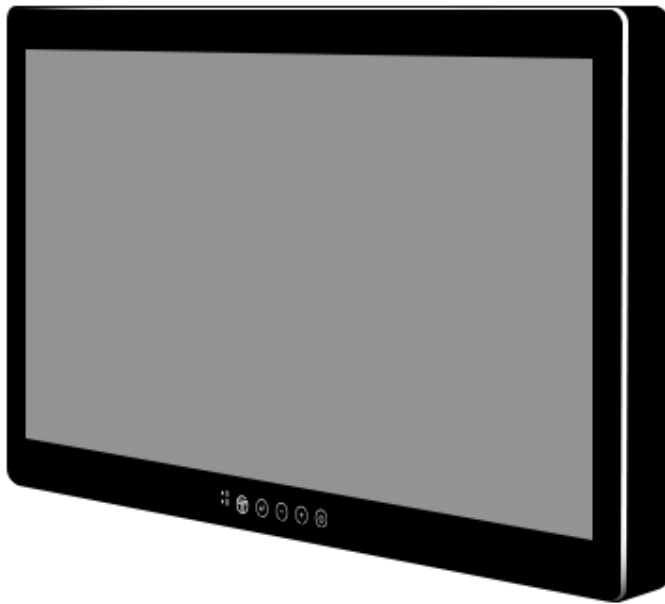




Operating Instruction

M270TF-XXX
M320TF-XXX
LCD Monitor



4K
ULTRA HD

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

Table of Contents

1. Owner's Record	3
2. What is Included	3
3. Installation	4
3.1 Remove the connector cover	4
4. Connecting Cables	4
5. Ground Pin	5
6. Connecting Power	5
7. Hard Power On	6
7.1 Hard Power On	6
7.2 Hard Power Off	6
7.3 Soft Power On and Off	6
8. Power Modes	6
9. IR Remotes	7
10. On Screen Display (OSD) Navigation	7
11. OSD Locking / Unlocking	8
12. Hot Keys	8
13. Quick Key	8
14. Basic OSD Menu Options: Display	10
15. Basic OSD Menu Options: Adjust	12
16. Basic OSD Menu Options: Audio	14
17. Basic OSD Menu Options: Multi-Display	15
18. Basic OSD Menu Options: OSD	17
19. Basic OSD Menu Options: ADVANCED	17
20. Indications for Use / Intended Use	19
21. Customers in the U.S.A.	19
22. Customers outside the U.S.A.	19
23. Important safeguards/notices for use in the medical environments	19
24. Important EMC notices for use in the medical environments	20
25. Warning and Cautions	23
26. Safety	25
26.1 Installation	25
26.2 Precautions for connecting this unit with other medical devices	25
26.3 Use with an electrosurgical knife, etc.	25

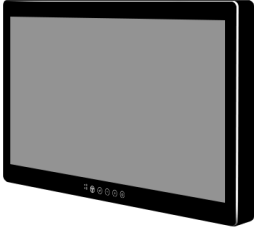
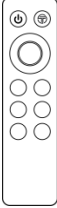
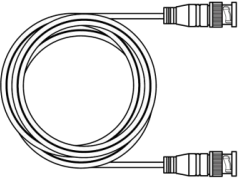
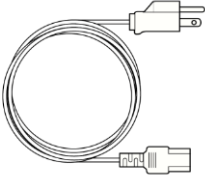
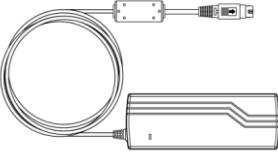
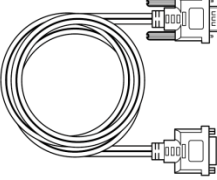
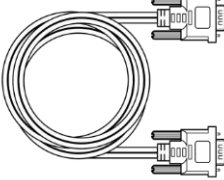
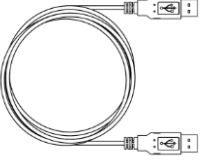

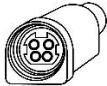


26.4	Precautions for using this unit safely	26
26.5	Recommendation to use more than one unit.....	26
27.	About the LCD display panel.....	26
27.1	Images that may cause burn-in	26
27.2	To reduce the risk of burn-in.....	26
27.3	About the screen protect panel	27
27.4	A long period of use	27
27.5	Moisture condensation	27
27.6	Cleaning before cleaning.....	27
27.7	Cleaning the monitor	27
27.8	Flat surface for better maintenance	28
27.9	Repacking	28
27.10	Disposal of the unit	28
28.	Biological Hazard and Returns	28
29.	Frequency Table.....	29
30.	Troubleshooting.....	29
31.	Technical Specification	30
31.1	Monitor	30
31.2	AC Adapter	31
32.	PIN Specification	32
33.	Dimensional Figure	35
33.1	27" Model.....	35
33.2	32" Model.....	36
34.	Meaning of Symbols on the unit.....	37

1. Owner's Record

The model and serial numbers are located at the rear of the unit. Record these numbers in the spaces provided below. Refer to these numbers whenever you call upon your Winmate dealer regarding this product.

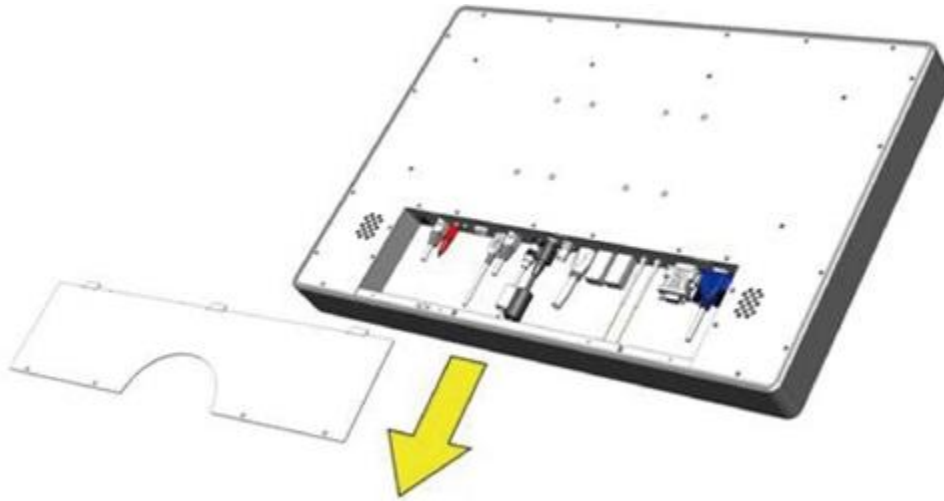
Model No. _____ Serial No. _____

2. What is Included

 <p>27" / 32" Surgical Display <i>Part number depends on the configuration the unit</i></p>	 <p>Remote Control 980000000418</p>	 <p>SDI cable 9470020020K1</p>	 <p>Medical Power Cable 94BA03303001 US</p>
 <p>24 Volt power supply 922D150W24V4</p>	 <p>DVI Cable 1.8 m 9455295290Q0</p>	 <p>VGA cable 9441151150P4</p>	 <p>USB Cable for touch screen 948018102100</p>
 <p>Manual 91521110100M</p>	 <p>Power Connectors – Male Type 604324906001</p>	 <p>Power Connectors – Female Type 604324906001</p>	 <p>M4 VESA Mounting Screws 10mm x 8 pcs 12mm x 8 pcs 15mm x 8 pcs</p>

3. Installation

3.1 Remove the connector cover



To access the connectors, remove the connector cover. Before removing the connector cover, disconnect the power cord.

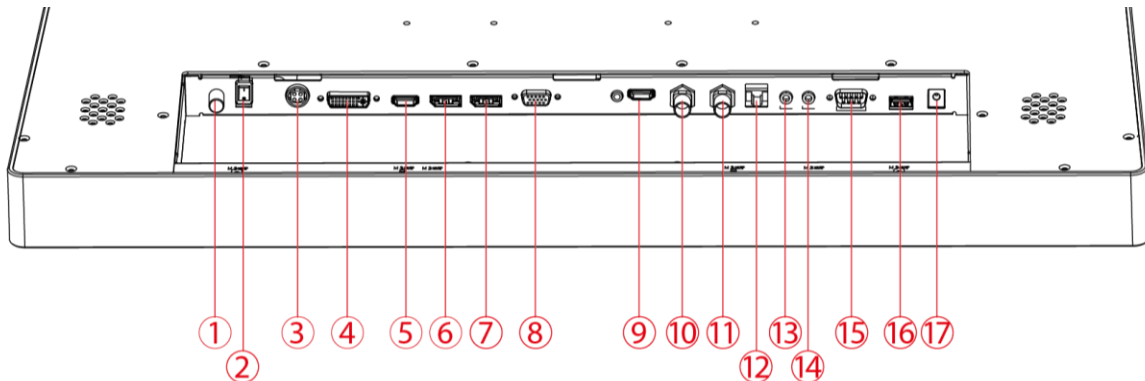
1. Remove the four screws on the connector cover.
2. Slide the connector cover in the direction of the arrow and remove it.



