Kramer Electronics, Ltd.

USER MANUAL

Model:

FC-46xl

HDMI Audio De-Embedder

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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 the video, audio, presentation, and broadcasting professional 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 11 groups[1] that are clearly defined by function.

Congratulations on purchasing your Kramer DigiTOOLS® **FC-46xl** *HDMI*[2] *Audio De-Embedder* which incorporates HDMI® technology and is ideal for:
- Home theater, presentation and multimedia applications
- Rental and staging

The package includes the following items:
- **FC-46xl** HDMI Audio De-Embedder
- Power adapter[3] (5V DC output)
- This user manual[4]

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
- Use Kramer high performance high resolution cables[5]

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1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; 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 Products

2 High-Definition Multimedia Interface

3 As an option, you can purchase the Kramer VA-100P-5 10 Port Universal 5-Volt Power Supply, enabling you to supply power to up to 10 Kramer devices that require 5V DC

4 Download up-to-date Kramer user manuals from our Web site at http://www.kramerelectronics.com

5 The complete list of Kramer cables is available at http://www.kramerelectronics.com

2.1 Quick Start

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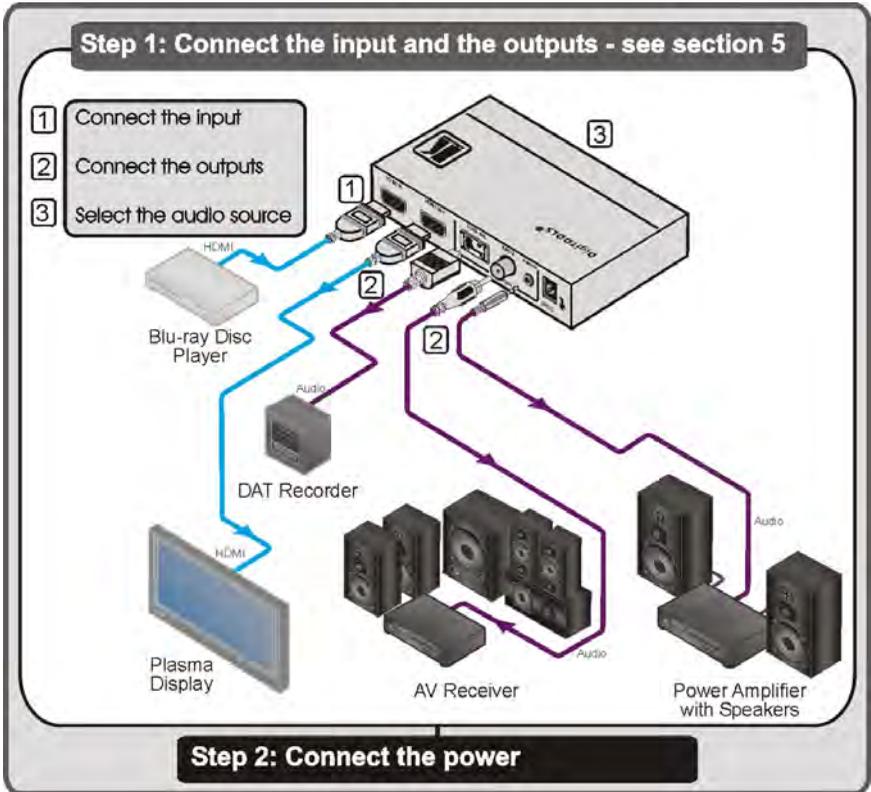
3 Overview

The **FC-46xl** *HDMI Audio De-Embedder* accepts an HDMI input signal, de-embeds the audio signal from either the HDMI input or the audio return channel (HDMI output), and transfers the audio signal simultaneously to:

- The HDMI output
- A digital audio S/PDIF output
- An optical TOSLINK® audio output
- An analog output

Note: When there are more than two channels of audio (for example, 5.1), it is available only on the digital outputs and the analog output is disabled.

In particular, the **FC-46xl**:

- Lets you connect your HDMI source to an HDMI display and enjoy high quality digital audio at the same time (for example, when using a high quality AV receiver)
- Features I-EDIDPro™ Kramer Intelligent EDID Processing™ an Intelligent EDID handling and processing algorithm that ensures Plug and Play operation for HDMI systems
- Features input format auto detection; digital RGB or YPbPr
- Supports resolutions up to 1080p@60Hz
- Supports deep color up to 36 bits per pixel at 1080p
- Is 5V DC fed
- Is HDCP compliant

3.1 About HDCP

The High-Bandwidth Digital Content Protection (HDCP) standard (developed by Intel), protects digital video and audio signals transmitted over DVI or HDMI connections between two HDCP-enabled devices to eliminate the reproduction of copyrighted material. To protect copyright holders (such as movie studios) from having their programs copied and shared, the HDCP standard provides for the secure and encrypted transmission of digital signals.

