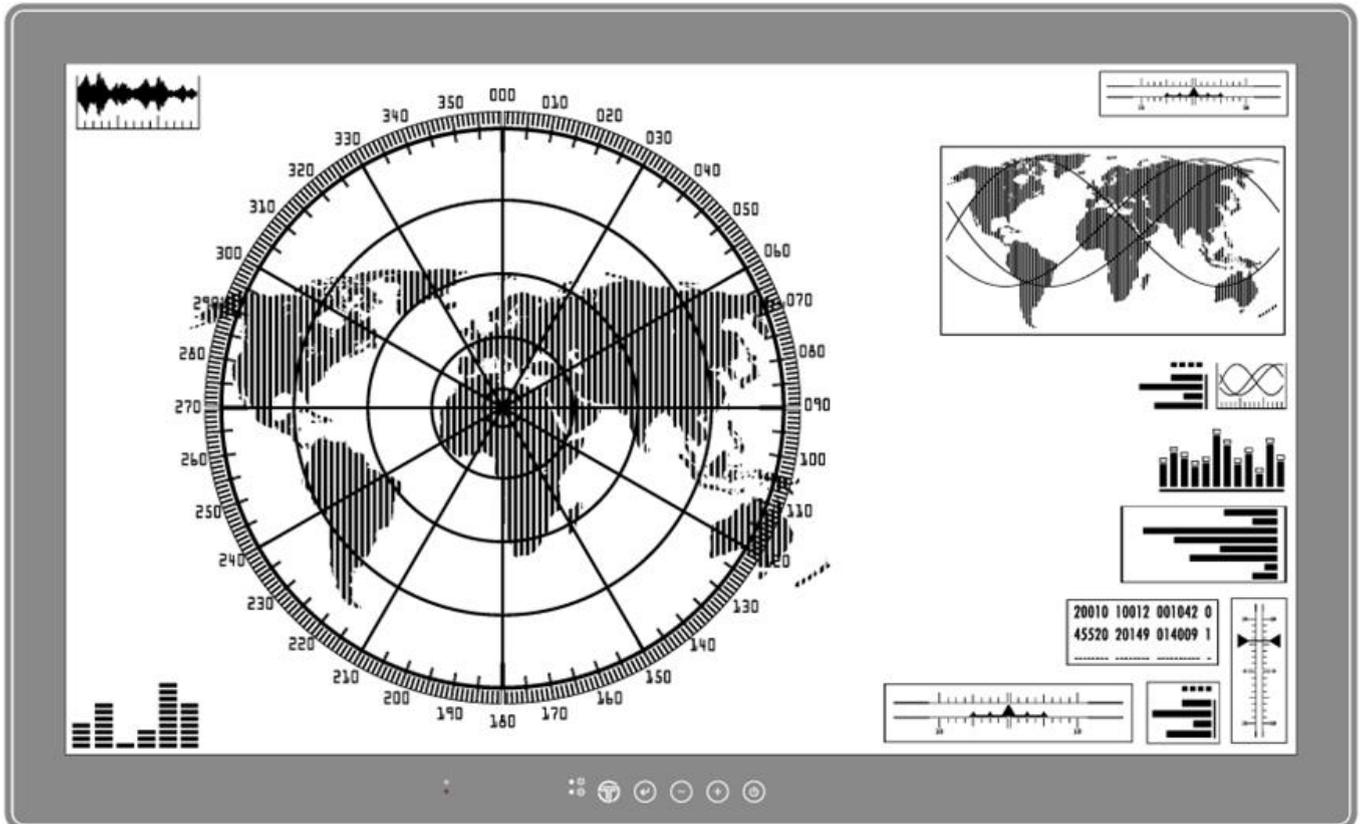


# 27"/ 32" 4K UHD Display Military Grade



**4K**  
Ultra HD

**Model No.**  
M270TF-MIL  
M320TF-MIL

# User Manual

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## Preface

### Copyright Notice

No part of this document may be reproduced, copied, translated, or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the prior written permission of the original manufacturer.

### Trademark Acknowledgement

Brand and product names are trademarks or registered trademarks of their respective owners.

### Disclaimer

We reserve the right to make changes, without notice, to any product, including circuits and/or software described or contained in this manual in order to improve design and/or performance. We assume no responsibility or liability for the use of the described product(s) conveys no license or title under any patent, copyright, or masks work rights to these products, and make no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described in this manual are for illustration purposes only. We make no representation or guarantee that such application will be suitable for the specified use without further testing or modification.

### Warranty

Our warranty guarantees that each of its products will be free from material and workmanship defects for a period of one year from the invoice date. If the customer discovers a defect, we will, at his/her option, repair or replace the defective product at no charge to the customer, provide it is returned during the warranty period of one year, with transportation charges prepaid. The returned product must be properly packaged in its original packaging to obtain warranty service. If the serial number and the product shipping data differ by over 30 days, the in-warranty service will be made according to the shipping date. In the serial numbers the third and fourth two digits give the year of manufacture, and the fifth digit means the month (e. g., with A for October, B for November and C for December).

For example, the serial number 1W16Axxxxxxx means October of year 2016.

### Customer Service

We provide a service guide for any problem by the following steps: First, visit the website of our distributor to find the update information about the product. Second, contact with your distributor, sales representative, or our customer service center for technical support if you need additional assistance.

You may need the following information ready before you call:

- Product serial number
- Software (OS, version, application software, etc.)
- Description of complete problem
- The exact wording of any error messages

In addition, free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

## Advisory Conventions

Four types of advisories are used throughout the user manual to provide helpful information or to alert you to the potential for hardware damage or personal injury. These are Notes, Important, Cautions, and Warnings. The following is an example of each type of advisory.



### Note:

A note is used to emphasize helpful information



### Important:

An important note indicates information that is important for you to know.



**Caution** A Caution alert indicates potential damage to hardware and explains how to avoid the potential problem.

**Attention** Une alerte 'attention' indique un dommage possible à l'équipement et explique comment éviter le problème potentiel.



### Warning!

An Electrical Shock Warning indicates the potential harm from electrical hazards and how to avoid the potential problem.

**Avertissement!** Un Avertissement de Choc Électrique indique le potentiel de choc sur des emplacements électriques et comment éviter ces problèmes.



**Alternating Current** The Protective Conductor Terminal (Earth Ground) symbol indicates the potential risk of serious electrical shock due to improper grounding.

**Mise à la Terre** Le symbole de Mise à Terre indique le risque potentiel de choc électrique grave à la terre incorrecte.

## Safety Information

### Warning!/ Avertissement!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on.

Sensitive electronic components can be damaged by sudden power surges.

Only experienced electronics personnel should open the PC chassis.

**Avertissement!** Toujours débrancher le cordon d'alimentation du chassis lorsque vous travaillez sur celui-ci. Ne pas brancher de connexions lorsque l'alimentation est présente. Des composants électroniques sensibles peuvent être endommagés par des sauts d'alimentation. Seulement du personnel expérimenté devrait ouvrir ces chassis.

