4×1

SOURCES DISPLAY

DisplayPort KVM Switcher

EXT-DPKVM-441

User Manual
Version A3

Gefen

4X1 DPKVM Switcher

1 2 3 4   IR   1 2 3 4 Power

Gefen
®

Important Safety Instructions

GENERAL SAFETY INFORMATION

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this product near water.

6. Clean only with a dry cloth.

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install or place this product near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11. Only use attachments/accessories specified by the manufacturer.

12. To reduce the risk of electric shock and/or damage to this product, never handle or touch this unit or power cord if your hands are wet or damp. Do not expose this product to rain or moisture.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

15. Batteries that may be included with this product and/or accessories should never be exposed to open flame or excessive heat. Always dispose of used batteries according to the instructions.

Warranty Information

Gefen warrants the equipment it manufactures to be free from defects in material and workmanship.

If equipment fails because of such defects and Gefen is notified within two (2) years from the date of shipment, Gefen will, at its option, repair or replace the equipment, provided that the equipment has not been subjected to mechanical, electrical, or other abuse or modifications. Equipment that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for ninety (90) days from the day of reshipment to the Buyer.

This warranty is in lieu of all other warranties expressed or implied, including without limitation, any implied warranty or merchantability or fitness for any particular purpose, all of which are expressly disclaimed.

1. Proof of sale may be required in order to claim warranty.

2. Customers outside the US are responsible for shipping charges to and from Gefen.

3. Copper cables are limited to a 30 day warranty and cables must be in their original condition.

The information in this manual has been carefully checked and is believed to be accurate. However, Gefen assumes no responsibility for any inaccuracies that may be contained in this manual. In no event will Gefen be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. The technical information contained herein regarding the features and specifications is subject to change without notice.

For the latest warranty coverage information, refer to the Warranty and Return Policy under the Support section of the Gefen Web site at www.gefen.com.

PRODUCT REGISTRATION

Please register your product online by visiting the Register Product page under the Support section of the Gefen Web site.

Contacting Gefen Technical Support

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

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

Fax: (818) 772-9120

Email: support@gefen.com

Visit us on the Web: www.gefen.com

Technical Support Hours: 8:00 AM to 5:00 PM Monday - Friday, Pacific Time

4x1 DPKVM Switcher is a trademark of Gefen, LLC.

Important Notice
Gefen, LLC reserves the right to make changes in the hardware, packaging, and any
accompanying documentation without prior written notice.

Operating Notes

- The 4x1 DPKVM Switcher supports pass-through EDID. The Switcher will use the EDID from the monitor connected to the output.

- Dual Link resolutions up to 2560 x 1600 are supported.

- HDCP content is not supported.

- The 4x1 DPKVM Switcher does not support DHCP.

- The default IR channel for both the Switcher and the IR Remote Control Unit is channel 0. See Setting the IR Channel for more information.

Features and Packing List

Features

- Front panel switching using discrete select buttons
- Supports resolutions up to 2560 x 1600
- Supports RGB and YCbCr color spaces
- RS-232 control
- IP control
- IR remote control
- Supports USB 2.0 with backward-compatibility for USB 1.1
- Jack for external IR Receiver (EXT-RMT-EXTIR)
- Save space on your desktop
- Rack-mountable

Packing List

The *4x1 DPKVM Switcher* ships with the items listed below. If any of these items are not present in your box when you first open it, immediately contact your dealer or Gefen.

- 4x1 DPKVM Switcher
- 1 x 6 ft. DisplayPort cables
- 1 x 6 ft. USB 2.0 cables (A - B)
- 1 x 6 ft. 3.5 mm mini-stereo audio cables
- 1 x IR remote control unit (EXT-RMT-4IR)
- 1 x 5V / 4A DC locking power supply (EXT-PS54AULP)
- 1 x Set rack ears
- 1 x Quick-Start Guide

