SONY®

LCD Monitor

Instructions for Use

Before operating the unit, please read this manual thoroughly
and retain it for future reference.

LMD-X2705MD
LMD-X2700MD

CE UK CA **4K** HDMI

Indications for Use/Intended Use

The LCD Monitor is intended to provide 4K 2D color video displays of images from endoscopic/laparoscopic camera systems and other compatible medical imaging systems.

The LCD Monitor is a widescreen, high-definition, medical grade monitor for real-time use during minimally invasive surgical procedures and is suitable for use in hospital operating rooms, surgical centers, clinics, doctors' offices and similar medical environments.

Notes

- This equipment is for medical professionals.
- This equipment is intended for use in medical environments, such as clinics, examination rooms, and operating rooms.

Warning

To reduce the risk of fire or electric shock, do not expose this equipment to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

No modification of this equipment is allowed.

Warning

To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

Warning

To disconnect the main power, unplug the power plug.

When installing the unit, incorporate a readily accessible disconnect device in the fixed wiring, or connect the power plug to an easily accessible socket-outlet near the unit.

Do not position the ME equipment where it is difficult to unplug the power plug.

If a fault should occur during operation of the unit, operate the disconnect device to switch the power supply off, or disconnect the power plug.

Symbols on the product

Safety sign
Follow the warnings in the instructions for use for parts of the unit on which this symbol appears.
NOTE   Background color: Blue
            Symbol: White

Consult the instructions for use
Follow the directions in the instructions for use for parts of the unit on which this symbol appears.

This symbol indicates the manufacturer, and appears next to the manufacturer's name and address.

This symbol indicates the Importer, and appears next to the Importer's name and registered office address.

EC | REP   This symbol indicates the European Community representative, and appears next to the European Community representative's name and address.

UK | RP   This symbol indicates the UK Responsible Person, and appears next to the UK Responsible Person's name and address.

CH | REP   This symbol indicates the Swiss authorized representative, and appears next to the Swiss authorized representative's name and address.

MD   This symbol indicates the medical device in the European Community.

This symbol indicates the date of manufacture.

SN   This symbol indicates the serial number.

UDI   This symbol indicates the Unique Device Identifier (UDI), and appears next to the bar code representation of the Unique Device Identification.

This symbol indicates the equipotential terminal which brings the various parts of a system to the same potential.

Storage and transport temperature
This symbol indicates the acceptable temperature range for storage and transport environments.

Storage and transport humidity
This symbol indicates the acceptable humidity range for storage and transport environments.

Storage and transport pressure
This symbol indicates the acceptable atmospheric pressure range for storage and transport environments.

For customers in the U.S.A.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.
All interface cables used to connect peripherals must be shielded in order to comply with the limits for a digital device pursuant to Subpart B of part 15 of FCC Rules.

If you have any questions about this product, you may call;
Sony Customer Information Service Center 1-800-222-7669 or http://www.sony.com/

Supplier's Declaration of Conformity

Trade Name	: SONY
Model	: LMD-X2705MD
	LMD-X2700MD
Responsible party	: Sony Electronics Inc.
Address	: 16535 Via Esprillo,
	San Diego, CA 92127 U.S.A.
Telephone Number	: 858-942-2230

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For customers in the U.S.A.

Caution

Federal law (United States of America) restricts this device to sale by or on the order of a licensed healthcare practitioner.

Rx
ONLY

For customers in Canada

This unit has been certified according to Standard CAN/CSA-C22.2 No. 60601-1.

Important safeguards and notices for use in the medical environments

1. All devices connected to the unit must be certified or compliant according to IEC 60601-1, IEC 60950-1, and IEC 60065 standards and other IEC/ISO standards applicable to the devices.

2. Furthermore, the system as a whole must comply with IEC 60601-1 standards. All peripheral devices connected to the signal input/output sections of the unit constitute the medical-use system, and therefore, the user is responsible for ensuring that the system as a whole complies with IEC 60601-1 standards. If in doubt, consult qualified Sony service personnel.

3. Connecting the unit to other devices may increase the leakage current.

4. For all peripheral devices connected to the unit that operate on commercial power supplies and do not comply with IEC 60601-1 standards, incorporate an isolation transformer that complies with IEC 60601-1 standards and connect to the commercial power supply via the transformer.

5. The unit generates, uses, and may radiate radio frequency energy. If it is not installed and used in accordance with the instruction manual, it may cause interference on other devices. If the unit causes interference (which can be determined by disconnecting the power cord from the unit), try the following.
   – Relocate the unit with respect to the affected devices.
   – Connect the unit and the affected devices to different branch circuits.
   For more information, consult qualified Sony service personnel.
   (Applicable standard: IEC 60601-1-2)

Important EMC notices for use in medical environments

- The LMD-X2705MD/X2700MD needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the instructions for use.
- The LMD-X2705MD/X2700MD is intended for use in a professional healthcare facility environment.
- Portable and mobile RF communications equipment, such as cellular phones, can affect the LMD-X2705MD/X2700MD.

Warning

- Portable RF communications equipment should be used no closer than 30 cm (12 inches) to any part of the LMD-X2705MD/X2700MD. Otherwise, degradation of the performance of this equipment could result.
- If the LMD-X2705MD/X2700MD will be used adjacent to or stacked with other equipment, normal operation of the LMD-X2705MD/X2700MD under such configurations should be verified via observation.
- The use of accessories and cables other than those specified, with the exception of replacement parts sold by Sony Corporation, may result in increased emissions or decreased immunity of the LMD-X2705MD/X2700MD.

Guidance and manufacturer's declaration – electromagnetic emissions		
The LMD-X2705MD/X2700MD is intended for use in the electromagnetic environment specified below. The customer or the user of the LMD-X2705MD/X2700MD should assure that it is used in such an environment.		
Emission test	Compliance	Electromagnetic environment – guidance
RF emissions CISPR 11	Group 1	The LMD-X2705MD/X2700MD uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11 CISPR 32	Class B	The LMD-X2705MD/X2700MD is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class D (AC input) Not applicable (DC input)	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies (AC input) Not applicable (DC input)	

Guidance and manufacturer's declaration – electromagnetic immunity

The LMD-X2705MD/X2700MD is intended for use in the electromagnetic environment specified below. The customer or the user of the LMD-X2705MD/X2700MD should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level		Electromagnetic environment – guidance
		AC input	DC input	
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±15 kV air	±8 kV contact ±15 kV air	±8 kV contact ±15 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, a relative humidity of at least 30% is recommended.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	 ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	±1 kV differential mode ±2 kV common mode	Not applicable	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	0% U_T (100% dip in U_T) for 0.5/1 cycles [a] 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25/30 cycles [a] (for 0.5 sec) 0% U_T (100% dip in U_T) for 250/300 cycles [a] (for 5 sec)	0% U_T (100% dip in U_T) for 0.5/1 cycles [a] 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25/30 cycles [a] (for 0.5 sec) 0% U_T (100% dip in U_T) for 250/300 cycles [a] (for 5 sec)	Not applicable	Mains power quality should be that of a typical commercial or hospital environment. If the user of the LMD-X2705MD/X2700MD requires continued operation during power mains interruptions, it is recommended that the LMD-X2705MD/X2700MD be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

NOTE: U_T is the a.c. mains voltage prior to application of the test level.

a For example, 10/12 means 10 cycles at 50 Hz or 12 cycles at 60 Hz.

Guidance and manufacturer's declaration – electromagnetic immunity

The LMD-X2705MD/X2700MD is intended for use in the electromagnetic environment specified below. The customer or the user of the LMD-X2705MD/X2700MD should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
			Portable and mobile RF communications equipment should be used no closer to any part of the LMD-X2705MD/X2700MD, including cables, than the recommended separation distance calculated from the equation appliance to the frequency of the transmitter. **Recommended separation distance**
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz outside ISM bands [c] 6 Vrms 150 kHz to 80 MHz in ISM bands [c]	3 Vrms 6 Vrms	$d = 1.2\,\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.7 GHz	3 V/m	IEC 60601-1-2: 2007 $d = 1.2\,\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\,\sqrt{P}$ 800 MHz to 2.5 GHz IEC 60601-1-2: 2014 $d = 2.0\,\sqrt{P}$ 80 MHz to 2.7 GHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, [a] should be less than the compliance level in each frequency range. [b] Interference may occur in the vicinity of equipment marked with following symbol:

NOTE 1:   At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2:   These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a   Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the LMD-X2705MD/X2700MD is used exceeds the applicable RF compliance level above, the LMD-X2705MD/X2700MD should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the LMD-X2705MD/X2700MD.

b   Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

c   The ISM (industrial, scientific and medical) bands between 150 kHz and 80 MHz are 6.765 MHz to 6.795 MHz; 13.553 MHz to 13.567 MHz; 26.957 MHz to 27.283 MHz; and 40.66 MHz to 40.70 MHz.

Recommended separation distances between portable and mobile RF communications equipment and the LMD-X2705MD/X2700MD

The LMD-X2705MD/X2700MD is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the LMD-X2705MD/X2700MD can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the LMD-X2705MD/X2700MD as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m				
	IEC 60601-1-2 : 2007			IEC 60601-1-2 : 2014	
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 2.7 GHz $d = 2.0\sqrt{P}$
0.01	0.12	0.12	0.23	0.12	0.20
0.1	0.38	0.38	0.73	0.38	0.63
1	1.2	1.2	2.3	1.2	2.0
10	3.8	3.8	7.3	3.8	6.3
100	12	12	23	12	20

For transmitters rated a maximum output power not listed above, the recommended separation distance *d* in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1:   At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2:   These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Guidance and manufacturer's declaration – electromagnetic immunity

The LMD-X2705MD/X2700MD is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. Portable RF communications equipment should be used no closer than 30 cm (12 inches) to any part of the LMD-X2705MD/X2700MD. Otherwise, degradation of the performance of this equipment could result.

Immunity test	Band [a]	Service [a]	Modulation	IEC 60601 test level	Compliance level
Proximity fields from RF wireless communications equipment IEC 61000-4-3	380 – 390 MHz	TETRA 400	Pulse modulation 18 Hz	27 V/m	27 V/m
	430 – 470 MHz	GMRS 460 FRS 460	FM ±5 kHz deviation 1 kHz sine	28 V/m	28 V/m
	704 – 787 MHz	LTE Band 13, 17	Pulse modulation 217 Hz	9 V/m	9 V/m
	800 – 960 MHz	GSM 800/900 TETRA 800 iDEN 820 CDMA 850 LTE Band 5	Pulse modulation 18 Hz	28 V/m	28 V/m
	1,700 – 1,990 MHz	GSM 1800 CDMA 1900 GSM 1900 DECT LTE Band 1, 3, 4, 25 UMTS	Pulse modulation 217 Hz	28 V/m	28 V/m
	2,400 – 2,570 MHz	Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE Band 7	Pulse modulation 217 Hz	28 V/m	28 V/m
	5,100 – 5,800 MHz	WLAN 802.11 a/n	Pulse modulation 217 Hz	9 V/m	9 V/m

NOTE: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a For some services, only the uplink frequencies are included.

