Gefen

8x1 DVI KVM DL/SL Switcher

EXT-DVIKVM-841DL

User Manual

www.gefen.com

ASKING FOR ASSISTANCE

Technical Support:
Telephone   (818) 772-9100
                                          (800) 545-6900

Fax   (818) 772-9120

Technical Support Hours:
8:00 AM to 5:00 PM Monday thru Friday.

Write To:

Gefen Inc.
c/o Customer Service
20600 Nordhoff St
Chatsworth, CA 91311

www.gefen.com
support@gefen.com

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INTRODUCTION

Congratulations on your purchase of the 8 x1 DVI-DL KVM Switcher. Your complete satisfaction is very important to us.

Gefen

Gefen delivers innovative, progressive computer and electronics add-on solutions that harness integration, extension, distribution and conversion technologies. Gefen's reliable, plug-and-play products supplement cross-platform computer systems, professional audio/video environments and HDTV systems of all sizes with hard-working solutions that are easy to implement and simple to operate.

The Gefen 8x1 DVI KVM DL/SL Switcher

The rack-mountable Gefen 8x1 dual link/single link DVI KVM Switcher offers an economical solution by eliminating the need to purchase many displays for each computer in a studio or lab situation. A plug-and-play solution that supports both Macintosh and IBM-PC computers, the 8x1 DVI KVM DL/SL Switcher shares one DVI display with up to eight computers or other DVI video sources. A single USB 2.0 port, keyboard & mouse ports, and an analog audio jack are also switched. The switcher saves space on your desktop by eliminating a crowded workspace full of DVI monitors, keyboards & mice, and USB and audio cables. Switching of DVI sources is easy and reliable.

How It Works

The DVI monitor is connected to the 8x1 DVI KVM DL/SL Switcher's output. Up to eight DVI video sources connect to the switcher's DVI inputs using included high quality DVI cables. The included power supply is connected to the switcher via the locking power plug and then to a power outlet. The currently selected DVI video signal appears on the shared monitor. DVI Video sources (and optionally keyboards & mice, USB and audio cables) are selected/switched using the RMT-8IR remote control, RS-232 control, or the input selector push button on the front panel of the switcher.

READ THESE NOTES BEFORE INSTALLING OR
OPERATING THE GEFEN 8X1 DVI KVM DL/SL SWITCHER

- The 8x1 DVI KVM DL/SL Switcher will take any of up to eight (8) DVI dual-link or single-link resolution inputs and switch them, one at a time, to a DVI output device such as a display/monitor or projector. Resolutions can be up to 3840x2400.

- The 8x1 DVI KVM DL/SL Switcher is housed in a metal box for better RF shielding.

- Computers must be turned on one at a time and the switcher must be selected to the computer that is booting up. This is so that monitor information (EDID) can be transmitted from the display to each computer. After one computer completes the startup process, you can boot up the second computer and repeat the process with the remaining computers. This can be avoided with the use of the LOCAL EDID mode (page 11) that will constantly supply each computer with an EDID. In this scenario, a stored EDID, or user uploaded EDID, is supplied to each input for use by the connected source device. Then, each computer can boot up in any order and at anytime, regardless of which computer the switch is selected to.

Features

- Switches easily between any eight DVI-SL or DVI-DL sources

- Switches USB 2.0, keyboard & mouse, and analog audio

- Maintains highest resolution dual link DVI

- Supports resolutions up through 3840x2400

- Extends the range of DVI video up to 50 feet

- Discrete IR remote control included

- Serial RS-232 remote port for switching via automated control or PC

- Supports DDWG standards for DVI monitors

- Rack ears included

Package Includes

(1) 8x1 DVI KVM DL/SL Switcher
(1) RMT-8IR Remote Control
(1) 5V DC Power Supply
(8) 6-foot Dual Link DVI cables
(8) 6-foot USB cables
(8) 6-foot 3.5mm jack analog audio cables
(1) Set of rack ears
(1) User's Manual

