JUSHA

JUSHA DISPLAY
USER MANUAL

User Manual

Model
E240C
E240C0
E240C1
E240C2
E240CG
JUSHA-E240C
JUSHA-E240C0
JUSHA-E240C1
JUSHA-E240C2
JUSHA-E240CG

Contents

Contents

ENGLISH

1.Manual instructions

1.1 About this manual

● The manual aims to guide users to install, configure and operate this professional medical monitor properly.

● When transfer the monitor to a third-party, please deliver this manual along with the monitor.

● Our goal is to provide you with the most accurate and usable documentation possible; if you discover errors, please let us know.

● For any further questions about this manual, you are welcome to contact Nanjing Jusha Display Technology Co., Ltd.

1.2 Explanation of symbols

This manual and product use the symbols below.

	Note Gives extra information about the described subject.
	Warning Indicates general cautionary, warning, or danger level information.
	Prohibition Indicates a general prohibition.
	Don't touch
	*China Compulsory Certification (CCC) Indicates the product meets the requirements of CCC.

FC	***Federal Communications Commission (FCC)** Indicates the product meets the requirements of FCC.
CE	***Conformite Europeanne Certification (CE)** Indicates the product meets the requirements of CE Certification.
EC REP	**European Authorized Representatives** Gives information of the Authorized European representatives.
SGS 710169	***Societe Generale de Surveillance S.A. (SGS)** Indicates the product has been certificated by SGS and qualified for North American market.
	Compliance ROHS instruction
	Waste Electrical and Electronic Equipment Directive (WEEE) 2002/96/EC Waste disposal should comply with local regulations.
	Recommend to refer the User Manual
	Manufacturer information
JUSHA	**JUSHA trademark**
SN	**Product serial number**
Rx Only	Caution: Federal law restricts this device to sale by or on the order of a licensed healthcare practitioner.

* This monitor complies with these standards only when a medical grade power supply is used. Power supply is specified as a part of ME EQUIPMENT.

1.3 Safety information

> ⚠️ **Warning:**
> Read all the important safety information before installing and operating your monitor.

About the environment

■ The equipment should be installed near an easily accessible outlet.

■ Place the device on a flat, solid and stable surface that can support the weight of at least 3 devices. If you use an unstable cart or stand, the device may fall, causing injury to a child or adult, and serious damage to the device.

■ Never use the monitor in the presence of flammable anesthetics mixture with air, oxygen or nitrous oxide.

■ Never expose the monitor to rain or moisture. Never use the monitor near water - e.g. near a bathtub, washbasin, swimming pool, kitchen sink, laundry tub or in a wet basement.

■ Please heed necessary space between the monitor and the wall forventilation. Do not cover or block any ventilation openings in the cover of the set.

■ Keep small object away from the product. If small object gets into the monitor, please shut off power supply immediately and contact us for technical support.

About the powering and grounding

■ Please use power cord provided with the monitor, and insert the plug into the socket firmly.

■ Don't touch power cord or plug/unplug it when thundering, or it may cause electric shock.

■ Please hold the attaching plug when you unplug it. Don't unplug it by pulling power cord, otherwise the power cord may be injured and result in electric shock.

■ Do not overload wall outlets and extension cords as this may result in fire or electric shock.

■ Please use the appropriate power supply. Please use the power supply within the voltage range specified in this manual, otherwise it may cause fire, electric shock or product damage.

■ If the device is not used for a long time, disconnect it from the AC inlet to avoid damage by transient over-voltage.

■ To fully disengage the power to the device, please disconnect the power cord from the AC inlet.

■ Please make sure that this product connected with a qualified computer or other devices, or it is connected to the protective earth.

■ Make sure the monitor is grounded properly.

About the maintains and repairs

■ Product failure may cause fire, electric shock or equipment damage. If the product gives off smoke or makes unusual noises, cut off the mains supply as soon as possible and pull out the plug from the socket. Please contact JUSHA for technical support.

■ Repairing is limited to trained engineers. Do not try to repair or disassemble the product by yourself. It may cause product damage or personal injury.

■ Please don't touch a damaged LCD screen with bared hand. Because the leaking liquid crystal material contains toxic substance. Please contact doctor immediately once it happens.

Some useful recommendations

■ For mission critical applications, we strongly recommend that a replacement unit be immediately available.

■ Please avoid excessive compression on the LCD screen, which may cause damage to it.

■ In order to avoid scratches, don't touch the screen with sharp objects, such as pen or fingernail. Please use a soft cloth to clean the screen.

■ The operator should not touch the video interface (such as DVI port, VGA port and etc.), or it may result in potential ESD (Electronic Static

Discharge) damage to the monitor.

■ The backlight of LCD has a service life limitation. We strongly suggest using this monitor in the recommended brightness to extend its service life.Please turn off the monitor if not use.

■ Waste disposal should comply with local regulations.

■ If using this monitor improperly, potential interference to other electronic devices around could be possible. Following methods are proposed to eliminate such interference:

◆ Relocate or reorient the device under interference.

◆ Set up curtain appliance between the monitor and the device under interference.

◆ Plug the monitor and the devices under interference into different power sockets.

1.4 Intended use

■ The E240C LCD Monitor is intended to provide 2Dcolor video displays of images from surgical endoscopic/laparoscopic camera systems and other compatible medical imaging systems. The E240C 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.

