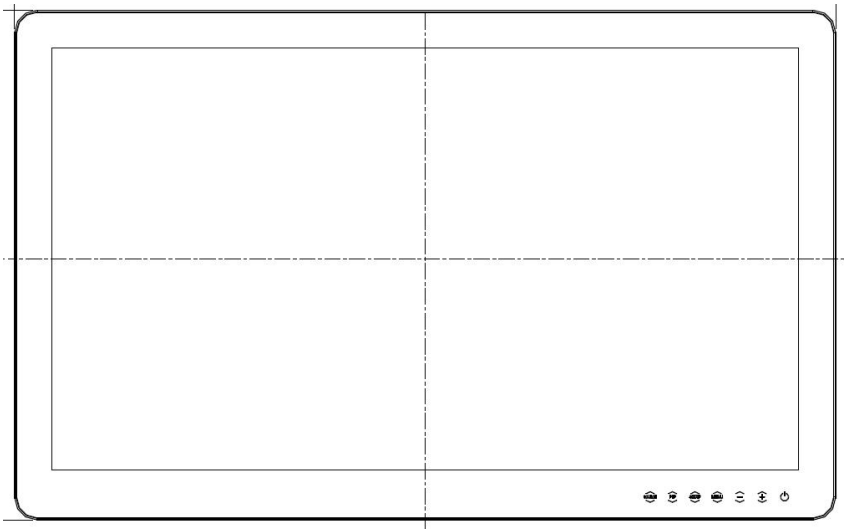
OLÓRIN

Display User's Manual



Olorin
MLG220 & MLG240

www.olorin.com

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Preface

Thank-you for purchasing this Olorin LCD Monitor.

To get the full benefit of the features that this product offers you, it is important that you read this User's Manual which, among other things, will explain how to properly install and operate the monitor. In this user guide there are detailed product specifications, explanations for many of the technical terms used in this manual as well as information on regulatory approvals, cleaning, service instructions, warranty terms, waste disposal and some other useful information.

It is of utmost importance that you carefully read and follow the safety instructions and safety notices included in this User´s Manual.

Failure to comply with these instructions could in some instances cause bodily harm to yourself or other persons and/or un-repairable damage to the product or to other attached devices / appliances.

Throughout this manual the following symbols are used to guide you to the proper use of the product:

Symbols

Expresses DO NOT.

Warning

Person could be at risk of severe injury or death.

Caution

Person or properties could be at risk of injury or damage.

Expresses MUST DO.

Keep this Users Manual in an easy accessible and safe place for future reading of it. If you lose your copy, you may request a new one by contacting us at our internet home page www.olorin.com.

Olorin reserves the right to change the specifications of this product without any notice. Such changes could cause the operation of the product to be slightly different from the descriptions in this copy of the Users Manual.

Windows and MS-DOS are trademarks and/or registered trademarks of Microsoft Corporation in the United States and/or other countries. VESA is a trademark of the Video Electronics Standard Corporation. All other product and company names are trademarks of their respective owners.

Product Features

Standard delivery

The product can be delivered in two main parts, which, when mounted together, form a normal monitor for desktop use.

- a LCD panel with TFT picture element which also contains the lamps for the backlight along with necessary electronics and cable connectors as well as power connector. These parts are mounted inside a plastic housing.
- a base unit (stand) to be mounted at the VESA holes at the back of the panel.

For certain applications, when the monitor is to be placed on a wall or built into a desk, then only the LCD panel part is delivered. In these cases it is quite often delivered with the plastic housing removed in what is called “open frame”. Certain other options or special mounting components might have been pre-installed.

Warning

When the monitor has been delivered as open frame there is a greater risk to come in contact with electric parts which could cause harm to yourself or your property. It should therefore only be handled with special precaution and only by properly trained service personnel.

High performance panel element

The monitor is ICD display with 8 million pixels which supports 1920x1080 resolution (Full HD, 1080p) on a single input, it is compliant with VESA standard display modes.

Protective glass

The monitor has a physical tempered glass.

True flat display

The monitor has a true flat design which makes it easy to clean and wipe.

Power management

This unit has power management system. The monitor will go into “sleep mode”, where power consumption is less than 10W, whenever either horizontal or vertical signals or both disappear.

VESA® standard wall / arm mountings

The unit is compliant with VESA’s 100mm-pitch for hanging tools. The base unit is detachable; the panel can be mounted on a wall or arm according to user’s enviroment.

Intended use of this product

This product has been designed and developed for use as a visual output device for direct connection to a Personal Computer and PC compatible devices as well as other video generating equipment, such as cameras. The product will accept industry standard video signals coming over cables with industry standard type connectors. The product will operate and function properly in normal office environment and under conditions as specified in the Product Specification chapter.

