice for surgical endoscopy applications.*

\*1 Viewable area measured diagonally.



## FEATURES

### Safety Listing and Compliance

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The LMD-2450MD 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

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#### ChromaTRU Color Processing

For an extra level of color reproduction accuracy, every LCD panel used in the LMD-2450MD 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-2450MD solves this problem by precisely calibrating each LCD panel's light output so that the R, G, B 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.

#### Excellent Brightness and Contrast (WUXGA Panel)

The LMD-2450MD provides high-brightness and high contrast images by utilizing super-wide aperture WUXGA LCD panels.

#### Natural Gradation and Accurate Color Reproduction (10-Bit DSP)

The LMD-2450MD adopts an advanced full 10-bit digital video signal processor to produce accurate, lifelike images with smooth and natural gradation.

#### Sophisticated I/P (Interlace to Progressive) Conversion

The LMD-2450MD uses an advanced technology to perform sophisticated I/P conversion. This method combines the pixels above, below, and in the diagonal direction of the image in areas where there is movement, and then inserts a natural pixel to create the absent lines. The result is very smooth image reproduction for both moving and static picture areas.

## Input Versatility (Multi-format Signal Support)

The LMD-2450MD monitor can accept almost any signal ranging from SD to HD video, as well as PC signals via its DVI-D or HD15 connectors. In addition to its standard inputs, four different optional input adapters are offered for use in its expansion slot. This flexibility allows images from a variety of medical equipment sources, including endoscopes, to be monitored. The LMD-2450MD also provides parallel and serial control (including via Ethernet) as standard.

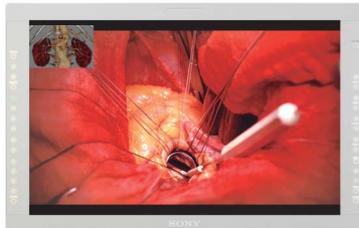
## Operational Convenience

### Gamma Curve Selection

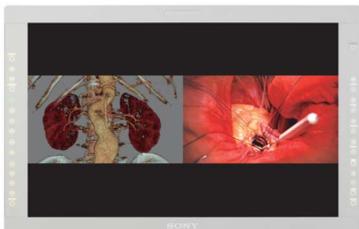
Users can choose from two gamma curves, DICOM or CRT 2.2, whichever is more appropriate for the image being monitored.

### Multiple Display Modes

The LMD-2450MD incorporates multiple display modes such as Picture-in-Picture, and Picture-and-Picture (including a side-by-side split screen). These flexible display modes can be used for special applications such as to view both live video and captured images simultaneously for more comprehensive coverage of the surgical procedure.



Picture-in-Picture



Picture-and-Picture  
(side-by-side split screen)

### Selectable Scan Size/Aspect Ratio

Either a 20% overscan mode or a 0% scan mode can be selected. Also, the aspect ratio can be set to either 16:9 or 4:3 to match the input signal.

### Protected Controls

The key-inhibit function helps prevent inadvertent operation from the control panel.

### Mounting Flexibility (VESA)

The LMD-2450MD complies with the 100-mm hole spacing VESA mounting standard making it ideal for use with surgical equipment arms.