3.2 Defining EDID

The Extended Display Identification Data (EDID[1]) is a data set provided by a display, to describe its capabilities to an HDMI source. The EDID enables the **FC-46xl** to identify what kind of display is connected to the output. The

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1 Defined by a standard published by the Video Electronics Standards Association (VESA)

EDID includes the manufacturer's name, the product type, the timing data supported by the display, the display size, luminance data and (for digital displays only) the pixel mapping data.

3.3 About HDMI

High-Definition Multimedia Interface (HDMI) is an uncompressed, all-digital[1] audio/video interface, widely supported in the entertainment and home cinema industry. It delivers the highest high-definition image and sound quality. Note that Kramer Electronics Limited is an HDMI Adopter[2] and an HDCP Licensee[3]. In particular, HDMI[4]:

- Provides a simple[5] interface between any audio/video source, such as a set-top box, Blu-ray Disc player, or A/V receiver and video monitor, such as a digital flat LCD/plasma television (DTV), over a single[6] cable
- Supports standard, enhanced, high-definition video, and multi-channel digital audio[7] on a single cable
- Transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements
- Benefits consumers by providing superior, uncompressed, High Definition digital video via a single cable[8] with a user-friendly connector
- Is backward-compatible with DVI (Digital Visual Interface)
- Supports two-way communication between the video source (such as a Blu-ray Disc player) and the digital television, enabling new functionality such as automatic configuration and one-button play

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1 Ensuring an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions

2 See http://www.hdmi.org/learningcenter/adopters_founders.aspx

3 See http://www.digital-cp.com/about_dcp/list

4 HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI licensing LLC

5 With video and multi-channel audio combined into a single cable, the cost, complexity, and confusion of multiple cables currently used in A/V systems is reduced

6 HDMI technology has been designed to use standard copper cable construction at up to 15m

7 HDMI supports multiple audio formats, from standard stereo to multi-channel surround-sound. HDMI has the capacity to support Dolby 5.1 audio and high-resolution audio formats

8 HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner

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KRAMER: SIMPLE CREATIVE TECHNOLOGY

HDMI has the capacity to support existing high-definition video formats (720p, 1080i, and 1080p@60Hz), as well as standard definition formats such as NTSC or PAL.

3.4 Recommendations for Best Performance

For best performance we recommend that you:
- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your **FC-46xl** in a location free from moisture and away from excessive sunlight and dust
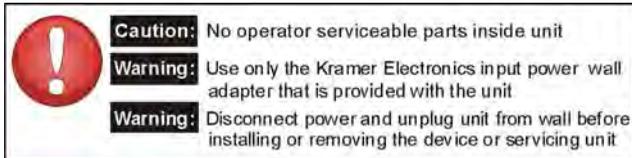
4   Defining the FC-46xl HDMI Audio De-Embedder

Figure 1 and Table 1 define the **FC-46xl** *HDMI Audio De-Embedder.*
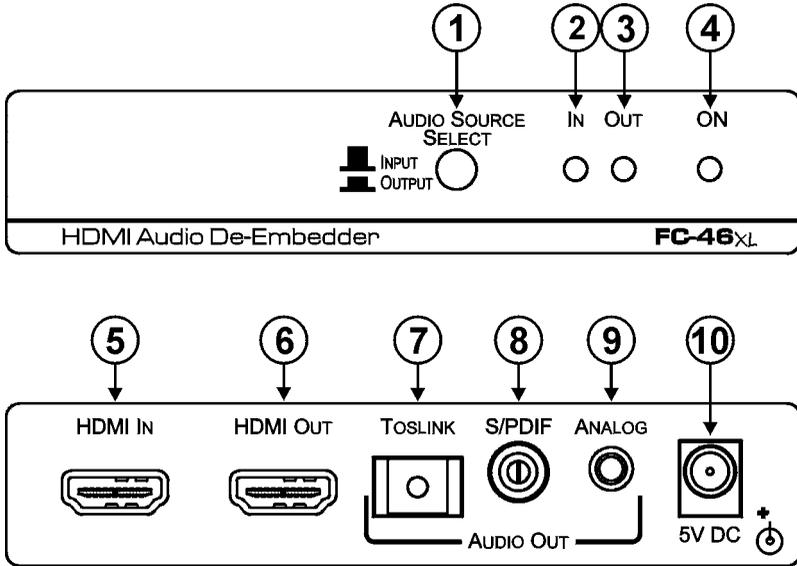
Figure 1: FC-46xl HDMI Audio De-Embedder Front and Rear Panel

Table 1: FC-46xl HMDI Audio De-Embedder Front and Rear Panel Features

#	Feature		Function
1	*AUDIO SOURCE SELECT* Button	*INPUT*	Release to select audio from HDMI IN
		OUTPUT	Press in to select audio from HDMI OUT TV audio return signal
2	*IN* LED		Lights to indicate signal presence at HDMI IN
3	*OUT* LED		Lights to indicate hat an acceptor is connected to HDMI OUT
4	*ON* LED		Lights when the unit is powered on
5	*HDMI IN* Connector		Connect to he HDMI source
6	*HDMI OUT* Connector		Connect to he HDMI acceptor
7	*TOSLINK* Connector	*AUDIO OUT*	Connect to he digital audio acceptor
8	*S/PDIF* RCA Connector		
9	*ANALOG* 3.5 Mini Connector		
10	*5V DC*		+5V DC connector for powering he unit, center posi ive

