BriteMED

BriteMED Technology Inc.

MODEL:

MMS-27C Series

User Manual

Rev. 1.02 –July 9, 2019

RoHS Lead Free

Revision

Date	Version	Changes
July 9, 2019	1.02	Updated Section 2: Packing List Modified statement
May 14, 2019	1.01	Modified statement and placement
March 27, 2019	1.00	Initial release

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Manual Conventions

WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.

CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.

NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

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1

Introduction

1.1 Overview

CAUTION:

1. A PDF version of user manual (included in the bundle USB flash drive) and a hard copy of quick installation guide are provided. Please refer to the documents before/during installation.

2. Model definition: MMS-27CXXXXXXXXXX (The “X” can be A-Z, 0-9, - or Blank to denote marking purpose.)

3. The monitor may not be used in the presence of flammable anesthetics mixture with air, oxygen or nitrous oxide. No part of this product may come in contact with a patient. Never touch the product and a patient at the same time. This product is capable of displaying Radiology (PACS) images for reference, not diagnostic purpose only. For mission critical applications, we strongly recommend that a replacement unit be immediately available.

4. The MMS-27C should connect to other devices to display images.

Figure 1-1: MMS-27C with Optional Stand

The MMS-27C is a monitor, equipping with multiple analog and digital input interfaces, that allows connection to various devices without extra effort. In addition, its loop through technology enables simultaneous display on other monitors, perfect for education and consultation purpose.

1.1.1 Operating Principle

The MMS-27C is designed to display the images on the screen. The monitor settings can be adjusted either by the OSD buttons or the SmartOSD application program on PC. The SmartOSD application program is to provide users with a simple interface to adjust monitor settings remotely from PC.

1.1.2 Intended Use

The LCD monitor is a display equipped with multiple analog and digital interfaces, which can display alphabetical, numerical and graphical data.

1.1.3 Intended User

Professional and General Adults

- General Adults:
  Someone over 18 years old with no significant disease can read English manual, and move 11~12 kg object by himself.

- Professional:
  Someone has ever been a participant of R&D, assembling, testing of LCD monitor.

1.1.4 Safety Instruction

On Safety

1. Before connecting the AC power cord to the DC adapter outlet makes sure the voltage designation of the DC adapter corresponds to the local electrical supply.
2. Never insert any metallic thing into the cabinet opening of the LCD monitor. Doing so may create the danger of electric shock.
3. To reduce the risk of electric shock, do not remove cover. Only a qualified technician should open the case of the LCD monitor.
4. Never use the monitor if the power cord has been damaged. Do not allow anything to rest on the power cord and keep the cord away from areas where people can trip over it.
5. Be sure to hold the plug, not the cord, when disconnecting the LCD monitor power cord from an electric socket.
6. Unplug the LCD monitor power cord when it is going to be left unused for an extended period of time.
7. Unplug your LCD monitor power cord from the AC outlet before any service.
8. If your LCD monitor does not operate normally, in particular, if there's any unusual sound or smell coming from it, unplug it immediately and contact authorized dealer or service center.

Do Not

1. Drop the device against a hard surface.
2. Strike or exert excessive force onto the LCD panel.
3. Touch any of the LCD panels with a sharp object.
4. In a site where the ambient temperature exceeds the rated temperature.

On installation

1. Openings in the LCD monitor cabinet are provided for ventilation. To prevent overheating, these openings should not be blocked or covered. If you put the LCD monitor in a bookcase or some other enclosed space, be sure to provide adequate ventilation.

2. Put your LCD monitor in a location corresponding to the operation and storage conditions which manufacturer suggests.
3. Do not expose the LCD monitor to rain or use it near water. If the LCD monitor accidentally gets wet, unplug it and contact an authorized dealer immediately. You can clean the LCD monitor with a damp cloth if necessary, but be sure to unplug the LCD monitor first.
4. Place your LCD monitor near an easily accessible AC outlet.
5. High temperature can cause problems. Don't use your LCD monitor in direct sunlight and keep it away from heaters, stoves, fireplaces and sources of heat.
6. Do not place your LCD monitor on an unstable stand, the LCD monitor may malfunction or fall.
7. Make sure to unpack and move the unit by the instructions in the user manual.
8. Do not use other cables or accessories that are not provided.
9. Do not lay this monitor on the other equipment.

1.2 Features

Some of the MMS-27C features are listed below:

- Full HD LCD panel for high-resolution image display.
- DICOM and Gamma calibration ensures accurate display quality.
- Accepts 10 V ~ 28 VDC wide range power input.
- Supports VESA 100 x100 and VESA 200 x 100 mounting.
- Multiple video input and loop through output interfaces.
- User-friendly 6-hotkeys for easy operation.

1.3 Front View

The front side of the MMS-27C includes the LCD panel and power LED (**Figure 1-2**). The bottom right corner contains six icons indicating the function keys for monitor adjustment.

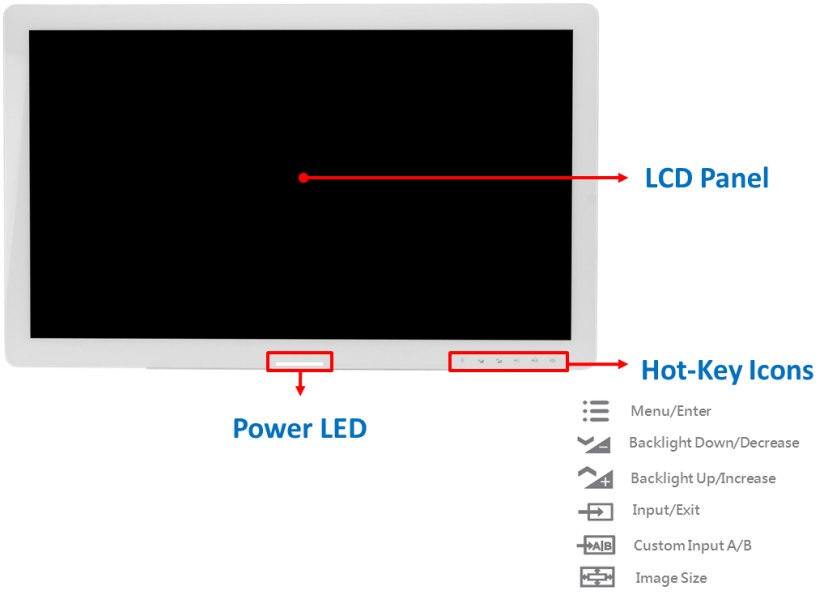


Figure 1-2: Front View

1.4 Rear and Bottom View

The rear side of the MMS-27C contains VESA 100 x 100 and VESA 200 x 100 mounting screw holes, I/O interfaces and control buttons listed as below (**Figure 1-3**).

- VGA input connector
- DVI-D input connector
- USB Type A connector for FW update/ SmartOSD application
- Audio input connector
- Analog input and output connectors (when analog interface included, see **Section 1.4.1**)
- 3G-SDI input and output connectors (optional)
- HDMI input and output connectors (when HDMI interface included)
- 10 V ~ 28 V DC power input jack (lockable)
- Power switch
- Equipotential ground pin
- VESA 100 x 100/ 200 x 100 mounting screw holes
- 6 Function keys