Warning

Attempting to use the product for any other purpose than its intended use or connecting to other devices could cause damage to the product and / or to other property and equipment. There could also be a risk of bodily harm to yourself or other persons.

The product operates on 24V DC power and must be connected thru the AC 100-240V, 50-60Hz to 24V DC adapter which is included with the product. Power to the adapter should be coming from an ordinary grounded AC 100-240V power outlet.

Warning

Never try to connect the product to any other power source than the 24V adapter delivered together with the product. There would be a risk of electrical shock which could cause bodily harm, possibly even death. Most certainly such electrical shock will damage the product.

The product can also be delivered with certain options installed. Such options could be touch panel or other special accessories.

Warning

All other uses of the product, including but not limited to attempts such as;

• connection to other types of power sources

• using other types of mounting or placement of the product

• connection to other devices than those for which the monitor has been designed.

will void any and all warranties of the product and the manufacturer will not be responsible or libel for any bodily injury or property damage either directly or indirectly caused by such non-intended use of the product.

Intended Markets

Olorin products are developed primarily for sales and installation in countries within Europe and North America. The products comply with all regulations and directives issued by the European Union and by authorities in the United States.

Warning

The products are not intended for sales and/or installation in countries, which require other or additional mandatory approvals than those required by the authorities of the European Union or the United States.

Consult the product identification label or product specification for regulatory approvals that apply to this product.

Safety Precautions

It is important that you read through the following notes of Safety Precautions to avoid any damage to the Product, yourself or other property. Following these precautions will also ensure that you get the best use of the Product.

Warning

DO NOT OPEN THE PRODUCT. There are no user serviceable parts inside. Because of high voltage inside there is a risk of bodily injury or death. Only authorized and qualified service personnel should maintain the product.

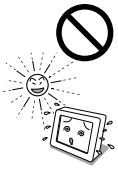
Cautions when setting up

Caution

Do not put the unit on unstable places (on a wonky table or in an inclined place), which might cause injuries if it falls down.

Caution

Do not place the unit where it is subject to direct sunlight or near any heating device. This could cause overheating resulting in damage to the product and eventually causing a fire.



Cautions when using

Warning

Do not put the unit in such a place where there is bad air circulation, dust, humidity, oily smoke or steam. It may lead to a fire.

Caution

Do not put any metal materials or flammable foreign objects into the unit through the vent holes. It may lead to electric shock and/or fire. Immediately disconnect the unit from the power outlet and contact your local re-seller for service.

Caution

Scratching or hitting with hard objects may damage the unit.

Safety Precautions

Warning

Do not use the unit turned over on its back, put on its side, or upside down. These positions may cause the heat that the unit generates to accumulate inside the unit. Such overheating can cause damage to the product and eventually start a fire.

Caution

When using the unit for several hours, you should take a 10-15 minute break every hour to reduce eyestrain. Failure to do so could cause injury to your eyes.

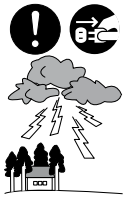
Abnormal circumstances

Warning

In case of any abnormality such as odor, sound, and overheat taking place, immediately turn off the power and disconnect the plug from the outlet. Continuing to use the unit under such condition may lead to electric shock and/or fire. For assistance contact your local re-seller.

Warning

In the event of thunder, immediately turn off the power and disconnect the plug from the outlet. Lightning strikes may cause electric shock and/or fire.



Warning

In the event of broken panel and leaking liquid crystal, do not inhale, swallow, or touch the liquid crystal. It may cause you to get poisoned and/or having a skin irritation. If you put it in your mouth, immediately gargle with water and contact a doctor to get a checkup. In case of getting it on your skin and/or cloth, wipe it off with alcohol and rinse them.

Safety Precautions

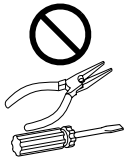
Maintenance

Warning

Do not remove the plastic cabinet. There are high voltage parts inside that may lead to electric shock. Ask a re-seller for adjustment and inspection.

Warning

Do not remodel or repair. It may lead to fire, electric shock, or injuries.



Caution

Clean the dust inside the display once a year. The dust that accumulates inside the unit may lead to fire. Ask a re-seller for adjustments and inspection.

Caution

Disconnect the plug from the outlet when you do not use the unit for a prolonged period.

Regulatory Tests and Certifications

All Olorin products have normally been tested to comply with all mandatory Regulatory requirements for the markets where the products are sold. Approvals are listed by each Regulatory Agency under the name of the manufacturer and model number as specified on the Product Identification Label. Copies of such approvals can be requested by contacting Olorin AB via www.olorin.com.

Approvals for this product is listed in the Product Specification section of this manual.

