KD-HDMSW4X4

HDMI/DVI Matrix Switcher capable of switching up to
4 HDMI/DVI Video Sources/Inputs to 4 independent Zones/Outputs via
HDMI/DVI and CAT5e/6 with included (4) KD-CATHD4X4Rx Baluns

Set Up Guide

HDMI®
HIGH-DEFINITION MULTIMEDIA INTERFACE

Key Digital's Phantom Series™ KD-HDMSW4x4 is a HDMI/DVI Matrix Switcher capable of switching up to 4 HDMI/DVI Sources/Inputs to 4 independent Zones/Outputs via HDMI/DVI and 2 CAT5e/6. IR routing over CAT5e/6 is also available. Kit includes 4 KD-CATHD4x4Rx Receiver Baluns with power supplies, four 3' and four 6' HDMI cables.

Key digital®

The Experts in Digital Video Technology and Solutions™

CE RoHS COMPLIANT WEEE COMPLIANT

Table of Contents

About KD-HDMSW4X4

Description

› KD-HDMSW4x4 is an HDMI Matrix switcher capable of switching 4 independent Inputs/Sources to 4 independent Outputs/Zones. There are both HDMI and CAT5e/6 Outputs (over 2 CAT5e/6 cables) and are available simultaneously. Built-in fully matrixed Serial IR routing is also available to control your displays remotely.

Key Features

› Simultaneous availability of HDMI/DVI and CAT5e/6 outputs

› Full switching of 2 independent matrixes: HDMI/DVI Audio/Video, one-directional IR or RS-232 Tx to Rx

› 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

› Supports lossless compressed digital audio:

   » Dolby® TrueHD, Dolby® Digital Plus and DTS™-HD Master Audio

› Internal EDID Library features 9 default EDID configurations, in addition to Native EDID data for any Output/Display

› Supported HDMI® 1.4 Features: **3D Ready, 4K Resolution Support**

Key Benefits

› Transmits 1080p/60Hz up to 75 ft. 1080i and all lesser resolutions up to 100 ft. when used with included KD-CATHD4X4Rx receiver Baluns

› Video, Audio, IR and RS-232 distribution via two CAT5e/6 cables

› 2 active outputs per zone provide 8 total outputs (4 HDMI/DVI and 4 CAT5e/6) in a 4X4 configuration enabling flexible integration options

› IR signals may be routed from your control system, through the switch to your display location over CAT5e/6 for full control of your display or other remotely located devices

› Serial IR, Optical IR, Front Panel & RS-232 control

› Supports major control systems such as AMX®, Control4®, Crestron®, RTI®, Universal®

Accessories

› (4) KD-CATHD4x4Rx CAT5e/6 Receive Baluns

› (4) 5V 1A DC Power Supplies for KD-CATHD4x4Rx Baluns

› (4pr) Brackets for KD-CATHD4x4Rx

› (1) External 12 Volt 2 Amp power supply (110V-240V 50/60Hz)

› (1) IR Remote control

› (1pr) Rack mounting ears for KD-HDMSW4x4

› (4) IR Emitters (for use with Baluns)

› (4) 3 ft. HDMI Cables - Visit www.keydigital.com for HDMI cable specifications

› (4) 6 ft. HDMI Cables - Visit www.keydigital.com for HDMI cable specifications

Mounting:

› Rack mount: Secure the rack ears to each side of the KD-HDMSW4X4 with the supplied hardware. Then, fasten the unit to the rack rails with the included machine screws.
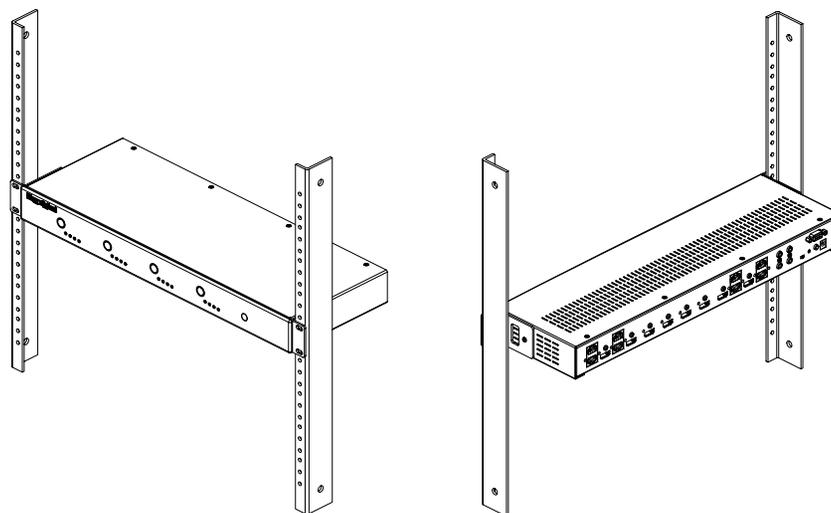
Connections, Buttons and LEDs