WARNING !

Do not remove any other screws other than the four screws affixing the connector cover. Doing so may cause electric shock.

4. Connecting Cables



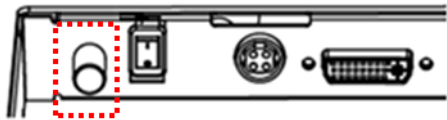
- | | | |
|--------------------|------------------|------------------|
| 1. Ground Pin | 7. DP In | 13. Mic In |
| 2. Switch | 8. VGA Connector | 14. Line Out |
| 3. 24 V DC In | 9. HDMI 2.0 | 15. RS-232 |
| 4. DVI-D dual link | 10. SDI In | 16. USB 2.0 |
| 5. HDMI 1.4 | 11. SDI Out | 17. Power 5V Out |
| 6. DP Out | 12. RJ-11 | |

There are several video and/or data cables that can be connected in many combinations. The number and type of connections will be automatically detected by the monitor. From the OSD (On Screen Display) the user can select the way the images will be displayed.

Be sure to tighten and thumb screws on the individual video cable. A secure connection is important to ensure the best image quality.

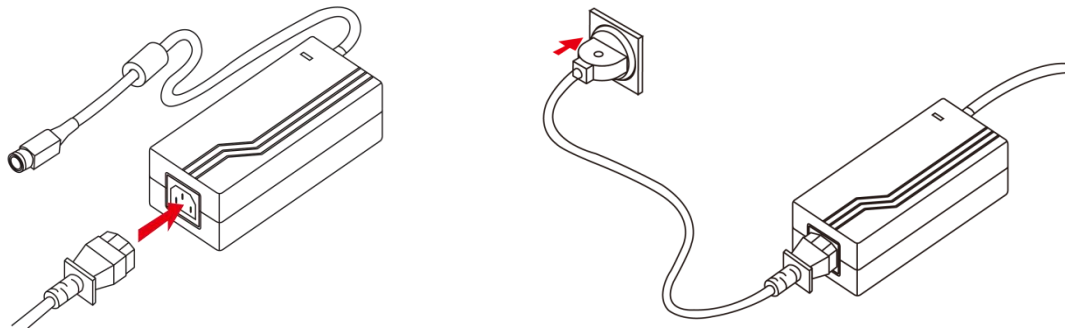
5. Ground Pin

Connect this monitor to the Protective Earth ground at this pin. This Pin is also used when potential equalization between the monitor and other equipment is required. Simply connect the potential equalization pin (POAG) found on devices, to the monitor ground pin using an AWG18 wire. (WIRE NOT PROVIDED)



6. Connecting Power

- Connect the AC cord to the AC IN terminal on the AC adaptor.
- Connect the DC OUT terminal of the AC adaptor to the DC IN terminal on the monitor.
- Align the notch on the cord connector with the guiding groove and plug it in.
- Connect the AC cord plug to the power outlet.

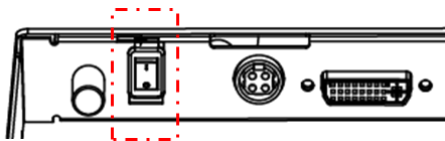


7. Hard Power On

Hard power and soft power are used independently. The differences explained below:

7.1 Hard Power On

Turn the POWER switch at the bottom of the monitor to On. The POWER indicator glows blue, indicating the monitor is internally powered.



7.2 Hard Power Off

Turn the POWER switch at the bottom of the monitor to Off. The POWER indicator light turns off, indicating the monitor is not internally powered.

7.3 Soft Power On and Off



The soft power button, when touched, will enable or disable the video screen. The soft power button need only be touched once. Depending on monitor's current state, there may be a few second delay in displaying an image.

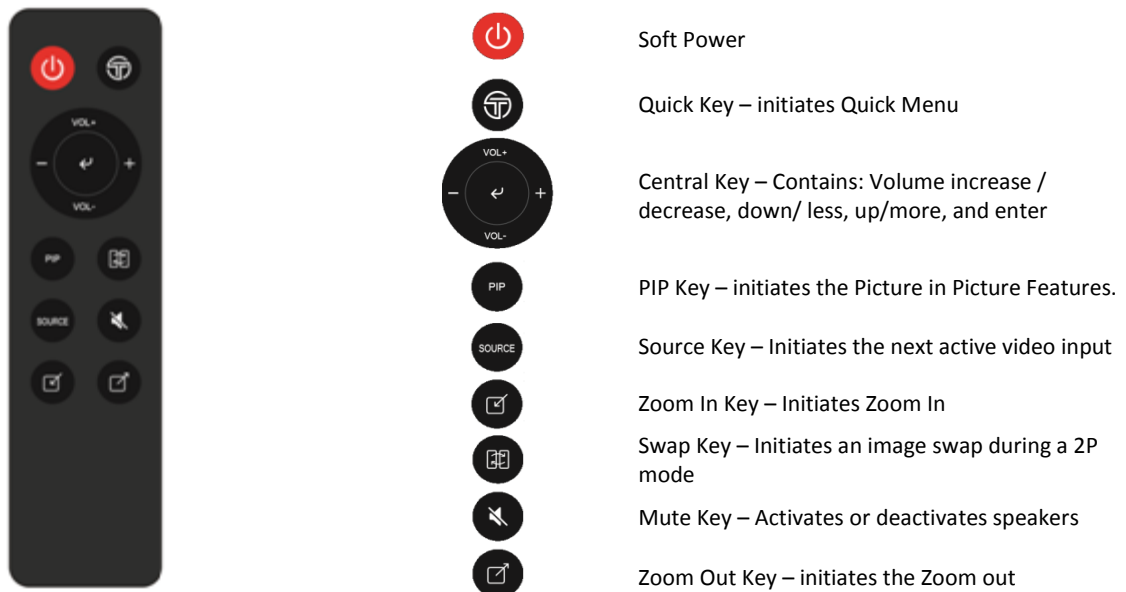
8. Power Modes

This table shows the LED light combinations and their meaning

Blue	Amber	Description
ON	OFF	Power On Mode Image being displayed
ON	ON	Searching for a signal
OFF	ON	No signal found or stand-by mode
OFF	OFF	Soft Power Off Mode The soft power button was pressed
OFF	OFF	Hard Power Off Mode No image being displayed

9. IR Remotes

All the monitor controls can be accessed through the IR remote control. This controller has a few quick access keys for the user's convenience.



10. On Screen Display (OSD) Navigation

When the Enter key is touched, the OSD (On Screen Display) menu will appear on the monitor screen. This menu offers the user ability to make many changes to the image. The table below shows the response after touching the different OSD icons



Icon	OSD Menu Status	Response
	Displaying	Close OSD menu
	Off	Open the Quick menu
	Displaying	Enter
	Off	Open OSD Menu
	Displaying	Move down / Decrease value
	Off	N/A
	Displaying	Move up / Increase value
	Off	Auto Adjust
	Displaying	Disable Video Image
	Off	Enable Video Image

11. OSD Locking / Unlocking

Touching both the and buttons simultaneously will either turn ON or OFF the OSD lockout feature.



12. Hot Keys

Touching either the or the button will initiate the brightness control feature.

13. Quick Key

The OSD Function key QUICK offers the user easier access to six major monitor adjustment.

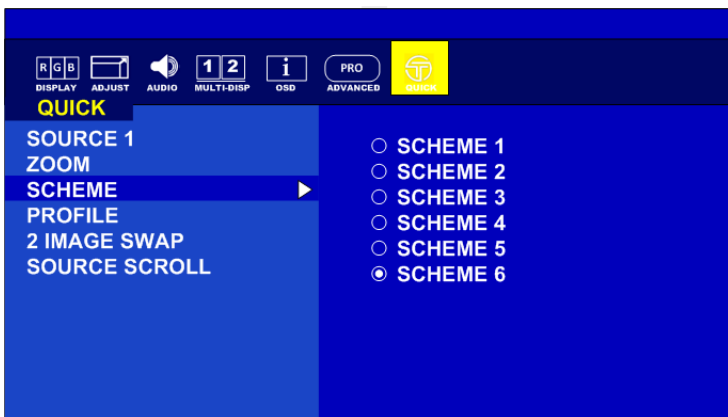
The sub-menu under the SOURCE 1 option allows the user to select the video source for the primary image.



The sub-menu under ZOOM allows the user the ability to select which image to zoom into. Depending on the Display Mode previously selected, different regions to apply the zoom function are displayed.

