



# PRO-H2SDI

HDMI to 12G-SDI Converter

**OPERATION MANUAL**

**HDMI**<sup>®</sup>  
HIGH-DEFINITION MULTIMEDIA INTERFACE

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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
<b>RDV1</b>	2022/02/18	Preliminary release
<b>RDV2</b>	2022/04/27	Updated text in specification section

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## 1. INTRODUCTION

This HDMI to 12G-SDI Converter allows HDMI signals up to 4K UHD<sup>+</sup> to be converted for use in native 12G-SDI video systems. This makes it easier for professionals to integrate and distribute non-HDCP HDMI signals from both consumer and prosumer video equipment, such as video cameras and laptops, within their professional video production environment while still providing a local HDMI output for monitoring purposes.

Additionally, the inclusion of an analogue stereo input lets users optionally insert external audio into the SDI output signal along with the primary video. Basic control is available via front panel buttons.

## 2. APPLICATIONS

- /// Display HDMI video signals on professional SDI displays
- /// Consumer HDMI to broadcast SDI video signal conversion
- /// 4K UHD HDMI signal conversion to 12G SDI

## 3. PACKAGE CONTENTS

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

## 4. SYSTEM REQUIREMENTS

- /// Non-HDCP HDMI source equipment such as media players, video game consoles, or set-top boxes.
- /// SDI receiving equipment such as editing/recording decks, professional studio monitors, or video broadcast equipment.

## 5. FEATURES

- /// HDMI 2.0 and DVI 1.0 compliant

- /// HDCP 1.x and 2.2 compliant

*Note: HDCP encoded content can only be output over the HDMI output. The SDI output will be blocked in the case of HDCP content.*

- /// 1 HDMI video input & 1 analogue stereo audio input

- /// 3 mirrored outputs (2×12G-SDI, 1×HDMI)

- /// Supports up to 4K UHD<sup>+</sup> (18Gbps, 4K@50/60Hz 4:4:4, 8-bit) digital video input.

- /// SDI output supports the following SMPTE standards: ST 292-1 Level A, ST 425-1, ST 2081-10, ST 2082-10

- /// 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)

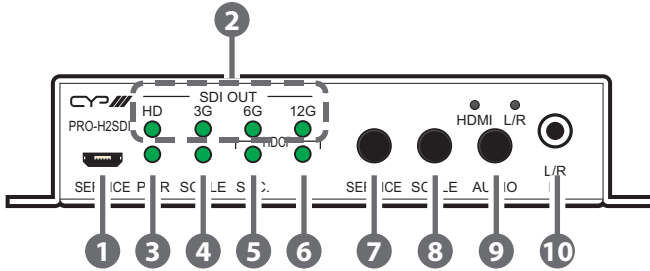
- /// 4K sources can be optionally downscaled to 1080p when output over the HDMI output to support lower cost local monitoring options

- /// Supports pass-through of LPCM audio (up to 8 channels) from the HDMI input, or 2 channels from the analogue audio input

- /// 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 OUT LEDs:** These LEDs will illuminate to indicate the SDI output format currently in use.
- 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 output is being downscaled.
- 5 **HDCP SRC LED:** This LED will illuminate when the HDMI source contains an HDCP encoded signal.
- 6 **HDCP IN LED:** This LED will illuminate to indicate that the HDMI input supports HDCP sources.
- 7 **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.

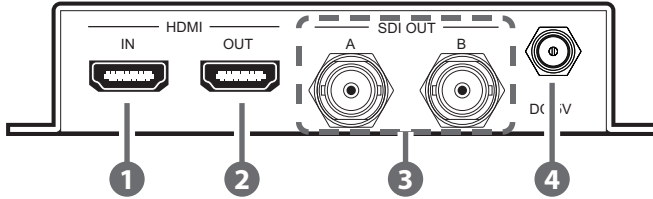
- 8 **SCALE Button:** Press this button to enable or disable the HDMI output's 4K to 1080p downscaling function.

*Note: 3840x2160 will be downscaled to 1920x1080. 4096x2160 will be downscaled to 2048x1080. YUV 4:2:2 format sources cannot be downscaled.*



