

**Kramer Electronics, Ltd.**



# **USER MANUAL**

**Model:**

**FC-331**

*SD/HD-SDI to HDMI Converter*

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## 1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront video, audio, presentation, and broadcasting professionals on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear in 14 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Video Products; GROUP 12: Digital Signage; GROUP 13: Audio; and GROUP 14: Collaboration.

Thank you for purchasing the Kramer DigiTOOLS® **FC-331 SD/HD-SDI to HDMI Converter**, which is ideal for:

- Home theater, presentation and multimedia applications
- Rental and staging
- SD/HD-SDI to HDMI Converter for medical equipment

The package includes the following items:

- **FC-331**
- Power supply (5V DC input)

## 2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual



Go to [www.kramerav.com/downloads/FC-331](http://www.kramerav.com/downloads/FC-331) to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

### 2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighbouring electrical appliances that may adversely influence signal quality
- Position your **FC-331** away from moisture, excessive sunlight and dust



This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

## 2.2 Safety Instructions



**Caution:** There are no operator serviceable parts inside the unit

**Warning:** Use only the power cord that is supplied with the unit

**Warning:** Do not open the unit. High voltages can cause electrical shock! Servicing by qualified personnel only

**Warning:** Disconnect the power and unplug the unit from the wall before installing

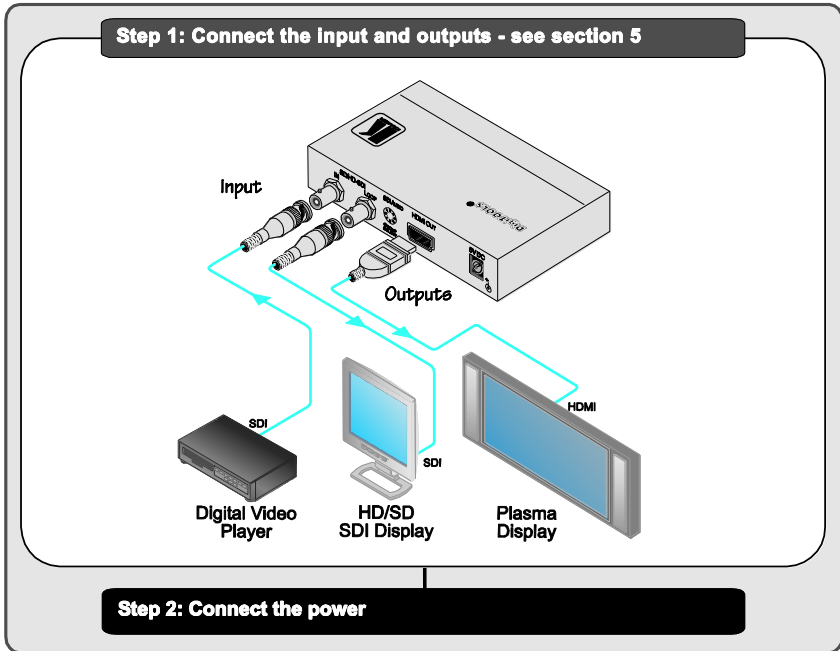
## 2.3 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at

<http://www.kramerelectronics.com/support/recycling/>.

## 2.4 Quick Start

This quick start chart summarizes the basic setup and operation steps.



### 3 Overview

The **FC-331 SD/HD-SDI to HDMI Converter** is a high-performance format converter for SDI (SMPTE 259M), HD-SDI (SMPTE 292M), and 3G HD-SDI (SMPTE 424M) signals. It converts an SDI (Level A) audio and video signal to an HDMI output signal with the same resolution and frame rate<sup>1</sup>.

The **FC-331** features:

- An SD/HD-SDI/3G HD-SDI input on a BNC connector
- An SDI loop on a BNC connector and an HDMI output
- HDTV compatibility
- Automatic active input LED indicators on the front panel. Green indicates a standard definition (SDI) input signal and blue indicates a high-definition (HD-SDI) input signal
- 5V DC power
- Medical equipment compliance

#### 3.1 Accessory to Medical Equipment (IEC 60601-1)

In the modern medical environment remote access is essential, for example, to transfer clinical data between doctors and to train to medical students.

