



# Stereoscopic 3D Display

## ZM-M215 Series

### Sales Guide

2010. 3.

## 1. Summary

### What is Stereoscopic 3D (3D-Three Dimension) technology?

Stereoscopic imaging refers to a technique of recording three-dimensional visual information or creating the illusion of depth in an image. This additional dimension allows 3D stereoscopic images to be displayed realistically and move with life.



- ✓ High Quality Stereoscopic 3D Display
- ✓ Simple 2D/3D Convertibility
- ✓ The Widest Viewing Angle of all Polarized 3D Monitors.
- ✓ Perfect Stereoscopic 3D Gaming Support
- ✓ No Ghost Imaging
- ✓ 3D Stereoscopic Player Included
- ✓ Stereoscopic 3D Samples Included
- ✓ No Need to Buy 3D Shutter Glass
- ✓ Two Types of 3D Glasses Provided

## 2. Features



### ✓ High Quality Stereoscopic 3D Display

The 3D filter on the LCD panel and 3D Glasses are designed to compensate perfectly and create stereoscopic optical 3D image with reduced eye strain and clear high quality stereoscopic 3D display.



### ✓ Simple 2D/3D Convertibility

Use the pre-assigned Toggle key to convert 2D into stereoscopic 3D game mode and vice versa.

## 2. Features



### ✓ The Widest Viewing Angle of all 3D Polarized Monitors

Vertical and horizontal viewing angles are created wider than other polarized monitors, and cross talk and eye strains are minimized.



### ✓ Perfect Stereoscopic 3D Gaming Support

Most games using NVIDIA, DDD, or iZ3D 3D drivers are supported to play in 3D stereoscopic mode.

## 2. Features



### ✓ No Ghost Imaging

The 3D filter on the LCD panel and 3D Glasses are designed to compensate for each eye and create perfect stereoscopic optical 3D image without ghosting.



### ✓ 3D Stereoscopic Player Included

Stereoscopic Player for playing most stereoscopic files is included.



## 2. Features



### ✓ Stereoscopic 3D Samples Included

Eight stereoscopic demo samples are included.



### ✓ HDCP Support (High-bandwidth Digital Content Protection)

HDCP, a digital content protection feature is supported which identifies HDCP code for video players and contents.

#### ※ What is HDCP?

A form of digital copy protection to protect digital audio and video content as it travels across DisplayPort, Digital Visual Interface (DVI), High-Definition Multimedia Interface (HDMI), Gigabit Video Interface (GVIF), or Unified Display Interface (UDI) connections.

## 2. Features



### ✓ High Quality Full HD Digital Pictures

Supports 1080p Full HD delivering clear and sharp picture quality.



### ✓ Fast 5ms Response Time

Fast 5ms response time eliminates ghosting and afterimages when playing the latest 3D games or action movies.

## 2. Features



### ✓ 16:9 Wide View Support

Supports 16:9 wide view enabling users to enjoy HD movies and 3D games without any distortions.



### ✓ 10,000:1 Contrast Ratio

Supports 10,000:1 Contrast Ratio for deep and high contrast color reproduction, and 300cd/m<sup>2</sup> brightness provides clear picture quality.



## 2. Features



### ✓ 4:3 Aspect Ratio

Aspect ratio can be switched from 16:9 wide to 4:3 ratio by adjusting the OSD menu according to user preferences.



### ✓ Easy To Use Interface

Easy to use OSD menu buttons such as Auto, Menu, ▲, ▼, and Power buttons are conveniently located in the right lower side.

## 2. Features



### ✓ DVI / D-SUB Support

DualLink and HDCP supporting DVI and D-SUB ports allow easy connection to a wide range of PC connections.



### ✓ VESA Wall Mount

Monitor is provided with a monitor stand, but it can also be wall-mounted with the provided 100 x 100 VESA wall mount holes.

## 2. Features



### ✓ Tilt Stand

The angle of the monitor can be adjusted by tilting according to user preferences.



