

# Eye3D User Manual

Copyright ©1999 i-Art Corporation. All rights reserved. Eye3D is a trademark of i-Art Corporation. All other brand and product names are registered trademarks or trademarks of their respective owners.

Disclaimer: i-Art Corporation reserves the right to make changes to this document and to the product specification without notice. While every effort is made to ensure that the information contained in this document is accurate and reliable, i-Art Corporation assumes no responsibility for any errors, omissions or changes. No reproduction of this document is allowed without the written permission of i-Art Corporation.

Table of Contents

<b>Package Contents.....</b>	<b>2</b>
<b>Minimum System Requirements.....</b>	<b>3</b>
<b>General Information.....</b>	<b>4</b>
3.1 Basic Knowledge of Stereoscopic Images.....	4
3.2 Viewing Stereoscopic Images.....	5
3.3 Introduction to Eye3D.....	6
<b>Installation.....</b>	<b>11</b>
4.1 Hardware Setup.....	12
4.2 Viewing Stereoscopic Images.....	13
A. Using Line Blanker to View Stereoscopic Images.....	13
B. Using 3DWin to View Stereoscopic Images.....	13
4.3 Usage of LC Shutter glasses.....	14
<b>How to Use.....</b>	<b>15</b>
5.1 The Infrared Emitter.....	15
5.2 LC Shutter Glasses.....	16
5.3 VGA Dongle with Cable.....	16
5.4 Eye3D Activator.....	16
A. Installation and How to Use.....	16
B. Uninstall Program.....	17
C. Note.....	17
5.5 3DWin.....	17
<b>Precaution.....</b>	<b>18</b>
<b>Q &amp; A.....</b>	<b>20</b>
<b>Medical Warning.....</b>	<b>22</b>
<b>More Information.....</b>	<b>22</b>

# *1*

---

## Package Contents

The following items are in the Eye3D package:

- (1) One pair of wireless LC shutter glasses
- (2) One infrared emitter unit
- (3) One VGA dongle with cable
- (4) One power adapter for the emitter
- (5) One Alkaline battery (23A/12V) for the LC shutter glasses
- (6) One i-Art 3DShowcase CD

If you find one or more items are missing or broken, please contact your retailer or i-Art Corporation.

# 2

---

## Minimum System Requirements

In order to make this product work properly with your computer and get the best performance, the minimum system requirements are recommended as follows.

- (1) CPU Pentium 90MHz or 100% compatible
- (2) 32MB RAM
- (3) Windows 95/98
- (4) CD-ROM driver
- (5) Multi-scan color monitor with 120Hz refresh rate
- (6) Compatible VGA card with at least 16-bit color depth

## General Information

### 3.1 Basic Knowledge of Stereoscopic Images

Before using Eye3D, it is time to understand the basic principle on how we can obtain stereoscopic vision with LC shutter glasses. Via the retinas of our eyes, our brain receives images from the real world and generates stereoscopic depth perception according to differences between the images from the right and left eyes. If we want to create real stereo vision with a computer, how can we use one monitor to generate both left-eye and right-eye images to compose a single stereoscopic image? There is a cost-effective solution to this problem. The eyes can be presented with stereo images by rapidly alternating the display of left-eye and right-eye images while alternately masking the right and left eye using a synchronous shutter viewer such as LC shutter glasses.

Using this basic principle, we get stereoscopic perception of left-eye and right-eye images. Using current computer and video monitor technology, the alternating display of left and right images is achieved by interlacing them on even and odd lines of a display operating in interlaced mode. With this mode, only half the display lines are used for each eye-specific image, so applications designed for shutter glasses must follow some special procedure for arranging those lines in video memory.

When generating stereoscopic pictures, the odd lines of the left-eye image are replaced with the odd lines of right-eye image. The following diagram shows how video memory is organized for stereoscopic images in Half Height mode.

Row 0	Left Image Line 0
Row 1	Right Image Line 1
Row 2	Left Image Line 2
Row 3	Right Image Line 3
Row 4	Left Image Line 4
Row 5	Right Image Line 5
Row 6	Left Image Line 6
Row 7	Right Image Line 7
...	...
...	...
Row N	Left Image Line N
Row N+1	Right Image Line N+1

### 3.2 Viewing Stereoscopic Images

There are various applications used with LC shutter glasses. The following four modes are most popular:

- (1) Interlacing
- (2) Page-Flipping
- (3) Line-Blanking
- (4) Sync-Doubling

The following chart demonstrates the advantages and drawbacks of these four modes.

