HALL RESEARCH

USER'S MANUAL

EMX-DVI

Single & Dual Link DVI Extender w/ EDID Mgmt

Equalizes and Boosts Single or Dual Link DVI video signals
Manage EDID (pass-thru or emulate)
Learns and Store EDID from any display
USB Port for device management with included software
Port-powered (from DVI sources that provide enough power)
Includes Universal power adapter

CUSTOMER SUPPORT INFORMATION

Order **toll-free** in the U.S. **800-959-6439**
FREE technical support, Call **714-641-6607** or fax **714-641-6698**
Mail order: **Hall Research**, 1163 Warner Ave., Tustin, CA 92780
Web site: **www.hallresearch.com** □ E-mail: **info@ hallresearch.com**

UMA1185 Rev C

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1.0 Introduction

Thank you for purchasing the Hall Research EMX-DVI. Use this device to boost and extend DVI video signals, emulate a display to the source by supporting EDID functions, and to be able to read/learn and emulate any display's EDID.

The EMX-DVI automatically compensates for the signal degradation caused by long video cable runs of up to 50 ft (15 m) on its input and can drive long DVI Cables on its output to 40 ft (12 m) by boosting and echo-canceling the DVI video output. Its ability to equalize cable losses makes it ideal to be placed at the far (display) end of long DVI cables.

By default, the unit is setup to buffer single link DVI (or HDMI) signals. Use the recessed LINK pushbutton to change the mode to support Dual link TMDS signals. There is an indicator on the top of the unit for the selected mode.

In most instances, when configured for Single Link extension, the unit can operate from the power available through the DVI source signal and no external power supply connection is required.

The unit ships with a universal power supply in case the power from the DVI input source is insufficient. The power supply is plugged in at the USB connector. When the USB port is connected to a PC (cable supplied), the unit is powered by the PC through the USB connection.

The DDC channel (that handles EDID and HDCP data) can either be bypassed through the EMX-DVI (so the source communicates directly with the connected display), or it can be emulated whereby the EDID is supplied from internal memory. The product is shipped with a fixed internal EDID table for emulate mode, but this table can be overwritten by either learning the EDID from a connected sink (display), or uploaded via the USB port using the free software from Hall Research. The user can revert to the original internal table if required, by performing factory reset using the software.

Advantages of having a mode that emulates the EDID are:

- Video problems may be caused by errors in the EDID data transmission from the display to the PC (long cables, or extension and switching equipment), supplying EDID from the EMX-DVI can resolve those problems.
- You can control the EDID table that is being emulated. For example you can “learn” a certain LCD’s EDID, or even upload your own edited EDID.
- In Emulate mode the PC detects a connected display even if there is no physical display connected, or if the display is off and not asserting its Hot Plug Detect signal. In emulate mode the HPD is asserted and the PC is allowed to fully boot in critical applications regardless of what is connected at its DVI (or VGA) output.
- Some sources such as MacBook™ laptops by default output video with HDCP (when they detect connection to a sink that supports HDCP), but when connected through the EMX-DVI in emulate mode, MacBook™s will output video without HDCP (if the source video has DRM, such as a DVD movie, then no video will be shown). This can be an advantage in cases where you are connecting a MacBook™ through some splitters or switches that support HDCP to a video conferencing system that cannot support HDCP. All that is needed is the EMX-DVI in emulate mode connected at the video output of the Mac.

The EMX-DVI provides a driver free USB port for connection to a PC. The package includes a universal power supply, a USB cable for connection to a PC, and a CD containing the User's Manual and Windows™ PC. This software allows reading, saving, manipulating, and writing EDID tables to and from the device. The EMX-DVI modes (Bypass vs. Emulate or Single-Link vs. Dual-Link) are also controllable via the USB port.

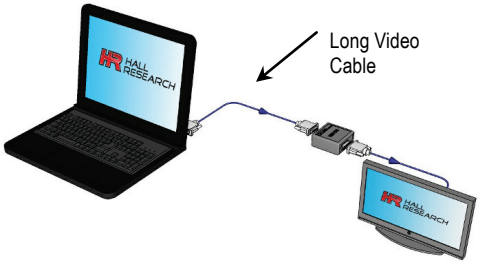
The DVI connectors used on the unit are DVI-I (they have all the pin sockets even for analog RGB). The device provides DVI-I bypass for analog RGBHV (or VGA) signals (i.e. analog pins on the DVI-I input are connected to the output), so it can manage EDID for VGA sources and displays using inexpensive VGA to DVI cables or adapters.

