

# **Kramer Electronics, Ltd.**



## **USER MANUAL**

**Model:**

**TP-300FW**

*FireWire Range Extender*

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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<sup>1</sup> that are clearly defined by function.

Congratulations on purchasing your Kramer TOOLS **TP-300FW FireWire Range Extender**, which is ideal for:

- Digital video production, editing studios, and digital video live broadcasting
- PC FireWire<sup>®</sup> port extensions and long cable drivers

The package includes the following items:

- **TP-300FW FireWire Range Extender**
- Power adapter (+12V DC input)
- This user manual<sup>2</sup>

## 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<sup>3</sup>

### 2.1 Quick Start

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

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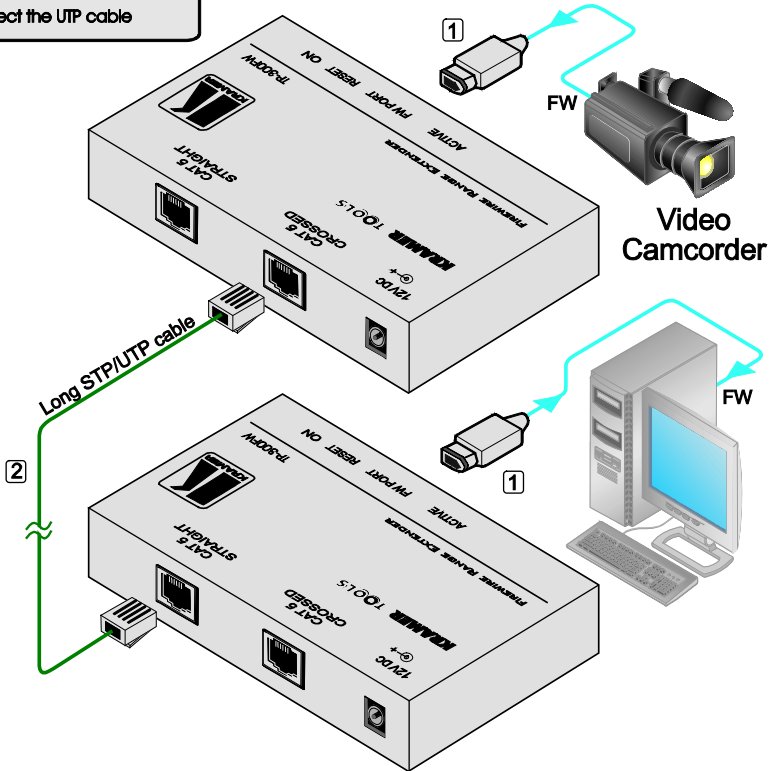
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

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

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

### Step 1: Connect the input, output and link - see section 5

- 1 Connect the FireWire devices
- 2 Connect the UTP cable



- 3 Turn on the FireWire devices
- 4 Connect the 12V Power Adapters to the units and to the mains power

## 3 Overview

The high quality Kramer TOOLS **TP-300FW** *FireWire Range Extender* is a truly unique product that lets you extend the standard 4.5m (13.5ft) FireWire range considerably. For example, a pair of **TP-300FW** units (see [Figure 2](#)) lets you extend the FireWire range to up to 100m (300ft), and connecting three **TP-300FW**

units (see [Figure 3](#)) lets you extend the FireWire range to up to 200m (600ft), using common and inexpensive Shielded or Unshielded Twisted Pair cable.

The **TP-300FW** *FireWire Range Extender* is based on FireWire which:

- Is a serial bus standard<sup>1</sup> that enables quick universal interfacing between digital video, audio and data, and computer hardware items<sup>2</sup>
- Is simple to use and operates independently of the host system letting you connect items for extended distances
- Supports Plug and Play<sup>3</sup>, hot swapping<sup>4</sup> and isochronous<sup>5</sup> and asynchronous applications

In particular, the **TP-300FW**:

- Supports the provisions of the IEEE 1394a-2000 and 1394-1995 Standard for High Performance 1394 Serial Bus
- Supports the provisions of the IEEE 1394b-2002 Standard at S100 signaling rates
- Enables 1394 100Mbps signals to be transmitted and received across an extended range on unshielded twisted pair cable
- Includes built-in protection from electrostatic discharge (ESD)<sup>6</sup>, by suppressing all transient high voltages down to the allowed level. In particular, ESD protection for high-speed data lines to IEC 61000-4-2 (ESD) 15kV (air), 8kV (contact), IEC 61000-4-5 (Lightning) 12A (8/20us), and IEC 61000-4-4 (EFT) 40A (5/50ns)