Caution

When you dispose of the unit or accessories, you must obey the laws in the relative area or country and the regulations in the relative hospital regarding environmental pollution.

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Warning on power connections

Use a proper power cord for your local power supply.
1. Use the approved Power Cord (3-core mains lead) / Appliance Connector / Plug with earthing-contacts that conforms to the safety regulations of each country if applicable.
2. Use the Power Cord (3-core mains lead) / Appliance Connector / Plug conforming to the proper ratings (Voltage, Ampere).

If you have questions on the use of the above Power Cord / Appliance Connector / Plug, please consult a qualified service personnel.

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Warning on power connections for medical use

Customers in the U.S.A. and Canada should use the following type of power cord.
Customers in other countries or regions should use the power cord prescribed by their country or region.

	U.S.A. and Canada
Plug type	HOSPITAL GRADE*
Cord type	Min. Type SJT
	Min. 18 AWG
Minimum rating for plug and appliance couplers	10 A / 125 V
Safety approval	UL Listed and CSA

* Note: Grounding reliability can only be achieved when the equipment is connected to an equivalent receptacle marked "Hospital Only" or "Hospital Grade".

Warning

The apparatus shall not be exposed to dripping or splashing. No objects filled with liquids, such as vases, shall be placed on the apparatus.

Warning

Make sure the surface is wide enough so that this apparatus's width and depth don't exceed the surface's edges.
If not, this apparatus may lean or fall over and cause an injury.

Warning

To prevent injury, if mounting the unit using a mounting arm, wall fixture, or other mounting device prepared by the customer, mount the unit securely as described in the instruction manual provided with the mounting device. Check beforehand that the mounting device used has sufficient strength to support the added weight of the unit. Check yearly that the mounting device is securely attached.

Caution

When installing, ensure the following space around the periphery of the unit, taking ventilation and servicing into consideration.
– Rear side: 10 cm (4 in.) or more
– Left/Right sides: 10 cm (4 in.) or more
– Bottom side: 8 cm ($3 \, {}^1/_4$ in.) or more
– Top side: 30 cm ($11 \, {}^7/_8$ in.) or more

Consult with Sony qualified personnel for the following types of installation location.
– Wall mount
– Mounting arm

Caution

The unit is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the unit itself has been turned off.

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Caution

Do not use the device in a MR (Magnetic Resonance) environment.
It may cause a malfunction, fire, and unwanted movement.

Caution

This monitor should only be used with a specified monitor stand.
For information on suitable stands, refer to "Specifications."
Installation of the monitor on any other stands may result in instability, possibly leading to injury.

This equipment is not suitable for use in locations where children are likely to be present.

Disposal of Old Electrical & Electronic Equipment (Applicable in Republic of India)

This symbol and its variations indicate that this product and its components, consumables, parts or spares thereof shall not be treated as household waste and may not be dropped in garbage bins. Product owners are advised to deposit their product at the nearest collection point for the recycling of electrical and electronic equipment. Your co-operation shall facilitate proper disposal & help prevent potential negative consequences/hazards to the environment and human health, which could otherwise be caused by inappropriate waste disposal including improper handling, accidental breakage, damage and/ or improper recycling of e-waste. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, you may contact our company's toll free number and website in India for assistance.
Toll Free: 1800-103-7799
Visit: www.sony.co.in for product recycling

Reduction in the Use of Hazardous Substances in Electrical & Electronic Equipment (Applicable in Republic of India)

This product and its components, consumables, parts or spares comply with the hazardous substances restriction of India's E-Waste (Management) Rules. The maximum allowable concentrations of the restricted substances are 0.1% by weight in homogenous materials for Lead, Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBB) and Polybrominated Diphenyl Ethers (PBDE), and 0.01% by weight in homogenous materials for Cadmium, except for the exemptions specified in Schedule II of the aforesaid Rules.

For the customers in the U.S.A.
SONY LIMITED WARRANTY - Please visit http://www.sony.com/psa/warranty for important information and complete terms and conditions of Sony's limited warranty applicable to this product.

For the customers in Canada
SONY LIMITED WARRANTY - Please visit http://www.sonybiz.ca/pro/lang/en/ca/article/resources-warranty for important information and complete terms and conditions of Sony's limited warranty applicable to this product.

For the customers in Europe
Sony Professional Solutions Europe - Standard Warranty and Exceptions on Standard Warranty. Please visit https://pro.sony/support-services/primesupport/support-professional-solutions-europe-standard-product-warranty for important information and complete terms and conditions.

For the customers in Korea
SONY LIMITED WARRANTY - Please visit http://bpeng.sony.co.kr/handler/BPAS-Start for important information and complete terms and conditions of Sony's limited warranty applicable to this product.

Table of Contents

Precaution

On Safety

- Operate the unit only with a power source as specified in the "Specifications" section.
- The nameplate indicating operating voltage, etc. is located on the rear panel of monitor and the AC adaptor.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for several days or more.
- To disconnect the AC power cord, pull it out by grasping the plug. Never pull the cord itself.
- The socket-outlet shall be installed near the equipment and shall be easily accessible.

On Installation

- Prevent internal heat build-up allowing adequate air circulation.
  Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation holes.
- Do not install the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Do not place the monitor near equipment which generates magnetism, such as a transformer or high voltage power lines.

Safety precautions for using this unit

- Viewing images may result in eye strain, fatigue, nausea, or other symptoms of discomfort. It is best to take frequent breaks when viewing content. Because the length and frequency of breaks will differ from person to person, be sure to trust your instincts when deciding to take breaks from viewing. When feelings of discomfort occur, stop viewing the images until the symptoms subside, and consult with a specialist physician if necessary.
- Avoid using this unit while walking or exercising, or in areas that shake violently, as doing so can increase the chances of feelings of discomfort.

- When connecting the unit to medical equipment, refer to "Precautions when connecting this unit to medical equipment".

Precautions when connecting this unit to medical equipment

- Before using this unit for medical purposes, be sure to confirm that use of this unit will not cause symptoms that may interfere with medical practice, such as eye strain, fatigue, and nausea, etc.
- Refrain from using this unit if symptoms occur that interfere with medical practice, or if such symptoms are likely to occur.
- Depending on the conditions of the video input to the unit (e.g., the steadiness, movement speed, and focus position of the video, the distance from subject, the area of the image the user is viewing) and the general health of the user, the user may experience visual fatigue, tiredness, and other discomfort.
- Before starting a medical procedure, make sure that the image from the connected device is displayed correctly on this unit.

To prolong the life of the unit

Turn off the power to preserve the performance when not in use for a prolonged time.

Cautions for RESPONSIBLE ORGANIZATION when connecting this equipment to IT-NETWORK

- connection of the PEMS to an IT-NETWORK that includes other equipment could result in previously unidentified RISKS to PATIENTS, OPERATORS or third parties;
- the RESPONSIBLE ORGANIZATION should identify, analyze, evaluate and control these RISKS;
- subsequent changes to the IT-NETWORK could introduce new RISKS and require additional analysis; and
- changes to the IT-NETWORK include:
  - changes in the IT-NETWORK configuration;
  - connection of additional items to the IT-NETWORK;
  - disconnecting items from the IT-NETWORK;

- update of equipment connected to the IT-NETWORK; and
- upgrade of equipment connected to the IT-NETWORK.

Use with electrosurgical knives and similar devices

If this unit is used together with an electrosurgical knife, etc., the picture may be disturbed, warped or otherwise abnormal as a result of strong radio waves or voltages from the device. This is not a malfunction.
When you use this unit simultaneously with a device from which strong radio waves or voltages are emitted, confirm the effect of this before using such devices, and install this unit in a way that minimizes the effect of radio wave interference.

Recommendation to Use more than One Unit

As problems can occasionally occur for the monitor, when the monitor is used for safety control of personnel, assets or stable picture, or for emergencies, we strongly recommend you use more than one unit or prepare a spare unit.

LCD image display

Due the physical characteristics of LCD panels, there may be a decrease in brightness or change in color temperature over a long period of use. These problems are not a malfunction.
In addition, these occurrences will not affect recorded data.

About the LCD Display Panel

- The LCD panel fitted to this unit is manufactured with high precision technology, giving a functioning pixel ratio of at least 99.99%. Thus a very small proportion of pixels may be "stuck", either always off (black), always on (red, green, or blue), or flashing. In addition, over a long period of use, because of the physical characteristics of the liquid crystal display, such "stuck" pixels may appear spontaneously. These problems are not a malfunction.

- Do not leave the LCD screen facing the sun as it can damage the LCD screen. Take care when you place the unit by a window.
- Do not push or scratch the LCD screen. Do not place a heavy object on the LCD screen. This may cause the screen to lose uniformity.
- If the unit is used in a cold place, a residual image may appear on the screen. This is not a malfunction. When the monitor becomes warm, the screen returns to normal.
- The screen and the cabinet become warm during operation. This is not a malfunction.

On a Long Period of Use

Due to the characteristics of LCD panel, displaying static images for extended periods, or using the unit repeatedly in a high temperature/high humidity environments may cause image smearing, burn-in, areas of which brightness is permanently changed, lines, or a decrease in overall brightness.

In particular, continued display of an image smaller than the monitor screen, such as in a different aspect ratio, may shorten the life of the unit.
Avoid displaying a still image for an extended period, or using the unit repeatedly in a high temperature/high humidity environment such an airtight room, or around the outlet of an air conditioner.

To prevent any of the above issues, we recommend reducing brightness slightly, and to turn off the power whenever the unit is not in use.

On Burn-in

For LCD panel, permanent burn-in may occur if still images are displayed in the same position on the screen continuously, or repeatedly over extended periods.

Images that may cause burn-in
- Masked images with aspect ratios other than 16:9
- Color bars or images that remain static for a long time
- Character or message displays that indicate settings or the operating state

To reduce the risk of burn-in
- Turn off the character displays
  Press the MENU button to turn off the character displays. To turn off the character displays of the connected equipment, operate the connected equipment accordingly. For details, refer to the operation manual of the connected equipment.
- Turn off the power when not in use
  Turn off the power if the monitor is not to be used for a prolonged period of time.

