



KRAMER ELECTRONICS LTD.

USER MANUAL

MODELS:

616T

Dual-Link Detachable Optical
DVI Transmitter

616R

Dual-Link Detachable Optical
DVI Receiver

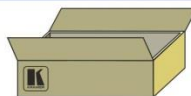


616T/R Quick Start Guide

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

- ☒ **616T/R** Two-Fiber Detachable Optical DVI Transmitter Receiver
- ☒ 2 Power supplies (5V DC)
- ☒ 1 Quick Start sheet

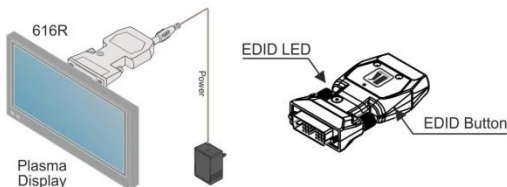


Save the original box and packaging in case you need to return your **616T/R** to the factory for service.

Step 2: Capture the EDID

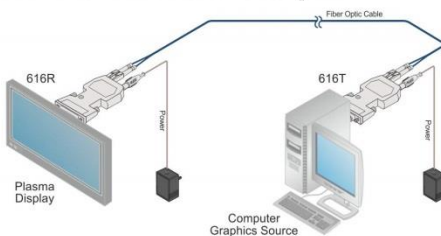
Capture the EDID of the display device if the display has a resolution different than 2560x1600.

1. Connect the power to the display.
2. Connect the power to the **616T**.
3. Push the EDID button.
4. Connect the **616T** directly to the display device (the LED flashes and turns off after about 7-8 seconds).
5. When the LED is off, disconnect the **616T** from the display.



Step 3: Connect the transmitter/receiver pair

1. Connect the power to the **616R**.
2. Connect the LC fiber cables to the **616T** and **616R** modules.
3. Plug the **616T** DVI connector directly to the DVI connector of the PC.
4. Plug the **616R** DVI connector directly to the DVI connector of the display.
5. Connect the power to the PC and the display.



Always use Kramer high-performance cables for connecting AV equipment to the **616T/R**.

Contents

1	Introduction	1
2	Getting Started	2
2.1	Achieving the Best Performance	2
2.2	Safety Instructions	3
2.3	Recycling Kramer Products	3
3	Overview	4
3.1	Powering the 616T and the 616R	5
4	Using the Dual-Link Detachable Optical DVI System	6
4.1	Capturing the EDID	6
4.2	Connecting the Dual-Link Detachable Optical DVI System	7
4.3	Avoiding Pitfalls During Operation	9
5	Technical Specifications	10

Figures

Figure 1: The Auto EDID Button on the 616T	7
Figure 2: Connecting the Fiber Optic Cable	8
Figure 3: Connecting the 616T/616R Dual-Link Detachable Optical DVI Transmitter/Receiver	8

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 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.

Congratulations on purchasing your Kramer **616T** *Dual-Link Detachable Optical DVI Transmitter* and **616R** *Dual-Link Detachable Optical DVI Receiver*, which are ideal for the following typical applications:

- Digital flat panel and plasma displays used in medical, commercial and travel applications
- Conference rooms and auditoriums
- Kiosks with digital flat panel displays for presenting information
- LED signboards in streets and stadiums

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.kramerelectronics.com/support/product_downloads.asp 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 **616T**, **616R** 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 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



Warning: Class 1 Laser Product

- Invisible laser radiation present
- Avoid long-term viewing of laser
- Avoid the use of magnifying viewing aids or instruments (such as binoculars, telescopes, microscopes and magnifying lenses, but not spectacles or contact lenses)
- Avoid placing optical devices in the emitted beam that could cause the concentration of the laser radiation to be increased

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/>.

3 Overview

The **616T** and **616R** are a small and lightweight fiber optic transmitter and receiver pair that transmit uncompressed resolutions up to WQXGA (2560x1600 @60Hz) or WQUXGA (3840x2400 @33Hz vertical refresh rate) over dual link DVI to a range of up to 500 meters (1640 feet) over duplex multimode fiber optic cable with two LC connectors. The **616T** converts dual link DVI signals to optical signals that it transmits to the **616R**. The **616R** decodes the optical signals back to a dual link DVI signal.