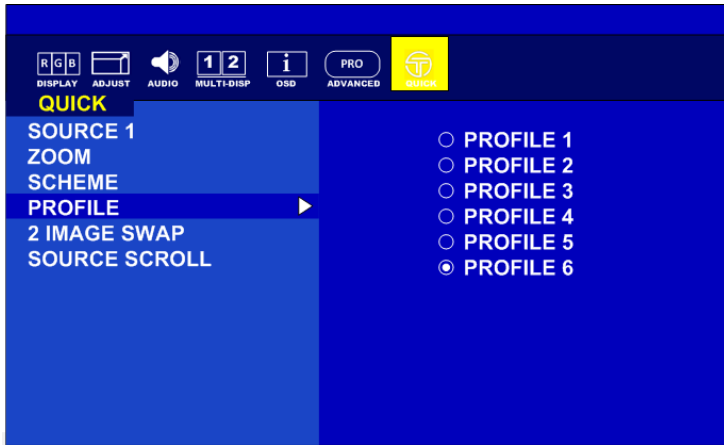


The sub-menu under SCHEME offers the user six (6) color schemes to choose from. Each color scheme can be adjusted individually under the OSD function DISPLAY, menu option SCHEME ADJUST. The primary colors and secondary colors are adjustable.



Under Profile, the sub-menu offers the user six (6) different previously saved 3D LUT (Look Up Table) profiles to select from.

Profile can be uploaded using the Winmate Color calibration software. (not included)

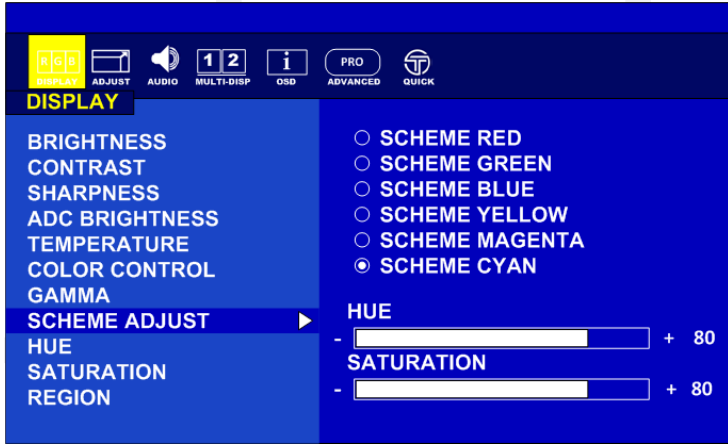


Source 1	Set Main Video Input
Zoom	Zoom in / Zoom out of an image
Scheme	Select the uploaded scheme file Scheme 1 to 6
Profile	Select from 6 standard color profiles Profile 1 to 6 *profile can be changed with optional calibration software
2 Image Swap	Swap the images under 2 image mode
Source Scroll	Change input source

14. Basic OSD Menu Options: Display

The OSD offers a variety of monitor adjustment capabilities. Below is a description of a few common functions used.

Under SCHEME ADJUST, the HUE and Saturation of each primary and secondary color can be changed. These changes are stored under the SCHEME currently activated. (Found under the Quick Menu)



Under COLOR CONTROL, the RED, GREEN, and BLUE colors of the current image are changed.

These adjustments DO NOT over write the setting of SCHEME or PROFILE.



Region allows the user to select the “region(s)” / input(s) to adjust with a feature.

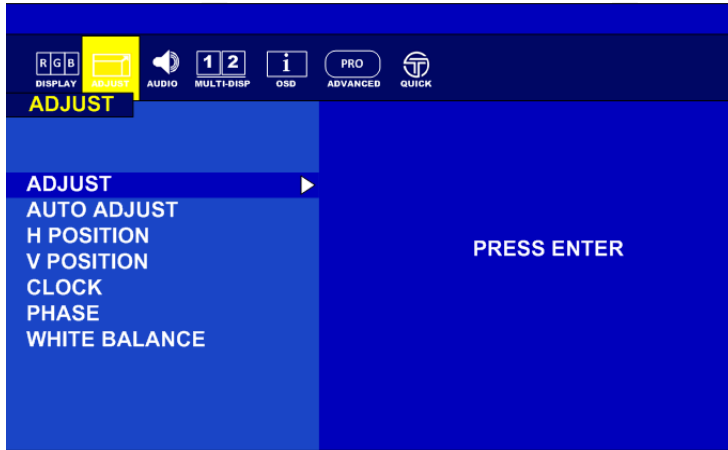
Example: Monitor has four inputs signals activated on a quad screen. There are nine (9) possible region combinations that can be adjusted. In the picture below, only quadrant “1” will receive adjustment.



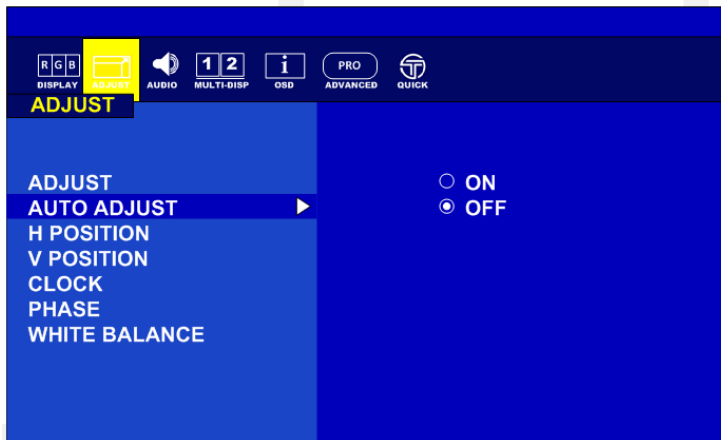
Brightness	Adjusts the overall image and background brightness Value: 0-100
Contrast	Adjusts the image contrast in relationship to the background Value: 0-100
Sharpness	Adjusts the crispness of the image Value: 0 to 4
ADC Brightness	Adjusts the Auto Display Control (ADC) brightness Value: 0-100
Temperature	Adjusts the color temperature of the entire screen. USER/5600/6500/7600/9300 Note: low color temperature makes the screen reddish. High color temperature makes the screen bluish.
Color Control	Adjusts the level of red, green, blue, yellow, magenta, and cyan colors RGB Slide Bar Value: 0-100
Gamma	Select a display gamma value for best picture quality. Native 1.8 / 2.0 / 2.2 / 2.4 / DICOM *DICOM Can be calibrated using optional calibration software
Scheme Adjust	Select scheme for different default setting combination. Adjust the appearance of the Active Scheme
Hue	Adjust the level of hue Value: 0-100
Saturation	Adjust the level of saturation Value: 0-100
Region	Select the multi source 1P 1/2P,2/2P ,1+2/2P 1/4P,2+3+4/4P 2/4P, 1+3+4/4P 3/4P, 1+2+4/4P 4/4P,1+2+3/4P,1+2+3+4/4P

15. Basic OSD Menu Options: Adjust

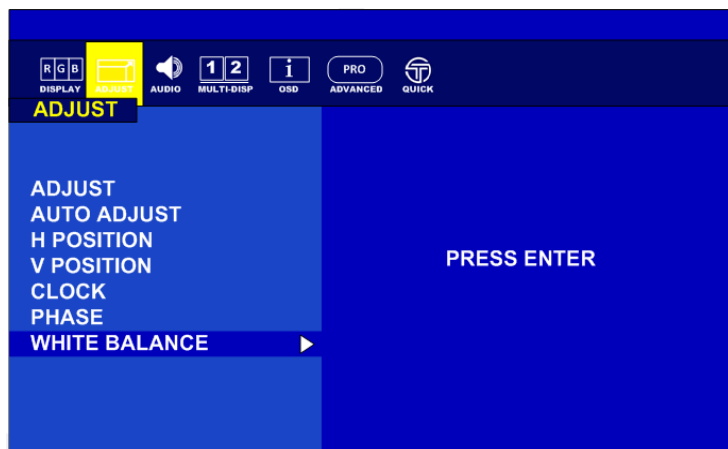
The ADJUST feature will automatically adjust an analog image.



When an analog image is initially detected, the monitor will attempt to automatically adjust the image positioning. This automatic adjustment feature can be turned On/Off here.