Items	Modes	Interlacing	Page-Flipping	Line-Blanking	Sync-Doubling
Control Method		Software (such as using 3DWin to make a VGA card produce interlaced display)	Software/ Hardware(internal)	Hardware (external )	Hardware (external )
Limitation		Restricted to different VGA cards (some VGA cards do not support interlaced mode)	Limited by the memory of a VGA card	No (adaptable to all VGA cards)	No (adaptable to all VGA cards)
Flicker		No (If using a VGA card supported by 3DWin)	Sometimes (It depends. Using software to control might flicker.)  No (using hardware won't flicker)	No (If a VGA card can support 120Hz or higher refresh rate, the flicker won't come out.)	No
Stereoscopic Image Format		Line Sequential; Interleaved	Field Sequential; Even/Odd Memory Banks	Line Sequential; Interleaved	Top/Bottom; Split-Screen

### 3.3 Introduction to Eye3D

Eye3D is the latest product developed by i-Art Corporation. It provides four popular stereo decoding modes to allow users to view stereoscopic images easily. The four functions are (1) interlacing (2) page-flipping (3) line-blanking and (4) sync-doubling. Users can utilize each special function to view stereoscopic images according to different image formats. By default, Eye3D's infrared emitter is in interlacing and page-flipping modes (the switch of **Line Blanker** on the emitter is **OFF**). The PC is usually in non-interlaced mode, so users need to turn the PC to interlaced mode to view interleaved images. To do so, Eye3D provides users with **3DWin** (3DWin is located on i-Art 3DShowcase CD) to convert the PC's 2D non-interlaced display mode to 3D interlaced display mode. While in 3D mode, users can view [Virtual Gallery Demo] (located on i-Art 3DShowcase CD) or all kinds of interleaved format images. If users cannot identify which function should be used to view stereo vision, just turn **OFF** the **Line Blanker** switch to activate interlacing and page-flipping mode. If the image format is top/bottom (or above/below) split image, users can use **Eye3D Activator** (located on i-Art 3DShowcase CD) to activate sync-doubling function. While the sync-doubling function is working, the LED of the emitter should be AMBER.

In addition, while using the sync-doubling function (e.g. playing stereoscopic PC games), please do not turn **ON** the **Line Blanker switch**. When the **Line Blanker** switch is **OFF**, Eye3D will automatically detect interlacing, page-flipping or sync-doubling mode and cooperate with the LC shutter glasses. The resolution and refresh rates of Eye3D are shown in the following table in sync-doubling mode.

<b>Resolution Refresh Rate</b>	640 x 480	800 x 600	1024 x 768
60Hz	V	V	V
70Hz	V	V	V
75Hz	V	V	V
80Hz	V	V	

Please note that 3DWin cannot support all kinds of VGA cards. To view the interleaved images, users can turn **ON** the **Line Blanker** switch to activate the line blanking function. If the LC shutter glasses flicker, please set the refresh rate to at least 120Hz to diminish the flicker. Please check out the following support list for known 3DWin limitations

ATI Series

<b>Resolution Colors</b>	<b>640x480</b>	<b>800x600</b>	<b>1024x768</b>
<i>ATI Mach64</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓
<i>ATI264VT2/GT2</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓
<i>ATI 3D Rage</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓

S3 Series

<b>Resolution Colors</b>	<b>640x480</b>	<b>800x600</b>	<b>1024x768</b>
<i>S3 Trio32/64, S3 765 Trio64V+, S3 775 Trio64V2</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓
<i>S3 325 ViRGE, S3 375 ViRGE/DX, S3 357 ViRGE/GX2 AGP 1x</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓
<i>S3 86C864/866/868/964/968/928PCI</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓



### Cirrus Logic Series

<i>Resolution Colors</i>	<b>640x480</b>	<b>800x600</b>	<b>1024x768</b>
<i>CL-GD5422/5424/5426/5428/5430/5434</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	
<b>16M</b>	✓	✓	
<i>CL-GD5440</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓
<i>CL-GD5446</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓		
<i>CL-GD5462/5464/546x</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓

### Matrox Series

<i>Resolution Colors</i>	<b>640x480</b>	<b>800x600</b>	<b>1024x768</b>
<i>MGA1064 PCI/AGP</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓
<i>MGA2064 PCI/AGP</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓
<i>MGA2164 PCI/AGP</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓

