



**CHAMPION
SERIES™**

KD-4x4CS

4 Inputs to 4 Outputs HDMI Matrix Switcher

Setup Guide



Key digital®

The Experts in Digital Video Technology and Solutions™

HDMI®
HIGH-DEFINITION MULTIMEDIA INTERFACE

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About KD-4x4CS

Description

- › Key Digital® Champion Series™ HDMI Matrix Switchers are designed and engineered to offer the best in quality, performance, and reliability, while providing a cost effective HDMI matrixing solution. KD-4x4CS enables any HDMI Source to be viewed on any HDMI Output/Display at any time and in any combination. KD-4x4CS maintains crystal-clear, pristine picture and sound quality, while supporting all HD and SD video standards, including 1080p/60 and 3D, and is switchable via pushbutton, IR, and RS-232 control.

Key Features

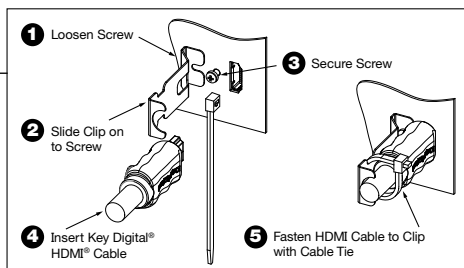
- › Internal EDID Library features 12 default EDID configurations, in addition to native EDID data for any Output/Display
- › Supports all SD, HD, and VESA (VGA, SVGA, XGA, WXGA, SXGA, UXGA) resolutions up to 1080p (60Hz & 50Hz)
 - › **SD & HD:** 480i, 480p, 720p, 1080i, 1080p
 - › **VESA / VGA (RGBHV):** From 640x480p up to 1920x1200p
- › Advanced HDMI® Features: **3D Ready**
- › Full support for 12-bit Deep Color and HDCP
- › Supports lossless compressed digital audio:
 - › Dolby® TrueHD, Dolby® Digital Plus and DTS™-HD Master Audio

Key Benefits

- › Key Digital's Buffered Matrix Technology™ allows up to 4 HDMI sources to be independently switched to 4 Displays or Zones at any time and in any combination
- › LED Link Lights indicate connectivity between KD-4x4CS and each input & output device
- › Serial IR, Optical IR, Front Panel & RS-232 control
- › Supports major control systems such as Compass Control®, AMX®, Control4®, Crestron®, RTI®, Universal®
- › Rack Mountable (1U) with included rack ears

Accessories

- › (1) External 12 Volt 2 Amp power supply (110V-240V 50/60Hz)
- › (1) IR Remote Control
- › (1 pair) Rack mounting ears
- › (8) HDMI Clips
- › Setup Guide
- › Warranty Card



Mounting:

- › Rack mount: Secure the rack ears to each side of the KD-4x4CS with the supplied hardware. Then, fasten the unit to the rack rails with the included machine screws.

Connections, Buttons and LEDs

Rear Panel Connections:

All connections to the KD-4x4CS are found on the rear panel of the unit. Refer to the illustrations below for port assignments while making connections.

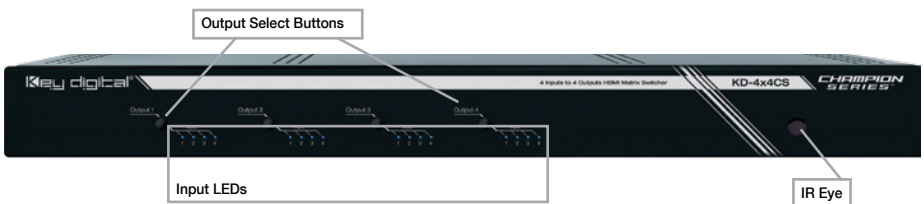


Connections

- **HDMI Inputs:** The 4 HDMI Inputs are located on the left side of the back panel. The Inputs have a blue LED that will illuminate when a source is connected and synced.
- **HDMI Outputs:** The 4 HDMI Outputs are located in the center of the back panel. The Outputs have a blue LED that will illuminate when a output device is connected and synced.
- The **RS-232, Serial IR, Optical IR Sensor, Operation Mode Switch and Power connections** are located on the right side of the back panel. The Operation Mode switch is used to update the unit's firmware, which is done using the DB9/RS-232 port. The firmware version as well as all RS-232 commands is available through the RS-232 command 'H'. A detailed list of RS-232 commands is available later in this guide.
- If newer firmware is made available, complete updating instructions will be included with it. Check the Key Digital website for any firmware updates.