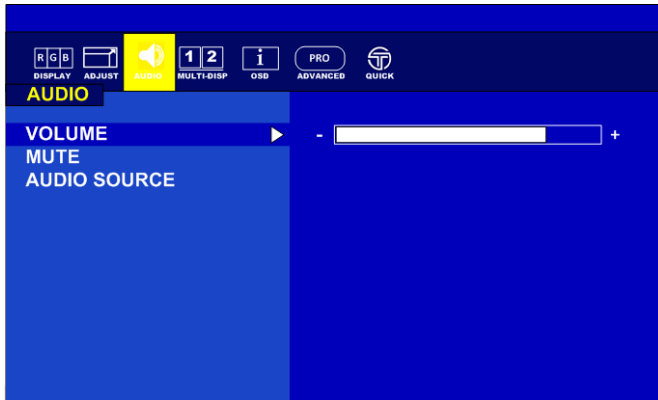
Adjust the white balance automatically here by selecting PRESS ENTER



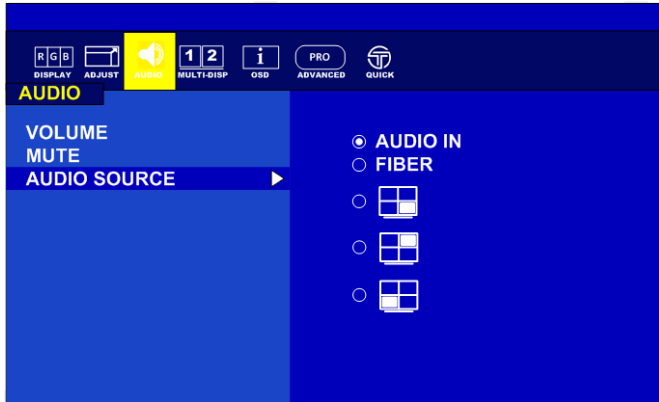
AUTO Adjust	Automatically adjusts screen size, H position, V position, Clock, Clock Phase when video source is changed
H Position	Controls the horizontal position of the image within the display area of the LCD. Value: 0-100
V Position	Controls the vertical position of the image within the display area of the LCD. Value: 0-100
Clock (Adjust H total)	+ Expand the width of the image on the right of the screen - Narrow the width of the image on the left of the screen Value: 0-100
Phase	Adjusts the image phase Value: 0-100
White Balance	Perform the white balance

16. Basic OSD Menu Options: Audio

The speaker volume for all audio inputs is controlled here.



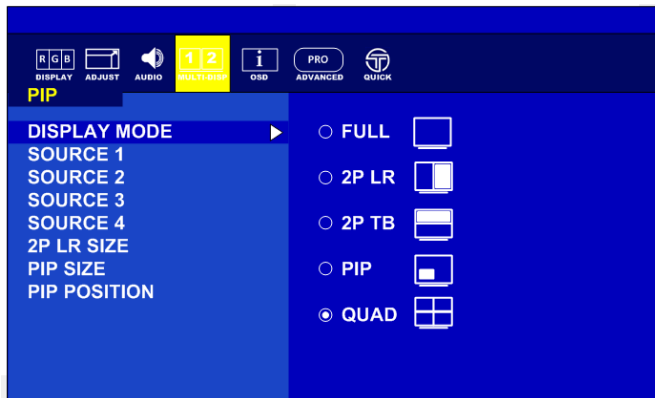
AUDIO SOURCE allows the user to select which from the available inputs. Example, there are 3 regions within the Quad display with audio.



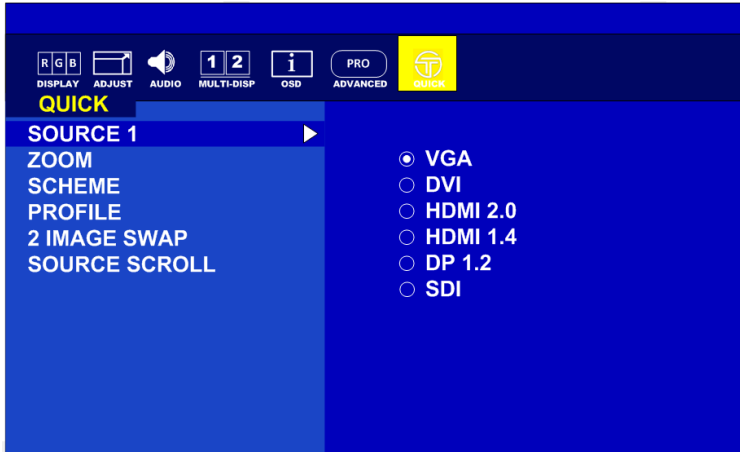
Volume	Adjusts the level of volume - Decrease + Increase Value: 0-100
Mute	ON/OFF
Audio Source	Select the Audio Source Audio IN, Fiber, 1P, 2P, 3P, 4P

17. Basic OSD Menu Options: Multi-Display

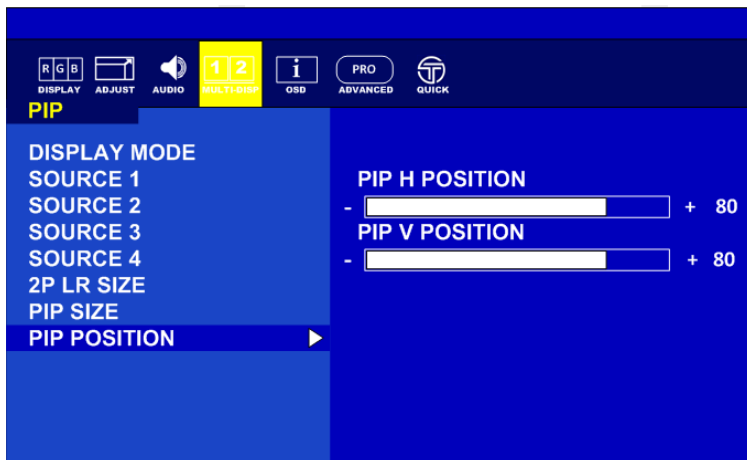
Display mode offer the user up to five different layouts to view input images



Each source can be assigned an active image (only one source can be set to auto scan)



Under the PIP layout position and size of the inner image can be adjusted



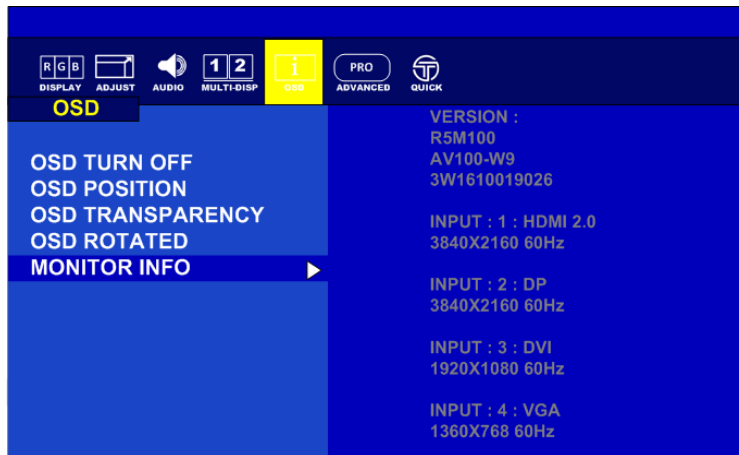
Display Mode	Choose the Display Mode Full, 2PLR, 2PTB, PIP or QUAD
Source 1	Choose the channel of display source Auto Scan/VGA/DVI/HDMI 2.0/HDMI 1.4/DP
Source 2	Choose the channel of display source Auto Scan/VGA/DVI/HDMI 2.0/HDMI 1.4/DP
Source 3	Choose the channel of display source Auto Scan/VGA/DVI/HDMI 2.0/HDMI 1.4/DP
Source 4	Choose the channel of display source Auto Scan/VGA/DVI/HDMI 2.0/HDMI 1.4/DP
2P LR Ratio	RATIO 0/1/2/3/4
PIP Size	Adjust picture-in-picture(PIP) size Value: 0-10

PIP Position-H	Adjust the horizontal position of PIP Value: 0-100
PIP Position-V	Adjust the Vertical position of PIP Value: 0-100

18. Basic OSD Menu Options: OSD

Selecting MONITOR INFO will display the current state of the monitor.

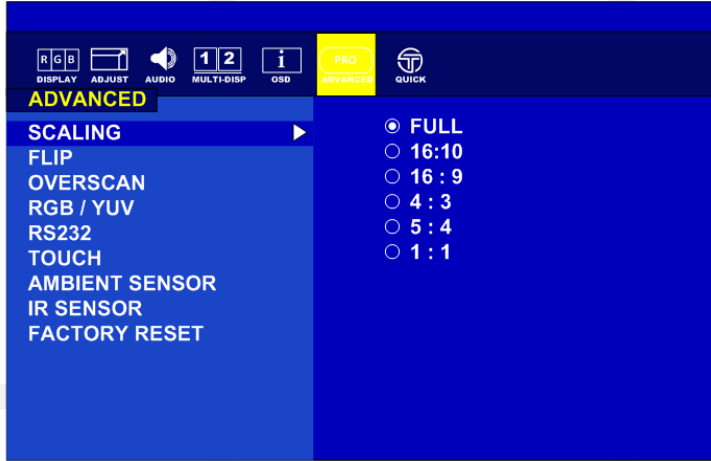
PCB version, firmware version, serial number, and inputs.