Table of Contents

4×1

SOURCES · DISPLAY

DisplayPort KVM Switcher

01   Getting Started

Panel Layout

Front Panel
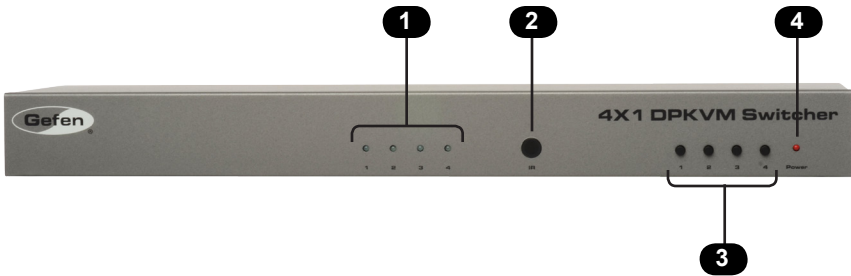
ID	Name	Description
1	Input indicators	Each of these LED indicators glows bright blue according to the input selection.
2	IR	Receives IR signals from the included IR remote control unit.
3	Input buttons	Press these buttons to select the desired input.
4	Power	This LED indicator will glow bright red when the unit is powered.

Back Panel
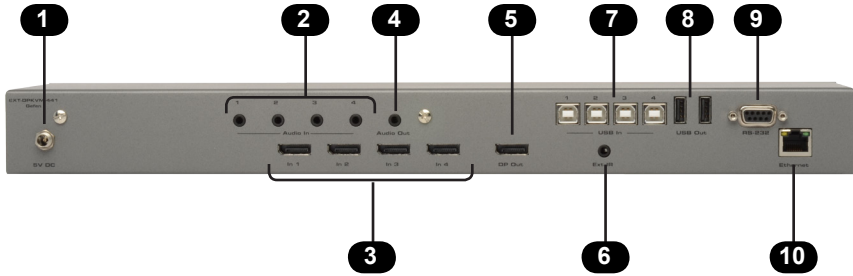
ID	Name	Description
1	5V DC	Connect the included 5V DC locking power supply to this receptacle.
2	Audio In (1 - 4)	Connects up to 4 audio sources using 3.5mm mini-stereo cable.
3	DP In (1 - 4)	Connects up to 4 DisplayPort sources.
4	Audio Out	Connects an audio output device using a 3.5mm mini-stereo cable.
5	DP Out	Connects to a DisplayPort output (display).
6	Ext. IR	Connect an IR extender (Gefen part no. EXT-RMT-EXTIR) to this jack.
7	USB In (1 - 4)	Connects up to 4 USB host devices.
8	USB Out (1 - 2)	Connect up to 2 USB devices to these ports.
9	RS-232	Connect an RS-232 cable from this port to an RS-232 control device. This port provides remote control of the product from a remote location.
10	Ethernet	Connect an Ethernet cable from this jack to a network in order to control the unit using the Telnet feature.

IR Remote Control Unit

Front
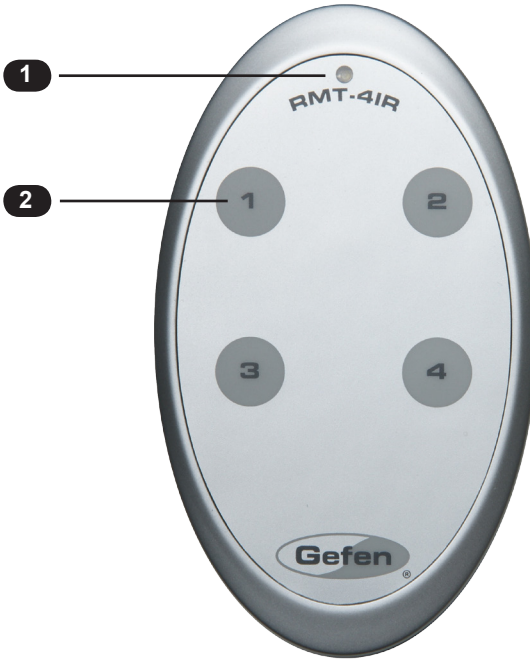
ID	Name	Description
1	Activity indicator	This LED glows bright orange when a key is pressed on the remote.
2	Source selection buttons (1, 2, 3, 4)	Used to control features in the On-Screen Display (see page 4).

