



User Guide

DVI-5312b DVI 1x2 Splitter / Repeater
DVI-5314b DVI 1x4 Splitter / Repeater



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WARNING – Product Safety

1. Do not dismantle the product housing or modify the printed circuit board module as this may result in electrical shock or burn.
2. Do not attempt to service this product yourself as opening or removing the product housing may expose you to dangerous voltages or other hazards. Refer all servicing to qualified service personnel.
3. Keep this product away from liquids. Spills into the product housing may result in fire, electrical shock, or equipment damage. If liquid spills into the housing, unplug the product immediately. Have the product checked by a qualified service engineer before using it again.
4. Place the product in an even and stable location. If the product falls or is dropped, it may cause an injury and/or malfunction.
5. Avoid exposing the product to extreme temperatures or to high humidity levels as this may result in damage to the product.
6. Only use the supplied External AC Power Adapter. The use of other power adapters may cause this product to fail or may cause a fire.
7. Do not twist or exert excessive force on the ends of the connected cables as this can cause them to malfunction. Take care to ensure that all connected cables are not forced to bend more than their minimum bend radius.

Product Liability Statement

Every effort has been made to ensure that this product is free of defects. DVI Gear cannot be held liable for the use of this product or for any direct or indirect consequential damages arising from its use. It is the responsibility of the users of this product to check that it is suitable for their requirements and that it is installed correctly. DVI Gear reserves the right to revise any of its hardware and software following its policy to modify and/or improve its products where necessary or desirable. This statement does not affect the legal rights of the user in any way.

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1.0 INTRODUCTION

The DVI-5312b and DVI-5314b are high-performance digital repeaters with one (1) DVI input and either two (2) or four (4) independent, re-clocked DVI outputs. All inputs and outputs are fully HDMI v1.3 compatible, enabling full interoperability with both DVI and HDMI sources and displays. These units accept a single DVI or HDMI input signal, which is de-serialized, buffered and applied to independent DVI compatible HDMI v1.3 transmitters at each output. This re-clocking process ensures a substantial reduction in jitter, which results in crisp, stable images. These units support a full array of DVI and HDMI v1.3 features, making them perfect solutions for high-quality digital signal distribution in professional systems.

Our digital video distribution products have been serving the professional AV industry for more than fifteen (15) years. Today, DVI Gear offers a full range of high performance products including: scalable AV-Over-10GbE Systems, Switchers, Splitters, Scalars, Up/Down/Cross-Converters, Format Converters, as well as a wide range of long-reach Digital Cables, Extenders, and Fiber Optic Transmission systems.

1.1 Features

These products offer several advanced features:

- HDMI v1.3, DVI v1.0, and HDCP v1.3 compliant
- Supports 8-bit color, 10-bit and 12-bit Deep Color modes
- Supports PC resolutions up to 1600x1200 and 1920x1200 pixels
- Supports HDTV resolutions up to 1080p and 2048x1080
- Supports Dolby Digital, Dolby Digital Plus, Dolby TrueHD, and DTS-HD Master Audio (only with HDMI v1.3 input signal)
- Supports HDMI signals using optional DVI to HDMI cables
- Input Signal Equalization enables longer cable runs
- Independent re-clocked outputs provide maximum jitter reduction and superior image stability
- Automatic discovery of connected display's EDID or selection of internally stored EDID values
- Rugged metal enclosure – may be rack mounted using optional DVI-5300-RM kit
- AC power adapter with locking plug for added security



