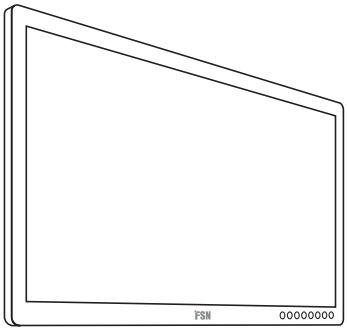

FSN

4K UHD Monitor

Instructions for Use

FM-E3230D
FM-E3230DG
FM-E3230DN
FM-E3250D
FM-E3250DG
FM-E3250DN

4K UHD

Before connecting, operating or adjusting this product, please read this instruction booklet carefully and completely.

English

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The specifications and information in this document are subject to change without notice.

Instructions for Use for this product are also available in electronic form (eIFU). Choose from several languages. Use Adobe Acrobat software to view eIFUs. Access the eIFUs online at fsnmed.com/support/eifu/

Product Description / Intended Use

This product from FSN Medical Technologies is a high-end surgical display monitor designed for advanced digital OR applications. This medical display is uniquely equipped to handle tasks in the demanding operating room environment. Performance characteristics include:

- Rapid signal detection, robust mode tables
- Artifact-free images
- Calibrated to clinical color
- Zoom, freeze, picture-in-picture

Intended Purpose

This device is intended to be connected to other medical equipment, and to display images or videos from endoscopic cameras, room cameras, and patient information such as ultrasound, cardiology, and anesthesiology. This device is not intended for diagnosis. This device is intended to be compatible with other highly specialized surgical and diagnostic equipment used in surgical suites, operating rooms, emergency rooms, and procedural facilities.

Intended Use Environment

This device is intended to be used by a trained medical professional in a healthcare facility setting where contact with a patient is unlikely (no applied part).

This device is designed to meet the medical safety requirements for a patient vicinity device.
Warning: This device may not be used in connection with life support equipment.

Indications for Use

This device is to be used by a trained medical professional to display images from procedures, such as endoscopy, ultrasound, cardiology, and anesthesiology. This device connects to medical imaging equipment to display images, videos or patient information during surgical procedures. This device is not intended for diagnosis.

Symbol Definitions

The following symbols appear on the product, its labeling, or the product packing. Each symbol carries a special definition, as defined below:

	Dangerous : High Voltage		Power adapter		Consult accompanying documents
	Direct current		Indicates equipotential earth ground		Unique Device Identifier
	Follow instructions for use		Indicates top-bottom direction		Korea Certification
	DC Power control switch		Fragile		Approved according to the CCC regulations
	Do not get wet		Maximum Stacking		China RoHS labels
	Consult the operating instructions		Indicates the manufacturer		Catalog Number
	Indicates the manufacturing date		Authorized representative in the European community		Medical Device
	Serial Number		Humidity limitation		Consult the operating instructions - electronic
	Temperature limitation		Atmospheric pressure limitation		Importer Entity
	UK Conformity Assessed		Power ON		Power OFF
	UK Responsible Person		Voluntary Control Council for Interference - Japan		China Green Product
	Eurasian Conformity		Available from licensed healthcare provider		UL Recognized Component
	Indicates proof of conformity to EU 2017/745 Medical Devices Regulation and applicable standards.				
	Medical Equipment is in accordance with ANSI/AAMI ES60601-1ES 60601-1:2005/A2:2021, CAN/CSA-C22.2 No. 60601-1 (Amendment 2:2022) in regards to electric shock, fire hazards, and mechanical hazard.				
	Tested to comply with FCC Class B standard (USA).				
	Waste electrical and electronic equipment (WEEE Directive 2012/19/EU). This symbol indicates that the waste of electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact the manufacturer or other authorized disposal company to decommission your equipment.				

Note: A printed copy of the manual in English is provided with the product. Users within EU member states, please contact local distributor for other languages. This applies to EU member states where the product has been purchased through authorized channels.

Warnings and Precautions

Caution Information

This symbol alerts the user that important literature concerning the operation of this unit has been included. Therefore, it should be read carefully in order to avoid potential problems.

This symbol warns users that un-insulated voltage within the unit may have sufficient magnitude to cause electrical shock. Therefore, it is dangerous to make contact with any part inside the unit. To reduce the risk of electrical shock, DO NOT remove cover (or back). There are no user-serviceable parts inside. Refer servicing to qualified service personnel.

To prevent fire or shock hazards, do not expose this unit to rain or moisture. Do not use this unit's polarized plug with an extension cord receptacle or other outlets unless the prongs can be fully inserted.

Underwriters Laboratories (UL) Classification:
UL safety Compliance:
This medical monitor is U.L. Classified WITH RESPECT TO ELECTRIC SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL 60601-1/CAN/CSA C22.2 NO. 601.1

EU Conformity and EMC Compliance:
This medical monitor unit meets the requirements of EN60601-1 and EN60601-1-2 so as to conform to the EU Medical Devices Regulation (MDR 2017/745). CE class I medical device accessory.

This medical monitor complies to the above standards only when used with the supplied medical grade power supply. Use 120V rating 5-15P type plug only in the U.S.

ATM250TS-P240 (FM-E3230D, FM-E3230DG, FM-E3230DN)
ATM300TS-P240 (FM-E3250D, FM-E3250DG, FM-E3250DN)

Caution: Make sure the power cord is the correct type that is required in your geographic area. This medical monitor has a universal power supply that allows operation in either 100-120V AC or 200-240V AC voltage areas (no user adjustment is required).

Use the proper power cord with correct attachment plug type. If the power source is 120 V AC, use a power cord which is a Hospital Grade Power Cord with NEMA 5-15 style plug, labeled for 125 volts AC with UL and C-UL approvals. If the power source is a 240 V AC supply, use the tandem (T blade) type attachment plug with ground conductor power cord that meets the respective European country's safety regulations.

A ground post, located on the back of the display, may be used for the purpose of grounding the display's chassis. Any such ground must be installed in accordance with applicable electrical codes. The ground post is shown on the mechanical drawing found in this instructions for use.

Recycling (WEEE Directive 2012/19/EU)
Follow local governing ordinances and recycling plans regarding the recycling or disposal of this equipment.

Warning: Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.

Warning: Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

Warning: Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of this medical monitor, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

Warning: Using this equipment in the X-ray or magnetic resonance environment could result in degradation of the performance of this equipment, interference with other equipment or interference with radio services.

Warning: The use of cables and/or other accessories with this device, other than those specified, may result in increased emissions or decreased immunity of this device.

Warning: This product is not considered physically to connect to HF (High Frequency) electrosurgical equipment.

Warning: Not suitable for use in the presence of a flammable anesthetics mixture with oxygen or with nitrous oxide.

Safety Instructions

On Safety

1. Before connecting the AC power cord to the DC adapter outlet make sure the voltage designation of the DC adapter corresponds to the local electrical supply.

2. Never insert anything metallic into the cabinet openings of the medical monitor. Doing so may create the danger of electric shock.

3. To reduce the risk of electric shock, do not remove cover. No user-serviceable parts inside. Only a qualified technician should open the case of the medical monitor.

4. Never use your medical monitor if the power cord has been damaged. Do not allow anything to rest on the power cord, and keep the cord away from areas where people can trip over it.