On Fan Error

The fan for cooling the unit is built in. When the fan error indication appears on the screen, turn off the power and contact an authorized Sony dealer.

On Temperature Error

When this unit is used in a high temperature environment and the internal temperature rises, a temperature error is displayed on the screen. When the temperature error is displayed, contact an authorized Sony dealer.

On condensation

If the unit is moved suddenly to a location with a different temperature or the ambient temperature changes suddenly, moisture may form on the outer surface of the unit and/or inside of the unit. This is known as condensation. If condensation occurs, turn off the unit and wait until the condensation clears before operating the unit. Operating the unit while condensation is present may damage the unit.

On Security

- SONY WILL NOT BE LIABLE FOR DAMAGES OF ANY KIND RESULTING FROM A FAILURE TO IMPLEMENT PROPER SECURITY MEASURES ON TRANSMISSION DEVICES, UNAVOIDABLE DATA LEAKS RESULTING FROM TRANSMISSION SPECIFICATIONS, OR SECURITY PROBLEMS OF ANY KIND.
- Depending on the operating environment, unauthorized third parties on the network may be able to access the unit. When connecting the unit to the network, be sure to confirm that the network is protected securely.
- This unit is equipped with a maintenance function performed via a network. Maintenance may be performed with your consent.
- This product is used with a leased line or intranet connection. Do not connect to an external network, as security issues may occur.

On Cleaning

Before cleaning
Be sure to disconnect the AC power cord from the AC outlet.

On cleaning the monitor
A material that withstands disinfection is used for the front protection plate of the medical use LCD monitor. The protection plate surface is specially treated to reduce reflection of light. When solvents such as benzene or thinner, or acid, alkaline or abrasive detergent, or chemical cleaning cloth are used for the protection plate surface/monitor surface, the performance of the monitor may be impaired or the finish of the surface may be damaged. Take care with respect to the following:
- Clean the protection plate surface/monitor surface with a 50 to 70 v/v% concentration of isopropyl alcohol or a 76.9 to 81.4 v/v% concentration of ethanol using a swab method. Wipe the protection plate surface gently (wipe using less than 1 N force).
- Stubborn stains may be removed with a soft cloth such as a cleaning cloth lightly dampened with mild detergent solution using a swab method and then clean using the above chemical solution.
  Never use solvents such as benzene or thinner, or acid, alkaline or abrasive detergent, or chemical cleaning cloth for cleaning or disinfection, as they will damage the protection plate surface/monitor surface.
- Do not use unnecessary force to rub the protection plate surface/monitor surface with a stained cloth. The protection plate surface/monitor surface may be scratched.
- Do not keep the protection plate surface/monitor surface in contact with a rubber or vinyl resin product for a long period of time. The finish of the surface may deteriorate or the coating may come off.

On Repacking

Do not throw away the carton and packing materials. They make an ideal container which to transport the unit.
If you have any questions about this unit, contact your authorized Sony dealer.

About this manual

The instructions in this manual are for the following models:
- LMD-X2705MD
- LMD-X2700MD

The illustration of LMD-X2705MD is used for the explanations. Any differences in specifications are clearly indicated in the text.

Features

This monitor displays color video images that are output from medical imaging systems on the LCD (liquid crystal display) panel.
Liquid crystal and color filters are laid on the front of flat light source (backlight) on the LCD panel. And then, the LCD panel displays images by controlling the aperture of the liquid crystal according to input signals.

Compliance with medical safety standards in U.S.A., Canada and Europe

IEC 60601-1 and product safety standards in the U.S.A., Canada and Europe have been obtained for this monitor.
The monitor is designed for use in the medical treatment field, with the sheet switch, screen protect panel, etc.

High brightness/high-resolution 4K panel

A 4K high-resolution (3840 × 2160) panel and wide field of view technology enables you to use the monitor under various lighting conditions and in numerous ways (installing on the wall, using several monitors to view an image, etc.).

Control panel

Assigns functions frequently used during an operation to buttons on the front surface of the monitor. The panel provides an user interface superior in operability through navigation by luminescent colors and status of the buttons.

Flat surface for better maintenance

The design allows the user to easily wipe liquids and gel off the LCD panel and control buttons – ensuring a high standard of disinfection and cleanliness.

Location and Function of Parts and Controls

Front Panel
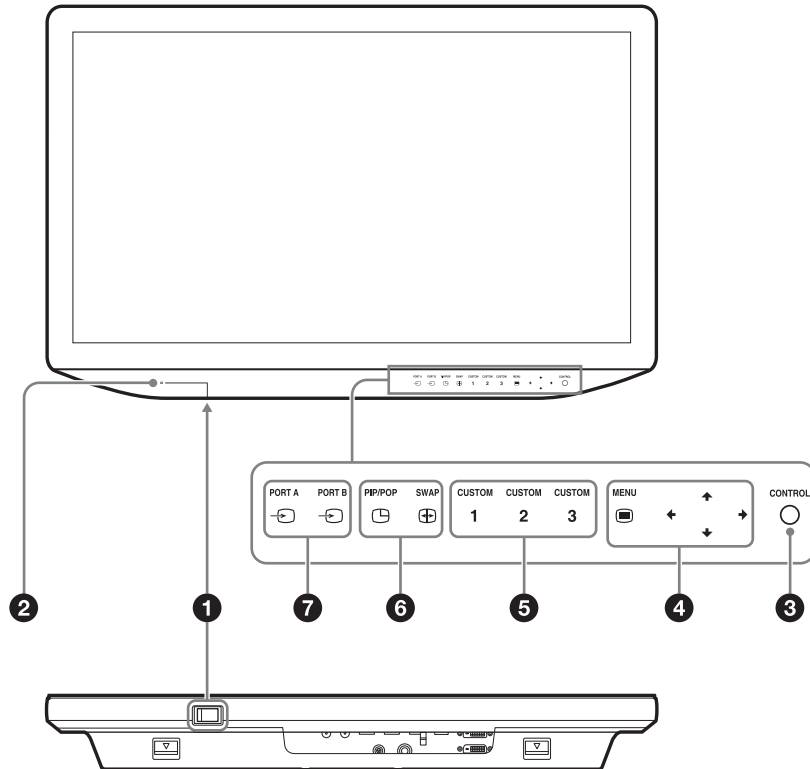
❶ I (On)/⏻ (Standby) switch
Press the **I** side to turn the monitor on. Press the ⏻ side to switch the unit to standby state.

❷ Power indicator

Indicator	Operating State
Green	Power on
Flashes in Green	Power on with image displayed (reduced backlight due to high temperature)
Orange	Standby
Flashes in Orange	No image displayed (remote standby)

❸ ○ CONTROL button
Displays or hides the operation buttons on the front panel.
Selects the items depending on the menu types.

❹ OSD menu operation buttons
  ▣ MENU button
  Press to display the on-screen menu.
  Press again to hide the menu.

  ↑/↓/←/→ buttons
  Press to select the items and setting values.

❺ CUSTOM buttons
Turns on or off the assigned function. You can adjust the assigned function by pressing the ←/→ buttons. (Refer to the custom buttons of the system configuration menu on page 28 and of the default setting on page 29.)
The following functions are assigned in the default setting.
  CUSTOM 1: Brightness
  CUSTOM 2: Contrast
  CUSTOM 3: Flip Pattern

❻ Multi-image display setting buttons
  ⊡ PIP/POP: For displaying the multi-image display or switching the multi-image display mode.
  ⊕ SWAP: For swapping between the main display and the sub display.

❼ Input select buttons

⊖ **PORT A/PORT B:** Each input connector can be assigned for PORT A/B.
In the default setting, Display Port 1 is assigned for PORT A and Display Port 2 is assigned for PORT B.
When you press ⊖ PORT A or ⊖ PORT B when it is lit in green, a menu for selecting the input connector assigned to the PORT A/B is displayed.
When you press ⊖ PORT A or ⊖ PORT B when it is lit in white, an image from the input connector assigned to the PORT A/B is displayed.

Input Signals and Adjustable/Setting Items

| Item	Input signal						
	DP1/DP2		HDMI		DVI-D		SDI (LMD-X2705MD only)
	Video	PC	Video	PC	Video	PC	
Gamma	○	○	○	○	○	○	○
Phase	○	○	○	○	○	○	○
Chroma	○	○	○	○	○	○	○
Brightness	○	○	○	○	○	○	○
Contrast	○	○	○	○	○	○	○
Color Temperature	○	○	○	○	○	○	○
Mono	○	○	○	○	○	○	○
Sharpness H	○	○	○	○	○	○	○
Sharpness V	○	○	○	○	○	○	○
RGB Range	○	○	○	○	○	○	✕
Color Space	○	○	○	○	○	○	○
4K Scan Size	○ 1)	✕ 4)	○ 1)	✕ 4)	✕	✕	✕
HD Scan Size	○ 2)	✕ 4)	○ 2)	✕ 4)	○ 2)	✕ 4)	○ 2)
SD Scan Size	○ 3)	✕ 4)	○ 3)	✕ 4)	○ 3)	✕ 4)	○ 3)
Flip Pattern	○	○	○	○	○	○	○
SD Aspect	○ 3)	✕ 4)	○ 3)	✕ 4)	○ 3)	✕ 4)	○ 3)
HDMI Signal Format	✕	✕	○	○	✕	✕	✕

○ : Can be adjusted/set
✕ : Cannot be adjusted/set

1) Reflected on the screen only when the 4K equivalent signal is input.
2) Reflected on the screen only when the HD signal is input.
3) Reflected on the screen only when the SD signal is input.
4) The setting value can be changed but is not applied to the screen when the PC signal is input.

