

Kramer Electronics, Ltd.



USER MANUAL

Models:

673T, HD-SDI Optical Transmitter

673R, HD-SDI Optical Receiver

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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 groups¹ that are clearly defined by function.

Congratulations on purchasing your Kramer DigiTOOLS® **673T HD-SDI Optical Transmitter** and/or **673R HD-SDI Optical Receiver** which are ideal for:

- Home theater, presentation and multimedia applications
- Long range multimedia distribution for cinemas, stores, and entertainment centers
- Video production and broadcast facilities
- Retail stores and other point-of-sale systems

The package² includes the following:

- **673T** and **673R**
- 2 power adapters (5V DC Input)
- This user manual³

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 cables⁴

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 Sealers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

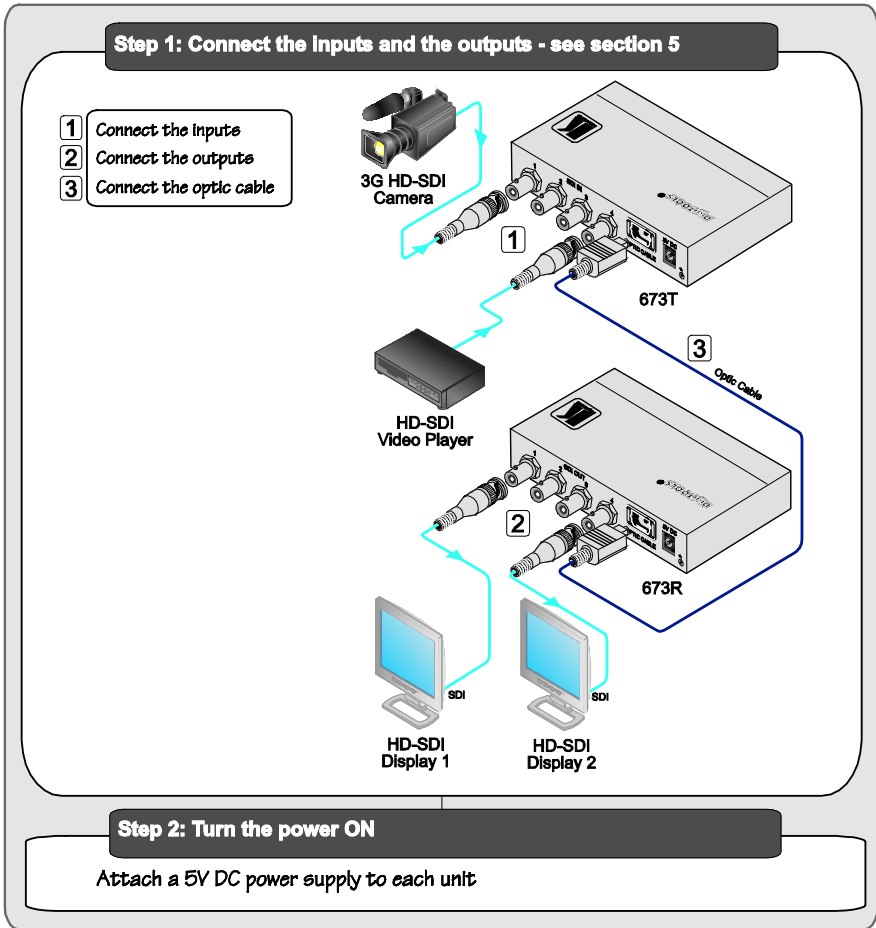
2 Each package consists of a transmitter and receiver set. Each item in the set is rendered to work specifically with each other, so two separate sets should not be mixed

3 Download up-to-date Kramer user manuals from the Internet at <http://www.kramerelectronics.com>

4 The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com>

2.1 Quick Start

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



3 Overview

The **673T** is a high-performance fiber optic transmitter for 3G HD-SDI, HD-SDI, SDI, and dual-link SDI signals. The unit converts up to four channels of serial digital signals on gold-plated BNC connectors to light pulses that are transmitted over a single multimode fiber optic cable to a **673R** receiver that converts them back to serial digital signals.

The **673T** and **673R** pair has a transmission range of 1000 meters (more than 3,200ft).

Both the **673T** and **673R**:

- Feature a maximum data rate of up to 3Gbps, enabling it to be used for standard definition, high definition and the new 3G high definition serial digital video signals (SD/HD-SDI)
- Feature a single multimode OM3 fiber optic with SC connectors
- Include four HD-SDI signals on gold-plated BNC connectors each for the transmitter and the receiver
- Support SDI, HD-SDI, 3G HD-SDI and dual-link¹ and support data rates of 270Mbps, 1483.5Mbps, 1485Mbps and 2970Mbps
- Are strictly regulated in accordance with Class 3R Laser Eye Safety in compliance with ANSI Z136 and IEC 60825-1:2007
- Feature HDTV compatibility
- Include cable equalization up to 350m for SD² signals, 140m for 1.5GHz HD³ signals, and 120m for 3GHz HD signals
- Feature fiber optic, output and input indication LEDs
- Include reclocking and equalization on each channel
- Include 5V DC power adapters and housing in Kramer DigiTOOLS[®] enclosures
- Can be rack mounted in a 1U rack space with the optional **RK-3T** rack adapter⁴

1 Using two BNC connectors per signal

2 Standard Definition (SD) means an NTSC or PAL compatible video format, consisting of 480 (for NTSC) or 576 (for PAL) lines of interlaced video


3 High Definition (HD) means a video format, consisting of 720 active lines of progressive video or 1080 lines of progressive or interlaced video

4 Up to three machines, side-by-side

3.1 Recommendations for Achieving the 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 **673T** and **673R** 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 unit¹.

