



# CLUX-H2SDI

HDMI to 3G SDI Dual-Output Converter



Operation Manual





## **DISCLAIMERS**

The information in this manual has been carefully checked and is believed to be accurate. Cypress Technology assumes no responsibility for any infringements of patents or other rights of third parties which may result from its use.

Cypress Technology assumes no responsibility for any inaccuracies that may be contained in this document. Cypress also makes no commitment to update or to keep current the information contained in this document.

Cypress Technology reserves the right to make improvements to this document and/or product at any time and without notice.

## **COPYRIGHT NOTICE**

No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or any of its part translated into any language or computer file, in any form or by any means—electronic, mechanical, magnetic, optical, chemical, manual, or otherwise—without express written permission and consent from Cypress Technology.

© Copyright 2011 by Cypress Technology.

All Rights Reserved.

Version 1.1 August 2011

## **TRADEMARK ACKNOWLEDGMENTS**

All products or service names mentioned in this document may be trademarks of the companies with which they are associated.





## 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.

## REVISION HISTORY

VERSION NO.	DATE DD/MM/YY	SUMMARY OF CHANGE
VR0	04/01/11	Preliminary release
VR1	04/07/11	Supported timing added
VR2	28/09/11	Spec. Position Changed
VS3	11/07/12	Updated format/diagrams/SDI standards
VS4	13/07/12	First release
VR5	24/07/12	SDI supports 480i@59.94





## CONTENTS

<b>1. Introduction</b> .....	1
<b>2. Applications</b> .....	1
<b>3. Package Contents</b> .....	1
<b>4. System Requirements</b> .....	1
<b>5. Features</b> .....	2
<b>6. Operation Controls and Functions</b> .....	3
6.1 Front Panel .....	3
6.2 Rear Panel.....	4
6.3 EDID Update Procedure.....	5
6.4 LED Signal Chart .....	7
<b>7. Connection Diagram</b> .....	10
<b>8. Specifications</b> .....	11
<b>9. Acronyms</b> .....	12





## 1. INTRODUCTION

The HDMI to SDI Converter allows HDMI signals to be shown on two SDI displays while ensuring high bit rates of 2.970 Gbit/s to give you high resolution signal without any loss. For professionals this means that it is now easier to convert your high def HDMI signal with audio to SDI for long distance transmission and display your work on two SDI displays. Also, a 2 CH L/R audio input allows DVI signal with 2CH audio to be converted to SDI in order to be shown on SDI displays. Furthermore, the device has a built-in default EDID and a recordable EDID that guarantee image display compatibility with source equipment.

## 2. APPLICATIONS

- HDMI signal display on SDI display(s)
- Extending a HDMI signal over 100m to two SDI displays
- DVI signal with audio display on SDI display(s) (DVI to HDMI adaptor cable required)
- Cascade HDMI signal over SDI cables

## 3. PACKAGE CONTENTS

- HDMI to 3G SDI Dual-Output converter
- 5V/2.6A Power Adaptor
- Operation Manual

## 4. SYSTEM REQUIREMENTS

- Input HDMI/DVI (with audio signal) source equipment with connection cable(s).
- Output SDI display(s) or SDI to HDMI converter(s) with connection cable(s).



## 5. FEATURES

- Shows HDMI source on two SDI displays simultaneously
- SDI interface operates at bitrates of 2.970 Gbit/s, 2.970/1.001 Gbit/s, 1.485 Gbit/s, 1.485/1.001 Gbit/s and 270 Mb/s
- Converts HDMI signal to SDI:
  1. 480i/576i to SD-SDI (SMPTE 259M-C, at bitrates of 270 Mbit/s)
  2. 720p/1080i to HD-SDI (SMPTE 292M, at bitrates of 1.485 Gbit/s or 1.485/1.001 Gbit/s)
  3. 1080p to 3G-SDI (SMPTE 424M/425M-AB, at bitrates of 2.970 Gbit/s and 2.970/1.001 Gbit/s)
- Supports HDMI input timings: 480i@59.94, 576i, 720p@50/59.94/60, 1080i@50/59.94/60, 1080p@23.98/24/25/29.97/30/50/59.94/60
- Choose between a selectable EDID and recordable EDID
- Integrated audio embedded up to 8 CH PCM 48 kHz for HDMI or 2 CH (external L/R) for DVI audio
- Supports SDI output distance up to 100 meters (3G-SDI), 200 meters (HD-SDI), or 300 meters (SD-SDI)