Front Panel

1 **2** **3** **4** **5**

Back Panel

10 **11** **12** **9**

6 **7** **8**
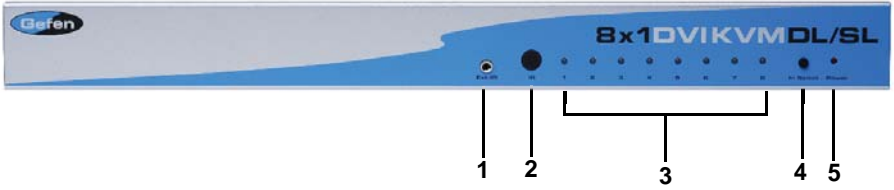
1 ***External IR Port***
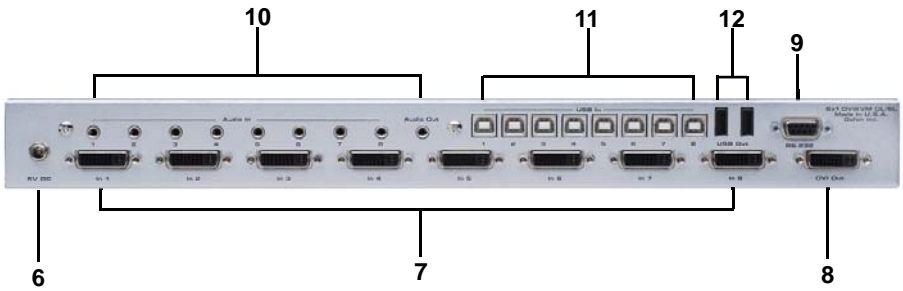For connection of external IR extension device such as the Gefen IR Extender (part # EXT-RMT-EXTIR).

2 ***IR Receiver***
Receives IR signal from the handheld Infrared remote control unit included with the 8x1 DVI KVM DL/SL Switcher.

3 ***DVI Signal Status LEDs 1-8***
Provide visual confirmation of the currently selected DVI input signal being output to the DVI display device.

4 ***DVI Input Selector***
Push-button switch cycles the next DVI input 1-8 in a forward sequence starting again at 1.

5 ***Power Indicator LED***
Indicates when the 8x1 DVI KVM DL/SL Switcher is receiving 5V DC power from its included AC power supply.

6 ***5V Locking Power Receptacle***
Supplies power to the 8x1 DVI KVM DL/SL Switcher from the included external 5V DC power supply. The 5V power supply has a locking power tip which screws into this receptacle.

7 ***DVI Input Ports 1-8***
DVI video sources one through eight attach to the 8x1 DVI KVM DL/SL Switcher.

8 ***DVI Output Port***
This DVI output port is connected to the display device (Monitor, Projector).

9 ***RS-232 Serial Communications Interface***
Provided for external control of the 8x1 DVI KVM DL/SL Switcher.

10 ***3.5mm Analog Audio Jacks 1-8***
Audio Sources one through eight connect to the switcher here.

11 ***USB Type B Ports 1-8***
USB devices one through eight connect to the switcher here.

12 ***USB Type A Control Ports 1-2***
The keyboard & mouse for controlling the selected remote computer or device connects to the switcher here.

CONNECTING & OPERATING THE 8X1 DVI KVM DL/SL SWITCHER

How to Connect the 8x1 DVI KVM DL/SL Switcher to your devices:

1. Connect your computers' DVI, USB, and Audio sources to the 8x1 DVI KVM DL/SL Switcher inputs using the supplied cables.

2. Connect your DVI display to the DVI output of the 8x1 DVI KVM DL/SL Switcher using a user-supplied DVI cable.

3. Connect your USB and audio devices to the USB and audio outputs with user-supplied cables.

4. Connect the included 5V DC power supply to the Switcher by by screwing its 5V DC power supply tip into the receptacle in the rear of the unit, then plug it into the wall.

5. Turn on the DVI display or projector first, then the DVI video sources/computers.

   Note: Computers must be turned on one at a time and the switcher must be selected to the computer that is booting up. This is so that monitor information (EDID) can be transmitted from the display to each computer. After one computer completes the startup process, you can boot up the second computer and repeat the process with the remaining computers. This can be avoided with the use of the LOCAL EDID mode (page 11) that will constantly supply each computer with an EDID. In this scenario, a stored EDID, or user uploaded EDID, is supplied to each input for use by the connected source device. Then, each computer can boot up in any order and at anytime, regardless of which computer the switch is selected to.

How to Operate the 8x1 DVI KVM DL/SL Switcher:

1. Use the RMT-8IR remote control to remotely switch between DVI video sources.

2. Alternatively, use a RS-232 control system or the front panel selection button.

The RMT-8IR remote control will allow the user to choose which of 8 DVI sources or computers will be selected. Please use the information below when selecting the desired source:

RMT-8IR Button	DVI Source
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

To use the RMT-8IR remote, remove the battery cover on the back of the remote to reveal the battery compartment. Insert the included battery into the open battery slot. The positive (+) side should be facing up. Ensure that both DIP (Dual Inline Package) switches are in the OFF position. Replace the battery cover. The remote ships with 2 batteries. One battery is needed for operation and the other battery is complimentary.