Tests and Approvals for VistaLine Series

Products in the VistaLine series has been tested as an IT-category product for normal office environment and for use as a desktop monitor. They comply with the following standards and regulations:

- CE for use within the European Union member states
- UL for use in the United States
- FCC for use in the United States
- WEEE for use within the European Union member states
- RoHS for use within the European Union member states

Tests and Approvals for MedicLine Series

Product in the MedicLine series has additionally been tested for risk of electrical shock and to comply with

- MDD directive 93/42/EEC class 1 for the European Union member states
- EN60601-1, EN60601-1-2
- IEC 60601-1

Some of the products have also been tested to comply with:

- UL 60601-1
- CAN/CSA C22-2 No. 601-1

Under these directives and regulations, MedicLine products are complying with the requirements for a Class 1 product with continuous mode of operation. The monitor must not be in direct contact with a patient.

Warning

Using any other 24V adapter than the medical approved one delivered with the product or connecting this to a non-grounded power outlet voids the approval.

Warning

Before taking the product in use, the person installing it must test that the grounding of the monitor complies with the impedance requirements of the country where it is being installed.

Warning

When using at 240 V in the United States, supply must be from center-tapped, 240 V, single phase circuit.

Test of medical power adapter

The power supply is Class I. Protective earthed parts are only located inside the power supply enclosure and therefore are not accessible. The accessible parts of the enclosure and output are DOUBLE INSULATED from all mains voltage electrical parts. Ground continuality test is not relevant.

Leakage test of the adapter is made by having the measurement equipment connected to the AC plug, no need to open the plastic enclosure.

FCC Information

FCC (U.S. Federal Communications Commission)

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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause unacceptable interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult your re-seller or an experienced radio/TV technician for help.

FCC Warning:

To assure continued FCC compliance, the user must use a grounded power supply cord and the provided shielded video interface cable with bonded ferrite cores. Also, any unauthorized changes or modifications to this monitor would void the user’s authority to operate this device.

Warranty and Limitation of Liability

Warranty

For details of the warranty please see the separate warranty document included with this product.

Limitation of Liability

Olorin AB, including any of its affiliates, manufacturing partners and sales agents, is not liable for any claim for damages including, but not limited to, loss of business profits, disruption of business, change or loss of saved data, when damage is arising from

- fire, earthquakes, actions taken by any third party, any other accidents, intentionally or negligently, improper use of the product by the user, or any use under other abnormal circumstances,
- the use or inability to use this product,
- the use for other purposes than the intended use as described in this document
- malfunctions caused by the combination of connected devices

Product identification

Affixed to the panel part of the product is a Product Identification Label. It is normally affixed in the connector compartment. This label contains the following information:

- Olorin logo and web address
- Product Family name (example: Olorin MedicLine MLG220)
- Manufacturers product number
- Part number
- Serial Number
- Power information
- Symbols for Regulatory approvals
- WEEE symbol for disposal of the product
- Manufacturers name
- Country of Origin

Cleaning of the Product

Caution

Be careful when cleaning the plastic housing of the panel so that no liquid or other objects will drip down into the product through the ventilation holes. This could cause electric shock and damage the product.

Normal dust and lint particles can be easily wiped off with a soft cloth tissue.

For grease or dirt that is more firmly fixed to the product, the use of a soft and dry micro fiber based cloth tissue will normally remove it all.

You can also use a mild liquid detergent mixed with water for cleaning together with a soft cloth tissue. This will clean both the cabinet and the LCD panel well. For the LCD panel you can also use isopropyl alcohol based liquids (without abrasive) or non-ammoniac glass cleaner.

When cleaning the LCD panel you will get the best result if you clean the panel when its surface has cooled down to normal room temperature. On a warm panel the liquid evaporates too quickly leaving traces of the cleaning. Afterwards wipe the surface dry with another soft cloth tissue.

Warning

When cleaning the cabinet do NOT use thinner, benzene or alcohol as these might damage the plastic and cause the paint to peel off. Do NOT use organic solvent such as acetone and toluene when cleaning the panel.

Warning

If you use any liquid for cleaning you must first un-plug the power to the monitor and not connect it again until you are certain that all the liquid particles have evaporated. Failure to do so could result in electric shock.

Caution

Do not use any tools with hard or sharp material for cleaning. The panel can very easily be scratched or damaged from such tools.

Caution

Do not press hard on the panel when cleaning. This could cause damage to the LCD panel element.

Disposal of the Product

Do not dispose of the unit with general wastes.

The monitor has been manufactured to comply with the EU directive on RoHS (Reduction of Harmful Substances) but even so the LCD panel contains a small amount of mercury and the monitor should therefore be disposed of according to local laws. Please get information from your local re-seller how collection is handled in your country. For countries that are members of the EU the WEEE directive applies and proper marking is on the product label affixed to the monitor.

