



KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

FC-69

HDMI Audio
Embedder/De-Embedder

P/N: 2900-300451 Rev 1



FC-69 HDMI Audio Embedder/De-embedder Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to <http://bit.ly/k-prod-downloads> to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- ☒ **FC-69** HDMI Audio Embedder/De-Embedder
- ☒ 1 Power supply (5V DC)
- ☒ 4 Rubber feet
- ☒ 1 Quick start guide

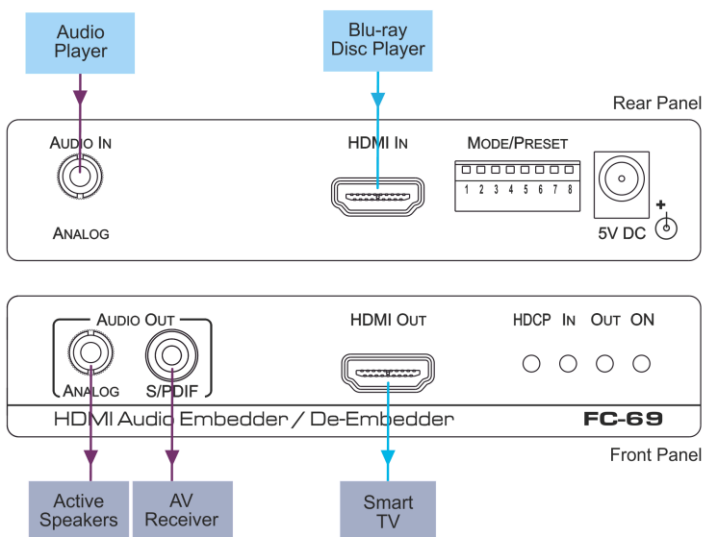


Step 2: Install the Device

Attach the rubber feet and place on a table or mount the **FC-69** in a rack (using an optional **RK-3T** rack adapter).

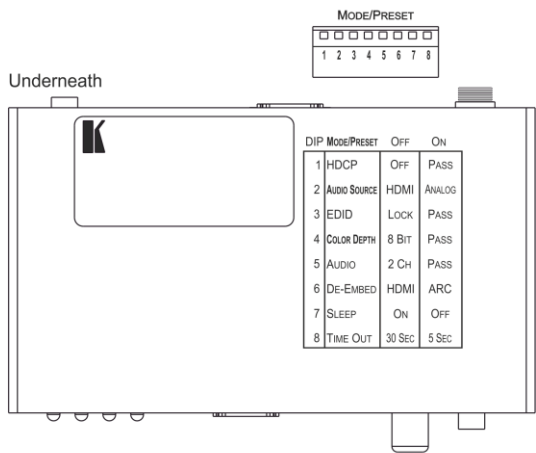
Step 3: Connect the inputs and outputs

Always switch off the power on each device before connecting it to your **FC-69**.



Always use Kramer high-performance cables for connecting AV equipment to the **FC-69**.

Step 4: Set the DIP-switches



Step 5: Connect the power

Connect the 5V DC power adapter to the **FC-69** and plug the adapter into the mains electricity.



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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 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 and GROUP 11: Sierra Video Products; GROUP 12: Digital Signage; and GROUP 13: Audio, and GROUP 14: Collaboration.

Congratulations on purchasing your Kramer **FC-69** *HDMI Audio Embedder/De-Embedder*, which is ideal for the following typical applications:

- Home theater, presentation and multimedia applications
- Rental and staging
- Education and corporate

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 <http://www.kramerav.com/downloads/FC-69> 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 neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **FC-69** 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.



Caution: No operator serviceable parts inside the unit

Warning: Use only the Kramer Electronics input power wall adapter that is provided with the unit

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

2.2 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/>.

3 Overview

The **FC-69** is a high-performance HDMI audio embedder and de-embedder. The device can embed analog audio into the HDMI output, or de-embed audio from the HDMI input or from the HDMI output Audio Return Channel to S/PDIF and analog audio outputs simultaneously.

The **FC-69** lets you connect your HDMI source to an HDMI display and enjoy audio on an external amplifier at the same time.



If the input audio is uncompressed, multi-channel PCM, the analog audio port only transmits the front-left and front-right channels. If the input audio is compressed, only digital audio is output and the analog output is disabled.