Back
(shown with cover removed)
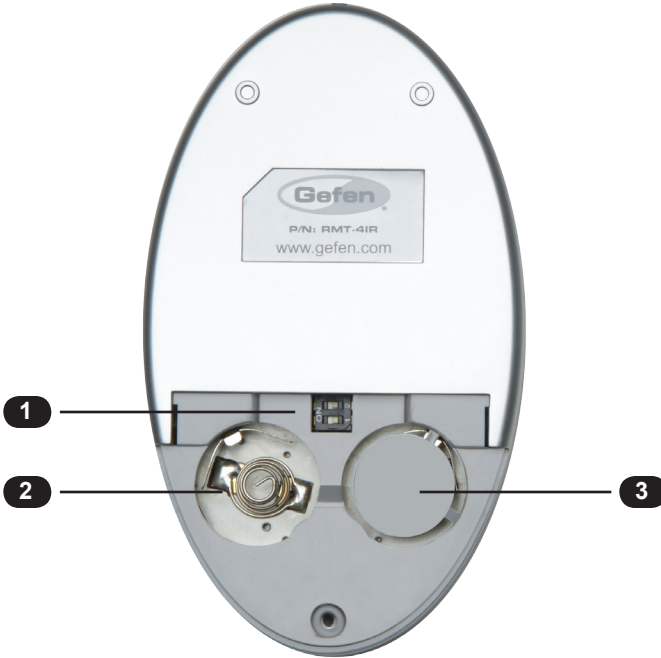
ID	Name	Description
1	DIP switch bank	Use these DIP switches to set the IR channel of the remote (see page 5).
2	Primary battery slot (shown without battery)	Holds the battery for operating the remote. Use only 3V CR2032-type batteries. Make sure that the positive (+) side of the battery is facing up.
3	Alternate battery slot	Allows for the installation of secondary (backup) battery.

Installing the Battery

The IR remote control unit ships with two batteries. Only one battery is required for operation. The second battery is a spare.

> ⚠ **WARNING:** Use only 3V CR2032-type batteries. Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

1.   Remove the back cover the IR Remote Control unit.

2.   Insert the included battery into the primary battery slot. The positive (+) side of the battery should be facing up.

3.   Replace the back cover.

> ℹ **NOTE:** An Activity Indicator that flashes quickly while holding down any one of the buttons indicates a low battery. Replace the battery as soon as possible**.**

Setting the IR Channel

In order for the included IR remote control to communicate with the 4x1 DPKVM Switcher, the IR remote control must be set to the same channel as the switcher.
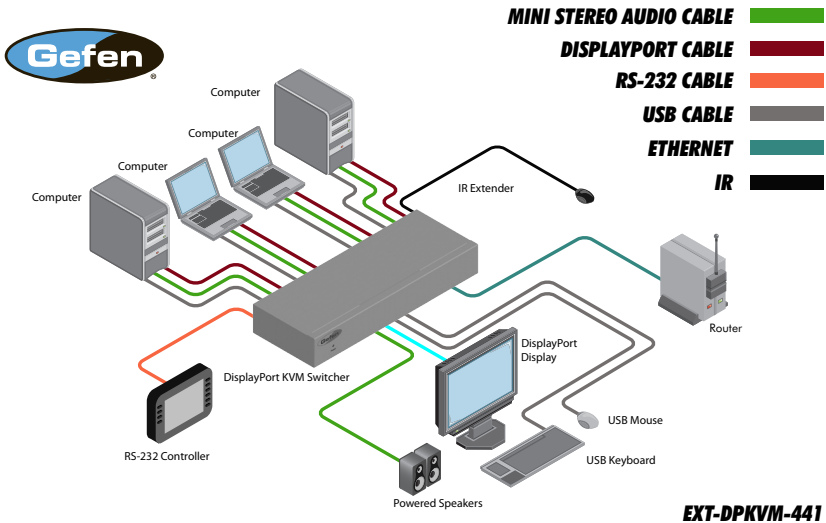Use the `#irrmtadd` command to set the IR channel of the switcher.

DIP switches

IR Channel	DIP settings
0 (default)	ON 1 2
1	ON 1 2
2	ON 1 2
3	ON 1 2

Installation

Connecting the 4x1 DPKVM Switcher

1. Connect up to four DisplayPort source devices to the DisplayPort inputs on the back panel of the Switcher using DisplayPort cables.