# 5 Connecting the FC-46xl HDMI Audio De-Embedder
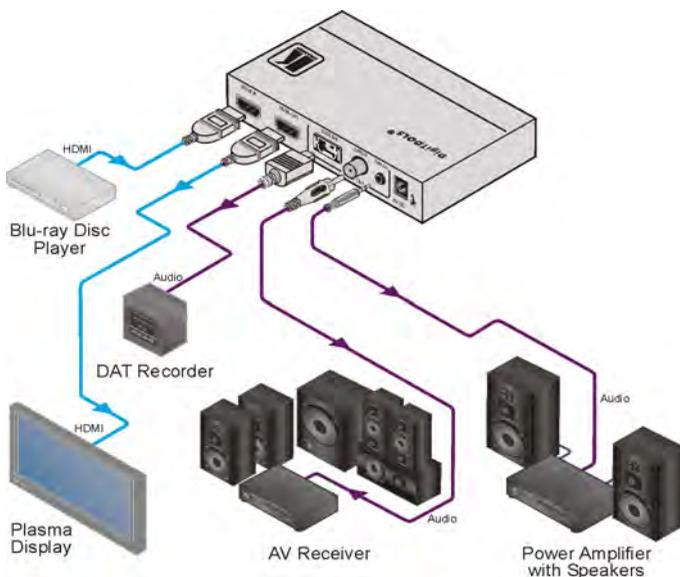
Figure 2: Connecting the FC-46xl HDMI Audio De-Embedder

To connect the FC-46xl as illustrated[1] in the example in Figure 2:

1. Connect the HDMI source (for example, a Blu-ray Disc player) to the HDMI IN connector.

2. Connect the HDMI OUT connector to the HDMI acceptor (for example, a plasma display).

3. Connect the audio output(s) to the digital/analog audio acceptor(s), (for example, a surround system).

Note: The analog audio output is disabled when there are more than two channels (for example, 5.1) on the audio input.

4. Using the Audio Source Selector button, select the audio source to be either the HDMI input (button released, audio is taken from the Blu-ray Disc), or the HDMI output (button pressed in, audio is taken from the TV audio return signal).

5. Connect the 5V DC power adapter to the power socket and connect the adapter to the mains electricity (not illustrated in Figure 2).

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1 Switch off the power to each device before connecting it to your FC-46xl After connecting your FC-46xl, switch on its power and then switch on the power to each device

6 Technical Specifications

Table 2 defines the technical specifications[1] of the **FC-46xl**.

Table 2: Technical Specifications of the FC-46xl HDMI Audio De-Embedder

INPUT:	HDMI Connector
OUTPUTS:	1 HDMI Connector 1 TOSLINK® op ical digital audio connector 1 S/PDIF digital audio on an RCA connector 1 Analog audio on a 3.5 mm mini connector
OPERATION FREQUENCY:	Supports up to 2 25Gbps (1080p @60Hz) 36 bit Deep Color
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI[2], HDCP 1.4
CONTROLS:	Audio Source Select button
INDICATOR LEDS:	ON, IN, OUT
POWER SOURCE:	5V DC 600mA
D MENSIONS:	12.4cm x 7cm x 2.4cm (4.9" x 2.8" x 0.94") W, D, H
WEIGHT:	0.4kg (0.88lbs) approx.
ACCESSORIES:	Power supply
OPTIONS:	Kramer 10-Port Universal 5V Power Supply VA-100P-5 RK-3T 19" Rack Adapter

1 Specifications are subject to change without notice

2 Including audio return and deep color

LIMITED WARRANTY

We warrant this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for three years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by us or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics com.

2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.

3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.

2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.

3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.

2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).

3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:

2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:   "Electromagnetic compatibility (EMC);
              generic emission standard.
              Part 1: Residential, commercial and light industry"
EN-50082:   "Electromagnetic compatibility (EMC) generic immunity standard.
              Part 1: Residential, commercial and light industry environment".
CFR-47:   FCC* Rules and Regulations:
              Part 15: "Radio frequency devices
              Subpart B Unintentional radiators"

CAUTION

▶ Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.

▶ Use the supplied DC power supply to feed power to the machine.

▶ Please use recommended interconnection cables to connect the machine to other components.
   * FCC and CE approved using STP cable (for twisted pair products)

⚠ **Caution**

Safety Warning:
Disconnect the unit from the power supply before
opening/servicing.

ISO 9001:2008
IQC
Institute of
Quality & Control
Certified Quality Management System

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