Kramer Electronics, Ltd.

KRAMER

USER MANUAL

Models:

VM-10FW, *1:10 FireWire Distributor/Hub*

VM-15FW, *1:15 FireWire Distributor/Hub*

VM-20FW, *1:20 FireWire Distributor/Hub*

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1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 350-plus different models now appear in 8 Groups[1], which are clearly defined by function.

Congratulations on purchasing your Kramer *FireWire Distributor/Hub*, which is available in the following models: **VM-10FW** (a *1:10 FireWire Distributor/Hub*), **VM-15FW** (a *1:15 FireWire Distributor/Hub*), and **VM-20FW** (a *1:20 FireWire Distributor/Hub*). The **VM-10FW**, **VM-15FW**, and **VM-20FW** are ideal for these applications:

- Digital video production and editing studios
- Digital video live broadcasting
- PC FireWire port extensions and long cable drivers

The package includes the following items:

- *FireWire Distributor/Hub*
- Power cord and this user manual[2]

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[3]

3 Overview

Each high quality *FireWire Distributor/Hub*—the **VM-10FW**, **VM-15FW**, and **VM-20FW**—are based on the IEEE-1394 (FireWire) standard, and let you distribute one of two selected inputs.

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1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

2 Download up-to-date Kramer user manuals from our Web site at http://www.kramerelectronics.com

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

In particular, the **VM-10FW**, **VM-15FW**, and **VM-20FW**:

- Can distribute 10, 15, or 20 outputs/ports

- Can be cascaded to increase the number of outputs, and since the unit reclocks the data, cascading several machines may be used to effectively increase the operation range

- Support "Plug and Play" and "hot-swapping"

- Operate for data rates of 100/200/400Mbps

On each *FireWire Distributor/Hub*, the:

- Selected input signal is equalized for cable losses, and the outputs are all reclocked

- Input ports are all electronically protected

- Front panel LEDs show the status of all the IEEE-1394 ports

Achieving the best performance means:

- Connecting 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)

- Avoiding interference from neighboring electrical appliances and positioning your Kramer **VM-10FW**, **VM-15FW**, or **VM-20FW** away from moisture, excessive sunlight and dust

4 Your FireWire Distributor/Hub

Sections 4.1, 4.2 and 4.3, describe the **VM-10FW**, **VM-15FW**, and **VM-20FW**, respectively.

4.1 About the VM-10FW FireWire Distributor/Hub

The **VM-10FW** is similar to the **VM-20FW** (see section 4.3), except with 10 OUT/IN ports.

4.2 About the VM-15FW FireWire Distributor/Hub

The **VM-15FW** is similar to the **VM-20FW** (see section 4.3), except with 15 OUT/IN ports.

4.3 About the VM-20FW FireWire Distributor/Hub

Figure 1 illustrates the **VM-20FW** *1:20 FireWire Distributor/Hub*. Table 1 and Table 2 define the front and rear panels of the **VM-20FW**, respectively.
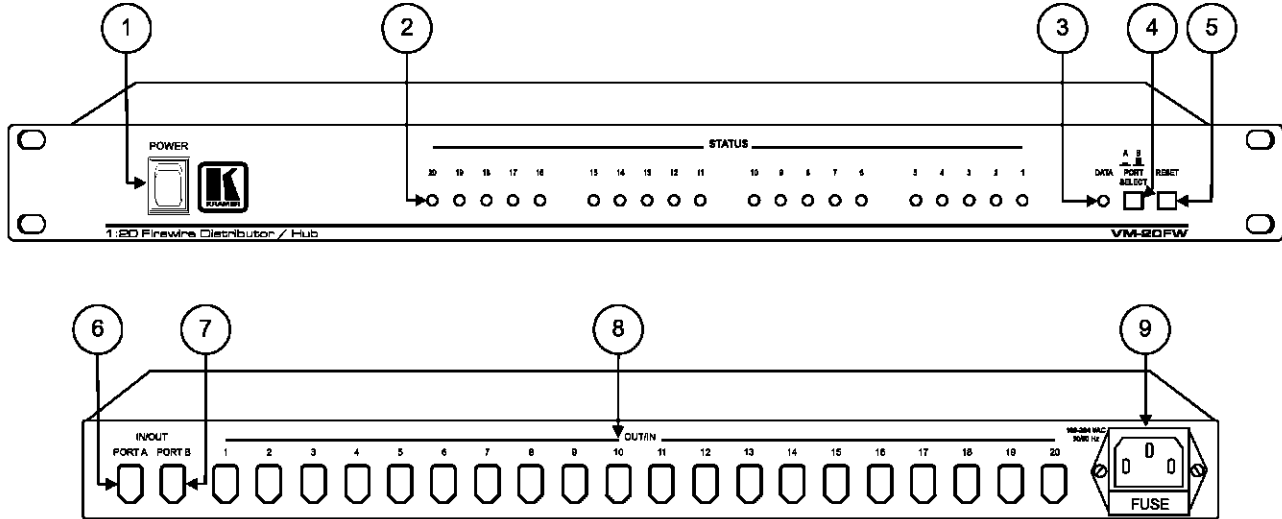
Figure 1: VM-20FW 1:20 FireWire Distributor/Hub