5. Be sure to hold the plug, not the cord,when disconnecting the medical monitor power cord from an electric socket.

6. Unplug your medical monitor power cord when it is going to be left unused for an extended period of time.

7. Unplug your medical monitor power cord from the AC outlet before any service.

8. If your medical monitor does not operate normally, in particular, if there are any unusual sounds or smells coming from it, unplug it immediately and contact an authorized dealer or service center.

9. Please contact the manufacturer if the set should be installed in an inaccessible area.

Warning: Do not touch input or output connectors and the patient simultaneously.

Warning: This medical monitor is intended for connection to input/output signals and other connectors that comply with relevant IEC standard (e.g.,IEC60950 for IT equipment and IEC60601 series for medical electrical equipment). In addition, all such combination-system shall comply with the standard IEC 60601-1-1 or clause 16 of the 3 Ed. of IEC 60601-1, respectively, safety requirements for medical electrical systems. Any person who has formed a combination-system is responsible for the system to comply with the requirements of IEC 60601-1-1 or clause 16 of the 3 Ed. of IEC 60601-1, respectively. If in doubt, contact qualified technician or your local representative.

Warning: To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth. Power supply (AC/DC Adapter) is specified as a part of the Color Display. Do not position equipment in such a way that it is difficult to disconnect the power cord plug from the appliance inlet.

Warning: Do not modify this equipment without authorization of the manufacturer.

Product fuse has a lower breaking capacity. Do not install at the building power system, prospective short-circuit current exceeding 35 A.

Environmental Conditions for Operation and Storage

Temperature range within 0°C to 40°C(operation), -20°C to 60°C (storage)
Relative humidity range 10% to 90%
Atmospheric pressure range within 700 to 1060hPa.

On Installation

1. Openings in the medical monitor cabinet are provided for ventilation. To prevent overheating, these openings should not be blocked or covered. If you put the medical monitor in a bookcase or some other enclosed space, be sure to provide adequate ventilation.

2. Do not expose the medical monitor to rain or use it near water. If the medical monitor accidentally gets wet, unplug it and contact an authorized dealer immediately. You can clean the medical monitor with a damp cloth if necessary, but be sure to unplug the medical monitor first.

3. Place your medical monitor near an easily accessible AC outlet.

4. High temperature can cause problems. Max operating temperature is 40°C. Don't use your medical monitor in direct sunlight and keep it away from heaters, stoves, fireplaces,and sources of heat.

5. Don't place your medical Monitor on an unstable stand, Medical monitor may malfunction or fall.

6. This medical monitor should not topple over when tilted at a 5° angle, in any position, during NORMAL USE, excluding transport.

7. In the position specified for transport, medical monitor shall not overbalance when tilted at a 10 degree angle.

8. When carrying this product, please use both handles (if included) on the left and right side of the product, and carry using two people. If you want the product to be installed in another place, please call your service center.

9. Always use only the original cables and accessories with the device.

10. Do not lay this monitor on other equipment.

Repair
Do not attempt to service the medical monitor yourself, as opening or removing covers may expose you to dangerous voltages or other hazards, and will void the warranty. Refer all servicing to qualified service personnel. Unplug the medical monitor from its power source and refer servicing to qualified personnel under the following conditions:

- If the power cord or plug is damaged or frayed.
- If liquid has been spilled into the medical monitor.
- If objects have fallen into the medical monitor.
- If the medical monitor has been exposed to rain or moisture.
- If the medical monitor has been subjected to excessive shock by being dropped.
- If the cabinet has been damaged.
- If the medical monitor seems to be overheated.
- If the medical monitor emits smoke or abnormal odor.
- If the medical monitor fails to operate in accordance with the operating instructions.

Biohazards
To prevent spreading of infections, this device should only be used in environments where biological decontamination can be successfully performed.

Returned Product
After troubleshooting, if problems persist, disinfect the monitor and return it to FSN using the original packaging. Include the accessories that came with the monitor in the return shipment. Please enclose a brief explanation of the malfunction.

Contact FSN Medical Technologies for a Return Authorization Number and instructions, prior to returning the device.

Accessories
Use only accessories specified by the manufacturer, or sold with the medical monitor.

Classification for Safety Compliance
- Protection against electric shock : Class I including AC/DC adapter. This medical equipment is in accordance with ANSI/AAMI ES60601-1 (2005) + AMD 1 (2012) and CAN/CSA-C22.2 No. 60601-1 (2014) in regards to electric shock, fire hazards, and mechanical hazard.
- Applied Parts : No Applied Parts.
- Degree of safety in the presence of flammable anesthetics mixture with air or with oxygen or with nitrous oxide. Not suitable for use in the presence of a flammable anesthetics mixture with oxygen or with nitrous oxide.
- For critical applications, it is recommended to have a replacement monitor available.
- Mode of operation : Continuous.

Notice to the user:
Any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established. Contact your local FSN Medical Technologies sales representative for information on changes and new products.

Electromagnetic Compatibility

This medical monitor unit has been designed and tested to comply with IEC 60601-1-2:2014/ AMD1:2020 requirements for EMC with other devices. To ensure electromagnetic compatibility (EMC), the monitor must be installed and operated according to the EMC information provided in this Instructions for Use.

This medical monitor unit has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against interference. This monitor can radiate radio frequency energy and, if not installed and used in accordance with the instructions, it may interfere with other radio communications equipment. There is no guarantee that interference will not occur in a particular installation. If this equipment is found to cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by carrying out one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the distance between the medical monitor and the subject of interference.
3. Plug the monitor into an outlet on a different electrical circuit than that to which the subject of interference is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

NOTICES TO USER

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.

FCC WARNING

This medical monitor generates or uses radio frequency energy. Changes or modifications to this medical monitor may cause harmful interference unless the modifications are expressly approved in the instruction manual. The user could lose authority to operate this equipment if an unauthorized change or modification is made.

PRODUCT LIFETIME

The performance of panels may deteriorate over long periods of time. Periodically check that this monitor is operating correctly. The expected service life of the device is four years. Keep the monitor clean to prolong its operational lifetime.

1. Guidance and manufacturer's declaration - electromagnetic emission

The medical monitor is intended for use in the electromagnetic environment specified below. The user of the device should make sure that the medical monitor is operated in such an environment.		
Interference emission measurements	Conformity level	Electromagnetic environment -guidance
RF emissions acc. to CISPR 11	Complies with Group 1	The characteristics of this device determined by broadcasting permit its industrial and hospital use (CISPR 11, Class A). When used in a living area (for which CISPR 11 usually requires Class B), this device may not provide adequate protection of radio services. The user must, if necessary, take remedial action such as implementation or reorientation of the device.
RF emissions acc. to CISPR 11	Complies with Class B	
Emission of harmonic oscillations acc. to IEC 61000-3-2	Complies with Class A	
Voltage fluctuations/flicker emissions acc. to IEC 61000-3-3	Complies	

2. For the use of ME devices in professional healthcare facilities. Guidance and manufacturer's declaration - electromagnetic immunity