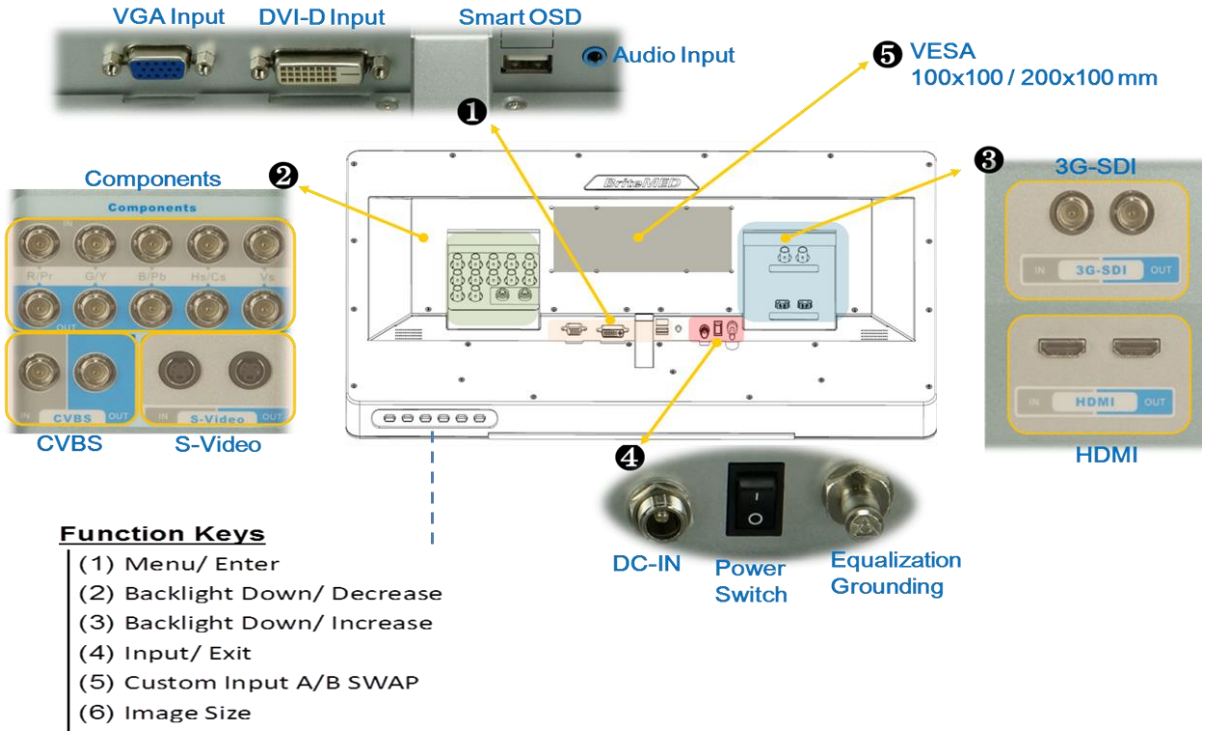


Figure 1-3: Rear View

1.4.1 Connector Interface Panels

1.4.1.1 Analog Input and Output Connectors (when analog interface included)

The MMS-27C provides additional analog input and output interfaces via an I/O board, including component, composite and S-video interfaces (**Figure 1-4**).**Be sure to use RG-59 (or above) cables for analog input/output connection.**

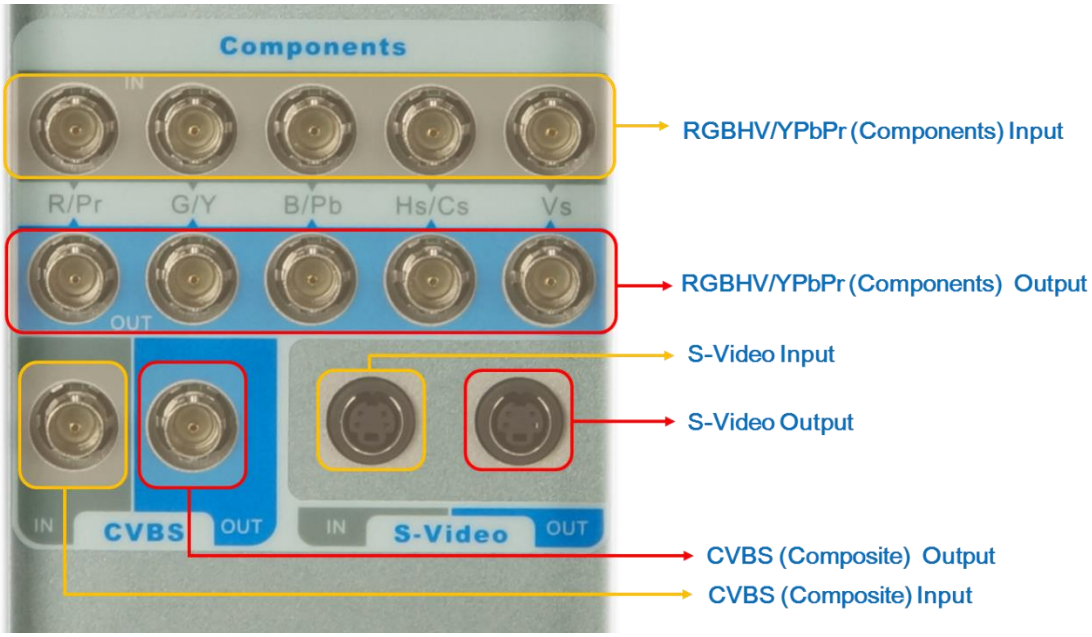


Figure 1-4: Analog Input and Output Connectors

1.4.1.2 3G-SDI and HDMI Connectors (when 3G-SDI and HDMI interfaces included)

The MMS-27C provides additional 3G-SDI and HDMI interfaces via an I/O board, including input and output interfaces (**Figure 1-5**).

RG-59 (or above) cable is required for 3G-SDI connection with the conductor impedance: 75 Ohm; BNC connector impedance: 75 Ohm.

For HDMI function, using our certified **HDMI Cable (MMSO-HDMI-Cable-R10)** will have better performance and user experience.

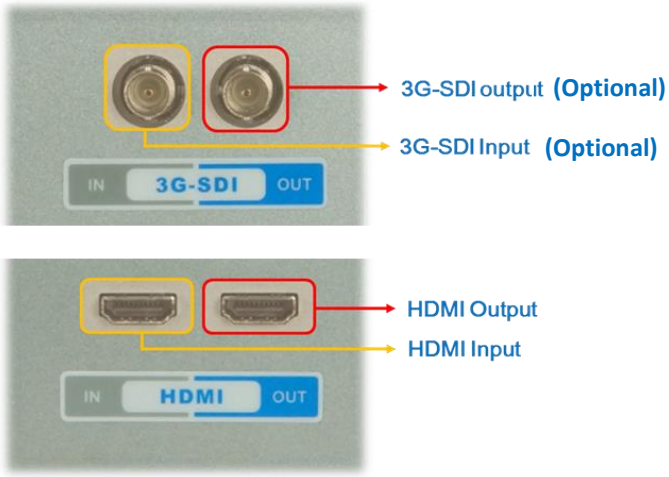


Figure 1-5: 3G-SDI and HDMI Connectors

1.5 Speakers

Each side panel consists of a speaker as indicated in **Figure 1-6**.

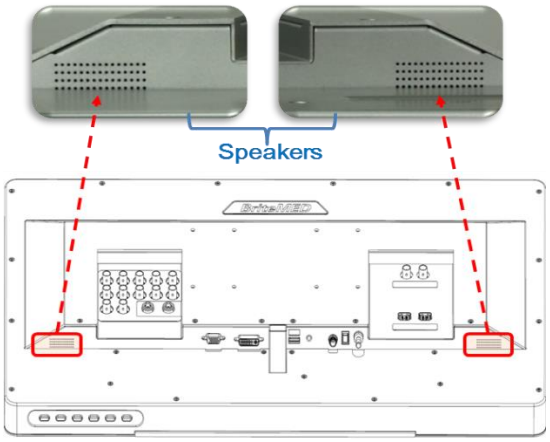


Figure 1-6: Speakers

1.6 Technical Specifications

The technical specifications for the MMS-27C are listed in **Table 1-1**.