Rear Panel Connections:

All connections to the KD-HDMSW4X4 are found on the rear panel of the unit. Refer to the illustrations below for port assignments while making connections

HDMI Inputs

Expansion Serial IR Ports

Operation Mode Switch

Power Connection

RS-232 Port

CAT5e/6　HDMI

HDMI / CAT5e/6 Outputs

HDMI　CAT5e/6

IR Eye　Serial IR
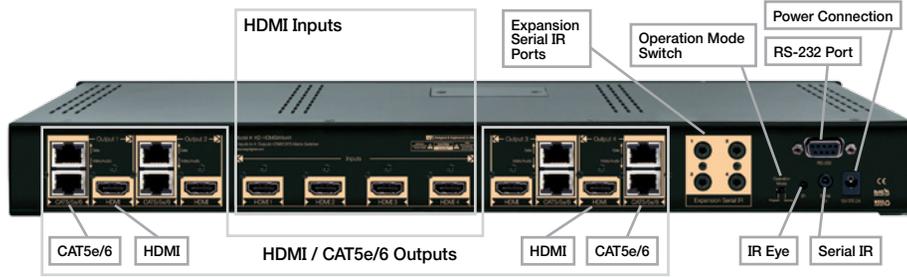
Connections

› **HDMI Inputs:** The 4 HDMI Inputs are located in the center of the back panel. The Inputs have a blue LED which will light when a source is connected and synced.

› **HDMI and CAT5e/6 Outputs:** There are 4 sets of HDMI Outputs and their associated CAT5e/6 Outputs located on either side of the HDMI Inputs. Both HDMI and CAT5e/6 Outputs have a blue LED which will light when a display/Balun is connected and synced.

› The HDMI and CAT5e/6 Outputs are both active simultaneously.

› There are 4 **Serial IR Inputs** located on the right side of the back panel. These are standard 3.5mm mono jacks. Connect these to any control system for routing IR over the CAT5e/6 outputs.

› 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 LED's:

Output Select Buttons

IR Eye

Input LEDs
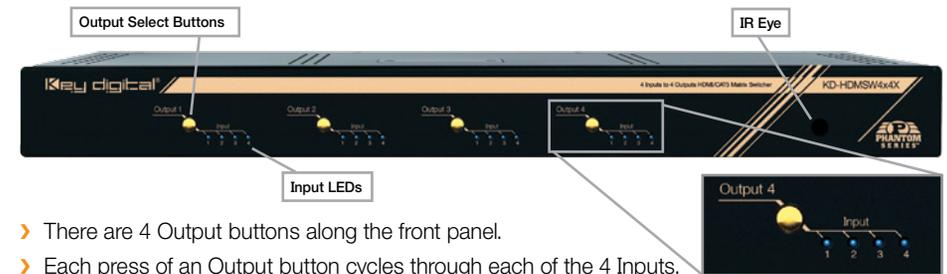
Output 4

Input
1 2 3 4

› There are 4 Output buttons along the front panel.

› Each press of an Output button cycles through each of the 4 Inputs.

› A blue LED will indicate which Input has been selected for each Output button.

› There is also an Optical IR window located on the right side of the front panel for the remote control signals.

KD-CATHD4x4Rx Baluns

If you will be utilizing the KD-CATHD4x4Rx Baluns (included), please follow this procedure.

› 2 CAT5e/6 UTP or STP cables need to be used.

› Be careful to connect the "Video/Audio" jacks to each other and the "Data" jacks to each other. Do not cross these connections.

› Use the shortest length HDMI cable you can when connecting the Balun to the Display.

› Ensure that the 2 cables are run directly from the switcher to the Baluns.

› Do not use patch panels, punch downs or wall plates.

› Each Balun is supplied with a power supply.

› **Key Digital recommends the use of CAT5e/6 STP cable with shielded RJ45 connectors for optimum performance and distances from your Balun.**

Key digital®

Transmitting IR signals with KD-CATHD4X4Rx Baaluns

The IR signal going to the Balun must be from a 12v powered output such as that from a common distribution block. The Balun does not provide power for this signal. In the case of an IR receiver, connect the 3 or 4 wire receiver to the distribution block and the emitter output of the block into the Balun.

When connecting the IR Emitter to the device you wish to control, make sure to find the IR receiver area on your particular device first. Experiment with locations and test the functionality before permanently fixing it.