The medical monitor is intended for use in the electromagnetic environment specified below. The user of the medical monitor should make sure that it is used in such an environment.		
Interference immunity test	IEC 60601-1-2:2014 conformity level	Electromagnetic environment-guidance
Electrostatic discharge (ESD) acc. to IEC 61000-4-2	Complies ±2 kV, ±4 kV, ±6 kV, ± 8 kV contact discharge ±2 kV, ±4 kV, ±8 kV, ± 15 kV air discharge	Floors should be made of wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity must be at least 30%
Rapid transient electric interferences/ bursts acc. to IEC 61000-4-4	Complies ± 2 kV for mains lines ± 1 kV for input/output lines	The quality of the supply voltage should correspond to that of a typical business or hospital environment.
Surge acc. to IEC 61000-4-5	Complies ± 1 kV push-pull voltage ± 2 kV common-mode voltage	The quality of the supply voltage should correspond to that of a typical business or hospital environment.
Voltage dips, short interruptions and fluctuations of the supply acc. to IEC 61000-4-11	0 % U_T*; 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315° 0% U_T; 1 cycle and 70% U_T; 25/30 cycles Single phase: at 0° 0% U_T; 250/300 cycle	Mains power quality should be that of a typical commercial or hospital environment. If the user of the device requests continued functioning even when interruptions of the power supply occur, it is recommended that the device be supplied from a power supply that is free of interruptions.
*Note: U_T is the mains alternating voltage before applying the test levels.		

3. For the use of ME devices in professional healthcare facilities. Test specification for ENCLOSURE PORT IMMUNITY to RF wireless communications equipment (according to IEC 60601-1-2:2014)

The medical monitor is intended for use in the electromagnetic environment specified below.
The user of the medical monitor should make sure that it is used in such an environment.

Test frequency MHz	Band MHz	Service	Modulation	Maximum power W	Distance m	IMMUNITY TEST LEVEL V/m
385	380 to 390	TETRA 400	Pulse modulation 18 Hz	1.8	1.0	27
450	430 to 470	GMRS 460, FRS 460	FM ± 5 kHz stroke ± 1 kHz sine wave	2	1.0	28
710	704 to 787	Band 13, 17	Pulse modulation 217 Hz	0.2	1.0	9
745						
780						
810	800 to 960	GSM 800/900 TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation 18 Hz	2	1.0	28
870						
930						
1720	1700 to 1990	GSM 1800, CDMA 1900, GSM 1900, DECT, LTE Band 1,3, 4, 25 UMTS	Pulse modulation 217 Hz	2	1.0	28
1845						
1970						
2450	2400 to 2570	Bluetooth, WLAN 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation 217 Hz	2	1.0	28
5240	5100 to 5800	WLAN 802.11 a/n	Pulse modulation 217 Hz	0.2	1.0	9
5500						
5785						

*Note: If necessary to achieve the IMMUNITY TEST LEVEL, the distance between the transmitting antenna and the medical monitor may be reduced to 1 m. The 1 m test distance is permitted by IEC 61000-4-3.

4. Guidance and manufacturer's declaration – electromagnetic immunity – for equipment and systems that are not life-supporting

The medical monitor is intended for use in the electromagnetic environment specified below.
The user of the medical monitor should make sure that it is used in such an environment.

Interference immunity tests	IEC 60601-1-2:2014 test level	Conformity level	Electromagnetic environment – guidelines
Conducted RF disturbances acc. to IEC 61000-4-6 Radiated RF disturbances according to IEC 61 000·4·3	3 V rms 150 kHz to < 80 MHz 3 V/m 80 MHz to 2.5 GHz	3 V eff 3 V/m	Portable and mobile RF communications equipment should be used no closer to any part of the medical monitor, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance: $d = 1.2 \sqrt{P}$ Where P is the nominal power of the transmitter in watts [W] according to the information provided by the manufacturer of the transmitter and d is the recommended separation distance in meters [m]. The field strength of stationary transmitters at all frequencies on site a should be, according to **a** study, less than the conformity level **b**. $d = 1.2 \sqrt{P}$ 80 MHz to < 800 MHz $d = 2.3 \sqrt{P}$ 800 MHz to 2.5 GHz Interference may occur in the vicinity of equipment marked with the following symbol:

Note: These guidelines may not apply in all situations. The propagation of electromagnetic quantities is affected by absorptions and reflections of buildings, objects, and persons.

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 of the stationary transmitters, a site survey should be considered. If the measured field strength in the location at which the device is used exceeds the above conformity levels, the device should be observed to verify normal operation. If unusual performance characteristics are observed, additional measures may be necessary, such as a modified orientation or a different location for the device.
b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

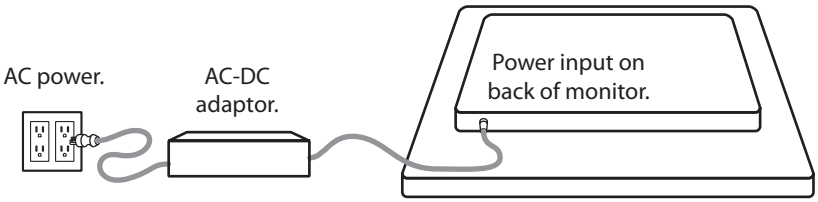
5. Recommended separation distances between portable and mobile RF communications equipment and the medical monitor

The medical monitor is intended for use in the electromagnetic environment in which the RF disturbances are controlled. The user of the device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the device – as a function of the output power of the communication device, as shown below.

Nominal power of transmitter [W]	Separation distanced [m] according to frequency of transmitter		
	150kHz to< 80 MHz $d = 1.2 \sqrt{P}$	80 MHz to< 800 MHz $d = 1.2 \sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at 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.

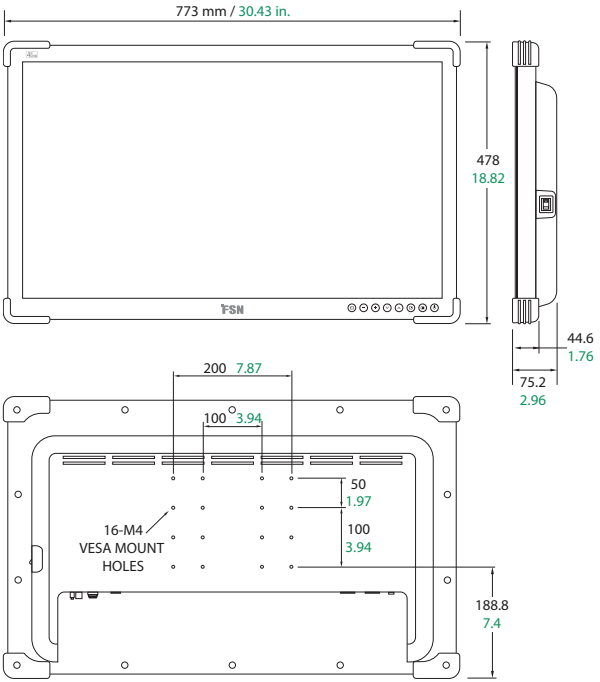
Connecting the Power Supply



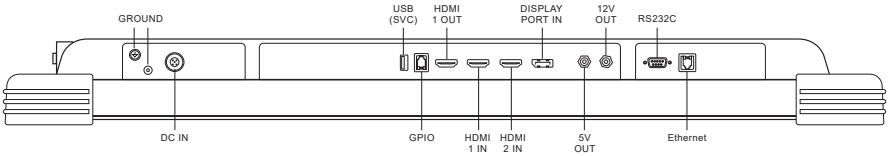
Monitor	Maximum DC Extension Cable Length* (feet)
FM-E3230D, FM-E3230DG, FM-E3230DN FM-E3250D, FM-E3250DG, FM-E3250DN	75

* If longer extension is used, there is a risk of abnormal operation of the product.

