yellobrik®

CHD 1812
yelloGUI compatible

3Gbit HDMI® to SDI Converter + Frame Synchronizer

- Supports SD/HD/3G -SDI formats
- 3D support
- Integrated Frame Synchronizer
- Multi-format sync reference input - cross lock compatible
- 2 x SDI outputs with optional SDI fiber output
- HDMI embedded audio passed transparently
- 2 x external analog audio inputs
- Professional balanced analog audio inputs or unbalanced line level audio inputs
- Selectable AES channel for embedding external audio
- HDMI, reference and audio present LED indication
- yelloGUI compatible to access additional internal settings

Shown with Fiber SFP Option Installed

The CHD 1812 is a versatile and compact HDMI to SDI converter with integrated frame synchronizer. It is an ideal solution for any application which requires a fully synchronized SDI input from an external asynchronous HDMI source.

The flexible reference sync input will accept any analog video sync format including SD bi-level sync, black burst, colorbars and tri-level HD sync. The sync input is auto detecting and fully cross lock compatible. For example: An SDTV reference can be used to frequency lock an HD HDMI input. If no reference is present, the converter performs a standard asynchronous HDMI to SDI conversion. A pair of stereo analog inputs can be embedded into any AES channel. Audio inputs can be either professional balanced audio with selectable full scale level, or unbalanced consumer line level audio. By default any audio present in the HDMI stream will be embedded into the SDI output or it can be replaced with the external audio signals.

The module is also compatible with the yelloGUI software package, which provides access to a host of additional internal settings including adjustable video delay for timing purposes.

An SDI fiber output is also provided with a variety of plug in SFP options available.

SDI Fiber Transmitter Options

Model	Description	Power
OH-TX-1-LC / ST / SC	SFP Fiber TX - Singlemode - LC, ST or SC conn. - 10km	-5dBm (1310nm)
OH-TX-0-850-MM	SFP Fiber TX- Multimode - LC conn. - 300m	-5dBm (850nm)

SDI CWDM Fiber Transmitter Options

Model	Description	Power
OH-TX-4-XXXX	CWDM SFP Fiber TX - Singlemode LC Conn. - 40km XXXX=Wavelength. 18 according to ITU T G692.2 1270nm through 1610nm	-1dBm

Note: *For legal reasons, HDMI capture devices from LYNX Technik AG are designed not to capture, convert or transmit video or audio from HDCP copy-protected sources (e.g. Satellite receivers, Cable receivers, BD players etc.)*

Technical Specifications

HDMI Input	3D compatible input using type A connector
	Up to 8 channels embedded audio in HDMI is passed transparently or replaced with external analog audio input
Reference Input	SDTV: Analog 525 or 625 bi-level sync, black burst or colorbars HDTV: All tri-level sync standards (exceptions 1080p 50/59.94/60Hz) Cross lock compatible
	SMPTE 274M, SMPTE 296M - 75 Ohm BNC connector
Frame Synchronizer	Functional if valid reference is detected, otherwise operates in free run (asynchronous) mode. External audio and HDMI input are frequency locked to external reference, fully cross lock compatible across standards. One frame adjustable delay (in line and pixel increments) using yelloGUI
SDI Outputs	2 x SDI video, 75 Ohm BNC. (both have the same signal - NOT dual link) SMPTE ST 259M (SDTV), SMPTE ST 292-1 (HDTV 1.5Gb/s) SMPTE ST 424M (3Gb/S) supporting ST 425-1 Level A and ST 425-2 (3D)
	Multi-standard output. SDTV (525/625) 720p and 1080p (23.98/24/25/29.97/30/50/59.94/60 Hz) 1080i (50/59.94/60 Hz)
Fiber Output	Optional plug in SFP for optical SDI output (see fiber options table)
Audio Inputs	Left and right analog audio using 1/4 inch jack plugs
	10k Ohm differential balanced input mode with 24,22,20,18,15,12 dBu full scale (selectable)
	Unbalanced mode with (line level) at -10 dBV (1/4 inch Jack Plug to RCA connection adapters supplied)
	Selectable AES channel for audio embedding (1 through 8) (Overwrites any HDMI embedded audio present in selected channel)
	Frequency response: <+/- 0.2dB 20Hz to 20KHz
	48kHz A/D sample rate (free run or frequency locked to reference input)
Power	+12VDC @ 4.7W nominal - (supports 10 - 14VDC input range)
Physical	Size: 138mm x 90mm x 22mm (5.43" x 3.54" x 0.86") including connectors Weight: 230g (8.11oz)
Ambient	5 - 40ºC (41 - 104ºF) 90% Humidity (non condensing)
Model #	CHD 1812 - (EAN# 4250479318335)
Includes	Module, AC power supply, RCA adapters, HDMI + USB cable, transport case

Specifications subject to change

Video Output Resolution

The SDI output format is automatically selected based on the detected HDMI input resolution. The module does not have an internal scaler, so if the input resolution does not match any of the supported SDI formats then the module will automatically select an appropriate SDI standard with a similar number of lines and pixels and map the signal into the SDI output, which may result in some image cropping (cut) or boxing (blanking)

The table below shows the input to output resolution settings that are applied is AUTOMATIC mode. The yelloGUI interface provides the ability to manually set the output resolution interdependently of the input resolution. For these cases the table below also lists the conversion mode applied to optimally fit the manually selected SDI output format by either cropping or boxing the image (C=Cut and H=Box / V=Vertical and H=Horizontal)