### Caution

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

**Attention** Toujours vérifier votre mise à la terre afin d'éliminer toute charge statique avant de toucher la carte CPU. Les équipements électroniques modernes sont très sensibles aux décharges d'électricité statique. Toujours utiliser un bracelet de mise à la terre comme précaution. Placer toutes les composants électroniques sur une surface conçue pour dissiper les charges, ou dans un sac anti-statique lorsqu'elles ne sont pas dans le chassis.



## Safety Precautions

For your safety carefully read all the safety instructions before using the device. All cautions and warnings on the equipment should be noted. Keep this user manual for future reference.

### On Safety

For your safety carefully read all the safety instructions before using the device.

- M270TF-XXX / M320TF-XXX is a DC powered device. Use with the supplied AC adaptor (AC-300MD).
- 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.
- Do not leave this equipment in an uncontrolled environment where the storage temperature is below -20°C (-4°F) or above 60°C (140°F). It may damage the equipment.



#### **WARNING!**

Only use the connection cords that come with the product. When in doubt, please contact the manufacturer.

**AVERTISSEMENT!** Utiliser seulement les cordons d'alimentation fournis avec le produit. Si vous doutez de leur provenance, contactez le manufacturier.



#### **WARNING!**

Always ground yourself against electrostatic damage to the device.

**AVERTISSEMENT!** Toujours vérifier votre mise à la terre afin que l'équipement ne se décharge pas sur vous.

### On 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.

### 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

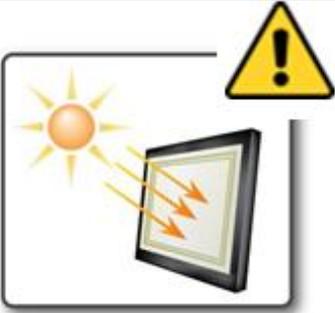
display, such “stuck” pixels may appear spontaneously. These problems are not a malfunction.

- 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 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.

## **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.

<b>CAUTION!</b>	<b>POSSIBLE PROBLEM</b>	<b>PREVENTION</b>
 <p data-bbox="183 1234 592 1305">Do not expose the display to direct sunlight.</p>	<p data-bbox="619 898 1007 969">Sunlight shines directly will cause the panel damage.</p>	<p data-bbox="1034 898 1398 1010">You should avoid placing the product under direct sunlight.</p>
 <p data-bbox="183 1648 564 1722">Do not place the display in wet environment.</p>	<p data-bbox="619 1312 979 1525">If the product is close to the wet ground such as grassplot, the moisture between panel and glass will make the product malfunction.</p>	<p data-bbox="1034 1312 1394 1413">You should avoid placing the product in wet environment.</p>

## Important Information

### Federal Communications Commission Radio Frequency Interface Statement



This device complies with part 15 FCC rules.

Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received including interference that may cause undesired operation.

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 generates, 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### EC Declaration of Conformity



This equipment is in conformity with the requirement of the following EU legislations and harmonized standards. Product also complies with the Council directions.

#### Electromagnetic Compatibility Directive (2014/30/EU)

- EN55024: 2010 EN 55022: 2010 Class B
  - IEC61000-4-2: 2009
  - IEC61000-4-3: 2006+A1: 2007+A2: 2010
  - IEC61000-4-4: 2012
  - IEC61000-4-5: 2014
  - IEC61000-4-6: 2013
  - IEC61000-4-8: 2010
  - IEC61000-4-11: 2004
- EN55022: 2010/AC:2011
- EN61000-3-2:2014
- EN61000-3-3:2013

#### Low Voltage Directive (2014/35/EU)

- EN 60950-1:2006/A11:2009/A1:2010/A12:2011/ A2:2013

## About This User Manual

This User Manual provides information about using the Winmate® Military Grade 4K UHD Display. The documentation set for the Military Grade 4K UHD Display provides information for specific user needs, and includes:

- **Military Grade 4K UHD Display User Manual** – contains detailed description on how to use the device, its components and features.



**NOTE:**

Some pictures in this guide are samples and can differ from actual product.

## Document Revision History

Version	Date	Note
1.0	11-Nov-2016	Initial release
1.1	26-Nov-2019	Revise formatting.

## **Chapter 1: Introduction**

This chapter gives you product overview, describes features and hardware specification. You will find all accessories that come with the HMI in the packing list. Mechanical dimensions and drawings included in this chapter.

---

## 1.1 Introduction

Thank you for choosing the Winmate® Military 4K UHD Display. In mission critical environments, performance, reliable, and accurate image reproduction are imperative. From landscape to radar images, this environment is complex ecosystem that requires advance technology to keep it running smoothly. Military Displays with a UHD 4K (3840 x 2160) native resolution help to minimize errors and improve operational efficiencies. With the number of display options available, knowing which will best suit your needs can be a challenge. The Winmate line of 4K monitors, implement the latest in technology, are making the decision easy.

## 1.2 Product Features

Wimate® Military 4K UHD Display offers the following features:

- UHD 4K (3840 x 2160) native resolution for video display and other on-site applications
- Thin and Compact Design with impact resistant screen
- AR Protection glass with Optional PCAP touch
- Backlight sensor, Ambient light sensor, IR Control, Dimming
- Fanless and Ventless design, Easy-to-Clean
- Compatible with existing imaging systems

## 1.3 Package Contents

Carefully remove the box and unpack your device. Please check if all the items listed below are inside your package. If any of these items are missing or damaged contact us immediately.

### Standard factory shipment list



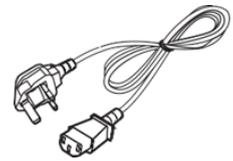
- Display



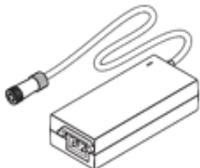
- User Manual (Hardcopy)



- VESA Mounting Screws (M4 x10 / M4 x 12)



- Power Cord 1.8M



- AC Adaptor



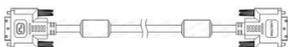
- Power Convert Cable



- VGA cable 1.8M (Male to Male)



- Dual Link DVI cable 1.8M (Male to Male)



- COM Cable 1.8M (Male to Female)



- USB cable for Touch (Optional)