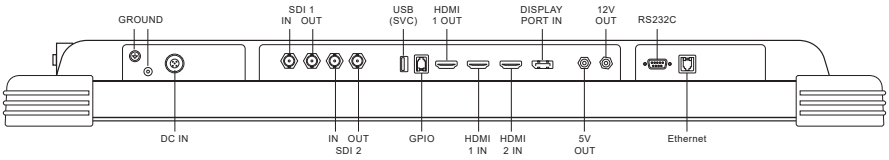
FM-E3230D, FM-E3230DG, FM-E3230DN



FM-E3230D



FM-E3230DG



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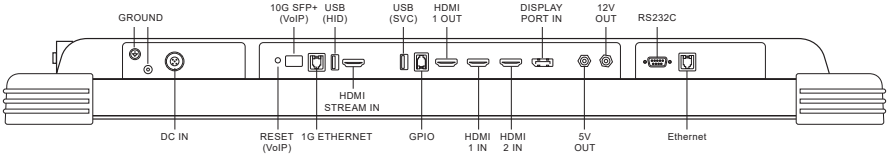
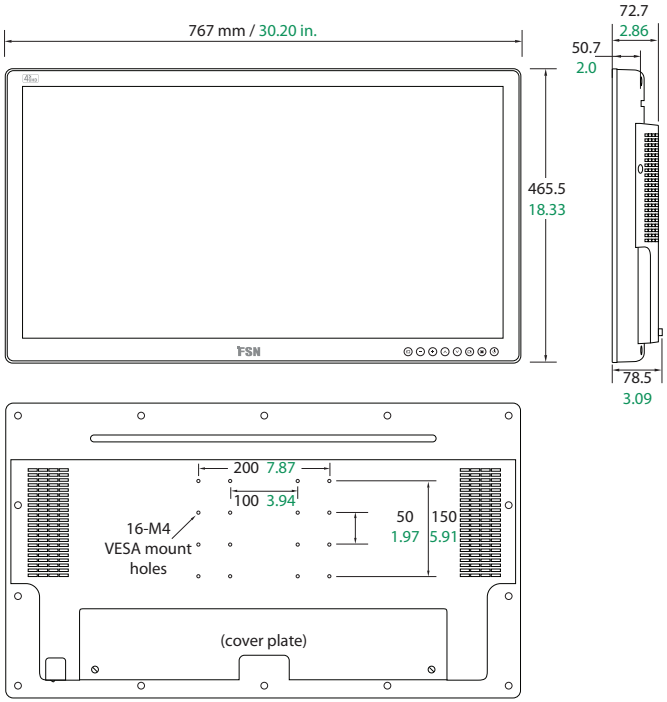
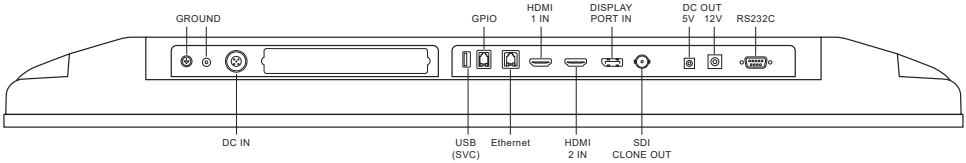


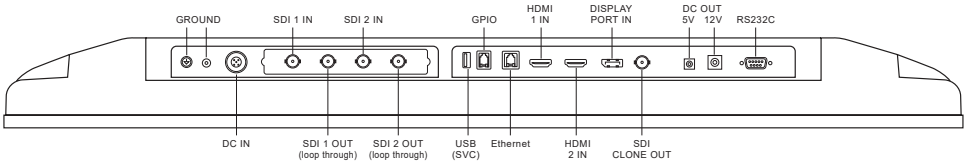
FM-E3250D, FM-E3250DG, FM-E3250DN



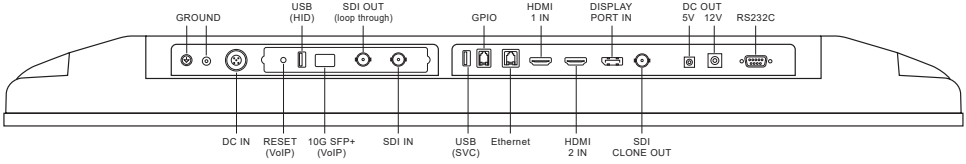
FM-E3250D



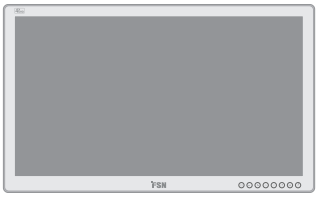
FM-E3250DG



FM-E3250DN

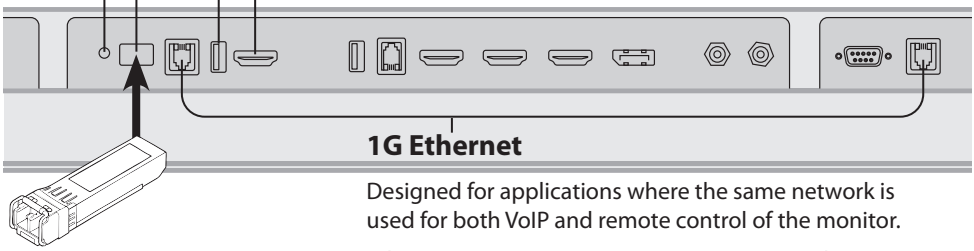


Accessories

Item	IFU	AC-DC Adaptor	AC Power Cord*	HDMI Cable	DisplayPort Cable	SDI BNC Cable	Mounting Screws
Length Weight	74g	6.23ft/1.9m 900g	6ft/1.8m 240g	6.56ft/2m 236g	6ft/1.8m 110g	6ft/1.8m 120g	8g
 FM-E3230DG	■	■	■	■	■	■	■
FM-E3230D FM-E3230DN	■	■	■	■	■		■
 FM-E3250DG	■	■	■	■	■	■ (2)	■
FM-E3250D FM-E3250DN	■	■	■	■	■	■	■

* US,UK,EU, China. Hospital grade.

Video Over Internet Protocol
FM-E3230DN



Reset
Resets VoIP.

10G SFP+
10G SFP+ modules used for VoIP.

USB (HID)
When using VoIP, connect keyboard or mouse.

Stream Input
HDMI input that is part of the monitor's built-in encoder.

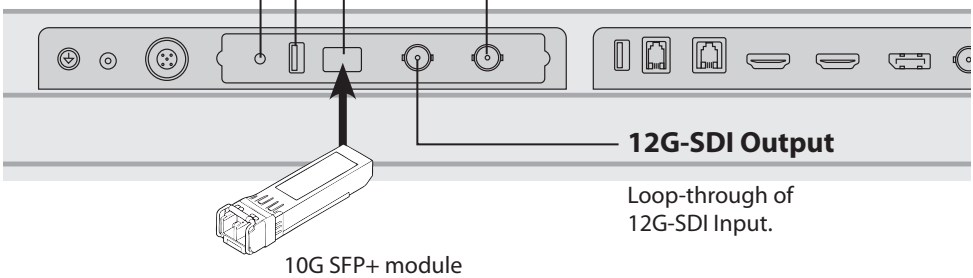
1G Ethernet

Designed for applications where the same network is used for both VoIP and remote control of the monitor.

