

3Gbit HDMI® to SDI Converter + Frame Synchronizer

- SDI video output formats up to 3Gbit (1080p60)
- 3G SDI Level A and Level B support
- Support for single link 3D formats
- 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 424M, SMPTE 292M, SMPTE 259M 3G Level A & B-DL & B-DS according to SMPTE ST 425-1 and ST 425-2 (3D) with image formats 1280 x 720 and 1920 x 1080 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: $\pm 0.2\text{dB}$ 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 - 40°C (41 - 104°F) 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 in 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 > Horizontal and Vertical crop, B > Horizontal and Vertical box, V=C / H=B > vertical crop and horizontal box, V=C > vertical crop only)

| SDI Output | HDMI Input Resolution | | | | | | | | |
|------------|-----------------------|------------------|--------------------|--------------------|----------------|-----------------|-----------------|------------------|--------------------|
| | SDTV 720 x 525/625 | 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.