Display	LCD size	27" inches
	Aspect Ratio	Widescreen ; 16:9
	Resolution	1920x1080
	Brightness(nits)	700
	Contrast ratio	1000:1(Typical)
	Viewing angle(H/V)	178/178
Interface	Standard	
	1 x VGA (DB-15) input	
	1 x DVI-D (single-Link) input	
	1 x USB (type A) for FW update/ SmartOSD application	
	1 x Audio (3.5mm phone jack)	
	1 x DC power jack ψ5.5/2.5 with lock	
	1 x power seesaw switch	
	1 x Equipotential Ground pin	
	Analog - optional	
	1 x RGBHV/YPbPr (BNC), (input & output)	
	1 x Composite-NTSC/PAL (BNC) , (input & output)	

	1 x S-video (mini din, 4 pin) , (input & output)
	3G-SDI- optional
	1 x 3G-SDI (BNC) , (input & output)
	HDMI- optional
	1 x HDMI 1.4 (type A) , (input & output)
LED Light	Power LED light bar (green: power on; orange: sleep)
Dimensions (W x H x D)	657x400x59.5 mm
Net Weight	10 kg
Color Temperature	
5500K,6500K,7500K, 9300K	
Feature	
Speaker Out: 2 x 0.8W	
Function key: 6 Keys	
Medical Grade Power Adapter	
Input : 100~240Vac 1.5~0.6A 50~60Hz	
Output: DC 12V 7.5A	
Environmental condition	
Operating Temperature/Humidity	0 ~ 40 ºC / 10 ~ 90%, (non-condensing)
Storage Temperature/Humidity	-20 ~ 60 ºC / 10 ~ 90%, (non-condensing)
Transportation Temperature	-20 ~60 ºC
Humidity	10 ~ 90 %, (non-condensing)
Pressure	70 ~ 106 kPa
Mounting Standard	
VESA 100 x 100/ 200 x 100	
Regulatory Compliance	
ANSI/AAMI ES60601-1; CAN/CSA-C22.2 No. 60601-1;EN 60601-1; FCC Part 18	

Table 1-1: Technical Specifications

1.6.1 VESA Timing

The following table lists the VESA timing standards that are supported by the MMS-27C.

Resolution	Refresh Rate
640x480	60Hz
640x480	72Hz
640x480	75Hz
800x600	56Hz
800x600	60Hz
800x600	72Hz
800x600	75Hz
848x480	60Hz
1024x768	43Hz
1024x768	60Hz
1024x768	70Hz
1024x768	75Hz
1152x864	75Hz
1280x768	60Hz
1280x768	60Hz
1280x768	75Hz
1280x800	60Hz
1280x800	75Hz
1280x960	60Hz
1280x1024	60Hz
1280x1024	75Hz
1360x768	60Hz
1600x1200	60Hz
1920x1080	60Hz

Table 1-2: VESA timing

1.7 Dimensions

The MMS-27C dimensions are shown in the figures below.

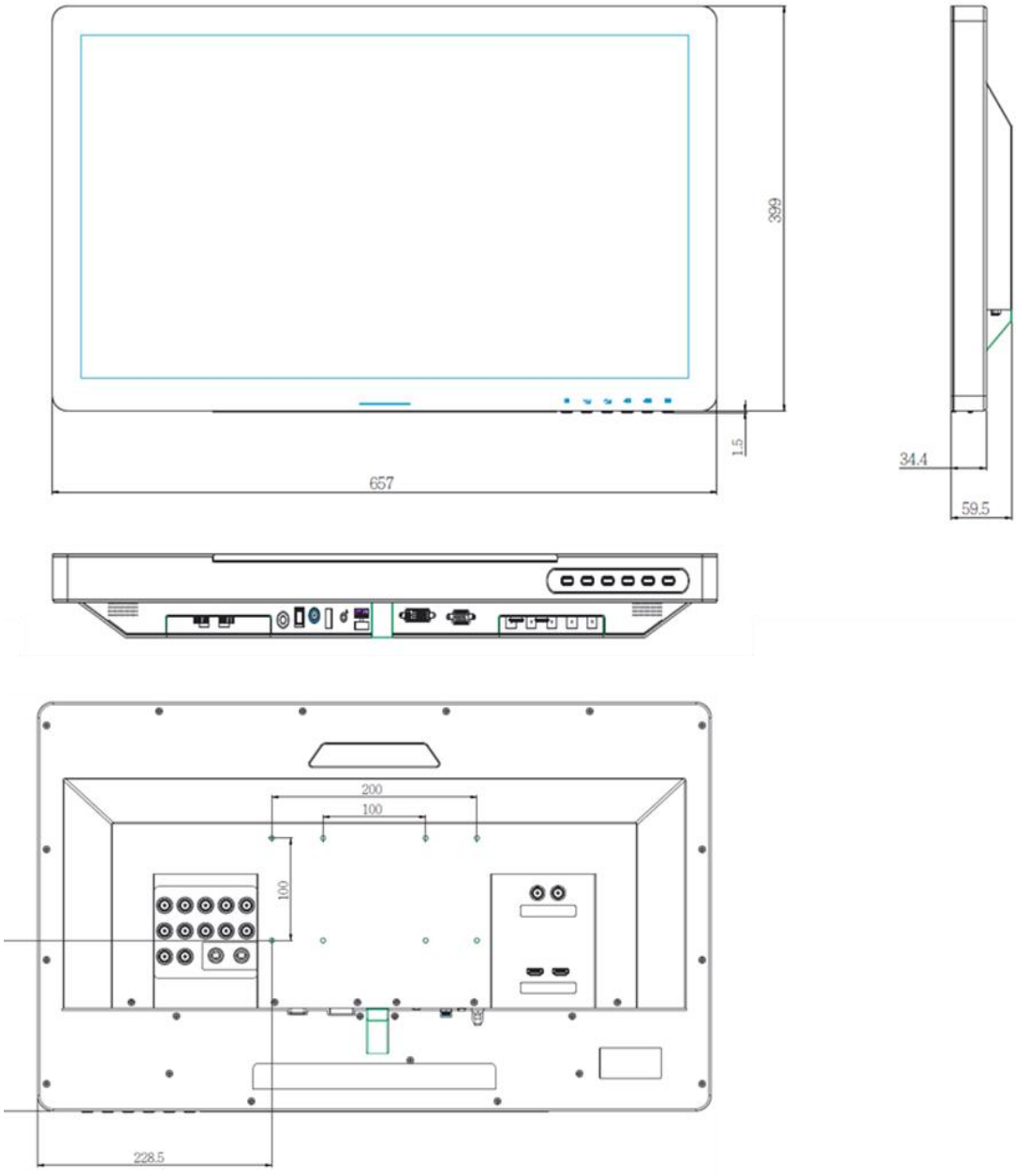


Figure 1-7: MMS-27C Dimensions (mm)

Chapter

2

Packing List

2.1 Unpacking

To unpack the MMS-27C, please follow the below steps:

WARNING:

The front LCD screen has a protective plastic screen. Only remove the plastic bag after the MMS-27C has been properly installed. This ensures the screen is protected during the installation process.

Step 1: Use box cutters, a knife or a sharp pair of scissors to unseal the top side of the box.

Step 2: Lift the monitor out of the boxes.

Step 3: Remove both polystyrene ends, one from each side.

Step 4: Pull the plastic bag off the MMS-27C.

Step 5: Make sure all the components listed in the packing list are present.

2.2 Packing List

CAUTION:

Please use the supplied accessories to avoid damage to the device.

The MMS-27C series is shipped with the following components:

Model No.	Configuration										
	Monitor	Adapter	Grounding Cable	Power Cord	DVI Cable	VGA Cable	USB Cable	Flash/QIG	Analog Module	HDMI Module	HDMI Cable
MMS-27C-R10	V	V	V	V	V	V	V	V			
MMS-27CA-R10	V	V	V	V	V	V	V	V	V		
MMS-27CH-R10	V	V	V	V	V	V	V	V		V	V
MMS-27CAH-R10	V	V	V	V	V	V	V	V	V	V	V

Quantity	Item	Image
1	MMS-27C LCD monitor	
1	Power adapter (FSP;FSP090M-RHA)	
1	Potential equalization grounding cable	
1	Power cord (EU or US or UK) EU (**P/N**:32000-000002-RS) US (**P/N**:32000-000025-RS) UK (**P/N**:32703-000700-100-RS)	
1	DVI signal cable (**P/N**:32004-001800-100-RS)	
1	VGA signal cable (**P/N**: 32000-036200-RS)	
1	USB Cable (for SmartOSD application) (**P/N**: 32001-006100-200-RS)	

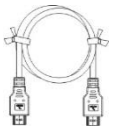
Quantity	Item	Image
1	Quick Installation Guide	
1	USB flash drive (includes user manual and utility)	
1	HDMI cable (**P/N**:MMSO-HDMI-Cable-R10)	

Table 2-1: Packing List

Make sure all the components listed in the packing list are present. If any of these items are missing or damaged, contact the distributor or sales representative immediately.