Trident Series

<i>Resolution Colors</i>	<i>640x480</i>	<i>800x600</i>	<i>1024x768</i>
<i>Trident 8800/8900</i>			
<i>256</i>	✓	✓	✓
<i>32K/64K</i>	✓	✓	
<i>16M</i>	✓		
<i>Trident 9000/9420/9440</i>			
<i>256</i>	✓	✓	✓
<i>32K/64K</i>	✓	✓	
<i>16M</i>	✓	✓	
<i>Trident 938x/9660/9680/9685/968x</i>			
<i>256</i>	✓	✓	✓
<i>32K/64K</i>	✓	✓	✓
<i>16M</i>	✓	✓	✓
<i>Trident 9750 AGP 1x/9850 AGP 2x</i>			
<i>256</i>	✓	✓	✓
<i>32K/64K</i>	✓	✓	✓
<i>16M</i>	✓	✓	

Tseng Labs Series

<i>Resolution Colors</i>	<i>640x480</i>	<i>800x600</i>	<i>1024x768</i>
<i>ET4000/W32/W32I/W32P</i>			
<i>256</i>	✓	✓	✓
<i>32K/64K</i>	✓	✓	✓
<i>16M</i>	✓	✓	
<i>ET6000</i>			
<i>256</i>	✓	✓	✓
<i>32K/64K</i>	✓	✓	✓
<i>16M</i>	✓	✓	✓

Intel

<i>Resolution Colors</i>	<i>640x480</i>	<i>800x600</i>	<i>1024x768</i>
<i>i740</i>			
<i>256</i>	✓	✓	✓
<i>32K/64K</i>	✓	✓	✓
<i>16M</i>	✓	✓	✓

SiS Series

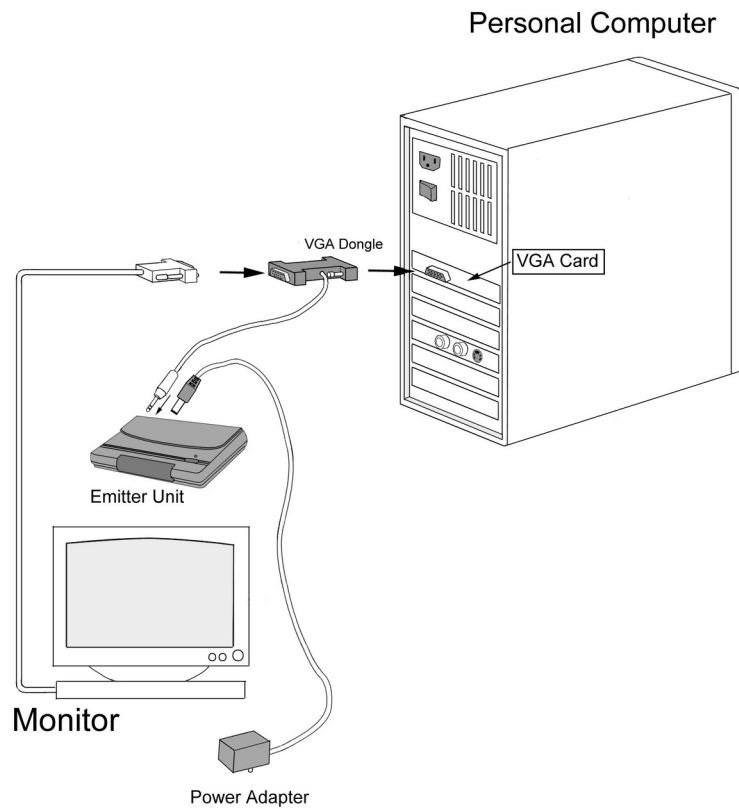
<b>Resolution Colors</b>	<b>640x480</b>	<b>800x600</b>	<b>1024x768</b>
<i>SiS 6205/6215/6225</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓
<i>SiS 6326AGP</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓

Nvidia Series

<b>Resolution Colors</b>	<b>640x480</b>	<b>800x600</b>	<b>1024x768</b>
<i>RIVA128</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓
<i>RIVA128/ZX</i>			
<b>256</b>	✓	✓	✓
<b>32K/64K</b>	✓	✓	✓
<b>16M</b>	✓	✓	✓

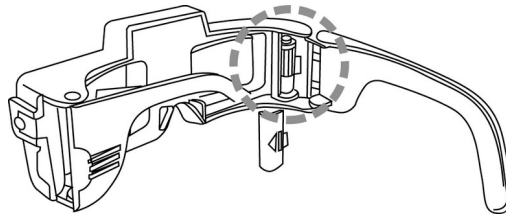
## Installation

Before installing, make sure you are using **Windows 95/98**. To setup our product, please turn off your computer. Follow the instructions step by step.