Getting started

Before operating this monitor, please make sure that all items listed below are present in your delivery.

Standard Items

- The LCD monitor panel
- User's manual
- 24V adapter
- AC Power cord
- DVI cable
- DP cable
- VGA cable
- USB cable

If any of the above items are found missing or if you wish to order the optional items, please contact your reseller.

Mounting on a arm or base unit

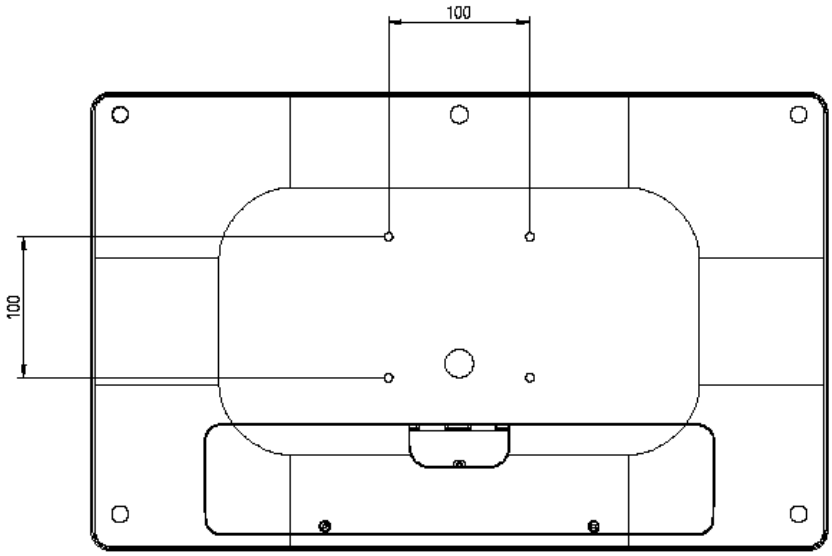
The Monitor has Video Electronics Standards Association (VESA) standard mounting holes tapped into the rear panel. The standard holes are M4 standard.

If you intend to mount the monitor on the wall, we strongly recommend that you use wall mount kits which can hold a load of more than the weight of the monitor. Ensure it is securely and safely installed.

If you need to place the monitor with the front down on a level surface when attaching a base unit, make sure that there are no objects on the surface that could damage the panel element.

Warning

If you mount any device using these 4 holes on the back of the panel you must not use use screws longer than 10 mm. Longer screws will cause damage which is not covered by the product warranty.



Connection Method

No tools are required to connect the LCD monitor to your PC or other device. Simply follow the instructions outlined in the next few pages.

Connectors for the signal cables and power are located on the back of the panel behind the cover lid. Please refer to the diagram on the next page for the connector configuration.

Connect Power Adapter and Cable

Connect the round shape plug end of the AC/DC adapter to the DC Power input connector of the LCD monitor. Connect the female end of the power cable to the AC power input receptacle on the AC/DC adapter. Then, plug the male end of the power cable into an grounded AC outlet.

Caution

Make sure you use the AC to DC adapter delivered with the product.

Connect Signal cable

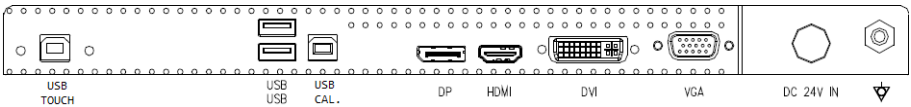
On next page you can see which input connectors there are available on your monitor and which cable you should connect depends on your source for the input signal.

Caution

When you disconnect the cord /cables, be sure to hold the connector and not the cable itself. Also make sure you use cables and connectors of high quality.

Input signals

Connector overview



DC 24V IN, Mini 4pin

DC 24V input, connect the included 24V power supply to this input to power the monitor.

VGA, DSUB 15 pin connection

Analog video display input, can be connected to the monitor using a VGA cable with video output source in the other end.

DVI

Digital video display input, can be connected to the monitor using a DVI cable with video output source in the other end.

HDMI

Digital video display input, can be connected to the monitor using HDMI cable with video output source in the other end.

DisplayPort

Digital video display input, can be connected to the monitor using DisplayPort cable with video output source in the other end.

USB Cal.

USB type B connector. USB hub upstream, connect to PC with relevant operating system and drivers. Windows 7, 8 and 10 are supported out of the box.

Also supports Calibration (RS232) commands with Qubyx *PerfectLum for Olorin* software.

USB

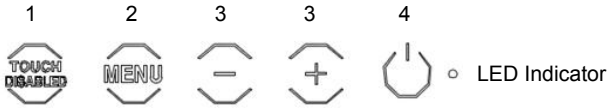
USB type A connector x2, for USB hub downstream link to external devices.