When using VoIP, must connect to a remote ethernet port to prevent network collisions.

10G SFP+ module

Video Over Internet Protocol
FM-E3250DN



12G-SDI Input
Direct monitor display.

Optional outputs to:
- SDI loop-through 12G port.
- 10G SFP+ TX VoIP port.

Reset
Resets VoIP.

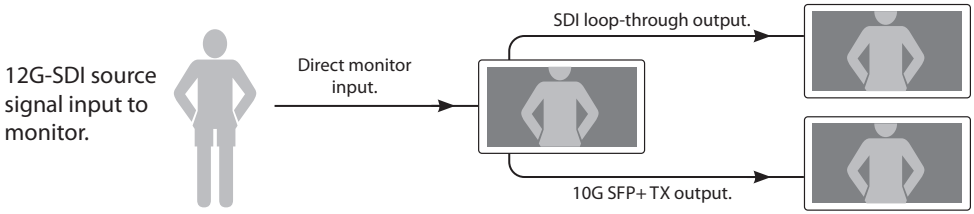
USB (HID)
When using VoIP, connect keyboard or mouse.

10G SFP+
10G SFP+ modules used for VoIP.

12G-SDI Output

Loop-through of 12G-SDI Input.

10G SFP+ module



Controls
On Screen Display (OSD)

	POWER	Press and hold about 2 seconds to turn the display's front screen ON and OFF. Confirm the power switch on the back of the display has been turned ON.
	MENU	Press to activate the OSD menu. When the OSD menu is active, press to exit from the main menu or submenu.
	PIP	Press to enable PIP (Picture in Picture) function. Not available when Smart Input is enabled. Press PIP and INPUT together for key beep sound on/off.
	DOWN	When the OSD menu is activated, press to move the menu selection downward.
	UP	When the OSD menu is activated, press to move the menu selection upward.
	PLUS	When the OSD menu is activated, press to enter sub menu, or increase the adjustment of the selected function.
	MINUS	When the OSD menu is activated, press to decrease the adjustment of the selected function.
	INPUT	Press to show the input selection menu and to change the display signal source. Press UP or DOWN, then press PLUS to select the desired source.

	Press PLUS and UP together to enable or disable the key lock function
	Press PIP and INPUT together for key beep sound on/off.

On Screen Display (OSD) Menus

FSN display monitors come equipped with a rich set of features for system set-up, image adjustments, and screen layout control. These features are managed through the On Screen Display, or OSD. Some options presented in the OSD are contextual and vary depending on the active input signal. See the Controls section for a complete description of each OSD button.

1. Enter the OSD

To activate the OSD menu, press the MENU button on the front of the display monitor. To close the OSD menu, press the menu button to exit from the main menu or a sub menu.

2. Pick a Main Menu Category

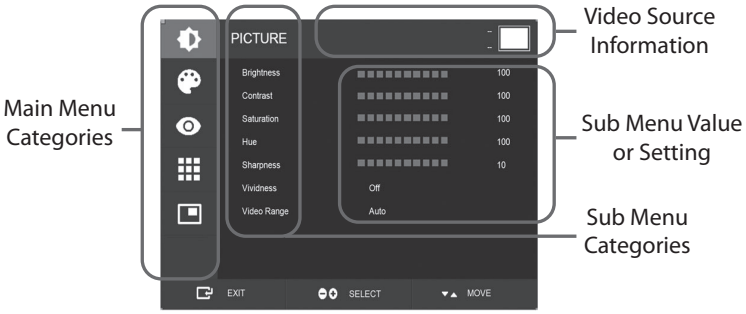
After entering the OSD, use the UP ∧ and DOWN ∨ buttons on the front of the display monitor to navigate to a main menu category: PICTURE, COLOR, ADVANCED, SETUP, LAYOUT.

3. Pick a Submenu Category

After entering the desired main menu category, press the + button to enter the submenus associated with the selected main menu. Use the UP ∧ and DOWN ∨ buttons to navigate to the desired submenu, then adjust as needed with the + and - buttons. Select the MENU button to exit from the submenu or main menu.

On Screen Display (OSD) Menus

FM-E3230D, FM-E3230DG, FM-E3230DN



Submenus under the PICTURE menu

1. BRIGHTNESS Increases or decreases the brightness. (Range : 0~100)
2. CONTRAST Increases or decreases the contrast. (Range : 0~100)
3. SHARPNESS Increases or decreases the sharpness. (Range : 0~10)
4. VIVIDNESS Sets image vividness. (Off, Low, Mid, High) Enhances image quality with minimal artificial effects. Vividness function works when the video range set to 0~255.
5. VIDEO RANGE Select a video range setting. (0~255, 16~235, or AUTO)
   AUTO: automatically changes to 0~255 for RGB format, or to 16~235 for other formats.

On Screen Display (OSD) Menus
FM-E3230D, FM-E3230DG, FM-E3230DN

Submenus under the COLOR menu
1. COLOR SPACE Select the color space setting. (NATIVE, BT.709, BT.2020, or AUTO)
2. GAMMA Select the appropriate gamma. (1.8, 2.0, 2.2, 2.4, 2.6, BYPASS).
3. COLOR MODE Changes the white points of standard. (Custom Color, D65, D75, D93)
4. RED Red balance. (Only works with Custom mode) (Range : 0~255)
5. GREEN Green balance. (Only works with Custom mode) (Range : 0~255)
6. BLUE Blue balance. (Only works with Custom mode) (Range : 0~255)
7. HDR SUPPORT Sets the HDR (High Dynamic Range). (Off, Auto, HLG)

Submenus under the ADVANCED menu
1. ASPECT RATIO Changes aspect ratio of the displayed image. (Full, Auto, Fill H, 4:3, 5:4, 16:9, 1:1)
2. OVER SCAN Adjusts the displayed size. (0~10)
3. FREEZE Keeps the image still.
4. PRESET Save or import OSD menu settings into 10 rooms. (PICTURE, COLOR, ADVANCED, SETUP, LAYOUT)
5. ROTATE/MIRROR Changes the displayed image direction. (Normal, 90, 180, 270, H-Mirror, V-Mirror)
6. SMART INPUT* Enables automatic switch to the backup source when main source is off.
7. SMART MAIN* When smart input is on, current source is changed to main source.
8. SMART 2ND* When smart input is on, backup source is set to 2nd source.
   * For use only with single layout mode.

Submenus under the SETUP menu
1. LANGUAGE Changes the menu language. (10 languages)
2. MENU OVERLAY Adjusts the menu transparency.
3. MENU POSITION Changes the menu position. (9 Positions)
4. MENU TIME Adjusts the length of time the menu is present on the screen. (range: 5~100 seconds)
5. MENU LOCK Sets the OSD lock. To unlock, press the PLUS and UP buttons.
6. BACKLIGHT Increases or decreases the backlight. (Range : 0~100)
7. DC OUTPUT Enables or disables the DC power output.
8. NETWORK View network information.
9. FACTORY RESET Changes all the OSD values to factory default.

