

27" Medical Panel Module Specification

1. Summary

The display is a high performance endoscope display specifically designed for use in medical environments. It adopts LG: LM270WFM-SLA1 27-inch screen, to achieve 1920×1080@60Hz resolution display.

2. Electrical Characteristics

2.1. Screen Characteristics

Panel Screen Model	LG: LM270WFM-SLA1
Size	27"
Effective Display Area	597.89 (H) ×336.31 (V) mm
Display Color	1.07B
Maximum Resolution	1920 (H) ×1080 (V) @60Hz
Dot Pitch	0.3114 (H) ×0.3114 (V) mm
Brightness	1000cd/m ² (TYP)
Contrast Ratio	1000: 1 (TYP)
Response Time	Tg=14ms (TYP)
Colour Gamut	100% sRGB (TYP)
Viewing Angle	R/L: 178°, U/D: 178° (TYP)
Display Surface Treatment	AG, Haze 25%, 3H
Backlight Type	LED

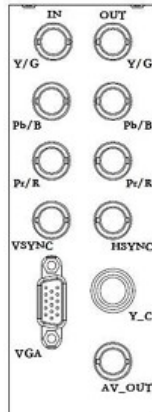
2.2. Display Characteristics

Signal Input Interface	SDI-IN/S-VIDEO/BNC/VGA/DVI-IN/USB (Software upgrade) YPbPr-IN/RS232
Signal Output Interface	SDI-OUT/DVI-OUT YPbPr-OUT/ S-VIDEO / (AV-OUT)
Factory Color Temperature	6500K
LUT	12Bit

2.3. Input Power

Power Supply Adapter Input Voltage	DC 100~240V, 50~60Hz
Input Current	24V~5A
Maximum Power Consumption	≤65W
Standby Power Consumption	≤1.5W

2.4. Interfaces



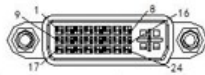
2.4.1. Signal Technical Specification

Signal	Specification	
DVI	DVI link	Dot frequency: <268.5MHz Supports up to 1920×1080@60Hz
VGA	Video Graphics Array	Dot frequency: <205MHz Supports up to 1920×1080@60Hz
USB	Universal Serial Bus	USB 2.0 Type-A

		Only used for software upgrades, and for playing simple pictures and videos.
SDI	Supports 3G SDI signal input, supports up to 1920×1080@60Hz	
S-Video	S terminal output supports up to 1024×768@60Hz	
BNC(Video)	Supports up to 720×576@60Hz	
YPbPr	Supports up to 720×576@60Hz	

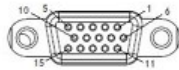
2.4.2. Input Signal

2.4.2.1. DVI



Pin	Signal	Pin	Signal
1	TMDS Data 2-	13	TMDS Data 3+
2	TMDS Data 2+	14	+5V Power
3	TMDS Data 2/4 Shield	15	Ground
4	TMDS Data 4-	16	Hot Plug Detect
5	TMDS Data 4+	17	TMDS Data 0-
6	DDC Clock(SCL)	18	TMDS Data 0+
7	DDC Data(SDA)	19	TMDS Data 0/5 Shield
8	/	20	TMDS Data 5-
9	TMDS Data 1-	21	TMDS Data 5+
10	TMDS Data 1+	22	TMDS Clock Shield
11	TMDS Data 1/3 Shield	23	TMDS Clock+
12	TMDS Data 3-	24	TMDS Clock-

2.4.2.2. VGA

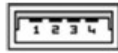


Pin	Signal	Pin	Signal
1	Red Video	9	PC_5V

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2	Green Video	10	VGA_DE
3	Blue Video	11	GND
4	GND	12	SDA
5	GND	13	H-Sync
6	Red GND	14	V-Sync
7	Green GND	15	SCL
8	Blue GND		

2.4.2.3. USB 2.0 Type-A



Pin	Signal	Pin	Signal
1	+5V Power	3	Data +
2	Data -	4	Ground

2.4.2.4. CVBS/SDI Terminal



Pin	Signal	Pin	Signal
1	CVBS/SDI	2	GND

2.4.2.5. DC 24V~5A



Pin	Signal	Pin	Signal
1	GND	2	+
3	-		

2.5. Environmental Requirements

Testing Environment	
Preheating Time	>20 min
Power Supply	100~240 V, 50~60 Hz AC
Ambient Temperature	20°C~25°C
Relative Humidity	30%~80% (Non-condensing)
Video Signal	1920×1080@60Hz; DVI
Surroundings	Darkroom
Set Up	Reset to factory defaults
Optical Tester (Chromathermograph)	Minolta CA-410 or equivalent
Operating Environment	
Operating Temperature	0°C-50°C
Humidity Range	20%-85% (Non-condensing)
Operating Air Pressure	84KPa -106KPa
Storage Environment	
Storage Temperature	-20°C-60°C
Storage Humidity	10%-90%