USB Touch *

USB type B connector. Touch screen controller input, connect to PC with relevant operating system and drivers. Windows 7, 8 and 10 are supported out of the box.

* Only for PCAP models.

How to Operate



Touch keypad

The monitor is operated with a touch keypad on the bottom right side on the front of the monitor, there are several buttons that are used controlling different things on the monitor. Press the keypad once to activate the OSD (the buttons will light up in blue) and then make your selection.

1. **TOUCH DISABLED ***
   Press and hold this button for three seconds to disable the touch keypad, the OSD will show Touch disabled". Press and hold for three seconds to enable the OSD again. This functionality is useful when you want to clean the monitor.

2. **MENU**
   Press this button to open and close the Main menu and make selections.

   Please view the next page for details on the OSD menu.

3. **DOWN (-)** and **UP (+)**
   Use these two buttons to control the functions of the OSD menu. When you're not in the OSD menu, these buttons will adjust the Brightness (or Dimming if enabled) of the monitor.

4. **POWER**
   Press this button to turn on the monitor. When the monitor is turned on, press and hold this button for four seconds, a message will appear on screen, to turn it off.

   The POWER button will light up in blue when the monitor is turned OFF.

LED Indicator

The LED indicator is GREEN when the monitor is ON and an Input source is displayed, the indicator is ORANGE when the monitor is in stand-by and no Input source is available.

* Only for PCAP models.

Charts of OSD Adjustment Functions

Main menu

Brightness / Contrast		Sub menu for adjusting the appearence of the picture.
	Brightness	Set the brightness of the display, from 0 - 100.
	Contrast	Set the contrast of the display, from 0 - 100.
Color Mode		Sub menu for controlling the color and Gamma of the monitor.
	Normal	Adjust Gamma and Color temperature. Gamma 1.8, 2.0, 2.2, 2.4 and Linear (LUT bypass) are available. Color temperature can be set to Warm, Neutral, Cool or User defined. User defined color temperature can be adjusted with Red, Green and Blue gain.
	DICOM	Set Gamma to medical DICOM standard.
	Calibration	Calibrate monitor using external device and software, Brightness / Contrast settings will be limited.
Input Source		Sub menu for selecting the source to display from: VGA, DVI, HDMI, DisplayPort
Display		Sub menu for adjusting signal timing of analog input (VGA).
	Auto	Automatic screen adjustment, only for VGA input.
	H. Position	Adjust the Horizontal screen position of the image, range from 0 - 100.
	V. Position	Adjust the Vertical screen position of the image, range from 0 - 100.
	Phase	Adjust the phase of the image, range from 0 - 100.
	Clock	Adjust the clock of the image, range from 0 - 100.
OSD		Sub menu for controlling various aspects of the OSD menu.
	Language	Set OSD language to English, Francais, Deutsch, Italiano, Espanol or Japanese.
	Transparency	Adjusts the transparency of the OSD menu, range is OFF / 1 / 2 / 3 / 4
	Horizontal	Adjusts the H position for the OSD menu, range from 0 - 100.
	Vertical	Adjusts the V position for the OSD menu, range from 0 - 100.
	OSD Timeout	Adjusts when the OSD will disappear after inactivity, range is 5 / 10 / 20 / 30 / 60 sec.
System		Sub menu for system settings.
	Reset	Reset all OSD adjustment functions and restore factory settings.
Info. / Exit		Close the Main menu. This sub menu also displays information for input timing and current color mode.

Applicable Signal Timings

The display may not work correctly with timings other than listed below.

Olorin MLG220

Timing Table								
Mode Name	Resolution		Frequency		Input Signal			
	H	V	H(kHz)	V(Hz)	VGA	DVI	HDMI	DP
VGA	640	480	31.47	59.94	O	O	O	O
SVGA	800	600	35.16	56.25	O	O	O	O
	800	600	37.88	60.32	O	O	O	O
XGA	1024	768	48.36	60	O	O	O	O
SXGA	1280	1024	63.98	60.02	O	O	O	O
UXGA	1600	1200	75	60	O	O	O	O
1080P	1920	1080	68	60	O	O	O	O

Applicable Signal Timings

The display may not work correctly with timings other than listed below.