### ✓ Energy Efficient Environment Friendly Monitor

The standby power consumption is less than 1W, and only recyclable materials are used to provide an environment friendly monitor.

## 3. Specification and Resolution

### 3. 1. Specification

Model	ZM-M215W	
Display	LCD Monitor	55 cm / 21.5 inch
	Screen Ratio	16:9 wide
	Max Resolution	Full HD 1920 x 1080
	Response Time	5ms
Input Signal	Horizontal Frequency	30~83KHz (Digital)
	Vertical Frequency	56~75Hz (Digital)
	Video Signal	Analog RGB / DVI
	Video Ports	15pin D-Sub / DVI / Audio In
Power	Power Consumption	≤ 40watt
	Vertical Frequency	≤ 1watt
	V o l t a g e	100~240V Free Voltage
	Plug and Play	DDC 1/2B
	Power Type	Built-in Power
Dimension	Product Size	531 x 382 x 200mm (W x H x D)
	B o x S i z e	575 x 420 x 125mm (W x H x D)
Weight	M o n i t o r	4kg
MSRP		265.00 Euro, U\$349.90

### 3. 2. Supported Resolutions

Resolution	Horizontal Frequency(KHz)	Vertical Frequency(Hz)
1920 x 1080	67.5	60
1680 x 1050	65.3	60
1280 x 1024	64.0	60
1024 x 768	48.4	60
	56.5	70
	60.0	75
800 x 600	37.9	60
	48.1	72
	46.9	75
640 x 480	31.5	60
	37.9	72
	37.4	75
720 x 400	31.5	70

## 4. Components

Components



LCD Monitor



Power Cord



15Pin D-Sub Cable



3D Installation DVD



DVI Cable \*1



Audio Cable \*2



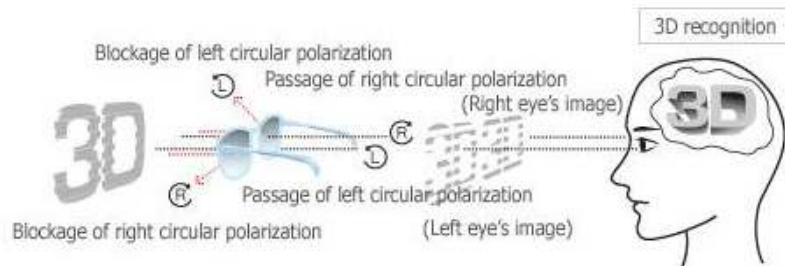
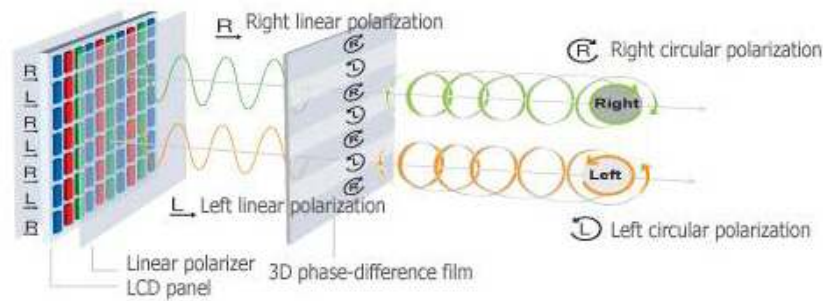
3D Glasses(Clip Type & Glass Type)

\*1: **For DVI Model only.**

\*2: **For Audio Model only.**



## 5. Zalman's 3D Stereoscopic Display Technology



### ✓ Glass Type 3D Stereoscopic Display

ZM-215W Series is a passive type monitor using space separation and splits an image at the pixel level for left and right eye which is passed through 3D phase difference film enabling left eye to see only left side images and right eye to see only right eye images when viewed using polarized 3D glasses. The two images are processed by the brain as two different images, and the technology fuses the two views together creating a sense of depth and stereoscopic visions.