2.3 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
Stand (**P/N**: STAND-DWH-R10)	
3G-SDI input and loop-through add-on module (assemble-to-order) (**P/N**: MMSO-3GSDI-R10)	

Table 2-2: Optional Items

Chapter

3

Installation

3.1 Safety Precautions

Please follow the safety precautions outlined in this section.

3.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***The disconnecting device of supply mains of LCD monitor is AC inlet on the external power adapter*** *(*FSP;FSP090M-RHA) that came with the MMS-27C. Please make sure the disconnecting device shall be easily accessible after installation of LCD monitor.
- ***Follow the electrostatic precautions*** outlined below whenever the MMS-27C is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the MMS-27C is being installed, moved or modified.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if the MMS-27Cchassis is opened when the MMS-27C is running.
- ***Do not drop or insert any objects*** into the ventilation openings of the MMS-27C.
- ***If considerable amounts of dust, water, or fluids enter the MMS-27C***, turn off the power supply immediately. Unplug the power cord, and contact the MMS-27C vendor.

3.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the MMS-27C may result in permanent damage to the MMS-27C and sever injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the MMS-27C. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the MMS-27C is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding***: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring or working with an electrical component, place it on an anti-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component***: When handling the electrical component, hold the electrical component by its edges.

3.2 Installation Precautions

When installing the power module, please follow the precautions listed below:

- **Power turned off**: When installing the MMS-27C, make sure the power is off. Fail to turn off the power may cause severe injury to the body and/or damage to the system.
- **Certified Engineers**: Only certified engineers should install and modify onboard functionalities.
- **Grounding**: The MMS-27C should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated in the user manual.

3.3 Mounting the MMS-27C

The MMS-27C is equipped with VESA 100 and VESA 200-100 mounting screw holes on the rear panel (**Figure 3-1**). The user can mount the monitor onto a VESA (Video Electronics Standards Association) compliant device.

To install the optional stand, align the stand bracket with the VESA 100 mounting screw holes on the rear panel of the MMS-27C (**Figure 3-1**), and secure it to the monitor by inserting and tightening four retention screws.

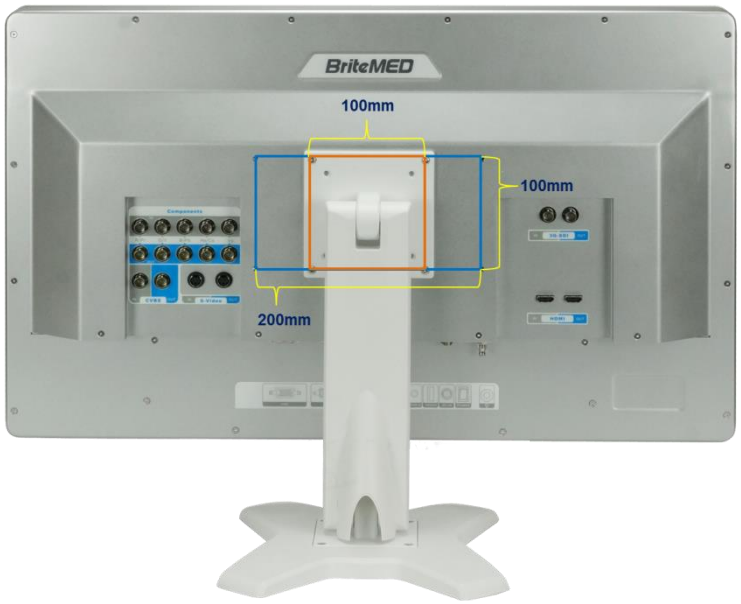


Figure 3-1: VESA 100 and VESA 200-100 Mounting Screw Holes

NOTE:

Mounting screw specifications:

- Diameter: 4.0mm
- Length: 8.0mm

3.4 Before Powering On

NOTE:

Please refer to **Figure 1-3** and **Figure 1-4** to find the I/O interface locations.

To prevent disconnection, ensure the LCD display to well connect with the cables, such as the VGA cable, DVI cable, BNC cable and power adapter.

Before powering on the MMS-27C, the user has to connect the signal input source and power source, as well as the following two cables to the MMS-27C:

- **Potential equalization grounding cable**: This cable is used to connect the monitor and signal input source, so that both connected devices have the same voltage.
- **DC-IN Cable with adapter**: This cable is used to connect the monitor and power input source.

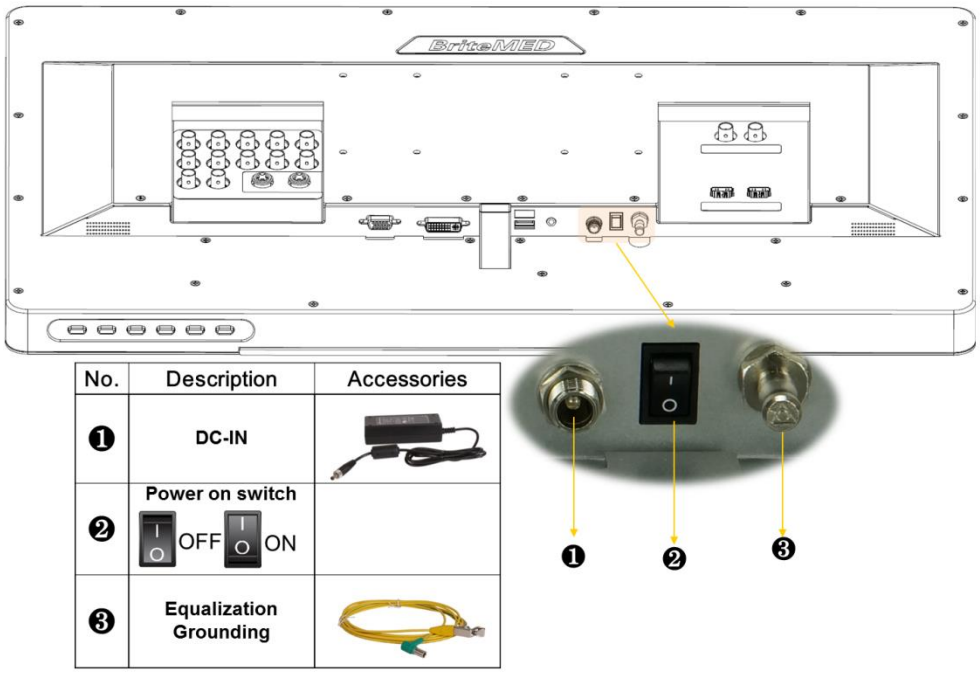


Figure 3-2: Connecting the MMS-27C

3.5 Powering On/Off the Monitor

To power on/off the monitor, please follow the below steps:

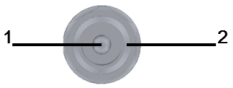
Step 1: Ensure the monitor is connected to a power source.

Step 2: Press the power switch (**Figure 3-2**) to power on or off the monitor.

Step 3: The user may use function keys to select the signal input source, image size, and the LCD backlight (**Figure 1-2**).

3.6 Connector Pin Assignments

DC Input

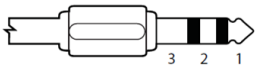


Pin No.	1	2
Description	12VDC Input	GND

USB interface connector

Pin No.	1	2	3	4
Description	+5 VDC	Data -	Data +	GND

Audio input/output

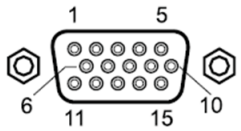


Pin No.	1	2	3
Description	Line left	Line right	GND

Equipotential earth terminal

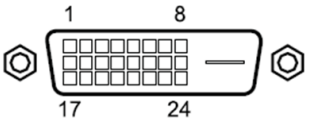
This should be connected to other equipment's earth terminal.

