KRAMER ELECTRONICS LTD.

USER MANUAL
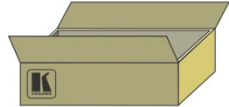
690T, 690R Quick Start Guide

This guide takes you through a basic installation and first-time use of your **690T/690R**.
For more detailed information, see the **690T, 690R** user manual. You can download the latest manual at http://www.kramerelectronics.com.

Step 1: Check what's in the box

☑ The **690T** SDI Fiber Optic Transmitter or

  the **690R** SDI Fiber Optic Receiver

☑ 1 power adapter (5V DC input)

☑ Mounting brackets
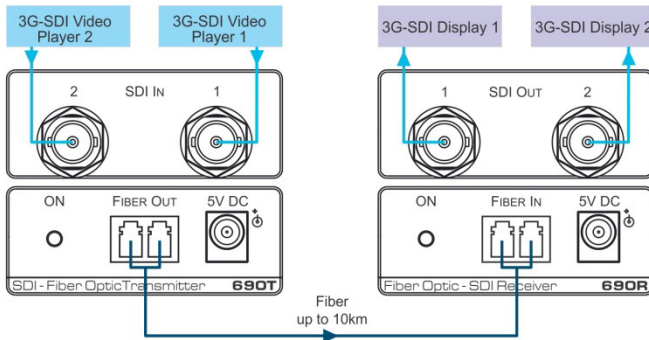
☑ 4 Rubber feet

☑ 1 Quick start guide

☑ 1 User Manual

Save the original box and packaging materials in case your Kramer product needs to be returned to the factory for service.

Step 2: Install the 690T/690R

Mount the units in a rack (**RK-4PT**) or place them on a table.

Step 3: Connect inputs and outputs

Always switch OFF the power on each device before connecting it to your **690T/690R**.

The SDI 1 IN source signal on the **690T** is always routed to the SDI 1 OUT acceptor on the **690R** and the SDI 2 IN source signal on the **690T** is always passed to the SDI 2 OUT acceptor on the **690R**

On the 690T:

▶ Connect two 3G-SDI video players

On the 690R:

▶ Connect two 3G-SDI displays

Connect 690T to 690R:

▶ Connect the fiber optic cable from the optic connector on the **690T** to the optic connector on the **690R**

Connect a power adapter to the 5V DC socket and to the mains electricity on both the **690T** and the **690R**.

Contents

Figures

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 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 and GROUP 11: Sierra Products.

Congratulations on purchasing your Kramer Pico TOOLS™ **690T** *SDI Fiber Optic Transmitter* or **690R** *SDI Fiber Optic Receiver* which are ideal for the following typical applications:

- 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
- Digital signage

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 cables

Go to http://www.kramerelectronics.com 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 to avoid 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 that may adversely influence signal quality

- Position your Kramer **690T** and the **690R** SDI Fiber Optic Transmitter and Receiver away from moisture, excessive sunlight and dust

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

3   Overview

The **690T** is a high-performance fiber optic transmitter for SD-SDI, HD-SDI and 3G-SDI signals. The unit converts up to two channels of serial digital signals to light pulses that are transmitted over a dual single mode cable to a **690R** receiver that converts them back to serial digital signals. The **690T** and the **690R** pair have a transmission range of 10km (more than 6.2 miles) for 3G-SDI.

The **690T** and the **690R** 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 (3G-SDI)

- Two SDI gold-plated BNC connectors each for the transmitter and the receiver

- SD-SDI, HD-SDI and 3G-SDI support of video pathological patterns for SMPTE 259M, SMPTE 344M, SMPTE 292M and SMPTE 297-2006
  Standard Definition (SD-SDI) means an NTSC or PAL compatible video format, consisting of 480 (for NTSC) or 576 (for PAL) lines of interlaced video
  High Definition (HD-SDI) means a video format, consisting of 720 active lines of progressive video or 1080 lines of progressive or interlaced video
  3G-SDI means a video format, consisting of 1080 lines of progressive video