2. Connect a DisplayPort-supported display to the DisplayPort output on the back panel of the Switcher.

3. Connect up to four USB host devices (computers, etc) to the USB In ports.

4. Connect up to two USB devices (mouse, keyboard, camera, etc.) to the USB Out ports.

5. Connect the included 5V locking power supply to the power receptacle on the 4x1 DPKVM Switcher. Connect the AC power cord to an available electrical outlet.

6. To use the RS-232 communication feature, connect an RS-232 cable between the Switcher and RS-232 host controller.

7. To communicate with the Switcher using Telnet, connect an Ethernet cable from the Ethernet jack on the back of the Switcher to the network. See IP Configuration for more information on using the Telnet feature.

8. To extend the range of the IR control, connect an IR Extender (Gefen part no. EXT-RMT-EXTIR) to the back of the Switcher.

Sample Wiring Diagram

MINI STEREO AUDIO CABLE	
DISPLAYPORT CABLE	
RS-232 CABLE	
USB CABLE	
ETHERNET	
IR	

Computer
Computer
Computer
Computer
IR Extender
Router
DisplayPort KVM Switcher
RS-232 Controller
DisplayPort Display
USB Mouse
USB Keyboard
Powered Speakers

EXT-DPKVM-441

⚠️ **WARNING:** This product should always be connected to a grounded electrical AC outlet.

4×**1**

SOURCES   DISPLAY

DisplayPort KVM Switcher

02 Operating the 4x1 DPKVM Switcher

Switching Sources

Switching sources using the Front Panel Buttons

The front panel of the 4x1 DPKVM Switcher has a set of four (4) LED indicators, displaying which input (source) is being displayed. Each of these LED indicators corresponds to one of the push-buttons on the front panel.

For our first example, we will switch to Input 3 using the buttons on the front panel.

1.   Press button 3 on the front panel of the 4x1 DPKVM Switcher.

2.   The LED indicator for input 3 will glow bright blue on the front panel.

Press button 3

LED indicates that Input 3 is the active input.
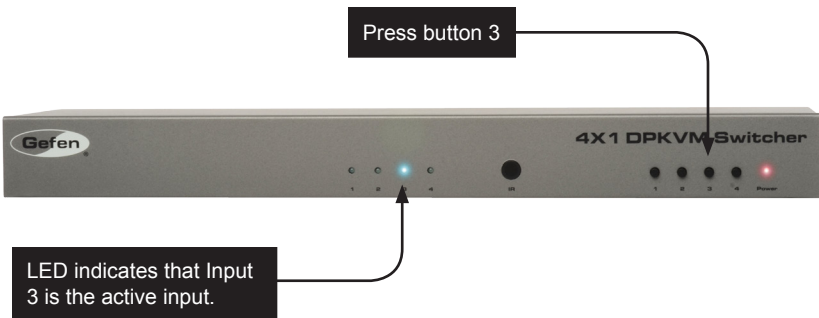
Switching sources using the IR Remote Control

In this example, we will switch to Input 1, using the IR remote control unit.

Point the IR remote control unit at the IR sensor on the front panel of the *4x1 DPKVM Switcher*.

If an IR Extender (Gefen part no. EXT-RMT-EXTIR) is being used, then point the IR remote control unit at the sensor of the IR Extender.

1. Prress button 1 on the IR Remote Control Unit. The Activity Indicator on the IR Remote Control Unit will glow yellow, indicating that a button was pressed.

2. The LED indicator, on the front panel, for Input 1 will glow bright blue.

LED indicates a button was pressed

Press button 1 on the IR remote control unit.

IR sensor

LED indicates that Input 1 is the active input.