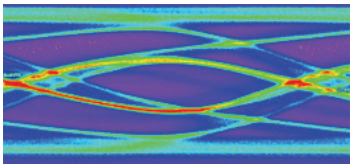
2.0 Features

- Equalize and boost Single or Dual Link DVI video
- Manage EDID (pass-thru or emulate)
- Learn and Store EDID form any display
- USB port for managing EDID and configuration with free software
- Port-powered (from DVI sources that provide enough power)
- Includes Universal power adapter
- LED indicators for Mode display
- Analog VGA pass-through
- In Emulate mode allows PC to fully boot with video even if there is no physical display connected
- Supports Single and Dual-Link DVI, HDMI™, CEC & 3D Video
  Use with or without display
- USB port for control and mgmt of EDID
- Designed and made in USA

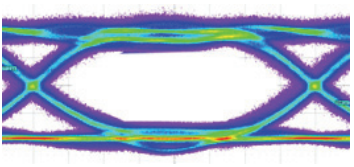
3.0 Installation

The EMX-DVI connects between the video source and an optional display device.
Though designed to drive long cables on its output, when used as an extender, it is best to place the EMX-DVI at the end of the long cable. In that way, its automatic equalizer can clean the output signal and open the TMDS “eye”.





TMDS Signal at end of long Cable

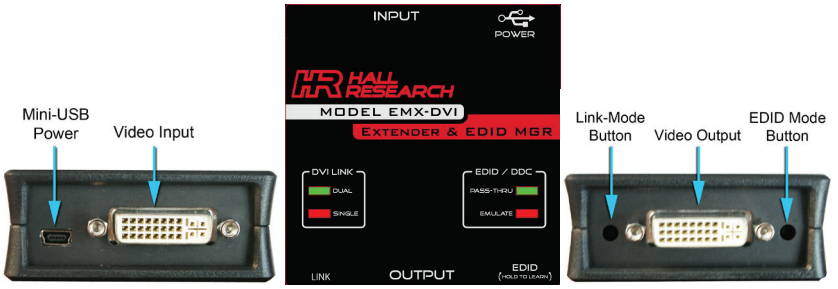


TMDS Signal after Equalization

The DVI source may have enough power to power up the unit (particularly when configured in Single-Link Mode), so connection to an external power supply would not be needed. The only way to find out if a particular source can supply the required power is to try it. If a power supply in deemed necessary, the package includes one that will plug to its USB port. When the EMX-DVI USB port is connected to a PC, it draws power from the USB and no additional power supply is needed.

Connect the video source to the EMX-DVI video input (50 ft or 15 meters max). Connect the EMX-DVI video output to the display device (40 ft or 12 meters max).

The EMX-DVI LEDs show the current device settings. Refer to the operations section for more information.



Input, Output, and Top views

4.0 Default EMULATION resolutions

The following is a list of supported resolutions in the internal EDID of the EMX-DVI as shipped from the factory – the native resolution is highlighted in grey. When the user "learns" a new EDID or uploads a new EDID to the box through the USB port, then this table is overwritten. However the default EDID table can be restored by performing a Factory Default reset (using the free Windows® software, or by pressing buttons as described in Section 6).

RESOLUTION	FREQUENCY	ASPECT RATIO	RESOLUTION	FREQUENCY	ASPECT RATIO
640x480	60, 67, 72, 75	(Aspect 4:3)	720x480i	59.94/60	(Aspect 4:3, 8:9)
800x600	56, 60, 72, 75	(Aspect 4:3)	720x480p	59.94/60	(Aspect 4:3, 8:9)
1024x768	60, 70, 75	(Aspect 4:3)	1280x720p	59.94/60	(Aspect 16:9, 1:1)
1280x720	**60**	**(Aspect 16:9)**	1920x1080i	59.94/60	(Aspect 16:9, 1:1)
1280x800	60	(Aspect 16:10)	1920x1080p	50, 59.94/60	(Aspect 16:9, 1:1)
1280x1024	60, 75, 85	(Aspect 5:4)			
1400x1050	60	(Aspect 4:3)			
1440x900	60	(Aspect 16:10)			
1600x1200	60	(Aspect 4:3)			
1680x1050	60	(Aspect 16:10)			
1920x1080	60	(Aspect 16:9)			
1920x1200	60	(Aspect 16:10)			

5.0 Power Requirements

This device requires 5 Volts DC which can be sourced through the mini-B USB connector (by connecting to the included power supply or a PC's USB port), or from Pin 14 (+5 V) of the DVI connector.

To power the EMX-DVI from the DVI input power, the source must be able to supply a minimum of 120 mA (@ 5 vDC) for SINGLE LINK DVI operation and a minimum of 220 mA (@ 5 vDC) for DUAL LINK DVI operation. Using a video source with insufficient power capabilities will result in erratic operation and loss of video. If this happens, the user must connect the USB port to a PC or a power supply.