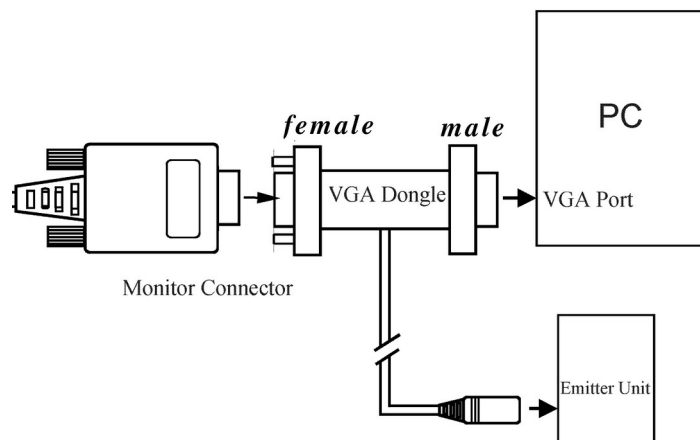


## 4.1 Hardware Setup

- (1) Place the Alkaline battery (23A/12V) into the LC shutter glasses. **(As shown below)**



- (2) Place the emitter on the top of your color monitor. Connect the power adapter to the emitter and plug it into the surge protector. Set the **LINE BLANKER** switch to **OFF**.
- (3) Plug the VGA dongle (15 PIN male) into your VGA port, and attach the monitor connector to the VGA dongle (15 PIN female). (As shown below)



- (4) Plug the VGA dongle's MINI DIN-8 into the emitter.
- (5) Turn on your computer. The LED of the emitter should be RED.

## 4.2 Viewing Stereoscopic Images

### A. Using Line Blanker to View Stereoscopic Images

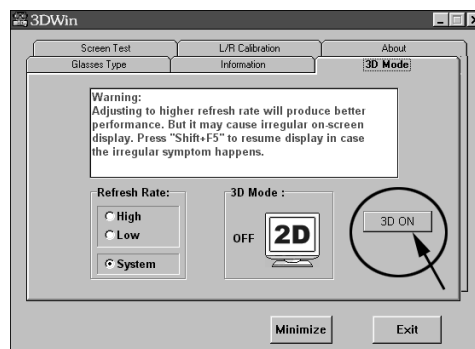
After installing your Eye3D hardware, you can use the line-blanking function to view the interleaved images as long as your VGA card can support a **120 Hz** refresh rate. Simple steps to get Eye3D line-blanking features working:

- (1) Place your i-Art 3DShowcase CD in your CD-ROM drive.
- (2) Double-click on your CD-ROM drive and select the [Virtual Gallery Demo] folder and run [VG.exe].
- (3) Turn **ON** the emitter's Line Blanker switch (the LED of the emitter should be GREEN). Put on your LC shutter glasses and activate them to view stereoscopic images.

### B. Using 3DWin to View Stereoscopic Images

After installing your Eye3D hardware, you can use the interlacing function to view stereoscopic images. Follow these simple steps to get Eye3D interlacing features working:

- (1) Place your i-Art 3DShowcase CD in your CD-ROM drive.
- (2) Double-click your CD-ROM drive and select the [3DWin English] folder to run [Setup.exe].
- (3) After successful installation, choose the [3D Mode] tag from 3DWin and set 3D on. (As shown below)

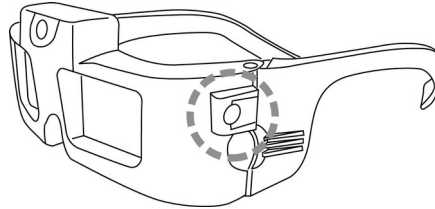


- (4) Click your CD-ROM drive and select the [Virtual Gallery Demo] folder and run VG.exe.