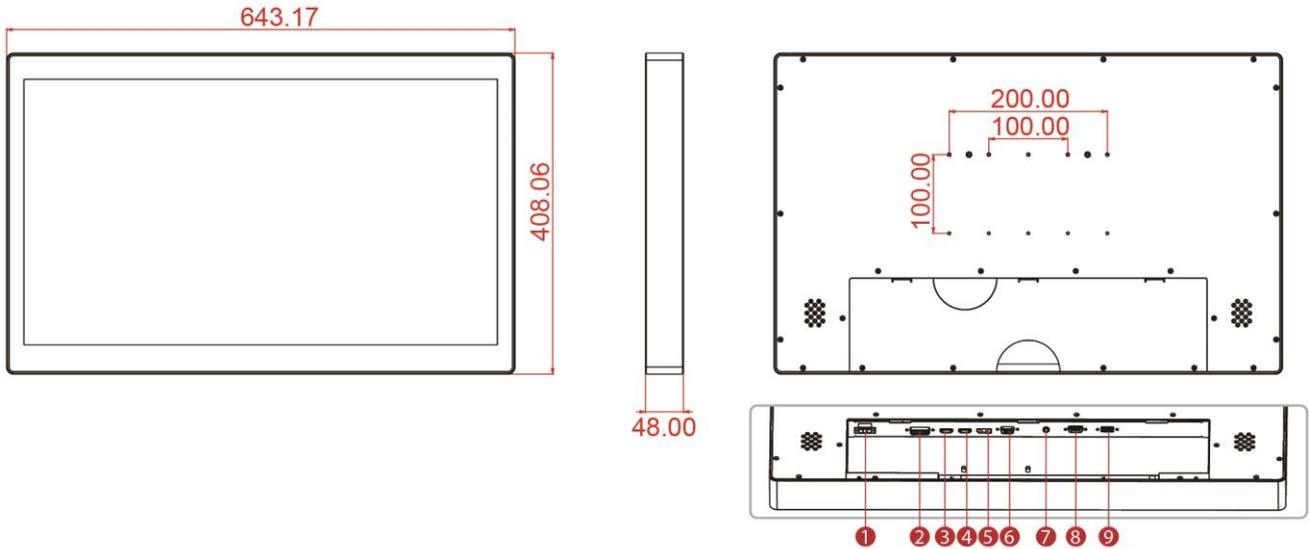
### 1.4 Schematics and Dimensions

This section includes mechanical drawing and mechanical dimensions of the Display.

27", M270TF-MIL

Unit : mm

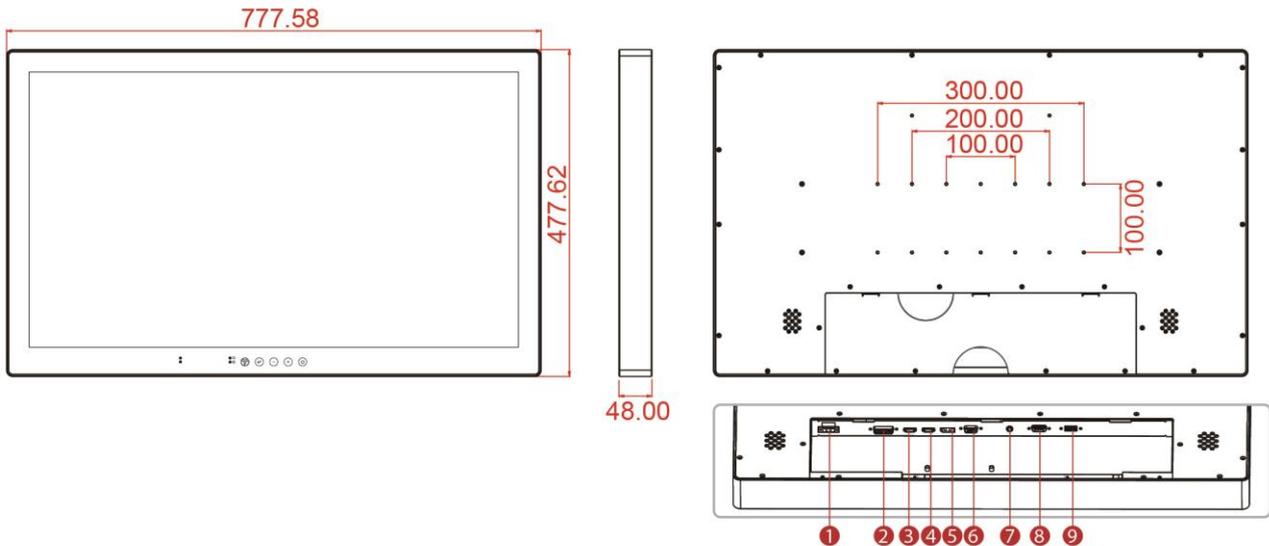
Dimensions: 643.17 x 408.06 x 48



32", M320TF-MIL

Unit : mm

Dimensions: 777.58 x 477.62 x 48



No	Description	No	Description
①	24V DC In	⑥	VGA Connector
②	DVI Connector	⑦	Audio Line In
③	HDMI 1.4	⑧	RS-232 for Remote Control
④	HDMI 2.0	⑨	USB for Optional Touch
⑤	Display Port		

For connector pin assignment refer to [Chaper 2, Connecting Other Devices](#)

## 1.5 OSD Panel

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	Hot Key "Brightness"
	Displaying	Move up / Increase value
	Off	Hot Key "Brightness"
	Displaying	Power on
	Off	Power off

To lock or unlock the key, press and at the same time.

## 1.6 Soft Power On and Off

This table shows the LED light combinations and their meaning:



Blue	Amber	Description
OFF	OFF	Power off
ON	OFF	Power on activate
ON	ON	Searching mode, standby mode

## **Chapter 2: Getting Started**

This chapter tells you important information on power supply, adapter and precautions tips. Pay attention to power considerations.



## 2.1 Powering On

### 2.1.1 Power Considerations

Follow the recommendations below when powering on the equipment.

- Plug-in the power cord to easy accessible AC outlet.
- Plug-in the AC adapter to a grounded outlet.



**ALTERNATING CURRENT** This product must be grounded. Use only a grounded AC outlet. Install the additional PE ground wire if the local installation regulations require it. *\*If you do not use a grounded outlet while using the device, you may notice an electrical tingling sensation when the palms of your hands touch the device.*

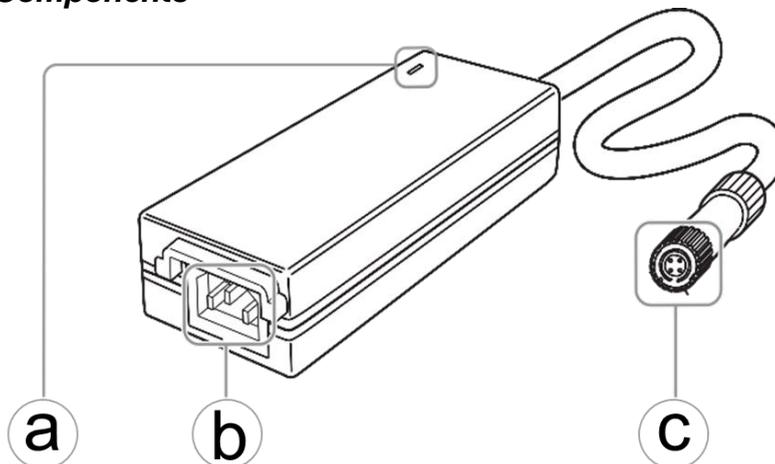
**MISE À LE TERRE!** Ce produit doit être mis à la terre. Utiliser seulement un cordon d'alimentation avec mise à la terre. Si les règlements locaux le requiert, installer des câbles de mise à la terre supplémentaires.