OSD Turn Off	Set the time of auto close OSD menu Value: 0-60 sec
OSD Position	Adjust the horizontal and vertical location where the OSD appears on the screen Value: 0-100
OSD Transparency	Adjust the transparency level of OSD Value: 0-255
OSD Rotated	Set to rotate the OSD menu 0°/90°/270°
Monitor Information	PCB Version Firmware version Serial number Current input Current resolution

19. Basic OSD Menu Options: ADVANCED

By selecting SCALING, the user can choose the perspective the image is displayed in.



The ability to control the monitor's functions by way of an infrared remote can be enabled/disabled here.



Scaling	Adjust the image scaling setting Full/16:10/16:9/4:3/5:4/1:1
Flip	Set the flip image mode Rotate 0 / Rotate 90 / Rotate 180 / Rotate 270 / LEFT/RIGHT /UP/DOWN
Overscan	Perform over scan function Under scan Over Scan
RGB/YUV	RGB/YUV Can Switch Between Color Spaces
RS232	Select the RS232 signal source: local COM or Fiber Local / Fiber
Touch	Select the Touch signal source: local COM or Fiber Local / Fiber
Ambient Sensor	On / off
IR Sensor	On / off
Factory Reset	Resets OSD options back to factory settings. Yes/No

20. Indications for Use / Intended Use

The LCD Monitor is intended to provide 4K 2D color video display from endoscopic/laparoscopic camera systems and other compatible medical imaging systems. The Monitor is a widescreen, high-definition, medical grade display for use during minimally invasive surgical procedures and is suitable for hospital operating rooms, surgical centers, clinics, doctors' offices and similar medical environments.

21. Customers in the U.S.A.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

All interface cables used to connect peripherals must be shielded to comply with the limits for a digital device pursuant to Subpart B of part 15 of FCC Rules.

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.

22. Customers outside the U.S.A

This product has been manufactured by or on behalf of Winmate Inc.

Inquiries related to product compliance based on European Union legislation shall be addressed to the authorized representative, Winmate Inc. For any service or guarantee matters, please refer to the addresses provided in the separate service or guarantee documents.

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

23. Important safeguards/notices for use in the medical environments

1. All the equipment connected to this unit shall be certified per Standard IEC60601-1, IEC60950-1, IEC60065 or other IEC/ISO Standards applicable to the equipment.
2. Furthermore, all configurations shall comply with the system standard IEC60601-1-1. Everybody who connects additional equipment to the signal input part or signal output part configures a medical system, and is therefore, responsible that the system complies with the requirements of the system standard
3. IEC60601-1-1.
4. If in doubt, consult the qualified service personnel.

5. The leakage current could increase when connected to other equipment.
6. For this equipment, all accessory equipment connected as noted above, must be connected to mains via an additional isolation transformer conforming to the construction requirements of IEC60601-1 and providing at least basic insulation.
7. This equipment generates, uses, and can radiate radio frequency energy. If it is not installed and used in accordance with the instruction manual, it may cause interference to other equipment. If this unit causes interference (which can be determined by unplugging the power cord from the unit), try these measures: Relocate the unit with respect to the susceptible equipment. Plug this unit and the susceptible equipment into different branch circuit.

24. Important EMC notices for use in the medical environments

The M270TF-XXX / M320TF-XXX needs special precautions regarding EMC and needs to be installed and put into service per the EMC information provided in the instructions for use.

The portable and mobile RF communications equipment such as cellular phones can affect the M270TF-XXX / M320TF-XXX.




WARNING !

The use of accessories and cables other than those specified, with the exception of replacement parts sold by Winmate Inc., may result in increased emissions or decreased immunity of the M270TF-XXX / M320TF-XXX .

Guidance and manufacturer's declaration-electromagnetic emissions		
The M270TF-XXX / M320TF-XXX is intended for use in the electromagnetic environment specified below. The customer or the user of the M270TF-XXX / M320TF-XXX should assure that it is used in such an environment.		
Emission test	Compliance	Electromagnetic environment-guidance
RF emissions CISPR 11	Group 1	The M270TF-XXX / M320TF-XXX uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The M270TF-XXX / M320TF-XXX is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	D	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration - electromagnetic immunity			
The M270TF-XXX / M320TF-XXX is intended for use in the electromagnetic environment specified below. The customer or the user of the M270TF-XXX / M320TF-XXX should assure that it is used in such as environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/ output lines	±2 kV for power supply lines ±1 kV for input/ output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	< 5% (> 95% dip in) for 0.5 cycle 40% (60% dip in) for 5 cycles 70% (30% dip in) for 25 cycles < 5% (> 95% dip in) for 5 sec	< 5% (> 95% dip in) for 0.5 cycle 40% (60% dip in) for 5 cycles 70% (30% dip in) for 25 cycles < 5% (> 95% dip in) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the LMD-M270TF-XXX / M320TF-XXX requires continued operation during power mains interruptions, it is recommended that the M270TF-XXX / M320TF-XXX be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: is the A.C. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration - electromagnetic immunity			
The M270TF-XXX / M320TF-XXX is intended for use in the electromagnetic environment specified below. The customer or the user of the M270TF-XXX / M320TF-XXX should assure that it is used in such as environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms 150 kHz to 80 MHz	<p>Portable and mobile RF communications equipment should be used no closer to any part of the M270TF-XXX / M320TF-XXX , including cables, than the recommended separation distance calculated from the equation appliance to the frequency of the transmitter.</p> <p>Recommended separation distance: d</p> $d = \left[\frac{3,5}{v_1} \right] \sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m 80 MHz to 2.5 GHz	<p>Recommended Separation Distance</p> $d = \left[\frac{3,5}{E_1} \right] \sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}$ $d = \left[\frac{7}{E_1} \right] \sqrt{P} \quad 80 \text{ MHz to } 2.5 \text{ GHz}$ <p>Where P is the maximum output power rating of the transmitter in watts (W) per the transmitter manufacturer and d is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, ^A should be less than the compliance level in each frequency range.</p> <p>^B Interference may occur near equipment marked with following symbol:</p> 
NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.			
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the M270TF-XXX / M320TF-XXX is used exceeds the applicable RF compliance level above, the M270TF-XXX / M320TF-XXX should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the M270TF-XXX / M320TF-XXX .			

Recommended separation distances between portable and mobile RF communications equipment and the M270TF-XXX / M320TF-XXX

The M270TF-XXX / M320TF-XXX is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the M270TF-XXX / M320TF-XXX can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the M270TF-XXX / M320TF-XXX as recommended below, per the maximum output power of the communications equipment.

Rated maximum output power [W] of transmitter	Separation distance per frequency of transmitter [m]		
	150 kHz to 80 MHz $d = 1.2$ $d = \left[\frac{3,5}{v_1} \right] \sqrt{p}$	80 MHz to 800 MHz $d = 1.2$ $d = \left[\frac{3,5}{E_1} \right] \sqrt{p}$	800 MHz to 2.5 GHz $d = 2.3$ $d = \left[\frac{7}{E_1} \right] \sqrt{p}$
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 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) per the transmitter manufacturer.

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

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

25. Warning and Cautions



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



To prevent injuries, firmly fix the unit to the floor or wall following the installation manual.



If the M270TF-XXX / M320TF-XXX should be used adjacent to or stacked with other equipment, it should be observed to verify normal operation in the configuration in which it will be used.



CAUTION

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



CAUTION

When installing, the installation space must be secured in consideration of the ventilation and service operation. Leave a space 4 cm (1 5/8 inches) or more behind, 10 cm (4 inches) or more from the left and right sides of, 6 cm (2 3/8 inches) or more from the bottom side of, and 30 cm (11 7/8 inches) or more above the unit.

Warning on power connection:



WARNING !

Use a proper power cord for your local power supply. Use the approved Power Cord (3-core mains lead) / Appliance Connector / Plug with earthing-contacts that conforms to the safety regulations of each country if applicable. Use the Power Cord (3-core mains lead) / Appliance Connector / Plug conforming to the proper ratings (Voltage, Ampere). If you have questions on the use of the above Power Cord / Appliance Connector / Plug, please consult a qualified service personnel.

For the customers in U.S.A. and Canada

Please use the following power supply cord.

United States and Canada	
Plug Type	HOSPITAL GRADE*
Cord Type	Min. Type SJT Min. 18 AWG
Minimum Rating for Plug and Appliance Couplers	10A/125V
Safety Approval	UL Listed and CSA



NOTE

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

**CAUTION**

This unit is heavy. Make sure to unpack and move the unit with two or more people.

26. Safety

- M270TF-XXX / M320TF-XXX is a DC powered device. Use with the supplied AC adaptor (EM11701F).
- Operate the unit on 100-240V AC only.
- The nameplate indicating operating voltage, etc. is located on the AC adaptor.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for several days or more.
- To disconnect the AC power cord, pull it out by grasping the plug. Never pull the cord itself.
- The socket-outlet shall be installed near the equipment and shall be easily accessible.

