



KRAMER ELECTRONICS LTD.

USER MANUAL

MODELS:

613T
3G HD-SDI Mini Optical
Transmitter

613R
3G HD-SDI Mini Optical
Receiver

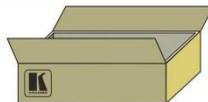


613T/R Quick Start Guide

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

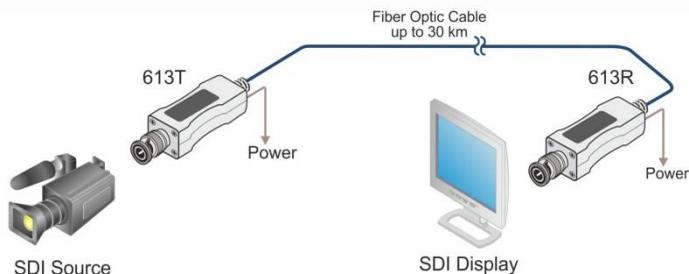
- 613T/R 3G HD-SDI Mini Optical Transmitter/Receiver
- 2 Power supplies (5V DC)
- 1 Quick Start sheet



Save the original box and packaging materials in case you need to return your **613T/R** for service.

Step 2: Connect the inputs and outputs

Always switch off the power on each device before connecting it to your **613T/R**.



Always use Kramer high-performance cables for connecting AV equipment to the **613T/R**.

Step 3: Connect the power

Connect the 5V DC power adapters to the **613T** and **613R** and plug the adapters 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 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.

Congratulations on purchasing your Kramer **613T, 613R 3G HD-SDI Mini Optical Transmitter/Receiver**, which is ideal for the following typical applications:

- EFP (electronic field production) and ENG (electronic news gathering) broadcasting
- Stadium to studio 3G-SDI digital video extension broadcasting
- Medical, military, government and security applications

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 **613T**, **613R** 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 **613T** converts 3G-SDI, HD-SDI and DVB-ASI (Digital Video Broadcasting – Asynchronous Serial Interface) digital video signals to optical signals. It transmits them over single mode-fiber optic cable to the **613R** that decodes the optical signals back to electrical 3G-SDI, HD-SDI and DVB-ASI digital video signals.

The **613T** and **613R** transmitter/receiver pair:

- Supports up to 3G-SDI digital video signals over fiber optic cable
- Supports 1080p, 3G-SDI format
- Is designed to transport one-channel SMPTE-424M 3G-SDI, SMPTE 292M HD-SDI or SMPTE-259M serial digital video signal over long distance through single-mode optical fiber
- Features laser standards compliance - IEC 60825-1, FDA 21CFR1040; Laser Class 1: Safety of laser products
- Features signal equalizing and re-clocking
- Has a transmission range of up to 19 miles (30 km) at 3Gbps
- Handles SDI, DVB-ASI, HD-SDI, 3G-SDI
- Includes a latch locking mechanism for the power supply to prevent the power from disconnecting due to misuse
- Includes power and status blue LEDs
- Does not require any special memory size, CPU speed and chipsets, when using a computer

Both the **613T** and **613R** come in a very small standalone, metal die-cast enclosure suitable for rugged applications.

3.1 Defining the 613T, 613R 3G HD-SDI Mini Optical Transmitter/Receiver

This section defines the **613T**, **613R**.

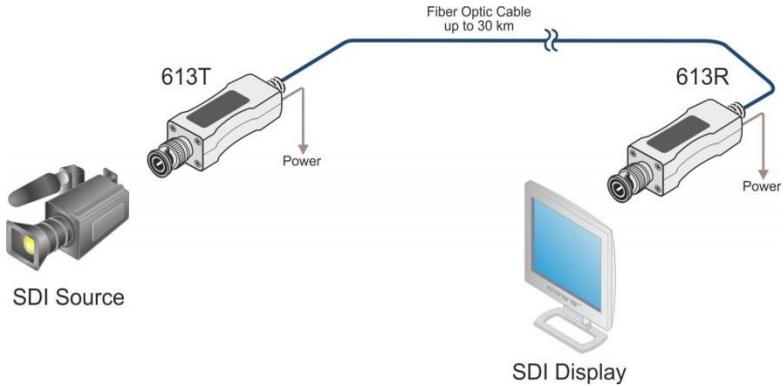


Figure 1: 613T, 613R 3G HD-SDI Mini Optical Transmitter/Receiver

3.2 Powering the 613T, 613R

Your **613T/613R** pair comes with two 5V DC power adapters. Both units need to be connected to their external power adapter. [Figure 2](#) illustrates the power connector pinout:

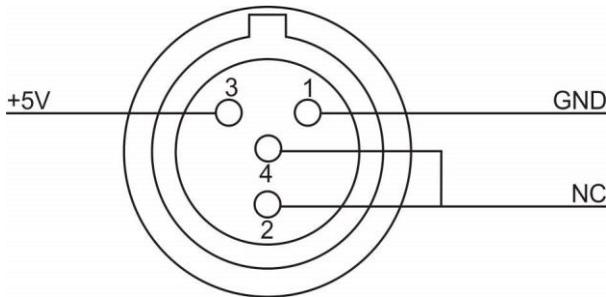


Figure 2: Power Connector Pinout

4 Using the 3G-SDI Mini Optical Set

This section describes how to:

- Connect the detachable optical 3G-SDI Mini Optical Transmitter/ Receiver (see [Section 4.1](#))
- Avoid pitfalls when using the **613T** and **613R** (see [Section 4.2](#))

4.1 Connecting the 3G-SDI Mini Optical Transmitter/Receiver Set

To connect the **613T 3G-SDI Mini Optical Transmitter** with the **613R 3G-SDI Mini Optical Receiver**, as the example in [Figure 1](#) illustrates, do the following:

1. Connect the BNC connector of the SDI Source (for example, a camera) **directly** to the **613T** BNC connector.
Avoid using any intermediate cable which may result in signal quality deterioration.
2. Plug the 5V power adapters to the transmitter and to the receiver, and connect the adapters to the mains electricity.
The blue LED lights.
3. Connect the **613R** BNC connector **directly** to the BNC connector of the display device.
4. Remove the protective cover from the optic fiber ST connector on the **613T** and connect to the fiber optic cable.
Use glass single-mode fiber optic cable with 1310, 1550nm bandwidth on ST connectors.
5. Remove the protective cover from the optic fiber ST connector on the **613R** and connect to the other side of the fiber optic cable.
6. Turn ON the power on the source and the display devices.

4.2 Avoiding Pitfalls Using the 613T and 613R

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

If the display device shows only a black screen:

- Make sure that all the AC and DC plugs and jacks used by the external power supplies are firmly connected
- Be sure that the BNC connectors are firmly plugged into the SDI source and the display devices, and be sure that the transmitter and receiver modules are correctly plugged into the source and SDI display devices, respectively
- Check if the SDI source and display are powered ON and properly booted
- Reset the system by unplugging and then replugging the transmitter SDI port or receiver SDI port and then reboot the system

If the picture on the screen appears distorted or displays noise, check the quality of the SDI source and the length of the optical fiber cable.



Caution: Be sure that the fiber optic cables are always stored and used away from liquid or dirt

5 Technical Specifications

INPUTS:	613T: SD/HD/3G HD-SDI on a 75Ω BNC connector 613R: 1 optical ST connector
OUTPUTS:	613T: 1 optical ST connector 613R: SD/HD/3G HD-SDI on a 75Ω BNC connector
MAXIMUM DATA RATE:	Up to 3Gbps
MAXIMUM LENGTH:	30km (19mi) @3G, 1080p 3G-SDI format
FORMAT:	SMPTE 424M: 3G HD-SDI; SMPTE 292M: HD-SDI; SMPTE 259: SDI, DVB-ASI
RECOMMENDED FIBER-OPTIC CABLE:	1310, 1550nm single-mode optical fiber with ST connectors
POWER CONSUMPTION:	5V DC, 1.5A
OPERATING TEMPERATURE:	-20° to 70°C (-4° to 158°F)
STORAGE TEMPERATURE:	-30° to 85°C (-22° to 185°F) ambient
HUMIDITY:	5% to 95% RH
DIMENSIONS:	1.9cm x 8.3cm x 1.0 cm (0.7" x 3.3" x 0.7") W, D, H
WEIGHT:	613T and 613R 0.1kg (0.2lbs) approx.
INCLUDED ACCESSORIES:	2 power supplies
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

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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

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@kramere.com



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing



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Rev: 4