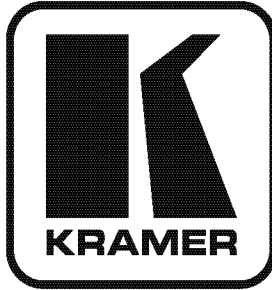


**Kramer Electronics, Ltd.**



# **USER MANUAL**

**Model:**

**VS-21DPIR**

*2x1 DisplayPort Switcher*

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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 DigiTOOLS® **VS-21DPIR 2x1 DisplayPort Switcher**! The **VS-21DPIR** is ideal for PC, presentation and multimedia applications.

The package includes the following items:

- **VS-21DPIR 2x1 DisplayPort Switcher**
- Power adapter (5V DC)
- **RC-IR2** infrared remote control transmitter (including the required batteries and a separate user manual<sup>2</sup>)
- 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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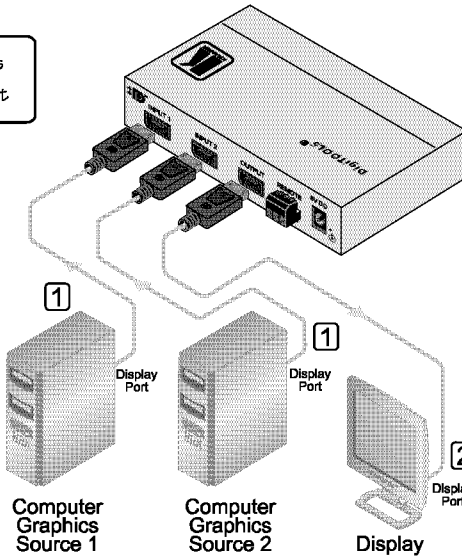
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Sealers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from 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>

**Step 1: Connect the Inputs and outputs - see section 5**

- 1 Connect the inputs
- 2 Connect the output



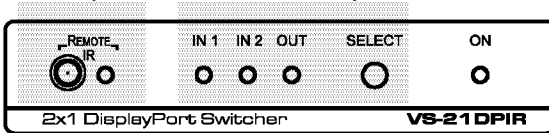
**Step 2: Turn the power ON**

**Step 3: Select an Input (see section 5)**

VIA THE IR REMOTE CONTROL:

VIA THE FRONT PANEL BUTTONS:

VIA THE REMOTE PINS:



By momentarily connecting the appropriate IN 1 or IN 2 PIN to the G (Ground) PIN



### 3 Overview

The **VS-21DPIR** is a high quality switcher for DisplayPort (DP) signals that accepts two DP inputs—letting you select either DP input using a switch located on the panel—and routes the selected DP input signal to the DP output. In particular, the **VS-21DPIR**:

- Uses up to four lanes at rates of 1.6Gbps or 2.7Gbps bandwidth per lane
- Features a maximum resolution of 2560x1600 pixels and a total maximum data rate of 10.8Gbps over four lanes
- Is HDCP compliant and HDTV compatible
- Passes the EDID signals from the display device to the source
- Features high-resolution and rich colors, and the transport of audio and multiple video streams

The **VS-21DPIR** is 5V DC fed and can be controlled remotely via the contact closure REMOTE input select terminal block connector or the infrared remote control transmitter.

#### 3.1 About DisplayPort

DisplayPort (DP) is a digital display interface standard for the PC industry. It delivers the highest resolutions and sound quality.

In addition, DisplayPort:

- Provides a simple interface between a PC and a display, projector or TV
- Supports 1 to 4 data pairs ("lanes") at a transfer rate of 1.62Gb or 2.7Gb per second
- Has a maximum length of 15 meters for video transmission, at a resolution of 1080p/60Hz and 3 meters for full bandwidth transmission
- Video specs include a video path that supports 6 to 16 bits per color channel, a maximum resolution of 2560x1600 pixels and a total maximum bandwidth of 10.8Gbps over four lanes
- Is backward-compatible with HDMI, DVI (Digital Visual Interface) and VGA, via an appropriate adapter
- Version 1.1 supports HDCP (see section 3.2)
- Supports two-way communication over its auxiliary channel between the video source (for example, a PC) and the digital display, enabling new functionality such as automatic configuration and one-button play
- Replaces the interface needed between the PC and an external display, as well as the low voltage differential signaling (LVDS) interface in notebook computers, monitors, to connect to LCD panels

### 3.2 About HDCP

The High-Bandwidth Digital Content Protection (HDCP) standard<sup>1</sup> protects digital video and audio signals transmitted over DVI or HDMI connections between two HDCP-enabled devices to eliminate the reproduction of copyrighted material. To protect copyright holders (such as movie studios) from having their programs copied and shared, the HDCP standard provides for the secure and encrypted transmission of digital signals.