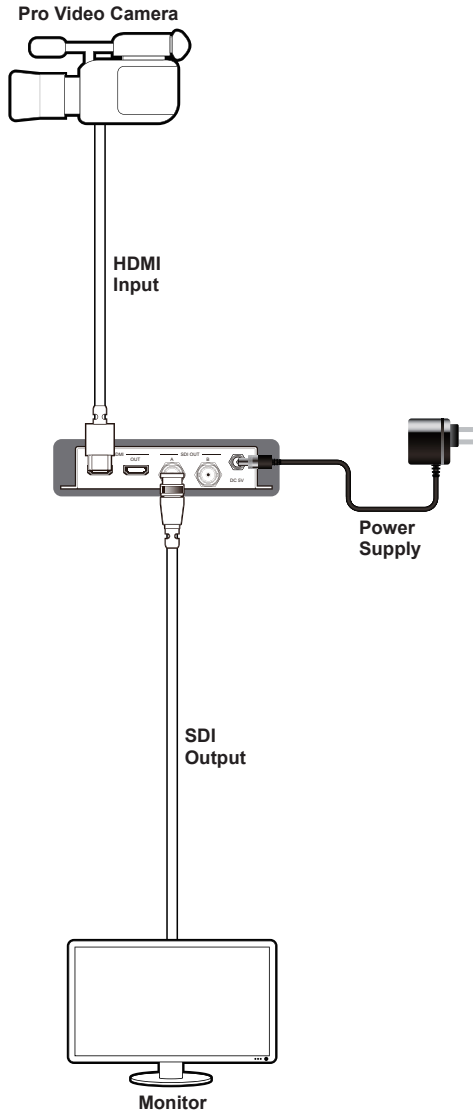
- 9 **AUDIO Button & LEDs:** Press this button to toggle the audio source to embed between HDMI audio and analogue audio. The LEDs will illuminate to indicate which source is currently selected.
- 10 **L/R IN Port:** Connect to the analogue stereo output of a device such as an audio player or PC.

## 6.2 Rear Panel



- 1 **HDMI IN Port:** Connect to HDMI source equipment such as a media player, game console, or set-top box. DVI sources are supported with the use of an HDMI to DVI adapter.
- 2 **HDMI OUT Port:** Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.
- 3 **SDI OUT A~B Ports:** Connect to SDI receiving equipment such as editing/recording decks, professional studio monitors, or video broadcast equipment.
- 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

<b>HDMI Bandwidth</b>	18Gbps
<b>SDI Bandwidth</b>	12Gbps
<b>SMPTE Standard Support</b>	ST 292-1 Level A ST 425-1 ST 2081-10 ST 2082-10
<b>Input Ports</b>	1×HDMI (Type-A) 1×Unbalanced Stereo Audio (3.5mm)
<b>Output Ports</b>	2×12G-SDI (BNC) 1×HDMI (Type-A)
<b>Service Port</b>	1×USB 2.0 (Micro-B)
<b>Power Supply</b>	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
<b>ESD Protection (HBM)</b>	±8kV (Air Discharge) ±4kV (Contact Discharge)
<b>Dimensions (W×H×D)</b>	128mm×25mm×75mm [Case Only] 128mm×25mm×94mm [All Inclusive]
<b>Weight</b>	347g
<b>Chassis Material</b>	Metal (Steel)
<b>Chassis Colour</b>	Black
<b>Operating Temperature</b>	0°C – 40°C/32°F – 104°F
<b>Storage Temperature</b>	-20°C – 60°C/-4°F – 140°F
<b>Relative Humidity</b>	20 – 90% RH (Non-condensing)
<b>Power Consumption</b>	6.138W

## 8.2 Video Specifications

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

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

## 8.3 Audio Specifications

### 8.3.1 Digital Audio

HDMI Input / Output	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard & High-Definition

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

### 8.3.2 Analogue Audio

Analogue Input	
Max Audio Level	2Vrms
Impedance	30kΩ
Type	Unbalanced

## 8.4 Cable Specifications

Cable Length	720p	1080p	4K30	4K60
	12-bit	12-bit	(4:4:4) 8-bit	(4:4:4) 8-bit
<b>High Speed HDMI Cable</b>				
<b>HDMI Input</b>	15m	10m	5m	3m
<b>HDMI Output</b>	15m	10m	5m	3m
<b>Coaxial SDI Cable (Belden 1694A 6GHz Cable)</b>				
<b>SDI Output</b>	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<sup>+</sup> 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
<b>4K UHD</b>	4K Ultra-High-Definition (10.2Gbps max)
<b>4K UHD<sup>+</sup></b>	4K Ultra-High-Definition (18Gbps max)
<b>COAX</b>	Coaxial
<b>dB</b>	Decibel
<b>DVI</b>	Digital Visual Interface
<b>EDID</b>	Extended Display Identification Data
<b>Gbps</b>	Gigabits per second
<b>HD</b>	High-Definition
<b>HDCP</b>	High-bandwidth Digital Content Protection
<b>HDMI</b>	High-Definition Multimedia Interface
<b>HDR</b>	High Dynamic Range
<b>kHz</b>	Kilohertz
<b>LED</b>	Light-Emitting Diode
<b>LPCM</b>	Linear Pulse-Code Modulation
<b>MHz</b>	Megahertz
<b>SDI</b>	Serial Digital Interface
<b>SNR</b>	Signal-to-Noise Ratio
<b>THD+N</b>	Total Harmonic Distortion plus Noise
<b>TMDS</b>	Transition-Minimised Differential Signaling
<b>UHDTV</b>	Ultra-High-Definition Television
<b>USB</b>	Universal Serial Bus
<b>VGA</b>	Video Graphics Array
<b>WUXGA (RB)</b>	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
<b>XGA</b>	Extended Graphics Array
<b>Ω</b>	Ohm











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