Olorin MLG240

Timing Table								
Mode Name	Resolution		Frequency		Input Signal			
	H	V	H(kHz)	V(Hz)	VGA	DVI	HDMI	DP
VGA	640	480	31.47	59.94	O	O	O	O
SVGA	800	600	35.16	56.25	O	O	O	O
	800	600	37.88	60.32	O	O	O	O
XGA	1024	768	48.36	60	O	O	O	O
SXGA	1280	1024	63.98	60.02	O	O	O	O
UXGA	1600	1200	75	60	O	O	O	O
1080P	1920	1080	68	60	O	O	O	O
WUXGA	1920	1200	74.03	59.95	O	O	O	O

Specifications

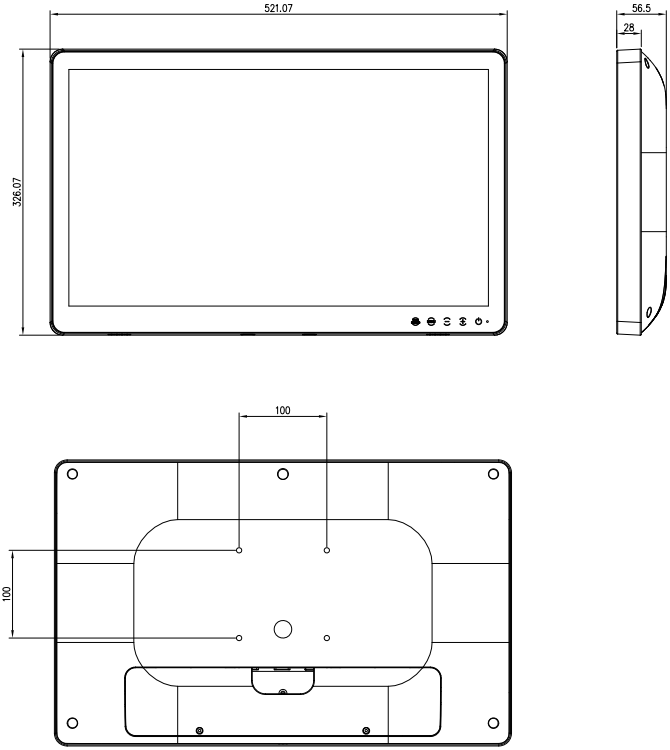
Olorin MLG220

Display	Screen size	22” 16:9	
	Brightness, candela/m2	250 cd/m2	
	Contrast	1000:1	
	Resolution	1920 x 1080	
	Response time	16 ms	
	Viewing angles, H/V	178 / 178	
	Color depth	16,7M	
	Backlight type	LED	
Environmental		**Operating**	**Storage**
	Temperature, Celcius		
	Humidity (non-condensation)		
	Air pressure		
Input signal	Connections	VGA, DVI, HDMI, DisplayPort, USB Hub, USB (For touch screen)	
Power	Power supply	Ext. Adapter 24V	
	Power consumption	< 40W (<2W in stand-by)	
Functionality	Automatic adjustment	Yes, via OSD	
	OSD for settings	Yes	
	Speakers	No	
	Luminance compensation	No	
	Pivot	Yes, with graphics card	
	Protective glass	Yes, IP65 front.	
	Touch panel	Optional, PCAP Multi touch.	
	Dimming	No	
	Sunlight Readable	No	
	DICOM pt. 14 preset	Yes	
International standards	Medical certificates	CE(EN60601-1,EN60601-1-11)	
		FCC certified	
		UL/cUL certified	
		cTUVus certified	
Warranty	Replacement warranty	Two (2) years	

Specifications

Olorin MLG220

Appearance	Net. weight	5,5 kgs
	Measurements (WxHxD)	521,07 x 326,07 x 56,5 mm
	Product color	White (black front bezel)
	Open frame	No
Mounting	Kensington lock	No
	VESA standard	100 x 100 mm