Rear/Bottom Panel
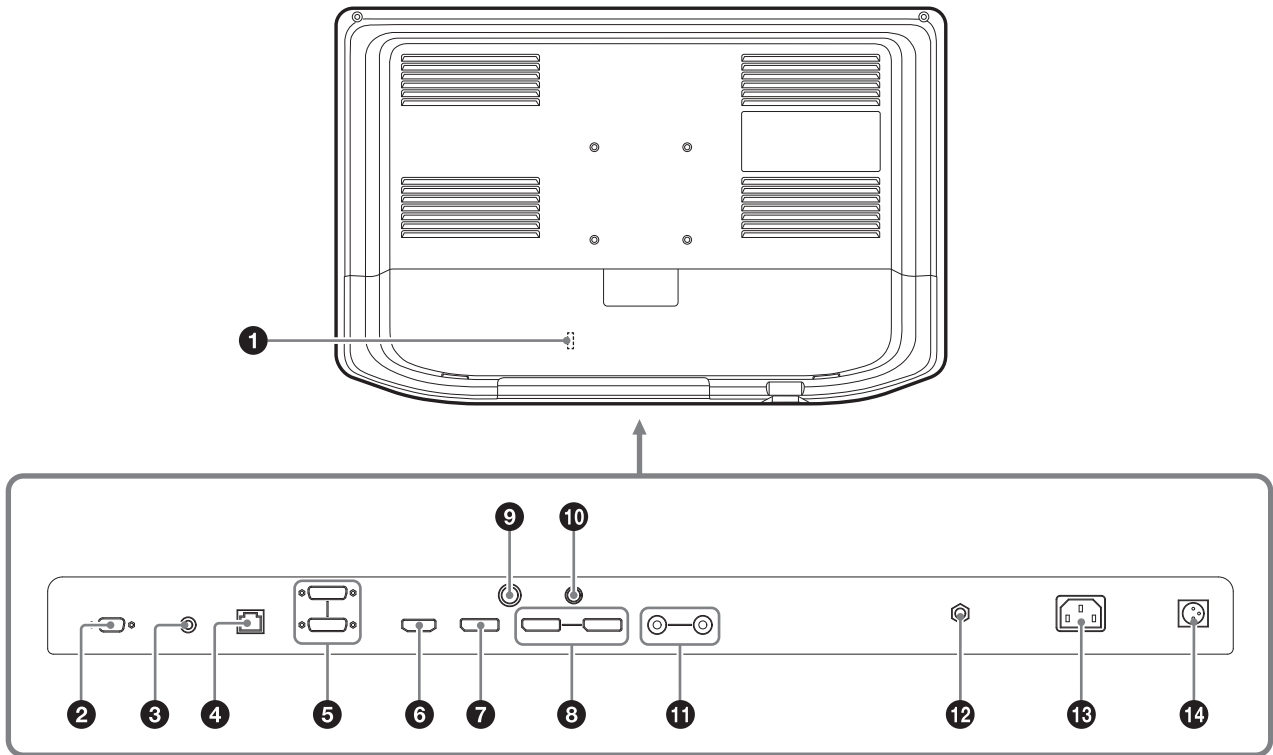
❶ HDMI cable holder
Secures the HDMI cable (Ø7 mm or less).

Close

Cable
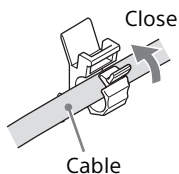
❷ ⧄ SERIAL REMOTE RS-232C connector (D-sub 9-pin, female)
The monitor can be operated according to control commands sent from connected external equipment.

❸ ⧄ REMOTE connector (Stereo mini jack)
The monitor can be operated partially by connecting the optional Foot Switch FS-24.

❹ ⧄ SERIAL REMOTE connector (RJ-45)
The monitor can be operated according to control commands sent from connected external equipment.
Connect to the network by using a 10BASE-T/100BASE-TX LAN cable (non-shielded type of 5 or more category, optional).

Note
Consult with Sony qualified personnel at using this terminal.

Caution
For safety, do not connect the connector to peripheral device wiring that might have excessive voltage.
Follow the instructions for use for this port.

Note

The connection speed may be affected by the network system. This unit does not guarantee the communication speed or quality of 10BASE-T/100BASE-TX.

❺ **DVI-D input/output connector (DVI-D)**
 ⊸ **input connector**
Input connector of DVI Rev.1.0 applicable
digital signal.
 ⊸ **output connector**
Active through output connector of the DVI
digital signal.
The signal protected by HDCP [1] is not output.

1) HDCP (High-bandwidth Digital Content
   Protection) is a copyright protection technology
   using encryption technology of digital video
   signals.

| Notes |

• A signal is output from the connector only
  when the monitor is turned on. When the
  monitor is turned off, the signal is not output
  from the connector.
• The DVI-D input/output connector is not
  compatible with the 4K equivalent signal. For
  details, refer to "Available signal formats" on
  page 33.

❻ ⊸ **HDMI input connector**
Input connector for HDMI signals.
Use the Premium High Speed cable that is
shorter than 3 m (meters) with the cable-type
logo. (Cables manufactured by Sony are
recommended.)

❼ ⊸ **DP1 (Display Port 1) input connector**
Input connector for Display Port signals.
Display Port is an interface developed by VESA
that supports transfer of both video and audio
digital signals on a single cable.
Use the DisplayPort standard version 1.2-certified
cable.

| Note |

This monitor does not support Display Port audio
signals.

❽ **DP2 (Display Port 2) input/output
   connector**
 ⊸ **input connector**
Input connector for Display Port signals.
 ⊸ **output connector**
Output connector for Display Port signals. The
signals are output when signals input to the
DP2 input connector are displayed on the
screen. HDCP-protected signals are not output.

❾ ⎓ ⊸ **12V 2.5A (DC output) connector**
Outputs 12 volts for connected external
equipment.

❿ ⎓ ⊸ **5V 2.0A (DC output) connector**
Outputs 5 volts for connected external
equipment.

⓫ **SDI input/output connector (BNC type)
   (LMD-X2705MD only)**
 ⊸ **input connector**
Input connector for serial digital component
signals (HD/SD).
 ⊸ **output connector**
Active through output connector for serial
digital component signals (HD/SD).

Recommended cables
3G-SDI: Coaxial cable L-5CFB manufactured by
Canare Electric Co., Ltd. or an equivalent cable
HD-SDI: Coaxial cable L-5CFB manufactured by
Canare Electric Co., Ltd. or an equivalent cable
SD-SDI: Coaxial cable L-5CFB manufactured by
Canare Electric Co., Ltd. or an equivalent cable

| Notes |

• An SDI signal is output from the output
  connector only when the monitor is turned on.
  When the monitor is turned off, the signal is
  not output from the output connector.
• Be sure to connect equipment or cables
  specified by Instructions for Use of this monitor
  to the SDI output connectors. If you connect
  unspecified equipment or cables, the monitor
  may affect the operation of the connected
  equipment.

⓬ ▽ **(Equipotential) terminal**
Connects the equipotential plug.

⓭ **AC input connector**
Connects the supplied AC power cord.

⓮ ⎓ ⊸ **(DC input) connector**
Connect the DC connector of the optional AC
adaptor.

Warning
For the DC power supply, make sure to use the
optional AC adaptor, AC-300MD.
If another power supply is used, there is a risk of
fire or electric shock.

⬛ⓘ

Warning

Using this unit for medical purposes

The connectors on this unit are not isolated.
Do not connect any device other than one which conforms to IEC 60601-1 standards.
When an information technology device or AV device that uses an alternating current is connected, current leakage may result in an electric shock to the patient or operator.
If use of such a device is unavoidable, isolate its power supply by connecting an isolation transformer, or by connecting an isolator between the connecting cables.
After implementing these measures, confirm that the reduced risk now conforms to IEC 60601-1 standards.

⬛ⓘ

Caution

Do not touch a connector terminal and the patient at the same time.
Doing so may result in a generation of voltage that can be harmful to patients if the unit is malfunctioning.
Always disconnect the power cord before connecting and disconnecting connectors.

Preparation

Connecting

1 Make sure that the **I** (On)/ ⏻ (Standby) switch is set to ⏻ (Standby).

2 Remove the connector cover.

While pressing the lock levers to the direction △, slide off the connector cover.

Lock lever

Lock lever
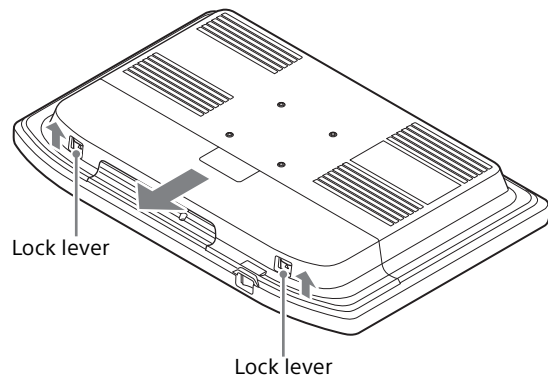
3 Connect the connection cable.

The connection cable should be wired to fit in the cable clamp.

Cable clamp
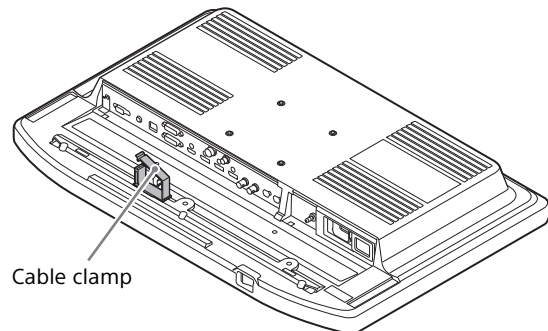
4 Connect the AC power cord.

Slide the shutter of the AC power connector to show the AC input connector, and plug the AC power cord into the AC input connector.

Shutter

AC input connector

AC power cord

AC plug holder
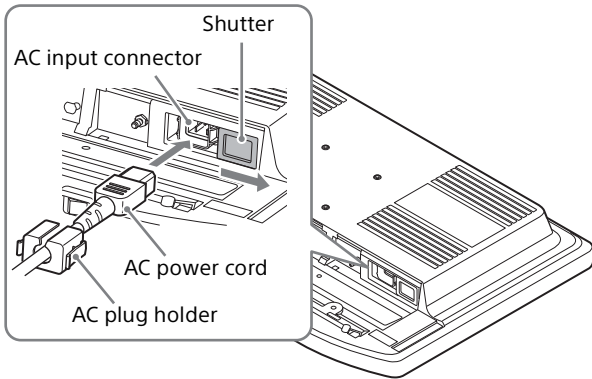
When using the AC adaptor (optional)
Slide the shutter to show the DC input connector and insert the DC connector to the DC input connector until it locks. Then, plug the AC power cord into the optional AC adaptor.
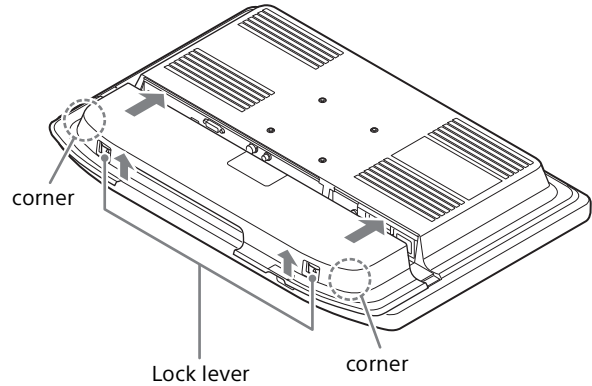

DC input connector

Shutter
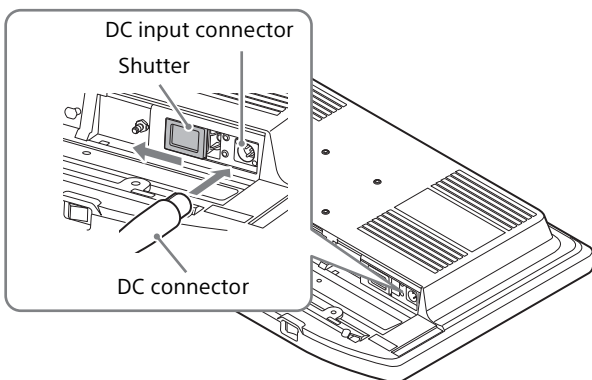
DC connector

Note

When the cable cover is removed, it can be used as a cable outlet for the connection cable and AC power cord.