## Input Signals

| Video Signal Formats | Input Signal |              |              |                          | Interface     |                 |                   |                   |                   |                 |
|----------------------|--------------|--------------|--------------|--------------------------|---------------|-----------------|-------------------|-------------------|-------------------|-----------------|
|                      | Total Lines  | Active Lines | Aspect Ratio | Frame rate* <sup>3</sup> | Composite Y/C | Component RGB   | SD-SDI HD-SDI     | SDI 4:2:2         | Composite Y/C     | Component RGB   |
|                      |              |              |              |                          | Standard      |                 | Optional BKM-220D | Optional BKM-227W | Optional BKM-229X |                 |
| 575/50i (PAL)        | 625          | 575          | 16:9 & 4:3   | 25                       | ○             | ○               | ○                 | ○                 | ○                 | ○               |
| 480/60i (NTSC)       | 525          | 483          | 16:9 & 4:3   | 30                       | ○             | ○               | ○                 | ○                 | ○                 | ○               |
| 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                       | –             | ○* <sup>2</sup> | ○                 | –                 | –                 | ○* <sup>2</sup> |
| 1080/25PsF           | 1125         | 1080         | 16:9         | 25                       | –             | ○* <sup>2</sup> | ○                 | –                 | –                 | ○* <sup>2</sup> |
| 1080/24p             | 1125         | 1080         | 16:9         | 24                       | –             | ○* <sup>2</sup> | ○                 | –                 | –                 | ○* <sup>2</sup> |
| 1080/25p             | 1125         | 1080         | 16:9         | 25                       | –             | ○* <sup>2</sup> | ○                 | –                 | –                 | ○* <sup>2</sup> |
| 1080/30p             | 1125         | 1080         | 16:9         | 30                       | –             | ○* <sup>2</sup> | ○                 | –                 | –                 | ○* <sup>2</sup> |
| 1080/50i             | 1125         | 1080         | 16:9         | 25                       | –             | ○               | ○                 | –                 | –                 | ○               |
| 1080/60i             | 1125         | 1080         | 16:9         | 30                       | –             | ○               | ○                 | –                 | –                 | ○               |
| 720/50p              | 750          | 720          | 16:9         | 50                       | –             | ○* <sup>2</sup> | ○                 | –                 | –                 | ○* <sup>2</sup> |
| 720/60p              | 750          | 720          | 16:9         | 60                       | –             | ○               | ○                 | –                 | –                 | ○               |

\*<sup>2</sup> Available with component input only \*<sup>3</sup> Also compatible with 1/1.001 frame rates

## HD15 Input Signal Format

| Resolution      | Dot Clock [MHz] | fH [kHz] | fV [Hz] | Sync Polarity |          |
|-----------------|-----------------|----------|---------|---------------|----------|
|                 |                 |          |         | Horizontal    | Vertical |
| 640x480 @60Hz   | 25.175          | 31.469   | 59.940  | N             | N        |
| 800x600 @56Hz   | 36.000          | 35.156   | 56.250  | P             | P        |
| 800x600 @60Hz   | 40.000          | 37.879   | 60.317  | P             | P        |
| 800x600 @72Hz   | 50.000          | 48.077   | 72.188  | P             | P        |
| 800x600 @75Hz   | 49.500          | 46.875   | 75.000  | P             | P        |
| 800x600 @85Hz   | 56.250          | 53.674   | 85.061  | P             | P        |
| 1024x768 @60Hz  | 65.000          | 48.363   | 60.004  | N             | N        |
| 1024x768 @70Hz  | 75.000          | 56.476   | 70.069  | N             | N        |
| 1024x768 @75Hz  | 78.750          | 60.023   | 75.029  | P             | P        |
| 1024x768 @85Hz  | 94.500          | 68.677   | 84.997  | P             | P        |
| 1152x864 @75Hz  | 108.000         | 67.500   | 75.000  | P             | P        |
| 1280x960 @60Hz  | 108.000         | 60.000   | 60.000  | P             | P        |
| 1280x1024 @60Hz | 108.000         | 63.981   | 60.020  | P             | P        |
| 1600x1200 @60Hz | 162.000         | 75.000   | 60.000  | P             | P        |
| 640x480 @60Hz   | 23.625          | 29.531   | 59.780  | P             | N        |
| 800x600 @60Hz   | 35.500          | 36.979   | 59.837  | P             | N        |
| 1024x768 @60Hz  | 56.000          | 47.297   | 59.870  | P             | N        |
| 1280x960 @60Hz  | 85.250          | 59.201   | 59.920  | P             | N        |
| 1600x1200 @50Hz | 132.375         | 61.742   | 49.994  | N             | P        |
| 1600x1200 @60Hz | 130.375         | 74.077   | 59.981  | P             | N        |
| 1360x768 @50Hz  | 69.500          | 39.489   | 49.922  | N             | P        |
| 1360x768 @60Hz  | 84.625          | 47.649   | 59.936  | N             | P        |
| 1360x768 @60Hz  | 72.000          | 47.368   | 59.960  | P             | N        |
| 1920x1080 @50Hz | 141.375         | 55.572   | 49.975  | N             | P        |
| 1920x1080 @60Hz | 138.625         | 66.647   | 59.988  | P             | N        |
| 1920x1200 @50Hz | 158.000         | 61.719   | 49.975  | N             | P        |
| 1920x1200 @60Hz | 154.125         | 74.099   | 59.999  | P             | N        |
| 1280x1024 @60Hz | 91.000          | 63.194   | 59.957  | P             | N        |
| 1280x768 @50Hz  | 65.125          | 39.518   | 49.959  | N             | P        |
| 1280x768 @60Hz  | 80.125          | 47.693   | 59.992  | N             | P        |
| 1280x768 @75Hz  | 102.875         | 60.091   | 74.926  | N             | P        |
| 1280x768 @60Hz  | 68.250          | 47.396   | 59.995  | P             | N        |
| 720x400 @70Hz   | 28.322          | 31.469   | 70.087  | N             | P        |
| 1280x800 @60Hz  | 68.900          | 48.935   | 59.969  | N             | N        |
| 1920x1200 @60Hz | 154.000         | 74.642   | 59.935  | P             | P        |