1.5 Principle of operation

■ Jusha professional medical display is used by trained medical practitioners to view digital images, it converts the picture collected by endoscope to digital or analog signal . These digital information or analog information is send to the screen, then the screen displays the pictures.

1.6 Mechanism of action

■ The principle of display digital images using medical display is the selection of the screen, the screen will affect the quality of medical images.

Note:
1.E240C,E240C0,E240C1,E240C2,E240CG,JUSHA-E240C,JUSHA-E240C0,JUSHA-E240C1,JUSHA-E240C2,JUSHA-E240CG. The operation method and specifications is the same as E240C.

2.Overview

Thank you for using Jusha endoscopic surgery professional monitors.

Jusha endoscopic surgery professional medical monitor is designed for endoscope host, ICU display, operation room to display high-quality video and images.

2.1 Packing list

JUSHA endoscopic surgery professional medical monitor comes with:

- Endoscopic monitor (some monitors don't have the base)
- Base（optional）
- Power Adaptor
- AC Power Cord
- DVI cable
- SDI cable（optional）
- Y/C cable（optional）
- VGA cable（optional）
- CVBS cable（optional）
- RGBS/YPBPR cable（optional）
- User Manual
- After-Sales Service Record
- Packing list
- Warranty Card
- Product Certification
- Desiccant
- Screwdriver

Note:

1. Please only use the original accessories supplied with the monitor. JUSHA is not responsible for any technical problems caused by using Third-party accessories.

2. Packing list is for reference only, different models need to match different packing list, Please refer to the packing list in the product box. If any of the components are damaged or missing, please contact Nanjing JUSHA Display Technology Co., Ltd. (025-83305050).

3. Please keep the original package well. If you need to transport the product, use the original package.

2.2 Front view and keypad

Front view

Endoscopic surgery professional medical monitors have front keypads. They are shown as below.

The front keypad

Keypad description:

1	Power light	Indicates the monitor operating status 1. Lights up in orange, indicates monitor in power-on standby 2. Lights up in white, indicates monitor in power-on state
2	Source Select key	Select the input source
3	Down key	Select the next menu item
4	Up key	Selects the previous menu item
5	Menu key	1. Open the User menu 2. Exit the User menu
6	Right key	Increase the menu option value or go to the next menu level

7	Left key	Decrease the value of the menu option

2.3 The backside view of the monitor:

Backside of monitor

Connectors:

The connector configuration may depend on customer's requirements.
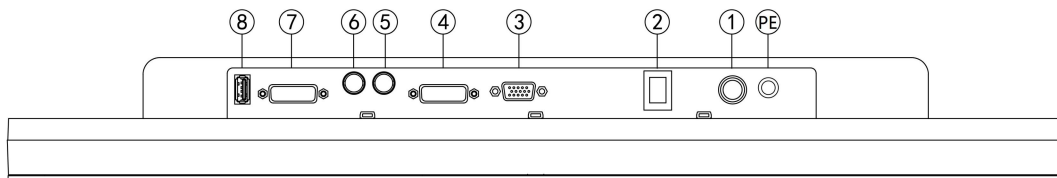
Primary port interface definition
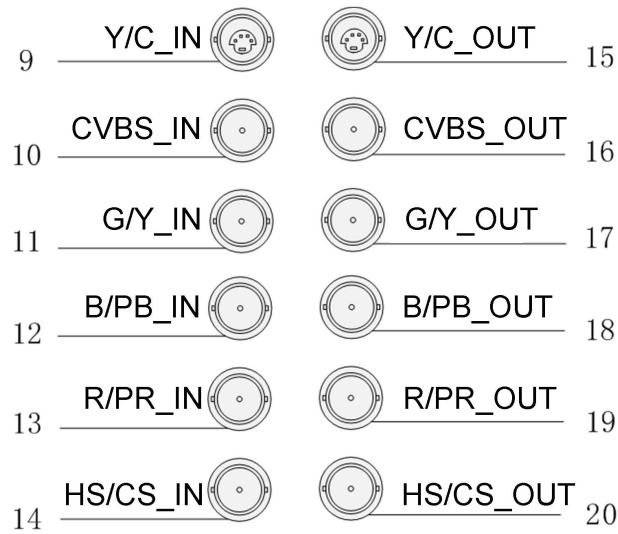
BNC board interface definition

Connectors' description:

1	DC power input	**2**	ON/OFF
3	VGA input	**4**	DVI input
5	SDI output	**6**	SDI input
7	DVI output	**8**	5V output
9	Y/C input	**10**	CVBS input
11	G/Y input	**12**	B/PB input
13	R/PR input	**14**	HS/CS input
15	Y/C output	**16**	CVBS output
17	G/Y output	**18**	B/PB output
19	R/PR output	**20**	HS/CS output
PE	Ground hole		

3.Monitor installation

3.1 Monitor installation

Note:
Unpack the product and check the accessories according to packing list. Confirm the monitor and accessories are complete.

Make sure that endoscopic host and monitors are powered off.

