Kramer Electronics, Ltd.

USER MANUAL

Optical DVI Extension Cable Models:

C-4FDM/4FDM-10

C-4FDM/4FDM-20

C-4FDM/4FDM-30

C-4FDM/4FDM-50

C-4FDM/4FDM-100

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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 Optical DVI Extension Cable, which is available in these models: **C-4FDM/4FDM-10, C-4FDM/4FDM-20, C-4FDM/4FDM-30, C-4FDM/4FDM-50,** and/or **C-4FDM/4FDM-100**.

The unique Kramer Optical DVI Extension Cable is ideal for extending the distance of DVI signals without the need for a Repeater. For example, using the **C-4FDM/4FDM-100** you can extend the range to up to 100 meters.

The package includes the following items:

- Optical DVI Extension Cable: **C-4FDM/4FDM-10, C-4FDM/4FDM-20, C-4FDM/4FDM-30, C-4FDM/4FDM-50,** or **C-4FDM/4FDM-100**
- Two Power adapters (5V DC Input)
- This user manual[2]

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

3 Overview

The Kramer Optical DVI Extension Cable is available in these models:

- **C-4FDM/4FDM-10** (extends to up to 33 ft / 10 meters)
- **C-4FDM/4FDM-20** (extends to up to 66 ft / 20 meters)
- **C-4FDM/4FDM-30** (extends to up to 98 ft / 30 meters)
- **C-4FDM/4FDM-50** (extends to up to 164 ft / 50 meters)
- **C-4FDM/4FDM-100** (extends to up to 328 ft / 100 meters)

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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 Download up-to-date Kramer user manuals from: http://www.kramerelectronics.com

The transmitter can read the display device's EDID (Extended Display Identification Data), and once it is connected to the computer, it provides this data (See section 4.1).

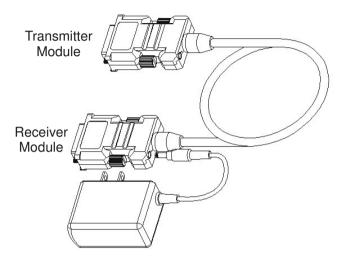Figure 1 illustrates the Kramer Optical DVI Extension Cable:

Figure 1: Optical DVI Extension Cable

3.1 System Requirements for Setup (Hardware)

You must have a DVI graphic controller or card that:

- Has a DVI port in your PC, SUN or Mac system
- Supports the graphic resolution of the display that you want to connect

There are no special requirements regarding:

- The memory size, CPU speed and chipsets, if the DVI graphic controller or card is properly installed
- Software, if the DVI graphic controller or card is properly installed in your operating system

Power Technical Advisory: The Kramer Optical DVI Extension Cable Tx module is designed to use a +5V internal power supplied through a DVI PIN (#14) from the graphic card. The Tx module also has a power anti-switching circuit to protect from plugging in an external power supply while it is powered through the DVI PIN. The Rx module requires an external 5V DC power supply.

3.2 Achieving best performance

To achieve the best performance:

- 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 and position your Kramer **C-4FDM** away from moisture, excessive sunlight and dust

Caution – No operator-serviceable parts inside unit.

Warning – Use only the Kramer Electronics input power wall adapter that is provided with this unit[1].

Warning – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

Since your **C-4FDM** Optical DVI Extension Cable is an active electronic device (and not just an ordinary cable) its future removal or replacement may be necessary. Accordingly, we advise against installing it permanently as part of an installation. When a permanent installation is required, alternative detachable products—such as the Kramer **610T/R**, **621T/R** and **622T/R**—are available.

4 Using Your Optical DVI Extension Cable

This section describes how to:

- Capture the EDID of the display device (see section 4.1)
- Install the Optical DVI Extension Cable (see section 4.2)
- Avoid pitfalls when using it (see section 4.3)

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1 For example, part number 99-9090510 or 99-9090512

4.1 The Display Device EDID

The EDID of the display device is captured by the transmitter for the computer to read.

4.1.1   Defining EDID

The Extended Display Identification Data (EDID[1]) is a data-structure, provided by a display, to describe its capabilities to the DVI graphics source (for example, the graphics card of the computer). The EDID enables the computer to "know" what kind of monitor is connected to the output. The EDID includes the manufacturer's name, the product type, the phosphor or filter type, the timing data supported by the display, the display size, luminance data and, for digital displays only, the pixel mapping data.