In particular, the **FC-69** features:

- A maximum data rate of 8.91Gbps (2.97Gbps per data channel)
- HDTV compatibility up to Ultra HD (4K)
- HDCP compliance
- HDMI support for ARC and up to 7.1 uncompressed audio channels
- Support for deep color
- An unbalanced audio output for de-embedded audio or de-embedding of HDMI 1.4 ARC audio from the output
- S/PDIF digital audio output for de-embedded audio or for de-embedding of HDMI 1.4 ARC audio from the output
- The ability to embed audio even when no video is present
- Re-Klocking—complete regeneration of HDMI video and clock signals
- HDMI power on the output follows the input, (that is, there is no power on the output when there is no active input, with customizable delay)
- DIP-switches for control of embedding, EDID, HDCP and 5V output delay
- EDID locking and modification
- Support for CEC

4 Defining the FC-69

[Figure 1](#) defines the front panel of the **FC-69 HDMI Audio De-Embedder**.

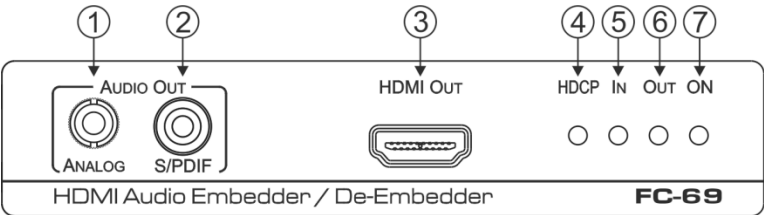


Figure 1: FC-69 Front Panel

#	Feature	Function
1	AUDIO OUT	ANALOG 3.5mm mini jack
2		S/PDIF RCA connector
3	HDMI OUT	Connect to the HDMI acceptor
4	HDCP LED	Lights to indicate that the content is HDCP encoded
5	IN LED	Lights green when there is an active HDMI input
6	OUT LED	Lights green when there is an active HDMI output
7	ON LED	Connect to the HDMI acceptor

[Figure 2](#) defines the rear panel of the **FC-69 HDMI Audio De-Embedder**.

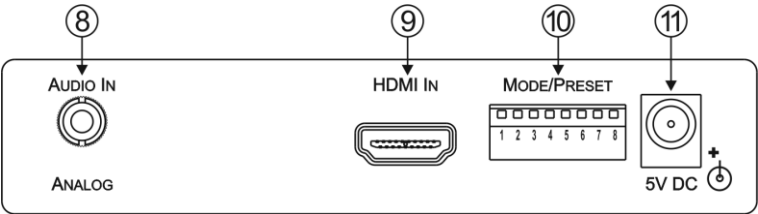


Figure 2: FC-69 Rear Panel

#	Feature	Function
8	AUDIO IN 3.5mm Mini Jack	Connect to the analog audio source
9	HDMI IN Connector	Connect to the HDMI source
10	MODE/PRESET DIP-switch	Use to set the device behavior, (see Section 6.1 and the legend underneath the device)
11	5V DC Power Connector	Connect the 5V DC power adapter

5 Connecting the FC-69



Always switch off the power to each device before connecting it to your **FC-69**. After connecting your **FC-69**, connect its power and then switch on the power to each device.

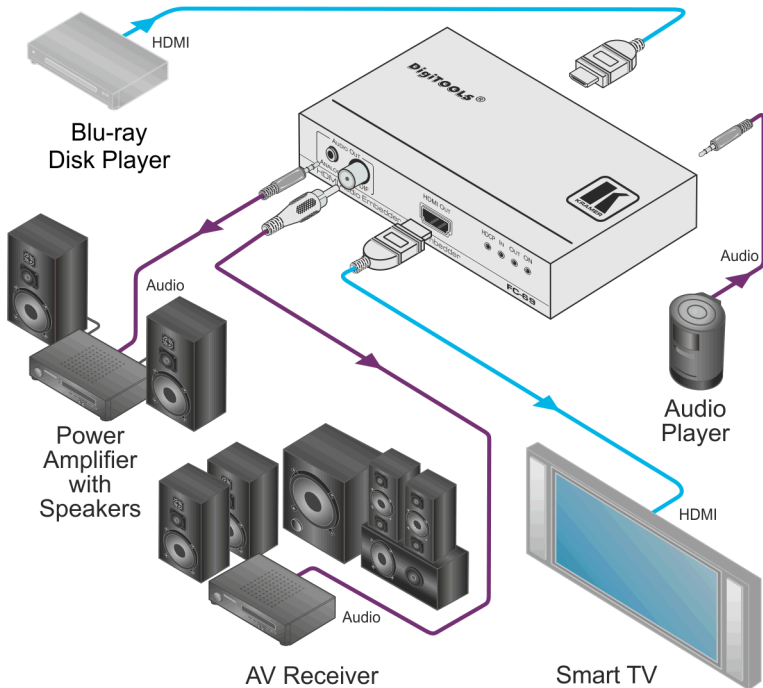


Figure 3: Connecting the FC-69 HDMI Audio Embedder/De-Embedder

To connect the FC-69 as illustrated in the example in [Figure 3](#):

1. Connect the HDMI source, (for example, a Blu-ray disc player) to the HDMI IN connector.
2. Connect the analog audio source, (for example, an audio player) to the Audio IN connector.
3. Connect the HDMI OUT connector to the HDMI acceptor, (for example, a smart TV).