## 6. 3D Stereoscopic Display's Strength and Weakness

### 6. 1. Comparison Between Glass Type and Non-Glass Type 3D Display Comparison

Classification		Viewing Angle	Cross talk	Comfort	2D/3D Toggle	Future Prospect
Glass Type	Polarizer	△	O	△	O	O
	Shutter	O	△	X	O	O
Non Glass Type	Parallax barrier	X	△	O	△	△

O: Good △: Average X: Bad

#### ✓ Glass Type 3D Stereoscopic Display

Glass Type is widely used in cinema systems, home 3DTV, Stereoscopic 3D monitors, etc.

- Advantages: Viewing angle is excellent, cross talk is minimized, and is 2D/3D convertible.

#### ✓ Non-Glass Type 3D Stereoscopic Display

The non-Glass Type is limited by current technology. It is used in small cell phones, 7-inch photo frames, etc.

- Advantages: Glasses are not required.

## 5. 3D Stereoscopic Display Comparison

### 5. 2. Comparison between Polarizer and Shutter Type Stereoscopic 3D display

Classification		Polarizer Type	Shutter Type
Display Quality	Viewing Angle	Disadvantage	Advantage (No viewing angle limitation)
	Flicker	Advantage (No Flicker)	Disadvantage
	Brightness	Advantage	Disadvantage
Manufacturing Cost	Panel	Disadvantage	Advantage
	Glasses	Advantage	Disadvantage
Glass Comfort		Advantage	Disadvantage

#### ✓ Stereoscopic 3D Polarization Display

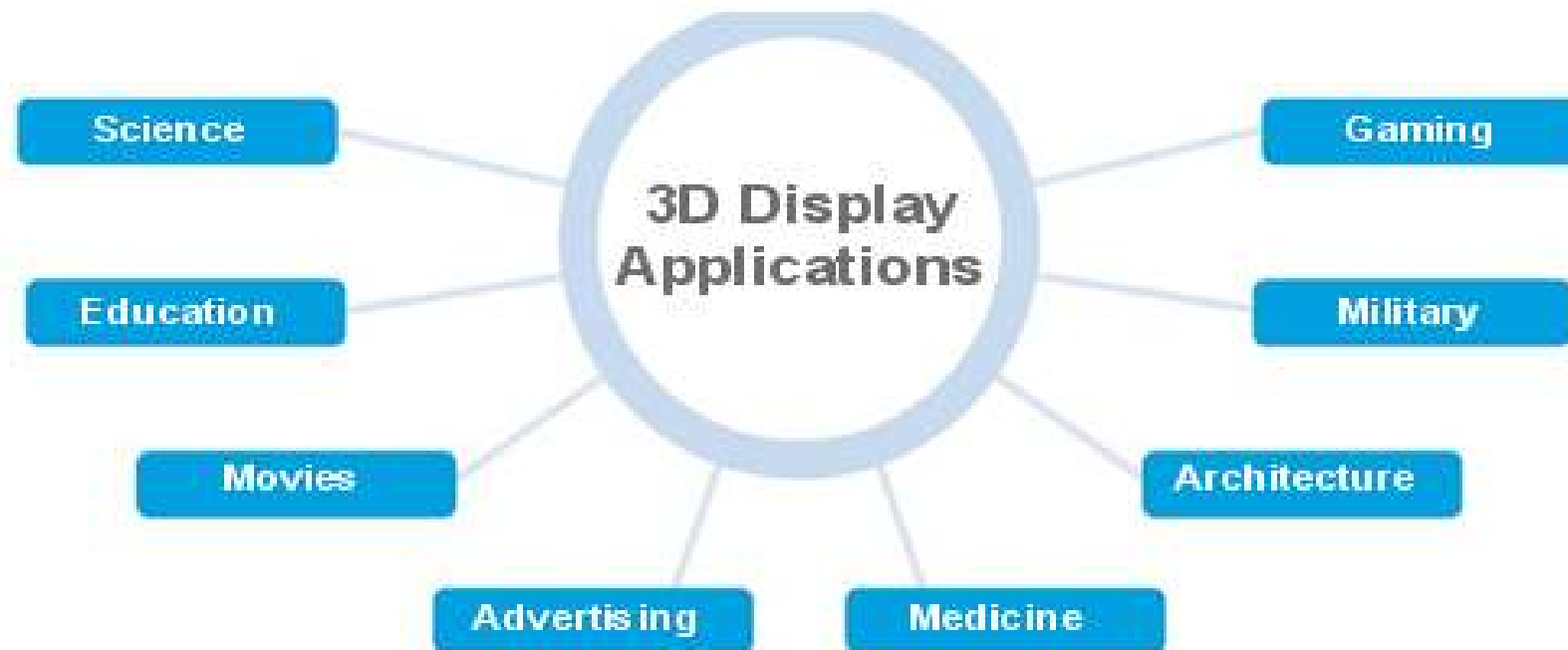
- ▶ Advantage: 3D Glasses are smaller and lighter, and the display is flicker-free and brightness is excellent.
- ▶ Disadvantage: Viewing angle is limited, and 3D filter manufacturing and processing incur additional costs.