The **616T** and **616R** feature:

- A maximum data rate of 13.5Gbps (2.25Gbps per graphic channel)
- Supported resolutions – HDTV: 480p, 720p, 1080p;
Vesa: VGA to WQUXGA @33Hz (XGA not supported)
- A range of up to 500m (1640ft) (multimode)
- Duplex multimode fiber optic cable with two LC connectors (Kramer C-2LC/2LC series)
- EDID capture that copies and stores the EDID from a display device (**616T**)
- Standards compliance - supports DVI1.0, fully implemented by fiber-optic communication and DDC2B by virtual DDC
- Compliance with the limits for a Class A digital device, pursuant to part 15 and 2 of FCC and CE
 - Laser standards compliance - IEC 60825-1, FDA 21CFR1040;
Laser Class 1: Safety of laser products
- No EMI/RFI from the interconnecting cable
- HDTV compatibility, no HDCP compliance
- Two external 5V DC power adapters (supplied)
- NanoTools size

3.1 Powering the 616T and the 616R

Your **616T/616R** pair comes with two 5V DC power adapters. The **616R** module must always be powered by the power adapter. The **616T** can be powered either by an external power adapter or internally from the 5V pin on the DVI card of the computer. The **616T** automatically detects if it is being powered via the external power adapter, and if so, the internal power supply is cut off. Use of the external power adapter for the **616T** is strongly recommended for better performance.

4 Using the Dual-Link Detachable Optical DVI System

This section describes how to:

- Capture the EDID of the display device (see [Section 4.1](#))
- Connect the detachable optical DVI transmitter and receiver (see [Section 4.2](#))
- Avoid pitfalls when using the **616T** and **616R** (see [Section 4.3](#))

4.1 Capturing the EDID

The **616T** and **616R** are connected via one dual link channel. The EDID of the display device is captured by the transmitter for the computer to read.

The factory default EDID is set to WQXGA (2560x1600). If your display has this resolution, you do not need to capture the EDID.

You can capture the EDID of the display device on the **616T** so that when the computer connects to the **616T**, it reads the virtual EDID information and identifies 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 must be set on the **616T** transmitter.

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

1. Power the display on.
2. Connect the 5V power adapter to the power socket of the **616T**, and connect the adapter to the mains electricity.
3. Push the EDID button (illustrated in [Figure 1](#)), using a thin screwdriver.
The status LED lights.
4. Connect the **616T** unit **directly** to the display device.
The status LED flashes rapidly while reading the EDID and turns off after about 7-8 seconds.

5. Disconnect the **616T** from the display.
The new EDID information is stored.

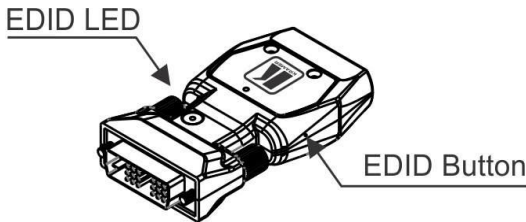


Figure 1: The Auto EDID Button on the 616T

4.2 Connecting the Dual-Link Detachable Optical DVI System

To connect the **616T** *Dual-Link Detachable Optical DVI Transmitter* with the **616R** *Dual-Link Detachable Optical DVI Receiver*, as the example in [Figure 3](#) illustrates, do the following:

1. Capture the EDID of the display device (see [Section 4.1](#)).
2. Connect the **616R** to the 5V DC power adapter and connect the adapter to the mains electricity. The LED lights.
3. Connect the duplex LC fiber cable to the **616T** and **616R** modules, one connector at a time, as illustrated in [Figure 2](#).
4. Plug the **616T** DVI connector **directly** to the DVI connector of the computer.
Do not use any intermediate cable or adapter between them, and connect cables 1 and 2 as indicated in [Figure 2](#).
5. Connect the **616R** DVI connector **directly** to the DVI connector of the display device.