4. Connect the analog audio output to an analog audio acceptor, (for example, a power amplifier with speakers).



If the input audio is uncompressed multi-channel PCM, the analog audio port only transmits the front-left and front-right channels. If the input audio is compressed, only digital audio is output and the analog output is disabled.

5. Connect the S/PDIF audio output to a digital audio acceptor, (for example, an AV receiver).
6. Connect the 5V DC power adapter to the power socket and connect the adapter to the mains electricity (not illustrated in [Figure 3](#)).

6 Operating the FC-69

6.1 Setting the DIP-switches

The following table describes the functions of the DIP-switches.

A DIP-switch that is up is off; one that is down is on. Default is up (off).

#	Mode/Preset	Off	On
1	HDCP	HDCP not supported	Pass HDCP (default)
2	Audio source	HDMI (default)	Analog
3	EDID	Lock the EDID	Pass the EDID (default)
4	Color depth	Limited to 8 bits	Pass (default)
5	Audio	Limit audio to 2 channels LPCM	Pass (default)
6	De-embed	HDMI (default)	ARC Note: When DIP-switch 2 is on, ARC does not work
7	Sleep	On (default)	Off
8	Time Out, (effective only when DIP-switch 7 is off)	30 Seconds (default)	5 Seconds

6.2 LED Status

The following table describes the status of the LEDs.

LED	Off	On
HDCP	Input signal without HDCP	Input signal with HDCP
Out	Output disconnected	Output connected
In	Input invalid	Input valid
On	No power	Power connected

6.3 Audio Extraction

If the source signal contains uncompressed, LPCM, multi-channel audio, the analog audio port only outputs the front-left and front-right channels.

If the source signal contains compressed audio, the analog output is muted.

Note: If an ARC source signal contains compressed audio, the analog output transmits unclear audio.

6.4 Output 5V Control

If the 5V signal output timeout is enabled (via DIP-switch 7), the 5V output is turned off after either 5 or 30 seconds depending on DIP-switch 8, (see [Section 6.1](#)).

7 Technical Specifications

INPUTS:	1 HDMI on an HDMI connector 1 Analog stereo audio on a 3.5mm mini jack
OUTPUTS:	1 HDMI on an HDMI connector 1 S/PDIF digital audio on an RCA connector 1 Analog stereo audio on a 3.5 mm mini jack
OPERATION FREQUENCY:	Supports up to 8.91Gbps (2.97Gbps per graphic channel) 1080p @60Hz, 36-bit Deep Color
AUDIO THD+N:	-75dB
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI, HDCP
CONTROLS:	8-way DIP-switch
INDICATOR LEDS:	ON, IN, OUT, HDCP
POWER SOURCE:	5V DC, 500mA
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing
COOLING:	Convection
ENCLOSURE TYPE:	Aluminium
DIMENSIONS:	12cm x 7.15cm x 2.44cm (4.72" x 2.81" x 0.96") W, D, H
RACK MOUNT:	With optional adapter
FURNITURE MOUNT:	With included rubber feet
PRODUCT WEIGHT:	0.18kg (0.4lbs) approx.
SHIPPING WEIGHT:	0.56kg (1.23lbs) approx.
VIBRATION:	ISTA 1A in carton (International Safe Transit Association)
REGULATORY COMPLIANCE:	CE
ENVIRONMENTAL REGULATORY COMPLIANCE:	Complies with appropriate requirements of RoHs and WEEE
INCLUDED ACCESSORIES:	Power supply
OPTIONS:	RK-3T 19" rack adapter
WARRANTY:	7 years parts and labor
Specifications are subject to change without notice at http://www.kramerelectronics.com	

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 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.

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IF ANY PRODUCT TO WHICH THIS LIMITED WARRANTY APPLIES IS A "CONSUMER PRODUCT" UNDER THE MAGNUSON-MOSS WARRANTY ACT (15 U.S.C.A. §2301, ET SEQ.) OR OTHER APPLICABLE LAW, THE FOREGOING DISCLAIMER OF IMPLIED WARRANTIES SHALL NOT APPLY TO YOU, AND ALL IMPLIED WARRANTIES ON THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE, SHALL APPLY AS PROVIDED UNDER APPLICABLE LAW.

Other Conditions

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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 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.



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We welcome your questions, comments, and feedback.

Web site: www.kramerelectronics.com

E-mail: info@kramerel.com

CE



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing



P/N: 2900-300451



Rev: 1