1.Plug one side of the signal wire into monitor's back interface, and the other side into endoscopic host's interface, then Tighten the screws. E240C supports desktop and wall design. So it can be installed by wall hanging or bracket, which should withstand the force of 7kg at least.
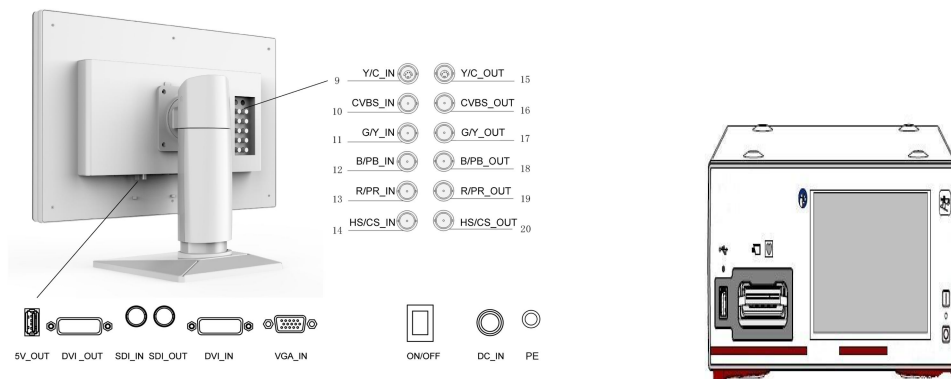
2. Connect to the operating room grounding system through the PE ground which is on the back of the monitor.

3.Connect power adaptor to power wire firstly, and then plug power adaptor into monitor's power input port, finally power LED indicater will turns orange.

Warning:
- Please use the power cord provided with this monitor. If the power cord is inconsistent with the table below, please contact your supplier. Please make sure the power cord matches the voltage of the power socket and has been approved by and complies with the safety standard of your particular country.

- To avoid risk of electric shock, AC/DC adaptor must only be connected to a power socket with protective earth.

- Power Cord: The monitor should be powered from a center tapped circuit when used at voltages over 120V. And plug type of monitor varies in different countries or areas, as shown in the following table.

Country/Area	U.S.A./Canada	EU (except U.K.)	U.K
Plug Shape			
Standard	ANSI/UL 817 CSA-C22.2 No.21	DIN VDE 0620-1:2010	BS1363/BS546
Voltage	120V	230V	230V
Country/Area	Brazil	Japan	Korea
Plug Shape			
Standard	NBR14136	JIS 8303	KSC8305:2002R
Voltage	220V	110V	220V
Country/Area	Denmark	Singapore	China
Plug Shape			
Standard	SB 107-2-D1	SS145	GB15934-2008
Voltage	230V	230V	220V

3.2 Installing the display to wall or suspension arm

This display can be installed onto the wall or suspension arm that complies with the international VESA standards.

When attaching to an arm or stand, follow the instructions of their User's Manual.

• When using another manufacturer's arm or stand, confirm the following in advance and select one conforming to the VESA standard.

- Clearance between the screw holes: 100 mm × 100 mm

- Strong enough to support three times weight of the monitor unit (except the stand) and attachments such as cables.

• When using another manufacturer's arm or stand, use the following screws to secure it.

- Screws fixing the stand to the monitor and screws supplied with this monitor

• Connect the cables after attaching an arm or stand.

• Do not move the removed stand up and down. Doing this may lead to the damage of device.

• The monitor and arm or stand are heavy. Dropping them may result in injury or equipment damage.

Warning:
Contact a technician for the installation. JUSHA is not responsible for any damages to the product or harm to customers when the installation is done by the customer.

4.Monitor settings

4.1 Turn on the monitor

Turn the power on, the power indicator will turn orange, press the power button on the front of the monitor, then the power indicator will turn white, and the monitor's screen will display the JUSHA boot screen, indicating that the monitor is running.

⚠️ **Warning:**

Only the original power cord and adaptor shall be used.

Please guarantee the plug can be wholly plugged into the socket.

Please guarantee the voltage be lower than nominal voltage of the power line.

When pushing the screen down, please don't touch the neck of monitor.
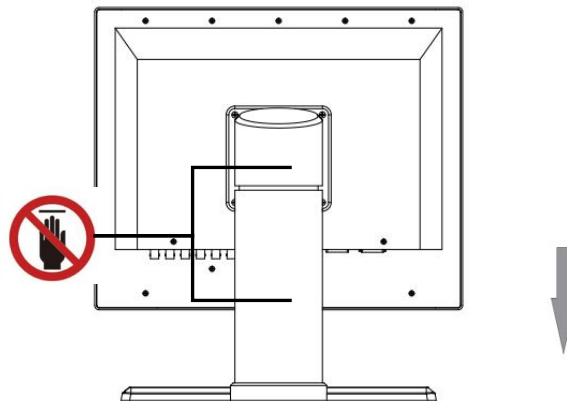
4.2 Turn off the monitor

Press the Power Switch key, and the Power Indicator will turn orange, then unplug the power cord.

Recommendation: The connector / cable of the adapter should be placed in an easily accessible place.

4.3 Adjust Monitor Parameters

A 7 buttons keypad, located at the lower right bottom on the front of the

monitor, which allows users to adjust monitor's parameters by using the On Screen Display (OSD) system.

4.4 Operate OSD menu

4.4.1 Choose signal source

To display the standard input menu, please press the "INPUT" button once to open the signal source selection menu.
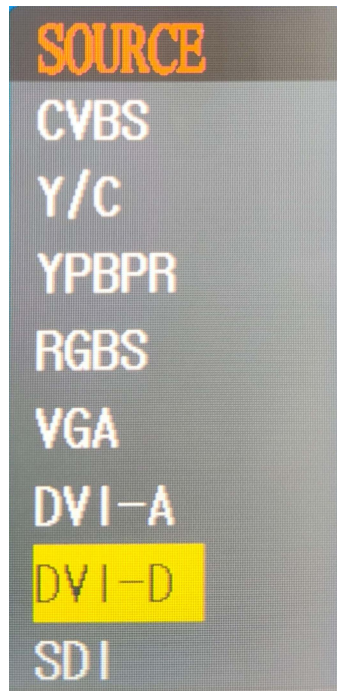
Signal source selection menu

4.4.2 Control description

In the user menu, press "UP" / "DOWN" key to highlight the option you want.