*\*Si vous n'utilisez pas une prise d'alimentation avec mise à la terre, vous pourriez remarquer une sensation de picotement électrique quand la paume de vos mains touche à l'appareil.*

### 2.1.2 Connecting the Power

Follow instructions in this section to connect the display to the source of power.

#### 2.1.2.1 AC Adaptor Components



Item	Part Description	Function
a	MAIN POWER indicator	Glows green: when the AC adaptor power is On. OFF: when the AC adaptor power is Off.
b	AC IN terminal	Connect the AC cord.
c	DC OUT terminal	Connect to the DC IN terminal on the monitor.

#### 2.1.2.2 Connecting the Power

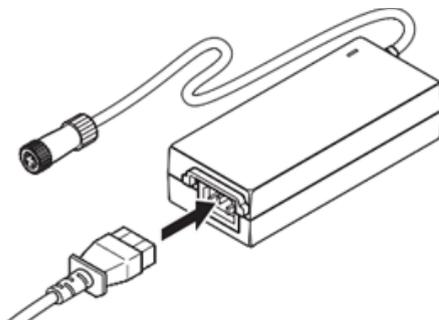


**WARNING!** Serious injury due to shock is possible if unit is wired incorrectly or connected to voltage exceeding the input voltage range.

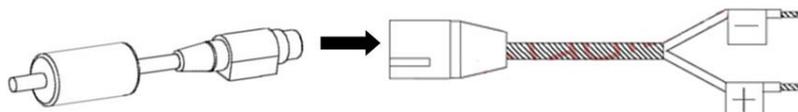
**AVERTISSEMENT!** Des blessures graves en raison du choc est possible si l'unité est mal câblé ou connecté à la tension maximale de la plage de

tension d'entrée.

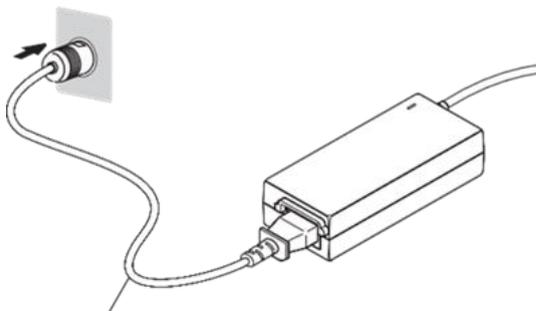
1. Connect the AC cord to the AC IN terminal on the AC adaptor. Plug cord in firmly all the way.



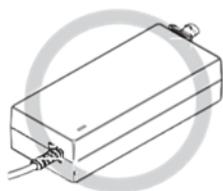
2. Connect the DC OUT terminal of the AC adaptor to the convert cable and connect to DC IN terminal on the monitor.



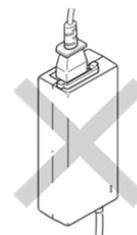
3. Align the notch on the cord connector with the guiding groove and plug it in. Tighten the connection by turning the lock ring in clockwise direction.



4. Connect the AC cord plug to the power outlet.



**OK: Horizontal position**



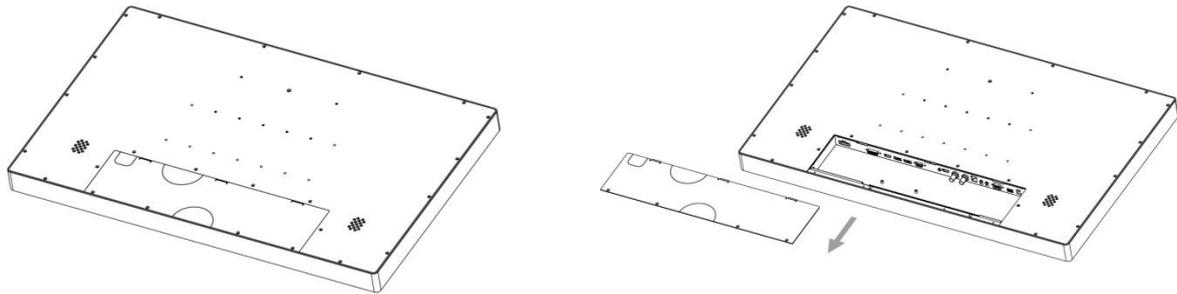
**NG: Vertical position**

## 2.2 Connecting Other Devices

This section describes how to connect other devices to 4K UHD Military Display and introduces connector pin assignment.

### 2.2.1 Removing the Connector Cover

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



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



**WARNING!** Do not remove screws other than the two screws fixing the clamp. Doing so may cause electric shock  
**AVERTISSEMENT!** Ne pas enlever les vis autres que les deux vis de fixation de la pince. Cela pourrait provoquer un choc électrique.

When using a thick connecting cable that cannot be positioned under the attaching cable clamp or connector cover, do not forcefully fix the cable. Use the unit with the connector cover removed.

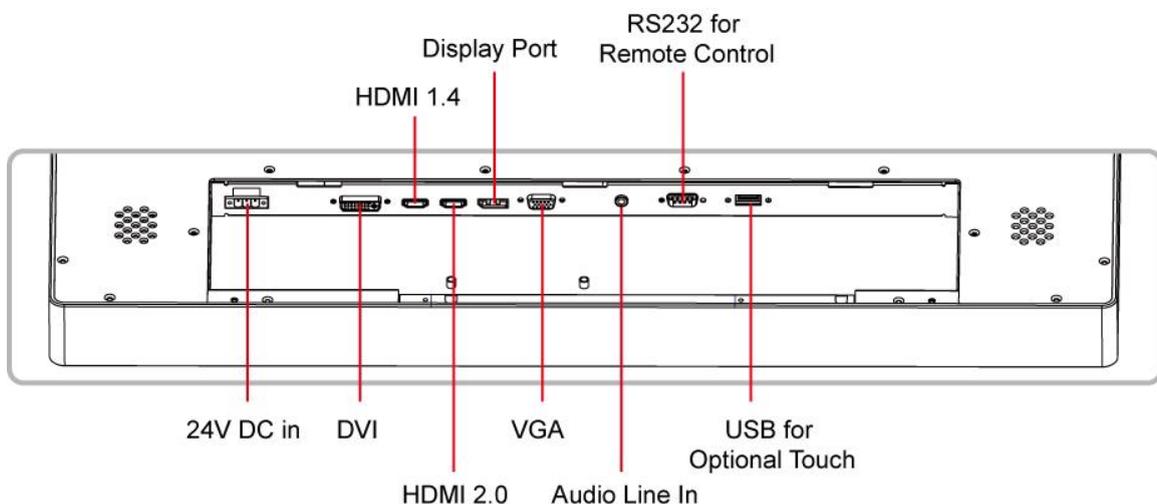


**NOTE:**

This unit with the connector cover attached conforms to the waterproofed standard. Note that if the unit is used with the connector cover removed, its waterproof performance is not guarantee.

### 2.2.2 Connector Pin Assignment

The location and pin assignment of the cables are as follows.