To achieve the best performance:

- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **TP-300FW** away from moisture, excessive sunlight and dust

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1 Originally developed by Apple™ and published as IEEE 1394 by the Institute of Electrical and Electronics Engineers

2 Hardware items include digital cameras, computers, printers, VCRs, CD-ROMs, hard disks, scanners and graphic cards

3 Configures automatically. Whenever a device is added or removed, the 1394 bus re-enumerates

4 You can connect and disconnect inputs and outputs dynamically, without having to restart the PC or cycle power

5 Video/audio applications require constant transfer rates, which the serial bus provides by supporting isochronous transfers

6 Often when connecting a "live" DV source to a receptor, an electrical potential difference or any other element creating a high voltage (such as ESD or a live chassis) may permanently damage one or both of the connected devices. This high voltage may be seen as a spark occurring at the instant of connection, or may not be seen at all, but nevertheless can result in costly damage

### 3.1 Shielded Twisted Pair/Unshielded Twisted Pair

We recommend that you use Shielded Twisted Pair (STP) cable. There are different categories of STP cable available and we advise you to use the best quality STP cable that you can afford. Our non-skew-free cable, Kramer **BC-STP** is intended for digital signals and for analog signals where skewing is not an issue. For cases where there is skewing, our Unshielded Twisted Pair (UTP) skew-free cable, Kramer **BC-XTP**, may be used. Bear in mind though, that we advise using STP cables where possible, since the compliance to electromagnetic interference has been tested using STP cables.

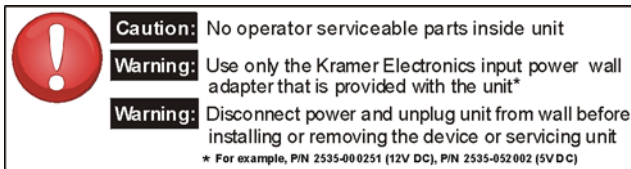
Although UTP cable might be preferred for long range applications, the UTP cable should be installed as far as possible from electric cables, motors, and so on, which often create electrical interference.

However, since the use of UTP cable might cause non-conformity to electromagnetic standards, Kramer does not commit to meeting the standard with UTP cable.

### 3.2 Recommendations for Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables<sup>1</sup> 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, and position your Kramer **TP-300FW** away from moisture, excessive sunlight and dust



<sup>1</sup> Available from <http://www.kramerelectronics.com>

4 Defining the TP-300FW FireWire Range Extender

Figure 1 and Table 1 define the **TP-300FW FireWire Range Extender**.

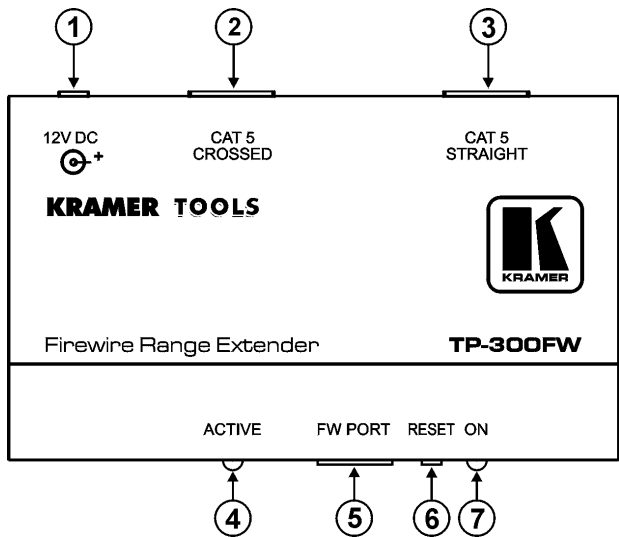


Figure 1: TP-300FW FireWire Range Extender

Table 1: TP-300FW FireWire Range Extender Features

#	Feature	Function
1	12V DC	+12V DC connector for powering the unit, center pin positive
2	CAT 5 CROSSED RJ-45 Connector	Connects to the CAT 5 STRAIGHT connector on another TP-300FW unit
3	CAT 5 STRAIGHT RJ-45 Connector	Connects to the CAT 5 CROSSED connector on another TP-300FW unit
4	ACTIVE LED	Lights green when a powered and fully functioning FireWire device is connected
5	FW PORT	Connects to the FireWire device
6	RESET Button	Reboots the unit (without having to disconnect and reconnect the power)
7	ON LED	Lights red the unit is powered on