1) Then press "LEFT" / "RIGHT" key to adjust the highlight option in the user menu.
2) The target source is selected; press the "INPUT" button to change the target source In the signal source selection menu.
3) The selection rule of main source and sub source in Multi-window function: (black dots indicate the signal can be used for both main or sub signal, then white dots cannot)

Main window / Sub window	CVBS	Y/C	YPbPr	RGBS	VGA	DVI-A	DVI-D	SDI
CVBS	○	○	●	●	●	●	●	●
Y/C	○	○	●	●	●	●	●	●
YPbPr	●	●	○	○	○	○	●	●

RGBS	●	●	○	○	○	○	●	●
VGA	●	●	○	○	○	○	●	●
DVI-A	●	●	○	○	○	○	●	●
DVI-D	●	●	●	●	●	●	○	○
SDI	●	●	●	●	●	●	○	○

Table 1 The selection rule of main source and sub source in Multi-window function

4.4.3 Functional specification

1) Press the "MENU" key once to open the user menu:
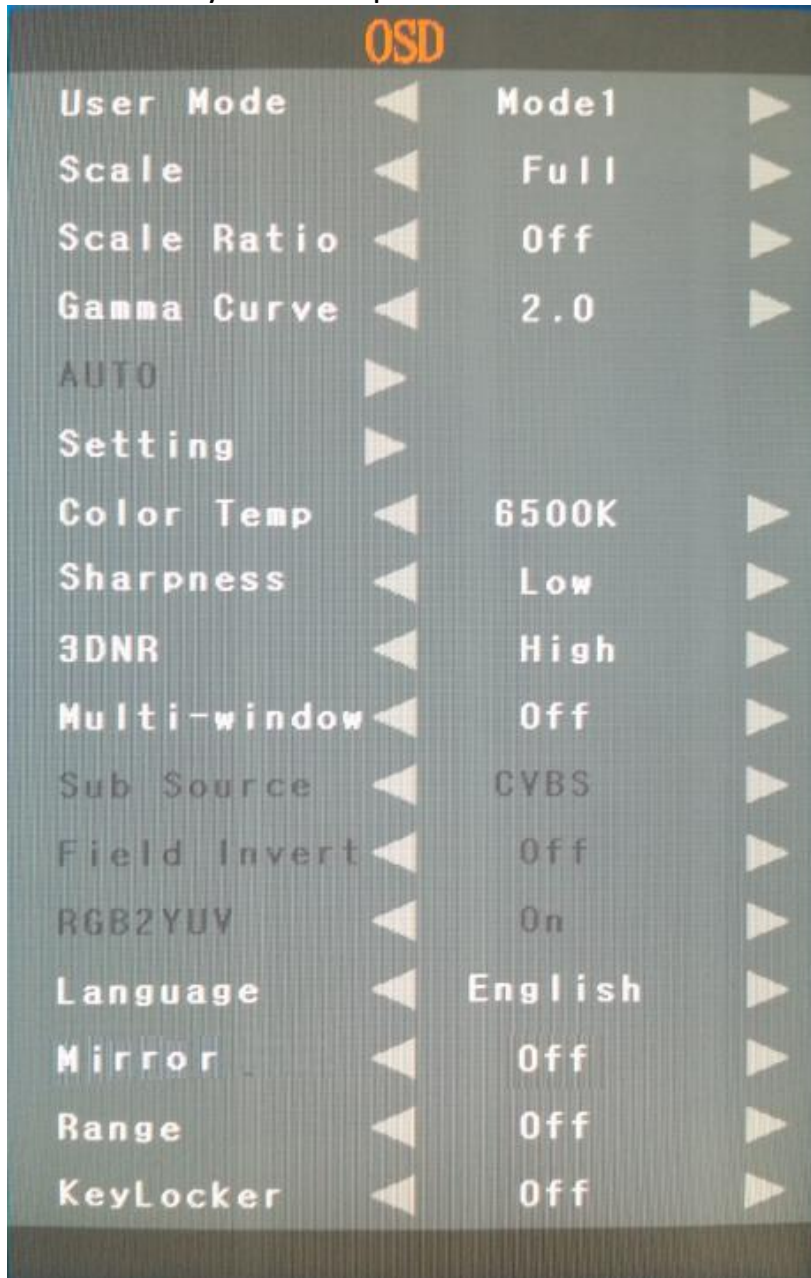
User Menu

2) The structure of user menu and functional specification:

Item	Sub-Menu	Functional Specification	Default	
User Mode	Mode1	User1 Mode, in this mode, the first user 's preference parameters(such as brightness, sharpness) shall be stored.	Mode1	
	Mode2	User2 Mode, in this mode, the second user 's preference parameters(such as brightness, sharpness) shall be stored.		
	Mode3	User3 Mode, in this mode, the third user 's preference parameters(such as brightness, sharpness) shall be stored.		
	Mode4	User4 Mode, in this mode, the fourth user 's preference parameters(such as brightness, sharpness) shall be stored.		
	Mode5	User5 Mode, in this mode, the fifth user 's preference parameters(such as brightness, sharpness) shall be stored.		
	Mode6	User6 Mode, in this mode, color parameters(such as brightness, saturation) shall be bypassed.		
Scale	Full	Picture full-screen	Full	
	Original	Picture original-screen		
	Min Ratio	Compare the horizontal and vertical scaling ratio, set the minimum ratio direction full display, set another direction display (maybe full display \not full display \ overscan)		
	Max Ratio	Compare the horizontal and vertical scaling ratio, set the maximum ratio direction full display, set another direction display (maybe full display \not full display \ ovescan)		
	4:3	Set the screen horizontal and vertical display ratio as 4:3		
	5:4	Set the screen horizontal and vertical display ratio as 5:4		
	16:9	Set the screen horizontal and vertical display ratio as 16:9		
	16:10	Set the screen horizontal and vertical display ratio as 16:10		

Scale Ratio	Off	Off	OFF
	5%	Scale up 5%	
	10%	Scale up 10%	
	15%	Scale up 15%	
	20%	Scale up 20%	
Gamma Curve	1.8	Gamma 1.8's effective	2.4
	2.0	Gamma 2.0's effective	
	2.2	Gamma 2.2's effective	
	2.4	Gamma 2.4's effective	
	2.6	Gamma 2.6's effective	
	DICOM	DICOM effective	
Auto	no item	Auto adjustment for analog source only(VGA, RGBS)	no item
Setting	Backlight	0--100	50
	Brightness	0--100	50
	Contrast	0--100	50
	Saturation	0--100	50
	Hue	0--100	49
Color Temp	5500K	5500K color temperature effective	6500K
	6500K	6500K color temperature effective	
	8000K	8000K color temperature effective	
	9300K	9300K color temperature effective	
	Bypass	LCD Panel's color temperature.	
	USER	6500K color temperature effective	
Sharpness	High	Sharpness level-high	Low
	Middle	Sharpness level-middle	
	Low	Sharpness level-low	
	Off	Close sharpness	
3DNR	Off	Close the 3DNR	High
	Low	Noise reduction function open, low effective	
	Mid	Noise reduction function open, medium effective	
	High	Noise reduction function open, high effective	
Multi-window	Off	Close the picture in picture mode	Off
	PIP	Open the picture in picture mode	

ENGLISH

	POP1	Open the picture out picture mode1,picture in main and sun window shall be displayed adaptively according to input source	
	POP2	Open the picture out picture mode2, picture in main and sun window shall be displayed in max ratio according to input source	
Sub Source	---	The sub source shall be determined by the main source, please refer to Table 1 to find the selection rule of main source and sub source in Multi-window function	
Field Invert	Off	Open Field Invert(only VGA and RGBS can be selectable)	Off
	On	Close Field Invert(only VGA and RGBS can be selectable)	
RGB2YUV	Off	Open RGB2YUV, do not turn RBG color space to YUV color space(not selectable)	Off
	On	Close RGB2YUV, turn RBG color space to YUV color space(not selectable)	
Language	Chinese	Set OSD language to Chinese	English
	English	Set OSD language to English	
Mirror	Off	Close the graphic mirror	Off
	On	open the graphic mirror	
Range	Off	Close the Function that called out of gray rang	Off
	On	Open the Function that called out of gray rang	
Key lock	Off	Close the Function that key lock	Off
	On	Open the Function that key lock	
Factory reset			

5.Important information

5.1 Technical specifications

5.1.1   E240CG

Input voltage	DC 24V
Standby power consumption	<0.5W
Consumption(nominal)	<40W
LCD Panel	24 inch,mono-TFT Liquid Crystal Display
Viewing angle	Horizontal 178°,Vertical 178°　（CR ≥ 10）
Pixels distance	0.27mm(H)mmx 0.27(V)mm
Resolution	1920 x 1200
Visual Size	518.4 (H)x324 (V)mm
Recommended normal luminance used	450cd/m^2
Recommended max luminance used	600cd/m^2
Recommended min luminance used	300cd/m^2
Input interface	VGA、DVI-A/D、SDI、Y/C(S-Video)、YPbPr、RGBS、CVBS
Output interface	Y/C(S-Video)、 YPbPr、 RGBS、 CVBS、 DVI-D、 3G-SDI
Operation Environment	Temperature: 0°C~40°C Humidity: 20%~85%　no condensation Air pressure: 700hPa~1060hPa
Environment for transportation and storage	Temperature: -20°C~60°C Humidity: 10%~90% no condensation Air pressure: 200hPa~1060hPa
Certification standards	CCC

📄 Note:
The specifications of JUSHA products are subject to change without notice.

5.2 Safety standards

Safety standards for E240CG

Safety Standards for the Medical Display (Including Power Adaptor)	GB4943.1-2011
Authentication	CCC
Declaration of Conformity	ROHS
Safety Category	Class Ⅰ
Protection level	Protection level I

5.3 Electromagnetic compatibility

5.3.1 EMC information

⚠ **Warning: Display requires special precautions regarding EMC and need to be installed, put into service and used according to the following information.**

1. Do not use other cables provided or specified by us. Using other cables may cause the increase of emission or decrease of immunity.
2. Do not put any portable and mobile RF communications equipment close to display. Doing so may affect display.
3. Display should not be used adjacent to or stacked with other equipment. If adjacent orstacked use is necessary, the equipment or system should be observed to verify normal operation in the configuration in which it will be used.
4. Anyone who connects additional equipment to the signal input part or signal output parts, configuring a medical system, are responsible that the system complies with the requirements of IEC/EN60601-1-2.