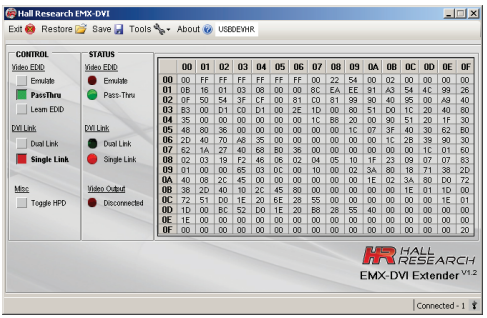
6.0 Operation

The EMX-DVI recessed buttons prevent inadvertent changes to its settings.
Changing the settings requires a pointed device inserted into the hole to depress the button.
Some functions require depressing the button for several seconds.

- **EDID/DDC – PASS-THRU LED**
  - EDID & HDCP information passes through the device without modification.
  - HDCP is supported in this mode if the connected sink device is HDCP compliant.
  - Hot-Plug Detect signal (HPD) from connected display passes to the DVI input.
- **EDID/DDC – EMULATE LED**
  - Emulates the EDID using the table that is currently stored in the device.
  - HDCP is not supported in this mode
  - HPD signal remains active (no monitor required)
- **LINK – SINGLE LED**
  - DVI video passes through the device in SINGLE LINK format.
- **LINK – DUAL LED**
  - DVI video passes through the device in DUAL LINK format.
- **LEARNING the EDID from Connected LCD**
  - Press and hold the EDID button for approximately 3~5 seconds until the EMULATE LED starts blinking
  - Release the button, the EMULATE LED will continue blinking while the unit is reading and saving the EDID form the LCD connected to the output.
  - If the EDID read process is successful, then ALL LED's will illuminate one at a time in a circular pattern 5 times.
  - If the EDID is NOT successfully read, the PASS-THRU and EMULATE LEDs will alternately flash 5 times to indicate the error.
- **SET FACTORY DEFAULTS**
  - Simultaneously press and hold BOTH the LINK and EDID buttons for approximately 3~5 seconds until BOTH the EMULATE and SINGLE LINK LED's start blinking.
  - Release both buttons.
  - If the factory defaults were successfully restored, all LED's will illuminate one at a time in a circular pattern 5 times.

7.0 Windows Software GUI

The EMX-DVI is controllable via a free Windows™ based GUI available from the Hall Research website.
All of the device features, and more, are accessible from the GUI. EDID files can be exported or imported. The device is also capable of writing custom EDID data back to compatible display devices.The user guide for the Software GUI is only available from the website.



8.0 Troubleshooting

Problem: No LEDs illuminate or LED's only momentarily FLASH when buttons are pushed, or No video appears on the connected LCD

Possible Cause: If connected via DVI input cable only, your source may not have enough power through its DVI connector to power the device, connect and check power supply

Problem: DVD or Blu-ray content does not display

Possible Cause: The source is content protected using HDCP. HDCP is not supported in EMULATE mode, use the PASS-THRU mode.

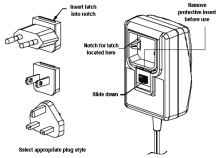
9.0 Returning unit for Repair

If you need to transport or ship your unit: Package it carefully. We recommend that you use the original container.

Before you ship the units back to Hall Research for repair or return, contact us to get a Return Authorization (RMA) number.

10.0 Specifications

Power Supply ..... **(North American)**
5 vDC, 1 ADC
USB-A to mini-B cable
90-264 VAC, 47-63 HZ
CE/FCC/UL



(Export)
5 vDC, 1.2 ADC
Integral mini-B cable
90-264 VAC, 47-63 HZ
CE/FCC/UL
Inter-changeable blades

Size ..... 2.71" (W) x 2.825" (D) x 1.25" (H)
(68.83 mm) x (71.76 mm) x (31.75 mm)
Weight ..... 1 Lb (0.453 kg)
Operating Temperature ..... 32 to 122 DegF (0 to 50 DegC)
Storage Temperature ..... -40 to 185 DegF (-40 to 85 DegC)
Humidity ..... 10 to 90% non-condensing
Cooling ..... Convection
Enclosure type ..... Black Plastic ABS-94VO, UL File #56070
Vibration ..... ISTA 1A in carton (International Safe Transit Association)
Safety ..... CE
EMI/EMC ..... CE, FCC Class A
MTBF ..... 90,000 hours
Warranty ..... 2 years parts and labor
USB ..... 1.1 Full Speed
Support video formats ..... DVI 1.0
HDMI™ 1.4
HDCP 1.0
Analog RGBHV

11.0 Trademarks

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