26.1 Installation

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

26.2 Precautions for connecting this unit with other medical devices

Before you utilize this device and/or connect this device to any other medical device, please be aware of and abide by the following precautions:

- Before actually using this device for medical practice, please check and confirm that you do not experience any discomfort in the use of this monitor
- If you experience or are likely to experience discomfort, please refrain from using this device.
- Generally, discomfort (such as eye strain, fatigue, nausea, or motion sickness) can be provoked by quick movements of video picture, focal positioning of video images, distances between moving objects and changing image colors.
- Before prolonged use, make sure the image of the connected medical device is displayed properly.

26.3 Use with an electrosurgical knife, etc.

If this unit is used together with an electrosurgical knife, etc., the picture may be disturbed, warped or otherwise

abnormal because of strong radio waves or voltages from the device. This is not a malfunction. When you use this unit simultaneously with a device from which strong radio waves or voltages are emitted, confirm the effect of this before using such devices, and install this unit in a way that minimizes the effect of radio wave interference.

26.4 Precautions for using this unit safely

- Some people may experience discomfort (such as eye strain, fatigue, or nausea) while watching video images. It is recommended that all viewers take regular breaks while watching video images. The length and frequency of necessary breaks will vary from person to person. You must decide what works best.
- Avoid watching the display in environments where your head may shake, because there is a higher possibility that you experience discomfort.

26.5 Recommendation to use more than one unit

As problems, can occasionally occur, when the monitor is used under critical conditions, we strongly recommend you use more than one unit or prepare a spare unit for replacement.

27. About the LCD display panel

- The LCD panel fitted to this unit is manufactured with high precision technology, giving a functioning pixel ratio of at least 99.99%. Thus, a very small proportion of pixels may be “stuck”, either always off (black), always on (red, green, or blue), or flashing. In addition, over a long period of use, because of the physical characteristics of the liquid crystal display, such “stuck” pixels may appear spontaneously. These problems are not a malfunction.
- Do not leave the LCD screen facing the sun as it can damage the LCD screen. Take care when you place the unit by a window.
- Do not store the monitor FACE DOWN.
- Do not push or scratch the LCD screen.
- Do not place a heavy object on the LCD screen. This may cause the screen to lose uniformity.
- If the unit is used in a cold place, a residual image may appear on the screen. This is not a malfunction. When the monitor becomes warm, the screen returns to normal.
- The screen and the cabinet become warm during operation. This is not a malfunction.

27.1 Images that may cause burn-in

- Masked / boarded images with aspect ratios other than 16:9
- Color bars or images that remain static for a long time
- Continuous characters or messages displaying on the screen

27.2 To reduce the risk of burn-in

Turn off the character displays from connected equipment.

27.3 About the screen protect panel

The screen protect panel is made of toughened glass, but there is a possibility that it may crack.

- Handle with care. Avoid strong impact, such as dropping from a high place or an object swinging into it.
- Do not scratch the panel with a sharp object or place it in harm's way.

27.4 A long period of use

- Due to the characteristics of LCD panel, displaying static images for extended periods, or using the unit repeatedly in a high temperature/high humidity environments may cause image smearing, burn-in, areas of which brightness is permanently changed, lines, or a decrease in overall brightness.
- In particular, continued displaying of an image smaller than the monitor screen, such as in a different aspect ratio, may shorten the life of the unit.
- Avoid displaying a still image for an extended period, or using the unit repeatedly in a high temperature/high humidity environment such as an airtight room, or around the outlet of an air conditioner.

27.5 Moisture condensation

If the unit is suddenly taken from a cold to a warm location, or if ambient temperature suddenly rises, moisture may form on the outer surface of the unit and/or inside of the unit. This is known as condensation. If condensation occurs, turn off the unit and wait until the condensation clears before operating the unit. Operating the unit while condensation is present may damage the unit.

27.6 Cleaning before cleaning

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

27.7 Cleaning the monitor

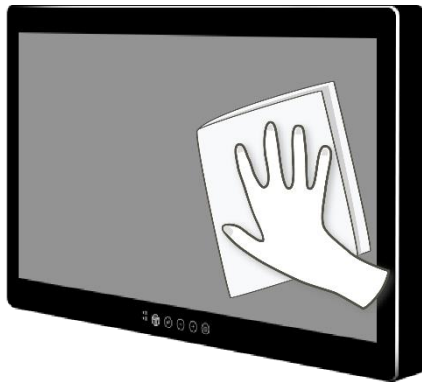
A material that withstands disinfection is used for the front protection plate of the medical use LCD monitor. The protection plate surface is specially treated to reduce reflection of light. When solvents such as benzene or thinner, or acid, alkaline or abrasive detergent or chemical cleaning cloth are used for the protection plate surface/monitor surface, the performance of the monitor may be impaired or the finish of the surface may be damaged. Take care with respect to the following:

- Clean the protection plate surface/monitor surface with a 50 to 70 v/v% concentration of isopropyl alcohol or a 76.9 to 81.4 v/v% concentration of ethanol using a swab method. Wipe the protection plate surface gently (wipe using less than 1 N force).
- Stubborn stains may be removed with a soft cloth such as a cleaning cloth lightly dampened with mild detergent solution using a swab method and then clean using the above chemical solution.
- Never use solvents such as benzene or thinner, or acid, alkaline or abrasive detergent, or chemical cleaning cloth for cleaning or disinfection, as they will damage the protection plate surface/monitor surface.
- Do not use unnecessary force to rub the protection plate surface/monitor surface with a stained cloth. The protection plate surface/monitor surface may be scratched.

- Do not keep the protection plate surface/monitor surface in contact with a rubber or vinyl resin product for a long period of time. The finish of the surface may deteriorate.

27.8 Flat surface for better maintenance

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



27.9 Repacking

Do not throw away the carton and packing materials. They can be used again to repack monitor.
If you have any questions about this unit, contact your authorized dealer.

27.10 Disposal of the unit

Do not dispose of the unit with general waste. Do not include the monitor with household waste.

28. Biological Hazard and Returns

The structure and the specifications of this device as well as the materials used for manufacturing makes it easy to wipe and clean and therefore suitable to be used for various applications in hospitals and other medical environments, where procedures for frequent cleaning are specified.

However, normal use shall exclude biological contaminated environments, to prevent spreading of infections.

Therefore use of this device in such environments is at the exclusive risk of Customer. In case this device is used where potential biological contamination cannot be excluded.

Customer shall implement the decontamination process as defined in the latest edition of the ANSI/AAMI ST35 standard on each single failed Product that is returned for servicing, repair, reworking or failure investigation to Seller (or to the Authorized Service Provider). At least one adhesive yellow label shall be attached on the top site of the package of returned Product and accompanied by a declaration statement proving the Product has been successfully decontaminated.

Returned Products that is not provided with such external decontamination label, and/or whenever such declaration is missing, can be rejected by Seller (or by the Authorized Service Provider) and shipped back at Customer expenses.

29. Frequency Table

Signal name	Vertical Frequency (Hz)	DVI	VGA	SDI	DP 1.2	HDMI 1.4	HDMI 2.0
640 x 480	60	✓	✓		✓	✓	✓
	72	✓	✓		✓	✓	✓
	75	✓	✓		✓	✓	✓
480P	60	✓	✓	✓	✓	✓	✓
	72	✓	✓		✓	✓	✓
	75	✓	✓		✓	✓	✓
800 x 600	60	✓	✓		✓	✓	✓
	72	✓	✓		✓	✓	✓
	75	✓	✓		✓	✓	✓
1024 x 768	60	✓	✓		✓	✓	✓
	72	✓	✓		✓	✓	✓
	75	✓	✓		✓	✓	✓
720P	60	✓	✓	✓	✓	✓	✓
	72	✓	✓		✓	✓	✓
	75	✓	✓		✓	✓	✓
1280 x 1024	60	✓	✓		✓	✓	✓
	72	✓	✓		✓	✓	✓
	75	✓	✓		✓	✓	✓
1600 x 1200	60	✓	✓		✓	✓	✓
	72	✓	✓		✓	✓	✓
	75	✓	✓		✓	✓	✓
1920 x 1080	60	✓	✓	✓	✓	✓	✓
	72	✓	✓		✓	✓	✓
	75	✓	✓		✓	✓	✓
1920 x 1200	60	✓	✓		✓	✓	✓
2560 x 1440	60	✓			✓	✓	✓
3840 x 2160	30	✓			✓	✓	✓
	60				✓		✓
4096 x 2160	60				✓		✓

30. Troubleshooting

Problem	Check the following
There is a black dot or dead pixel dot on the screen	A missing pixel does not constitute an out of spec. defective product
Cannot turn power on	Turn off the power supply, and check that the AC cord or DC cord are securely inserted. After checking, turn on the power supply again.
It takes time for image to appear	Since the monitor processes various signals digitally to reproduce beautiful images, it may take time before images appear when it is turned on, input is switched, or when the mode is switched to "Multi Window".
There are spots on the screen	There may be electrical distortion from vehicles, trains, high voltage lines or fluorescent lamps.