	HDMI Input Resolution								
SDI Output	SDTV 720x [56]25	720p 1280x720	1080i 1920x1080	1080p 1920x1080	VGA 640x480	SVGA 800x600	XGA 1024x768	WXGA 1280x768	WUXGA 1920X1200
<auto>	SDTV	720p	1080i	1080p	720p	720p	1080p	1080p	1080p
SDTV	n.a.	C	C	C	V=C / H=B	V=C / H=B	C	C	C
720p	n.a.	n.a.	n.a.	C	B	V=C / H=B	V=C / H=B	V=C	C
1080i	B	B	n.a.	n.a.	B	B	B	B	V=C
1080p	n.a.	B	n.a.	n.a.	B	B	B	B	V=C

Cross Lock and Frame Rate Conversion

The frame synchronizer is fully cross lock compatible, meaning it can cross lock between different standards. With a given reference signal connected the synchronizer will drop or add frames to achieve a correctly synchronized (frame rate converted) SDI output.

Note. *This conversion drops and adds frames to achieve the desired output frame rate and will not provide the performance typical of a sophisticated standards converter. Please refer to the tables below for the conversion possibilities. Red = Drop Frame, Yellow = Adding Frames*

HDMI inputs with @ 23.98/29.97/59.94Hz Frame Rates

Reference Signal	23.98Hz		24Hz
	29.97Hz	30Hz	25Hz
	59.94Hz	60Hz	50Hz
HDMI Input	**SDI Output Formats**		
525 / 59.94Hz	525 / 59.94Hz	525 / 60Hz	625 / 50Hz
720p / 59.94Hz	720p / 59.94Hz	720p / 60Hz	720p / 50Hz
720P / 29.97Hz	720p / 29.97Hz	720p / 30Hz	720p / 25Hz
720p / 23.98Hz	720p / 23.98Hz	720p / 30Hz	720p / 24Hz
1080i / 59.94Hz	1080i / 59.94Hz	1080i / 60Hz	1080i / 50Hz
1080p / 59.94Hz	1080p / 59.94Hz	1080p / 60Hz	1080p / 50Hz
1080p / 29.97Hz	1080p / 29.97Hz	1080p / 30Hz	1080p / 25Hz
1080p / 23.98Hz	1080p / 23.98Hz	1080p / 30Hz	1080p / 24Hz

HDMI inputs with @ 24/30/60Hz Frame Rates

Reference Signal	23.98Hz		24Hz
	29.97Hz	30Hz	25Hz
	59.94Hz	60Hz	50Hz
HDMI Input	**SDI Output Formats**		
525 / 60Hz	525 / 59.94Hz	525 / 60Hz	625 / 50Hz
720p / 60Hz	720p / 59.94Hz	720p / 60Hz	720p / 50Hz
720P / 30Hz	720p / 29.97Hz	720p / 30Hz	720p / 25Hz
720p / 24Hz	720p / 23.98Hz	720p / 30Hz	720p / 24Hz
1080i / 60Hz	1080i / 59.94Hz	1080i / 60Hz	1080i / 50Hz
1080p / 60Hz	1080p / 59.94Hz	1080p / 60Hz	1080p / 50Hz
1080p / 30Hz	1080p / 29.97Hz	1080p / 30Hz	1080p / 25Hz
1080p / 30Hz	1080p / 23.98Hz	1080p / 30Hz	1080p / 24Hz

HDMI inputs with @ 24/25/50Hz Frame Rates

Reference Signal	23.98Hz		24Hz
	29.97Hz	30Hz	25Hz
	59.94Hz	60Hz	50Hz
HDMI Input	**SDI Output Formats**		
625 / 50Hz	525 / 59.94Hz	525 / 60Hz	625 / 50Hz
720p / 50Hz	720p / 59.94Hz	720p / 60Hz	720p / 50Hz
720P / 25Hz	720p / 29.97Hz	720p / 30Hz	720p / 25Hz
720p / 24Hz	720p / 23.98Hz	720p / 30Hz	720p / 24Hz
1080i / 50Hz	1080i / 59.94Hz	1080i / 60Hz	1080i / 50Hz
1080p / 50Hz	1080p / 59.94Hz	1080p / 60Hz	1080p / 50Hz
1080p / 25Hz	1080p / 29.97Hz	1080p / 30Hz	1080p / 25Hz
1080p / 24Hz	1080p / 23.98Hz	1080p / 30Hz	1080p / 24Hz

CHD 1812 Frame Rate Conversion Applications

In North American (or legacy NTSC) markets the HDMI signals from most devices tends to be at the consumer 60Hz frame rate and not 59.94Hz which is the required frame rate for broadcast and production.

The CHD 1812 can be used to solve this problem and convert a 60Hz HDMI signal to a 59.94Hz SDI signal. This is accomplished using the integrated frame synchronizer (which will drop frames to achieve the correct frame rate)

If fact, the module can also convert between 50Hz and 60Hz standards using the frame synchronizer, which is useful for monitoring applications.

Its also possible to precisely adjust the timing of the SDI output up to one full frame relative to the reference sync in pixel and line increments - which is useful for timing and synchronizing SDI sources into production switchers or routers etc.

60Hz to 59.94Hz Conversion — SDI Broadcast Output — HDSDI @ 59.94Hz — HDMI @ 60Hz — HDSDI @ 59.94Hz — Fiber Out — Studio Ref 59.94Hz — PC with 60Hz HDMI Output