Empty Battery Slot

IR Code Dip Switches

RMT-8IR REMOTE AND 8X1 KVM SWITCHER CONFIGURATION

How to Resolve IR Code Conflicts

In the event that IR commands from other remote controls conflict with the supplied RMT-8IR remote control, changing the remote channel will alleviate this issue. The RMT-8IR remote control and the 8x1 DVI KVM DL/SL Switcher both have banks of DIP (Dual Inline Package) Switches for configuring the remote channel that both units use to communicate. These settings must exactly match each other for proper operation.

The DIP Switch bank on the RMT-8IR is located underneath the battery cover. DIP Switch banks for the 8x1 DVI KVM DL/SL Switcher are located on the underside of the unit beneath a black piece of metallic tape. One DIP switch bank (4-switch) is for the adjustment of remote control frequencies and switch behavior. The other DIP switch (8-switch) is reserved for DL Only mode (page 11). Switches 1 and 2 on the RMT-8IR directly correspond to DIP Switches 1 and 2 on the 8x1 DVI KVM DL/SL Switcher. Only switches 1 and 2 (of 4 in that bank) are used for IR Code settings.

Remote Channel 1: Default

Remote Channel 2:

Remote Channel 3:

Remote Channel 4:

Left: Picture of the opened rear battery compartment of the RMT8-IR remote showing the exposed DIP Switch bank between the battery chambers.

8x1 DVI KVM DL/SL Switcher

Remote Channel 1: Default

Remote Channel 2:

Remote Channel 3:

Remote Channel 4:

EDID. What is it and what is it used for?

Under normal circumstances, an source device (digital and analog) will require information about a connected device/display to assess what resolutions and features are available. The source can then cater its output to send only resolutions and features that are compatible with the attached device/display. This information is called EDID (Extended Display Information Data) and a source device can only accept and read one EDID from a connected device/display. Likewise, the source an only output one resolution for use by a connected device/display.

Why is EDID so important with the 8x1 DVI KVM DL/SL Switcher?

The 8x1 DVI KVM DL/SL Switcher is complex piece of technology that switches between multiple inputs. Each connected source device will require one EDID to read. EDID management is carefully handled by 8x1 DVI KVM DL/SL Switcher to provide a single EDID for each source to read.

What options do I have to manage the EDID in the 8x1 DVI KVM DL/SL Switcher?

The 8x1 DVI KVM DL/SL Switcher has the ability to use 2 modes for routing EDID. The default mode is the LOCAL mode which will route a stored EDID (one for each input) in the 8x1 DVI KVM DL/SL Switcher. The EDID stored in each LOCAL location can be loaded from various sources. This includes an external EDID that can be uploaded to the 8x1 DVI KVM DL/SL Switcher via the RS-232 serial communications port. The 8x1 DVI KVM DL/SL Switcher also includes a EDID bank which has the ability to store up to 7 separate EDID's which can then be loaded to each of the LOCAL EDID locations. The second mode is the DS (Down Stream) mode which functions as a simple EDID pass-through. In this mode, the display connected to the 8x1 DVI KVM DL/SL Switcher will pass its EDID directly to whichever DVI input source is currently selected.

How do I change EDID modes in the 8x1 DVI KVM DL/SL Switcher?

There is an bank of 4 DIP switches located on the main-baord on the underside of the 8x1 DVI KVM DL/SL Switcher. DIP switch 3 can be used to set either the DS or LOCAL EDID modes. The 8 bank of DIP switches are used for the DL (dual link) only feature.

TIP: Advanced EDID functions can also be managed via the RS-232 serial communications port. See page 13 for more information on the RS-232 serial communication features.

EDID Modes

The diagram below illustrates the 4 DIP switch bank. The 8 DIP switch bank functions are outlined later on this page.

DIP SWITCH	Function
1	IR Channel
2	IR Channel
3	EDID Mode
4	N/A

Use DIP switch 3 to set the desired EDID mode.

LOCAL EDID Mode (Switch 3=OFF)

- EDID that is stored in the LOCAL memory location is passed to all inputs.

