

EasyGO 3-D Player v.1.9.0

Overview

EasyGO 3-D Player is a 3-D movie player designed to work with the most important Internet browsers (Explorer, Google Chrome, Firefox, Opera, Safari) and based on the Adobe Flash technology, the same that is usually adopted to view traditional 2D videos on the Internet.

EasyGO 3-D Player, starting from a 3-D **cross side-by-side** (Fig. 1) Flash video file (.flv o .f4v format), allows a 3-D movie to be viewed with **passive 3-D glasses (anaglyph o circular polarized*)** or **freeviewing** techniques (specific training required).

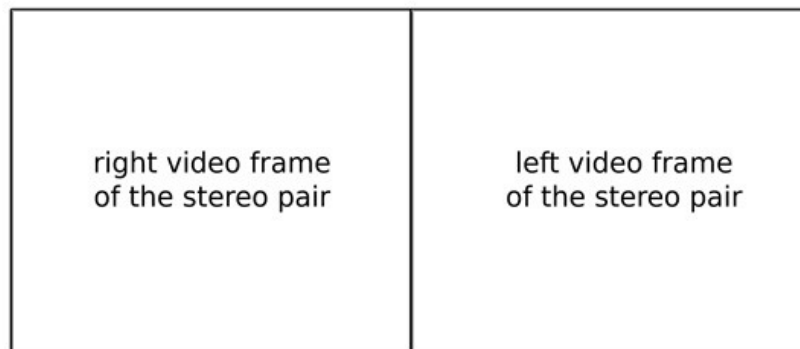


Fig. 1: cross side-by-side format establishes that the left and right frames of the 3-D movie are to lay next to each other and crossed (left frame on the right and viceversa).

* 3-D circular polarized glasses can be used only with intended circular polarized 3-D monitors

Usually, on the Internet, 3-D movies have been published in anaglyph format and compressed via **codec** algorithms which are inclined, in order to obtain a significative reduction of the final size, to uniform homologous pixels colors thus spoiling the foundation for a correct anaglyph implementation: the separation of the two images of the stereo pair via two complementary colors.

The result, most of the times, is simply a poor experience with or without the 3-D glasses (fig. 2).

3d anaglyph stereo film



Fig. 2: This is the result (<http://www.youtube.com/watch?v=y0k4RzSeBbE>) of what is usually found in Internet for a well shot but badly encoded red/cyan anaglyph. 3-D Encoding right after post-production and then using a general 2D player is usually a bad idea; a better one is to rely on a dedicated 3-D player which can encode 3-D videos on-the-fly obtaining a significant reduction of artifacts.

EasyGO 3-D Player on the other hand, having at its disposal the two movies of the stereo pair, can compose the two videos on-the-fly (in real time) obtaining a pure anaglyph in which the two reference colors are not “ polluted ” by the compression (fig. 3).

An advantage, apart from better quality, of this technique is to let the user choose the type of 3-D glasses depending on what he has available including 3-D encoding other than anaglyphs like the **interleaved rows** that well match the cheap **3-D circular polarized monitors** available on the market. And what if he doesn't own 3-D glasses? In the meanwhile he can enjoy the show in 2D simply disabling the 3-D encoding.

EasyGO 3-D Player allows also the modification in real time of the **parallax** which enables the final user to choose where to place the scene in the space (Z-axis).



Fig. 3: a screen view of a 3-D movie encoded in red/cyan anaglyph on-the-fly (frame by frame in real time) by EasyGO 3-D Player

EasyGo 3-D Player, with its engine based on Adobe Flash technology, doesn't require any kind of additional software installation and weights like any other traditional Internet video player (less than 100 KB)

For short 3-D movies (less than 10 minutes) it is also possible to **embed the videos inside an executable** file to be played, without any additional software installation, in a Windows PC (details of the service to be asked to ANAG 3D Studio).

System requirements for the final user

Minimal system requirements for showing a 3-D movie via the Internet with EasyGo 3-D Player are:

- Dual Core PC
- Internet Browser: Explorer, Google Chrome, Firefox, Opera, Safari
- Adobe Flash version 9.0.115 or greater
- Fast Internet connection (ADSL or greater)

Activation Domain

The **EASY3-D_v190.swf** file is encrypted and configured to play exclusively 3-D movies located on the licensed domain. It's not allowed to exploit an EasyGo 3-D Player licensed for a specific domain to publish 3-D movies located on other not-licensed domains.

Location of the 3-D video files

Your 3-D movies surely worth. That's why before sending you the files related to EasyGo 3-D Player we ask you for the internal folder (a sub-directory of the one in which the **EASY3D190.swf** file will be placed) in which you'll locate your 3-D videos; this, in order to hide the real path, allowing access via the player but not directly from outside.

That directory is not requested and it is not specified if you prefer to rely on **ANAG 3D Studio** fast and safe **hosting services** for your 3-D video files.