2.0 SPECIFICATIONS

Model Numbers	
DVI-5312b	DVI 1x2 Splitter / Repeater
DVI-5314b	DVI 1x4 Splitter / Repeater
General Specifications	
Compliance	DVI v1.0, HDMI v1.3 and HDCP v1.3
Maximum Pixel Clock Frequency	225 MHz
Maximum Video Bit Rate	2.25 Gbps (single-link)
Color Depth	8-bit, 10-bit, or 12-bit
PC Resolutions	Up to 1920x1200 and 1600x1200
HDTV Formats	480i, 480p, 576i, 576p, 720p, 1080i, 1080p, and 2048x1080
Digital Audio Support	Dolby Digital, Dolby Digital Plus, Dolby TrueHD and DTS-HD Master Audio (only with HDMI v1.3 input signal)
Input Signal Equalization	+10 dB correction @ 825 MHz
Maximum Input Cable Length	12.5 meters using DVI Gear SHR™ Series copper cables
Maximum Output Cable Length	10 meters using DVI Gear SHR™ Series cables, longer if using DVI Gear (ACE™)
Input / Output Connectors	
Input	1x 29-pin female DVI connector
Outputs	DVI-5312b: 2x 29-pin female DVI connectors DVI-5314b: 4x 29-pin female DVI connectors
Mechanical	
Dimensions (H-W-D)	1.84" x 8.59" x 5.53" (46.7 mm x 218.2 mm x 140.4 mm)
Net Weight	DVI-5312b: 2.13 lbs. (964 g) DVI-5314b: 2.16 lbs. (978 g)
Environmental Specifications	
Operating Temperature	+32° to +122°F (0° to +50°C)
Storage Temperature	+14° to +158°F (-10° to +70°C)
Humidity (storage / operating)	10% to 90% (non-condensing)
Warranty	
Limited Warranty	3 Years Parts and Labor
Power Requirements	
External AC Power Adapter	Input: 100-240 VAC, 50-60Hz Output: 5VDC, 2.6A
Regulatory Approvals	
Splitter Unit	FCC, CE, RoHS
AC Power Adapter	FCC, CE, UL, C-UL, CEC, GS, PSE, RoHS
Included Accessories	
1x AC Power Adapter with USA plug, 1x User Guide	
Optional Accessories	
DVI-5300-RM	Rack Mount Kit for DVI-5300 Series Splitters - accepts two units
DVI-7206-PS	International AC Power Adapter (USA, Euro, UK, or Australian plug)



3.0 PACKAGE CONTENTS

Before attempting to use this unit, please check the packaging and make certain the following items are contained in the shipping carton:

- 1x DVI 1x2 Splitter / Repeater or DVI 1x4 Splitter / Repeater
- 1x External AC Power Adapter
- 1x User Guide

Note: Please retain the original packing material should the need ever arise to return the unit. If you find any items are missing, contact your reseller or DVI Gear immediately. Please have the Model Number, Serial Number, and Invoice Number available for reference when you call.

4.0 CONNECTING THE HARDWARE

Please study the images below to become familiar with the location of the controls, status LEDs, signal input, signal outputs, and the power input.



DVI-5312b DVI 1x2 Splitter / Repeater



DVI-5314b DVI 1x4 Splitter / Repeater



The DVI-5312b and DVI-5314b splitters are functionally identical with the exception of the number of outputs. Both units have a single DVI-D input and a +5 VDC power input jack. These connections, as well as the output connectors, are located on the rear panel.

4.1 Input / Output Connections

Connect a DVI-D or HDMI compliant input signal from a suitable source device to the DVI Input Port. Next connect the output devices (typically displays) to the DVI Output Ports. Make certain that all cables are securely plugged in on both ends. Always use high quality cables, as short a length as possible, to ensure the best results. Do not exceed the recommended cable lengths indicated in this User Guide.

4.2 Connecting the Power

This product is shipped with an External AC Power Adapter that converts 100-240 VAC at 50/60Hz to +5 VDC with 2.6A output current. Connect the output cable from the AC Power Adapter to the locking receptacle on the rear panel. Take care to insert, then twist the connector a quarter turn in the clockwise direction. There is no power switch on these units. The units will turn ON as soon as the supplied AC Power Adapter is connected to a live AC power receptacle.

5.0 OPERATING THE UNIT

To use the DVI-5312b and DVI-5314b splitters, first connect a DVI-D or a DVI-HDMI cable from the DVI or HDMI source device to the input of the splitter. Next, connect the outputs of the splitter to their destination devices (typically displays or projectors). Take care to ensure the cable quality and lengths are consistent with the recommendations provided herein.