There are several video and/or data cables that can be connected in any combination. The number and type of connections will be automatically detected by the monitor. From the OSD (On Screen Display) the user can select the manner in which 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.

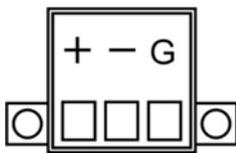


**WARNING!** Make sure the power is off when connecting and disconnecting the connectors.

**AVERTISSEMENT !** Assurez-vous que l'alimentation est coupée lors de la connexion et la déconnexion des connecteurs.

### 2.2.1 Power Input Connector

The 4K UHD Military Display uses a 3pin terminal block that accepts 24V DC in.



**Voltage**

Minimum Voltage 12V  
Maximum Voltage 24V  
Maximum Current 6.6A

### 2.2.2 DVI Connector

Use DVI to connector in the rear of PC system, and plug the other end to the TFT LCD display. Fasten cable connectors with screws.



Pin №	Signal Name	Pin №	Signal Name
1	DVI_RX2-	2	DVI_RX2+
3	GND	4	DVI_RX4-
5	DVI_RX4+	6	DVI_SCL
7	DVI_SDA	8	NC
9	DVI_RX1-	10	DVI_RX1+
11	GND	12	DVI_RX3-
13	DVI_RX3+	14	+5V_DVI
15	DVI_CON_CABLE	16	DVI_CON_HP
17	DVI_RX0-	18	DVI_RX0+
19	GND	20	DVI_RX5-
21	DVI_RX5+	22	GND
23	DVI_CLKP	24	DVI_CLKN
C1	NC	C2	NC
C3	NC	C4	NC
C5	NC		

### 2.2.3 HDMI 1.4 Connector

Use HDMI to connector in the rear of PC system, and plug the other end to the TFT LCD display. Fasten cable connectors with screws.



Pin №	Signal Name	Pin №	Signal Name
1	HDMI_RX2+	2	GND
3	HDMI_RX2-	4	HDMI_RX1+
5	GND	6	HDMI_RX1-
7	HDMI_RX0+	8	GND
9	HDMI_RX0-	10	HDMI_RXC+
11	GND	12	HDMI_RXC-
13	HDMI_CON_CEC	14	NC
15	HDMI_CON_SCL	16	HDMI_CON_SDA
17	GND	18	+5V_HDMI
19	HDMI_CON_HP		

### 2.2.4 HDMI 2.0 Connector

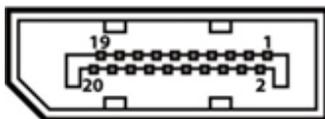
Use HDMI to connector in the rear of PC system, and plug the other end to the TFT LCD display. Fasten cable connectors with screws



Pin №	Signal Name	Pin №	Signal Name
1	HDMI_RX2+	2	GND
3	HDMI_RX2-	4	HDMI_RX1+
5	GND	6	HDMI_RX1-
7	HDMI_RX0+	8	GND
9	HDMI_RX0-	10	HDMI_RXC+
11	GND	12	HDMI_RXC-
13	HDMI_CON_CEC	14	NC
15	HDMI_CON_SCL	16	HDMI_CON_SDA
17	GND	18	+5V_HDMI
19	HDMI_CON_HP		

### 2.2.5 Display Port

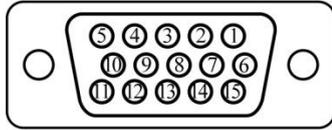
Connect Display Port connector on the rear of PC system, and plug the other end to the TFT LCD display. Fasten cable connectors with screws.



Pin №	Signal Name	Pin №	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	GND
15	AUX_D	16	GND
17	AUX_N	18	Hot Plug
19	Return	20	DP_PWR

### 2.2.6 VGA Connector

Military 4K UHD has VGA connector (D-Sub 15pin Female). Use VGA cable to connect the display to the PC system. Fasten cable connectors with screws.



Pin №	Signal Name	Pin №	Signal Name
1	RED	2	GREEN
3	BLUE	4	ID2/RES
5	GND	6	RED_RTN
7	GREEN_RTN	8	BLUE_RTN
9	KEY/PWR	10	GND
11	ID0/RES	12	ID1/SDA
13	H Sync	14	V Sync
15	ID3/SCL		

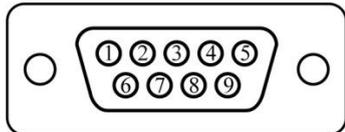
### 2.2.7 Audio Line In



Pin No.	Signal name	Pin No.	Signal name
1	AGND	4	AUDIO_IN
2	AUDIO_IN	5	NC
3	NC		

### 2.2.8 RS-232 for Remote Control

The 4K UHD Military Display uses D-SUB 9pin connector for remote control.



Pin №	Signal Name	Pin №	Signal Name
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

### 2.2.9 USB2.0 Connector for Optional Touch

The 4K UHD Military Display has a USB2.0 connector for optional touch.



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

## **Chapter 3: Mounting**

This chapter provides mounting guide for all available mounting options. Pay attention to cautions and warning to avoid any damages.



### 3.1 Cable Mounting Considerations

For a nice look and safe installation, make sure cables are neatly hidden behind the device.



**WARNING!** Observe all local installation requirements for connection cable type and protection level.

**AVERTISSEMENT!** Suivre tous les règlements locaux d'installations, de câblage et niveaux de protection.



**WARNING!/ AVERTISSEMENT!**

Turn off the device and disconnect other peripherals before installation.

Éteindre l'appareil et débrancher tous les périphériques avant l'installation.



**ALTERNATING CURRENT** To prevent electrical shock, the Safety Ground location on the rear must be bonded to the local earth ground through a minimum 12 AWG wire as short as possible.

**MISE À LE TERRE!** Pour éviter les chocs électriques, l'emplacement de la prise terre à l'arrière doit être lié à terre locale, à travers un 12 AWG minimum et aussi court que possible.

### 3.2 Safety Precautions

Observe the following common safety precautions before installing any electronic device:

- Use separate, non-intersecting paths to route power and networking wires. If power wiring and device wiring paths must be crossed make sure the wires are perpendicular at the intersection point.
- Keep the wires separated according to the interface. Wires that share similar electrical characteristics must be bundled together.
- Do not bundle input wiring with output wiring. Keep them separate.

When necessary, it is strongly advised that you label wiring to all devices in the system.



**WARNING!** Follow mounting instructions and use recommended mounting hardware to avoid the risk of injury.

**AVERTISSEMENT!** Suivez les instructions de montage et d'utilisation recommandé le matériel de montage pour éviter le risque de blessure.