4×**1**
SOURCES   DISPLAY
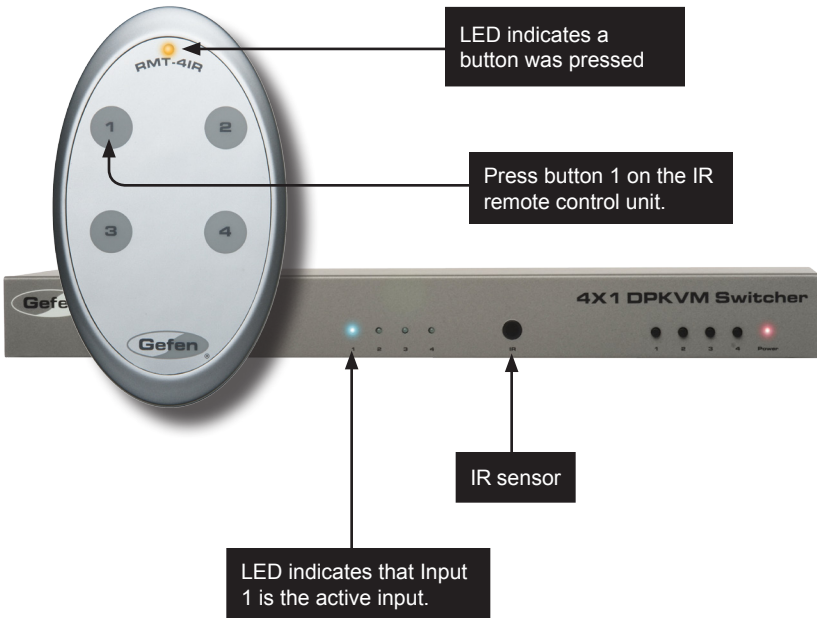
DisplayPort KVM Switcher

03   Advanced Operation

RS-232 and IP Configuration

RS-232 Interface

5 4 3 2 1

6 7 8 9
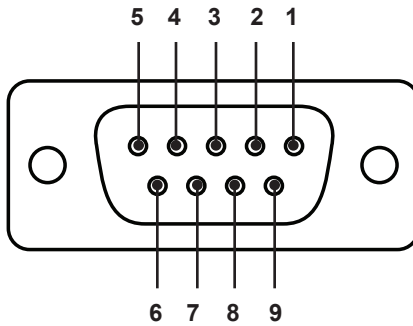
RS-232 Controller   Switcher

DCD	1		1	DCD
RXD	2		2	RXD
TXD	3		3	TXD
DTR	4		4	DTR
GND	5		5	GND
DSR	6		6	DSR
RTS	7		7	RTS
CTS	8		8	CTS
R1	9		9	R1
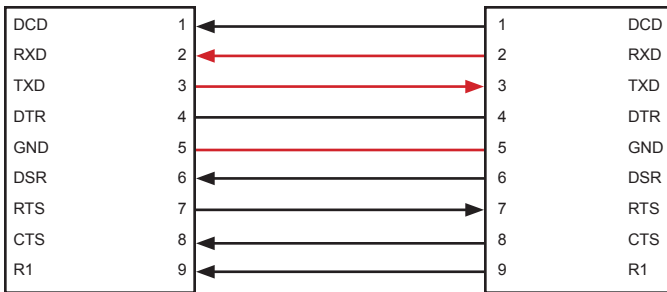
Only TXD, RXD, and GND are used.

RS-232 Settings

Description	Setting
Baud rate	19200
Data bits	8
Parity	None
Stop bits	1
Hardware flow control	None

⚠️ **IMPORTANT:** When sending RS-232 commands, a carriage return must be included at the end of the command. A space *must* be included between the command and each parameter.

IP Configuration

The *4x1 DPKVM Switcher* supports also IP-based control using Telnet. To set up IP control, the network settings for the *4x1 DPKVM Switcher* must be configured via RS-232. The default network settings for the switcher are as follows:

Description	IP Address / Port	Description	IP Address / Port
IP Address	192.168.1.72	Telnet Port	23
Subnet	255.255.255.0		
Gateway	192.168.1.254		
HTTP Port	80		

1. Connect an RS-232 cable from the PC to the *4x1 DPKVM Switcher*. Also make sure that an Ethernet cable is connected between the switcher and the network.

2. Launch a terminal emulation program (e.g. HyperTerminal) and use the RS-232 settings listed on the previous page.

> **NOTE:** Depending upon the network, all related IP / Telnet settings will need to be assigned. Consult your network administrator to obtain the proper settings.