N = Negative P = Positive

# SPECIFICATIONS

## Picture Performance

|                                |                                                                   |
|--------------------------------|-------------------------------------------------------------------|
| LCD Panel Type                 | a-Si TFT Active Matrix                                            |
| Resolution                     | WXGA (1920 X 1200)                                                |
| Effective Picture Size (W x H) | Approx. 518 x 324 mm (20 1/2 x 12 7/8 inches)                     |
| Diagonal                       | 609 mm (24 inches)                                                |
| Aspect                         | 16:10                                                             |
| Colors                         | Approx. 16,770,000 colors (8-bit)                                 |
| Viewing Angle                  | 89°/89°/89°/89° (typical)<br>(up/down/left/right contrast > 10:1) |

## Input / Output

|               |                                                                |                                                                                                                                                                          |
|---------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input         | Composite                                                      | BNC (x 1), 1.0 Vp-p ±3dB, sync negative                                                                                                                                  |
|               | Y/C                                                            | 4pin Mini DIN (x 1)<br>Y: 1.0 Vp-p ±3dB, sync negative<br>C: 0.286 Vp-p ±3dB (NTSC), 0.3 Vp-p ±3dB (PAL)                                                                 |
| Component/RGB | BNC (x 3)                                                      | Component: 0.7 Vp-p ±3dB<br>(75% chrominance standard color bar signal)<br>RGB: 0.7 Vp-p ±3dB<br>(Sync On Green, 0.3 Vp-p, sync negative)                                |
|               | Ext. Sync                                                      | BNC (x 1)<br>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-p, sync positive<br>(Sync On Green, 0.3 Vp-p, sync negative)<br>Sync: TTL level (polarity free, H/V separate sync)<br>Plug & Play function: corresponds to DDC-2B |
|               | Optional                                                       | 1 slot<br>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<br>Modular 8-pin (x 1)                                                                                                                                          |
| Output        | Serial                                                         | D-sub 9-pin (RS-232C) (x 1)<br>RJ-45 modular (ETHERNET) (x 1)                                                                                                            |
|               | 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