**Note:** When 3DWin does not work with your VGA card, you can still turn ON the emitter's Line Blanker switch and run [VG.exe] in the [Virtual Gallery Demo] directory. However if the refresh rate is less than 120Hz in your Display Properties settings, the LC shutter glasses will flicker.

### 4.3 Usage of LC Shutter glasses

While entering stereo mode, please put on our Eye3D LC shutter glasses. Press its small **Push Button** (**as shown below**) to activate and adjust the stereoscopic images. This small Push Button is used to (1) turn power on/off (2) reverse left/right image.



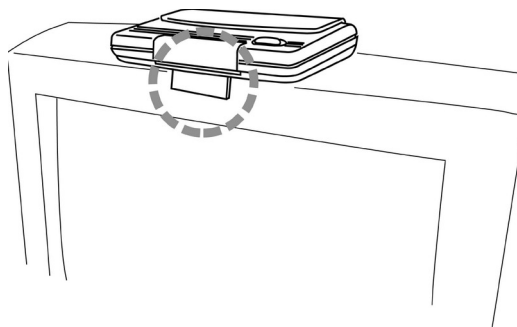
**Note:** Press the Push Button to turn on the LC shutter glasses. Press the Push Button more than 3 seconds to turn off the power of the LC shutter glasses. If no infrared signal is received within 10 seconds, the LC shutter glasses will automatically shut off. When you don't want to use the glasses any more, just store the eyeglasses into a safe place (i.e. inside a drawer) without any infrared signal, or place them **facedown** on the desktop. It is sometimes possible to see reversed left/right images. This is called the **Pseudo Stereo Effect**. It will make your eyes uncomfortable. In such a case, just press the Push Button to revert to the proper stereoscopic images.

---

## How to Use

### 5.1 The Infrared Emitter

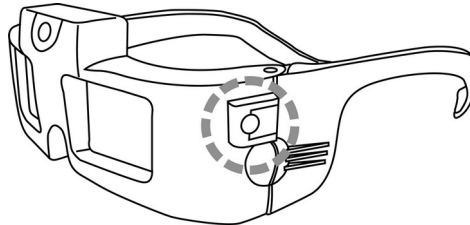
- (1) While using, please ensure the power adapter is plugged in. The LED of the emitter is on. While the Line Blanker switch is turned ON, the LED of the emitter is GREEN, which means the line-blanking function is on. While the Line Blanker switch is turned OFF, the LED of the emitter is RED, which means it is in the interlacing and page-flipping mode. While the Line Blanker switch is turned OFF, the LED of the emitter is AMBER, which means the sync-doubling function is working.
- (2) This infrared emitter will automatically turn off. When your PC is off or there is no VGA signal for around 10 seconds (such as the monitor is in sleeping mode), the power of emitter will automatically shut off. In this case, the LED of the emitter is off. Turn on the PC or move your mouse, the emitter LED will be on again.
- (3) The emitter is designed for wide angle (**170 degrees in one meter**) operating. Its effective emitting distance is around **7 meters** with **30 degrees** of effective angle. Any pair of i-Art's Eye3D wireless LC shutter glasses within the effective emitting range will work well.
- (4) Please don't put anything between the emitter and LC shutter glasses. We strongly recommend you place the emitter on the top of your monitor to get the best working view.
- (5) If you place this emitter on the slope of a surface, e.g. top of the monitor, please put down the **anti-slipping stopper** underneath the emitter and place the emitter on the edge of slope to prevent it from slipping down. (**As shown below**)





## 5.2 LC Shutter Glasses

(1) This pair of eyeglasses is a very sensitive infrared receiver which acts as an LC Shutter. Before using, you have to place the **23A/12V** alkaline battery into the glasses. Press its small **Push Button (as shown below)** to turn on the power. In the meantime, the left and right glasses will flash for five times to tell you that battery is well installed and powerful enough. If the emitter has already been turned on and you are in its emitting area, then the glasses will flash only twice to indicate they're ready for use.



(2) Press the Push Button to turn on the LC shutter glasses. Press the Push Button more than 3 seconds to turn off the power of the LC shutter glasses. If there is no infrared signal received in around 10 seconds, the LC shutter glasses will automatically shut off. When you don't use glasses any more, just store the eyeglasses in a safe place (i.e. inside a drawer) without any infrared signal, or place it **facedown** on the desktop.