VGA interface connector



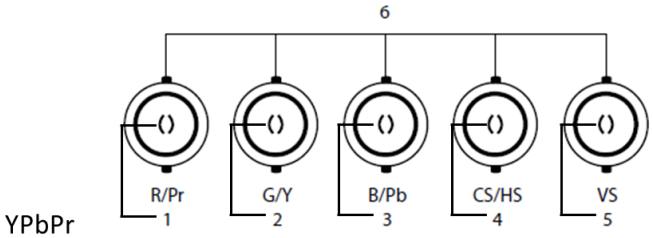
Pin No.	1	2	3	4	5
Description	Red	Green	Blue	N/A	N/A
Pin No.	6	7	8	9	10
Description	GND-Red	GND-Green	GND-Blue	DDC 5V	N/A
Pin No.	11	12	13	14	15
Description	N/A	DDC Data	Horizontal SYNC	Vertical SYNC	DDC Clock

DVI interface connector



Pin No.	1	2	3	4
Description	TMDS Data 2-	TMDS Data 2+	TMDS Data 2/4 Shield	N/A
Pin No.	5	6	7	8
Description	N/A	DDC Clock	DDC Data	N/A
Pin No.	9	10	11	12
Description	TMDS Data 1-	TMDS Data 1+	TMDS Data 1/3 Shield	N/A
Pin No.	13	14	15	16
Description	N/A	+5 Power	GND	Hot Plug Detect
Pin No.	17	18	19	20
Description	TMDS Data 0-	TMDS Data 0+	TMDS Data 0/5 Shield	N/A
Pin No.	21	22	23	24
Description	N/A	TMDS Clock Shield	TMDS Clock+	TMDS Clock-

Component interface connector



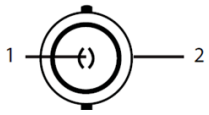
YPbPr

Pin No.	1	2	3	4	5	6
Description	Pr	Y	Pb	N/A	N/A	GND

RGBHsVs/ RGBCs

Pin No.	1	2	3	4	5	6
Description	Red	Green	Blue	H-Sync/C-Sync	V-Sync	GND

CVBS interface connector

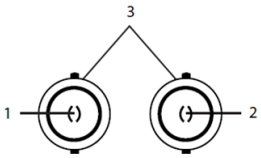


Pin No.	1	2
Description	Composite	GND

S-Video interface connector

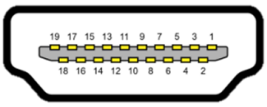
Pin No.	1	2	3	4
Description	GND (Y)	GND (C)	Y (Intensity)	C (Color)

SDI interface connector



Pin No.	1	2	3
Description	SDI Input	SDI Output	GND

HDMI interface connector



Pin No.	1	2	3	4
Description	TMDS Data 2+	TMDS Data 2 Shield	TMDS Data 2-	TMDS Data 1+
Pin No.	5	6	7	8
Description	TMDS Data 1 Shield	TMDS Data 1-	TMDS Data 0+	TMDS Data 0 Shield
Pin No.	9	10	11	12
Description	TMDS Data 0-	TMDS Clock +	TMDS Clock Shield	TMDS Clock -
Pin No.	13	14	15	16
Description	N/A	N/A	SCL	SDA
Pin No.	17	18	19	
Description	DDC GND	+5 V Power	Hot Plug Detect	

Chapter

4

On-Screen Display (OSD) Controls

4.1 Using the OSD and Function Keys

MMS-27C Function Keys are located on the bottom right corner of the panel (**Figure4-1**). To change the monitor settings, follow the below steps:

Step 1: Press the (1) MENU/ ENTER key to open the OSD main menu.

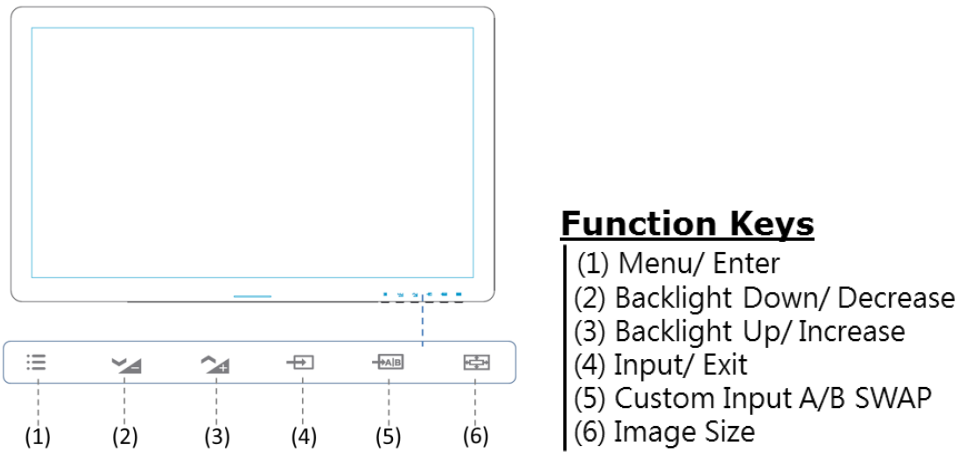


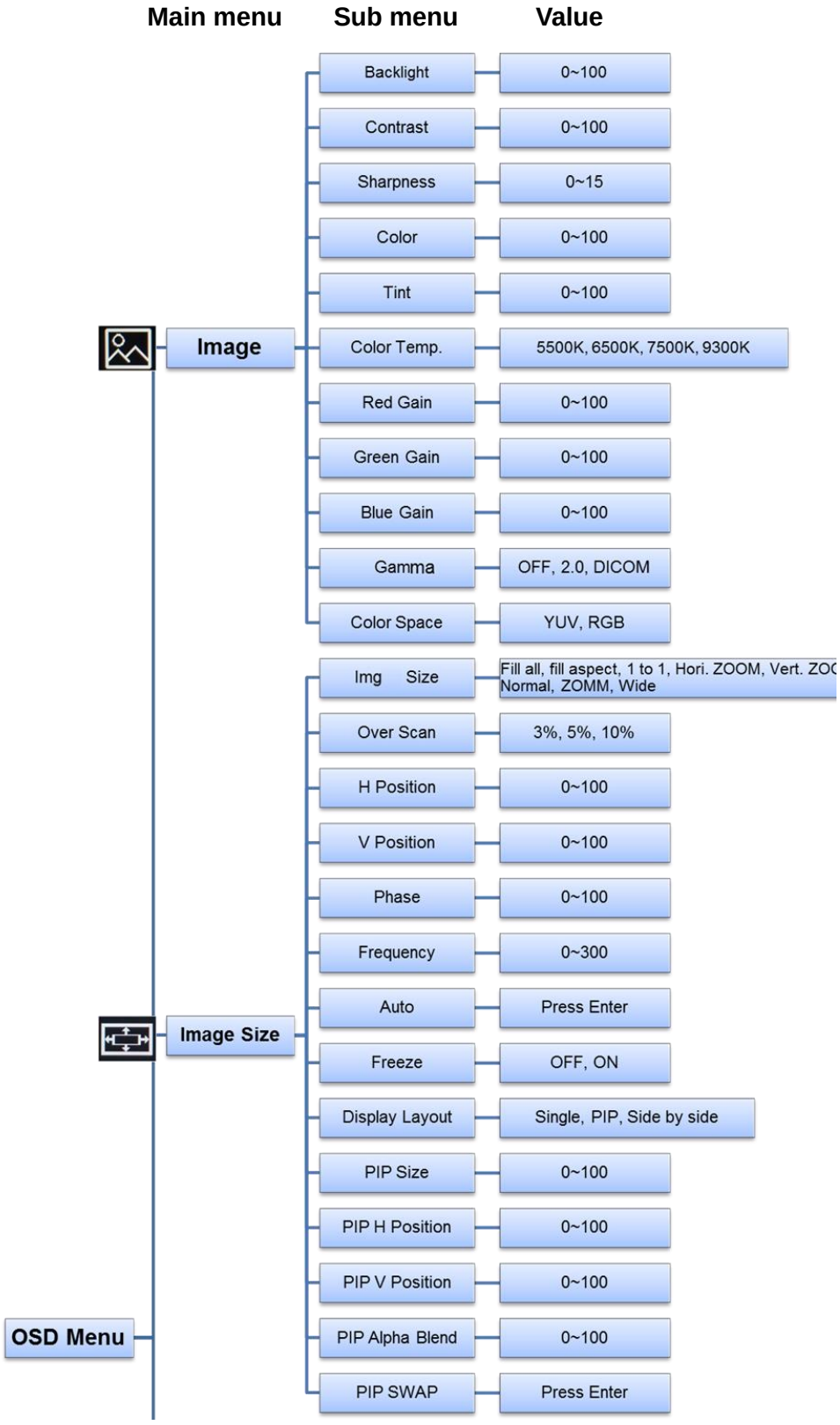
Figure4-1: Function Keys

Step 2: Use the (2) DECREASE and (3) INCREASE key to select sub-menu. Press the (1) MENU/ENTER key to confirm.