### 3.3 Recommendations for 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 **VS-21DPIR** 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 unit<sup>2</sup>.

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

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<sup>1</sup> Developed by Intel

<sup>2</sup> For example, part number 2535-052002

## 4 Your VS-21DPIR 2x1 DisplayPort Switcher

Figure 1 and Table 1 define the **VS-21DPIR 2x1 DisplayPort Switcher**:

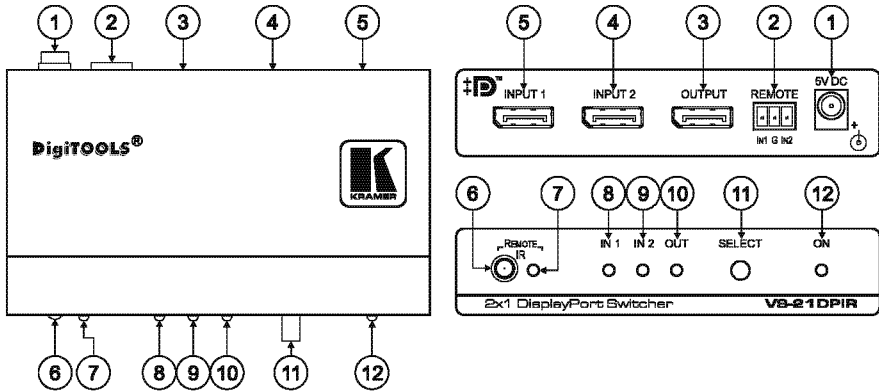


Figure 1: VS-21DPIR 2x1 DisplayPort Switcher

Table 1: VS-21DPIR 2x1 DisplayPort Switcher Features

#	Feature	Function
1	5V DC	+5V DC connector for powering the unit
2	REMOTE Terminal Block Connectors	Connect to a contact closure switch (see section 5.2)
3	OUTPUT DisplayPort Connector	Connects to the DP acceptor
4	INPUT 2 DisplayPort Connector	Connects to the DP source 2
5	INPUT 1 DisplayPort Connector	Connects to the DP source 1
6	REMOTE	Receiver Window
7	IR	LED
8	IN 1 LED	Lights when source 1 is selected
9	IN 2 LED	Lights when source 2 is selected
10	OUT LED	Lights when the output is connected
11	SELECT Button	Toggles <sup>1</sup> between IN 1 and IN 2
12	ON LED	Lights when receiving power

<sup>1</sup> IN 1 LED lights when INPUT 1 is selected, or the IN 2 LED lights when IN 2 is selected

## 5 Connecting the VS-21DPIR 2x1 DisplayPort Switcher

To connect the **VS-21DPIR**, as the example in Figure 2 shows, do the following<sup>1</sup>:

1. Connect up to two computer graphics sources to INPUT 1 and INPUT 2.
2. Connect the OUTPUT connector to the DisplayPort acceptor (for example, a display), using the Kramer DisplayPort cable<sup>2</sup>.
3. Connect the 5V DC power adapter to the power socket and connect the adapter to the mains electricity (not illustrated in Figure 2).
4. Press the SELECT button<sup>3</sup> to choose which DP input to route to the output. The SELECT button toggles between INPUT 1 and INPUT 2, lighting the IN 1 LED when INPUT 1 is selected, or the IN 2 LED when IN 2 is selected.