Table 1: Front Panel VM-20FW 1:20 FireWire Distributor/Hub Features

#	Feature	Function
1	*POWER* Switch	Illuminated switch supplying power to the unit
2	*STATUS* Red LEDs	Each LED lights when its corresponding port is active (from 1 to 20)
3	*DATA* Red LED	Lights when there is an active FireWire connection
4	*PORT SELECT* Button	Push in to select channel A; release to select channel B
5	*RESET* Button	Resets the operation of the unit

Table 2: Rear Panel VM-20FW 1:20 FireWire Distributor/Hub Features

#	Feature	Function
6	IN/OUT 6-pin PORT A	Connect to the device[1] for channel A
7	IN/OUT 6-pin PORT B	Connect to the device[1] for channel B
8	OUT/IN 6-pin Ports	Connect to the devices[1] (from 1 to 20)
9	Power Connector with *FUSE*	AC connector enabling power supply to the unit

5 Using Your VM-20FW FireWire Distributor/Hub

This section describes how to connect and operate:

- FireWire, see section 5.1
- **VM-20FW** *1:20 FireWire Distributor/Hub*, see sections 5.2 and 5.4
- **VM-20FW** as four 1:4 Distributors, see sections 5.3 and 5.5

5.1 Understanding the FireWire Connection

When connecting the **VM-20FW**, be aware that:

- Not all ports need to be connected[2]

- Everything depends on your computer's software, and the firmware of the devices. Sometimes, it is possible that a computer can work with many FireWire devices simultaneously (like a distribution amplifier), sometimes it can work with many devices in time-sharing mode (like a switcher). But most often it is possible to work one to one. In this case, you have to disconnect all the devices that are unnecessary at this time and leave only two of them. Since FireWire is a hot-plug standard, you can connect/disconnect devices at any time

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1 Each device(s) can serve as a source or as an acceptor (as appropriate)

2 Any unused port should simply be left unconnected. Port A/B must be connected to device(s) that can manage or broadcast over 20 ports

5.2 Connecting the VM-20FW 1:20 FireWire Distributor/Hub

To connect the **VM-20FW** *1:20 FireWire Distributor/Hub*, as the example in Figure 2 illustrates, do the following:

1. Connect a FireWire device using a 1394 cable to the IN/OUT 6 pin:

- PORT A (for example, a Video Camcorder)
- PORT B (for example, a Laptop)

2. Connect up to 20 FireWire devices[1] using 1394 cables to the OUT/IN 6 pin ports, for example, a:

- Computer to port 9 and port 12
- Video Camcorder to port 1, port 7 and port 11
- Hard Drive to port 20

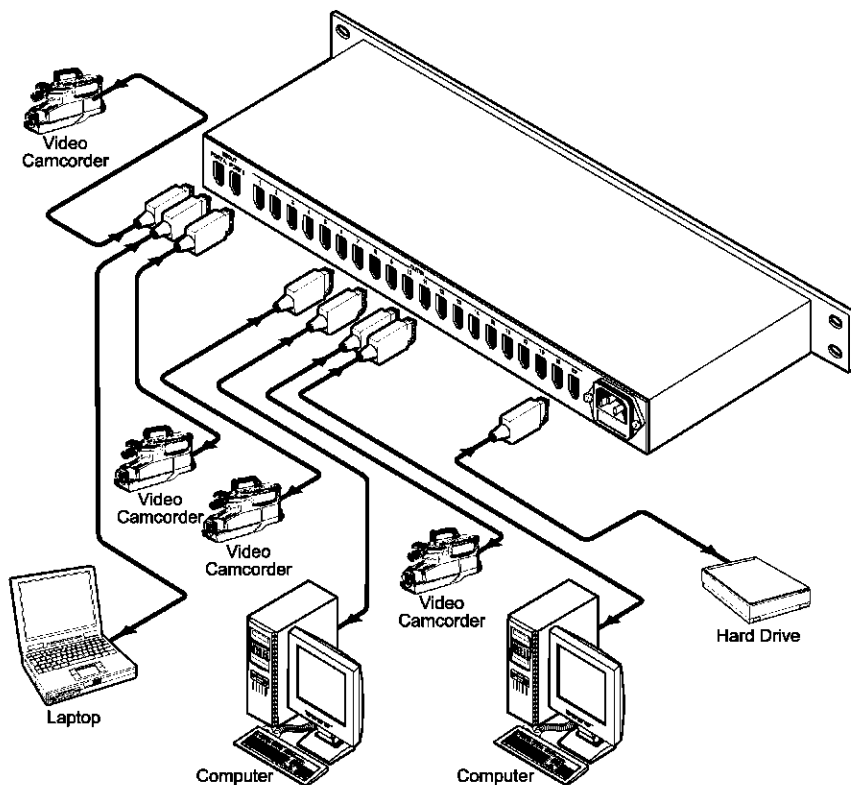3. Connect the power cord (not illustrated in Figure 2).