Cable cover
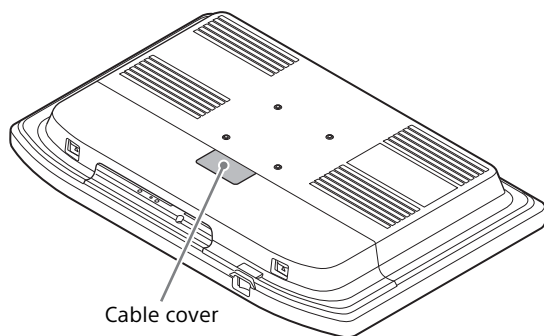
5 Attach the connector cover.

While pushing the lock levers upward in the △ direction, push the corners of the connector cover to slide it towards the monitor to attach.

corner

Lock lever   corner

Notes

• Do not slide the connector cover by pushing the lock levers, as the lock levers may become damaged.
• Slide the connector cover all the way in until it locks in place. If it is not completely locked in place, the connector cover may fall off.

To unplug the AC power cord

Press the **I** (On)/ ⏻ (Standby) switch to the ⏻ (Standby) side to set the unit to the standby state, then unplug the AC power cord from the AC power plug holder by holding both sides of the fixing levers of the holder to release the lock. When the optional AC adaptor is used, set the unit to the standby state, then unplug the AC power cord from the AC adaptor before disconnecting the DC connector from the unit.

Turning on the Monitor/Switching Input Settings

1 Press the **I** (On)/ ⏻ (Standby) switch to the **I** (On) side to turn on the monitor.

The power indicator on the front panel lights in green.

2 Switch the input settings.

If the desired image is not displayed, press the CONTROL button to show the operation buttons on the front panel, then press ⊡ PORT A or ⊡ PORT B.

Note

For details on switching the input settings, refer to "Location and Function of Parts and Controls" on page 16 or "Input/Output Configuration menu" on page 26.

Initial Setting

When you turn on the unit for the first time after purchasing it, select the area and language where you intend to use this unit from among the options.

To set the using area

1 Turn on the unit.

The Area Setting screen appears.

```
Area Setting

World Wide (Except Japan)        ►
Japan                            ►
```

2 Press the CONTROL button.

3 Press the ♠ or ♥ button to select the area where you intend to use the unit and press the ➡ button.

4 When the confirmation screen is displayed, press the ⬅ or ➡ button to select Yes and press the CONTROL button.

The Area Setting screen disappears and the Language Setting screen appears.
The following item in the menu is automatically applied to the value corresponding to the selected area.

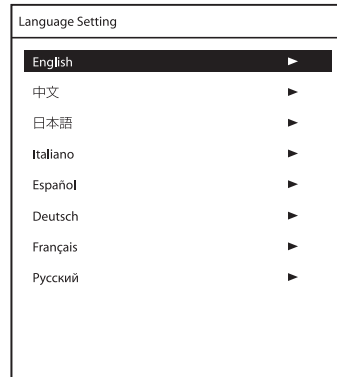| Area	Color Temperature
World Wide (Except Japan)	D65
Japan	D93

Note

If you have selected the wrong area, change the Color Temperature setting (page 25).

To set the using language

You can select one of eight languages (English, Chinese, Japanese, Italian, Spanish, German, French, and Russian) for display on the menu and other on-screen displays. The default menu language is set to "English."

1 On the Language Setting screen, press the ♠ or ♥ button to select the desired language and press the ➡ button.

```
Language Setting

English          ►
中文             ►
日本語           ►
Italiano         ►
Español          ►
Deutsch          ►
Français         ►
Русский          ►
```

2 When the confirmation screen is displayed, press ⬅ or ➡ button to select Yes and press the CONTROL button.

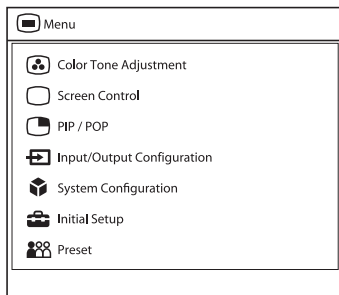The menu changes to the selected language.

Using the Menu

The unit is equipped with an on-screen menu for making various adjustments and settings such as picture control, input setting, setting change, etc.

For changing the display language, refer to "Language" (page 27) in the System Configuration menu.
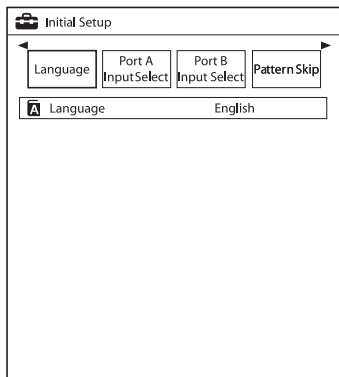
MENU ■   ← ↑ → ↓   CONTROL ○

2   3~6   1
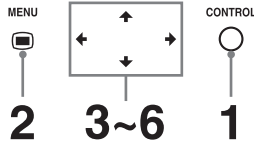
1 Press the CONTROL button.

The operation buttons are displayed.

2 Press the MENU button.

The menu-selecting screen appears.
The menu presently selected is shown in blue.

```
■ Menu

  ⊙ Color Tone Adjustment
  ◯ Screen Control
  ▢ PIP / POP
  ⊞ Input/Output Configuration
  ◈ System Configuration
  ⌂ Initial Setup
  ♙ Preset
```

3 Press the ▲/▼ button to select a menu.

When you press the ➡ or CONTROL button, the selected menu appears and setting items of the selected tab are displayed.

```
⌂ Initial Setup

  Language | Port A Input Select | Port B Input Select | Pattern Skip

  A Language          English
```

4 Press the ←/➡ button to select the tab.

The selected tab is shown in blue, and setting items of the selected tab appear.

5 Select an item.

Press the ▲/▼ button to select the item.
The item to be changed is displayed in blue.

6 Make the setting or adjustment on an item.

When changing the adjustment level:
To increase the number, press the ➡ button.
To decrease the number, press the ← button.
When selecting the setting:
Press the ←/➡ button to select the setting.

> **Note**
>
> If the Control Lock is set to "On," the setting cannot be changed.
> For details about Control Lock, see page 27.

To hide the menu

Press the MENU button.
The menu disappears automatically if a button is not pressed for one minute.

To hide the operation buttons

Press the CONTROL button.

About the storage of the settings

The adjusted settings are automatically stored in the monitor memory.
For details on settings for the next power-on, refer to "Power On Setting" in (page 27) the System Configuration menu.

About the control navigation

Depending on the state, the operation buttons of the unit light as shown below:
White light: Operable state.
Green light: Operating state.
Off: Unable to operate.

Adjustment Using the Menus

Items

The screen menu of this monitor consists of the following items.

⊙ Color Tone Adjustment (page 24)

Gamma
Phase
Chroma
Brightness
Contrast
Color Temperature
Gain R Offset
Gain G Offset
Gain B Offset
Bias R Offset
Bias G Offset
Bias B Offset
Mono
Sharpness H
Sharpness V
RGB Range
Color Space

▢ Screen Control (page 25)

4K Scan Size
HD Scan Size
SD Scan Size
Flip Pattern
SD Aspect
HDMI Signal Format

▢ PIP / POP (page 25)

Clipping Size
Sub Screen Position
Pattern Skip

⊡ Input/Output Configuration (page 26)

Port A Input Select
Port B Input Select
Input Name
Power Supply
HDCP Setting
Auto Input Select

📦 System Configuration (page 27)

Control Lock

OSD Setting
Power On Setting
Power Save
Serial Remote
Remote
Ethernet Setting
Custom Button
Panel Display
I/P Mode
Monitor Information

🧰 Initial Setup (page 28)

Language
Port A Input Select
Port B Input Select
Pattern Skip
PIP / POP
Custom Button
Auto Input Select

👥 Preset (page 29)

Load User Setting
Save User Setting
User Name
Load Default

Adjusting and changing the settings

⊙ Color Tone Adjustment menu

The Color Tone Adjustment menu is used to adjust picture quality for each input.
You need to use the measurement instrument to adjust the color temperature.
Recommended: Konica Minolta color analyzer CA-310 or an equivalent instrument

Submenu	Setting
Gamma	Select the appropriate gamma mode from among "1.8," "2.0," "2.2," "2.4," "2.6," "DICOM," "HLG." "DICOM" is for reference, not diagnostic, purposes only. Select "HLG" when the input signal is HDR-HLG.
Phase	Adjusts color tones. The higher the setting, the more greenish the picture. The lower the setting, the more purplish the picture.
Chroma	Adjusts color intensity. The higher the setting, the greater the intensity. The lower the setting, the lower the intensity.
Brightness	Adjusts brightness.
Contrast	Adjusts contrast.

Submenu	Setting
Color Temperature	Select the color temperature from among "D56," "D65," "D93."

Note

If the setting is changed, Gain R/G/B Offset and Bias R/G/B Offset are restored to 0 respectively.

