

# CV-513ZK-BI

12G/6G/3G/HD-SDI and HDMI 2.0 Bi-directional  
Converter with Audio Embedder & Extractor

User Manual



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## INTRODUCTION

The **CV-513ZK-BI 12G/6G/3G/HD-SDI and HDMI 2.0 Bi-directional Converter with Audio Embedder & Extractor** provides a professional way to convert HDMI 2.0 to 12G/6G/3G/HD SDI & 12G/6G/3G/HD-SDI to HDMI 2.0 in real time. The conversion between SDI and HDMI is pure digital and guarantees no loss transformation for both audio and video. Plus, with up to 8 channels audio support, 7.1 channel or 5.1 channel audio becomes available. The CV-513ZK-BI also provides one low jitter SDI output and to provide more flexible application possibility, CV-513ZK-BI is also equipped with high quality analog stereo embedder & extractor. With the use of CV-513ZK-BI, the most popular uncompressed video interface in the consumer world is readily available for professional SDI equipment!

## FEATURES

- Supported high-definition (HD) formats:  
720p@50,720p@59.94, 720p@60, 1080i@50, 1080i@59.94, 1080i@60, 1080p@23.97, 1080p@24, 1080p@25, 1080p@29.97, 1080p@30, 1080p@50, 1080p@59.94, 1080p@60, 4K2K@23.98, 4K2K@24, 4K2K@25, 4K2K@29.97, 4K2K@30, 4K2K@50, 4K2K@59.94, 4K2K@60,  
Bit Rate: 11.88 Gbps, 11.88/1.001 Gbps, 5.94 Gbps, 5.94/1.001 Gbps, 2.97 Gbps, 2.97/1.001 Gbps, 1.485 Gbps, 1.485/1.001 Gbps, 270 Mbps
- Auto 12G/6G/3G/HD-SDI detection
- Support HDMI 2.0 & below
- Supports analog stereo embedder & extractor



- ONLY supports format converter. NOT support frame rate conversion & scaling.
- ONLY supports two-sample interleave sampling scheme. NOT support Square Division method.
- NOT support SD-SDI
- NOT support 3G-SDI level B
- 4K2K@24/25/30Hz RGB or YCbCr 4:4:4 deep color signal can NOT be converted to YCbCr 4:2:2, only bypass to display.

## PACKAGE CONTENTS

- 1x CV-513ZK-BI
- 1x 5V power adapter
- 1x User Manual

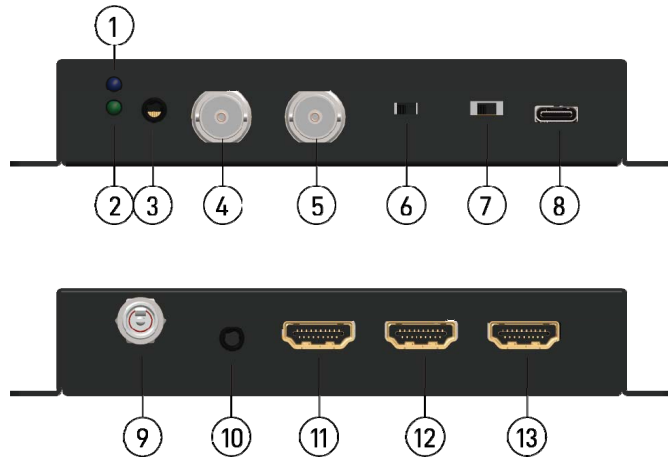
## SPECIFICATIONS

Model Name	CV-513ZK-BI
<b>Technical</b>	
SDI standards	12G/6G/3G/HD-SDI
HDMI standards	HDMI 2.0
Auto 12G/6G/3G/HD-SDI detection	Yes
Video bandwidth	[SDI][ 11.88 Gbps, 11.88/1.001 Gbps] [HDMI] [up to 18Gbps]
Video support	[12G] 4K2K @50/59.94/60Hz [6G] 4K2K @23.98/24, 25, 29.97, 30Hz [3G] 1080p50/59.94/60 [HD] – 720p @50/59.94/60Hz,1080i @50/59.94/60Hz, 1080p @23.98/24/25/29.97/30Hz [HDMI ] up to 4K2K@60
Input signal	1x SDI + 1x HDMI + 1x Audio
Output signal	2x HDMI + 1x SDI + 1x Audio
Output impedance(SDI)	75Ω
Synchronization mode	Internal synchronization or external synchronization
Eye pattern characteristics	[12G-SDI] Timing jitter: 0.29 UI, Alignment jitter: 0.13 UI [6G-SDI] Timing jitter: 0.18 UI, Alignment jitter: 0.06 UI [3G-SDI] Timing jitter: 0.09 UI, Alignment jitter: 0.03 UI
Cable equalization	[12G-SDI] up to 70m [6G-SDI] up to 100m [3G-SDI] up to 190m [HD-SDI] up to 300m
Audio support	[Analog Audio] Support 2ch [HDMI] Surround Sound(up to 7.1ch)
PCB stack-up	6-layer board [impedance control — differential 100Ω; single 50Ω]
Input	1x BNC [SDI] + 1x HDMI + 1x Audio Jack
Output	2x HDMI + 1x BNC [SDI] + 1x Audio Jack
BNC connector	75Ω inter-locked socket
HDMI connector	Type A [19-pin female]
<b>Mechanical</b>	
Housing	Metal enclosure
Dimensions [L x W x H]	Model Package Carton
Weight	Model Package
Power supply	5V DC
Power consumption	Watts [max]
Operation temperature	0~40°C [32~104°F]