Submenus under the LAYOUT menu - Single
1. LAYOUT Changes the image layout. (Off, PIP, PBP, Triple, Quad)

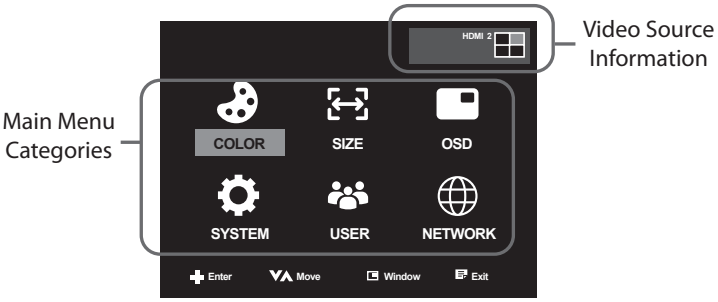
Submenus under the LAYOUT menu - PIP
1. LAYOUT Changes the image layout. (Off, PIP, PBP, Triple, Quad)
2. MODE Not applicable in PIP mode.
3. WINDOW SELECT Selects the active window.
4. INPUT SWAP Swaps the position of the primary and secondary images.
5. PIP SIZE Changes the PIP size.
6. PIP POSITION Changes the PIP position. (L-Top, R-Top, Mid, L-Bot, R-Bot)

Submenus under the LAYOUT menu - PBP
1. LAYOUT Changes the image layout. (Off, PIP, PBP, Triple, Quad)
2. MODE Changes the layout mode. (Mode1, Mode 2, Mode 3)
3. WINDOW SELECT Selects the active window.
4. INPUT SWAP Swaps the position of the primary and secondary images.

Submenus under the LAYOUT menu - Triple
1. LAYOUT Changes the image layout. (Off, PIP, PBP, Triple, Quad)
2. MODE Changes the layout mode. (Mode1, Mode 2, Mode 3, Mode 4)
3. WINDOW SELECT Selects the active window.

Submenus under the LAYOUT menu - Quad
1. LAYOUT Changes the image layout. (Off, PIP, PBP, Triple, Quad)
2. MODE Changes the layout mode. (Mode1, Mode 2, Mode 3, Mode 4, Mode 5)
3. WINDOW SELECT Selects the active window.

On Screen Display (OSD) Menus
FM-E3250D, FM-E3250DG, FM-E3250DN



Submenus under the COLOR menu

1. COLOR SPACE Select the color space setting. (Auto, BT709, BT2020, DCI, Native)
2. GAMMA Select the appropriate gamma. (Only works with SDR) (1.8, 2.0, 2.2, 2.4, 2.6, Bypass, DICOM)
3. COLOR TEMP Changes the white points of standard. (D65, D75, D93, C1, C2, C3, User)
4. RED GAIN Red balance. (Range : 0~255)
5. GREEN GAIN Green balance. (Range : 0~255)
6. BLUE GAIN Blue balance. (Range : 0~255)
7. VIDEO RANGE Select a video range. (Auto, Full, Limit)
   When set to Auto, range will automatically switch to Full with RGB input signal. All other input signal formats will switch to Limit.
8. BRIGHTNESS Increases or decrease the brightness. (Range : 0~100)
9. CONTRAST Increases or decreases the contrast. (Range : 0~100)
10. SHARPNESS Increases or decreases the sharpness. (Range : 0~100)
11. HDR High Dynamic Range. (Off, Auto, PQ, HLG) HDR expands the range of brightness to be as close as possible to the actual visual experience.
    PQ: Perceptual quantization gamma curves.
    HLG: Hybrid log gamma curves.

Submenus under the SIZE menu

1. ASPECT RATIO Changes aspect ratio of the displayed image. (4:3, 5:4, 16:9, Auto)
2. OVER SCAN Adjusts the displayed size. (0~10)
3. FREEZE FRAME Keeps the image still.
4. ROTATION Changes the displayed image direction. (Normal, 180, Horizon-Mirror)

Submenus under the OSD menu

1. LANGUAGE Changes the menu language. (English, Chinese, Korean, Japanese, German, French, Spanish, Italian, Turkish, Portuguese)
2. LOCK Locks or unlocks the OSD menu. (Press PLUS and UP together)
3. POSITION Changes the menu position. (5 Positions)
4. TIME Adjusts the length of time the menu is present on the screen. (10~30 seconds, infinity)
5. TRANSPARENCY Adjusts the OSD transparency. (0~100)

On Screen Display (OSD) Menus
FM-E3250D, FM-E3250DG, FM-E3250DN

Submenus under the SYSTEM menu

1. BACKLIGHT Increases or decreases the backlight. (Range : 0~100)
2. DC OUTPUT Enables or disables the DC power output.
3. SMART INPUT* Enables automatic switch to the backup source when main source is off.
   * For use only with single layout mode.
4. CLONE OUTPUT Changes the output resolution of the clone output.
   (1920x1080 50Hz/60Hz, 3840x2160 50Hz/60Hz)
5. CLONE MASK Sets the mask for the clone output.
   Mask Color : Black, White, Red, Green, Blue
   Mask Position X : Move the mask area left and right.
   Mask Position Y : Move the mask area up and down.
   Mask Width : Increase the width of the mask area.
   Mask Height : Increase the height of the mask area
6. FACTORY RESET Changes all the OSD values to factory default. Press and hold the Plus key for 3 seconds to reset.

Submenus under the USER menu

1. PRESET NUMBER (Room 0~9) Save or import OSD menu settings into 10 rooms. (COLOR, SIZE, OSD, SYSTEM)
2. LOAD Press and hold the Plus (+) key for 3 seconds to load the OSD menu's settings.
3. SAVE Press and hold the Plus (+) key for 3 seconds to save the OSD menu's settings.

Submenus under the NETWORK menu

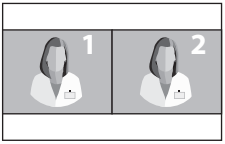
1. DHCP Sets the Dynamic Host Configuration Protocol. (On, Off)

Window Layout
FM-E3230D, FM-E3230DG, FM-E3230DN

Picture in Picture (PIP)

PIP Sizes: small, medium, large, huge.
PIP Positions: left-top, right-top, middle, left-bottom, right-bottom.

Picture by Picture (PBP)