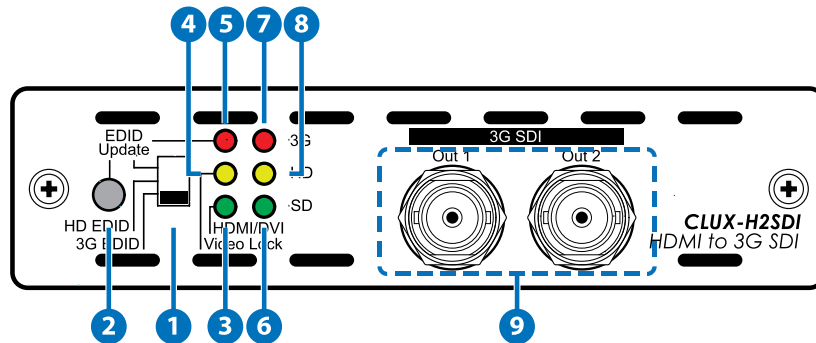
### **Note:**

1. *Tested with Belden 1694A Cable. Operating distances may vary if used with cables of different specifications.*
2. *This product does not process HDCP encrypted input signals. There will be no video output when the input signal contains content that is HDCP encrypted.*



## 6. OPERATION CONTROLS AND FUNCTIONS

### 6.1 Front Panel

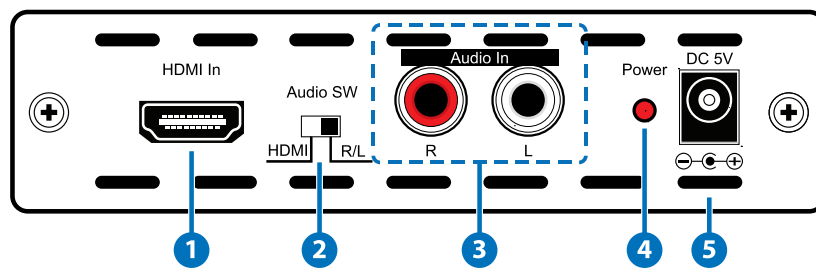


- 1 EDID Switch:** Use this switch to select between the built-in or to update the EDID settings. Default EDID settings as shown below:  
3G EDID→Native Mode 1080p@60  
HD EDID→Native Mode 1080i@60  
EDID update→Native Mode 720p@60
- 2 EDID Update button:** Only use this function when the image has not displayed correctly after trying to switch the EDID Update/HD/3G mode with the EDID switch (refer to Section 6.3 for update procedure).
- 3 HDMI/DVI LED:** The LED will illuminate green only when the input source is HDMI. It will not illuminate when the input is DVI.
- 4 Video Lock LED:** The LED will illuminate yellow when the HDMI input is receiving and locking a signal.
- 5 EDID Update LED:** The LED will illuminate red when the EDID settings are being updated (refer to Section 6.4 LED Signal Chart).
- 6 SD LED:** The LED will illuminate green when the HDMI input signal is 480i/576i.
- 7 3G LED:** The LED will illuminate red when the HDMI input signal is 1080p@50/60.
- 8 HD LED:** The LED will illuminate yellow when the input HDMI input signal is 1080p@24/25/30, 1080i@50/60 or 720p@50/60.



- 9 **3G SDI Out 1 & 2:** Connect to up to 2 SDI TVs or monitors for mirrored display or to a SDI to HDMI converter to cascade the SDI signal to multiple displays or devices

## 6.2 Rear Panel



- 1 **HDMI In:** Connect to the HDMI source equipment such as DVD or Blu-ray player or it can also be connected to a DVI source (with DVI to HDMI Adaptor cable).
- 2 **Audio Switch:** Use this switch to select between HDMI audio or an external analogue stereo source (R/L RCA jack).
- 3 **Audio In R/L:** Connect to an audio source such as a DVD or Blu-ray player with R/L RCA jack output or an alternate audio source such as a PC/Notebook. Can be used to provide audio for a DVI input.
- 4 **Power LED:** The LED will illuminate when the device is connected to a power supply.
- 5 **DC 5V:** Plug the 5V DC power supply into the Converter and connect the adaptor to an AC outlet.