(3) It is sometimes possible to see the incorrectly reversed left/right images. This is called the **Pseudo Stereo Effect**. It will make your eyes uncomfortable. In such a case, just press the Push Button to perceive the proper stereoscopic images.

## 5.3 VGA Dongle with Cable

Our VGA dongle needs electricity to process the VGA signals. Whenever you connect it to your monitor and your VGA card, make sure the cable is connected with the emitter and the power of emitter is on.

## 5.4 Eye3D Activator

You can use [Eye3D Activator] to set your hotkeys to activate the sync-doubling function and to toggle between [Sync-doubling] and [Normal] modes.

### A. Installation and How to Use

- (1) Eye3D Activator is for Windows 9x and NT. Before installing, we strongly recommend you close all other applications.
- (2) Run Setup.exe in the Eye3D Activator folder.
- (3) After successfully installing, click [Control Panel] in the [Settings].
- (4) From the Control Panel, double click on the Monitor Icon.
- (5) Select the [Eye3D Activator] tab to set the hotkeys for toggling between [Sync-Doubling] and [Normal] mode.
- (6) After installation, Eye3D Activator is added to the [Start] bar. Upon restarting Windows, Eye3D Activator will be automatically executed.

(7) You can only change your hotkeys in the Eye3D Activator within the Display Properties Window.  
Note: If Eye3D Activator can't be used after successful installation, please restart your computer.  
Make sure you've stopped running all applications. Directly choose the Eye3D Activator and run from your [Start Bar].

#### **B. Uninstall Program**

- (1) Stop running Eye3D Activator.
- (2) Eye3D Activator can be removed from Windows 9x and NT 4.0 by clicking the Add/Remove Programs icon in the Windows 9x or NT 4.0 Control Panel. Select Eye3D Activator and press the Remove button.
- (3) Or select [Uninstall Eye3D Activator] to run it.

#### **C. Note**

When you are using Voodoo2 to play PC games, Eye3D Activator will not work. After stopping running games, you can use Eye3D Activator to change modes back and forth.

### **5.5 3DWin**

Please refer to **3DWin User Manual** for details.

# 6

---

## Precaution

- (1) To activate the sync-doubling function (e.g. playing stereoscopic PC games), please ensure the **Line Blanker** switch on the emitter is **OFF**. If the LED of the emitter is AMBER, it means the sync-doubling function works well.
- (2) Whenever you connect the VGA dongle to your monitor and your VGA card, make sure the cable is connected with the emitter and the power of emitter turned on.
- (3) When 3DWin does not work with your VGA card, you can still turn ON the Line Blanker switch on the emitter and run [VG.exe] in the [Virtual Gallery Demo] directory. Please set your refresh rate to 120Hz in your Display Properties sheet in order to avoid flickering from the LC shutter glasses.
- (4) After viewing stereoscopic images or playing stereoscopic PC games, if the 3D mode refuses to turn off, please use the hotkeys in Eye3D Activator to back to the desktop. However when you are using Voodoo2 to play PC games, Eye3D Activator will not work. After stopping running games, you can use Eye3D Activator to change modes back and forth.
- (5) When you don't use the LC shutter glasses any more, just store the eyeglasses in a safe place (i.e. inside a drawer) without any infrared signal, or place them **facedown** on the desktop. If you won't use the LC shutter glasses for a long time, please remember to remove the battery from the glasses to prevent the circuitry from being damaged by unexpected current leakage and possible caustic chemicals produced by the battery.
- (6) Our LC shutter glasses can work at a very wide range of refresh rates. If your software or color monitor cannot support the recommended at least **120Hz**, the LC shutter glasses will flicker. And your eyes will be very uncomfortable. In such a situation, please turn down your monitor's brightness and room light to reduce the discomfort.
- (7) Please always keep the **Infrared Sensor**, located at the upper center of LC shutter glasses, clean. If needed, please wipe it with a soft cloth to get good performance.

- (8) The pair of LC shutter glasses is a high-performance electro-optical precision device. When not in use, please store it in a safe place to protect it from direct sunlight, high humidity and dust. The LCD glasses are fragile. They will crack if dropped or placed under heavy objects. So, they must be treated with care. When cleaning, don't expose the LC shutter glasses to moisture because any possible liquid will damage the circuitry inside. In addition, use a soft cloth for lens to clean up dust, smudges or grease on the glasses, otherwise the LCD lenses will be easily scratched.
- (9) The **23A/12V** Alkaline battery used on the LC shutter glasses can be replaced by **U23, 23, 23L, 23M, EL12, VR22, ...** etc. It is very easy to buy because it is widely used on the Car and Security Alarms, Electronic Transmitter, and Remote Control Devices.