#### ✓ Stereoscopic 3D Shutter Display

- ▶ Advantage: Viewing angle is not restricted and 3D filter is not required.
- ▶ Disadvantage: Shutter glass flicker may cause dizziness and nausea. Brightness is poor, and glasses are heavier and uncomfortable.

## 7. Stereoscopic 3D Display Applications

### 7. 1. Applications



## 7. Stereoscopic 3D Display Applications and 3D Contents

### 7. 2. Content Links

#### ✓ Educations

National Geographic	<a href="http://www.nationalgeographic.com">www.nationalgeographic.com</a>
Designmate	<a href="http://www.designmate.com">www.designmate.com</a>
VMD	<a href="http://www.ks.uiuc.edu/Research/vmd/">www.ks.uiuc.edu/Research/vmd/</a>
3DTV Stereoscopic Player	<a href="http://www.3dtv.at">www.3dtv.at</a>
Maya 2009	<a href="http://www.autodesk.co.kr">www.autodesk.co.kr</a>
Spatial View	<a href="http://www.spatialview.com/en">www.spatialview.com/en</a>
Eon Reality	<a href="http://www.eonreality.com">www.eonreality.com</a>
VirTools	<a href="http://www.virttools.co.kr">www.virttools.co.kr</a> (Korean)
Kovi	<a href="http://www.kovi.com">www.kovi.com</a> (Korean)
Starosta	<a href="http://www.starosta.com/">www.starosta.com/</a>
3D Photography	<a href="http://www.3dphoto.net/">www.3dphoto.net/</a>
Digital Stereo Photography	<a href="http://www.ledametrix.com/">www.ledametrix.com/</a>

#### ✓ Military

Hanjin Information Systems	<a href="http://www.hist.co.kr">www.hist.co.kr</a> (Korean)
GeoSystem	<a href="http://www.vingeo.com/geosyst.html">www.vingeo.com/geosyst.html</a>

#### ✓ Game

4D4D Game	<a href="http://www.4d4d.co.kr">www.4d4d.co.kr</a> (Korean)
Aven	<a href="http://www.aven.kr">www.aven.kr</a> (Korean)
Hytechnology Korea	<a href="http://www.hytechkor.com">www.hytechkor.com</a> (Korean)
KGT Racing	<a href="http://www.kgtracing.com">www.kgtracing.com</a> (Korean)
Super Rider	<a href="http://www.superrider.co.kr">www.superrider.co.kr</a> (Korean)
Kingdom Rider	<a href="http://www.kingdomrider.co.kr">www.kingdomrider.co.kr</a> (Korean)
Korea Amusement Industry Association	<a href="http://www.gamekorea.or.kr">www.gamekorea.or.kr</a> (Korean)
S-3D Gaming Alliance	<a href="http://www.s3dga.com">www.s3dga.com</a>