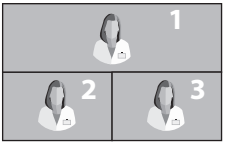


Mode 1

Mode 2

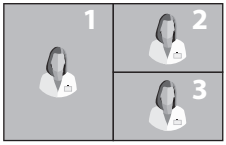
Mode 3

Triple

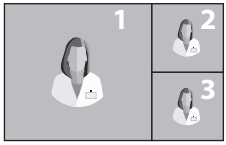


Mode 1

Mode 2



Mode 3

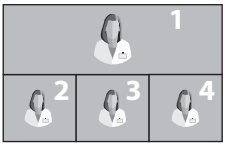


Mode 4

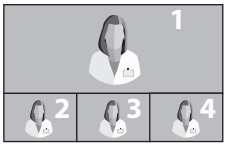
Window Layout
FM-E3230DG, FM-E3230DN

Quad

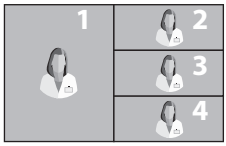
Mode 1



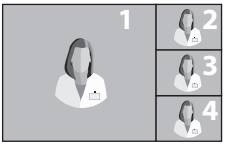
Mode 2



Mode 3



Mode 4

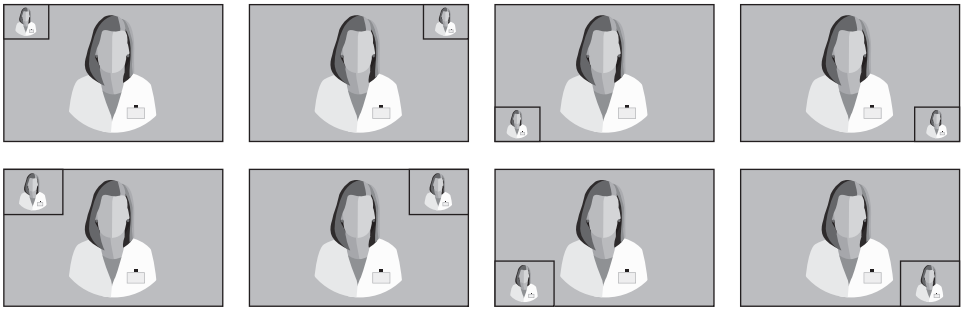


Mode 5

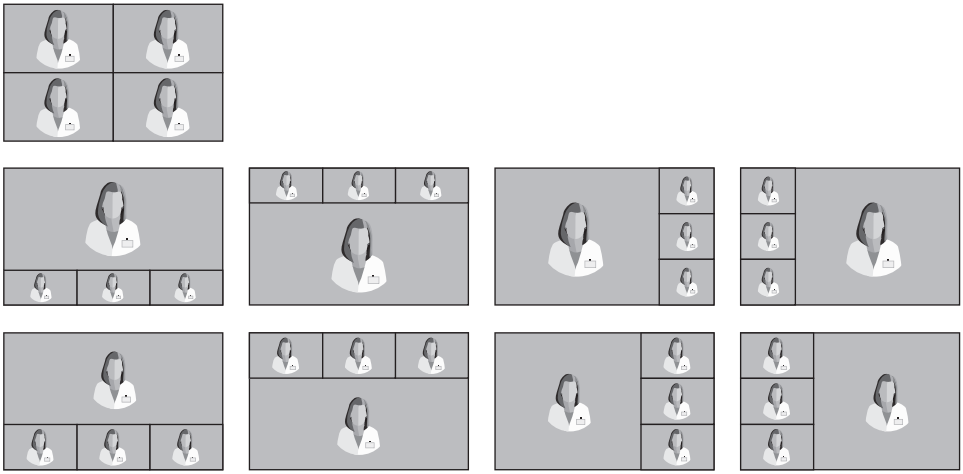
Window Layout
FM-E3250D, FM-E3250DG, FM-E3250DN

Picture by Picture (PBP)

Picture in Picture (PIP)



Quad



Input Signal Timing (SDI)

Interface	Resolution	Sampling and Format	Pixel Depth	SDI 1	SDI 2†
HD	1280 x 720 / 24p *	YCbCr 4 : 2 : 2	10 bit	•	•
	1280 x 720 / 25p	YCbCr 4 : 2 : 2	10 bit	•	•
	1280 x 720 / 30p	YCbCr 4 : 2 : 2	10 bit	•	•
	1280 x 720 / 50p	YCbCr 4 : 2 : 2	10 bit	•	•
	1280 x 720 / 59.94p	YCbCr 4 : 2 : 2	10 bit	•	•
	1280 x 720 / 60p0	YCbCr 4 : 2 : 2	10 bit	•	•
	1920 x 1080 / 24p *	YCbCr 4 : 2 : 2	10 bit	•	•
	1920 x 1080 / 25p	YCbCr 4 : 2 : 2	10 bit	•	•
	1920 x 1080 / 30p	YCbCr 4 : 2 : 2	10 bit	•	•
	1920 x 1080 / 50i	YCbCr 4 : 2 : 2	10 bit	•	•
	1920 x 1080 / 59.94i	YCbCr 4 : 2 : 2	10 bit	•	•
	1920 x 1080 / 60i	YCbCr 4 : 2 : 2	10 bit	•	•

Interface	Resolution	Sampling and Format	Pixel Depth	SDI 1	SDI 2†
3G	1280 x 720 / 50p	YCbCr 4 : 4 : 4	10 bit	•	•
	1280 x 720 / 60p	YCbCr 4 : 4 : 4	10 bit	•	•
	1920 x 1080 / 50i	YCbCr 4 : 4 : 4 Level A & B * Level A-Dual Link *	10 bit	•	•
	1920 x 1080 / 60i	YCbCr 4 : 4 : 4 Level A & B * Level A-Dual Link *	10 bit	•	•
	1920 x 1080 / 50p	YCbCr 4 : 2 : 2 Level A & B * Level A-Dual Link *	10 bit	•	•
	1920 x 1080 / 60p	YCbCr 4 : 2 : 2 Level A & B * Level A-Dual Link *	10 bit	•	•
12G	3840 x 2160 / 50p	YCbCr 4 : 2 : 2	10 bit	•	•
	3840 x 2160 / 60p	YCbCr 4 : 2 : 2	10 bit	•	•
	4096 x 2160 / 50p	YCbCr 4 : 2 : 2	10 bit	•	•
	4096 x 2160 / 60p	YCbCr 4 : 2 : 2	10 bit	•	•

* FM-E3230DG
† Unavailable on FM-E3250DN

Input Signal Timing (HDMI, DP)

Resolution	Sampling and Format	Pixel Depth	HDMI 1	HDMI 2	DP
640 x 480 / 60p	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •
720 x 480 / 60p	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •
720 x 576 / 50p	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •
1280 x 720 / 50p	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •
1280 x 720 / 60p	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •
1920 x 1080 / 50i	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •
1920 x 1080 / 60i	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •
1920 x 1080 / 50p	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •
1920 x 1080 / 60p	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •
3840 x 2160 / 25p	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •

Resolution	Sampling and Format	Pixel Depth	HDMI 1	HDMI 2	DP
3840 x 2160 / 30p	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •
4096 x 2160 / 25p	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •
4096 x 2160 / 30p	RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2	8 / 10 bit 8 / 10 bit 12 bit	• • •	• • •	• • •
3840 x 2160 / 50p	RGB 4 : 4 : 4 RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2 YCbCr 4 : 2 : 0	8 bit 10 bit 8 bit 10 bit 12 bit 8 bit	• • • •	• • • •	• • • • • •
3840 x 2160 / 60p	RGB 4 : 4 : 4 RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2 YCbCr 4 : 2 : 0	8 bit 10 bit 8 bit 10 bit 12 bit 8 bit	• • • •	• • • •	• • • • • •
4096 x 2160 / 50p	RGB 4 : 4 : 4 RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2 YCbCr 4 : 2 : 0	8 bit 10 bit 8 bit 10 bit 12 bit 8 bit	• • • •	• • • •	• • • • • •
4096 x 2160 / 60p	RGB 4 : 4 : 4 RGB 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 4 : 4 YCbCr 4 : 2 : 2 YCbCr 4 : 2 : 0	8 bit 10 bit 8 bit 10 bit 12 bit 8 bit	• • • •	• • • •	• • • • • •

