PRO-SDI2H

12G-SDI to HDMI Converter

OPERATION MANUAL

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Version 1.1

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SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.
- Please completely disconnect the power when the unit is not in use to avoid wasting electricity.

VERSION HISTORY

REV.	DATE	SUMMARY OF CHANGE
RDV1	2022/03/03	Preliminary release
RDV2	2022/04/27	Updated text in specification section

CONTENTS

1. Introduction 1

2. Applications 1

3. Package Contents 1

4. System Requirements 1

5. Features 2

6. Operation Controls and Functions 3

6.1 Front Panel 3

6.2 Rear Panel 4

7. Connection Diagram 5

8. Specifications 6

8.1 Technical Specifications 6

8.2 Video Specifications 7

8.3 Audio Specifications 9

8.3.1 Digital Audio 9

8.3.2 Analogue Audio 9

8.4 Cable Specifications 10

9. Acronyms 11

1. INTRODUCTION

This 12G-SDI to HDMI Converter allows SDI signals up to 4K UHD^{+} to be converted for display on standard HDMI video displays. This makes it easier for professionals to monitor or output professional SDI video production sources on standard, relatively low-cost, HDMI displays while allowing the original SDI signal to continue to be looped on to other SDI equipment in their production environment. Additionally, the inclusion of a 3.5mm analogue stereo output lets the user monitor the audio using simple powered speakers or headphones. Basic control is available via front panel buttons.

2. APPLICATIONS

- Display 12G-SDI video signals on standard 4K HDMI displays
- Broadcast SDI to consumer HDMI video signal conversion
- 12G-SDI signal extension via re-clocked loop output

3. PACKAGE CONTENTS

- 1× 12G-SDI to HDMI Converter
- 1× 5V/2.6A DC Power Adapter
- 1× Operation Manual

4. SYSTEM REQUIREMENTS

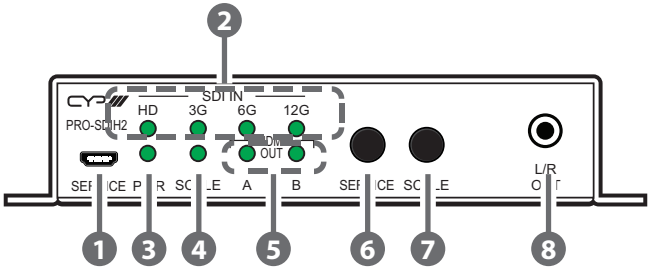
- SDI source equipment such as editing/recording decks, professional cameras, or video broadcast equipment.
- HDMI receiving equipment such as HDTVs, monitors, or audio amplifiers.

5. FEATURES

- HDMI 2.0 and DVI 1.0 compliant
- 1 SDI video input
- 3 mirrored outputs (2×HDMI, 1×12G-SDI) & 1 analogue stereo audio output
- Supports up to 4K UHD (12Gbps, 4K@50/60Hz 4:2:2, 8-bit) digital video input
- SDI input supports the following SMPTE standards: ST 292-1 Level A, ST 425-1, ST 2081-10, ST 2082-10
- Looped SDI output is re-clocked
- SDI signal extension distance varies based on signal type: 80 meters (12G-SDI), 100 meters (6G-SDI) 200 meters (3G-SDI), or 260 meters (HD-SDI)
- 4K sources can be optionally downscaled to 1080p when output over the HDMI outputs to support lower cost local monitoring options
- Supports pass-through of LPCM audio (up to 8 channels)
- Controllable via front panel controls

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel

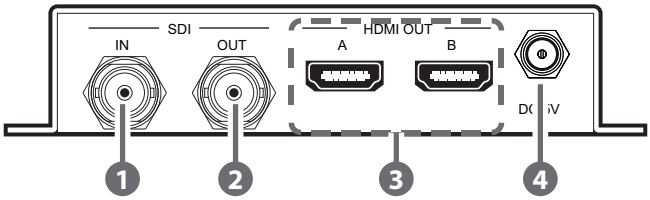


1. **SERVICE Port:** This port is reserved for firmware update use only.
2. **SDI IN LEDs:** These LEDs will illuminate to indicate the SDI format currently in use on the SDI input.
3. **PWR LED:** This LED will illuminate to indicate the unit is on and receiving power.
4. **SCALE LED:** This LED illuminate when the HDMI outputs are being downscaled.
5. **HDMI OUT A~B LEDs:** These LEDs will illuminate to indicate when a valid sink has been detected on the associated output port. When no sink is detected the LED will remain off.
6. **SERVICE Button:** Press this button to put the unit into its firmware update mode.