EMC for E240CG

EMI Voltage/radiated interference	GB/T9254-2008,GB17625.1-2012
	IEC60601-1-2:2014、EN60601-1-2:2015

5.4 EMC Guidelines

Below cables information are provided for EMC reference.

Cable	Max. cable length, Shielded/unshielded		Number	Cable classification
AC Power Line	1.7m	Unshielded	1 Set	AC Power
DVI Cable	1.9m	shielded	1 Set	DC Power

About the maintains and repairs

■ Product failure may cause fire, electric shock or equipment damage. If the product gives off smoke or makes unusual noises, cut off the mains supply as soon as possible and pull out the plug from the socket. Please contact JUSHA for technical support.

■ Repairing is limited to trained engineers. Do not try to repair or disassemble the product by yourself. It may cause product damage or personal injury.

■ Please don't touch a damaged LCD screen with bared hand. Because the leaking liquid crystal material contains toxic substance. Please contact doctor immediately once it happens.

Important information regarding Electro Magnetic Compatibility(EMC)

LCD MEDICAL DISPLAY needs special precautions regarding EMC and put into service according to the EMC information provided in the user manual; LCD MEDICAL DISPLAY   conforms to this IEC 60601-1-2:2014 standard for both immunity and emissions. Nevertheless, special precautions need to be observed:

■ LCD MEDICAL DISPLAY with no ESSENTIAL PERFORMANCE is intended used in Professional healthcare facility environment.

■ 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 the LCD MEDICAL DISPLAY, including cables specified by the manufacturer. Otherwise,

degradation of the performance of this equipment could result."

■ The use of accessories and cables other than those specified by NANJING JUSHA DISPLAY TECHNOLOGY CO., LTD., with the exception of accessories and cables sold by NANJING JUSHA DISPLAY TECHNOLOGY CO., LTD. of LCD MEDICAL DISPLAY   as replacement parts for internal components, may result in increased EMISSIONS or decreased IMMUNITY of the LCD MEDICAL DISPLAY.

■ WARNING: Use of this equipment LCD MEDICAL DISPLAY   adjacent to or stacked with other equipment should be avoided because it could result in improper operation."

■ When the AC input voltage is interrupted, the LCD MEDICAL DISPLAY will shut down and if the power supply restored, it could be recovered automatically, this degradation could be accepted because it will not lead to unacceptable risks and it will not result in the loss of basic safety or essential performance.

EMI Compliance Table

Table 1 – Emission

Phenomenon	Compliance	Electromagnetic environment
RF emissions	CISPR 11 Group 1, Class B	Professional healthcare facility environment
Harmonic distortion	IEC 61000-3-2 Class A	Professional healthcare facility environment
Voltage fluctuations and flicker	IEC 61000-3-3 Compliance	Professional healthcare facility environment

Table 2 - Enclosure Port

Phenomenon	Basic EMC standard	Immunity test levels
		Professional healthcare facility environment
Electrostatic Discharge	IEC 61000-4-2	±8 kV contact ±2kV, ±4kV, ±8kV, ±15kV air

Radiated RF EM field	IEC 61000-4-3	3V/m 80MHz-2.7GHz 80% AM at 1kHz
Proximity fields from RF wireless communications equipment	IEC 61000-4-3	Refer to table 3
Rated power frequency magnetic fields	IEC 61000-4-8	30A/m 50Hz or 60Hz

Table 3 – Proximity fields from RF wireless communications equipment

Test frequency (MHz)	Band (MHz)	Immunity test levels
		Professional healthcare facility environment
385	380-390	Pulse modulation 18Hz, 27V/m
450	430-470	FM, ±5kHz deviation, 1kHz sine, 28V/m
710	704-787	Pulse modulation 217Hz, 9V/m
745		
780		
810	800-960	Pulse modulation 18Hz, 28V/m
870		
930		
1720	1700-1990	Pulse modulation 217Hz, 28V/m
1845		
1970		
2450	2400-2570	Pulse modulation 217Hz, 28V/m
5240	5100-5800	Pulse modulation 217Hz, 9V/m
5500		
5785		

Table 4 – Input a.c. power Port

Phenomenon	Basic EMC standard	Immunity test levels
		Professional healthcare facility environment
Electrical fast transients/burst	IEC 61000-4-4	±2 kV 100kHz repetition frequency
Surges	IEC 61000-4-5	±0.5 kV, ±1 kV

Line-to-line		
Surges Line-to-ground	IEC 61000-4-5	±0.5 kV, ±1 kV, ±2 kV
Conducted disturbances induced by RF fields	IEC 61000-4-6	3V, 0.15MHz-80MHz 6V in ISM bands between 0.15MHz and 80MHz 80%AM at 1kHz
Voltage dips	IEC 61000-4-11	0%　; 0.5 cycle At 0º, 45º,　90º, 135º, 180º, 225º, 270º and 315º
		0%　; 1 cycle and 70%　; 25/30 cycles Single phase: at 0º
Voltage interruptions	IEC 61000-4-11	0% ; 250/300 cycles

Table 5 – Signal input/output parts Port

Phenomenon	Basic EMC standard	Immunity test levels
		Professional healthcare facility environment
Conducted disturbances induced by RF fields	IEC 61000-4-6	3V, 0.15MHz-80MHz 6V in ISM bands between 0.15MHz and 80MHz 80%AM at 1kHz

5.5 Calibration function

5.5.1　Automatic luminance calibration

JUSHA medical display has Auto Luminance calibration function, the luminance level can be stabilize at the value which the user set. This function is performed by medical display when working , No user action

5.5.2 DICOM and GAMMA calibration

1. DICOM and GAMMA calibration of each machine is completed before outing factory
2. User calibration steps
   (1) Power on the display

(2) Connect the display and the host computer with USB cable.