Specifications

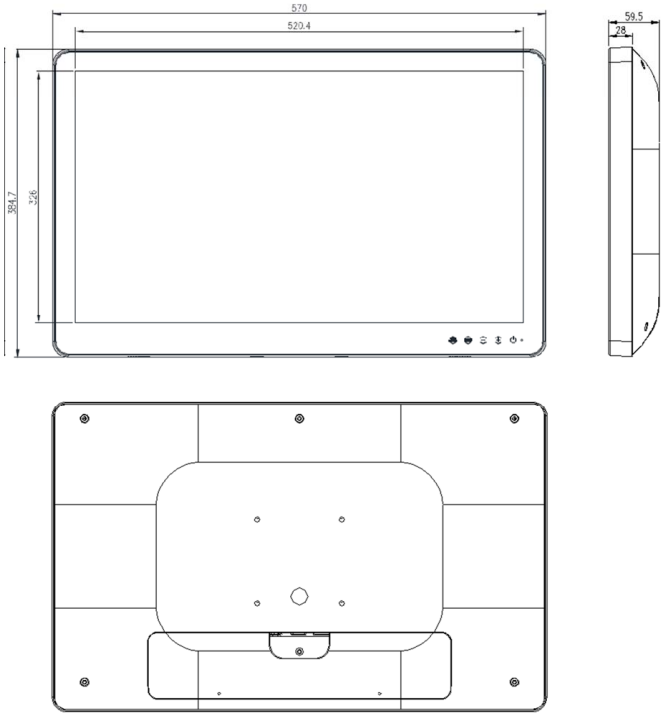
Olorin MLG240

Display	Screen size	24” 16:10	
	Brightness, candela/m2	300 cd/m2 (HPCAP version is 900 cd/m2)	
	Contrast	1000:1	
	Resolution	1920 x 1200	
	Response time	14 ms (Gray to Gray)	
	Viewing angles, H/V	178/178	
	Color depth	16,7M	
	Backlight type	LED	
Environmental		**Operating**	**Storage**
	Temperature, Celcius		
	Humidity (non-condensation)		
	Air pressure		
Input signal	Connections	VGA, DVI, HDMI, DisplayPort, USB Hub, USB (For touch screen)	
Power	Power supply	Ext. Adapter 24V	
	Power consumption	<60W (<2W in stand-by)	
Functionality	Automatic adjustment	Yes, via OSD	
	OSD for settings	Yes	
	Speakers	No	
	Luminance compensation	No	
	Pivot	Yes, with graphics card	
	Protective glass	Yes, IP65 front.	
	Touch panel	Optional, PCAP Multi touch	
	Dimming	No	
	Sunlight Readable	No	
	Color modes	Gamma (1.8, 2.0, 2.2, 2.4), DICOM, Calibration	
International standards	Medical certificates	ANSI/AAMI ES60601-1:2005/R:2012-08 CAN/CSA-C22.2 No. 60601-1:2014 EN 60601-1-2: 2015 IEC 60601-1:2005 IEC 60601-1:2005/AMD1:2012 IEC 60601-1-6:2010 IEC 62366:2007	
Warranty	Replacement warranty	Two (2) years	

Specifications

Olorin MLG240

Appearance	Net. weight	6,8 kg
	Measurements (WxHxD)	570 x 384,7 x 59,5 mm
	Product color	White (black front bezel) or Black
	Open frame	No
Mounting	Kensington lock	No
	VESA standard	100 x 100 mm



Special Considerations for LCD Panels

Manufacturing of LCD panels is very delicate with large panel elements being manufactured in one unit and then cut to smaller sizes to be used in different products. In addition a panel consists of several layers of components (back-light lamps, diffusers, electronics and color filters). There are different technologies used with each having its advantages and disadvantages resulting in end user products with different specifications even when taken from the same manufacturing batch. Below are explanations to some observations that can be made and which are not considered defects since they are merely problems inherent in the technology of LCD monitors. Over time, the performance of the panel will also change.

Native resolution

All panels have a fixed number of pixels in both horizontal and vertical directions. For instance is a 19" panel normally built with 1280 pixels horizontal and 1024 vertical giving a native resolution of 1280x1024. At this resolution you will get the sharpest picture and it is therefore recommended that you use the native resolution. Thru scaling technologies it is possible to use other resolutions but the picture will be less sharp. Some text will appear to have shadows.

Native color temperature

Most commonly LCD panels are manufactured to have a color temperature of 6500K (Kelvin degrees) for full white picture. The color temperature can vary with shade of grey being showed. For instance it could be 7500K at 50% grey and more than 9000 at 90% grey. For an individual panel the color temperature at full white can also vary by +/- 15%. Inside the panel there is a color filter and over time this will age and become more yellow in its color tone. Therefore, over time, the color temperature will gradually go lower so that at full white it could come down to 5000K.

Typical values

In product specifications there are values for brightness, contrast, view angles etc. The values are given as "typical values" meaning that actual value for any given product can vary by up to 20% from this value. For instance, a product specified to give 300 candela as typical maximum value for brightness may for individual samples vary from 240 candela to 360 candela. The values specified are for a new product. Due to wear of the backlight lamps the values will change over time and gradually become lower.

Uniformity and Mura patterns

Depending on the placement of the backlight lamps, how many they are and the size of the panel the brightness over the entire panel will vary by up to 20%. Generally the highest brightness is in the centre of the panel and becoming gradually lower towards the outer edges. This does not follow a linear curve and there might also be "areas" on the screen where there is a noticeable difference in the uniformity. Such clouded areas are referred to as "Mura" and are more related to the panel itself than to the backlight. These Mura patterns are different in size and shape and are color and grayscale dependent since they are a result from deterioration of the liquid crystal alignment layer. Mura is most commonly caused by long term operation under high ambient temperature and is a phenomenon that cannot be repaired.

Non-performing pixels

Each pixel on the panel actually consists of 3 sub-pixels (one for each of Red, Green and Blue). A 19" panel with 1280x1024 therefore has almost 4 million sub-pixels. It can happen that a pixel can get stuck in ON status (bright pixel defect) or in OFF status (dead pixel defect) or in an in-between status (low bright pixel defect). Usually such defects only affect a sub-pixel and not an entire pixel. The defect can therefore only be seen at certain color settings. The ISO 13406-2 standard specifies how many pixel defects that are acceptable before an entire panel will be considered faulty.