---

## Q & A

### ***(1) When the LC shutter glasses don't work properly, what shall I do?***

First of all, please make sure to check all of the following:

- A. Your computer, the emitter and the VGA dongle are connected to each other correctly. And, the cable of the VGA dongle is connected to the emitter.
- B. The power of the emitter is "ON".
- C. The 23A/12V alkaline battery is properly placed into the LC shutter glasses.
- D. The Infrared Sensor, located at the upper center of eyeglasses, is clean.
- E. Set the 3D Mode "ON" while using the 3DWin.
- F. Press the Push Button on the eyeglasses. And, check the stereo vision again. If it still doesn't work, please replace it with a fresh 23A/12V alkaline battery. Otherwise, the eyeglasses need to be sent back for repair.

### ***(2) When I set the 3D Mode "ON", there is nothing shown on the monitor screen. Or, there are two squeezed displays, upper one and lower one on the screen. What shall I do?***

There are two ways to solve this problem.

- A. Upgrade your current monitor to a new one with **higher refresh rate**, i.e. **at least 120Hz**.
- B. Please set up your **refresh rate** within the range of **40Hz~50Hz**, or **87Hz**, or just "Interlace", by using the Refresh-Rate Setup Utility in **Windows' Console**, please refer to your **VGA Card User's Manual** for details, which is normally supported by the VGA maker. In addition, you can also set the lower refresh rate by using the **3DWin**, please refer to **VR Show! User's Manual** for details.

### ***(3) When set the 3D Mode "ON", but the monitor still doesn't display stereovision images. What shall I do?***

There are two ways to solve this symptom.

- A. Please replace the VGA card with one that is supported by **3DWin**.
- B. Turn ON the Line Blanker switch on the emitter. To avoid having the LC shutter glasses to flicker, please set the refresh rate at least 120Hz.

### ***(4) How can I use the LC shutter glasses for other Windows applications, such as viewing stereoscopic images from a web site?***

First you have to know which image format you are going to view. If it is top/bottom split format, you can use Eye3D Activator to enable the sync-doubling function. If it is interleaved format, you can either use 3DWin or turn on the Line Blanker switch on the emitter to view it.

**(5) *When do I know the alkaline battery inside the LC shutter glasses needs to be replaced?***

When viewing a stereoscopic picture, there are left and right images overlapping each other (i.e. **ghosting**, image doubling), and such a phenomenon didn't happen on the same picture before. Or, when you press the Push Button on the eyeglasses, it should **flash** for **five times** to indicate a passed **Power-Diagnosis** while there is no infrared signal being received. If not, that means the battery is not powerful enough to drive the LC shutter glasses. It is time to replace it with a fresh battery.

**(6) *Under a lower refresh rate working environment, how do I reduce the flicker in the LC shutter glasses?***

There are two effective solutions to reduce the flicker:

- A. Diminish or even turn off the room light, especially the fluorescent lamp around your computer.
- B. Turn down your monitor's brightness until you feel better.

**(7) *How can I turn off the LC shutter glasses?***

Press the Push Button more than 3 seconds to turn off the power to the LC shutter glasses. Or you can store our LC shutter glasses in a safe place (i.e. inside a drawer) without any infrared signal or place it **facedown** on the desktop. **Note: When not in use, please don't place the LC shutter glasses face-up on the desktop since there are significant infrared signals from other light sources like fluorescent lamps, PL lamps, or even sunlight. These external light sources will probably cause the LC shutter glasses to fall incompletely into sleeping mode and will continuously consume the battery power.**

# 8

---

## Medical Warning

Please don't continuously use Eye3D for a long time without any break to relax your eyes. The artificial stereoscopic images can possibly produce symptoms like headache, dizziness, and nausea for sensitive users. If such symptoms occur when you are using the glasses, you have to stop using Eye3D immediately and wait for the discomfort to go away before using again.

# 9

---

## More Information

Please visit our web site (<http://www.iart3d.com>) to obtain updated information about Eye3D. You can also do on-line shopping on our web. From our web site, you can easily buy another pair of the LC shutter glasses and/or other 3D-image printing and authoring tool.