#### ✓ Community

Meant To Be Seen	<a href="http://www.mtbs3d.com">www.mtbs3d.com</a>
S-3D Gaming Alliance	<a href="http://www.s3dga.com">www.s3dga.com</a>
Stereoscopy.com	<a href="http://www.stereoscopy.com">www.stereoscopy.com</a>
3D Guy	<a href="http://3dguy.tv">3dguy.tv</a>
Stereo3d.com	<a href="http://www.stereo3d.com">www.stereo3d.com</a>
National Stereoscopic Association	<a href="http://www.stereoview.org">www.stereoview.org</a>



## 7. Stereoscopic 3D Display Applications and 3D Contents

### 7. 2. Content Links

#### ✓ Movies - I

Red Star Studio	<a href="http://www.redstar3d.com">www.redstar3d.com</a>
Nwave Pictures	<a href="http://www.nwave.com">www.nwave.com</a>
3ality Digital	<a href="http://www.3alitydigital.com">www.3alitydigital.com</a>
Inition	<a href="http://www.inition.co.uk">www.inition.co.uk</a>
Bug	<a href="http://www.bug.no">www.bug.no</a>
Danimation	<a href="http://www.danimation.com">www.danimation.com</a>
Dzignlight Studios	<a href="http://www.dzignlight.com">www.dzignlight.com</a>
Liquid Pictures	<a href="http://www.liquidpictures3d.com">www.liquidpictures3d.com</a>
3D Revolution	<a href="http://www.the3drevolution.com">www.the3drevolution.com</a>
Pace 3D Technologies	<a href="http://www.pacehd.com/">www.pacehd.com/</a>
Digital Revolution Studios	<a href="http://www.digitalrevolutionstudios.com">www.digitalrevolutionstudios.com</a>
3D Film Factory	<a href="http://www.3dfilmfactory.com">www.3dfilmfactory.com</a>
Lahaye TV	<a href="http://lahaye.tv/ingles/index.html">lahaye.tv/ingles/index.html</a>
Voyage Films	<a href="http://www.voyagefilms.com">www.voyagefilms.com</a>
3D Movie List	<a href="http://www.3dmovielist.com">www.3dmovielist.com</a>
3DSX	<a href="http://3dxx.com">3dxx.com</a>

#### ✓ Movies - II

Paradise FX	<a href="http://www.paradisefx.com">www.paradisefx.com</a>
3D Camera Company	<a href="http://www.3dcameracompany.com">www.3dcameracompany.com</a>
Fanta Wild	<a href="http://www.fantawild.com">www.fantawild.com</a>
Big I Entertainment	<a href="http://www.bigient.com">www.bigient.com</a> (Korean)
Sigong Media	<a href="http://www.koreavisuals.com/kor">www.koreavisuals.com/kor</a> (Korean)
Einpictures	<a href="http://www.einpictures.co.kr">www.einpictures.co.kr</a> (Korean)
JAD Media Works	<a href="http://www.jadmw.co.kr">www.jadmw.co.kr</a> (Korean)
Hi-Tech Media	<a href="http://www.vr.co.kr">www.vr.co.kr</a> (Korean)
Media Front	<a href="http://www.mediafront.co.kr">www.mediafront.co.kr</a> (Korean)
Real Scope	<a href="http://www.realscope.co.kr">www.realscope.co.kr</a> (Korean)
Video Arts	<a href="http://www.videoarts.co.kr">www.videoarts.co.kr</a> (Korean)
Skylife Broadcasting	<a href="http://www.skylife.co.kr">www.skylife.co.kr</a> (Korean)
3D Blue Ray Movies	<a href="http://www.3dmovies.ws/">www.3dmovies.ws/</a>
Movist 3D portal	<a href="http://www.movist.com/3d_del">www.movist.com/3d_del</a> (Korean)

## 8. Q&A

✓ **Blurs and Patterns are present when the screen is OFF.**

This phenomenon is the result of the interference of external light present on the air layer between the LCD screen and the 3D filter. The intensity of this pattern is very weak, which makes it unnoticeable when the LCD is ON so the monitor can be used without any inconvenience.

✓ **Images are presented as 2D and not stereoscopic.**

This monitor is 2D/3D convertible monitor. Media that was produced in 2D can only be viewed in 2D, and only media created in 3D can be viewed in 3D.