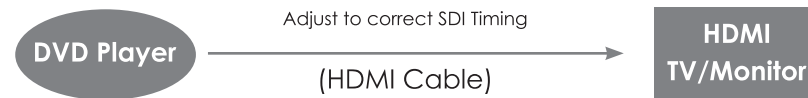
### 6.3 EDID Update Procedure

Please follow this procedure if there is no image displayed or it is displayed incorrectly.

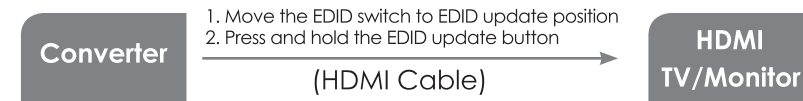
- A. Please ensure that the display output settings of the source input device (such as a Blu-ray player or HD Camcorder) is set to "Automatic". If the source image is displayed correctly no further action is necessary but if not to step B.



- B. Connect the HDMI source directly (without connecting to the Converter) to a HDMI monitor or TV to see if the image is displayed correctly. Ensure that the source's output timing supports SDI or the Converter's timing. If it is supported, go to step C. If not, please try a different monitor or TV and adjust the timing until the image is displayed correctly.



- C. Connect the HDMI monitor or TV to the input port of the Converter and then set the EDID switch to the 'EDID update' position. Press and hold the EDID update button consistently until the Video Lock LED illuminates. This will allow the Converter to replace the default EDID settings with the monitor/TV's EDID settings.



- D. Finally, connect the HDMI source to the HDMI input of the Converter and connect the output to a SDI monitor which should now be correctly displaying the image.





## 6.4 LED Signal Chart

System Operation LED Signal Status									
No.	EDID		Signal LED			EDID	Video	HDMI	Description
	Switch	key	3G	HD	SD	Update	/Lock	/DVI	
1	3G	Not Pressed	●	●	●	●	●	●	Input timing is 3G, HDMI mode
2	3G	Not Pressed	●	●	●	●	●	●	Input timing is HD, HDMI mode
3	3G	Not Pressed	●	●	●	●	●	●	Input timing is SD, HDMI mode
4	3G	Not Pressed	●	●	●	●	●	●	Input timing no support , HDMI mode
5	3G	Not Pressed	●	●	●	●	●	●	Input timing is 3G, DVI mode
6	3G	Not Pressed	●	●	●	●	●	●	Input timing is HD, DVI mode
7	3G	Not Pressed	●	●	●	●	●	●	Input timing is SD, DVI mode
8	3G	Not Pressed	●	●	●	●	●	●	Input timing no support , DVI mode
9	HD	Not Pressed	●	●	●	●	●	●	Input timing is 3G, HDMI mode
10	HD	Not Pressed	●	●	●	●	●	●	Input timing is HD, HDMI mode
11	HD	Not Pressed	●	●	●	●	●	●	Input timing is SD, HDMI mode
12	HD	Not Pressed	●	●	●	●	●	●	Input timing no support , HDMI mode
13	HD	Not Pressed	●	●	●	●	●	●	Input timing is 3G, DVI mode
14	HD	Not Pressed	●	●	●	●	●	●	Input timing is HD, DVI mode
15	HD	Not Pressed	●	●	●	●	●	●	Input timing is SD, DVI mode
16	HD	Not Pressed	●	●	●	●	●	●	Input timing no support , DVI mode
17	Update	Not Pressed	●	●	●	●	●	●	Input timing is 3G, HDMI mode
18	Update	Not Pressed	●	●	●	●	●	●	Input timing is HD, HDMI mode
19	Update	Not Pressed	●	●	●	●	●	●	Input timing is SD, HDMI mode
20	Update	Not Pressed	●	●	●	●	●	●	Input timing no support , HDMI mode
21	Update	Not Pressed	●	●	●	●	●	●	Input timing is 3G, DVI mode
22	Update	Not Pressed	●	●	●	●	●	●	Input timing is HD, DVI mode
23	Update	Not Pressed	●	●	●	●	●	●	Input timing is SD, DVI mode
24	Update	Not Pressed	●	●	●	●	●	●	Input timing no support , DVI mode
25	Update	Not Pressed	●	●	●	●	●	●	No input signal or No connect
26	3G	Not Pressed	●	●	●	*	*	●	Input with HDCP Encryption
27	HD	Not Pressed	●	●	●	*	*	●	Input with HDCP Encryption
28	Update	Not Pressed	●	●	●	*	*	●	Input with HDCP Encryption



Note

1. Key:

"●" LED On

"•" LED Off

"\*" LED Flashing

2. Not all of HDMI timings can be converted to SDI, therefore selecting the default EDID settings provides the HDMI source with output timing reference.