   Firmware Update Process: To update firmware after pressing the button, connect the unit to a PC/laptop via the Micro-USB Service port and the unit will appear as an external drive. Drag an appropriate firmware file onto this drive and the unit will automatically begin the update process. After the update completes, the unit will automatically reboot.
7. **SCALE Button:** Press this button to enable or disable the HDMI outputs' 4K to 1080p downscaling function.

   Note: 3840x2160 will be downscaled to 1920x1080. 4096x2160 will be downscaled to 2048x1080.
8. **L/R OUT Port:** Connect to powered speakers or an amplifier for analogue stereo audio output.

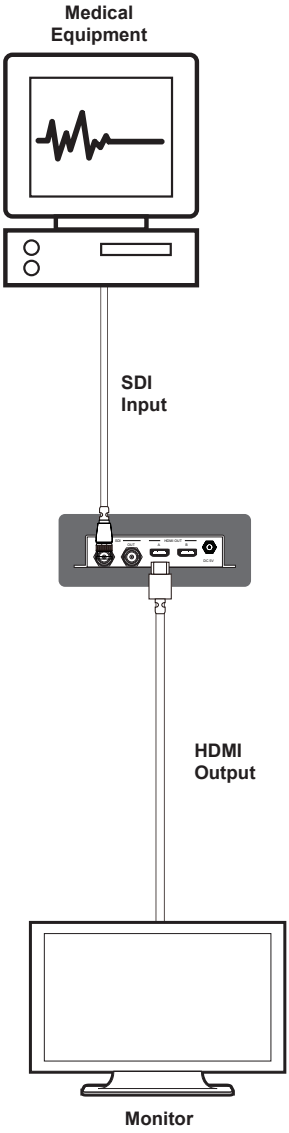
6.2 Rear Panel



1. **SDI IN Port:** Connect to SDI source equipment such as editing/ recording decks, professional cameras, or video broadcast equipment. SDI signals up to 12G-SDI are supported.
2. **SDI OUT Port:** Connect to SDI receiving equipment such as editing/ recording decks, professional studio monitors, or video broadcast equipment.

   Note: This output is re-clocked to support sequential daisy chain cable extensions, without signal loss, if desired.
3. **HDMI OUT A~B Ports:** Connect to HDMI TVs, monitors, or amplifiers for digital video and audio output.
4. **DC 5V Port:** Plug the 5V DC power adapter into this port and connect it to an AC wall outlet for power.

7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	18Gbps
SDI Bandwidth	12Gbps
SMPTE Standard Support	ST 292-1 Level A ST 425-1 ST 2081-10 ST 2082-10
Input Ports	1×12G-SDI (BNC)
Output Ports	1×12G-SDI (BNC) 2×HDMI (Type-A) 1×Unbalanced Stereo Audio (3.5mm)
Service Port	1×USB 2.0 (Micro-B)
Power Supply	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	128mm×25mm×75mm [Case Only] 128mm×25mm×94mm [All Inclusive]
Weight	347g
Chassis Material	Metal (Steel)
Chassis Colour	Black
Operating Temperature	0˚C – 40˚C/32˚F – 104˚F
Storage Temperature	-20˚C – 60˚C/-4˚F – 140˚F
Relative Humidity	20 – 90% RH (Non-condensing)
Power Consumption	4.95W

8.2 Video Specifications

Supported Resolutions (Hz)	Input	Output	
	SDI	HDMI	SDI
720×400p@70/85	×	×	×
640×480p@60/72/75/85	×	×	×
720×480i@60	×	×	×
720×480p@60	×	×	×
720×576i@50	×	×	×
720×576p@50	×	×	×
800×600p@56/60/72/75/85	×	×	×
848×480p@60	×	×	×
1024×768p@60/70/75/85	×	×	×
1152×864p@75	×	×	×
1280×720p@50/59.94/60	✓	✓	✓
1280×768p@60/75/85	×	×	×
1280×800p@60/75/85	×	×	×
1280×960p@60/85	×	×	×
1280×1024p@60/75/85	×	×	×
1360×768p@60	×	×	×
1366×768p@60	×	×	×
1400×1050p@60	×	×	×
1440×900p@60/75	×	×	×
1600×900p@60RB	×	×	×
1600×1200p@60	×	×	×
1680×1050p@60	×	×	×
1920×1080i@50/59.94/60	✓	✓	✓