2.6. GAMMA, Brightness and Color Temperature Specifications

Factory Default	Gamma	Color Temperature		Brightness
	Gamma2.2	6500K	X: 0.313±0.010 Y: 0.329±0.010	Default brightness: 500±50cd/m ²

Note:

1. This model has 11 sets of Gamma curves:

LINEAR/Gamma1.8/Gamma1.9/Gamma2.0/Gamma2.1/Gamma2.2/Gamma2.3/Gamma2.4/

Gamma2.5/Gamma2.6/DICOM

2. Brightness measurement method: When the full-white mode and menu brightness is 50, the device is measured at the center point of the liquid crystal surface after passing through the protective glass.

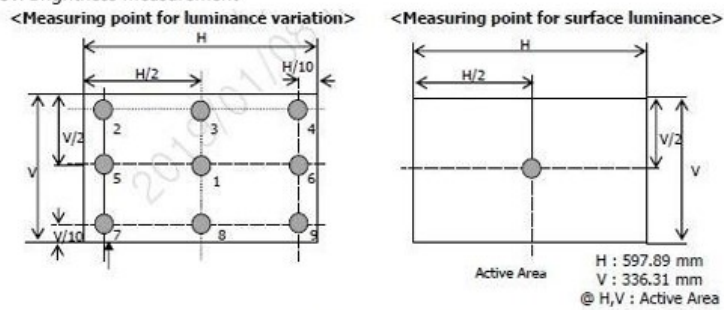
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(Note1)

3. Viewing Angle (Note2)
4. Response Time (Note3)
5. Light leakage detection standard for the whole display: Under the ambient brightness of 200LUX, the full-screen display area gray level 30 not visible.
6. Testing equipment installation: Measuring equipment should be placed in a draft-free and dark room. The test probe must be kept perpendicular to the monitor screen and aligned with the center of the screen.

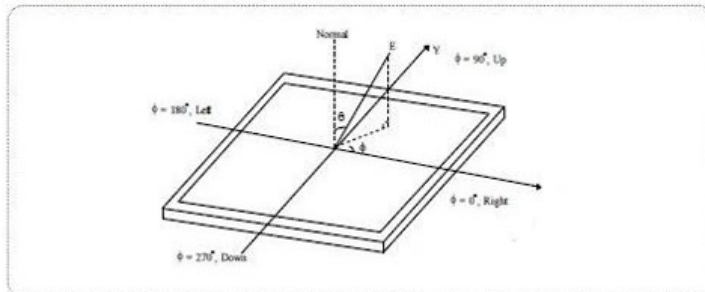
Note1: Brightness Measurement



Measure point for luminance.

Note2: Viewing Angle

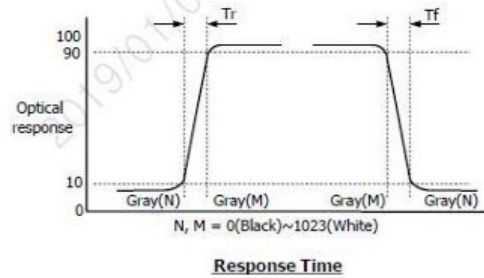
Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface.



Viewing angle

Note3: Response Time

Response time is defined as the following figure and shall be measured by switching the input signal for "Gray(N)" and "Gray(M)".



3. Function Menu Operation

3.1. Button Definition



Icon	Function
*	Freeze the image; Unfreeze the image
γ	Gamma shortcut key
☰	To enter OSD menu; select the current menu
—	Select down menu
+	Select up menu
⏏	To exit the current menu, select shortcut key for signal when there is no menu.
⏻	Power warm-start switch shortcut key
●	Power indicator light (See 3.2 for details)

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3.2. Power Light

Indicator Color	Status of Display
Lights off	No power supply
Steady Red	Power is connected, no signal standby
Steady Green	Power is connected, normally working

