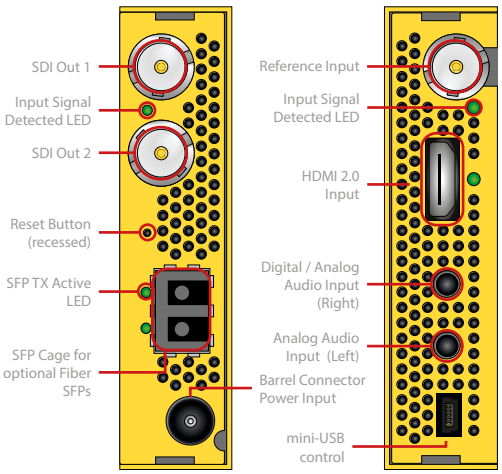
yellobrik®

CHD 1412

LYNX | Centraal™ ✓ yelloGUI ✓

HDMI to 12G-SDI Converter with Frame Synchronizer and Analog Audio Embedder

Shown with optional fiber SFP installed



Features

- Supports video inputs from 1.5G-SDI up to 12G-SDI
- 3G-SDI Level A And Level B Support
- Integrated Frame Synchronizer
- Multi-Format Sync Reference Input - Cross Lock Compatible
- 2x 12G-SDI outputs with optional Fiber Transmitter
- HDMI Embedded Audio pass-through transparently
- Support for Dolby Digital Plus and Dolby Atmos
- Balanced Analog Audio, Unbalanced Line Level Audio, Or AES Input
- Selectable AES Channel For Embedding External Audio
- HDMI, Reference And Audio Present LED Indication
- LynxCentraal & yelloGUI Compatible For Additional Internal Settings

Description

The CHD 1412 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 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. It can also lock to the HDMI input. 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. PCM, Dolby Digital (AC3), Dolby Digital Plus (E-AC-3) and Dolby Atmos (JOC) audio formats present in the HDMI stream are passed through to the SDI output in selflock mode "Ref Source= Auto / HDMI".

The module is compatible with yelloGUI and LynxCentraal for monitoring and configuration.

An optional SDI SFP transmitter can be installed to enable fiber transmission. See SDI Fiber Transmitter table.

CAUTION: This is a high power module. If mounting the module in the RFR 1200 rack frame please leave an empty slot each side of the module to allow for adequate airflow to prevent the risk of overheating.

*Distance is an approximation. Actual distances achieved can be longer or shorter depending on the type of cable. Determine link losses and perform optical budget calculations to ensure correct operation.

Technical Specifications

Supported Formats	4K	4096x2160p	23.98, 24, 25, 29.97, 30, 47.95, 48, 50, 59.94, 60			
	UHD	3840x2160p	23.98, 24, 25, 29.97, 30, 50, 59.94, 60			
	2K	1920x1080p	23.98, 24, 25, 29.97, 30, 47.95, 48, 50, 59.94, 60			
	HD	1920x1080p	23.98, 24, 25, 29.97, 30, 50, 59.94, 60			
	HD	1920x1080PsF	23.98, 24, 25, 29.97, 30			
	HD	1920x1080i	50, 59.94, 60			
	HD	1280x720p	23.98, 24, 25, 29.97, 30, 50, 59.94, 60			
	SD	720x625i	50			
	SD	720x525i	59.94			
Supported Standards	SMPTE 259M, SMPTE 292M, SMPTE 424M, SMPTE 2081-1, SMPTE 2082-1					
Color Precision	YCbCr	4:2:2	10-bit			
	YCbCr/RGB	4:4:4	10, 12-bit			
HDMI Input	Type A 2.0b connector for up to 2160p60					
	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, 3G, 12G: All tri-level sync standards (exceptions 1080p 50/59.94/60Hz)					
	Cross lock compatible					
Frame Synchronizer	Defaults to free-run (asynchronous) mode when no valid reference signal is present					
	External audio and HDMI input are frequency locked to external reference (fully cross lock compatible across standards)					
	Adjustable Delay: 15 Frames (300ms) for all SD/HD/3G and 12G signals					
	Audio Input Delay: max. 682.65ms					
	HDMI Audio Delay: max. 682.65ms					
SDI Output	2x 12G-SDI video outputs on BNC connector (75 Ohm)					
	Electrical Return Loss:		to 1.5GHz >15dB	to 3GHz >10dB	to 6GHz >7dB	to 12GHz >4dB
	Automatic Cable EQ*	270Mbit/s	1.5Gbit/s	3Gbit/s	6Gbit/s	12Gbit/s
		340m	200m	150m	100m	100m
		Belden 1694A			Belden 4794R	
Fiber Output	(optional) 1x fiber transmitter - SMPTE 297M - 2006					
Audio Formats	HDMI	PCM Audio				
		Dolby Digital (AC-3)				
		Dolby Digital Plus (E-AC-3), including Dolby Atmos (JOC)				
	SDI	AES Audio				
Audio Inputs	Left and right analog audio using mono 3.5mm jack plugs					
	10k Ohm differential balanced input mode with 24,22,20,18,15,12 dBu and User defineable full scale level (selectable)					
	Unbalanced mode with (line level) at -10 dBV (3.5mm 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: <+/- 0.1dB 20Hz to 20KHz					
	48kHz A/D sample rate (frequency locked to SDI output)					
Power	+12V DC @ 10W nominal - (supports 8 - 24V DC input range)					
Physical	Size (incl. connectors): 126mmx 90mmx 22mm (4.96"x 3.54"x 0.86")					
	Weight (excl. SFP): 207g (7.05oz)					
Ambient	5 - 40ºC (41 - 104ºF) 90% Humidity (non condensing)					
Model #	CHD 1412 - (EAN# 4250479328112)					
Includes	Module, AC power supply, RCA adapters, HDMI + USB cable					