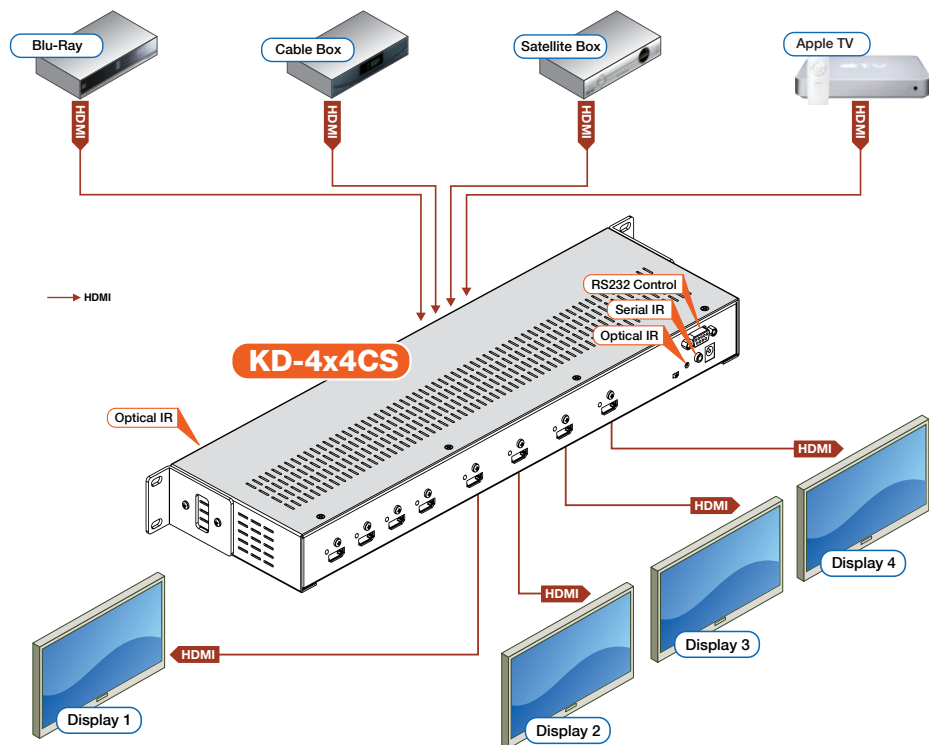


Front Panel Buttons and LEDs



- There are 4 Output buttons along the front panel.
- Pressing an output button will select the next HDMI input.
- A blue LED will indicate which Input has been selected for each Output.
- There is also an Optical IR window located on the right side of the front panel for IR remote control signals.

Application Example



Quick Setup Guide:

1. Begin with the KD-4x4CS and all input/output devices turned off and power cables removed.
2. Connect HDMI sources to the appropriate input ports on the KD-4x4CS.
3. Connect HDMI outputs to the appropriate output device (display, projector, AV Receiver, etc).
4. Connect power to the KD-4x4CS and all other input and output devices and turn them on.
5. Operate the KD-4x4CS switcher via front panel buttons, IR Remote, Serial IR or RS-232 control.

Operation:

After performing the setup above, the unit is ready for operation.

There are several options for controlling the unit. Commands can be issued via IR remote control, RS-232 or by using the front panel buttons. Note that the advanced commands are available only via the RS-232 protocol.

Settings

The KD-4x4CS features a library of 12 internal EDID (Extended Display Identification Data) files, in addition to allowing any Input source to receive a copy of the EDID information of any selected Output connected via HDMI. The default EDID setting is "04" – 1080p 2ch Digital Audio. Changing to EDID settings may be necessary when connecting to or from an AV Receiver, or for passing 3D content derived from a Cable or Satellite source if the default EDID has problems. They can also speed up the switching process with cable or satellite sources.

The possible EDID settings can range from '01' to '12'. ('04' is the default).

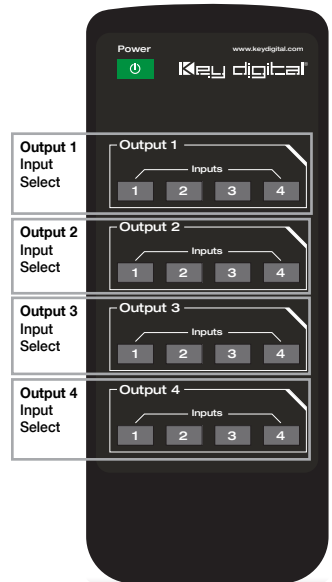
01	1080i, 2CH Audio	07	3D, 1080p 2CH Audio
02	1080i, DOLBY/DTS 5.1	08	3D, DOLBY/DTS 5.1
03	1080i, HD Audio	09	3D, HD Audio
04	1080p, 2CH Audio	10	1280x1024 DVI
05	1080p, DOLBY/DTS 5.1	11	1920x1080 DVI
06	1080p, HD Audio	12	1920x1200 DVI

When selecting an EDID from the library (settings 01-12), your source device will see the KD-4x4CS EDID choice instead of the display's EDID, overriding the display's own EDID information. If your display is not capable of accepting the video resolution or audio type selected, you may not see a picture or hear sound. In this case please choose another more compatible EDID, or use the default EDID.