Once the input and output cables and External AC Power Adapter are connected, plug the power adapter into a live AC power receptacle and the splitter will begin to function. A Power LED on the front of the unit will confirm power is present. Other than connecting cables and applying power, there are no other set-up steps required with the exception of setting the EDID selector switch on the front panel.

Note: Proper operation of this product depends on the use of high quality cables. DVI Gear's Super High Resolution (SHR™) DVI or HDMI cables provide low loss, low jitter, high bandwidth signal handling and are the recommended cables for use with this product.

5.1 EDID Management

EDID (Extended Display Identification Data) is a collection of data cached inside all modern displays that describes the unit's capabilities. The EDID information is defined by a standard published by the VESA (Video Electronics Standards Association) and includes information such as the manufacture's name, model number, supported resolutions and video timings, supported audio formats, color space, etc. During boot-up, a source device must be able to read the EDID of the connected display. When using a splitter, it is necessary that the EDID from one of the connected displays is passed back to the source device. The EDID value used is critical to the performance of the system as a whole.

On the front of the unit there is an EDID selection switch. This switch controls what EDID information the splitter will report to the source device. The EDID information provided to the source can either be EDID from one of the connected displays (**AUTO** EDID Mode) or from an on-board memory chip that contains a library of the most commonly used resolutions (**INT** EDID Mode). These internally stored resolutions are listed in the table below.

Resolution		Vertical Rate (Hz)	Scan Format
480p	720x480	60	Progressive
576p	720x576	50	Progressive
720p	1280x720	50,60	Progressive
1080i	1920x1080	50,60	Interlaced
1080p	1920x1080	50,60	Progressive
VGA	640x480	60	Progressive
SVGA	800x600	60	Progressive
XGA	1024x768	60	Progressive
SXGA	1280x1024	60	Progressive
UXGA	1600x1200	60	Progressive
WXGA	1280x800	60	Progressive
WXGA+	1440x900	60	Progressive
WSXGA+	1680x1050	60	Progressive
WUXGA	1920x1200	60	Progressive

When set to the **AUTO** position, the splitter will automatically discover and apply the EDID based on a predetermined selection hierarchy as follows:

HDMI v1.3 → HDMI v1.2 → DVI

When the splitter powers ON, it automatically begins the EDID discovery process by sequentially scanning the connected displays on all outputs, starting with



Output #1, then Output #2, etc. The splitter will select the EDID from the first HDMI v1.3 compatible display that it finds. If no such displays are connected to the splitter, it will select the first EDID that it finds from a connected display that is HDMI v1.2 compatible. If no such displays are found, it will select the first EDID that it finds from a connected DVI display. The selected EDID information becomes the “reference EDID” and is stored in the splitter’s memory. When the connected source device boots up it will read the EDID stored in the splitter’s memory and react as if it were connected directly to the display that provided it.

For example, if the display connected to Output #1 is a DVI monitor, or if no display is connected, the splitter will search for EDID information from Output #2, then Output #3, and Output #4, until it finds a display with valid HDMI EDID information. In the event none of the outputs has an HDMI display connected, the splitter will use the EDID of the first DVI display that is connected as the “reference EDID” for the source device.

The default factory setting for the EDID switch setting is **AUTO**. This setting works best for most applications. If one or more displays do not operate properly such that there is no image, or the image is too large or too small, then reset the EDID switch to the **INT** position. After changing the EDID switch setting, it is necessary to cycle power to the splitter (remove power, then replace power) in order to force the source and the displays to re-sync the EDID information. With some source devices (PCs) it may be necessary to re-boot in order to recognize the new EDID information.

5.2 LED Operation

There are two types of status LEDs that indicate the operation of the splitter: Input LEDs and Output LEDs.