- By default, during each power on process the connected display's EDID will be automatically copied to each of the input's LOCAL EDID locations.*

- The EDID stored in the LOCAL locations, using the default process, can be overwritten with another EDID from the following locations (These options can only be initiated by using RS-232 serial communication commands) :

  - Built-in EDID bank (up to 7 can be stored)

  - Directly from the input display

  - Externally uploaded via the RS-232

*For the default EDID writing process to be successful the connected display must be powered on.

DS (Down Stream) EDID Mode (Switch 3=ON) DEFAULT

- EDID is passed directly from the connected display to the currently active input.

DL (Dual Link) Only Modes

The 8 DIP switch bank, located on the underside of the 8x1 DVI KVM DL/SL Switcher cab be used to set each individual input to work in a Dual Link Only mode. These modes should only be enabled if issues occur when using Dual Link sources and displays in the default mode.

DIP SWITCH	Function	DIP SWITCH	Function
1	Input 1 Mode	5	Input 5 Mode
2	Input 2 Mode	6	Input 6 Mode
3	Input 3 Mode	7	Input 7 Mode
4	Input 4 Mode	8	Input 8 Mode

Use DIP switch 3 to set the desired EDID mode.

DL (Dual Link) and SL (Single Link) Mode (Switch=OFF) DEFAULT
- This setting can be set individually for each input. This mode will allow the connection of both Dual Link and Single Link displays.

DL (Dual Link) Only Mode (Switch=ON)
- This setting can be set individually for each input. This mode should be enabled if issues with the default occur with Dual Link displays.

What features are available via the RS-232 serial communications port?

The 8x1 DVI KVM DL/SL Switcher can accept commands through the RS-232 serial communications port located on the rear panel. The current RS-232 control features are:

- Switching/routing of inputs to outputs without the RMT-8IR remote control.

- Switch EDID modes without operating the DIP switches on the underside of the unit.

- Managing the EDID bank and EDID that is loaded into the LOCAL EDID.

- Upload new EDID's to the EDID bank or directly to the LOCAL EDID location.

How do I use these features?

These features were initially intended for utilization by custom installers in automated setups. However, these features can be tested by using any Windows PC with the Hyperterminal program.

What pins are used for communication with the 8x1 DVI KVM DL/SL Switcher?

Only pins 2 (Receive), 3 (Transmit), and 5 (Ground) are used for communication. A null-modem adapter should not be used with this product.

Only Pins 2 (RX), 3 (TX), and 5 (Ground) are used on the RS-232 serial interface

What are the communication port settings?

Bits per second 19200

Data bits 8

Parity .... None

Stop bits 1

Flow Control .... None

1. ECHO PROTOCOL

Definition:

Semi echo mode – the product send echo every byte it received, except on receiving EDID file.

Full echo mode – the product send echo every byte it received, even on receiving EDID file.

The default of the system is Semi echo mode.

If working with hyper terminal, choose the semi echo mode.

2. REMOTE FUNCTION

The remote functions are used to modify the setting of the products, such as:

Input to output routing, EDID memories management etc.

These functions are available only by the serial port.

2.1 MODIFY BY SHORT-CUT CHARACTER

Switching command

The character indicates which input will route to the output.

ASCII	Input	Binary
1	1	0011 0001
2	2	0011 0010
3	3	0011 0011
4	4	0011 0100
5	5	0011 0101
6	6	0011 0110
7	7	0011 0111
8	8	0011 1000

Setting function menu

The 'P' or 'p' command will present the setting function menu.

2.2 MODIFY BY FUNCTION

The syntax for each function is always the same. The '#' character is the start flag followed by the function name in capital letter and a space. The space tells the MCU that the function name is ending. Finally, the parameters required for each function are separated by a space and ending by the '\r' character or "Enter"

#FunctionName_param1_param2_param3_param4…\r

DS EDID store in Locals EDID

This function reads EDID file from DS and store it in all input Locals EDID

#EDIDDSTOLO

DS EDID store in EDID Bank

This function read EDID file from DS and store it in EDID bank

#EDIDDSTOBA_param1\r

Parameter	Name	Value
1	EDID bank offset	[1 : 7]

EDID from Bank store in Locals EDID

This function read EDID file from EDID bank and store it in all Input Locals EDID

#EDIDBATOLO_param1\r

Parameter	Name	Value
1	EDID bank offset	[1 : 7]

Route Input DDC to DS EDID

This function route Input DDC to DS EDID (pass through mode).

#DDCTODS

Route Input DDC to Local EDID

This function route Input DDC to Local EDID.

#DDCTOLO

Print DS EDID

This function read DS EDID file and send it to the serial port.