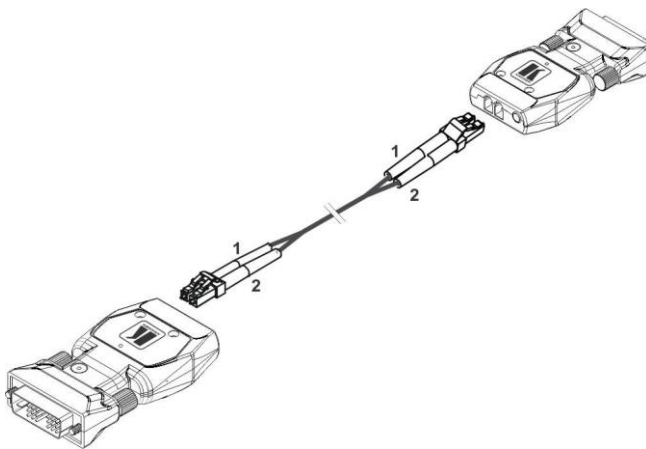


Figure 2: Connecting the Fiber Optic Cable

6. Turn on the computer power and then turn on the display device power.
7. If the transmitter does not power up, connect the 5V power adapter to the **616T** transmitter, and connect the adapter to the mains electricity.
You can use the power supplied through a DVI pin from the graphic cards instead of using the power adapter. After completing the installation, if the system does not seem to work properly, reconnect the power adapter while the system is powered.

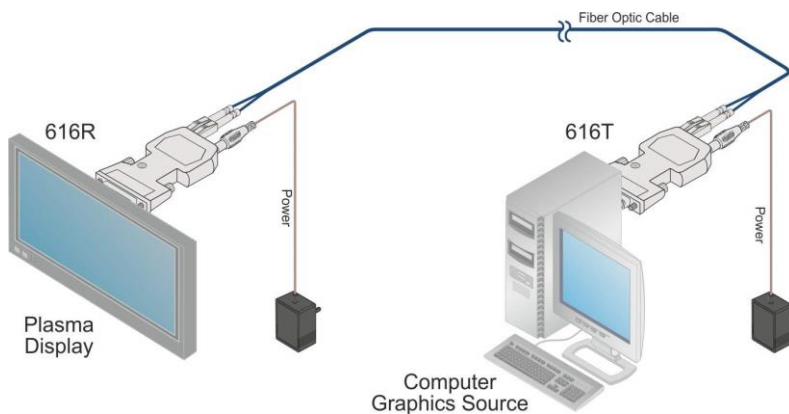


Figure 3: Connecting the 616T/616R Dual-Link Detachable Optical DVI Transmitter/Receiver

4.3 Avoiding Pitfalls During Operation

If any of these problems occur, we recommend the following:

If the display device shows only a black screen:

- Check that all the AC and DC plugs and jacks used by the external power supplies are firmly connected
- Check 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 computer and display device, respectively
- Check if the computer and display are powered on and properly booted
- Reset the system by unplugging and then replugging the transmitter DVI port or receiver DVI port and then reboot the system

If the screen is distorted or displays noise:

- Check if the graphics resolution is properly set
- Go to Display Properties of Windows and check the settings
- Be sure that the resolution is set for WQXGA (2560 x 1600) at 60Hz, or WQUXGA (3840x2400 @33Hz vertical refresh rate) (not to the unsupported XGA resolution)
- Reset the system
- Disconnect and reconnect the optical DVI cables



Be sure that at all times the cables are stored and used away from liquid or dirt.

5 Technical Specifications

INPUTS:	DVI IN (616T), 1 duplex multimode fiber optic with 2 LC connectors (616R)
OUTPUTS:	1 duplex multimode fiber optic with 2 LC connectors (616T), DVI OUT (616R)
RESOLUTION:	13.5Gbps (2.25Gbps bandwidth per graphic channel) WQUXGA, 33Hz (XGA is not supported)
MAX. RANGE:	500m (1640ft) for WQUXGA (3840x2400) at 33Hz refresh rate.
POWER CONSUMPTION:	5V DC, 430mA max. (616T); 350mA max. (616R)
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 85%, RHL non-condensing
DIMENSIONS:	3.9 cm x 7.2 cm x 1.5 cm (1.5" x 2.8" x 0.75") W, D, H
WEIGHT:	0.14kg (0.31lbs) approx.
INCLUDED ACCESSORIES:	2 power supplies: 5V DC/1A
OPTIONS:	C-2LC/2LC 2 LC fiber optic cable
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

One year 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.

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.

Exclusive Remedy

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF KRAMER ELECTRONICS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT AS PROVIDED UNDER APPLICABLE LAW.

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

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 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 where updates to this user manual may be found.

We welcome your questions, comments, and feedback.

Web site: www.kramerelectronics.com

E-mail: info@kramerel.com



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing



P/N: 2900-300250



Rev: 2