INPUT LEDs: Power, HDMI / DVI, HDCP, and SYNC

Power: LED illuminates red when the External AC Power Supply is connected to both the unit and a live AC power outlet.

HDMI / DVI: LED illuminates green when the source is HDMI. The LED is turned off if the source is DVI.

HDCP: (High-bandwidth Digital Content Protection) LED is illuminated green if the input signal is HDCP encrypted.

SYNC: LED illuminates green if the source provides an active signal.

OUTPUT LEDs: Are identified with a number from 1 to 4 depending upon the type of splitter. The numbers correspond to the splitter’s outputs. These LEDs will be illuminated green if the output of the splitter is connected to a working display or other type of destination device.



6.0 TROUBLESHOOTING

In the event of problems, first make certain that the input and output cables are connected securely and are of the highest possible quality.

Note: *Use of low quality cables can seriously degrade the performance of this product. To ensure optimal performance and maximum cable distance, use premium quality cables such as DVI Gear's Super High Resolution (SHR™) Series cables.*

Next, bypass the Splitter by connecting the source device directly to known working display devices using a short cable. Verify that a proper image and audio (if sending an HDMI signal) are present.

Next, check the Power LED to make certain that the Splitter is receiving power. It should be fully illuminated and not flickering or intermittently going on and off. Intermittent operation may indicate a problem with the AC Power Adapter or too low AC voltage being applied to the AC Power Adapter input.

If the input signal is HDCP encrypted, check to ensure that the connected display(s) or other output device(s) are HDCP compatible. Also check to ensure that the source device supports HDCP Repeater functionality.

Note: *For troubleshooting HDCP links, it can be very helpful to have a test generator that can turn HDCP On and Off manually. DVI Gear's DVI-7050a HDMI Test Generator is a good solution for this requirement.*

Some Blu-ray players and DVD players will provide non-HDCP encrypted content briefly on power-up (e.g. splash screen). Also many DVDs and Blu-ray players intentionally do not use HDCP encryption on the previews that precede the main feature; this can provide a helpful indication when diagnosing HDCP related problems.

If the problem persists after trying the above suggestions, please contact your dealer for additional assistance. If the dealer's technical personnel are unable to assist you, please contact DVI Gear via telephone at 1.888.463.9927 (toll-free for United States and Canada) or 1.770.421.6699. You may contact DVI Gear by e-mail at support@dvigear.com.



7.0 LIMITED WARRANTY

LIMITED WARRANTY – Subject to the limitations stated below, DVI Gear warrants that this product will be free from defects in materials and workmanship for a period of three (3) years from the date of purchase.

Should the product, in DVI Gear's opinion, prove defective within the warranty period stated above, DVI Gear, at its option, will repair or replace this product without charge. Any defective parts replaced become the property of DVI Gear. This warranty does not apply to products that have been damaged due to accident, unauthorized alterations, improper repair, modifications, inadequate maintenance and care, or use in any manner for which the product was not intended.

If repairs are necessary under this warranty policy, the original purchaser must obtain a Return Authorization Number from DVI Gear and return the product freight prepaid to a location designated by DVI Gear. After repairs are complete, the product will be returned, freight prepaid.

The foregoing warranty is the sole and exclusive warranty given by DVI Gear, express or implied, and DVI Gear disclaims all implied warranties, including but not limited to implied warranties of merchantability or fitness for a particular use.

LIMITATIONS – The liability of DVI Gear with respect to any defective products will be limited to the repair or replacement of such products. In no event shall DVI Gear be responsible or liable for any damage arising from the use of such defective products, including but not limited to loss of use, revenue or profit, whether such damages are direct, indirect, consequential or otherwise and whether such damages are incurred by the reseller, end-user, or any third-party.

8.0 REGULATORY COMPLIANCE

This product has been tested for compliance with appropriate FCC and CE rules and regulations. The supplied AC Power Adapter has been tested for compliance with FCC, CE, UL, C-UL, CEC, GS, and PSE rules and regulations. This product and the supplied AC Power adapter are RoHS compliant.



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