## 5 Using Your TP-300FW FireWire Range Extender

The standard FireWire range between two FireWire devices is limited to 4.5m (13.5ft). The **TP-300FW Range Extender** is used to extend this distance to 100m (300ft).

### 5.1 Extending the Distance Between Two FireWire Devices to 100m

To connect a pair of TP-300FW units via STP/UTP cable to extend the FireWire range as illustrated in the example in [Figure 2](#):

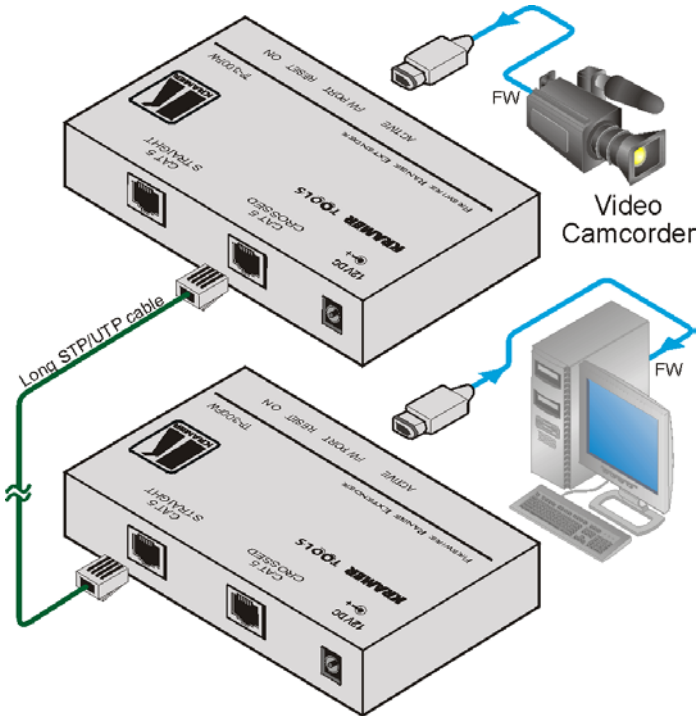


Figure 2: Extending the Distance Between Two FireWire Devices to 100m

1. Connect a FireWire device (for example, a video camcorder) to the FW PORT on the first **TP-300FW** unit, and a FireWire device (for example, a PC) to the FW PORT on the second **TP-300FW** unit.
2. When using a straight pin-to-pin STP/UTP cable, connect the CAT 5 STRAIGHT RJ-45 connector on the first **TP-300FW** unit to the CAT 5 CROSSED RJ-45 connector on the second **TP-300FW** unit<sup>1</sup>.

<sup>1</sup> Alternatively, connect the CAT 5 CROSSED RJ-45 connector on the first TP-300FW unit to the CAT 5 STRAIGHT RJ-45 connector on the second TP-300FW unit



When using a crossover STP/UTP cable, connect the CAT 5 STRAIGHT RJ-45 connector on the first **TP-300FW** unit to the CAT 5 STRAIGHT RJ-45 connector on the second **TP-300FW** unit<sup>1</sup>.

3. Be sure that the power on each FireWire device is turned ON.  
On each **TP-300FW** unit, the ACTIVE green LED lights indicating that a cable from an external powered and fully functioning FireWire device is connected.
4. On each **TP-300FW** unit, connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity.  
The red ON LED lights.

## 5.2 Connecting Three TP-300FW Units to Extend the Distance to 200m

You can daisy-chain three **TP-300FW** units to extend the FireWire range to 200m.