(3) Open the calibration software

(4) Click on the calibration button

(5) report is generated after the end of the calibration

5.5.3 Color calibration

E240C calibrate color refer to EBU standard.

(1) display the test image on E240C.

(2) measure the chromaticity coordinate of the image using color analyzer.

(3) judge whether the color difference between test data and standard data is less than the error threshold. If the difference between test data and standard data is larger than the error threshold, we adjust the saturation, hue and color brightness of the image and repeat the process of testing data and judging color difference, otherwise we store the value of the saturation, hue and color brightness of the image and end the process.

6. Maintenance

6.1 Avoid screen over-heat

Please use the display in the recommended environment, including appropriate temperature, humidity and air pressure. Turn off the display or lower its luminance if not use, or it may cause over-heat damage. In addition, if the screen displays the same image for a long time, it may over-heat and cause damage to some pixels.

6.2 Maintain the proper humidity

The display can work properly at the humidity between 20% and 85%. When humidity is higher than 85%, the condensation may occur inside the display. It makes the display components easy to rust, corroded, or even short-circuit. Therefore, LCD display must be moisture proof. If the display is not used for a long time, user should power on the display once a month at least.

If there is condensation in the screen surface, use a soft cloth to wipe gently before turn on the power. If the moisture has got into the screen, put the screen to a warm (no higher than 60°C) and dry environment to evaporate the moisture. Power a humid LCD will cause a permanent damage.

6.3 Clean the display properly

It is recommended to clean the display regularly to maintain appearance and extend product service life.

To clean the screen:
1)   Wipe the screen with a clean, soft, lint-free cloth.

2)   For further cleaning, apply a small amount of non-ammonia, non-alcohol based cleanser onto the cloth and wipe the screen.

Warning:
• Make sure the display is powered off before cleaning.

• Never spray or pour any liquid directly onto the surface of the screen or case.

Some chemical cleanser may damage the screen and case of the display. We recommend to use non-ammonia and non-alcohol based cleanser. We are not liable for damage resulting from ammonia or alcohol based cleanser.

6.4 Avoid shock and vibration

The LCD screen is quite fragile, so avoid strong shock and vibration. Falling to the ground or other strong shocks will cause damage to the LCD screen and the electrical components. Besides, please avoid any heavy pressure on the LCD screen surface.

6.5 Do not disassemble the display

Never try to disassemble the display or remove/change its LCD panel.

Maintenance

Unauthorized repair and refit will result in temporary or permanent display failure.

Warning:

Please do not touch the metal part of power plug to avoid electric shock.

Please keep the power socket and 5V DC away from water.

Please do not drop the LCD Monitor to avoid injure yourself.

7.Cleaning and Disinfection

7.1 Cleaning

It is recommended to clean the monitor regularly to maintain appearance and prolong product cycle life.

• Make sure the monitor is turned off.

• Never spray or pour any liquid directly onto the screen or case.

To clean the screen:

1. Wipe the screen with a clean, soft, lint-free cloth. This removes dust and other particles.

2. If still not clean, apply a small amount of non-ammonia, non-alcohol based glass cleaner onto a clean, soft, lint-free cloth, and wipe the screen.

Disclaimer

7.2 Disinfection

It is recommended to disinfection the monitor using 50% to 75% alcohol regularly to disinfection the LCD Monitor.

1 .Make sure the monitor is turned off.

2 .Wipe the screen with a clean, soft, lint-free cloth(strength ≤1N).

Attention: Never spray or pour alcohol directly onto the screen or case.

8. Hardware/software compatibility requirements

8.1 Available signal format

E240C LCD Monitor supports several input video signal, that includes analog signal format and digital signal format.

Analog signal format

Input interface signal format	S_VIDEO	RGBS	YPBPR	CVBS	VGA	DVI-A
NTSC	√			√		
PAL	√			√		
480/60i		√	√		√	√
480/60p		√	√		√	√
576/50i		√	√		√	√
576/50p		√	√		√	√
720/60p		√	√		√	√
720/50p		√	√		√	√
1080/50i		√	√		√	√
1080/60i			√		√	√
1080/60p			√		√	√

Digital signal format

Input interface signal format	DVI-D	3G_SDI
480/60i		√
480/60p	√	
576/50i		√
576/50p	√	
720/60p	√	√
720/50p	√	√
1080/50i	√	√
1080/60i	√	√
1080/50p	√	√
1080/60p	√	√
1080/30p		√

9.Malfunction analysis

Note:
Please contact us if failed to resolve problem after reading the recommended solutions followed.

To solve the problem, please contact Nanjing Jusha display technology co., Ltd after-sales service or read the manual to find proper solutions. If you use the recommend below solution still can't solve the problem, please contact Nanjing jusha display technology co., Ltd.