3.3. Menu Function

Main Menu Items	Secondary Menu Items	Secondary Submenu Items	Factory Default	
Image	Brightness	0-100	50	
	Contrast Ratio	0-100	50	
	Black Level Correction	0-100	50	
	Saturation	0-100	50	
	Hue	0-100	50	
	Acutance	0-100	50	
GAMMA	LINEAR/Gamma1.8/Gamma1.9/Gamma2.0/Gamma2.1/ Gamma2.2/Gamma2.3/Gamma2.4/Gamma2.5/ Gamma2.6/DICOM		Gamma2.2	
Display	Image Scale	User-defined	Horizontal Width 0-1920 Vertical Height 0-1080	1920 1080
		16:9/4:3/Auto/1:1/Full Screen		Auto
Color Temperature	Auto color	N/A		N/A
	Color Temperature	User	Red 0-256	128
			Green 0-256	128
			Blue 0-256	128
		6500K/7500K/8500K/9300K/10000K	6500K	
Menu	Menu language	Chinese/English		Chinese
	Transparency	Off/low/medium/high		off
	Time setting	10/20/30/40/50/60Sec		20Sec

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	Serial number	N/A	N/A
Time setting	Software upgrading	N/A	N/A
	Reset	N/A	N/A
	Automatic signal search	off/on	on
	RGB/YPBPR	RGB/YPBPR	YPBPR
	Signal selection	YPBPR/VGA/DVI/SDI/BNC/ (Y/C)	DVI

3.4. Signal Input

Before connecting: Before connecting the monitor to computer, please adjust computer display settings (resolution and refresh rate) to match the display modes in the table below.

Note: Lower resolution display modes, such as 640x480, will automatically enlarge to full screen display in some cases, and some characters may be distorted. If both the computer and monitor support VESA DDC, no manual settings are required. Simply connect the monitor to the computer to set the optimal resolution and refresh rate.

The monitor supports the following display modes:

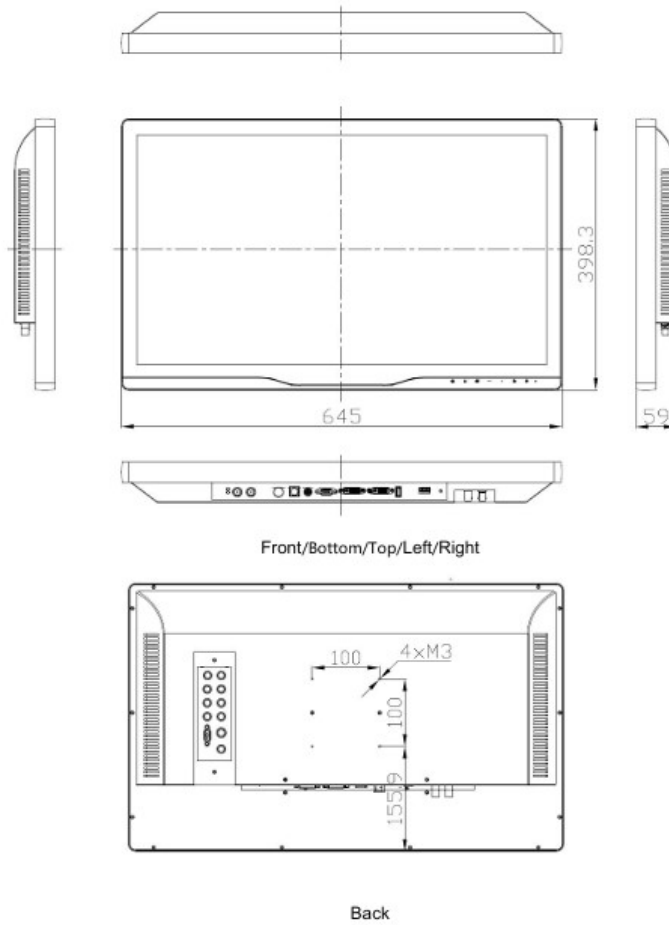
Name	Resolution	Refresh Rate
DOS Mode	720×400	70
SVGA	800×600	60
	800×600	72
	800×600	75
XGA	1024×768	60
	1024×768	75
SXGA	1280×1024	60
	1280×1024	75
Full HD	1920×1080	60

Cable connecting: Plug the signal cable into the interface on the back of the monitor, and then plug the other end into the computer's display interface. After connecting, please tighten the screws.

Note: Make sure the signal cable is connected first, and then connect the power supply.