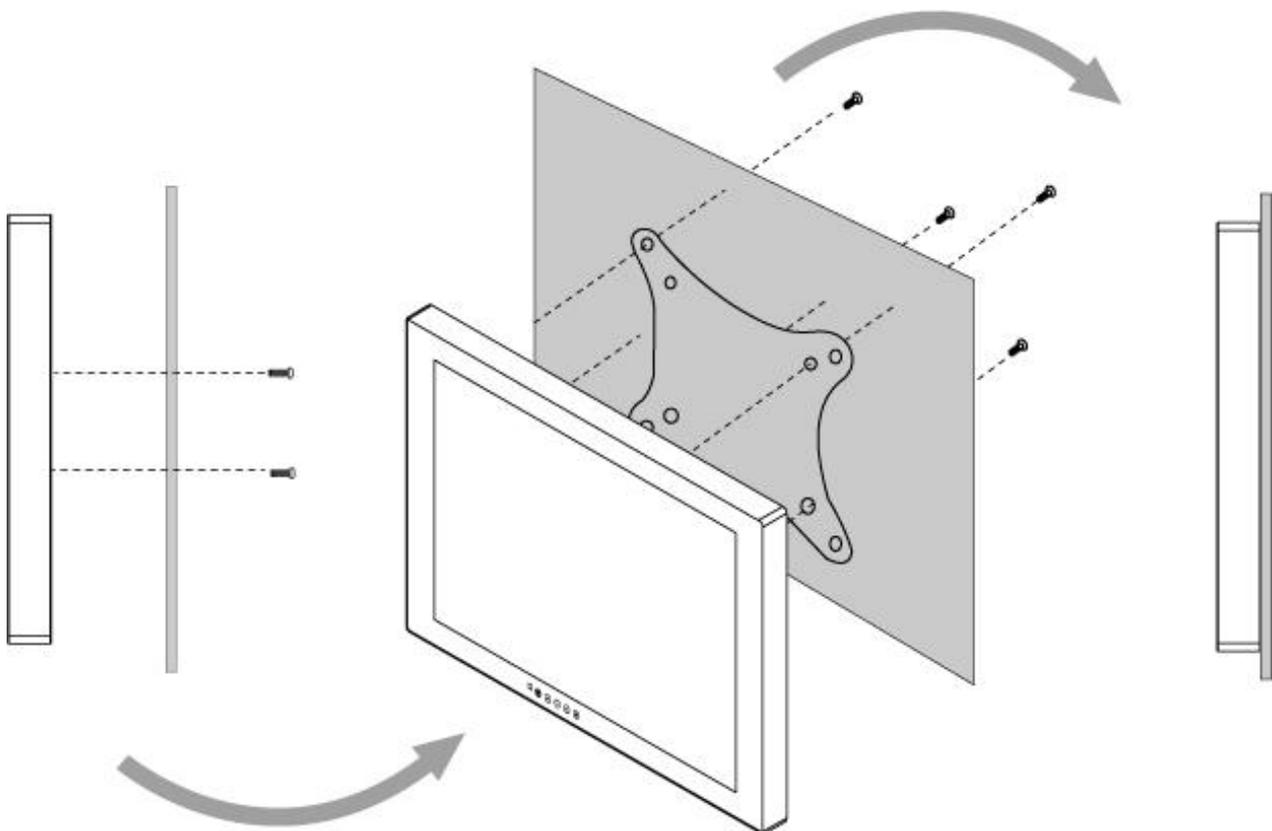
### 3.3 Mounting Guide

The main mounting approach for Military Grade 4K UHD Display is VESA Mount - suitable for most of the industrial and commercial applications. Refer to sub-sections below for more details.

#### VESA Mount

4K UHD Military Display supports VESA Mount installation.

VESA Plate	
27"	32"
100 x 100 mm	100 x 100 mm
200 x 100 mm	200 x 100 mm
	300 x 100 mm



*\*with customer's bracket*

#### Mounting Steps:

1. Screw VESA bracket to the fixture (ex. wall).
2. Place the device on VESA bracket.
3. Continue with the instructions provided with your VESA-compatible wall bracket (not supplied by Winmate).

## **Chapter 4: On-Screen Display Control**

This chapter provides information about On-Screen Display (OSD) Control interfaces.



## 4.1 OSD Control Function Buttons

Refer to [Chapter 1, OSD Panel](#) for a detailed description of buttons located on OSD Panel and its functions.

## 4.2 OSD Locking / Unlocking

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



## 4.3 Hot Keys

Touching either the  $\ominus$  or the  $\oplus$  button will initiate the brightness control feature.

## 4.4 OSD Menu Navigation

This section describes how to navigate the OSD Menu.



### 4.4.1 Quick Menu

The OSD Function key QUICK offers the user easier access to 5 major monitor adjustment.

Press “◀” or “▶” to adjust.

OSD Icon	Sub menu	Settings
 <b>Quick Menu</b>	<b>SOURCE 1</b>	Allows the user to select the video source for the primary image <b>VGA</b> <b>DVI</b> <b>HDMI 1.4</b> <b>HDMI 2.0</b> <b>DP</b>
	<b>ZOOM</b>	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.
	<b>SCHEME</b>	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.
	<b>PROFILE</b>	Under Profile, the sub-menu offers the user six (6) different previously saved 3D LUT profiles to select from. Profile can be uploaded using the Tomlinson Color calibration software (not included).
	<b>2 IMAGE SWAP</b>	Swap the image under 2 image mode
	<b>SOURCE SCROLL</b>	Change input source

### 4.4.2 Display

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

Press “◀” or “▶” to adjust.

OSD Icon	Sub menu	Settings
 Display	<b>BRIGHTNESS</b>	Adjusts the overall image and background brightness. <b>Value: 0-100</b>
	<b>CONTRAST</b>	Adjusts the image brightness in relationship to the background. <b>Value: 0-100</b>
	<b>SHARPNESS</b>	Adjusts the crispness of the image. <b>Value: 0 to 4</b>
	<b>ADC BRIGHTNESS</b>	Adjusts the ADC brightness <b>Value: 0-100</b>
	<b>TEMPERATURE</b>	Adjusts the color temperature of the entire screen. <b>USER/5600/6500/7600/9300</b> <b>Note:</b> Low color temperature makes the screen reddish. High color temperature makes the screen bluish.
	<b>COLOR CONTROL</b>	Adjusts the level of red, green, blue, yellow, magenta, and cyan colors <b>RGB Slide Bar</b> <b>Value: 0-100</b>
	<b>GAMMA</b>	Select a display gamma value for best picture quality. <b>NATIVE/1.8/2.0/2.2/2.4/D2COM</b>
	<b>SCHEME ADJUST</b>	Select scheme for different default setting combination. <b>R/G/B/Y/M/C</b> <b>HUE/ SATURATION</b>
	<b>HUE</b>	Adjust the level of hue <b>Value: 0-100</b>
	<b>SATURATION</b>	Adjust the level of saturation <b>Value: 0-100</b>
	<b>REGION*</b>	Region allows the user to select the “region(s)” / input(s) to adjust with a feature. <b>1P</b> <b>1/2P,2/2P ,1+2/2P</b> <b>1/4P,2+3+4/4P</b> <b>2/4P, 1+3+4/4P</b> <b>3/4P, 1+2+4/4P</b> <b>4/4P,1+2+3/4P,1+2+3+4/4P</b>

### 4.4.3 Adjust

The ADJUST feature will automatically adjust an analog image.