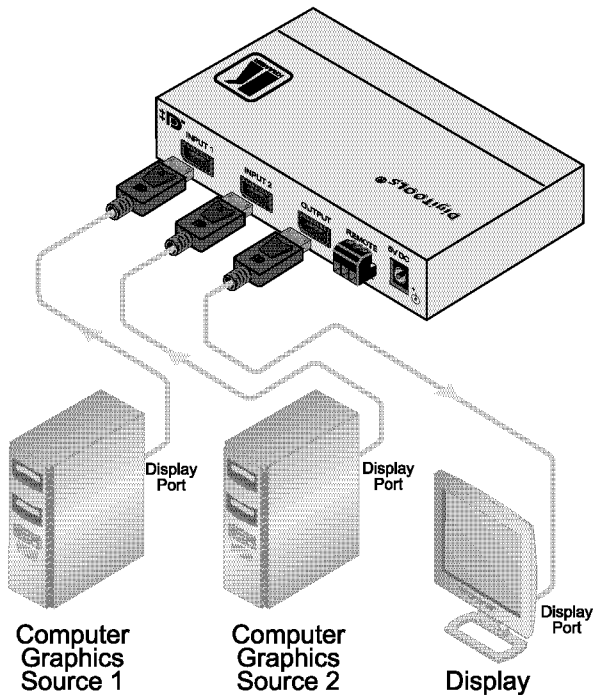


Figure 2: Connecting a VS-21DPIR 2x1 DisplayPort Switcher

1 Switch OFF the power on each device before connecting it to your VS-21DPIR. After connecting your VS-21DPIR, switch on its power and then switch on the power on each device

2 You can connect the DP output to an HDMI acceptor by using an appropriate adapter and setting the DIP-switches

3 Alternatively you can press key 1 or 2 on the remote transmitter, once setup (see section 5.1), or use the contact closure remote control pins (see section 5.2)



## 5.1 Using the Remote Control Transmitter

You can use the remote control transmitter<sup>1</sup> to switch INPUT 1 or 2 to the output. Before doing so, set it to work with the **VS-21DPIR** by assigning a GROUP number.

To assign the GROUP number on the remote control transmitter, do the following:

1. Point the remote control transmitter at the remote receiver (item 10 in Figure 1 / Table 1) and press the GROUP key.
2. Press key 11.  
This sets and saves the group number.

To switch INPUT 1 or 2 to the output via the remote control transmitter, press key 1 or 2.

## 5.2 Controlling via the REMOTE Terminal Block Connector

The contact closure remote control pins operate in a similar way to the input SELECT button. Using the contact closure remote control lets you select an input by remote control. To do so, temporarily connect the required input (IN1 or IN2) pin on the REMOTE terminal block connector to the G (ground) pin, as illustrated in the examples in Figure 3.

**DO NOT** connect more than one PIN to the G PIN at the same time

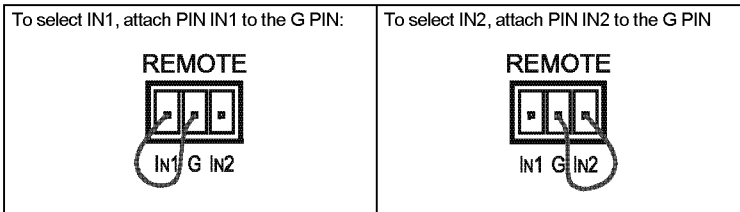


Figure 3: Connecting the REMOTE Input Select Connector

<sup>1</sup> The setup parameters for the remote control transmitter are as follows: router number = 1 (default); group number = 11, single digit mode (default), video (default). For further details, see the RC-IR2 user manual

## 6 Technical Specifications

Table 2 includes the technical specifications<sup>1</sup> of the **VS-21DPIR**:

*Table 2: Technical Specifications<sup>2</sup> of the VS-21DPIR 2x1 DisplayPort Switcher*

INPUTS:	2 DisplayPort Connectors
OUTPUT:	1 DisplayPort Connector
BANDWIDTH:	Supports up to 2.7Gbps bandwidth per graphic channel
COMPLIANCE WITH HDMI STANDARD:	Supports: DisplayPort 1.1 and HDCP 1.3
CONTROLS:	Input SELECT button, IR remote control, contact closure remote control pins
INDICATOR LEDs:	IN 1, IN 2, OUT, and ON LEDs
POWER SOURCE:	5V DC, 70mA
DIMENSIONS:	12cm x 7.15cm x 2.44cm (4.72" x 2.44" x 0.96"), W, D, H
WEIGHT:	0.3kg (0.67lbs) approx.
ACCESSORIES:	Power supply, bracket installation kit, IR transmitter
OPTIONS:	Kramer DisplayPort cables <sup>3</sup> , RK-3T rack adapter

<sup>1</sup> Specifications are subject to change without notice

<sup>2</sup> Environmental Specifications: Operating temperature: -10°C to 50°C; storage temperature: -30°C to 60°C

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

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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 three 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 installation 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)





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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.



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**Kramer Electronics, Ltd.**

Web site: [www.kramerelectronics.com](http://www.kramerelectronics.com)

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P/N: 2900-000521 REV 2