4. Structural Specification

4.1. Appearance Schematic Diagram

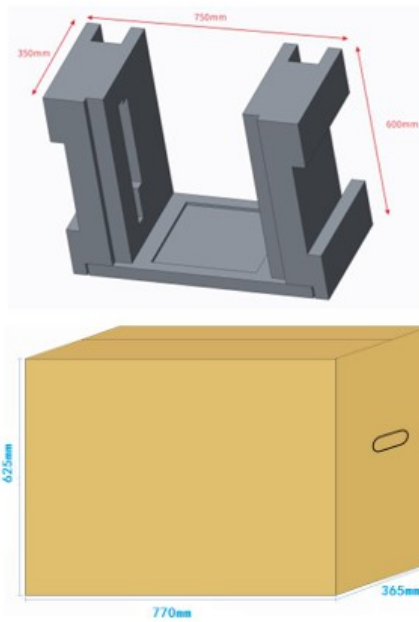


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Item	Description	
Overall Dimension	Length (mm)	645
	Width (mm)	398.3
	Thickness (mm)	59
Shell Assembly	Profile surface frame, sheet metal back shell	
Color Standard	Silver frame, white back	
Screen Viewable Area	597.89 (H) × 336.31 (V) mm	
Heat Dissipation	Convection in the left and right louver holes in the upper rear shell	
Base or wall mount connection	VESA hole: 100×100	Screw: 4×M3

4.2. Packaging

4.2.1. Packaging Drawing of The Display



4.2.2. Package Dimension, Weight and Storage Condition

Carton Size (mm)	Depth (mm)	770
	Width (mm)	365
	Height (mm)	625

Net Weight (Kg)	Base not included	6.7kg
Gross Weight(Kg)	Base not included	10kg

Storage/Transportation Temperature	-20°C ~+60°C
Storage/Transportation Humidity	0% ~90%, Non-condensing
Storage/Transportation Temperature Gradient	Max. 10°C/h, Non-condensing
Storage/Transportation Air Pressure	84KPa-106KPa

5. Safety Regulations Certification

No.	Certification Program	Certification Standard	Model
1	CCC	GB4943.1-2011; GB/T 9254.1-2021; GB17625.1-2012	27" Monitor

6.1. LCD Inspection Standard

1. Dot Defect

1.1. Bright Dot

Dots(sub-pixels) which appeared brightly in the screen when the LCM displayed only with Full Black pattern.

- R, G, B 1 dot 2 Max
- Adjacent 2 dots 1 Max
- Total amount of Bright dots 2 Max
- Minimum distance of Bright dots 15mm

1.2. Partial bright dot with 64 Gray pattern.

- Partial bright dot (tiny dot) 8 Max

1.3. Dark Dot

Dots(sub-pixels) which appeared darkly in the screen when the LCM displayed with Full Red, Green and Blue patterns.

- 1 dot 5 Max
- Adjacent 2 dots 2 Max
- Total amount of Dark dot 5 Max
- Minimum distance of Dark dots 15 mm

1.4. Total amount of Dot Defects 5 Max (Combination)

- Note) a. Every dot herein means Sub-Pixel(Each Red, Green, or Blue Color)
 b. Bright dot defect damaged less than half size of sub-pixel is not counted as a bright dot defect. And dark dot defect damage less than half size of sub-pixel is not counted as a dark dot defect.
 c. Dots darker than half brightness of sub-pixel are not defined as bright dot defect and dots brighter than half brightness of sub-pixel are not defined as dark dot defect.

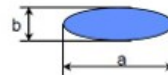
2. Polarizer Defects

Items	Criteria
Scratches	$0.05 \leq W \leq 0.1, 0.3 \leq L \leq 3.0, N \leq 3$
Dent/Bubble	$D \leq 0.7, N \leq 3$

Where, W :Width
 L : Length
 D : Average diameter $= (a+b)/2$












Note)

- a. Average Diameter
 b. Linear : $a > 2b$, Circular : $a \leq 2b$



- c. Extraneous substances which can be wiped out, like Finger Print, Particles, are not considered as a defect.
 b. Defects which is on the Black Matrix(outside of Active Area) are not considered as a defect.

6.2. Screen Module Appearance Inspection Standards

location	Items	Criterion for Defects		Type	scope
All	Stain		Removable stain is OK	-	All
Be related to PNL	Crack		Not Allowed	Major	Shipment status: Single Cell/FOG /MDL Production
	Side Chipping		Function and assembly are not affected	Minor	
	Corner Chipping		Function and assembly are not affected	Minor	
	Burr		Function and assembly are not affected	Minor	
	Scratch		PNL with POL , based on point/line foreign (scratch) standard to determine.	Minor	
Be related to FPC/PCB	short circuit / open circuit		Not Allowed	Major	Shipment status: FOG/MDL Production
	components and parts		Component missing is not allowed	Minor	
Be related to Backlight	Code-spurting		Key information can be identified is OK	Minor	Shipment status: MDL Production
	Scratch		Limit Sample	Minor	
	Stain		Removable stain is OK	Minor	