Press “◀” or “▶” to adjust.

OSD Icon	Sub menu	Settings
 <b>Auto Adjust</b>	<b>*ADJUST</b>	Automatically adjusts screen size, H position, V position, Clock, Clock Phase when video source is changed <b>ON/OFF</b>
	<b>*H POSITION</b>	Controls the horizontal position of the image within the Display area of the LCD. <b>Value: 0-100</b>
	<b>*V POSITION</b>	Controls the vertical position of the image within the Display area of the LCD. <b>Value: 0-100</b>
	<b>*CLOCK (Adjust H total)</b>	[+] Expand the width of the image on the right of the screen [-] Narrow the width of the image on the left <b>Value: 0-100</b>
	<b>*PHASE</b>	Adjusts the image phase <b>Value: 0-100</b>
	<b>*WHITE BALANCE</b>	Perform the white balance

*\*VGA CHANNEL ONLY*

### 4.4.4 Audio

The speaker volume for all audio inputs is controlled here.

Press “◀” or “▶” to adjust.

OSD Icon	Sub menu	Settings
 <b>Audio</b>	<b>VOLUME</b>	Adjusts the level of volume
	<b>MUTE</b>	ON/OFF
	<b>AUDIO SOURCE</b>	Select the Audio source <b>AUDIO/ FIBER/ DIGITAL (1P/2P/3P/4P)</b>

### 4.4.5 Multi-display Settings

OSD Icon	Sub menu	Settings
 <p><b>Multi-display</b></p>	<b>DISPLAY MODE</b>	Choose the Display Mode for 1P , 2P , 4P <b>1P / 2P(L/R) / 2P(T/B) / 2P(M/S) / 4P</b>
	<b>SOURCE 1</b>	Choose the channel of display source <b>Auto Scan/VGA/DVI/ HDMI 2.0/HDMI 1.4/DP</b>
	<b>SOURCE 2</b>	Choose the channel of display source <b>Auto Scan/VGA/DVI/ HDMI 2.0/HDMI 1.4/DP</b>
	<b>SOURCE 3</b> <i>Only 4P</i>	Choose the channel of display source <b>Auto Scan/VGA/DVI/ HDMI 2.0/HDMI 1.4/DP</b>
	<b>SOURCE 4</b> <i>Only 4P</i>	Choose the channel of display source <b>Auto Scan/VGA/DVI/ HDMI 2.0/HDMI 1.4/DP</b>
	<b>2P LR RATIO</b> <i>Only 2PLR</i>	<b>SIZE 0/1/2/3/4</b>
	<b>PIP SIZE</b> <i>Only 2P PIP</i>	Adjust picture-in-picture(PIP) size <b>Value: 0-10</b>
	<b>PIP POSITION-H</b> <i>Only 2P PIP</i>	Adjust the horizontal position of PIP <b>Value: 0-100</b>
	<b>PIP POSITION-V</b> <i>Only 2P PIP</i>	Adjust the Vertical position of PIP 0-100

#### 4.4.6 OSD Setting

Selecting MONITOR INFO will display the current state of the monitor. PCB version, firmware version, serial number, and inputs.

Press “◀” or “▶” to adjust.

OSD Icon	Sub menu	Settings
 <b>OSD</b>	<b>OSD TURN OFF</b>	Set the time of auto close OSD menu <b>Value: 0-60 sec</b>
	<b>OSD POSITION-H</b>	Adjust the horizontal location where the OSD appears on the screen <b>Value: 0-100</b>
	<b>OSD POSITION-V</b>	Adjust the vertical location where the OSD appears on the screen <b>Value: 0-100</b>
	<b>OSD TRANSPERANCY</b>	Adjust the transparency level of OSD <b>Value: 0-255</b>
	<b>OSD ROTATED</b>	Set to rotate the OSD menu <b>ROTATE 0°/90°/270°</b>
	<b>MONITOR INFORMATION</b>	Show BIOS version & resolution info

#### 4.4.7 Advanced

Press “◀” or “▶” to adjust.

OSD Icon	Sub menu	Settings
 <b>Advanced</b>	<b>SCALING</b>	Adjust the image scaling setting <b>Full/16:10/16:9/4:3/5:4/1:1</b>
	<b>FLIP</b>	Set the flip image mode <b>0°/ 90°/ 150°/ 270°/ Left &amp; Right/ Up &amp; Down</b>
	<b>OVERSCAN</b>	Perform over scan function <b>Under scan/ Over scan</b>
	<b>RGB/YUV</b>	RGB/YUV
	<b>RS232</b>	Select the RS232 signal come from local COM or Fiber <b>Local COM / Fiber</b>
	<b>TOUCH</b>	Select the Touch signal come from local COM or Fiber <b>Local COM / Fiber</b>
	<b>AMBIENT SENSOR</b>	On / off
	<b>IR SENSOR</b>	On / off
<b>FACTORY RESET</b>	Resets OSD options back to factory settings. EXCEPT FOR: CHANGE SECURITY PASSWORD <b>Yes/No</b>	

## **Chapter 5: Maintenance**

This chapter includes regular cleaning and maintenance procedures. Follow all the recommendations in this chapter in order to ensure long product lifecycle.

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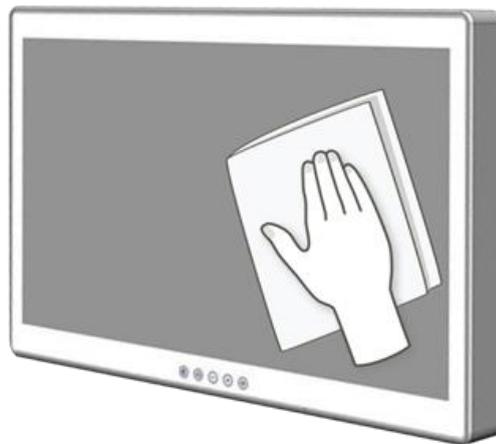
## 5.1 General Instruction

A 4K high-resolution panel and high brightness/ultra-wide field of view technology enables you to use the monitor under various lighting conditions and in numerous ways (installing on the wall, using several monitors to view an image, etc.). Because a color filter with wide-color reproduction and LCD materials with high response speed are used, the motion picture of the video signal is displayed.

## 5.2 Cleaning the Display Screen

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.

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.

## 5.3 Cleaning the Casing

Use the following procedure to clean the equipment.



**CAUTION** Always turn off the device and disconnect other peripherals before cleaning and maintenance procedures.

**ATTENTION** Toujours éteindre l'appareil et débrancher tous les périphériques avant que les procédures de nettoyage et d'entretien.

### Before Cleaning:

- Make sure the device is turned off.
- Disconnect the power cable from any AC outlet.

### When Cleaning:

- Wipe dust off the outside casing with a cloth slightly moistened with water or mild ammonia-based cleaning solution. Do not use this cloth on a display screen!
- Do not use an abrasive cleaner or high pressure washer on the screen.
- Do not rub the unit with a dry cloth. This action can result in a static charge being built up and cause a spark. Always use damp cloth while cleaning the unit.