Figure 2: Connecting the VM-20FW 1:20 FireWire Distributor/Hub

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1 See section 5.1

5.3 Connecting the VM-20FW as Four 1:4 Distributors

You can use your **VM-20FW** *1:20 FireWire Distributor/Hub*, as four 1:4 Distributors, without reference to PORT A or PORT B.

To connect the **VM-20FW** as four 1:4 Distributors, as the example in Figure 3 illustrates, do the following[1]:

1. Connect a FireWire device (source 1) via a 1394 cable to the OUT/IN 6 pin port 1, and then connect up to 4 FireWire devices using 1394 cables to the OUT/IN 6 pin ports 2, 3, 4, and 5 (outputs (1)).

2. Connect a FireWire device (source 2) via a 1394 cable to the OUT/IN 6 pin port 6, and then connect up to 4 FireWire devices using 1394 cables to the OUT/IN 6 pin ports 7, 8, 9, and 10 (outputs (2)).

3. Connect a FireWire device (source 3) via a 1394 cable to the OUT/IN 6 pin port 11, and then connect up to 4 FireWire devices using 1394 cables to the OUT/IN 6 pin ports 12, 13, 14, and 15 (outputs (3)).

4. Connect a FireWire device (source 4) via a 1394 cable to the OUT/IN 6 pin port 16, and then connect up to 4 FireWire devices using 1394 cables to the OUT/IN 6 pin ports 17, 18, 19, and 20 (outputs (4)).
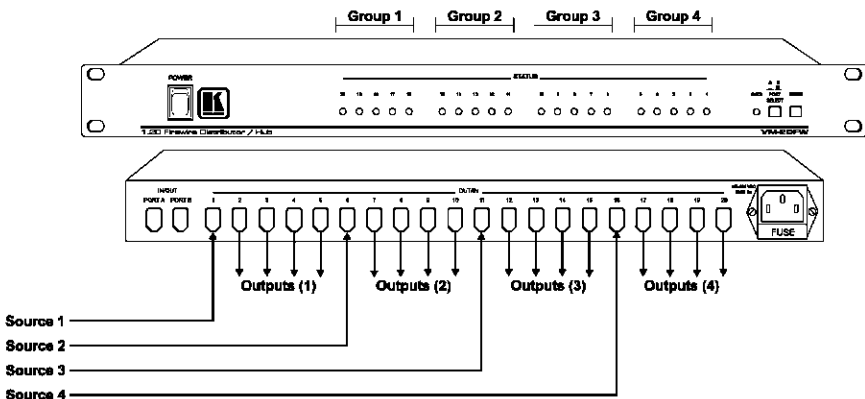
5. Connect the power cord.

Figure 3: Connecting the VM-20FW as Four 1:4 Distributors

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1 Not all ports need to be connected. Any unused port should simply be left unconnected

5.4 Operating the VM-20FW FireWire Distributor/Hub

To distribute the signal from:

- PORT A (that is, from the PC[1]), push in the PORT SELECT button
The signal from the PC transmits to all the FireWire devices which are connected and powered on

- PORT B (that is, from the Laptop[1]), release the PORT SELECT button
The signal from the Laptop transmits to all the FireWire devices which are connected and powered on

5.5 Operating the VM-20FW as Four 1:4 Distributors

After powering on the **VM-20FW**, the signal from each Group automatically distributes to the respective four acceptors, as follows:

- Source A at port 1 distributes to acceptors A1, A2, A3, and A4 at ports 2, 3, 4, and 5

- Source B at port 6 distributes to acceptors B1, B2, B3, and B4 at ports 7, 8, 9, and 10

- Source C at port 11 distributes to acceptors C1, C2, C3, and C4 at ports 12, 13, 14, and 15

- Source D at port 16 distributes to acceptors D1, D2, D3, and D4 at ports 17, 18, 19, and 20

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1 In the example in Figure 2

5.6 Cascading VM-20FW FireWire Distributor/Hubs

You can cascade several **VM-20FW** machines to increase the number of outputs, and to effectively increase the operation range[1].