- Support of data rates of 270Mbps, 1483.5Mbps, 1485Mbps and 2970Mbps

- SMPTE 297-2006 compatible electrical-to-optical interfaces

- HDTV compatibility

- Reclocking and equalization on each channel

- Cable equalization up to 200m for 1.5GHz HD signals, and 100m for 3GHz HD signals

- Strict regulation in accordance with Class 3R Laser Eye Safety in compliance with ANSI Z136 and IEC 60825-1:2007

- 5V DC power adapters and housing in Kramer Pico TOOLS™ enclosures. Four units can be rack mounted side−by−side in a 1U rack space with the optional **RK-4PT** rack adapter

3.1 Defining the 690T and the 690R SDI Fiber Optic Transmitter and Receiver

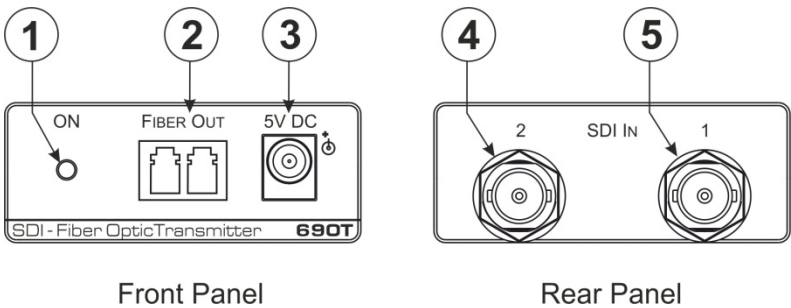Figure 1 and Figure 2 define the **690T** and **690R**, respectively.

Figure 1: 690T SDI Fiber Optic Transmitter Front and Rear Panels

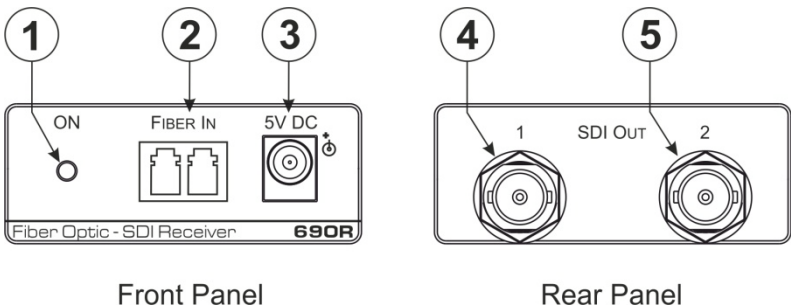| #	Feature	Function
1	*ON* LED	Illuminates when receiving power
2	*FIBER OUT* Dual SFP Connector	Connects to the dual optical connector on the **690R** via dual single mode cable
3	*5V DC* Connector	Connect to the power adapter
4	SDI IN 2 BNC Connector	Connect to the SDI source 2
5	SDI IN 1 BNC Connector	Connect to the SDI source 1

Figure 2: 690R SDI Fiber Optic Receiver Front and Rear Panels

#	Feature	Function
1	*ON LED*	Illuminates when receiving power
2	*FIBER IN* Dual SFP Connector	Connects to the dual optical connector on the **690T** via dual single mode cable
3	*5V DC Connector*	Connect to the power adapter
4	*SDI OUT 1* BNC Connector	Connect to the SDI acceptor 1
5	*SDI OUT 2* BNC Connector	Connect to the SDI acceptor 2

4 Connecting the 690T and the 690R

> ⚠️ Always switch off the power to any device before connecting it to your **690T** and/or **690R**. After connecting your **690T** and/or **690R** connect the power and then switch on the power to the device.

To connect the 690T and the 690R as illustrated in the example in [Figure 3](#):

1. Connect up to two SDI sources (for example, 3G-SDI video players) to the two SDI IN connectors.

2. Connect the two SDI OUT connectors to up to two SDI acceptors (for example, 3G-SDI displays).

> ℹ️ The SDI 1 IN source signal on the **690T** is always routed to the SDI 1 OUT acceptor on the **690R** and the SDI 2 IN source signal on the **690T** is always passed to the SDI 2 OUT acceptor on the **690R**

3. Remove the dust caps and connect the OPTIC CABLE connector of the **690T** to the OPTIC CABLE connector of the **690R**, via dual single mode cable (9/12) over LC connectors (a maximum range of 10km (more than 6.2 miles)).