Bad color	Color density or tint control may not be adjusted properly. (See the adjusted value of image.)
Image appears and disappears	Input may not be connected properly.
When changing the scan size, the top and bottom part of the screen does not show images	When using a video software program (such as a cinema size program) with a screen wider than one in the 16:9 mode, blank areas separate from the images are formed at the top and bottom of the screen.
Image contour flickers	Due to the characteristics of the display control, contour of animated parts of images may seem to flicker, but that is not a breakdown.
Color is extremely bad	Input configuration “RGB”/“YPBPR” may not be selected properly.
The POWER indicator is flashing orange	After checking the number of flashes, turn off the power and contact the dealer where the monitor was purchased.

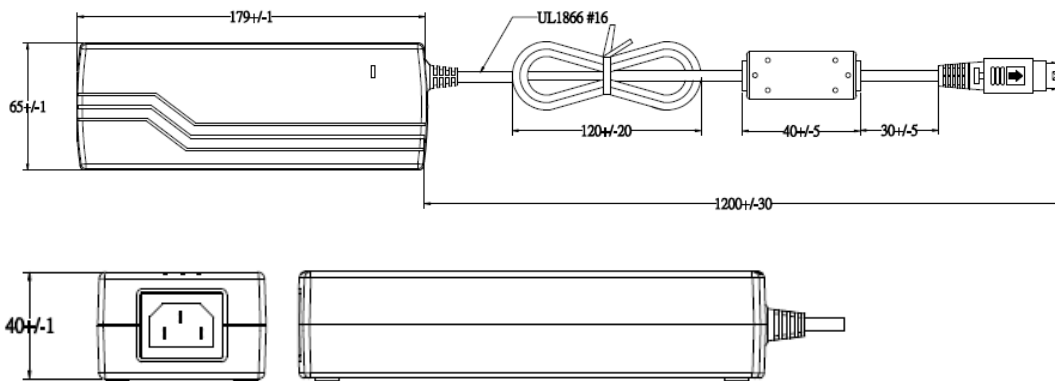
31. Technical Specification

31.1 Monitor

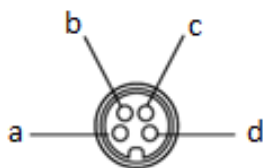
	M270TF-XX	M320TF-XX
Power Source	DC 24 V 150 W	DC 24 V 150 W
LCD Panel	27 inch (16:9 aspect ratio)	32 inch (16:9 aspect ratio)
Number of pixels	3840 x 2160	3840 x 2160
Viewing Angle	Horizontal: 178 ° Vertical: 178 °	Horizontal: 178 ° Vertical: 178 °
Video Input terminal	1.0 Vp-p (75 Ω) B N C	1.0 Vp-p (75 Ω) B N C
Video Output terminal	1.0 Vp-p (75 Ω) B N C	1.0 Vp-p (75 Ω) B N C
SDI Input terminal	1 system (HD-SDI/SDI) BNC type	1 system (HD-SDI/SDI) BNC type
SDI Output terminal	1 system (HD-SDI/SDI) BNC type	1 system (HD-SDI/SDI) BNC type
DVI-D Input terminal	Dual link system supports HDCP	Dual link system supports HDCP
RGB/YPBPR Input terminal	Y/G (BNC type): with sync 1.0 Vp-p (75 Ω) PB/ PR (BNC type): 0.7 Vp-p (75 Ω) R/B (BNC type): 0.7 Vp-p (75 Ω) SYNC (BNC type): 0.3 Vp-p – 4.0 Vp-p (75 Ω)	Y/G (BNC type): with sync 1.0 Vp-p (75 Ω) PB/ PR (BNC type): 0.7 Vp-p (75 Ω) R/B (BNC type): 0.7 Vp-p (75 Ω) SYNC (BNC type): 0.3 Vp-p – 4.0 Vp-p (75 Ω)
HD15 Input terminal	R/G/B: 0.7 Vp-p (75 Ω) HD/VD: TTL (high impedance) (mini D-sub15 pin)	R/G/B: 0.7 Vp-p (75 Ω) HD/VD: TTL (high impedance) (mini D-sub15 pin)
RS-232C terminal	External control terminal (D-sub 9 pin), RS-232C compliant	External control terminal (D-sub 9 pin), RS-232C compliant

GPI Input terminal	External control terminal (D-sub 9 pin) Not set : Open Set: GND level (level operation only)	External control terminal (D-sub 9 pin) Not set : Open Set: GND level (level operation only)
DC Output terminal	DC 5 V 1 A	DC 5 V 1 A
Dimensions (W × H × D)	643.17 x 408.06 x 48 mm (25.3 x 16.1 x 1.8 in)	777.58 x 477.62 x 48 mm (30.6 x 18.8 x 1.8 in)
Weight (Mass) (Main unit)	Approx. 8.9 kg (19.6 lbs.)	Approx. 11 kg (24.2 lbs.)
Storage and transport conditions	Ambient temperature: -20°C – 60°C (-4°F – 140°F) Relative humidity: 10 % – 85 %	Ambient temperature: -20°C – 60°C (-4°F – 140°F) Relative humidity: 10 % – 85 %
Operating conditions	Ambient temperature: 0°C – 35°C (32°F – 95°F)	Ambient temperature: 0°C – 35°C (32°F – 95°F)
Water drip-proof	IP65	IP65

31.2 AC Adapter



Pin assignment and signal name of AC adapter DC OUT terminal

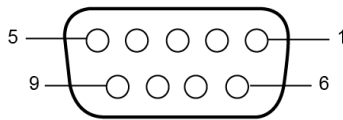


Pin No.	Signal Name
a	GND
b	GND
c	DC 24 V
d	DC 24 V

AC IN	AC 100 V – 240 V 50 Hz/60 Hz – 1.2 A
Dimensions (W × H × D)	179 mm (7.04") × 40 mm (1.5") × 65 mm (2.5")
Weight (Mass)	Approx. 0.7 kg (1.5 lbs.)
Storage and transport conditions	Ambient temperature: -20°C – 60°C (-4°F – 140°F) Relative humidity: 10 % – 85 % Atmospheric pressure: 700 hPa – 1060 hPa
Operating conditions	Ambient temperature: 5°C – 35°C (41°F – 95°F) Recommended operating temperature: 20°C – 30°C (68°F – 86°F) Relative humidity: 30 % – 85 % Atmospheric pressure: 700 hPa – 1060 hPa
Protection class against electric shock	Class I

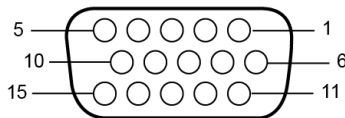
32. PIN Specification

Pin assignment and signal name of RS-232 C terminal



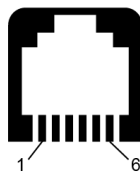
Pin No.	Signal Name	Content
1	CD	NC (no connection)
2	TXD	Transmission data
3	RXD	Reception data
4	DSR	Short circuit at pin 6 on the monitor
5	GND	GND
6	DTR	Short circuit at pin 4 on the monitor
7	CTS	Short circuit at pin 8 on the monitor
8	RTS	Short circuit at pin 7 on the monitor
9	RI	NC (no connection)

Pin assignment and signal name of HD15 input terminal (mini D-Sub 15 pin)



Pin No.	Signal Name	Pin No.	Signal Name
1	R	9	NC (no connection)
2	G	10	GND
3	B	11	NC (no connection)
4	NC (no connection)	12	SDA
5	GND	13	HD/SYNC
6	GND	14	VD
7	GND	15	SCL
8	GND		

Pin assignment and signal name of GPI terminal



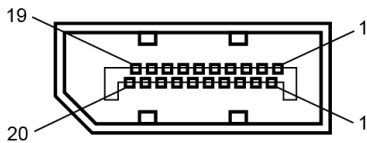
Pin No.	Signal Name	Pin No.	Signal Name
1	DGND	4	RJ11_GPIO_3
2	RJ11_GPIO_1	5	RJ11_GPIO_4
3	RJ11_GPIO_2	6	DGND