3. Set the IP address for the switcher using the `#sipadd` command.

4. Set the subnet mask using the `#snetmask` command.

5. Set the gateway (router) IP address using the `#sgateway` command.

6. Set the Telnet listening port using the `#set_telnet_port` command.

7. Set the HTTP listening port using the `#set_http_port` command.

8. Reboot the switcher to apply all changes, then type the IP address that was specified in step 3, in the Telnet client to access the switcher.

RS-232 / IP Commands

Command	Description
#activebolo	Activates the boot loader
#display_telnet_welcome	Enables / disables the Telnet welcome message
#fadefault	Resets the routing state to factory-default settings
#get_indev_name	Retrieves the specified input device name
#get_outdev_name	Retrieves the output device name
#help	Displays the list of RS-232 / Telnet commands
#ipconfig	Displays all TCP/IP settings
#irrmtadd	Sets the IR channel for the switcher
#resetip	Sets IP configuration to default settings
#set_http_port	Sets the Web server listening port
#set_indev_name	Sets the name of the specified input device
#set_outdev_name	Set the name of the output device
#set_pass	Sets the Telnet password
#set_telnet_port	Sets the Telnet listening port
#set_user_name	Sets the Telnet user name
#sgateway	Specifies the new gateway
#show_pass	Displays the current Telnet password
#show_user_name	Displays the current Telnet user name
#show_ver_data	Displays the current hardware and firmware version
#sipadd	Specifies a new IP address
#snetmask	Specifies a new net mask
#stbymode	Enables / disables Standby Mode
#use_telnet_pass	Toggles Telnet password prompt
r	Switches to the specified input

#activebolo

The #activebolo command activates the boot loader. This command is use when upgrading the firmware. See the Firmware Upgrade Procedure for instructions on upgrading the firmware.

Syntax:

#activebolo

Parameters:

None

#display_telnet_welcome

The #display_telnet_welcome command enables or disables the Telnet welcome message.

Syntax:

#display_telnet_welcome param1

Parameters:

param1   Value   [0 ... 1]

Value	Description
0	Disable welcome message
1	Enable welcome message

#fadefault

The #fadefault command resets the routing to factory-default settings.
This command is similar to the #resetip command, except that TCP/IP settings are preserved.

Syntax:

#fadefault

Parameters:

None

Example:

```
#fadefault
Return to factory default
Route to input 1
```

#get_indev_name

The #get_indev_name command retrieves the specified input name. Use the #set_indev_name command to assign a name to the input.

Syntax:

#get_indev_name

Parameters:

param1   Input   [1 ... 4]

Example:

```
#get_indev_name 1
Device input name = Macbook
```

#get_outdev_name

The #get_outdev_name command retrieves the output device name.

Syntax:

```
#get_outdev_name
```

Parameters:

None

Example:

```
#get_outdev_name
Device output name = None
```

#help

The #help command displays the list of available RS-232 / IP commands. The #help command can also be used to provide help on a specific command.

Syntax:

```
#help [param1]
```

Parameters:

param1   Command (optional)

Notes:

When asking for help on a specific command, the "#" character must be included as part of the command.

Example:

```
#help #fadefault

Cmd #fadefault: Return to factory default: Routing=1, Disable Lock
power mode, IR RMT add=0
```

#ipconfig

The #ipconfig command displays the current TCP/IP settings.

Syntax:

#ipconfig

Parameters:

None

Example:

```
#ipconfig
 ------------- TCP/IP settings -------------

MAC addr  = 00:1C:91:02:50:27
IP addr   = 192.168.2.204
Net Mask = 255.255.255.0
Gateway  = 192.168.2.1
Web Server Port = 80
Telnet Server Port = 23
Telnet password on login is set to OFF
Telnet welcome at login is set to OFF
```

#irrmtadd

The #irrmtadd command sets the IR channel of the switcher. In order for the included IR remote control unit to function correctly with the switcher, both the IR remote control unit and the switcher must share the same IR channel. After executing this command, the DIP switch settings for the included IR remote control unit are returned. See Setting the IR Channel for information on setting the IR channel on the IR remote control unit.