Supported Resolutions (Hz)	Input	Output	
	SDI	HDMI	SDI
1920×1080psf (4:2:0)	✓	✓	✓
1920×1080p@23.98/24/25/29.97/30	✓	✓	✓
1920×1080p@50/59.94/60/100/120	✓	✓	✓
1920×1200p@60RB	×	×	×
2560×1440p@60RB	×	×	×
2560×1600p@60RB	×	×	×
2048×1080p@23.98/24/25/29.97/30	✓	✓	✓
2048×1080p@50/59.94/60	✓	✓	✓
3840×2160p@23.98/24/25/29.97/30	✓	✓	✓
3840×2160p@50/59.94/60 (4:2:0)	✓	✓	✓
3840×2160p@24, HDR10	×	×	×
3840×2160p@50/60 (4:2:0),HDR10	×	×	×
3840×2160p@50/59.94/60	✓	✓	✓
4096×2160p@23.98/24/25/29.97/30	✓	✓	✓
4096×2160p@50/59.94/60 (4:2:0)	✓	✓	✓
4096×2160p@24, HDR10	×	×	×
4096×2160p@50/60 (4:2:0), HDR10	×	×	×
4096×2160p@50/59.94/60	✓	✓	✓

8.3 Audio Specifications

8.3.1 Digital Audio

SDI Input / Output	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	48
Bitstream	
Supported Formats	None

HDMI Output	
LPCM	
Max Channels	2 Channels
Sampling Rate (kHz)	48
Bitstream	
Supported Formats	None

8.3.2 Analogue Audio

Analogue Output	
Max Audio Level	2Vrms
THD+N	< –80dB@0dBFS 1kHz (A-wt)
SNR	> 70dB@0dBFS
Frequency Response	< ±3dB@20Hz~20kHz
Crosstalk	< –60dB@10kHz
Impedance	600Ω
Type	Unbalanced

8.4 Cable Specifications

Cable Length	720p 12-bit	1080p 12-bit	4K30 (4:4:4) 8-bit	4K60 (4:4:4) 8-bit
High Speed HDMI Cable				
HDMI Output	15m	10m	5m	3m
Coaxial SDI Cable (Belden 1694A 6GHz Cable)				
SDI Input	260m	200m	100m	80m
SDI Output	260m	200m	100m	80m

Note: SDI cable distance measurements are based on Belden 1694A 6GHz cable. Operating distance may vary if different quality cables are used. Bandwidth category headings are representative examples only, and do not indicate this product's support for any specific resolution or colour bit depth.

Bandwidth Category Examples:

1080p (FHD Video)

- Up to 1080p@60Hz, 12-bit colour
- Data rates lower than 5.3Gbps or below 225MHz TMDS clock

4K30 (4K UHD Video)

- 4K@24/25/30Hz & 4K@50/60Hz (4:2:0), 8-bit colour
- Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps

4K60 (4K UHD+ Video)

- 4K@50/60Hz (4:4:4, 8-bit)
- 4K@50/60Hz (4:2:0, 10-bit HDR)
- Data rates higher than 10.2Gbps

9. ACRONYMS

ACRONYM	COMPLETE TERM
4K UHD	4K Ultra-High-Definition (10.2Gbps max)
4K UHD+	4K Ultra-High-Definition (18Gbps max)
COAX	Coaxial
dB	Decibel
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
Gbps	Gigabits per second
HD	High-Definition
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
kHz	Kilohertz
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
MHz	Megahertz
SDI	Serial Digital Interface
SNR	Signal-to-Noise Ratio
THD+N	Total Harmonic Distortion plus Noise
TMDS	Transition-Minimised Differential Signaling
UHDTV	Ultra-High-Definition Television
USB	Universal Serial Bus
VGA	Video Graphics Array
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array
Ω	Ohm

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