Submenu	Setting
Gain R Offset Gain G Offset Gain B Offset	Adjust color temperature in detail, and color balance (Gain).
Bias R Offset Bias G Offset Bias B Offset	Adjust color temperature in detail, and color balance (Bias).
Mono	Sets the display to a monochrome picture. Set to "On" for a monochrome picture, set to "Off" for a normal (chromatic) picture.
Sharpness H	Adjusts the horizontal sharpness. The higher the setting, the sharper the picture. The lower the setting, the softer the picture.
Sharpness V	Adjusts the vertical sharpness. The higher the setting, the sharper the picture. The lower the setting, the softer the picture.
RGB Range	Select the RGB signal range from "Auto," "Limited," "Full." If you set to "Auto," this item is set to "Limited" when inputting video signals, and "Full" when inputting PC signals.
Color Space	Select the color gamut from "Auto," "BT.709," "BT.2020," "Native." Select "Auto" only for the HDMI input connector.

⬚ Screen Control menu

The Screen Control menu is used to set the image display setting for each input.

| Submenu	Setting
4K Scan Size	Select the scan size for the 4K signal display from "Off," "Mode4," "Underscan." Selecting "Underscan" reduces the screen size to approximately 80%.
HD Scan Size	Select the scan size for the HD signal display from "Off," "Mode2," "Mode3," "Underscan." Selecting "Underscan" reduces the screen size to approximately 80%.
SD Scan Size	Select the scan size for the SD signal display from "Off," "Mode1."
Flip Pattern	Select the flip pattern of the image display from "Off," "Rotation," "Mirror."
SD Aspect	Select the aspect ratio of the SD signal display from "4:3," "16:9."

Submenu	Setting
HDMI Signal Format	Select the HDMI signal format from "Standard Format," "Enhanced Format."

- Standard Format:
  Select to use for a standard HDMI format signal.
- Enhanced Format:
  Select to use for a high-resolution HDMI format signal [1] or HDR-compatible HDMI format signal.

  1) Signals in resolutions of 3840 × 2160 or 4096 × 2160 are listed below:
  4:4:4 RGB/YCbCr-50P/60P-8bit signals
  4:2:2 YCbCr-50P/60P-12bit signals
  4:4:4 RGB/YCbCr-25P/30P-10bit signals

Notes

- Images and sounds may not be output correctly with "Enhanced Format." In that case, select "Standard Format."
- To display the corresponding signal with "Enhanced Format," use a Premium High-Speed HDMI cable within a length of 3 meters (Sony product recommended).

⬚ PIP / POP menu

The PIP / POP menu is used to set the display mode for the multi-image display and for each input.

Submenu	Setting
Clipping Size	Select the clipping size of the HD signal from "Normal," "4:3," "5:4" when displaying the multi-image display.
Sub Screen Position	
PIP	Sets the sub screen position for the multi-image display (PIP).
POP	Sets the sub screen position for the multi-image display (POP).
Pattern Skip	Sets the pattern that is skipped when changing the displaying pattern by pressing the PIP/POP button on the front panel while displaying multi-image display. Set to "Not Skip" or "Skip" for the PIP1, PIP2, POP1, or POP2 pattern.

⬅️➡️ Input/Output Configuration menu

Submenu	Setting
Port A Input Select	Sets the input connector that is skipped when changing the input signal by pressing the PORT A button. Set to "Not Skip" or "Skip" for the Display Port 1, Display Port 2, HDMI, DVI-D, SDI (LMD-X2705MD only) input connector.
Port B Input Select	Sets the input connector that is skipped when changing the input signal by pressing the PORT B button. Set to "Not Skip" or "Skip" for the Display Port 1, Display Port 2, HDMI, DVI-D, SDI (LMD-X2705MD only) input connector.
Input Name	Set the name of the Display Port 1, Display Port 2, HDMI, DVI-D, SDI (LMD-X2705MD only) input connector. • Endoscope • Laparoscope • Ultrasound • Recorder • Printer • PACS • C-arm • Room Camera • Surgical Camera • Microscope • Vital Device
Power Supply	• 5V Output (DVI-D): Select "On" when the 5 V output power of the DVI-D input connector is output. Select "Off" when the power is not output. • DC Output Select: Select "5V OUT" when voltage is output from the 5V 2.0A (DC output) connector. Select "12V OUT" when voltage is output from the 12V 2.5A (DC output) connector. Select "Off" when voltage is not output.
HDCP Setting	Sets the HDCP setting for signals input to the DP2 ⬅️➡️ input connector and DVI-D ⬅️➡️ input connector. • Enable: Sets to use the signals protected with HDCP. • Disable: Sets to use the signals not protected with HDCP. Signals are output from the DP2 ➡️ output connector and DVI-D ➡️ output connector only when the HDCP Setting is set to "Disable" with the signals not protected with HDCP.

Note

When "Disable" is set for the signals protected with HDCP, images are not displayed.

Submenu	Setting
Auto Input Select	Select the auto detection setting of the input signal from "Mode1," "Mode2," "Off." • Mode1: Inputting signals to the input connector automatically changes connectors.

Notes

- When "Auto Input Select" is set to "Mode1" and there is no input signal to any connector, inputting a signal to one of the connectors detects the signal and displays it on the screen.
- When a signal is input to one of the connectors, the "Auto Input Select" function does not operate even if a signal is input to another connector.
- When "Skip" is set for the signal input connector, the signal is displayed on the screen.
- When using a multi-image display, the detected signal is displayed on the main display.
- If a signal is detected while displaying the menu, the menu will be hidden.

• Mode2:
Gives priority to PORT A and switches the PORT automatically.

Notes

- When "Auto Input Select" is set to "Mode2" and a signal is input to the connector assigned to PORT A, or PORT A and PORT B, the PORT A signal is displayed on the screen. When a signal is not input to the connector assigned to PORT A or the signal disappears in the middle of input, and a signal is input to the connector assigned to only PORT B, the PORT B signal is displayed on the screen.
- When a signal is input to the connector assigned to PORT A while displaying the PORT B signal on the screen, the PORT A signal is displayed on the screen.
- If a signal is input to the connector not assigned to PORT A/B, the signal is not displayed on the screen.
- If a signal is detected while displaying the menu, the menu will be hidden.

Submenu	Setting
	• Off: The Auto Input Select function does not operate.

📦 System Configuration menu

Submenu	Setting
Control Lock	
Control Lock	Set when you want to limit the operation of the control panel. Set to "Off" for no limit, "On" to limit.
Lock Mode	Sets the range to limit the operation of the control panel. This setting is available when "Control Lock" is set to "On." • Menu: Limits the menu operations other than the control lock setting. • Menu&Button: Limits all operations other than the control lock setting.
OSD Setting	
Menu Position	Sets the screen position for the OSD menu.
Status Display	Select Port, Input Connector Name, Control Lock, Signal Format, Scan Size, Flip Pattern, PIP/POP Mode, and Energy Saving Mode are displayed.

Select Port   Input Connector Name   Control Lock

⟶A SDI   O⟋ㄇ

1080/60i ⟶ Signal Format

Scan Size: Mode1 ⟶ Scan Size

ⴽ Ꮭ Ⴘ

Flip Pattern   Energy Saving Mode

PIP/POP Mode
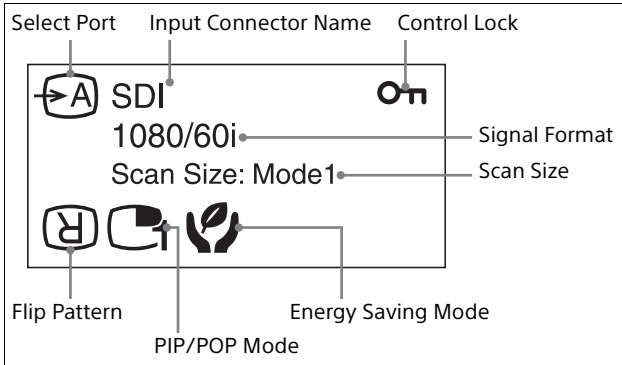
Submenu	Setting
	• Auto: The format and scan mode are displayed temporarily when the content of Status Display is changed. • On: The format and scan mode are always displayed. • Off: The format and scan mode are not displayed.

Notes

- Even if "Status Display" is set to "Auto" or "Off," the flip pattern is always displayed.

ⴽ

- For details about the signal format, refer to no signal and incompatible signal displays.

Input	Signal format display
No signal	No Sync
Non compatible signal (except for DVI-D)	Unknown
Non compatible signal (DVI-D)	Out Of Range

Submenu	Setting
Language	You can select the menu or message language from the following languages. • English: English • 中文: Chinese • 日本語: Japanese • Italiano: Italian • Español: Spanish • Deutsch: German • Français: French • Русский: Russian
Power On Setting	
Power On Mode	Select the setting when the monitor is turned on from the following settings. • Last: The setting when the monitor was last turned off. • Default Setting: The setting that is set in the default setting. • User1 to 20: The selected user setting.
Logo	When the power turns on, select from among "On - 5sec," "On - 10sec," "On - 30sec," "On - 60sec," "On - 120sec," "Off."

Submenu	Setting
Power Save	
Energy Saving Mode	You can select the energy saving mode from the following options. • Off: Turns the energy saving mode off. • Mode1: Dims the backlight. • Mode2 [1]: Stabilizes the backlight to a low brightness state and stops the rotation of the fan. 1) It stops the output of voltage from the DC output connectors. When the monitor reaches a higher temperature, the fan rotates.
Sleep Mode	Sets the sleep mode to on or off. When you set to "On," the monitor enters into power saving mode by turning off the backlight if there is no input signal from the selected connector for more than 1 minute.
Serial Remote	
Serial Remote	Selects the using mode. • Off: Disables the serial remote function. • RS-232C: Controls this unit via RS-232C command. • Ethernet: Controls this unit via Ethernet command.
Remote	
Remote Mode	Sets the remote function when the REMOTE connector is connected to the optional Foot Switch FS-24. • Off: Disables the remote function. • Port: Switches between PORT A and PORT B. When PORT A is selected, it is switched to PORT B. When PORT B is selected, it is switched to PORT A. • PIP/POP: Switches between the single-image display and multi-image display (PIP1/PIP2/POP1/POP2).
Ethernet Setting	Sets the Ethernet. • IP Address: Sets the IP Address. • Subnet Mask: Sets the Subnet Mask. • Default Gateway: Sets "On" or "Off" of the Default Gateway. • Address: Sets the Default Gateway. • Save: Saves the confirmed setting. • Cancel: Returns to the previous setting from the confirmed setting.