Syntax:

#irrmtadd param1

Parameters:

param1   IR channel   [0 ... 3]

Example:

#irrmtadd 2
Set IR RMT 2

#resetip

The #resetip command resets the IP configuration to factory-default settings.
The switcher must be rebooted after executing this command.

Syntax:

#resetip

Parameters:

None

Example:

#resetip
TCP/IP configuration was cleared to default, reboot to take efect

#set_http_port

The `#set_http_port` command specifies the Web server listening port. The switcher must be rebooted after executing this command. The default port setting is 80.

Syntax:

```
#set_http_port param1
```

Parameters:

param1	Port	[1 ... 65535]

Example:

```
#set_http_port 82
New HTTP port set to: 82
```

#set_indev_name

The `#set_indev_name` command sets the name for the specified input. The name of the input cannot exceed 15 characters in length. Use the `#get_indev_name` command to retrieve the specified input name.

Syntax:

```
#set_indev_name param1 param2
```

Parameters:

param1	Input	[1 ... 4]
param2	Name	

Example:

```
#set_indev_name Macbook
```

#set_outdev_name

The #set_outdev_name command sets the name for the input. The name of the output cannot exceed 15 characters in length. Use the #get_outdev_name command to retrieve the output name.

Syntax:

#set_outdev_name param1

Parameters:

param1   Name

Example:

#set_indev_name Macbook

#set_pass

The #set_pass command sets the Telnet password. The default password is Admin. The switcher must be rebooted after executing this command. The password cannot exceed 20 characters in length. Use the #show_pass command to display the current Telnet password.

Syntax:

#set_pass param1

Parameters:

param1   Password

Example:

#set_pass reindeer
Telnet password updated to: reindeer

#set_telnet_port

The `#set_telnet_port` command sets the TCP terminal server listening port. The default port setting is 23. The switcher must be rebooted after executing this command.

Syntax:

```
#set_telnet_port param1
```

Parameters:

param1   Port   [1 ... 65535]

Example:

```
#set_telnet_port 24
New Telnet port set to: 24
```

#set_user_name

The #set_user_name command sets the Telnet user name. The user name cannot exceed 20 characters in length. The default user name is Admin. Use the `#show_user_name` command to display the current user name.

Syntax:

```
#set_user_name param1
```

Parameters:

param1   User name

Example:

```
#set_user_name Doc_Holiday
Telnet username set to: Doc_Holiday
```

#sgateway

The `#sgateway` command sets the gateway address. The gateway must be typed using dot-decimal notation. The default gateway is `192.168.1.254.` The switcher must be rebooted after executing this command.

Syntax:

`#sgateway param1`

Parameters:

param1   Gateway

Example:

```
#sgateway 192.168.1.1
New IP Gateway set to: 192.168.1.1
```

#show_pass

The `#show_pass` command displays the current Telnet password. Use the `#set_pass` command to set the Telnet password.

Syntax:

`#show_pass`

Parameters:

None

Example:

```
#show_pass
Telnet password: reindeer
```

#show_user_name

The #show_user_name command displays current user name. Use the #set_user_name command to set the user name.

Syntax:

```
#show_user_name
```

Parameters:

None

Example:

```
#show_user_name
Telnet login: Admin
```

#show_ver_data

The #show_ver_data command displays the current hardware and firmware version.

Syntax:

```
#show_ver_data
```

Parameters:

None

Example:

```
#show_ver_data
Hardware version 0
Firmware Release version 1.4.9
Release date: Apr 22 2012
Release time: 14:56:52
Boot loader version 1.6
```

#sipadd

The `#sipadd` command sets the IP address of the switcher. The IP address must be entered using dot-decimal notation. The switcher must be rebooted after executing this command.