Step 3: When a setting is selected, use the (2) DECREASE and (3) INCREASE key to adjust.

Step 4: Press the (4) INPUT/EXIT key to confirm the setting and exit OSD.

4.2 OSD Menu Structure and Value



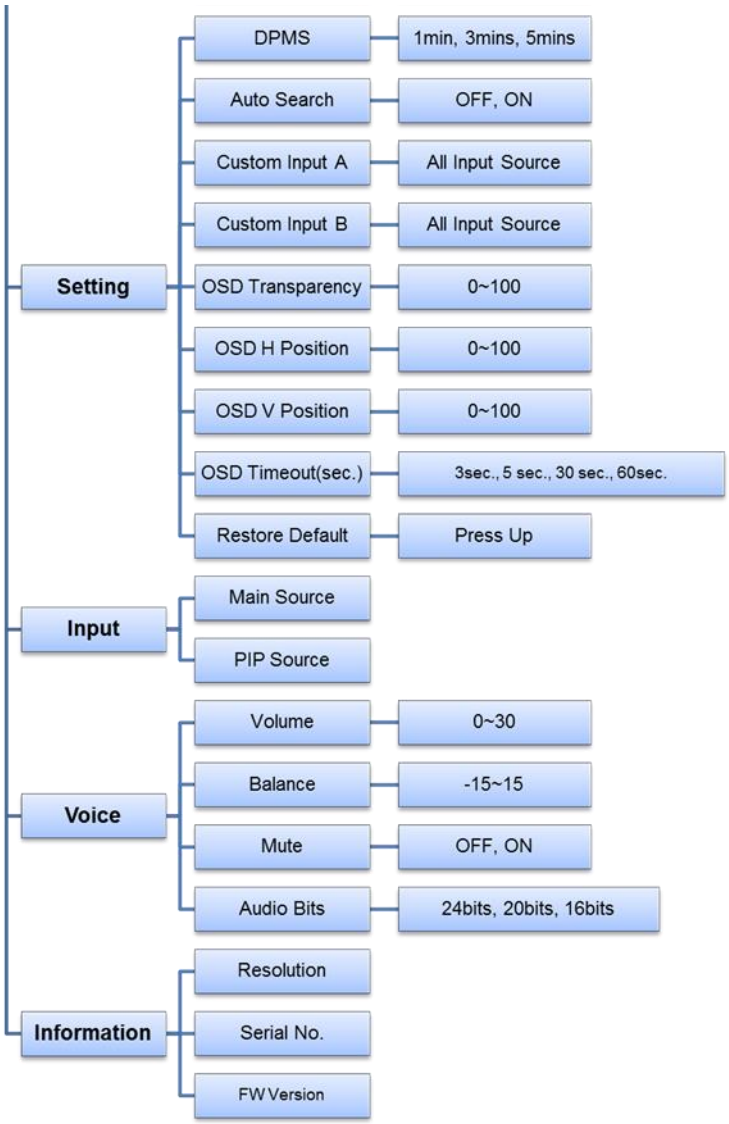
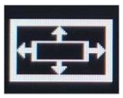
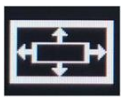
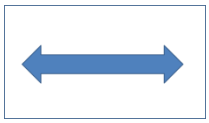
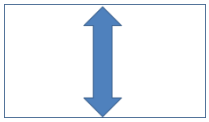


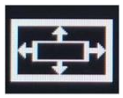
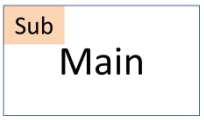
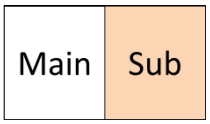
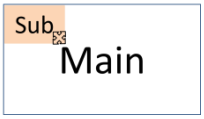
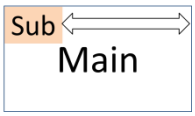
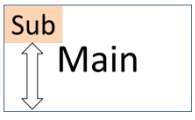
Table 4-1: OSD Menu Structure and Options

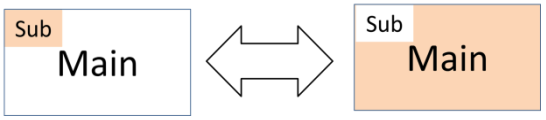
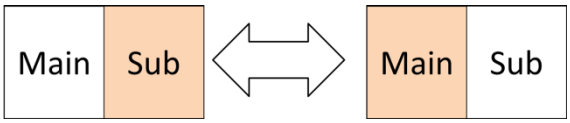
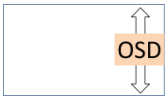
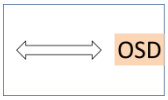
Table 4-1 shows the OSD menu structure and options for the MMS-27C monitor.

OSD Icon	Functions	Detail
	Backlight	Adjust the intensity of the fluorescent lamp behind the screen that makes the picture more intense. (Range 0~100)
	Contrast	Adjust the contrast level of the screen.(Range 0~100)
	Sharpness	Adjust a subjective perception of sharpness that is related to the edge contrast of an image.(Range 0~15)
	Color	Adjust color saturation, is used to describe the intensity of color in the image. (Range 0~100) **NOTE:** This item is available while video mode only.
	Tint	Adjust color appearance parameters (Range 0~100) **NOTE:** while video mode only.
	Color Temp.	Select the setting of screen color (5500K, 6500K, 7500K,9300K)
	Red Gain	Adjust the gain of red (Rang 0~100)
	Green Gain	Adjust the gain of green (Rang 0~100)
	Blue Gain	Adjust the gain of blue (Rang 0~100)
	Gamma	Adjust the gamma curve of a video image. (OFF, 2.0, DICOM) **Note:** DICOM setting followed –GSDF part 14”- grayscale standard display function (reference grade).
	Color Space	Select the color model of screen (YUV, RGB) **NOTE:** This item is available when using the VGA/DVI/Components input interfaces for source input.

<table>
<tr><th>OSD Icon</th><th>Functions</th><th>Detail</th></tr>
<tr><td>  </td><td>Img Size</td><td>
The available options are varied by input sources as table.
<table>
<tr><th>Image Setting</th><th>Graphic Mode</th><th>Video Mode</th></tr>
<tr><td>FILL ALL</td><td>○</td><td>○</td></tr>
<tr><td>FILL ASPECT</td><td>○</td><td>X</td></tr>
<tr><td>1 TO 1</td><td>○</td><td>○</td></tr>
<tr><td>Hori.ZOOM</td><td>○</td><td>○</td></tr>
<tr><td>Vert.ZOOM</td><td>○</td><td>○</td></tr>
<tr><td>Normal</td><td>X</td><td>○</td></tr>
<tr><td>ZOOM</td><td>X</td><td>○</td></tr>
<tr><td>WIDE</td><td>X</td><td>○</td></tr>
</table>
For detailed information, please refer to the following:
[FILL ALL]
Enlarges or shrinks the image to fill the entire screen.
[FILL ASPECT]
Enlarges or shrinks the image, maintaining its aspect ratio, until the screen can display the entire image.
[1 TO 1]
Displays as the actual image size.
[Hori. ZOOM]
Enlarges or shrinks the image, maintaining its aspect ratio, to fill the left and right borders of the monitor.
[Vert. ZOOM]
Enlarges or shrinks the image, maintaining its aspect ratio, to fill the upper and lower borders of the monitor.
[NORMAL]
For an image with 4:3 ratio, the 16:9 screen will display a 4:3 image. If the aspect ratio of the input and output images are close, the result of this adjustment will be the same as FILL ALL.
[ZOOM]
Enlarges the image, maintaining its aspect ratio. When the monitor is 4:3 ratio and the image is 16:9 ratio, this option can eliminate the black borders displayed on the upper and lower side, but the image will exceed the screen on the left and right side; when the monitor is 16:9 ratio and the image is 4:3 ratio, this option can eliminate the black borders displayed on the left and right side, but the image will exceed the screen on the upper and lower side.
[WIDE]
This option takes effect for the images with 4:3 ratio. When the Display Layout item is set to PIP/Side by side, the result of this adjustment will be the same as FILL ALL.
</td></tr>
</table>