3. EDID switch mode/Default EDID setting:

3G → 1080p@60

HD → 1080i@60

Update → 720p@60

4. Due to the fact that the HDMI default timing is mainly set to 480p, there is a possibility that the image will not be displayed correctly as that timing is not supported by SDI. To avoid this, set the HDMI source input output setting to "Automatic" so that the source equipment will receive the native EDID settings of the display.

5. The EDID update procedure only needs to be done for Nos. 4,8,12,16,20 & 24. (please refer to "EDID Update button" in section 6.3).

6. When the HDMI input source signal has content that is HDCP encrypted the EDID Update and Video Lock LEDs will both flash, the other LEDs will not illuminate and no image will be displayed.



EDID Update LED Confirmation Status									
No.	EDID	EDID	Single LED			EDID	Video	HDMI	Description
	Switch	key	3G	HD	SD	Update	Lock	/DVI	
1	Update	Pressed On	●	•	•	●	●	●	3G Native, HDMI mode, Read OK
2	Update	Pressed On	•	●	•	●	●	●	HD Native, HDMI mode, Read OK
3	Update	Pressed On	•	•	●	●	●	●	SD Native, HDMI mode, Read OK
4	Update	Pressed On	•	•	•	●	●	●	No support timing, HDMI mode, Read OK
5	Update	Pressed On	●	•	•	●	●	•	3G Native, DVI mode, Read OK (Note4)
6	Update	Pressed On	•	●	•	●	●	•	HD Native, DVI mode, Read OK (Note4)
7	Update	Pressed On	•	•	●	●	●	•	SD Native, DVI mode, Read OK (Note4)
8	Update	Pressed On	•	•	•	●	*	•	EDID format error (Note5)
9	Update	Pressed On	•	•	•	*	•	•	No connection or connection error