Installation

To install and make your first tests of publishing your 3-D videos over the Internet via EasyGo 3-D Player you need to follow these steps:

1. Copy **EASY3-D_v190.swf**, **expressInstall.swf**, **swfobject.js** and **EasyGO.html** files in a directory of the web server of the licensed domain
2. Create inside that directory the “ private ” folder specified in the previous paragraph which will host your 3-D video files and copy the 3-D **cross.flv** test video file
3. Connect to the **EasyGO.html** of your web server and verify the proper working of the player

To create your own web page to show your 3-D movies we suggest you to take **EasyGO.html** as a reference, modify and suit it according to your needs and then invoke it passing the configuration parameters (have a look at **Parameters for the configuration of the player** paragraph for details) separated by the **&** character; for example:

```
EasyGO.html?lange=EN&coding=RC&parallax=5&cross_file=cr_video.flv&buf_percent=6
```

Obviously it is possible also to embed the player directly into the web page using the javascript **swfobject.js** file (details can be found at: <http://code.google.com/p/swfobject/>) and the *flashvars* parameters. This file is included in the installation package for your convenience; working in conjunction with the **expressInstall.swf** file it helps the final user to simply and automatically install a newer release of the Flash player if needed.

If you rely on our hosting services for your 3-D videos, step 2 can be skipped since your EasyGO 3-D Player version already contains the “ private ” path to our servers.

Parameter for the configuration of the player

EasyGO 3-D Player can be configured at the start with several parameters passed via the command line:

Parameter Name	Allowable Value	Default Value	Description
cross_file	String with no spaces	cross.flv	Name of the cross 3-D video file including the suffix (.flv, .f4v) located inside the “ private ” folder of your 3-D videos
parallax	Signed whole number (ranging from -20 to 20)	0	Arrange the viewing parallax shifting in one direction or another the frames of the stereo pair. Lower values bring objects forward; bigger values push the objects backward
buf_percent	From 0 to 100	5	Percentage of the 3-D movie to be loaded (buffered) before start playing
lange	ITA (italian) EN (english)	ITA	Language to be adopted for the descriptions
coding	<p>RC (red/cyan)</p> <p>RC_OPT (optimized red/cyan)</p> <p>VM (green/magenta)</p> <p>RB (red/blu)</p> <p>GB (yellow/blu)</p> <p>RV (red/green)</p> <p>mono (2D visualization)</p>	RC	<p>3-D encoding to adopt. RC, RC_OPT, VM, RB, GB and RV are anaglyphs; mono traditional 2D (no coding) for those who haven't 3-D glasses.</p> <p>INT_0 e INT_1 enable 3-D coding for circular polarized monitor (Zalman, Hyundai and other). The difference between the two is related only to the orientation of the two video files (please, have a look at “ <i>Expert Mode</i>” for details).</p> <p>CROSS and PAR sono classic 3-D cosing for freeviewing; CROSS allows for crossed vision (left video on the right and viceversa), PAR allows parallel freeviewing (left video on the left and right video on the right).</p>

	INT_0 (interleaved)		
	INT_1 (interleaved with inversion of the polarization)		
	CROSS		
	PAR		

Main Bar (EasyGO Mode)

Main Bar automatically shows up when the mouse icon passes over the area occupied by the 3-D video.

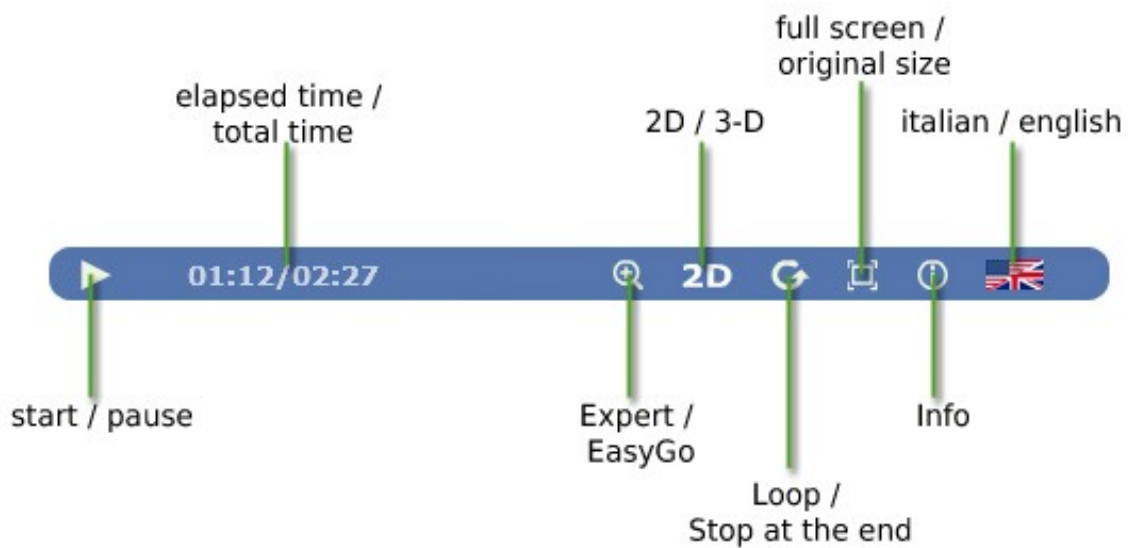


Fig. 4: Main Bar in "EasyGO" mode; some buttons are analogous to those in traditional video players

Main Bar doesn't show up when the player is in **Full Screen** or during video **buffering** operations.