Specification
FM-E3230D, FM-E3230DG, FM-E3230DN

Item		Description			
Panel		32 inch TFT LCD			
Resolution		3840 x 2160 pixels			
Active Area		708.48 (H)mm x 398.82 (V)mm			
Pixel Pitch (mm)		0.1845 x 0.1845			
Response Time (typical)		18 ms			
Number of Colors		1.07 Billion			
Brightness (typical)		800 cd/m^2			
Color Gamut		BT.709(100%), BT.2020(DCI-P3 95%)			
Contrast Ratio (typical)		1500 : 1			
Surface Treatment		Double side anti-reflection and anti-fingerprint			
Viewing Angle (CR>10)		R/L 178°, U/D 178°			
Input Signal			FM-E3230D	FM-E3230DG	FM-E3230DN
		HDMI 2.0	x 2	x 2	x 3
		DP 1.4 SST	x 1	x 1	x 1
		SDI (12G)	-	x 2	-
		10G SFP+ (Rx)	-	-	x 1
Output Signal		HDMI 2.0	x 1	x 1	x 1
		SDI (12G)	-	x 2	-
		10G SFP+ (Tx)	-	-	x 1
DC Power Out		12V/2A x 1, 5V/2A x 1			
External Control		RS-232, Ethernet			
GPIO Port		Source change, Single/PBP/PIP select, Recording indicator			
Power Supply		AC/DC Adaptor (AC 100~240V, DC 24V/8.3A)			
Power Consumption	FM-E3230D	150W max			
	FM-E3230DG	160W max			
	FM-E3230DN	155W max			
Unit Dimension		773(W) x 478(H) x 75.2(D) mm 30.43(W) x 18.82(H) x 2.96(D) inch			
Package Dimension		905(W) x 744(H) x 230(D) mm 35.6(W) x 29.3(H) x 9(D) inch			
IP Rating		IP33 - overall			
Weight	FM-E3230D	10.5 kg, 23.15 lbs. (monitor with cover) 16.3 kg, 35.94 lbs. (shipping package)			
	FM-E3230DG	10.7 kg, 23.6 lbs. (monitor with cover) 16.5 kg, 36.38 lbs. (shipping package)			
	FM-E3230DN	10.6 kg, 23.4 lbs. (monitor with cover) 16.4 kg, 36.16 lbs. (shipping package)			

Specification
FM-E3250D, FM-E3250DG, FM-E3250DN

Item		Description		
Panel		32 inch mini-LED		
Resolution		3840 x 2160 pixels		
Active Area		708.48 (H)mm x 398.52 (V)mm		
Pixel Pitch (mm)		0.1845 x 0.1845		
Response Time (typical)		20 ms		
Dimming Zones		2304		
Number of Colors		1.07 Billion, 10 bit (True 10) support		
Brightness (typical)		1000 cd/m² white luminance (full screen) 1800 cd/m² white luminance (10% center patch)		
Color Gamut		BT.709(100%), BT.2020(DCI-P3 98%)		
Contrast Ratio (typical)		1800 : 1 (1,000,000 : 1 dynamic)		
Surface Treatment		Double side anti-reflection and anti-fingerprint		
Viewing Angle (CR>10)		R/L 178°, U/D 178°		
Input Signal			FM-E3250D	FM-E3250DG	FM-E3250DN
		HDMI 2.0	x 2	x 2	x 2
		DP 1.4 SST	x 1	x 1	x 1
		SDI (12G)	-	x 2	x 1
		10G SFP+ (Rx)	-	-	x 1
Output Signal		SDI (12G) clone out	x 1	x 1	x 1
		SDI (12G) loop through	-	x 2	x 1
		10G SFP+ (Tx)	-	-	x 1
DC Power Out		12V/2A x 1, 5V/2A x 1		
External Control		RS-232, Ethernet		
GPIO Port		Source change, Single/PBP/PIP select, Recording indicator		
Power Supply		AC/DC Adaptor (AC 100~240V, DC 24V/12.5A)		
Power Consumption	FM-E3250D	190W max		
	FM-E3250DG	200W max		
	FM-E3250DN	205W max		
Unit Dimension		767(W) x 465.5(H) x 72.7(D) mm 30.20(W) x 18.32(H) x 2.86(D) inch		
Package Dimension		905(W) x 744(H) x 230(D) mm 35.6(W) x 29.3(H) x 9(D) inch		

Specification
FM-E3250D, FM-E3250DG, FM-E3250DN

Item		Description
IP Rating		IP22
Weight	FM-E3250D	11.5 kg, 25.35 lbs. (monitor with cover) 17.8 kg, 39.24 lbs. (shipping package)
	FM-E3250DG	11.6 kg, 25.57 lbs. (monitor with cover) 17.9 kg, 39.46 lbs. (shipping package)
	FM-E3250DN	11.7 kg, 25.79 lbs. (monitor with cover) 18 kg, 39.68 lbs. (shipping package)

Cleaning Instructions

Follow your hospital protocol for the handling of blood and body fluids. Clean the display with a diluted mixture of mild detergent and water. Use a soft cotton towel or swab. Use of certain detergents may cause degradation to the labels and plastic components of the product. Consult cleanser manufacturer to see if agent is compatible. Do not allow liquid to enter the display.

Precautions

- Take care not to damage or scratch the front filter or panel.
- Do not use cloth made from synthetic material (polyester) as this may cause electrostatic discoloration within the panel.
- Follow your hospital protocol in case the display needs to be disinfected prior to installation.

Front Filter

1. Remove dust with a dry, lint-free, non-abrasive soft cotton cloth.
2. Remove fingerprints or grease using a lint-free, non-abrasive soft cotton cloth that is lightly moistened with plain water or isopropyl alcohol with concentration < 5%.
3. Gently wipe dry with a dry cotton cloth.

Do NOT use on front filter:

• Alcohol/solvents at higher concentration > 5% • Strong alkalis, strong solvents • Acid • Detergents with fluoride • Detergents with ammonia • Detergents with abrasives • Steel wool • Sponge with abrasives • Steel blades • Synthetic (polyester) cloth • Cloth with steel thread

Cabinet

1. Clean the cabinet using a soft cotton cloth, lightly moistened with a recognized cleaning product for medical equipment.
2. Repeat with water only.
3. Wipe dry with a dry cloth.

The cabinet has been tested for resistance to the following products:
• Virex Ready-to-use Disinfectant Cleaner • Misty Clear Lemon 10 Disinfectant • Misty Multi-Purpose Disinfectant Cleaner • Misty Multi-Purpose Disinfectant Cleaner II • Zep Heavy-duty glass & all surface cleaner • Klear Screen • Screen TFT (Kontakt Chemie) • Incidin Foam (Ecolab) • Microzid • Mild detergent • Isopropyl alcohol with concentration < 5% • Household bleach (generic sodium hypochlorite, solutions of 5.25% sodium hypochlorite diluted with water between 1:10 and 1:100) • Precise Hospital Foam Cleaner Disinfectant

Thank you for choosing our product.

Service
Contact the appropriate customer service listed below for product information or assistance.

Warranty
One year, parts and labor.

EC REP EC Representative
KTR Europe GmbH
Mergenthalerallee 77, Eschborn 65760, Germany
Tel : +49(0)6196-887170

FORESEESON GmbH
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UK RP **FORESEESON UK Ltd.**
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Specifications are subject to change with or without notice.

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