The **FC-331** is certified according to the IEC 60601-1-2, Clause 2.1.3, Medical Electrical Equipment, Part 1: General Requirements for EMC standard which is required when accessory devices are used at locations where medical personnel and patients are present.

The **FC-331** constitutes an optional component that can be considered necessary and suitable as part of medical equipment or for use as part of a medical system to provide real time simultaneous video feeds to those present at the local medical environment and at remote locations. In this environment, the **FC-331** can be added to the system **ONLY** if the connecting equipment has been evaluated and meets the IEC 60601-1-2 EMC standards. Note, that when attaching accessory devices to a digital or analog interface, they must comply with the IEC standard for which they are used: EMC Standard (IEC 60601-1-2), Information Technology equipment (IEC 60950-1 (2ed)).

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<sup>1</sup> No scaling is performed

## 4 Your FC-331 SD/HD-SDI to HDMI Converter

Figure 1 and Table 1 define the FC-331 SD/HD-SDI to HDMI Converter:

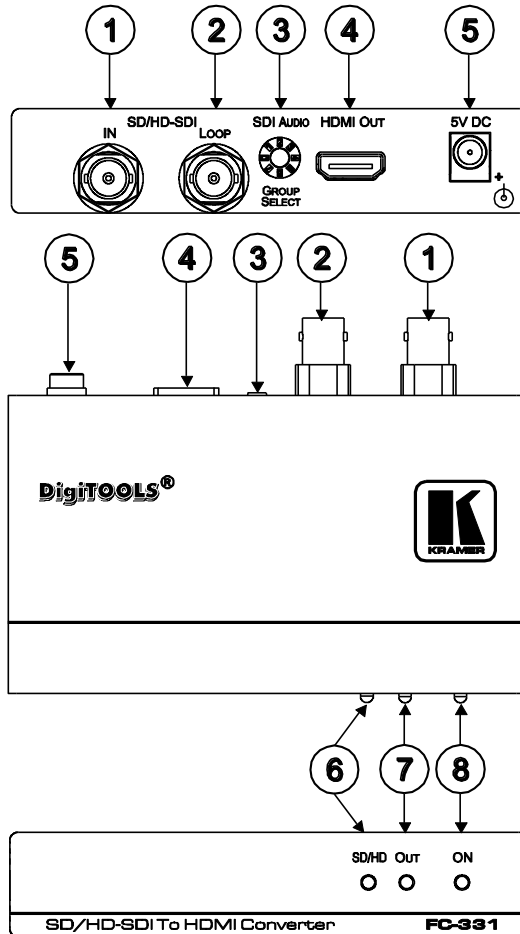


Figure 1: FC-331 SD/HD-SDI to HDMI Converter



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Your FC-331 SD/HD-SDI to HDMI Converter

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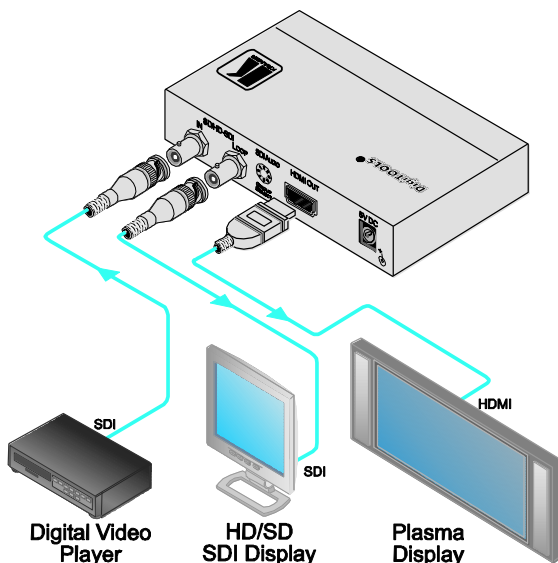
*Table 1: FC-331 SD/HD-SDI to HDMI Converter Features*