To connect three **TP-300FW** units (using straight pin-to-pin STP/UTP cables) to extend the FireWire distance to 200m, as illustrated in the example in [Figure 3](#):

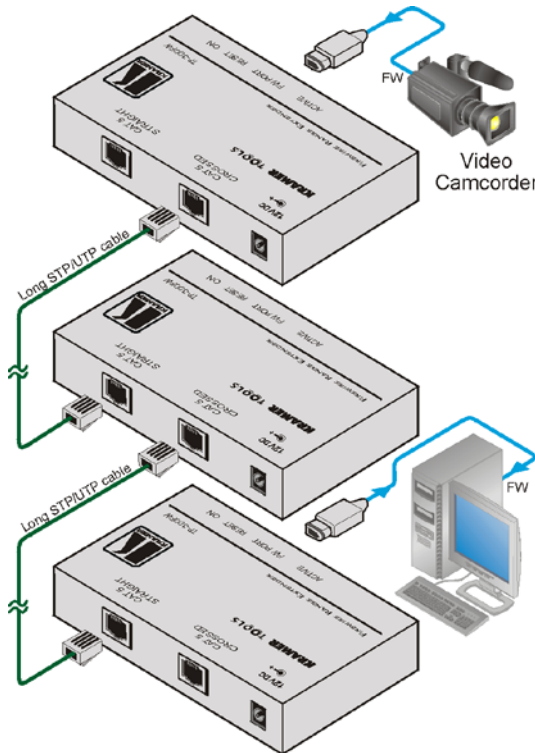


Figure 3: Connecting Three TP-300FW Units to Extend the Distance to 200m

<sup>1</sup> Alternatively, connect the CAT 5 CROSSED RJ-45 connector on the first TP-300FW unit to the CAT 5 CROSSED RJ-45 connector on the second TP-300FW unit

1. Connect a FireWire device (for example, a video camcorder) to the FW PORT on the first **TP-300FW** unit, and a FireWire device (for example, a PC) to the FW PORT on the third **TP-300FW** unit.
2. Connect the CAT 5 STRAIGHT RJ-45 connector on the first **TP-300FW** unit to the CAT 5 CROSSED RJ-45 connector on the second **TP-300FW** unit.
3. Connect the CAT 5 STRAIGHT RJ-45 connector on the second **TP-300FW** unit to the CAT 5 CROSSED RJ-45 connector on the third **TP-300FW** unit<sup>1</sup>.
4. Be sure that the power on each FireWire device is turned ON.  
On the first and third **TP-300FW** units, the ACTIVE green LED lights indicating that a cable from an external powered and fully functioning FireWire device is connected.
5. On all **TP-300FW** units, connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity.  
The red ON LED lights.

## 6 Technical Specifications

[Table 2](#) includes the technical specifications.

*Table 2: Technical Specifications<sup>2</sup> of the TP-300FW FireWire Range Extender*

PORT:	One 6-pin serial 1394 FireWire port 2 RJ-45 STP/UTP ports
TRANSFER RATE:	100Mbps
IEEE-1394 STANDARDS:	IEEE 1394a-2000, IEEE 1394-1995, IEEE 1394b-2002 @ up to 100Mbps
ESD LINE PROTECTION:	IEC 61000-4-2 (ESD) 15kV (air), 8kV (contact), IEC 61000-4-5 (Lightning) 12A (8/20us), and IEC 61000-4-4 (EFT) 40A (5/50ns)
POWER SOURCE:	12 VDC, 60mA
DIMENSIONS:	12.1cm x 7.5cm x 2.5cm (4.76" x 2.95" x 0.98") W, D, H
WEIGHT:	0.3 kg. (0.67 lbs.) approx.
ACCESSORIES:	Power supply, mounting bracket
OPTIONS:	RK-3T 19" rack adapter

<sup>1</sup> Alternatively, connect the CAT 5 CROSSED RJ-45 connector on the first TP-300FW unit to the CAT 5 STRAIGHT RJ-45 connector on the second TP-300FW unit, and connect the CAT 5 CROSSED RJ-45 connector on the second TP-300FW unit to the CAT 5 STRAIGHT RJ-45 connector on the third TP-300FW unit

<sup>2</sup> 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 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](http://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)





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**For the latest information on our products and a list of Kramer distributors, visit our Web site [www.kramerelectronics.com](http://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.



P/N:

2900-000300



Rev:

2

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**Kramer Electronics, Ltd.**  
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