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

4 Your HD-SDI Optical Transmitter and Receiver

This section describes the:

- **673T HD-SDI Optical Transmitter**, see section [4.1](#)
- **671R HD-SDI Optical Receiver**, see section [4.2](#)

4.1 Your 673T HD-SDI Optical Transmitter

Figure 1 and Table 1 define the **673T HD-SDI Optical Transmitter**:

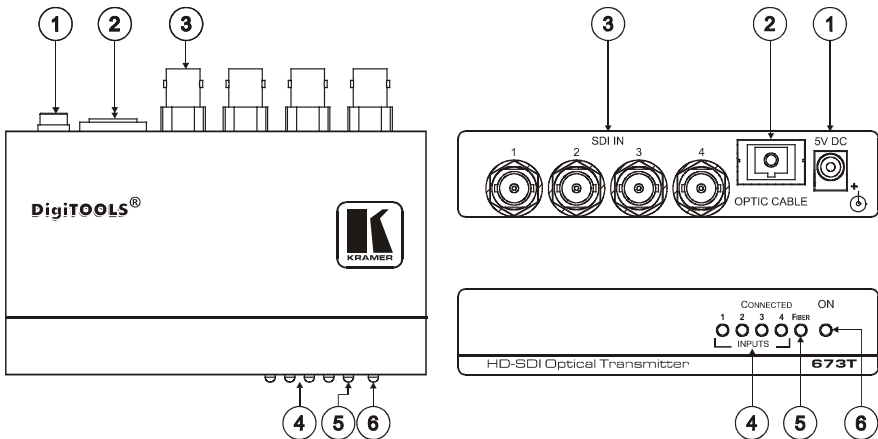


Figure 1: 673T HD-SDI Optical Transmitter

¹ For example, part number 2535-052002

Table 1: 673T HD-SDI Optical Transmitter Features

| # | Feature | Function |
|---|-----------------------|--|
| 1 | 5V DC | +5V DC connector for powering the unit |
| 2 | OPTIC CABLE Connector | Connects to the optical connector on the 673R via multimode fiber cable |
| 3 | SDI IN BNC Connector | Connects to the SDI source (from 1 to 4) |
| 4 | CONNECTED INPUT LEDs | Lights when a valid input is connected (from 1 to 4) |
| 5 | FIBER | Lights when the fiber optic cable is connected |
| 6 | ON LED | Illuminates when receiving power |

4.2 Your 673R HD-SDI Optical Receiver

Figure 2 and Table 2 define the **673R HD-SDI Optical Receiver**:

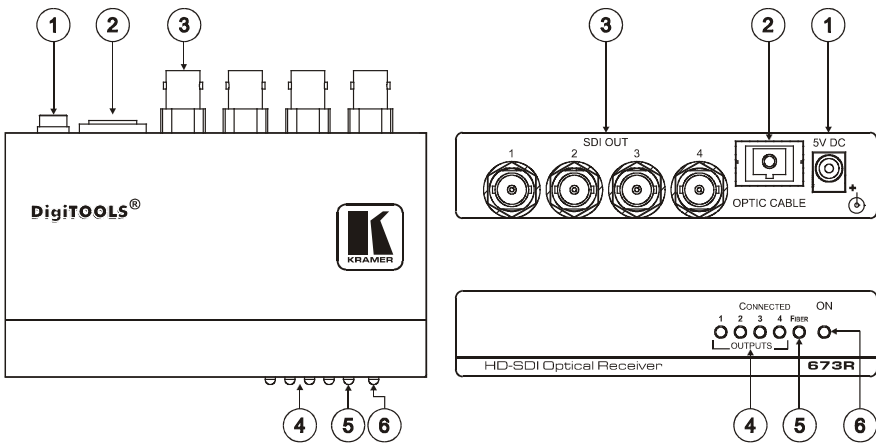


Figure 2: 673R HD-SDI Optical Receiver

Table 2: 673R HD-SDI Optical Receiver Features

| # | Feature | Function |
|---|-----------------------|--|
| 1 | 5V DC | +5V DC connector for powering the unit |
| 2 | OPTIC CABLE Connector | Connects to the optical connector on the 673R via multimode fiber cable |
| 3 | SDI OUT BNC Connector | Connects to the SDI acceptor (from 1 to 4) |
| 4 | CONNECTED OUTPUT LEDs | Illuminates to show the valid input signals connected on the transmitter (from 1 to 4) |
| 5 | FIBER | Illuminates when the fiber optic cable is connected |
| 6 | ON LED | Illuminates when receiving power |