Syntax:

```
#sipadd param1
```

Parameters:

param1   IP address

Example:

```
#sipadd 192.168.1.127
New IP set to: 192.168.1.127
```

#snetmask

The `#snetmask` command sets the subnet mask. The net mask must be entered using dot-decimal notation. The switcher must be rebooted after executing this command. The default net mask is `255.255.255.0`

Syntax:

```
#snetmask param1
```

Parameters:

param1   Gateway

Example:

```
#snetmask 255.255.0.0
New IP mask set to: 255.255.0.0
```

#stbymode

The `#stbymode` command toggles the Standby Mode state. When Standby Mode is enabled, the LED of the currently active input will flash. Once the switcher is placed in Standby Mode, no video will be displayed. The power LED will continue to glow bright red. Placing the switcher in Standby Mode *does not* power-down the switcher.

Syntax:

```
#stbymode param1
```

Parameters:

param1   Value   [0 ... 1]

Value	Description
0	Disable Standby mode (On)
1	Enable Standby mode (Off)

Examples:

```
#stbymode 1
Video power is set to OFF

#stbymode 0
Video power is set to ON
```

#use_telnet_pass

The `#use_telnet_pass` command enables or disables the login credentials when starting a Telnet session.

Syntax:

```
#use_telnet_pass param1
```

Parameters:

param1   Value   [0 ... 1]

Value	Description
0	Disable password
1	Force password

Example:

```
#use_telnet_pass 1
Telnet password on login is set to ON
```

r

The `r` command switches to the specified input. Do not precede this command with the "#" symbol.

Syntax:

```
r param1
```

Parameters:

param1   Input   [1 ... 4]

Example:

```
r 3
Route to input 3
```

4×**1**
SOURCES   DISPLAY

DisplayPort KVM Switcher

04   Appendix

Firmware Upgrade Procedure

The following items are required to update firmware:

- Gefen 4x1 DPKVM Switcher
- Computer running Windows XP
- Terminal-emulation program (e.g. HyperTerminal)
- RS-232 cable (do not use a null-modem cable)
- Firmware files (downloaded from Gefen Web site)

To begin the update procedure use the `#activebolo` command. The following set of instructions will be using Hyperterminal.

1. Power-on the switcher.
2. Connect an RS-232 cable to the PC and open the terminal program. See RS-232 Settings for configuration information.
3. Type the command `#activebolo` and press the ENTER key.
4. Type and enter the `#activebolo` command a second time.

   The following will be displayed on the terminal screen:

   ```
   ==============================
    Download new program_____1
    Cancel_____0
   ==============================
   ```

5. Press the '`1`' on the computer keyboard to select `Download new program`.

   The following will be displayed:

   ```
   Waiting for the file to be sent ... (press 'a' to abort)
   ```

6. In Hyperterminal, click `Transfer --> Send File...`
7. Select the firmware file using the Browse button.
8. Select `YModem` from the Protocol drop-down list.
9. Click the `Send` button on the Send File dialog.

   The firmware update procedure will begin. This process should take a few moments. After the firmware update is successful, the following will be displayed in the terminal program.

   ```
   Programming Completed Successfully!
   ```

Mounting Plate 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

Supported Formats	
Resolution (max.)	• 2560 x 1600

Electrical	
Maximum Pixel Clock	• 360 MHz
Input indicators	• 4 x LED, blue
Power Indicator	• 1 x LED, red

Connectors	
Video Inputs	• 4 x DisplayPort, female
Video Output	• 1 x DisplayPort, female
Audio Inputs	• 4 x 3.5mm mini-stereo
Audio Output	• 1 x 3.5 mini-stereo
USB	• 4 x Type B, female • 1 x Type A, female
RS-232	• 1 x DB-9, male
Ethernet	• 1 x RJ-45 (100BaseT)
IR Extender	• 1 x 3.5mm mini-stereo jack

Control	
Input buttons	• 4 x Push button, momentary

Operational	
Power Input	• 1 x 5V DC
Power Consumption (max.)	• 10W

Physical	
Dimensions (W x H x D)	• 17.1" x 1.75" x 4.25" (434mm x 44m x 108mm)
Unit Weight	• 1.8 lbs (0.8 kg)

Stretch it, Switch it, Split it, Control it.
Gefen's got it. ®

20600 Nordhoff St., Chatsworth CA 91311
1-800-545-6900   818-772-9100   fax: 818-772-9120
www.gefen.com   support@gefen.com

This product uses UL or CE listed power supplies.