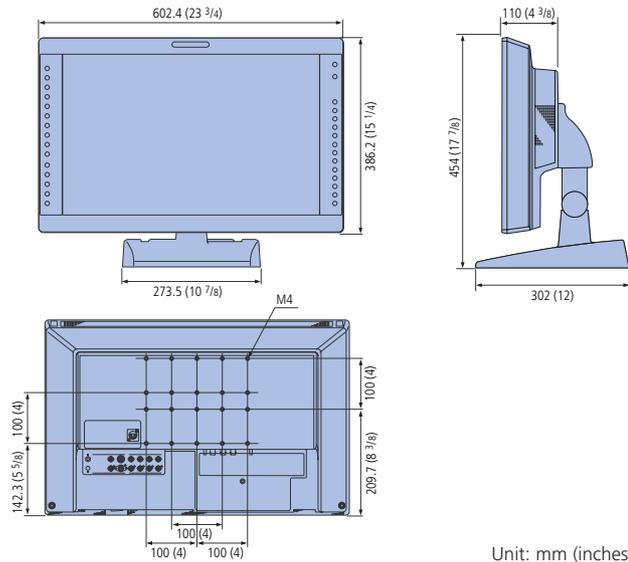
|                                            |                                                                                                                                                                                                                        |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power Consumption                          | Maximum: Approx. 115 W (with 2 x BKM-229X)                                                                                                                                                                             |
| Power Requirements                         | AC 100 to 240 V, 50/60 Hz, 1.2~0.6 A,<br>DC 24 V 3.5 A, 5 V 0.030 A                                                                                                                                                    |
| Operating Temperature                      | 0 to 35 °C (32 to 95 °F),<br>Recommended: 20 to 30 °C (68 to 86 °F)                                                                                                                                                    |
| Operating Humidity                         | 30 to 85 % (no condensation)                                                                                                                                                                                           |
| Storage & Transport Temperature            | -20 to 60 °C (-4 to 140 °F)                                                                                                                                                                                            |
| Storage & Transport Humidity               | 0 to 90 % (no condensation)                                                                                                                                                                                            |
| Operating, Storage, and Transport Pressure | 700 to 1060 hPa                                                                                                                                                                                                        |
| Dimensions (W x H x D)                     | Approx. 602 x 386 x 110 mm<br>(23 3/4 x 15 1/4 x 4 3/8 inches)<br>(including projections)                                                                                                                              |
| Mass                                       | Approx 10 kg (22 lb) (without optional board)                                                                                                                                                                          |
| 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

|             |                             |
|-------------|-----------------------------|
| BKM-220D    | SD-SDI 4:2:2 Input Adaptor  |
| BKM-243HS*4 | HD-SDI/SD-SDI Input Adaptor |
| BKM-227W    | NTSC/PAL Input Adaptor      |
| BKM-229X    | Analog Component Adaptor    |
| SU-560      | Monitor Stand               |

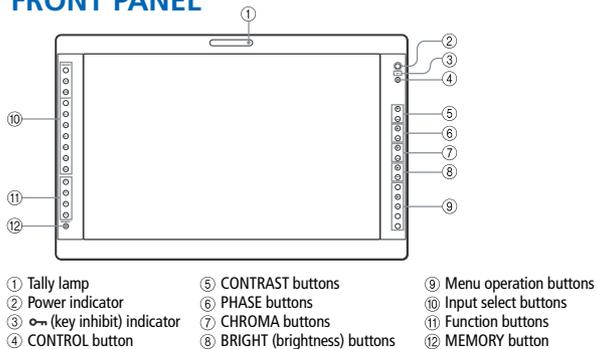
\*4 The LMD-2450MD is equipped with all inputs on the BKM-243HS as standard.

# DIMENSIONS

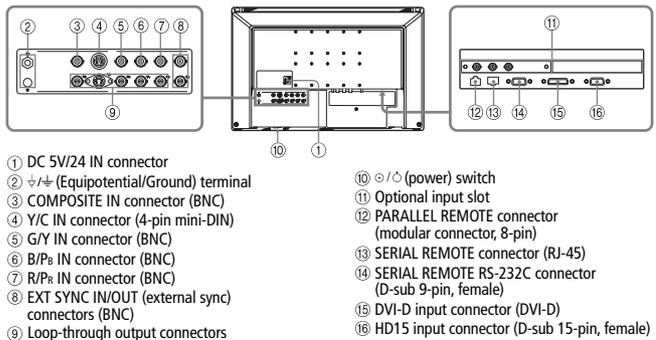


Unit: mm (inches)

# FRONT PANEL



# CONNECTOR PANEL



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