4. Connect the power adapter to the 5V DC socket and to the mains electricity for both the **690T** and the **690R** (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.
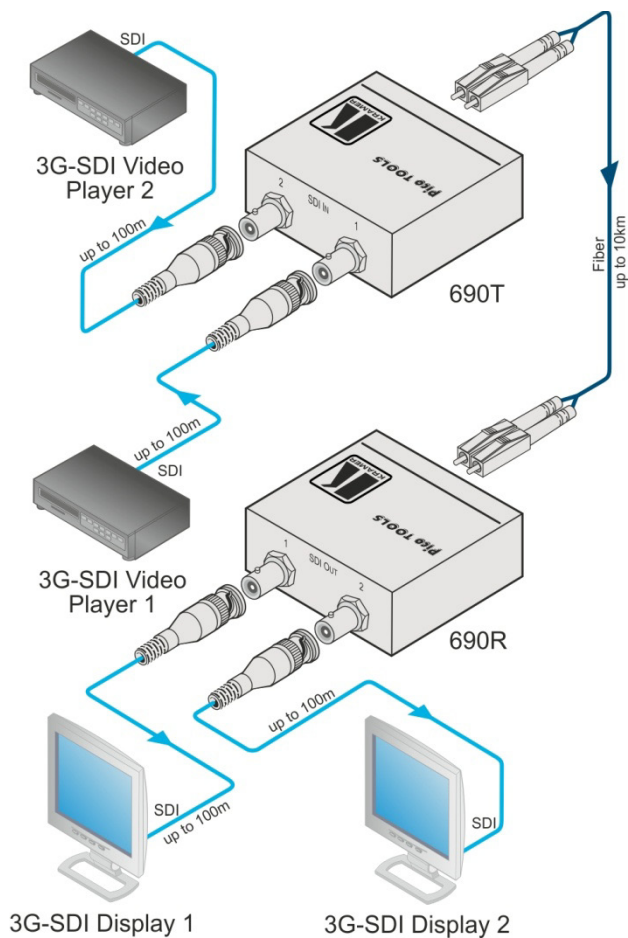
Figure 3: Connecting the 690T and/or 690R

5   Technical Specifications

	690T	690R
INPUTS:	2 SDI/HD −SDI/3G-SDI on BNC connectors	2 LC optical connectors
OUTPUTS:	2 LC optical connectors	2 SDI/HD −SDI/3G-SDI on BNC connectors
BANDWIDTH:	Supports up to 3Gbps bandwidth for each input	
FIBER OPTIC EXTENSION:	Up to 10km (>6.2 miles) for 3G-SDI	
INPUT CABLE EQUALIZATION	200m for SDI, 100m for 3G-SDI	
FIBER-OPTIC CONNECTION:	Dual single mode fiber (9/125) over LC connectors	
POWER SOURCE:	5V DC, 480mA	5V DC, 350mA
OPERATING TEMPERATURE:	0° to +55°C (32° to 131°F)	
STORAGE TEMPERATURE:	-45° to +72°C (-49° to 162°F)	
HUMIDITY:	10% to 90%, RHL non-condensing	
DIMENSIONS:	6.2cm x 5.2cm x 2.4cm (2.4" x 2.0" x 0.9") W, D, H	
WEIGHT:	0.14kg (0.31lbs) approx each	
ACCESSORIES:	1 Power supply	
OPTIONS:	RK-4PT rack adapter	
Specifications are subject to change without notice at http://www.kramerelectronics.com		

LIMITED WARRANTY

We warrant 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 us 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 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

Class 3R Laser Compliance	
CLASS 3R LASER PRODUCT	This product complies with "ANSI Z136" and IEC 60825-1:2007".