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Olorin products are warranted to follow this standard as a Class II product.

Image sticking

If the same image is shown for a long period of time there is a risk for “image sticking”. This is a result of that the thin film transistors will get stuck in a certain position and continue to show that image even when a new image is sent to the panel. The image will disappear if you put a full white picture on the monitor for several hours. The best solution is to have a screen saver that moves around on the screen so that no static image is constantly shown.

Slow operating in cold environments

The thin film transistors contain some liquid that will cause them to operate slowly in cold temperatures. When temperature inside the panel has increased to normal room temperature, the speed will be up to normal again.

Cable length and input signal

When using long cables from the video source (PC, camera etc) to the monitor the signal level will be lower and cause distortions in the picture shown. A low quality graphic board could also cause such problems. Always use high quality graphic boards and signal cables.

Longer life for your monitor

The components that have biggest influence on the useful life of the product are the backlight lamps. These are made of LED (Light Emitting Diode). Over time these will decay and give less and less light. They generally have a spedification of 40,000 hours before they are worn out. If they are constantly on one year of use corresponds to just over 8,000 hours and thus a life of 5 years.

There are ways to improve the useful life.

The most radical and efficient way is to always switch the monitor off when not used.

The second best is to use the Power Save feature within the PC´s DPMA system. This will not switch off the monitor entirely but the backlight lamps will be switched off which is the important thing. When you start to use the keyboard or mouse, the monitor will be switched on within a couple of seconds.

PLEASE, NOTE THAT A SCREENSAVER WILL NOT SWITCH OFF THE BACKLIGHT LAMPS AND THUS IS NOT A SOLUTION FOR LONGER LIFE.

The higher the luminance is set on the monitor the greater is the wear of the backlight lamps. All monitors have the facility to adjust brightness. Never set this at maximum since this will cause the lamps to decay faster. A setting at 50% will be sufficient for use in office environment.

Gradual change of color

As the backlight lamps ages they will show a warmer color temperature which can be perceived as more yellow for white color than it was initially when the monitor was new. There are color filters in the panel which also will age and add to the yellowish color tone.

You can usually from the monitors OSD set your own color and by setting the value for blue higher than red and green will change the color temperature back to more normal. However, the blue color filter has lower translucence so the consequence is that you will get a lower brightness.

Troubleshooting

Start your trouble shooting with the following actions

Possible power problem

- Make sure power is connected. If you switch the monitor off and then back on, the diode on the front should show green light. Some models have a main power switch next to the power inlet check that this is set to on. If you have a model **without power** adapter and still the no green light it's not a power problem.
  - If **not**, check your power connection to the 24V adapter and to the wall. There is a similar diode on the 24V adapter that should show green light.
    - If **not**, the adapter might be broken. If you have another adapter of the same type you can verify by using that adapter.
    - If **yes**, there is a problem with the panel which should be repaired.
  - If **yes**, then it is not a power problem.

Possible signal problem

- If picture is not stable or not shown at all or you get "No Sync" then check connection of the signal cable and graphic board settings.
- If cable connections and graphic board settings are OK, then try the following
  - Switch monitor off. Wait 10 seconds and switch it back on
  - Re-boot the PC
  - Test monitor by connecting it to another PC
- If nothing of this helps, then there is something wrong with the monitor and it should be repaired. Contact your local reseller for assistance.

Reference

Barten curve

Curve used to emphasize areas of a digital grayscale where the human eye have trouble discerning similar shades of gray, named after its creator Dr. Peter G.J. Barten.

DDC *1

This unit conforms with DDC-2B and VESA *2 standards.

The DDC function reads information stored in the monitor about its capabilities. It communicates over the 15-pin D-sub connector and the 24-pin DVI-D connector and it takes place during start-up of Windows®. It sets the detailed information of the color LCD display in the system file in order to achieve Plug & Play.

The video cable must be connected for reading of the information to take place.

**1 DDC (Display Data channel) and *2 VESA are registered trademarks of Video Electronics Standards Association.*

DICOM (Digital Imaging and Communications in Medicine)

DICOM is a standard for handling, storing, printing, and transmitting information in medical imaging, Part 14 refers to the chapter: ”Grayscale Standard Display Function”.

Kensington Anti-Theft Security Lock Slot

The LCD monitor is equipped with a security lock slot compatible to Kensington® security lock type. The security cable lock maybe available thru your dealer or it can be purchased at most computer peripheral stores near you.

Power management

This unit conforms to the DPMS standard (Display Power Management Signaling).

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