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Video Output Resolution

The module does not have an internal scaler and no de-interlacer. If the input resolution does not match any of the supported SDI formats, the module will select an appropriate SDI standard with a similar number of line pixels and map the signal into the SDI output. This may result in some image cropping (cut) or boxing (blanking) of the overshot area. To change the output format, please connect the module to a PC or Mac via either yelloGUI or LynxCentraal.

HDMI Input	SDI Output				
	SDTV	720p	1080i	1080p	2160p
SDTV [720x 525/625]	N	B	B	B	B
720p [1280x720]	C	N	B	B	B
1080i [1920x1080]	C	C	N	N	B
1080p [1920x1080]	C	C	N	N	B
2160p [3840x2160]	C	C	C	C	N

HDMI Input	SDI Output				
	SDTV	720p	1080i	1080p	2160p
VGA [640x480]	B	B	B	B	B
SVGA [800x600]	C	B	B	B	B
XGA [1024x768]	C	CV/BH	B	B	B
WXGA [1280x768]	C	CV	B	B	B
WUXGA [1920x1200]	C	C	CV	CV	B
WQXGA [2560x1600]	C	C	C	C	B
WQUXGA [3840x2400]	C	C	C	C	CV

Legend	
C	Cropping (Horizontal and Vertical)
B	Boxing (Horizontal and Vertical)

CV/BH	Crop: Vertical / Boxing: Horizontal
CV	Crop: Vertical
N	Output = Input

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 repeat frames to achieve a correctly synchronized (frame rate converted) SDI output.

Reference Signal (fps)		Input Video Standard												
		525 i / 59	625 i / 50	1080 i / 50	1080 i / 59	1080 i / 60	16:9 p / 23	16:9 p / 24	16:9 p / 25	16:9 p / 29	16:9 p / 30	16:9 p / 50	16:9 p / 59	16:9 p / 60
23	SDI Output	525 i / 59	525 i / 59	1080 i / 59	1080 i / 59	1080 i / 59	16:9 p / 23	16:9 p / 23	16:9 p / 23	16:9 p / 23	16:9 p / 23	16:9 p / 59	16:9 p / 59	16:9 p / 59
24		625 i / 50	625 i / 50	1080 i / 50	1080 i / 50	1080 i / 50	16:9 p / 24	16:9 p / 24	16:9 p / 24	16:9 p / 24	16:9 p / 24	16:9 p / 50	16:9 p / 50	16:9 p / 50
25/50		625 i / 50	625 i / 50	1080 i / 50	1080 i / 50	1080 i / 50	16:9 p / 25	16:9 p / 25	16:9 p / 25	16:9 p / 25	16:9 p / 25	16:9 p / 50	16:9 p / 50	16:9 p / 50
29/59		525 i / 59	525 i / 59	1080 i / 59	1080 i / 59	1080 i / 59	16:9 p / 29	16:9 p / 29	16:9 p / 29	16:9 p / 29	16:9 p / 29	16:9 p / 59	16:9 p / 59	16:9 p / 59
30/60		625 i / 50	625 i / 50	1080 i / 60	1080 i / 60	1080 i / 60	16:9 p / 30	16:9 p / 30	16:9 p / 30	16:9 p / 30	16:9 p / 30	16:9 p / 60	16:9 p / 60	16:9 p / 60