5 Connecting the 673T and 673R Transmitter/Receiver System

To connect¹ the **673T** and **673R**, as illustrated in the example in [Figure 3](#), do the following:

1. Connect up to four SDI sources (for example video players and/or HD-SDI cameras) to the four SDI IN connectors.
2. Connect the four SDI OUT connectors to up to four SDI acceptors (for example, HD-SDI displays).
3. Remove the dust caps and connect the OPTIC CABLE connector of the **673T** to the OPTIC CABLE connector of the **673R**, via OM3 cabling² (maximum range of 900 meters (2950ft)).
4. Connect the 5V DC power adapter to the power socket on each unit and connect the adapter to the mains electricity (not shown in [Figure 3](#)).

Avoid direct eye exposure into the optic connectors when powered, although this product is regulated strictly enough to operate under the Laser Class 3R for eye safety

¹ You do not have to connect all the inputs and outputs

² With SC connectors

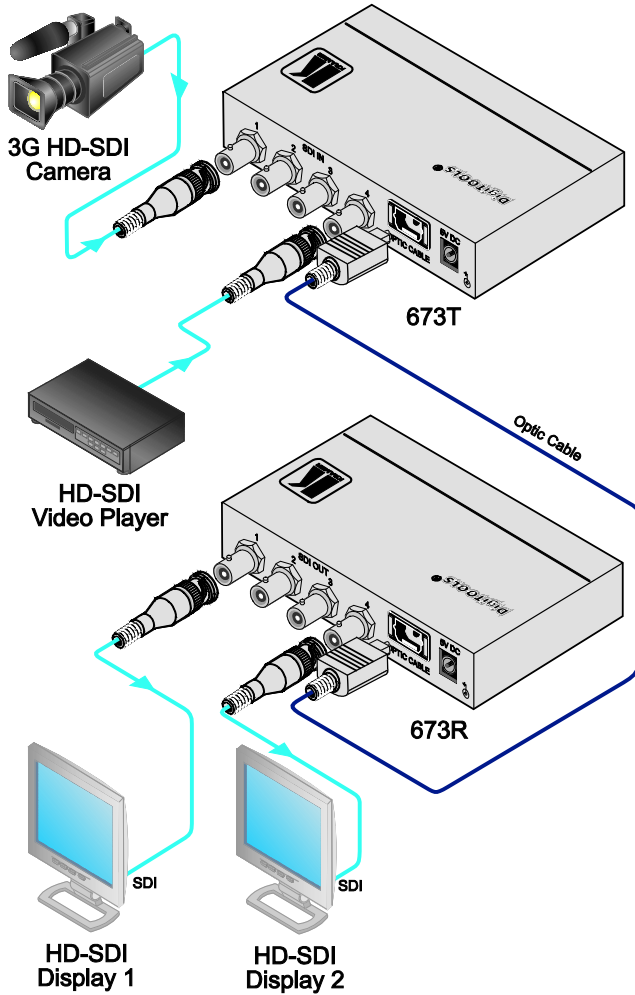


Figure 3: Connecting the 673T/673R Transmitter/Receiver System

6 Technical Specifications

[Table 3](#) includes the technical specifications¹.

Table 3: Technical Specifications of the 673T and the 673R

| | 673T | 673R |
|----------------------------------|--|--|
| INPUTS: | 3G HD-SDI/HD-SDI/SDI/Dual-link SDI serial video, 75Ω on BNC connectors | 1 optical connector |
| OUTPUTS: | 1 optical connector | 3G HD-SDI/HD-SDI/SDI/Dual-link SDI serial video, 75Ω on BNC connectors |
| BANDWIDTH: | Supports up to 3Gbps bandwidth for each input | |
| FIBER OPTIC EXTENSION: | Up to 1000m (>3200 feet) for 3G HD-SDI | |
| INPUT CABLE EQUALIZATION (673T): | 350m for SDI, 140m for HD-SDI, 120m for 3G HD-SDI | |
| FIBER-OPTIC CONNECTION: | SC connectors for multimode (OM3) fiber cable | |
| INDICATOR LEDs: | VIDEO, SOURCE, FIBER and ON LEDs | |
| POWER SOURCE: | 5V DC, 520mA | 5V DC, 780mA |
| DIMENSIONS: | 12cm x 7.95cm x 2.76cm (4.7" x 3.1" x 1.08", W, D, H) | |
| WEIGHT: | 0.3kg (0.67lbs) approx. each | |
| ACCESSORIES: | 2 power supplies, bracket installation kit | |
| OPTIONS: | RK-3T 19" rack mount | |

¹ Specifications are subject to change without notice

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 seven 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 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 your 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.



Caution

Safety Warning:

Disconnect the unit from the power supply before opening/servicing.

Class 3R Laser Compliance



CLASS 3R LASER PRODUCT

This product complies with “ANSI Z136” and “IEC 60825-1:2007”.



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