A click on the **Expert** button opens up the **Parallax** and **3-D Coding** panels reserved to expert users (details in the ***Expert Mode*** paragraph). A further click of the button gets the player back in EasyGO Mode hiding the Expert Mode panels.

2D/3-D button allows to pass from 3-D to the traditional 2D viewing which doesn't need 3-D glasses; a further click of the button restore the previous 3-D adopted parameters (3-D encoding and parallax).

Full Screen button brings the player in full screen mode for all 3-D encoding formats exception made for the interleaved ones which maximum magnification is equal to 800x600 pixels (stage size) . Further details are reported in ***Full Screen Mode*** paragraph .

Clicking on the **italian/english button** it is possible to switch the language of the descriptions of the player.

Progress Bar

Once the 3-D video has been started, the **Progress Bar** shows up over the Main Bar allowing, with the shift of its scrubber, to play the 3-D video from a preferred point in time. The cursor is allowed to be shifted in relation of the already downloaded video range only, which is pointed out by the green area of the bar; the remaining red area of the bar is related to the part of the video to be still downloaded.

Expert Mode

Panels coming out in **Expert Mode** allow to modify the **parallax**, choose the **3-D encoding** to be applied and convert the videos in **black&white** if needed (a typical situation being the presence of large red objects in a red/cyan anaglyph).



Fig. 5: Panels in Expert Mode allow the setting of some advanced parameters

Changing the parallax value modifies the placement over the Z-axis (related to depth) of the elements of the scene: in decreasing parallax all objects are proportionally brought forward towards the viewer, in increasing the parallax they are pushed backward. It is the perfect tool also to mitigate eventual **ghosts** (when images are not perfectly separated at viewer's eyes because of the excessive separation) or to resolve **stereo window violations**.

3-D Encoding decides the type of 3-D glasses that are going to be used: Red/cyan, Green/Magenta, Yellow/Blu, Red/Green are classic colors for anaglyph glasses, those with filters of two colors.

For the Red/Cyan encoding, two versions are supplied; in the second one (**RC_OPT** as the parameter, **Red*/Cyan** as the description in the panel), the red component is desaturated in order to limit the retinal rivalry caused by red-colored objects and that shows up like a sort of flicker. On the other hand, this type of encoding brings a lower fidelity of colors.

Parallel (LR) and **Cross (RL)** refer to freeviewing techniques that don't require the use of 3-D glasses.

Interleaved and **Interleaved+1** can be successfully selected with all kind of 3-D monitors which support a **circular polarization**. These kind of devices are supplied with a film able to impress a circular polarization to every single horizontal line of pixels. Odd rows are polarized clockwise and even rows are polarized counterclockwise or viceversa; the first rows are assigned the left image and the second ones the right image. The difference between the two modes depends simply by which rows are polarized in one direction and which in the other one; therefore, if a pseudo-stereo effect is noted (objects which should be front are in the back and viceversa), it is simply required to select the other mode in order to achieve the correct 3-D visualization.

Full Screen Mode

When entering full screen, **EasyGo 3-D Player** maximizes video sizes respecting proportions. For the interleaved encoding (**Interleaved**, **Interleaved+1**, those for 3-D monitors supporting circular polarization), maximum video size is related to Flash stage (800x600 pixels).

In full screen mode no operations are allowed exception made for starting to play the 3-D movie (in case the video was paused before entering full screen).

Full screen mode can be left by pressing **ESC** button of the keyboard (or **original size** button in the video is playing in interleaved 3-D encoding mode).

Addendum

Notes about the .f4v video format

The .f4v encoding is absolutely a good choice for converting your own 3-D video in the cross side-by-side format to be played by **EasyGo 3-D Player** since it allows a reduction of the size of the files and an increase in the quality even if at the expense of an increase request of CPU utilization. A couple of issues are to be considered when adopting this encoding format:

- **License:** the use of .f4v files, unlike .flv, could require the payment of a license; please, contact **MPEGLA** (<http://www.mpegla.com>) for the related details
- **Fast positioning inside the 3-D video to play:** unlike .flv files, it is not possible, while dragging the progress bar cursor, to view some related significative frames since these shows up only when releasing the cursor.

Requirements for the 3-D videos to be played

3-D videos to be played are to be supplied in cross side-by-side format (frames of the stereo pair coupled next to each other with the frame of the left video on the right of the stereo pair, see fig. 1); allowed encoding formats are .flv, .f4v.

Maximum final 3-D video resolution is **800x600 pixels**.