To cascade three **VM-20FW** machines to form an expanded *1:60 FireWire Distributor/Hub*, as the example in Figure 4 illustrates, do the following:

1. Connect a FireWire device via a 1394 cable to the IN/OUT 6 pin PORT A on the first **VM-20FW** machine.

2. Connect FireWire devices via 1394 cables to the OUT/IN 6 pin ports, as follows:

*   On the first **VM-20FW** machine, to acceptors 1 to 19
*   On the second **VM-20FW** machine, to acceptors 20 to 38
*   On the third **VM-20FW** machine, to acceptors 39 to 58

3. Connect the OUT/IN 6 pin port 20 on the first **VM-20FW** machine to the IN/OUT 6 pin PORT A on the second **VM-20FW** machine, and connect the OUT/IN 6 pin port 20 on the second **VM-20FW** machine to the IN/OUT 6 pin PORT A on the third **VM-20FW** machine.

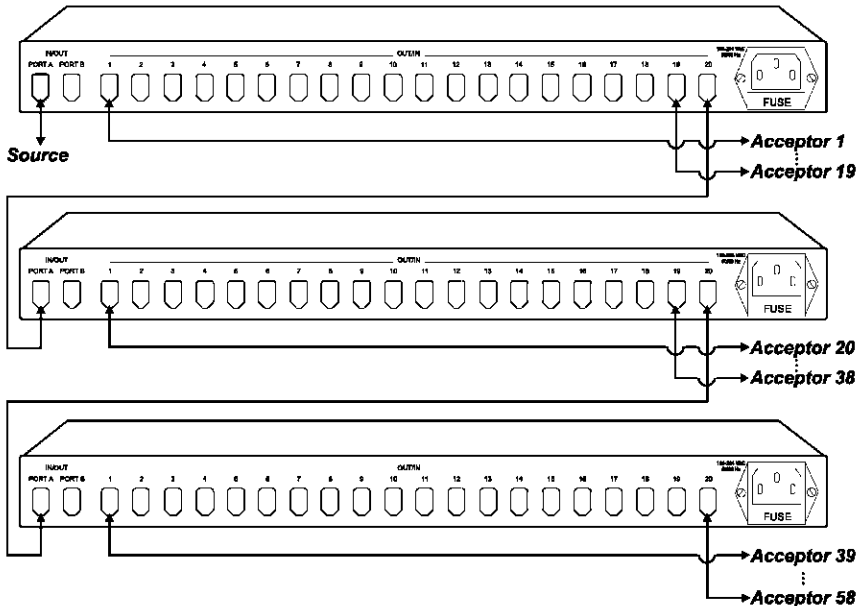4. Connect the power cord on each **VM-20FW** machine.

Figure 4: Connecting an Expanded 1:60 FireWire Distributor/Hub

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1 For example, use 2 VM-20FW machines to double the range, and use 3 VM-20FW machines to increase the range three-fold

6 Technical Specifications

Table 3 includes the technical specifications:

Table 3: Technical Specifications[1] of the VM-20FW

STANDARDS:	Compliant with IEEE 1394a-1995
PORTS:	20 IEEE-1394a serial ports + 2 selectable IEEE-1394a ports for source
BUS TRANSFER RATE:	100/200/400 Mbps
DEVICE INTERFACE:	400 Mbps, 20+2 ports, 3.3V (PHY)
CONTROL:	Reset: Channel A/B selection
CABLE:	IEEE-1394a 6 pin
LEDs:	Power LED; 20 LEDs for Link Ready (cable inserted OK)
COMPATIBLE:	PC/MAC
DIMENSIONS:	19-inch (W), 7-inch (D) 1U (H) rack-mountable
POWER SOURCE:	110-230VAC, 25VA
WEIGHT:	2.7 kg. (6 lbs.) approx.
ACCESSORIES:	Power cord

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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.
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)
     vi   Removal or installation of the product
     vii) 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.

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.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

Caution