DROP FRAME CONVERSION **REPEAT FRAME CONVERSION**

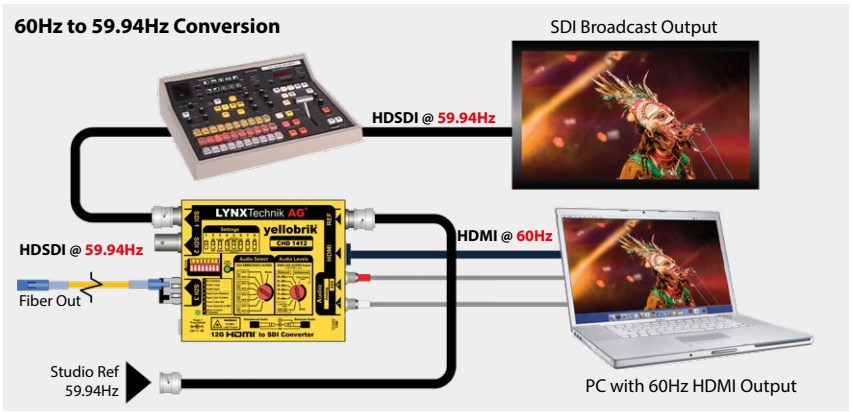
CHD 1412 Frame Rate Conversion Applications

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 1412 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)

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.



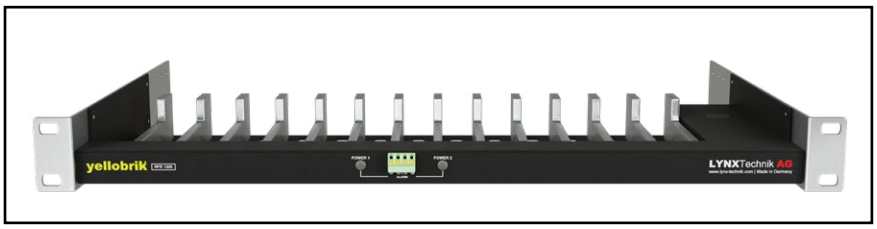
Optional Accessories

Rack Frames

This yellobrik can be placed in a rack frame along others to build increasingly complex systems, all monitored and controlled with a rack controller (RCT 1012) and server module (SRV 1000) via a PC or MAC using LynxCentraal.

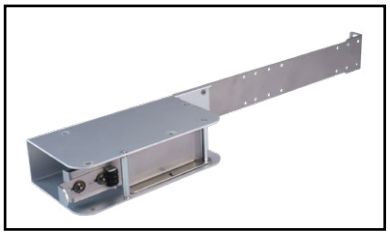
The RFR 1200 offers additional power redundancy with GPI alert. It automatically closes a connection between the A and B terminals on power failure.

The RPS A100 is a 100W power supply, which can be mounted at the rear end of the RFR 1200 with an RXT 1001 power supply holder for rack frames.



RFR 1200: yellobrik Rack Frame

RPS A100: 100W Power supply



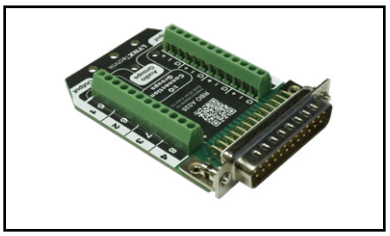
RXT 1001: Power Supply Holder

Breakout Boards and Cables

This module offers the possibility to use breakout modules and cables to connect in-/outputs via XLR or screw terminals to the module.

The RBO A025 module offers the flexibility to connect any kind of wiring directly to the 25 pin D-Sub connector of the module. The convenient markings on the extension module mark exactly which audio groups are mapped to which screw terminal.

The RAC series of cable connectors are offered in three different configurations:
- F 25: 8 female XLR connectors
- M 25: 8 male XLR connectors
- F/M 25: 4 female and 4 male XLR connectors



RBO A025: Sub D Breakout board

RAC F 25: 8x female XLR Breakout Cable

RAC F/M 25: 4/4 XLR Breakout Cable

RAC M 25: 8x male XLR Breakout Cable

Fiber I/O Options:

A wide range of SFP modules are available for this yellobrik. The selection listed here shows the most likely SFP modules for most typical setups.

More SFP modules are available. To find the perfect solution for your setup visit lynx-technik.com for more information or contact us.

SDI Fiber Transmitter Options

Model	Description	Power
OH-TX-12G-LC	SFP Fiber TX - Singlemode - LC connector - 10km*	-5 ... +0.5dBm
OH-TX-4-12G-LC	SFP Fiber TX - Singlemode - LC, ST or SC conn. - 40km*	-0.5 ... +3dBm
OH-TX-12G-XXXX-LC	CWDM SFP Fiber TX - Singlemode LC Conn. - 10km* XXXX=Wavelength. 18 according to ITU T G692.2 1270 -1610nm	-2 ... +3dBm
OH-TX-1 LC/ST/SC	3G SFP Fiber TX - Singlemode - LC/ST/SC connector - 10km*	-8 ... -3dBm
OH-TX-4-XXXX-LC	3G CWDM SFP Fiber TX - Singlemode - LC connector - 40km*	-4 ... +2dBm
OH-TX-8-XXXX-LC	3G CWDM SFP Fiber TX - Singlemode - LC connector - 80km*	+1 ... +5dBm