#	Feature	Function
1	<i>SD/HD-SDI IN</i> BNC Connector	Connects to an SD or HD-SDI source
2	<i>SD/HD-SDI LOOP</i> BNC Connector	Connects to an SD or HD-SDI acceptor
3	<i>SDI AUDIO GROUP SELECT</i>	Turn to select the SDI input stereo channel (0 to 7)
4	<i>HDMI OUT</i> Connector	Connects to an HDMI acceptor
5	<i>5V DC</i>	+5V DC connector for powering the unit
6	<i>SD/HD</i> LED	Illuminates green for an SD input signal and blue for an HD-SDI input signal
7	<i>OUT</i> LED	Illuminates green to indicate that a display is connected
8	<i>ON</i> LED	Illuminates green when receiving power

## 5 Connecting the FC-331 SD/HD-SDI to HDMI Converter

To connect the **FC-331**, as the example in *Figure 2* illustrates, do the following<sup>1</sup>:

1. Connect the SD/HD-SDI IN connector to a digital video source (for example, a digital video player).
2. Connect the SD/HD-SDI LOOP connector to a digital acceptor (for example, a digital display).
3. Connect the HDMI connector to an HDMI acceptor (for example, a plasma display).
4. Using a small screwdriver, turn the SDI AUDIO GROUP SELECT rotary switch to select an SDI stereo channel<sup>2</sup> from 0 to 7.
5. Connect the 5V DC power adapter to the power socket and connect the adapter to the mains electricity (not illustrated in *Figure 2*).



*Figure 2: Connecting the FC-331 SD/HD-SDI to HDMI Converter*

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1 Switch OFF the power on each device before connecting it to your FC-331. After connecting your FC-331, switch on its power and then switch on the power on each device

2 SDI audio is made up of 16 channels of audio information or 8 stereo pairs. Whereas most other devices access a group of 2-pairs, the FC-331 accesses a single pair out of a group for higher discrimination

## 6 Technical Specifications

The **FC-331** technical specifications are shown in *Table 2*:

*Table 2: Technical Specifications<sup>1</sup> of the FC-331 SD/HD-SDI to HDMI Converter*

INPUT:	1 SD/HD-SDI, 3G HD-SDI (Level A) on a BNC connector
OUTPUTS:	1 SD/HD-SDI, 3G HD-SDI (Level A) loop on a BNC connector, 1 HDMI connector
MAX DATA RATE:	Up to 3Gbps
STANDARD COMPLIANCE:	HDMI
INDICATOR LEDS:	SD/HD, OUT, ON
POWER SOURCE:	5V DC, 400mA
DIMENSIONS	12cm x 7.2cm x 2.4cm (4.7" x 2.8" x 1.0") W, D, H
WEIGHT:	0.3kg (0.7lbs)
ACCESSORIES:	Power supply
OPTIONS:	19" rack mount adapter

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<sup>1</sup> Specifications are subject to change without notice

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## LIMITED WARRANTY

The warranty obligations of Kramer Electronics for this product are limited to the terms set forth below:

### What is Covered

This limited warranty covers defects in materials and workmanship in this product.

### What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

### How Long Does this Coverage Last

Seven years as of this printing; please check our Web site for the most current and accurate warranty information.

### Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

### What Kramer Electronics will do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

### What Kramer Electronics will not do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

### How to Obtain a Remedy under this Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, please visit our web site at [www.kramerelectronics.com](http://www.kramerelectronics.com) or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required. You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

### Limitation on Liability

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

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### Other Conditions

This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, please visit our Web site at [www.kramerelectronics.com](http://www.kramerelectronics.com) or contact a Kramer Electronics office from the list at the end of this document.

Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.



For the latest information on our products and a list of Kramer distributors, visit our Web site: [www.kramerAV.com](http://www.kramerAV.com), where updates to this user manual may be found. We welcome your questions, comments and feedback.



**Caution**

**Safety Warning:**

Disconnect the unit from the power supply before opening/servicing.



P/N:



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Rev:



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