Problems	Probable solutions
The monitor does not respond	Check that the monitor's Power Switch is on. You turn on the system. Turn off the power and check the monitor's power cord and signal cable for proper connection.
"Out of Range display"	Check to see of the resolution or vertical frequency of your computer is higher than that of the LCD monitor. Reconfigure the resolution of your computer to make it less than or equal to 1920 x 1200. 1920 x 1200 is optimal. See Appendix A for more information on resolution.
Screen too bright or dark	Modify <Backlight> (There if life cycle limit for backlight of monitor. When it becomes dark or vibrant, please contact us.)
Appear ghost	Please confirm in long time display the same image, whether to use screen savers or timer. Ghost is caused by the liquid crystal monitor itself characteristic, should avoid long time display the same image.
Leave traces on the screen to pressure.	Keep the screen is completely white can alleviate this problem.
Restart the computer graphics installed after found no new hardware tips	Graphic card is not inserted or PCI slot has a problem, change slot to install

Malfunction analysis

Snowflake on screen	1. Connection problem of power wire or signal wire
	2. Main board static electricity or dust affection the connection of graphic card.
No figure after displaying well for a while	1. Connection problem of power wire or signal wire
	2. Main board static electricity or dust affection the connection of graphic card.

10. Declaration of Conformity

This machine could meet the following two conditions
- This machine will not generate Dangerous interference
- This machine will not come into unpredictable results

11. Declarations

11.1 Legal notice

The auxiliary equipment that is connected with JUSHA display should meet the corresponding IEC Standard (data processing equipment should meet IEC 60950-1 Standard and armamentariums should meet IEC60601-1 Standard). In addition, all configurations should meet IEC 60601- 1: 2005 + CORR. 1:2006 + CORR. 2:2007 + AM1:2012 Standard. Before a configuration is connected to signal output or input interface for processing system configuration, technician should make sure that the system meets IEC 60601- 1: 2005 + CORR. 1:2006 + CORR. 2:2007 + AM1:2012 Standard.

Staffs that are responsible for connecting the monitor with system should make sure that installed devices meet IEC 60601- 1: 2005 + CORR. 1:2006 + CORR. 2:2007 + AM1:2012 Standard. If there is any question, please contact with JUSHA Engineering Technology Service Department or local marketing representatives.

JUSHA markets its products through armamentarium manufacturers, distributors and franchisers. Therefore, please consult your seller whether he/she provides relevant maintenance service.

JUSHA will neither take any responsibility not authorize anyone to take any responsibility for product distribution and its use. Please read carefully the related documents, operation instruction and labels on package before you apply the product so that you can use and maintain the product properly.

Please note that its performance will be affected by system configuration, software, application program and client's data and client's operating control. Though JUSHA product is compatible with many systems, client's specific function might be come true differently. Whether the product is suitable for specific purpose or application program it depends on clients, therefore, JUSHA should not guarantee for it.

JUSHA expressly disclaims all warranties of any kind, whether statutory, express or implied, including, but not limited to, implied warranties of merchantability, fitness for particular purpose and non-infringement. JUSHA hereby explicitly rejects all warranties and state of any kind, any property or extent whether statutory, express or it

leads to any laws ,rules, commercial practice, conventions or trade disputes etc.

In no event shall JUSHA and its suppliers/franchisers be liable for any special, incidental, punitive, indirect or consequential damages (including, but not limited to, delay deliver, non-delivery, fault items, product design or production manufacture, being unable to use the product and service, loss of business or profits or other reasons, and any responsibility caused by buy or sell, lease, install or use related products, these terms and conditions and related articles of agreement.

The limits in this article and/or exclusions are not necessary suitable for some inadmissible exclusion clause, warranties or limited judicial districts. The maximum extent is permitted by applicable law in named jurisdiction under the circumstance.

JUSHA keeps patents, copyright and its exclusive right and all information in this manual including JUSHA all designs and related materials. Anyone cannot plagiarize JUSHA design or copy its product to sell or use without the company's explicit authority.

11.2   After-sale service declaration

The after-sale warranty is three years from the date of purchase, only if the product has been used with the recommended brightness. We are responsible for the quality problems caused by non-artificial factors and the maintenances are free of charge.

Note:
The user must contact and get permission from JUSHA before sending back the product for repairs.

To avoid the damage and/or loss during transit, the user must deliver the product in its original package or other adequate package with an equal degree of protection to the local distributor. Meanwhile, user must present proof of the product purchase date.

The user is not allowed to repair the monitor from anywhere except the authorized after-service spots. The original serial number should not be modified or removed. Don't derogate from requirements of this manual, otherwise it may result in quality assurance failure.

This product provides limited responsibility for quality assurance. JUSHA isn't responsible for malfunction caused directly/indirectly/accidently by users themselves. Users should pay

attention to the settings of the operation system and other applications. Above factors will affect the product performance.

Manufacture will provide circuit diagrams, component part lists, descriptions, calibration instructions to assist to SERVICE PERSONEL in parts repair.

11.3 Proprietary rights

Nanjing Jusha Display Technology Co., Ltd keeps the copyright of this manual and other related ownership. It is not allowed to copy, use or sell this manual without authorization of Nanjing Jusha Display Technology Co., Ltd.

12. Contact information

Nanjing Jusha Display Technology Co., Ltd.

Address: 8A, Block 1, Nanjing International Service Outsourcing Mansion, No.301 Hanzhongmen Street, Nanjing City, Jiangsu Province, 210036 China

Tel: 0086-25-83305050

Fax: 0086-25-58783273

Web: www.jusha.com.cn

ENGLISH