4.1.2   Capturing the Virtual EDID

The factory default EDID is set to UXGA (1600x1200) 60Hz. You can capture the EDID of the display device on the transmitter so that when the computer connects to the transmitter, it will read this EDID information[2] and identify the display device. This procedure is performed only once for the connected display device. After storing the EDID, the system can be connected and disconnected without having to set the EDID again. If the display device is replaced, the new EDID should be set on the transmitter transmitter.

To capture the EDID of a display device, do the following:

1. Carefully remove your Optical DVI Extension Cable from its packaging.

2. Connect the 5V power adapter to the power socket of the transmitter, and connect the adapter to the mains electricity.
   The blue indication LED lights.

3. Push the EDID button (illustrated in Figure 2), using a thin screwdriver or pin.
   The blue LED blinks twice and then no longer lights.
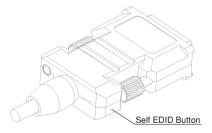
Self EDID Button

Figure 2: The EDID Button on the Transmitter Module

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1 EDID is defined by a standard published by the Video Electronics Standards Association (VESA)

2 The "virtual" EDID. This is the EDID of the display device, now stored in the Optical Extension Cable

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4. Connect the transmitter unit **directly** to the powered display device.
   The LED blinks several times while reading the EDID and then no longer lights.

5. Disconnect the transmitter from the display.

> When connecting to a different display, you can repeat steps 2 to 4 to capture the new EDID.

6. Disconnect the transmitter.
   The EDID information is now stored and the blue LED is on.

4.2 Installing Your Optical DVI Extension Cable

To connect the Optical DVI Extension Cable, do the following:

1. Connect the 5V power adapter to the power socket of the Receiver, and connect the adapter to the mains electricity.

2. Turn ON the power on both the computer and the display device.

3. Connect the transmitter to the DVI connector on the PC, and make sure that the blue LED lights, indicating that it is powered by the DVI pin (#14) from the graphic card.
   If the blue LED does not light, connect the 5V power adapter[1].

> Connect the DVI Extension cable directly to the PC and the display.
> Do NOT use any intermediate cable or adapter between them.

4. Plug the Receiver module of the Optical DVI Extension Cable into the DVI display receptacle.

5. From the start menu on your PC, select Control Panel and then Display. In the Settings tab of the Display window, set the correct resolution (for your display).

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1 when using a laptop or a PC with a PCI Express graphic card, it is best to use the 5V power adapter

4.3 Avoiding Pitfalls using the Optical DVI Extension Cable

Be aware of the following:

- **If the display device shows only a black screen** – be sure that the DVI ports are firmly plugged into the computer and the display device, and be sure that the Transmitter and Receiver modules are correctly plugged into the PC and display device, respectively.
  Make sure that the Self EDID process was performed correctly.
  Check if the PC and display are powered ON and properly booted. Reset the system by unplugging and then replugging the Transmitter DVI port or Receiver DVI port. Reboot the system while connecting the optical DVI cable system

- **Screen is distorted or displays noises** - check if the graphics resolution is properly set. Go to the Windows Display Properties and the settings tab. Be sure that the resolution sets less than WUXGA (1,920x1,200) at 60Hz refresh ratio. Reset the system. Disconnect and reconnect the optical DVI cables and the DC power adapters

- **Maintenance** - these cables contain sensitive fiber optic materials that can be damaged through rough handling. Use caution during the installation and use of these cables to ensure that you do not damage them. Do not install the cable in any environment where it is possible they could be stepped on, run over, pinched or crushed

- Make sure that the cables are stored and used away from liquid or dirt

5 Technical Specifications

Table 1 includes the technical specifications:

Table 1: Technical Specifications[1]

Compliance with DVI Standard:	Supports DVI1.0 and DDC2B, fully implemented by fiber-optic communication
Extension Limit:	Available up to 100m (>320 feet) for UXGA (1600 x 1200) at 60Hz refresh rate; can be custom made up to 500m (1640 feet)
Graphic Transmission Bandwidth:	Supports WUXGA at 60Hz or 1.65Gbps bandwidth per graphic channel
Pure 4-strand Fiber-optic Cable:	UL certified Riser Jacket of flame retardant PVC employing 4 strands
Tensile Load:	600N (cable only)
Minimum Bend Radius:	12cm
Outer Diameter of Cable:	5.5mm
Dimensions:	39mm / 15.4mm / 52.3mm (W/H/D)
Power Source:	5V DC, 175mA each (total for both transmitter and receiver is 350mA)
Clamping Strength to Cable:	14kg (installing)$_f$
Operating Temperature:	0℃ to 50℃
Storage Temperature:	- 30℃ to 70℃
Humidity:	10% to 85%

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1 Specifications are subject to change without notice

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LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for one year 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 Kramer, 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)

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

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