Pin assignment and signal name of DVI-D terminal



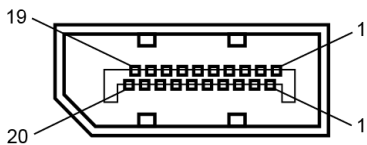
Pin No.	Signal Name	Pin No.	Signal Name
1	DVI_RX2-	16	DVI_CON_HP
2	DVI_RX2-	17	DVI_RX0-
3	GND	18	DVI_RX0+
4	DVI_RX4-	19	GND
5	DVI_RX4+	20	DVI_RX5-
6	DVI SCL	21	DVI_RX5+
7	DVI SDA	22	GND
8	NC	23	DVI_CLKP
9	DVI_RX1-	24	DVI_CLKN
10	DVI_RX1+	C1	NC
11	GND	C2	NC
12	DVI_RX3-	C4	NC
13	DVI_RX3+	C4	NC
14	+5V_DVI	C5	NC
15	DVI_CON_CABLE_DETECT		

Pin assignment and signal name of DP-IN



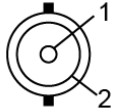
Pin No.	Signal Name	Pin No.	Signal Name
1	Lane 0	2	GND
3	Lane 0	4	Lane 1
5	GND	6	Lane 1
7	Lane 2	8	GND
9	Lane 2	10	Lane 3
11	GND	12	Lane 3
13	GND	14	Lane 3
15	AUX	16	GND
17	AUX	18	Hot Plug
19	Return	20	DP_PWR

Pin assignment and signal name of DP-Out



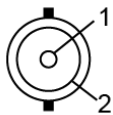
Pin No.	Signal Name	Pin No.	Signal Name
1	Lane 0	2	GND
3	Lane 0	4	Lane 1
5	GND	6	Lane 1
7	Lane 2	8	GND
9	Lane 2	10	Lane 3
11	GND	12	Lane 3
13	GND	14	Lane 3
15	AUX	16	GND
17	AUX	18	Hot Plug
19	Return	20	DP_PWR

Pin assignment and signal name of SDI-IN



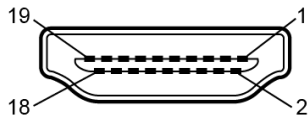
Pin No.	Signal Name	Pin No.	Signal Name
1	SDI	2	GND

Pin assignment and signal name of SDI-Out



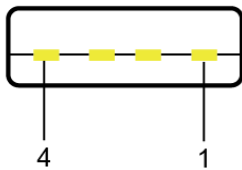
Pin No.	Signal Name	Pin No.	Signal Name
1	SDI	2	GND

Pin assignment and signal name of HDMI



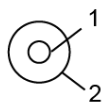
Pin No.	Signal Name	Pin No.	Signal Name
1	HDMI_DET	2	NC
3	HDMI_D2P	4	GND
5	HDMI_D2M	6	HDMI_D1P
7	GND	8	HDMI_D1M
9	HDMI_D0P	10	GND
11	HDMI_D0M	12	HDMI_CLKP
13	GND	14	HDMI_CLKM
15	HDMI_CEC_OUT	16	GND
17	DDC_CLOCK	18	DDC_DATA

Pin assignment and signal name of USB



Pin No.	Signal Name	Pin No.	Signal Name
1	+5V	2	Data-
3	Data+	4	GND

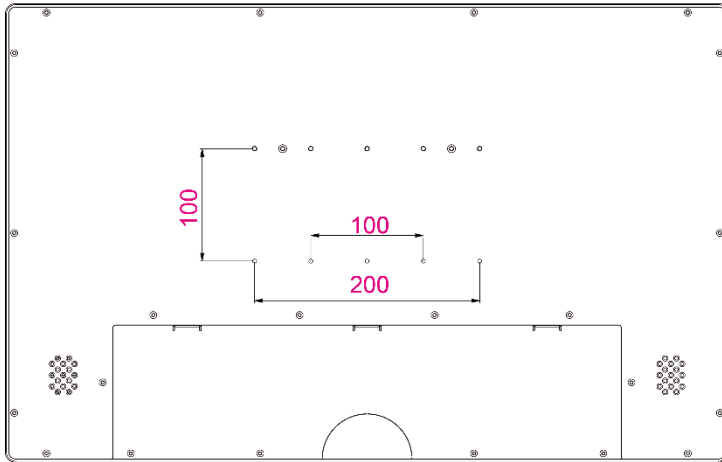
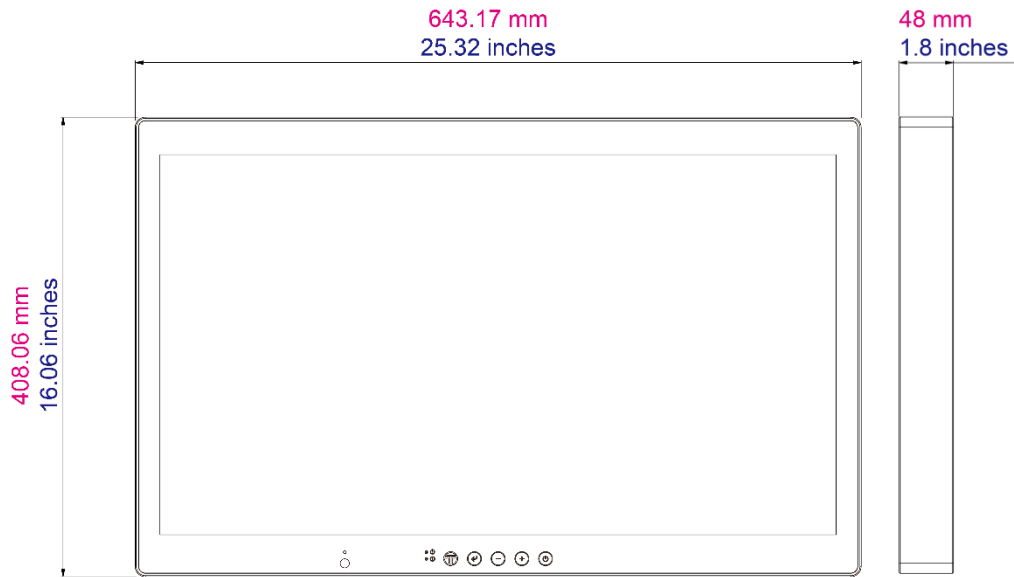
Pin assignment and signal name of Power

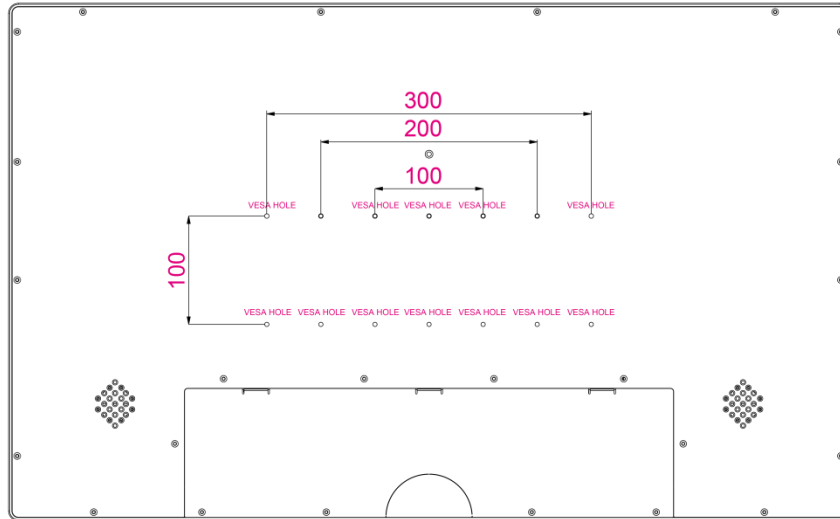


Pin No.	Signal Name	Pin No.	Signal Name
1	+5V	2	GND

33. Dimensional Figure


33.1 27" Model





34. Meaning of Symbols on the unit

Symbol	Description	Symbol	Description	Symbol	Description
	Potential equalization terminal (Sets other devices to same potential level)		This device complies with the Medical Device Directive 93/42/EEC.		Serial number
	Date of manufacture		Manufacturer/product owner		Direct current
	This way up		Stacking limit by number.		Keep away from rain
	Fragile		Weight		Consult operating instruction for use.
	Temperature limits		Recycling symbol for corrugated cardboard used for packaging		General warning sign
	Indicates user need to read user manual before using the device		UL Listing Mark		UL Recognized Component Mark
	TUV SUD Mark		Indicates device is approved according To The UL DEMKO Regulation		Indicates device is approved according To The VCCI Regulation
	Indicates this device is compliance with Part 15 of FCC rules (Class B)		Indicates this device must not throw in the trash		



Information on Disposal for Users of Waste Electrical & Electronic Equipment (private households)
 This symbol on the products and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.
 For proper treatment, recovery and recycling, please take these products to designated collection points, where they will be accepted on a free of charge basis. Alternatively, in some countries you may be able to return your products to your local retailer upon the purchase of an equivalent new product.
 Disposing of this product correctly will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point.
 Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.



For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

Information on Disposal in other Countries outside the European Union

Winmate Inc. reserves the right to make changes in specifications and features shown herein, or discontinue the product at any time without notice or obligation.”