Submenu	Setting
Custom Button	Assigns the function to the CUSTOM 1, CUSTOM 2 or CUSTOM 3 button on the front panel, and can set the following functions to on or off. • No Setting • Scan Size • Flip Pattern • POP Sub Screen Position • Gamma • Mono • Phase • Chroma • Brightness • Contrast
Panel Display	
Backlight	Adjusts the brightness of the display. A higher setting increases the brightness of the display, and a lower setting darkens the display.
I/P Mode	Set to minimize delay due to image processing in the monitor when it is mainly the interlace signal being input to the DVI or SDI connector. • Mode1: Prioritizes picture quality. An interpolation is performed between the fields depending on the movement of the images. Image processing time will be longer than when set in "Mode2" or "Mode3." The factory default is "Mode1." • Mode2 [1]: Shortens image processing time. The lines in the odd fields and even fields are combined alternately regardless of the movement of the images. • Mode3 [1] [2]: Minimizes image processing time. An interpolation is performed by repeating each line in the data receiving sequence once, regardless of the field. 1) When an interlace signal is being input, jitter, flicker, or image lag may occur in the images. 2) When used with other devices, such as electrosurgical knife, image irregularity or distortion may occur and/or the monitor may fail to operate correctly.
Monitor Information	
Software Version	Displays the software version.

Initial Setup menu

The Initial Setup menu is used to make the basic settings to use the unit.

Submenu	Setting
Language	You can select the menu or message language from the following languages. • English: English • 中文: Chinese • 日本語: Japanese • Italiano: Italian • Español: Spanish • Deutsch: German • Français: French • Русский: Russian
Port A Input Select	Sets the input connector that is skipped when changing the input signal by pressing the PORT A button. Set to "Not Skip" or "Skip" for the Display Port 1, Display Port 2, HDMI, DVI-D, SDI (LMD-X2705MD only) connector.
Port B Input Select	Sets the input connector that is skipped when changing the input signal by pressing the PORT B button. Set to "Not Skip" or "Skip" for the Display Port 1, Display Port 2, HDMI, DVI-D, SDI (LMD-X2705MD only) connector.
Pattern Skip	Sets the pattern that is skipped when changing the displaying pattern by pressing the PIP/POP button on the front panel while using multi-image display. Set to "Not Skip" or "Skip" for the PIP1, PIP2, POP1, or POP2 pattern.
PIP / POP	
PIP Sub Screen Position	Sets the sub screen position for the multi-image display (PIP).
POP Sub Screen Position	Sets the sub screen position for the multi-image display (POP).
PORT A HD Clipping Size/ PORT B HD Clipping Size	Select the clipping size of the HD signal from "Normal," "4:3," "5:4" when displaying the multi-image display.
Custom Button	Assigns the function to the CUSTOM 1, CUSTOM 2 or CUSTOM 3 button on the front panel, and can set the following functions to on or off. • No Setting • Scan Size • Flip Pattern • POP Sub Screen Position • Gamma • Mono • Phase • Chroma • Brightness • Contrast

Submenu	Setting
Auto Input Select	• Mode1: Inputting signals to the input connector automatically changes connectors. • Mode2: Gives priority to PORT A and switches the PORT automatically. • Off: The Auto Input Select function does not operate. For details, see page 26.

👪 Preset menu

The Preset menu is used to set the User1 to 20 preset setting.

Submenu	Setting
Load User Setting	Loads the settings that are stored User1 to 20.
Save User Setting	Stores the current settings to User1 to 20.
User Name	Registers the user names to User1 to 20.
Load Default	Loads the default settings.

Troubleshooting

This section may help you isolate the cause of a problem and as a result, eliminate the need to contact technical support.

- **The unit cannot be operated** → The key protection function is enabled. Set the Control Lock setting to "Off" (page 27).
- **The black bars appear at the upper and lower positions of the display** → When the signal aspect ratio is different from that of the panel, the black bars appear. This is not a failure of the unit.
- **Images of the DVI-D signal and Display Port 2 signal are not displayed.** → When the HDCP-protected signals are input to the DVI-D ⊖ input connector and DP2 ⊖ input connector, and the HDCP Setting is set to "Disable," the image is not displayed on the screen. Set the HDCP Setting to "Enable" (page 26).
- **While the logo is displayed, the operation buttons do not operate when pushed.** → While the logo is displayed, the operation buttons do not operate. After the logo disappears, the operation buttons can be operated. The logo display time can be set in the menu (page 27).
- **The display is dark.** → When the unit is used in a high temperature environment, the brightness of the display backlight is reduced to lower the temperature inside the unit. When this function is activated, the power indicator flashes in green.

Error Messages

When the following messages appear on the screen, turn off the power and contact an authorized Sony dealer.

Messages	Description
Fan Error	A malfunction occurs in the fan.
Temperature Error	The temperature of this unit has increased.

Specifications

Picture performance

LCD panel   a-Si TFT Active Matrix
Pixel efficiency
        99.99%
Viewing angle (panel specification)
        89°/89°/89°/89° (typical) (up/
          down/left/right, contrast >
          10:1)
Efficient picture size
        596.2 × 335.3, 684.0 mm (w/h, dia)
          ($23\,^1/_2 \times 13\,^1/_4$, 27 inches)
Resolution   H 3 840 dots, V 2 160 lines
Aspect ratio   16:9

Input

Display Port input connector
        Display Port connector (2)
        SST, HDCP1.3 correspondence
HDMI input connector
        HDMI connector (1)
        HDCP1.4 correspondence
DVI-D input connector
        DVI-D connector (1)
        TMDS single link, HDCP1.4
          correspondence
SDI input connector (LMD-X2705MD only)
        BNC type (1)
          SD: SMPTE ST 259 compliant
          HD: SMPTE ST 292-1 compliant
          3G: SMPTE ST 424 compliant
Remote connector
  Serial remote
        D-sub 9-pin (RS-232C) (1)
        RJ-45 modular connector
          (ETHERNET) (1)
  Remote   Stereo mini jack (1)
AC input connector
        100 V to 240 V, 50/60 Hz
DC input connector
        DC 26 V

Output

Display Port output connector
        Display Port connector (1)
DVI-D output connector
        DVI-D connector (1)

SDI output connector (LMD-X2705MD only)
        BNC type (1)
DC 5V OUT   Round type pin (female) (1)
DC 12V OUT   Round type pin (female) (1)

General

Power   AC IN: 100 V - 240 V, 50/60 Hz,
          1.5 A - 0.7 A
        DC IN: 26 V, 5.2 A (Supplied from
          AC adaptor)
Power consumption
        Maximum: approx. 149 W
Operating conditions
  Temperature
        0 °C to 35 °C (32 °F to 95 °F)
  Humidity   30% to 85% (no condensation
          allowed)
  Pressure   700 hPa to 1 060 hPa
Storage and transport conditions
  Temperature
        −20 °C to +60 °C (−4 °F to +140 °F)
  Humidity   20% to 90%
  Pressure   700 hPa to 1 060 hPa
Accessories supplied
        AC plug holder (2)
        Before Using This Unit (1)
        CD-ROM (including the
          Instructions for Use) (1)
        Service Contact List (1)
        Information for Customers in
          Europe (1)
Optional accessories
        AC adaptor
          AC-300MD
        Monitor stand
          SU-600MD
        Foot Switch
          FS-24

Caution

- AC-300MD does not conform to the drip-proof level of protection. Do not operate the unit in a place exposed to liquids, such as a floor in a surgical operating room.
- The FS-24 has an Ingress Protection rating of IPX3. Therefore, do not operate it environments exposed to splashing liquids (e.g., surgical operating rooms).
  For safety, use a device with a rating of IPX6 or higher when operating in such environments.

Medical Specifications

Protection against electric shock:
  Class I
Protection against harmful ingress of water:
  Only the front side (symbol: FR) IPX5
  Other sides (symbol: OTH) IPX2
Degree of safety in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide:
  Not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide
Mode of operation:
  Continuous

Design and specifications are subject to change without notice.

Notes
- Always verify that the unit is operating properly before use. SONY WILL NOT BE LIABLE FOR DAMAGES OF ANY KIND INCLUDING, BUT NOT LIMITED TO, COMPENSATION OR REIMBURSEMENT ON ACCOUNT OF THE LOSS OF PRESENT OR PROSPECTIVE PROFITS DUE TO FAILURE OF THIS UNIT, EITHER DURING THE WARRANTY PERIOD OR AFTER EXPIRATION OF THE WARRANTY, OR FOR ANY OTHER REASON WHATSOEVER.
- SONY WILL NOT BE LIABLE FOR CLAIMS OF ANY KIND MADE BY USERS OF THIS UNIT OR MADE BY THIRD PARTIES.
- SONY WILL NOT BE LIABLE FOR THE TERMINATION OR DISCONTINUATION OF ANY SERVICES RELATED TO THIS UNIT THAT MAY RESULT DUE TO CIRCUMSTANCES OF ANY KIND.

Pin assignment

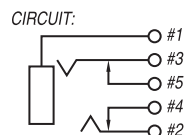### SERIAL REMOTE (RS-232C) connector
D-sub 9-pin, female
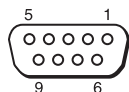
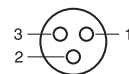| Pin number	Signal
1	NC
2	RX
3	TX
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC

REMOTE (stereo mini jack) connector

Pin number	Signal
1	GND
2	On (short to sleeve) Off (open)
3	NC
4	Insert detection
5	NC

5V 2.0A (DC output) connector

Pin number	Signal
1	5 V
2	NC
3	GND

12V 2.5A (DC output) connector
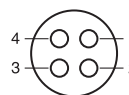
Pin number	Signal
1	GND
2	NC
3	12 V
4	NC

Available signal formats

The unit is compatible with the signal systems shown below:

Signal format		SDI (LMD-X2705MD only)
SD-SDI		
720×487/59.94i [3]	4:2:2 YCbCr 10bit	○
720×576/50i	4:2:2 YCbCr 10bit	○
HD-SDI		
1920×1080/24p [1]	4:2:2 YCbCr 10bit	○
1920×1080/25p	4:2:2 YCbCr 10bit	○
1920×1080/30p [1]	4:2:2 YCbCr 10bit	○
1920×1080/50i	4:2:2 YCbCr 10bit	○
1920×1080/60i [1]	4:2:2 YCbCr 10bit	○
1280×720/24p [1]	4:2:2 YCbCr 10bit	○
1280×720/25p	4:2:2 YCbCr 10bit	○
1280×720/30p [1]	4:2:2 YCbCr 10bit	○
1280×720/50p	4:2:2 YCbCr 10bit	○
1280×720/60p [1]	4:2:2 YCbCr 10bit	○
3G-SDI		
1920×1080/50p	4:2:2 YCbCr 10bit	○
1920×1080/60p [1]	4:2:2 YCbCr 10bit	○