**WARNING!** POTENTIAL ELECTROSTATIC CHARGE HAZARD – SEE INSTRUCTIONS

**AVERTISSEMENT!** POTENTIEL ÉLECTROSTATIQUE CHARGE DANGER - VOIR INSTRUCTIONS

## **Chapter 5: Technical Support**

This chapter includes troubleshooting guide and problem report form. Free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. If any problem occurs fill in problem report form enclosed and immediately contact us.



## 6.1 Troubleshooting

If your monitor fails to operate correctly, consult the following chart for possible solution before calling for repairs.

Problem	Check the following
<b>The picture does not appear on the screen</b>	<ul style="list-style-type: none"> <li>• Check if the signal cable is firmly seated in the socket.</li> <li>• Check if the Power is ON at the computer</li> <li>• Check if the brightness control is at the appropriate position, not at the minimum.</li> </ul>
<b>The screen is not synchronized</b>	<ul style="list-style-type: none"> <li>• Check if the signal cable is firmly seated in the socket.</li> <li>• Check if the output level matches the input level of your computer.</li> <li>• Make sure the signal timings of the computer system are within the specification of the monitor.</li> <li>• If your computer was working with a CRT monitor, you should check the current signal timing and turn off your computer before you connect the VGA Cable to this monitor.</li> </ul>
<b>The position of the screen is not in the center</b>	<ul style="list-style-type: none"> <li>• Adjust the H-position, and V-position, or Perform the Auto adjustment.</li> </ul>
<b>The screen is too bright or too dark</b>	<ul style="list-style-type: none"> <li>• Check if the brightness or contrast control is at the appropriate position, not at the Maximum (Minimum).</li> </ul>
<b>The screen is shaking or waving</b>	<ul style="list-style-type: none"> <li>• Perform the Auto adjustment.</li> <li>• Moving all objects which emit a magnetic field such as motor or transformer, away from the monitor.</li> <li>• Check if the specific voltage is applied.</li> <li>• Check if the signal timing of the computer system is within the specification of monitor.</li> </ul>

*\*If you are unable to correct the fault by using this chart, stop using your monitor and contact your distributor or dealer for further assistance.*



# Appendix

## Appendix A: Hardware Specifications

### Display Specifications

	Model Name	
	M270TF-MIL	M320TF-MIL
<b>Display</b>		
TFT Technology	LED Backlight Technology, TFT Active-matrix, Widescreen, IPS Technology	
Viewable Size	27" diagonal	32" diagonal
Active Area	596.16"(H) x 335.34"(V) mm	708.48"(H) x 398.52"(V) mm
Native Resolution	3840 x 2160 (UHD 4K)	3840 x 2160 (UHD 4K)
Pixel Pitch	155 (H) x 155(V)mm	184.5 (H) x 184.5(V)mm
Aspect Ratio	16:9	16:9
Response Time	12ms (Gray to Gray)	12ms (Gray to Gray)
Light Intensity	300 $cd/m^2$ (typ), optional high brightness up to 700 $cd/m^2$ (typ)	350 $cd/m^2$ (typ), optional high brightness up to 700 $cd/m^2$ (typ)
Contrast Ratio	1000:1 (typ)	1000:1 (typ)
View Angle	89/89/89/89	89/89/89/89
Max Colors	1.07B	1.07B
Synchronization Signal Auto-detect	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
Synchronization Range	31.5 kHz to 60.0 kHz (H) - 30 Hz to 75 Hz (V)	31.5 kHz to 60.0 kHz (H) - 30 Hz to 75 Hz (V)
Optimal Resolution and Hz	3840 x 2160 @ 60 Hz 4:4:4	3840 x 2160 @ 60 Hz 4:4:4
Detectable Resolutions (Partial List)	640 x 480, 720 x 400, 800 x 600, 1024 x 768, 1280 x 1024, 1600 x 1200, 1920 x 1080, 1920 x 1200, 2560 x 1440, 3840 x 2160, 4096 x 2160	640 x 480, 720 x 400, 800 x 600, 1024 x 768, 1280 x 1024, 1600 x 1200, 1920 x 1080, 1920 x 1200, 2560 x 1440, 3840 x 2160, 4096 x 2160
<b>Product Features</b>		
Highlighted Features	Backlight sensor, Ambient light sensor, IR Control, Dimming	Backlight sensor, Ambient light sensor, IR Control, Dimming
<b>Power Management</b>		
Power Input	24V DC in 150W, with external 110-240V AC to DC Adapter	24V DC in 150W, with external 110-240V AC to DC Adapter
<b>User Controls and Activity</b>		
Capacitive OSD	Power On/Off, On Screen Display Menu, Brightness Control (-/+)	Power On/Off, On Screen Display Menu, Brightness Control (-/+)
<b>Input Signal</b>		
Input Signal	DVI VGA HDMI 1.4 HDMI 2.0 Audio Line In RS232 for Remote Control Display Port USB for Optional Touch	DVI VGA HDMI 1.4 HDMI 2.0 Audio Line In RS232 for Remote Control Display Port USB for Optional Touch

	Model Name	
	M270TF-MIL	M320TF-MIL
<b>Mechanical Specifications</b>		
Dimensions	643.17 x 408.06 x 48 mm	777.58 x 477.62 x 48 mm
Mounting	VESA mounting 100 x 100mm VESA mounting 200 x 100mm	VESA mounting 100 x 100mm VESA mounting 200 x 100mm VESA mounting 300 x 100mm
Product Weight	9.0 Kg	11.0 Kg
<b>Factory Options</b>		
Options	Rubber Bumper , Projected Capacitive Multitouch screen (USB)	Rubber Bumper , Projected Capacitive Multitouch screen (USB)
<b>Environmental Considerations</b>		
Operating Temperature	0 deg. C to 50 deg. C, Humidity up to 95%	0 deg. C to 50 deg. C, Humidity up to 95%
Storage Temperature	-20 deg. C to 60 deg. C, Humidity up to 95%	-20 deg. C to 60 deg. C, Humidity up to 95%
IP Rating	Front IP65 Rear IP22	Front IP65 Rear IP22
<b>Standards and Certificates</b>		
Certificates	CE, FCC	CE, FCC
Compliance	MIL-STD 810F/G, MIL-STD 461E/F	MIL-STD 810F/G, MIL-STD 461E/F

### AC Adaptor Specifications

AC IN	AC 100V-240V
DC OUT	DC 24 V 3.33 A
Dimensions (L x W x H)	137 mm x 59 mm x 34 mm
Net weight	Approx. 0.45 kg
Storage and transport conditions	Ambient temperature: -20° to 85°C Relative humidity: 5~90%
Operating conditions	Operating temperature: 0° to 40°C Operating humidity: 10~90%
Harmonic standard and power factor	IEC 61000-3-2 Class D
EMI	Comply with CISPR 22, EN 55022 Class B

## Appendix B: Frequency Table

Military Grade 4K UHD Display supports the following frequency:

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