OSD Icon	Functions	Detail
	Over Scan	Adjust the display size when over scan of original input image. (ORIGINAL, 3%, 5%, 10%) **NOTE:** This item is available only when using the analog input source in video mode.
	H Position	Adjust the horizontal position of the image.  (Range 0~100) **NOTE:NOTE:** This item is available only when using the Components/VGA input source.
	V Position	Adjust the vertical position of the image.  (Range 0~100) **NOTE:** This item is available only when using the Components/VGA input source.
	Phase	Increases or decreases the phase level. (Range 0~100) **NOTE:** Recommend that do not adjust. This setting will adjust automatically after auto adjustment. When frequency value is wrong, picture noise may be present. This item is available only when using the VGA/RGBHsVs/RGBCs input source.
	Frequency	Increases or decreases the sampling frequency. (Range 0~300) **NOTE:** It's not recommended to adjust. This setting will adjust automatically after auto adjustment. When frequency value is wrong, the horizontal image may display incorrectly or picture noise may be present. This item is available only when using the VGA/RGBHsVs/RGBCs input interfaces.
	Auto	Automatically adjusts the H Position, V Position, Phase and Frequency settings. **NOTE:** This item is available only when using the VGA/ RGBHsVs/RGBCs input source.

OSD Icon	Functions	Detail
	Freeze	Keeps the image still. (ON, OFF) **NOTE:** Freezes the main image. Does not freeze secondary image in PIP mode.
	Display Layout	Change the layout of display. (Single, PIP, Side by side) **[PIP]**  **[Side by side]**  **NOTE:**PIP/Side by side mode is available only with HDMI input source.
	PIP Size	Adjust the size of the sub window when using PIP mode.  (Range 0~100)
	PIP H Position	Adjust the horizontal position of the sub window when using PIP mode.  (Rang 0~100)
	PIP V Position	Adjust the vertical position of the sub window when using PIP mode.  (Rang 0~100)
	PIP Alpha Blend	Adjust the value of transparency of the sub window when using PIP mode. (Rang 0~100)

OSD Icon	Functions	Detail
	PIP SWAP	Swaps the position of the primary and secondary images in PIP/Side by side mode. **[PIP]**  **[Side by side]** 
	DPMS	Adjust the length of time the DPMS mode on. (1 mins, 3 mins, 5 mins)
	Auto Search	Turn ON or OFF auto source select. (ON, OFF) **[ON]** Searches through all possible input sources until an active video source is found. **[OFF]** Video input is manually selected.
	Custom Input A	Select input source and the signal assigned to custom input A for Hokey application.
	Custom Input B	Select input source and the signal assigned to custom input A for Hokey application.
	OSD Transparency	Adjust the value of transparency of the OSD Menu. (Rang 0~100)
	OSD H Position	Adjust the horizontal position of the OSD Menu.  (Rang 0~100)
	OSD V Position	Adjust the vertical position of the OSD Menu.  (Rang 0~100)
	OSD Timeout(sec.)	Adjust the length of time the OSD Menu is present on the screen.(3, 5, 10, 30, 60 seconds)
	Restore Default	Restores to the default settings

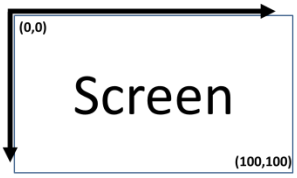
OSD Icon	Functions	Detail
	Source	Select the video input source Video input manually. [Sequence] VGA > DVI > CVBS >S-VIDEO >RGsB/YPbPr>RGBHsVs/RGBCs > HDMI > SDI
	Volume	Adjust the volume of sound. (Range 0~30)
	Balance	Adjust the value of balance for audio right and left channel.(Range -15~15)
	Mute	Mute or Unmute the audio channel.(ON, OFF) **[ON]** Mute the audio channel. **[OFF]** Unmute the audio channel.
	Audio Bits	Adjust audio signal format. (16, 20, 24 bits) **NOTE:** This item is available only when using the optional SDI input source.
	Resolution	Displays the current resolution.
	Serial NO.	Displays the serial number of the product.
	FW Version	Displays the firmware version.
Position definition: 		

Table 4-1: OSD Menu Structure and Options

Chapter

5

MMS SmartOSD

5.1 Overview

The MMS SmartOSD is a proprietary On-Screen Display (OSD) software solution that enables easy monitor setting adjustments in a Windows environment with general USB cable (Type A to Type A) or the optional USB cable (P/N: 32001-006100-200-RS). Please refer to the following sections to install and use the software.

5.2 Installing the MMS SmartOSD

To install the MMS SmartOSD, please follow the steps below:

Step 1: Use a USB cable (Type A to Type A) to connect with the USB Type A connector of MMS-27C at one end and to the computer at another end for firmware update and SamartOSD application (**Figure5-1**).

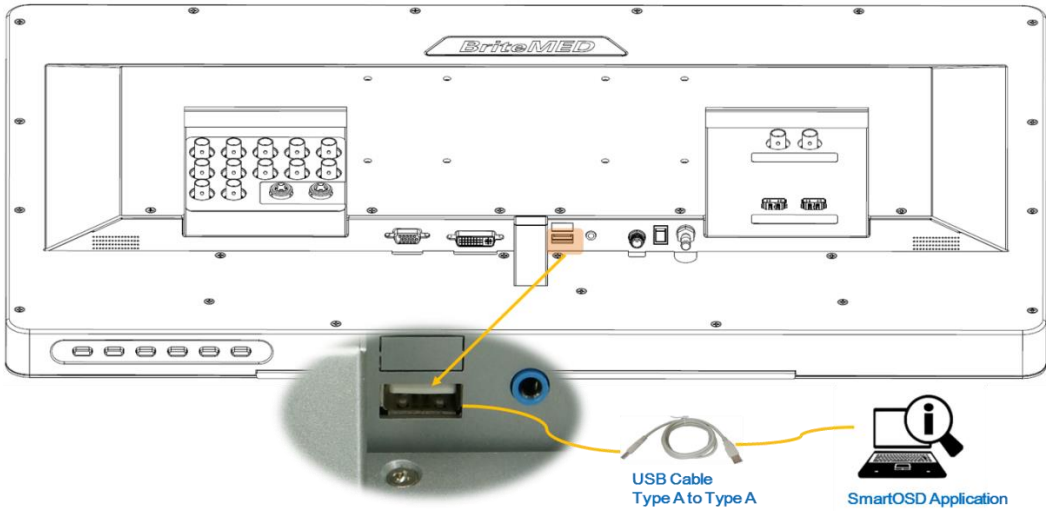


Figure5-1: Using the USB Cable to Connect MMS-27C to a Computer

Step 2: Windows installs the device driver automatically.

Step 3: Run the MMS SmartOSD setup file included in the bundled USB flash drive.

Step 4: The Setup Wizard welcome window appears (**Figure5-2**).

Follow the onscreen instructions to complete the software installation.

Figure5-2: Setup Wizard Welcome Window

Step 5: If the MMS SmartOSD software is installed to the connected computer, the MMS SmartOSD icon (**Figure5-3**) should appear on the Windows desktop.

Figure5-3: MMS SmartOSD Icon

5.3 Using the MMS SmartOSD

To use the MMS SmartOSD, please follow the steps below:

Step 6: Ensure that the MMS-27C is connected to the computer (**Figure5-1**).

Step 7: Double click the MMS SmartOSD icon (**Figure5-3**) on the Windows desktop to launch the MMS SmartOSD.

Step 8: The MMS SmartOSD menu appears (**Figure5-4**). For the detailed information of its configuration options, please refer to **Table 4-1**: OSD Menu Structure and Options.

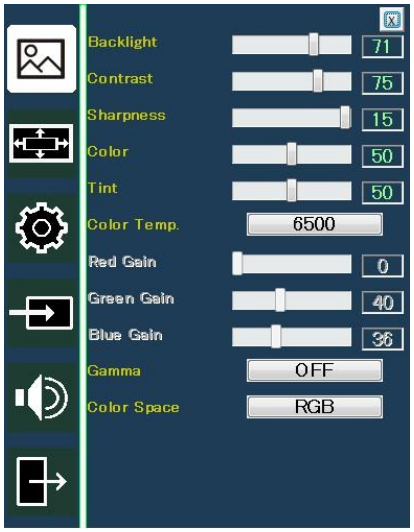


Figure5-4: MMS SmartOSD Menu

Chapter

6

Troubleshooting

This section may help you isolate the cause of a problem and as a result, eliminate the need to contact technical support.