EDID settings can only be changed through the RS-232 command protocol. See the RS-232 command section below for a list of EDID commands available.

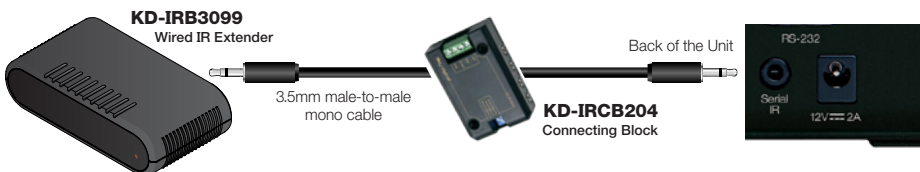
Remote Control

You may control the KD-4x4CS switching commands by using the supplied IR Remote control. There are 2 groups of controls, one group for each Output. Each Input can be selected by pressing the Input numbers 1-4.



IR Extender:

You may want to use an IR extender, such as the KD-IRKIT300. Front and Rear panel sensors are available for use with the IR extender. A wired IR serial connector is also provided at the rear of the unit. Wired IR Extender KD-IRB3099 in the KD-IRKIT300 uses a 3.5mm male-to-male Mono cable. (Not Included with KD-4x4CS)



RS-232 Commands

The KD-4x4CS provides access to all functions when used with an RS-232 control system.

The connection protocol is as follows:

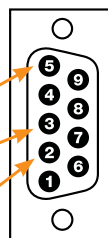
- » Baud rate: 57,600
- » Data Bits: 8
- » Parity: None
- » Stop Bits: 1
- » Flow Control: None
- » Carriage Return: Required
- » Line Feed: Required

RS-232 cable pin out

Pin 5 – Ground

Pin 3 – Receive

Pin 2 – Transmit



NOTE: All commands are case-insensitive. Spaces are shown for clarity; commands should not have any spaces. Every command below requires a carriage return at the end of the string for the command to be executed. If a new line character is received, a prompt should be sent back.

System Commands:

- » **H:** **Help** - Help command. List of all RS-232 commands and Firmware version.
- » **STA:** **Status Command** - Displays unit status for all internal variables such as Video Input, and EDID selected for each Input.
- » **PF:** **Power Off** - Power Off command
- » **PN:** **Power ON** - Power ON command

Commands:

Video Switch:

- » **'SP O xx SI yy'** To switch the desired Video Input to the desired Output:
- » xx = the Output number [01-04] –OR- [A] for 'All'
- » yy = the Input number [01-04] –OR- [U, D] for 'Up', 'Down' respectively.
- » 'U/D' will increase/decrease the input number from its current position.
- » This command will switch Inputs to your desired Output.

- » *Example:* To switch Output 3 to Input 1, issue the command; **'SPO01SI03'**
- » *Example:* To incrementally switch the Input Up from its present number for Output 1, issue the command: **'SPO01SIU'**
- » *Example:* To switch All Outputs to Input 3, issue the command: **'SPOASI03'**

EDID Copy and Default EDID Library:

- » **'SP C EDID xx H/D yy':** To Copy EDID to Input from HDMI Output, or from a Default Library
- » xx = Input numbers [01-04] –OR- [A] for 'All' Inputs
- » H = EDID Copy from HDMI Output
- » D = Default EDID Library selection (see list below)
- » yy = Output numbers [01-04] when 'H' variable is selected
–OR–
Default EDID library settings [01-12] when 'D' variable is selected.
- » This command will either copy the EDID information from a selected Output to a specific Input (or All Inputs), or, write EDID information from an internal library of default EDID settings to a specific Input (or All Inputs).
- » *Example:* To copy the EDID information from HDMI Output 2 to Input 4, issue the command: **'SPCEDID04H02'**
- » *Example:* To write the EDID information from the built-in default EDID library using default EDID 1 to Input 2, issue the command; **'SPCEDID02D01'**
- » **The possible EDID settings can range from '01' to '12'. ('04' is the default).**

01	1080i, 2CH Audio	07	3D, 1080p 2CH Audio
02	1080i, DOLBY/DTS 5.1	08	3D, DOLBY/DTS 5.1
03	1080i, HD Audio	09	3D, HD Audio
04	1080p, 2CH Audio	10	1280x1024 DVI
05	1080p, DOLBY/DTS 5.1	11	1920x1080 DVI
06	1080p, HD Audio	12	1920x1200 DVI

Front Panel Buttons Enabled/Disabled:

- » **'SP C FB E/D'**
- » Where 'E' will Enable the front panel buttons and 'D' will Disable the front panel buttons.
- » *Example:* To Disable the front panel buttons, issue the command; **'SPCFBD'**

Reset to Factory Defaults:

- » **'SP C DF xx'**
- » xx = [01-12] and is the default EDID library loaded during a factory reset.
- » This command will return the unit to its factory default settings including a user chosen default EDID setting. (See above for a list of possible default EDID library settings available)
- » *Example:* To reset the unit to factory default with an EDID setting of 1080i 2CH Audio, issue the command; **'SPCDF01'**
- » *Example:* To reset the unit to factory default with an EDID setting of 3D 1080p 2CH Audio, issue the command; **'SPCDF07'**

Specifications

Technical:

- » **Input (Each):** 1 HDMI Connector, Type A, 19 Pin Female
- » **Output (Each):** 1 HDMI Connector, Type A, 19 Pin Female
- » **Bandwidth:** TMDS bandwidth 10.2 Gb/s
- » **Control:** Front panel push buttons and LEDs; IR sensor front/rear; RS-232 Tx/Rx lines with full bi-directional operation
- » **Video/Audio Matrix Switching:** Full matrix switching for HDMI Video & Audio, DVI Video
- » **Deep Color Support:** Supports digital video formats in Deep Color Mode up to 12 bits/color with all HDMI and HDCP technologies
- » **HDMI® and HDCP Licensing:** Fully licensed and compatible with all HDMI and HDCP technologies
- » **Link:** Single Link
- » **EDID Control:** EDID information is assigned to the inputs from the internal EDID library or from a display's internal EDID data
- » **Lossless Compressed Digital Audio:** Supports lossless compressed digital audio: Dolby® TrueHD, Dolby® Digital Plus and DTS™-HD Master Audio
- » **DDC Signal (Data):** Input DDC Signal - 5 Volts p-p (TTL)
- » **HDMI Video/Audio Signal:** Input Video Signal - 1.2 Volts p-p
- » **DDC Communication:** EDID and HDCP Bi-directional Transparency from Display to Source
- » **Wired IR:** modulated IR signal input, 0-5V TTL or -10to +10V.
- » **Power:** External Power Supply. 12V/2A

General:

- » **Regulation:** CE, RoHS, WEEE
- » **Rack Mount:** 1U, Full Rack Width (rack ears included)
- » **Enclosure:** Black Metal
- » **Product Dimensions:** 17.13" x 6.63" x 1.71"
- » **Shipping Dimensions:** 23.1" x 9.45" x 3.8"
- » **Product Weight:** 4.05 lb.
- » **Shipping Weight:** 6 lb



Important Product Warnings:

1. Connect all cables before providing power to the unit.
2. Test for proper operation before securing unit behind walls or in hard to access spaces.
3. If installing the unit into wall or mounting bracket into sheet-rock, provide proper screw support with bolts or sheet-rock anchors.



Safety Instructions:

Please be sure to follow these instructions for safe operation of your unit.

1. Read and follow all instructions.
2. Heed all warnings.
3. Do not use this device near water.
4. Clean only with dry cloth.
5. Install in accordance with the manufacturer's instructions.
6. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
7. Only use attachments/accessories specified by the manufacturer.
8. Refer all servicing to qualified service personnel. Servicing is required when the device has been damaged in any way including:
 - » Damage to the power supply or power plug
 - » Exposure to rain or moisture



Power Supply Use:

You **MUST** use the Power Supply **provided** with your unit or you **VOID** the Key Digital® Warranty and risk damage to your unit and associated equipment.

How to Contact Key Digital®

System Design Group (SDG)

For system design questions please contact us at:

- › Phone: 914-667-9700
- › E-mail: sdg@keydigital.com

Technical Support

For technical questions about using Key Digital® products, please contact us at:

- › Phone: 914-667-9700
- › E-mail: tech@keydigital.com

Repairs and Warranty Service

Should your product require warranty service or repair, please obtain a Key Digital® Return Material Authorization (RMA) number by contacting us at:

- › Phone: 914-667-9700
- › E-mail: rma@keydigital.com

Feedback

Please email any comments/questions about the manual to:

- › E-mail: customersupport@keydigital.com



Warranty Information

All Key Digital® products are built to high manufacturing standards and should provide years of trouble-free operation. They are backed by a limited three-year parts and labor warranty.



Key Digital®, led by digital video pioneer Mike Tsinberg, develops and manufactures high quality, cutting-edge technology solutions for virtually all applications where high quality video imaging is important. Key Digital® is at the forefront of the video industry for Home Theater Retailers, Custom Installers, System Integrators, Broadcasters, Manufacturers, and Consumers.



Key digital®

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