Note

1. Key:

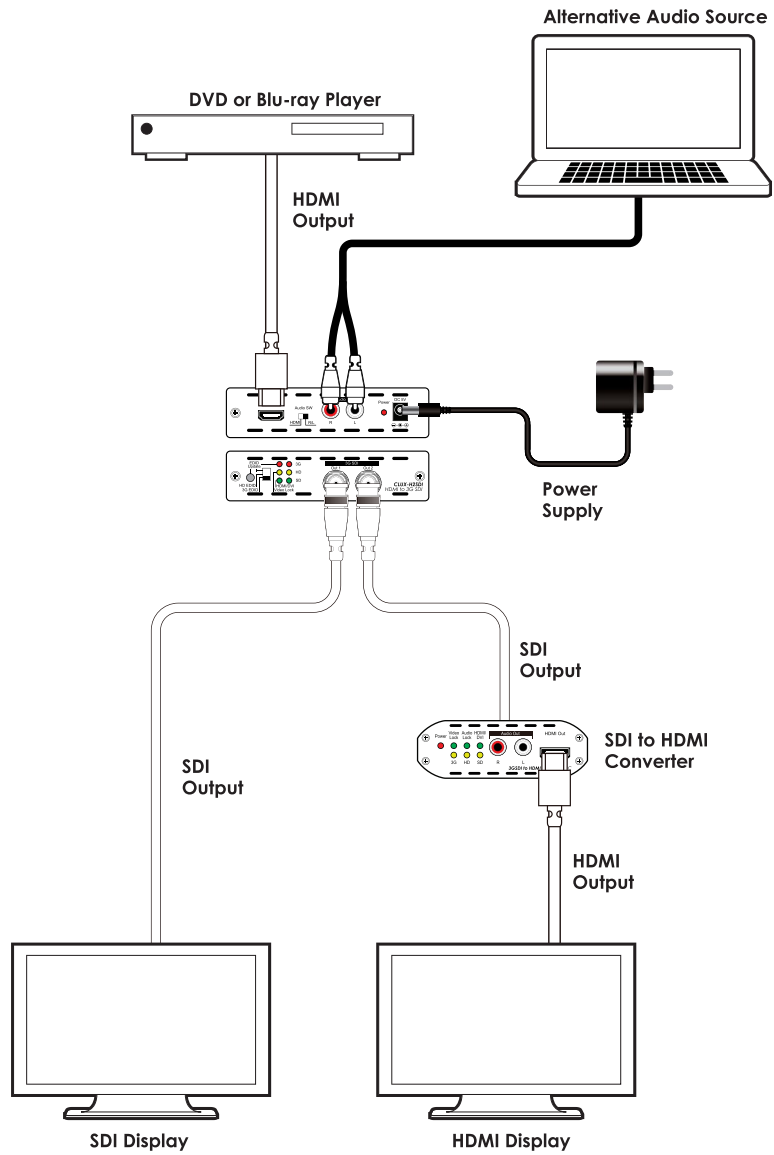
"●" LED On

"•" LED Off

"\*" LED Flashing

- Only when the EDID button is being pressed and hold constantly will the EDID update progress. When the update is complete the Video Lock LED will illuminate. If the button is not pressed the LED will illuminate according to "System Operation LED Signal Status".
- The output HDMI source's output resolution is based on output display monitor/TV's EDID settings but results may vary with different sources. The EDID update function is designed to resolve compatibility issue such as these.
- When DVI EDID settings are detected, the system will check if the EDID's native mode supports SDI timing. If it does, the image will be displayed in the formats in No. 5,6 & 7. If not, the system will automatically copy the default DVI EDID (Native 3G) mode and displayed in the format in No. 5.
- EDID format errors include: Header error, Checksum error and EDID error. Under this condition the default EDID or the updated EDID will not be updated.

## 7. CONNECTION DIAGRAM





## 8. SPECIFICATIONS

<b>SDI Transmission Rates</b>	2.970 Gbps, 2.970/1.001Gbps, 1.485 Gbps, 1.485/1.001Gbps & 270 Mbps
<b>Video Bandwidth</b>	225 MHz/6.75Gbps
<b>Input</b>	1×HDMI, 1×Stereo Audio (R/L)
<b>Output</b>	2×BNC (SD/HD/3G-SDI) 480i@59.94, 576i, 720p@50/59.94/60
<b>HDMI Timing Support</b>	1080i@50/59.94/60 1080p@23.98/24/25/29.97/30/50/59.94/60 SD-SDI: SMPTE 259M-C, 270 Mbit/s HD-SDI:
<b>SDI Timing Support</b>	SMPTE 292M, 1.485 & 1.485/1.001 Gbit/s 3G-SDI: SMPTE 424M/425M-AB, 2.970 & 2.970/1.001 Gbit/s
<b>SDI Cable Distance</b>	3G/HD/3G-SDI up to 100 /200/300 meters with BELDEN 1694A Cable
<b>Power Supply</b>	5V DC/2.6 A (US/EU standards, CE/FCC/UL certified)
<b>ESD Protection</b>	Human-body Model: ±8kV (air-gap discharge) ±4kV (contact discharge)
<b>Dimensions</b>	125mm (W)×115mm (D)×30mm (H)
<b>Weight</b>	275g
<b>Chassis Material</b>	Metal
<b>Silkscreen Color</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>	5.5 W

**Note:** SDI supports SD resolutions of 480i@59.94 and 576i@50 only. If the input source is sending an incompatible resolution, this may cause problems with the image or no image to be displayed. Please ensure that the source device is set to output in a compatible resolution.



## 9. ACRONYMS

ACRONYM	COMPLETE TERM
<b>3G</b>	Bandwidth 2.97Gbps $\approx$ 3G
<b>DVI</b>	Digital Visual Interface
<b>HDCP</b>	High-bandwidth Digital Content Protection
<b>HDMI</b>	High Definition Multimedia Interface
<b>SDI</b>	Serial Digital Interface







**CYPRESS TECHNOLOGY CO., LTD**  
Home page: <http://www.cypress.com.tw>