✓ **Reflections are seen on the screen.**

This monitor has a glass 3D filter attached to the front side of the LCD. It is not possible to remove the reflections on its surface. Therefore, it is a good idea to not place a light source behind the user. If the light source behind the monitor is unavoidable, adjust the monitors angle so that the light reflection does not show on the display.

✓ **May other manufacturer 3D glasses be worn to view stereoscopic 3D contents?**

This monitor must be viewed with the enclosed polarized glasses to view 3D effects. The enclosed glasses have been circularly polarized for compatibility with monitor's 3D filter. Using polarized glasses made by other manufacturers will not enable optimal viewing of 3D images on this monitor, and even if they are circularly polarized glasses, clear images cannot be viewed due to difference in optical characteristics.

## 8. Q&A

### ✓ What happens if the monitor is viewed outside the viewing angle?

To view clear 3D images, the user's eye level must be around the 3<sup>rd</sup> horizontal quarter(from the bottom of the display) and the user should be approximately 30~60cm (1~2 feet) away from the monitor. The 3D effect is clearest within a horizontal 90 degrees and a vertical angle of 12 degrees relative to the monitor.

### ✓ What should I do if right/left images have been swapped?

- For 3D videos, set the player's Right Eye Images to line up with display's Odd Numbered Horizontal Lines.

Stereoscopic Player can adjust by pressing F7 toggle Key.

- For 3D pictures, set the viewer's Right Eye Images to line up with the display's Odd Numbered Horizontal Lines.
- Other Possible Solutions

If the graphics signal is accurate but the image has shifted up or down a line, adjust the monitor's V. Position under Menu-Picture settings.

## 8. Q&A

✓ **What operating system(OS) is required to play 3D games in Stereoscopic 3D?**

Drivers from DDD or IZ3D can be used in any operating system to play 3D games in stereoscopic 3D.

✓ **What resolution is required to watch stereoscopic movie files?**

When viewing movie files, the resolution must be set to the maximum resolution of the monitor. This monitor supports Full HD, and the resolution should be set to 1920x1080 before watching. If the resolution is not set to 1920x1080, the movie file can be played but cannot be seen as stereoscopic 3D.

✓ **When playing the movie file, the display is not stereoscopic. What should I do?**

This may happen when the left and right images are swapped. Press the keyboard's F7 key to change the left and right images to enable stereoscopic 3D.

✓ **What is required to enjoy stereoscopic 3D games/movies?**

To play 3D games in stereoscopic 3D using AMD/ Nvidia graphic cards, a stereoscopic 3D driver must be installed. Stereoscopic 3D supporting drivers are provided by DDD and iZ3D. (For more details, please visit their respective homepages below). Stereoscopic 3D movie files can be played through the 'Stereoscopic Player' which does not require a stereoscopic 3D driver.

DDD homepage: [www.ddd.com](http://www.ddd.com) / iZ3D homepage: [www.iz3d.com](http://www.iz3d.com)

## 8. Q&A

✓ **White light is coming from the corner of the monitor (light escaping effect). Is there a problem with the monitor?**

A 3D glass filter is installed in front of the LCD panel for displaying stereoscopic 3D. This 3D filter is attached between the LCD panel and its steel cover. It's natural for this effect to appear in the corners, and the monitor is safe to use .

✓ **How many pairs of 3D glasses are included?**

One pair of 3D glasses and one pair of clip-on glasses are included for a total of two.

✓ **The LCD display or LED will not turn on.**

First, check to see if the monitor's power and adapter are connected. Disable the power saving mode.

✓ **The display is not clear (flicker, display interference, noises etc. are displayed).**

Check the VGA cables and display frequency by adjusting the Clock and Phase. The Frequency must be set 60Hz.

✓ **The display is blurry.**

Adjust the display frequency(60Hz) or eliminate outside signals.

✓ **The display is too dark or bright.**

Adjust the Brightness and/or Contrast.



Thank You