Signal format		Display Port 1, 2	HDMI	DVI-D
640×480/60p [1]	4:4:4 RGB 10bit/8bit [2]	○	○	○
720×480/60p [1]	4:4:4 RGB 10bit/8bit [2]	○	○	○
	4:4:4 YCbCr 10bit/8bit [2]	○	○	×
720×576/50p	4:4:4 RGB 10bit/8bit [2]	○	○	○
	4:4:4 YCbCr 10bit/8bit [2]	○	○	×
1920×1080/50i [4]	4:4:4 RGB 10bit/8bit [2]	○	○	○
	4:4:4 YCbCr 10bit/8bit [2]	○	○	×
	4:2:2 YCbCr 12bit	×	○	×
	4:2:2 YCbCr 10bit/8bit [2]	○	×	×
1920×1080/60i [1] [4]	4:4:4 RGB 10bit/8bit [2]	○	○	○
	4:4:4 YCbCr 10bit/8bit [2]	○	○	×
	4:2:2 YCbCr 12bit	×	○	×
	4:2:2 YCbCr 10bit/8bit [2]	○	×	×
1280×720/50p	4:4:4 RGB 10bit/8bit [2]	○	○	○
	4:4:4 YCbCr 10bit/8bit [2]	○	○	×
1280×720/60p [1]	4:4:4 RGB 10bit/8bit [2]	○	○	○
	4:4:4 YCbCr 10bit/8bit [2]	○	○	×
1920×1080/50p	4:4:4 RGB 10bit/8bit [2]	○	○	○
	4:4:4 YCbCr 10bit/8bit [2]	○	○	×
	4:2:2 YCbCr 12bit	×	○	×
	4:2:2 YCbCr 10bit/8bit [2]	○	×	×

Signal format		Display Port 1, 2	HDMI	DVI-D
1920×1080/60p [1]	4:4:4 RGB 10bit/8bit [2]	○	○	○
	4:4:4 YCbCr 10bit/8bit [2]	○	○	×
	4:2:2 YCbCr 12bit	×	○	×
	4:2:2 YCbCr 10bit/8bit [2]	○	×	×
3840×2160/60p [1]	4:4:4 RGB 8bit	○	○	×
	4:4:4 YCbCr 8bit	○	○	×
	4:2:2 YCbCr 12bit	×	○	×
	4:2:2 YCbCr 10bit/8bit [2]	○	×	×
	4:2:0 YCbCr 10bit/8bit [2]	×	○	×
3840×2160/50p	4:4:4 RGB 8bit	○	○	×
	4:4:4 YCbCr 8bit	○	○	×
	4:2:2 YCbCr 12bit	×	○	×
	4:2:2 YCbCr 10bit/8bit [2]	○	×	×
	4:2:0 YCbCr 10bit/8bit [2]	×	○	×
3840×2160/30p [1]	4:4:4 RGB 10bit/8bit [2]	○	○	×
	4:4:4 YCbCr 10bit/8bit [2]	○	○	×
3840×2160/25p	4:4:4 RGB 10bit/8bit [2]	○	○	×
	4:4:4 YCbCr 10bit/8bit [2]	○	○	×
4096×2160/60p [1]	4:4:4 RGB 8bit	○	○	×
	4:4:4 YCbCr 8bit	○	○	×
	4:2:0 YCbCr 10bit/8bit [2]	×	○	×
4096×2160/50p	4:4:4 RGB 8bit	○	○	×
	4:4:4 YCbCr 8bit	○	○	×
	4:2:0 YCbCr 10bit/8bit [2]	×	○	×
4096×2160/30p [1]	4:4:4 RGB 10bit/8bit [2]	○	○	×
	4:4:4 YCbCr 10bit/8bit [2]	○	○	×
4096×2160/25p	4:4:4 RGB 10bit/8bit [2]	○	○	×
	4:4:4 YCbCr 10bit/8bit [2]	○	○	×
800×600/60p [1]	4:4:4 RGB 10bit/8bit [2]	○	○	○
1024×768/60p [1]	4:4:4 RGB 10bit/8bit [2]	○	○	○
1280×768/60p [1]	4:4:4 RGB 10bit/8bit [2]	○	○	○
1360×768/60p [1]	4:4:4 RGB 10bit/8bit [2]	○	○	○
1600×1200/60p [1]	4:4:4 RGB 10bit/8bit [2]	○	○	○
1920×1200/60p (RB) [1]	4:4:4 RGB 10bit/8bit [2]	○	○	○
1920×1200/50p	4:4:4 RGB 10bit/8bit [2]	○	○	○
3840×2160/60p (RB) [1]	4:4:4 RGB 8bit	○	×	×

1) Also compatible with the frame rate 1/1.001.
2) Switches automatically between RGB/YCbCr format and 8/10bit according to the input signals. However, the DVI-D input is supported only for 8bit.
3) The signal 720 × 487/60i is described as "480/60i" with the signal format of OSD menu in this manual.
4) When using Display Port 1, Display Port 2 and HDMI input, jittering, flickering, or ghosting may occur in the images.

PC signal (DVI)
Range of DVI input signal (Compatible with up to 1920 × 1080/60 Hz)
   Vertical frequency: 50.0 Hz to 85.1 Hz
   Horizontal frequency: 31.0 kHz to 75.0 kHz
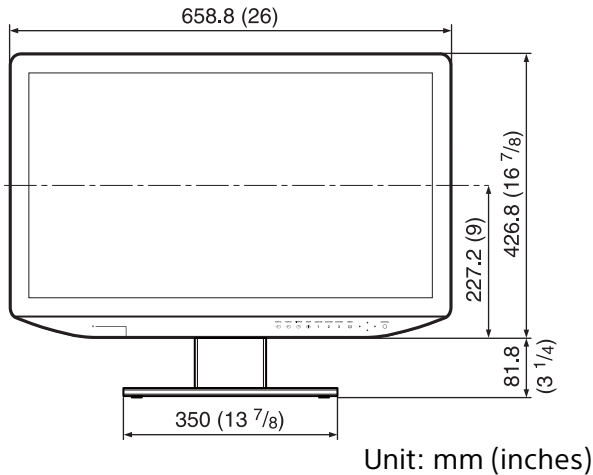   Dot clock: 25.175 MHz to 148.5 MHz
   Picture size, phase: automatic discrimination by the DE (Data Enable) signal
   Displays normally up to a maximum horizontal resolution of 1920 dots.
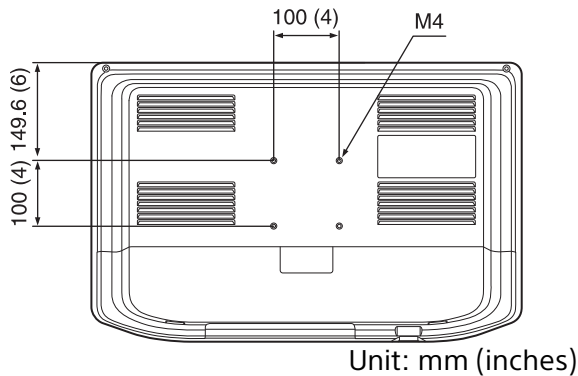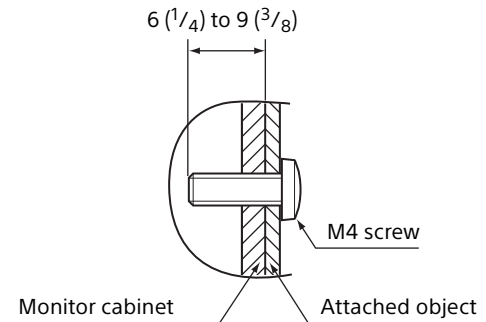
Dimensions

Front

When an optional stand SU-600MD is attached

658.8 (26)

426.8 (16 $^7/_8$)

227.2 (9)

81.8 (3 $^1/_4$)

350 (13 $^7/_8$)

Unit: mm (inches)

Rear (VESA Mount Instruction)

100 (4)   M4

149.6 (6)

100 (4)

Unit: mm (inches)

* Length of M4 screws (4)

6 ($^1/_4$) to 9 ($^3/_8$)

M4 screw

Monitor cabinet   Attached object

Unit: mm (inches)

Warning
- Be sure to set the tightening torque value to the following value.
  Torque value: 1.2±0.1 N·m
- Make sure the tightening torque value is at this value. If the torque value is not appropriate, the mounting part may become damaged or the screws may become loosened, and in the worst case, it may cause injury or damage to the unit due to the unit falling.
- The supplied screws are accommodated mounts with a thickness of 3 to 6 mm ($^1/_8$ to $^1/_4$ inches). When securing them to other objects, refer to the figure shown above and use the screws recommended for the attached object.
- When mounting the unit to objects such as movable mounting arms, if excessive force is applied, the mounting part may become damaged, and in the worst case, it may cause injury or damage to the unit due to the unit falling. To use the monitor with the movable mounting arm, hold the handle of the mounting arm to move the monitor and avoid applying excessive force to the mounting part.

Side

When an optional stand SU-600MD is attached

Unit: mm (inches)
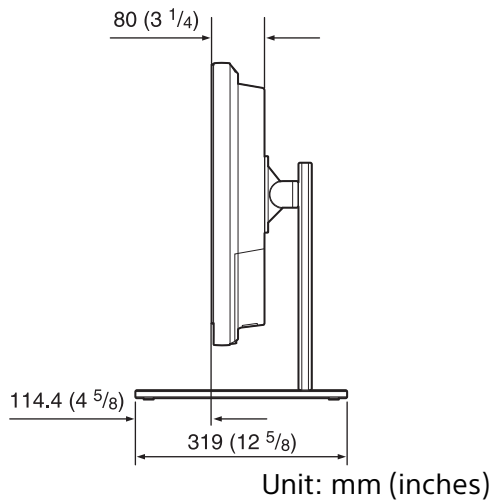
Mass:
  Approx. 8.8 kg (19 lb 6.4 oz) (when the optional stand is not installed)

Licenses

This product includes FreeRTOS, Linux, BusyBox, uClibc, U-Boot, uIP, and SHA-256 algorithm implementation (C/C++) software licensed under GNU General Public License, GNU Lesser General Public License, BSD License, and MIT License terms.
For details on the license, refer to "Software License Information" on the CD-ROM.
Each condition informs users that they have the rights to procure, alter, and redistribute the software source code.
For details on the source code, contact your local Sony representative. However, be aware that Sony will not answer questions concerning the data in the source code.