

Composition of HD Synchronizer System

- In order to transfer the data made by two cameras to a 3D data format, a time consuming and expensive editing process is usually required. Due to the high level of expertise required, such a production process constitutes a formidable obstacle for many production companies to switch easily to 3D content creation. By using our synchronizer system, it is possible to obtain and save uncompressed and compressed full HD image data (1080i/720p) without additional editing processes on a PC.
- By using a stereo controller (Stereo LANC) two cameras can be controlled simultaneously (e.g. functions such as start of recording, zoom-in, zoom-out, and auto focusing).
- Quality of 3D images can be confirmed through one of our Miracube 3D displays in real-time. The output of the HD-Synchronizer can also be conveniently recorded on a storage server in side-field or frame sequential format.

Signal Flow of the HD Synchronizer System

After the input signals made by the two HD cameras are converted to YCbCr data through an AD converter, color space change and synchronizing processes of the two channel data are conducted.

After the converting to 3D data through the HD Formatter:

- SMTPE-292MHD-SDD Serialization → recording on HD saving server
- DA Converting → Analog HD component output (YCbCr)
- Converting TMDS data → 3D HD Monitor (1920*1080)

Order of converting processes

- **A/D (Analog to Digital Converter)**
In order to make stereoscopic images, the images for left and right eyes are required. For that reason the input of the synchronizer consists of 2 channels. The AD converter transforms the input to a digital YCbCr signal, receiving HP Component Analog data.
- **Synchronization Module (Visual Synchronization Module)**
Of the two video signals that are digitally synchronized, the right eye images are synchronized based on the signals from the left eye images.
- **Formatter (3D Data Format Converting Module)**
The two synchronized left and right eye images are simultaneously converted to a format for stereoscopic 3D images. Here frame sequential and side-field formats are provided. The frame sequential format displays the images for the left eye on odd frames, whereas the images for the right eye go to even frames. The Side-field format compresses the input video data in parallel direction, the synchronized image data is shown on the screen in unchanged order.

HD Synchronizer

The stereoscopic camera system invented by Pavonine, Inc. has a 3D formatting process not by software, but by hardware, a fast and efficient 3D data format conversion is simultaneously made.

- Input Section: Receiving 3D data
 - Main Control Block: Controlling timing, input, output
 - 3D Formatting Block: Controlling 3D format converting of input data and SDRAM controller
 - SDRAM Controller: Controlling SDRAM for 3D formatter and flow of data
 - Output Section: Output data converted into 3D format from SDRAM
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- HD HDMI (Full HD Monitoring/Display Module)
It sends the recorded 3D video data to an HD monitor after converting it into an HDMI signal.
 - YPbPr (HD Component Output Module)
It sends the converted video data in 3D format as a YPbPr signal for output as analog HD component, after DA converting.
 - HD Analog To HD SDI
In order to support the sending of an HD signal format and SMTPE-292M (HD-SDI: Serial Digital Interface) which is the international broadcasting standard, 3D video data is converted through the processes of Serialization / converting to HD-SDI format / HD-SDI Driver. The HD-SDI signal of 1.485 Gbit/sec is recorded in real-time on an HD recording server. At this time it is possible to save without any loss of data and to compress the data in JPEG2000.

HD Synchronizer

HD Synchronizer System Key Composition

	Key	Explanation
View Finder	DUAL [2D]	When the 3D format is up & down, left images are up and right images are down.
	Left [2D]	Outputting left video images
	Right [2D]	Outputting right video images
	3D	Outputting 3D video images
Common	REV	When the data is in 2D, converted to 3D (UpDown & LeftRight)
	POWER	Power ON/OFF
	LED	When 2D, Green When 3D, Red (When pushing REV, Orange)