#PRDSEDID_param1\r

Parameter	Name	Value
1	Send BIN file	0
	Send TXT file	1

Print Local EDID

This function read Input Local EDID file and send it to the serial port.

#PRLOEDID_param1 \r

Parameter	Name	Value
1	Send BIN file	0
	Send TXT file	1

Print EDID bank

This function read EDID file from EDID bank and send it to the serial port.

#PRBAEDID_param1_param2\r

Parameter	Name	Value
1	EDID bank offset	[1 : 7]
	Send BIN file	0
2	Send TXT file	1

Load EDID to Locals EDID

These function loads EDID file through the serial port and store it in any Input Locals EDID.

#LOEDIDTOLO_param1_param2\r

Parameter	Name	Value
1	Semi echo mode	0
	Full echo mode	1
2	EDID.bin file(128 bytes)	1
	EDID.bin file(256 bytes)	2

Load EDID to EDID bank

This function load EDID through the serial port and store it in EDID bank.

#LOEDIDTOBA_param1_param2\r

Parameter	Name	Value
1	Semi echo mode	0
	Full echo mode	1
2	EDID.bin file(128 bytes)	1
	EDID.bin file(256 bytes)	2
3	EDID bank offset	[1 : 7]

Set default setting

This function set the products with default setting

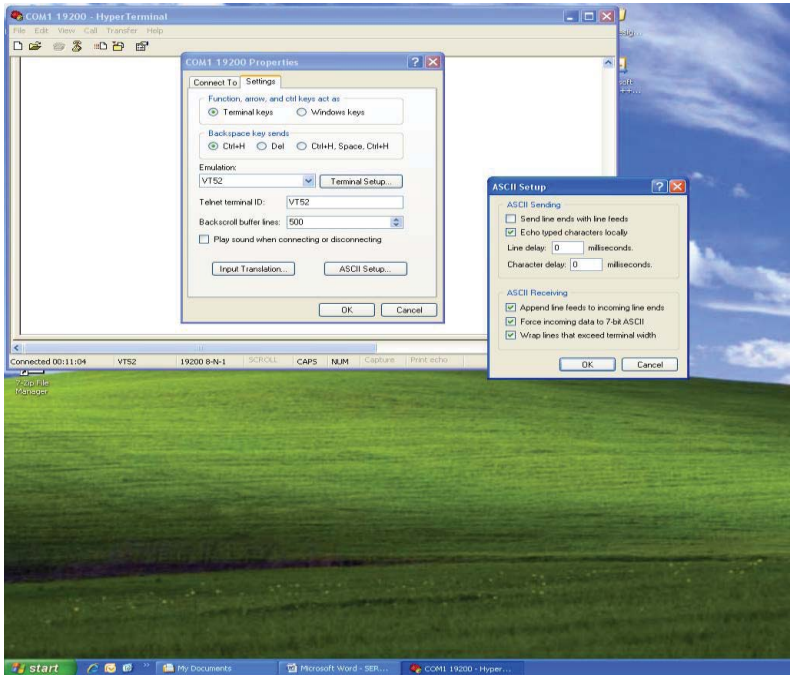1. All the features with hardware switches according to them.

#DEF\r

3. HOW TO LOAD FILE WITH HYPER TERMINAL

3.1 HYPER TERMINAL SETTING

File->Properties->Setting->ASCII Setup:

Unmark the check box of "Send line ends with Line feeds"

3.2 SEND THE FILE

Transfer->Send text file…

Change "Files of type:" to "All files (*.*)"

Open the file.BIN to send

Wait until "Function Done"

RACK MOUNT INSTALLATION

Rack mount ears are provided for installation of this unit into a 1U rack mount space.

1.   Locate the side screws on the unit.
2.   Remove the front 2 screws that are located closest to the front of the unit.
3.   Using the removed screws, screw the rack mounting bracket into the unit.
4.   Repeat the procedure on the opposite side of the unit.

1

Front of unit

Rear of unit

2

3

4

SPECIFICATIONS

Video Amplifier Bandwidth:...165 MHz x 2

Input Video Signal:..1.2 Volts p-p

Input DDC Signal:...5 Volts p-p (TTL)

Single Link Range:...1920 x 1200

Dual Link Range :.. 3840 x 2400

DVI Connector:.. DVI-I 29-pin female (digital only)

Power Supply:...5V DC

Power Consumption:...20 Watts (max)

Dimensions:..17" W x 1.75" H x 4.375" D

Rackmountable:..1U Rack Space

Shipping Weight:..12 lbs.