Storage temperature  
Relative humidity

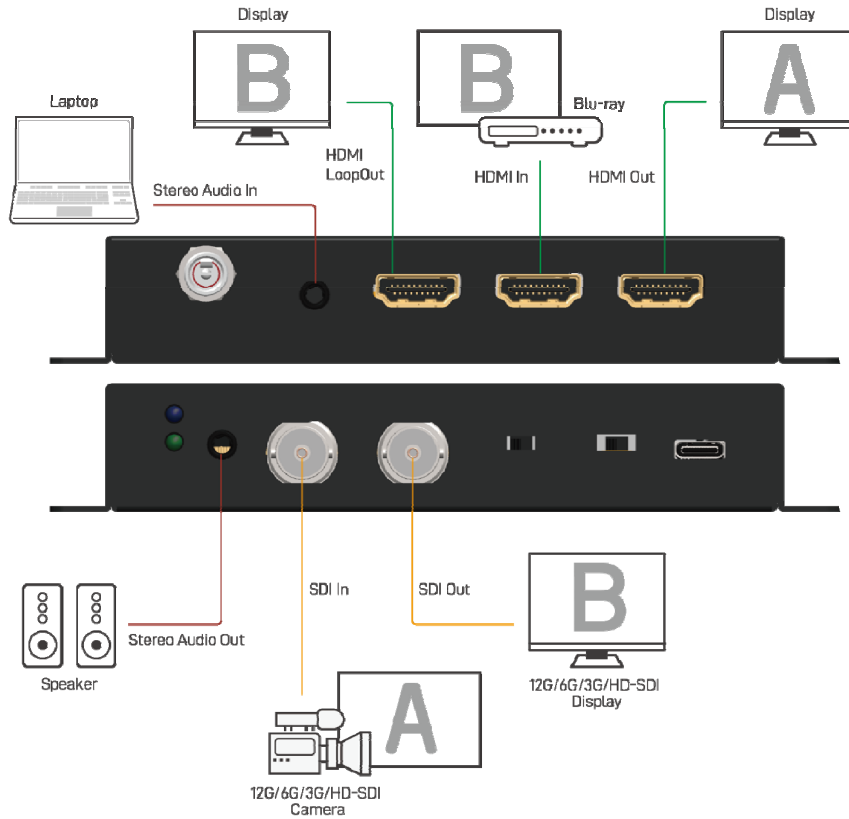
-20~60°C [-4~140°F]  
20~90% RH [no condensation]

## PANEL DESCRIPTIONS



1. **LED:** Power LED indicator
2. **LED:** Signal LED indicator
3. **Stereo Audio Output:** Stereo audio extracts from SDI or HDMI input
4. **SDI IN:** 12G/6G/3G/HD-SDI input
5. **SDI OUT:** 12G/6G/3G/HD-SDI output
6. **Slide Switch:**
  - [Right] Convert HDMI to SDI
  - [Left] Convert SDI to HDMI
7. **Slide Switch:**
  - [Right] F/W update
  - [Mid] Select SDI audio source from HDMI input audio
  - [Left] Select SDI audio source from stereo audio input
8. **USB-C:** for F/W update
9. **+5V DC:** Connect to a 5V DC power supply.
10. **Stereo Audio Input:** Stereo audio embeds to SDI out
11. **HDMI LOOPOUT:** Connect to a HDMI display with a HDMI male-male cable here.
12. **HDMI IN:** Connects to a HDMI source with a HDMI male-male cable
13. **HDMI OUT:** Connect to a HDMI display with a HDMI male-male cable here.

## CONNECTION DIAGRAM



## SUPPORTED RESOLUTIONS

12G-SDI Output	
4K2K @ 50/59.94/60Hz	SMPTE ST-2082
6G-SDI Output	
4K2K @ 23.98/24, 25, 29.97, 30Hz	SMPTE ST-2081
3G-SDI Output	
1080p @ 50 / 59.94 / 60Hz	SMPTE 424M, SMPTE 425M
HD-SDI Output	
720p @ 50Hz	SMPTE 296M -3
720p @ 60 / 59.94Hz	SMPTE 296M -1, -2
1080i @ 50Hz	SMPTE 274M -6
1080i @ 60 / 59.94Hz	SMPTE 274M -4, -5
1080p @ 24 / 23.98Hz	SMPTE 274M -10, -11
1080p @ 25Hz	SMPTE 274M -9
1080p @ 30 / 29.97Hz	SMPTE 274M -7, -8

## WARRANTY

The SELLER warrants the **CV-513ZK-BI 12G/6G/3G/HD-SDI and HDMI 2.0 Bi-directional Converter with Audio Embedder & Extractor** to be free from defects in the material and workmanship for 1 year from the date of purchase from the SELLER or an authorized dealer. Should this product fail to be in good working order within 1 year warranty period, The SELLER, at its option, repair or replace the unit, provided that the unit has not been subjected to accident, disaster, abuse or any unauthorized modifications including static discharge and power surges.

Unit that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for 90 days from the day of reshipment to the BUYER. If the unit is delivered by mail, customers agree to insure the unit or assume the risk of loss or damage in transit. Under no circumstances will a unit be accepted without a return authorization number.

The warranty is in lieu of all other warranties expressed or implied, including without limitations, any other implied warranty or fitness or merchantability for any particular purpose, all of which are expressly disclaimed.

Proof of sale may be required in order to claim warranty. Customers outside Taiwan are responsible for shipping charges to and from the SELLER. Cables are limited to a 30 day warranty and cable must be free from any markings, scratches, and neatly coiled.

The content of this manual has been carefully checked and is believed to be accurate. However, The SELLER assumes no responsibility for any inaccuracies that may be contained in this manual. The SELLER will NOT be liable for direct, indirect, incidental, special, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. **Also, the technical information contained herein regarding the CV-513ZK-BI features and specifications is subject to change without further notice.**