Problem	Solution
MMS-27C can't power on.	1) Check whether the power cord is well connected to the power source and also to the power adapter. 2) Ensure the power switch is on.
MMS-27C has no signal.	Check whether the signal cable is connected correctly, and press the Input Source Selection Button to choose input source. Or press the Menu to choose  the input source.
MMS-27C is on black screen.	1) Check if the system is powered on. 2) Check if the signal cable is well connected between the monitor and the system. 3) Check if the light bar at the bottom of panel shows orange light. This means the Power Management System (DPMS) is enabled.
No sound.	Check whether audio source is connected correctly and check OSD audio setting.
Image size is not suitable for display.	Press the Image size  Hotkey to adjust Image size directly.
Can't find the MMS Smart OSD icon on the computer.	Before installing, make sure USB cable is connected to a computer and the MMS-27C. Install MMS Smart OSD software from USB flash drive, and run the MMS Smart OSD setup file automatically.

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

FCC INFORMATION

This equipment has been tested and found to comply with limits of a Class B digital device, pursuant to Part 18 of the FCC rules. These limits are designed to provide reasonable protection against interference. This equipment can radiate radio frequency energy and, if not installed and used in accordance with the instructions, it may interfere with other radio communications equipment. There is no guarantee that interference will not occur in a particular installation. If this equipment is found to cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by carrying out one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the subject of interference.
- Plug the equipment into an outlet on a different electrical circuit than that to which the subject of interference is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Accessory equipment connected to this product must be certified according to the respective IEC Standards (i.e.,IEC 60950-1) for data processing equipment and IEC 60601-1 for medical equipment. Furthermore, all configurations shall comply with the system standard, IEC 60601-1-1. Anyone 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 system standard IEC 60601-1-1. Whoever is responsible for securing the unit to a system needs to insure that the mounting equipment used with this product complies to IEC standard 60601-1. If in doubt, consult the technical services department or your local representative.

NOTICES TO USER

This device complies with part 18 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.

FCC WARNING

This equipment generates or uses radio frequency energy. Changes or modifications to this equipment may cause harmful interference unless the modifications are expressly approved in the instruction manual. The user could lose authority to operate this equipment if an unauthorized change or modification is made.

Safety Compliance

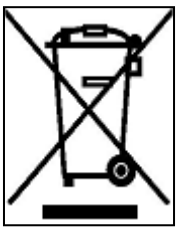
This product is M.E.T. approved with respect to electric shock, fire and mechanical hazards only is accordance with CAN/CSA C22.2 No.60601-1 and ANSI/AAMI ES60601-1.

Appendix

B

Product Disposal

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union – The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

Appendix

C

Maintenance and Cleaning Precautions

When maintaining or cleaning the MMS-27C, please follow the guidelines below.

Maintenance and Cleaning

Prior to cleaning any part or component of the MMS-27C, please read the below details.

- The interior does not require cleaning. Keep fluids away from the interior.
- Be careful not to damage the small, removable components inside.
- Turn off before cleaning.
- Never drop any object or liquid through the openings.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning.
- Avoid eating, drinking and smoking nearby.
- The enclosures of the monitor, power adapter and DC power cable, and the video cables and power cord are intended to be routinely cleaned by the user with 75% ethanol alcohol.

Cleaning Tools

Some components may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below items are suggested for cleaning.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended.
- ***Water/Ethanol alcohol*** –A cloth moistened with water or 75% ethanol alcohol can be used.
- ***Using solvents*** – The use of solvents is not recommended as they may damage the plastic parts.
- ***Cotton swabs*** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- ***Foam swabs*** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

D

Symbol Definitions

The following symbols appear on the product, its labeling, or the product packing. Each symbol carries a special definition, as defined below:

	Warning		Caution
	Dangerous: High voltage		Power adapter
	Direct current		Indicates equipotential earth ground
	Indicates protective earth ground		Fragile, handle with care
	This side up		Keep dry
	Consult the operating instructions		Refer to instruction manual
	Altitude limitation		Humidity limitation
	Atmospheric pressure limitation		Temperature limit
	Indicates the manufacturer		
	Indicates proof of conformity to applicable European Economic Community Council directives and to harmonized standards published in the official journal of the European Communities.		
	Medical equipment is in accordance with ANSI/AAMI ES60601-1 (R2012) and CAN/CSA C22.2 No. 60601-1 in regards to electric shock, fire hazards, and mechanical hazard.		
	Tested to comply with FCC Class B standard.		
	This symbol indicates that the waste of electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact the manufacturer or other authorized disposal company to decommission your equipment.		
	This product is recyclable.		

Appendix

E

EMC Test Summary

Guidance and manufacturer's declaration – electromagnetic emission		
This LCD monitor is intended for use in the electromagnetic environment specified below. The customer or the user of the LCD monitor should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment – guidance**
RF Emissions CISPR 11	Group 1	The LCD monitor 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 LCD monitor 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	Class A	
Voltage fluctuations IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration – electromagnetic immunity			
This LCD monitor is intended for use in the electromagnetic environment specified below. The customer or the user of the LCD monitor should assure that it is used in such an environment.			
Immunity test	**IEC 60601test level**	**Compliance level**	**Electromagnetic environment –guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	Contact:±8 kV Air:±15 kV	Contact:±8 kV Air:±15 kV	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	5/50ns, 100kHz, ±2kV	5/50ns, 100kHz, ±2kV	Mains power quality should be similar to that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	1.2/50 (8/20) μs LtL: ±1.0 kV LtG: ±2.0 kV	1.2/50 (8/20) μs LtL: ±1.0 kV LtG: ±2.0 kV	Mains power quality should be similar to that of a typical commercial or hospital environment.
Voltage dips, short Interruptions and voltage variations on power supply input lines IEC 61000-4-11	0 % *U*T for 0.5 cycle(1 phase) 0% *U*T for 1 cycle 70% *U*T for 25/30cycles (50/60 Hz) 0% *U*T for 250/300cycles (50/60 Hz)	0 % *U*T for 0.5 cycle(1 phase) 0% *U*T for 1 cycle 70% *U*T for 25/30cycles (50/60 Hz) 0% *U*T for 250/300cycles (50/60 Hz)	Main power quality should be that of a typical commercial or hospital environment. If the user of monitor requires continued operation during power mains interruptions, it is recommended that monitor be powered from an uninterruptible power supply or a battery. Note: *UT* is the A.C. mains voltage prior to application of the test level.
Power frequency (50/60Hz) Magnetic field IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

Guidance and manufacturer's declaration – electromagnetic immunity			
This LCD monitor is intended for use in the electromagnetic environment specified below. The customer or the user of the monitor should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**
Conducted RF IEC 61000-4-6 Amplitude modulated	150kHz to 80MHz 3V ISM Bands 6V ☒ 80%/1kHz	150kHz to 80MHz 3V ISM Bands 6V ☒ 80%/1kHz	**WARNING: Portable RF** Communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30cm (12 inches) to any part of the device, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.
Radio-frequency Electromagnetic field. Amplitude modulated	IEC 61000-4-3	150kHz to 80MHz 3V/m ☒Prof. Healthcare ☒ 80%/1kHz	**WARNING: Portable RF** Communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30cm (12 inches) to any part of the device, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.
Proximity fields from RF wireless communication equipment	IEC 61000-4-3	380 - 390 MHz 27V/m;PM 50%;18 Hz 430 - 470 MHz 28 V/m; (FM ±5kHz, 1 kHz sine)PM;18 Hz 704 - 787 MHz 9 V/m;PM50%;217 Hz 800 - 960 MHz 28 V/m;PM50%;18 Hz 1700 - 1990 MHz 28V/m;PM 50%;217Hz 2400 - 2570 MHz 28V/m;PM 50%; 217Hz 5100 - 5800 MHz 9V/m;PM 50%;217Hz	**WARNING: Portable RF** Communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30cm (12 inches) to any part of the device, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.