Application Example
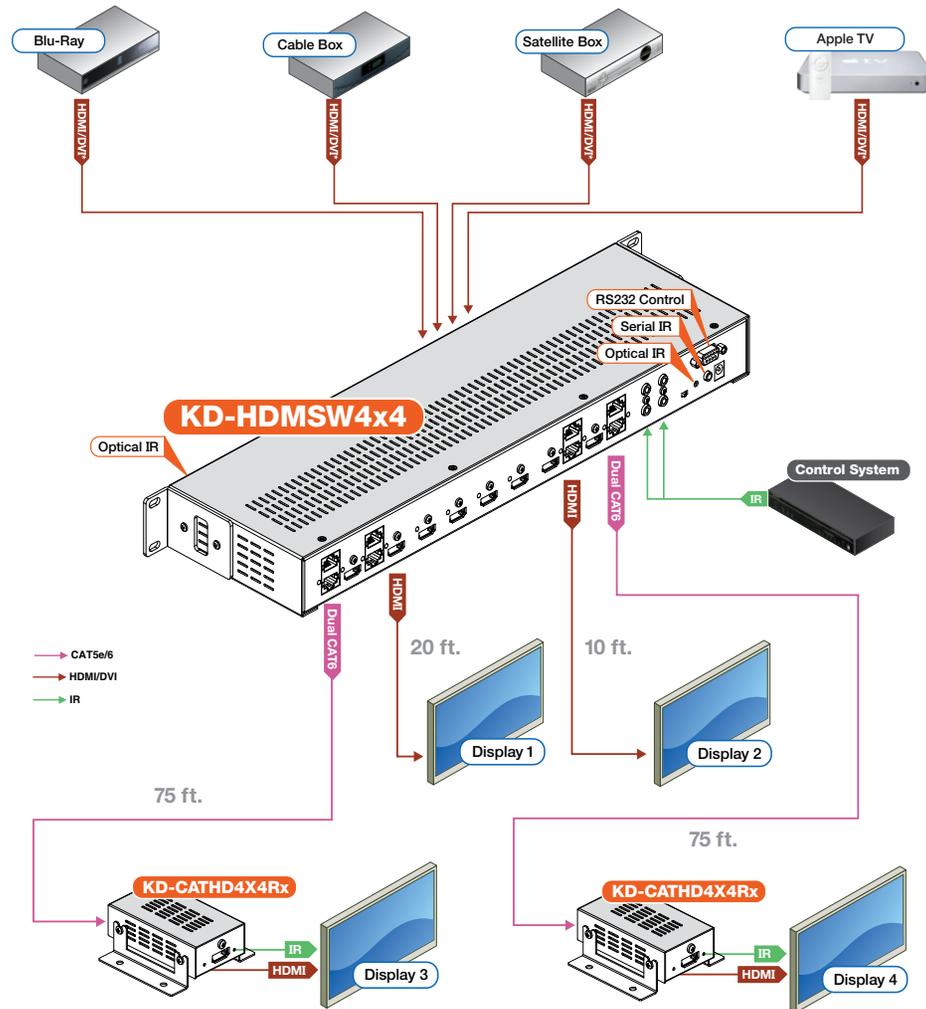
Quick Setup Guide:

Connections

1. Begin with the KD-HDMSW4x4 and all input/output devices turned off and power cables removed.
2. Connect HDMI sources to the appropriate input ports on the KD-HDMSW4x4.
3. Connect either or both HDMI and CAT5e/6 outputs. You will require 2x CAT5e/6 UTP or STP cables for each Balun connected.
4. Connect power to the KD-HDMSW4x4 as well as to all other input and output devices and turn them on.
5. Operate the KD-HDMSW4x4 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-HDMSW4x4 features a library of 9 internal EDID files, in addition to allowing the Input source to receive a copy of the EDID information of any selected Output connected via HDMI or CAT5e/6. The default EDID setting is "01" - 1080i w/ PCM 2ch Digital Audio. Changing to different 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.

Available EDID library settings: ('**01**' is the default)

01	1080i w/ PCM 2ch Digital Audio	06	3D w/ Dolby Audio
02	1080i w/ HD Audio	07	3D w/ HD Audio
03	1080p w/ PCM 2ch Digital Audio	08	DVI VESA 1280x1024
04	1080p w/ HD Audio	09	DVI VESA 1920x1200
05	3D w/ PCM 2ch Digital Audio		

When selecting an EDID from the library (settings 01-09), your source device will "see" the KD-HDMSW4x4 EDID choice instead of the displays EDID, over riding the displays 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 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.

Key digital®

Remote Control

You may control the KD-HDMSW4x4 switching commands by using the supplied IR Remote control. There are 4 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 Unit included in the KD-IRKIT300 uses a 3.5mm male-to-male Mono cable.

KD-IRB3099
Wired IR Extender

Back of the Unit

3.5mm male-to-male
mono cable

KD-IRCB204
Connecting Block

Serial IR   12V 2A

RS-232 Commands:

The KD-HDMSW4X4 provides access to all functions when used with an RS-232 control system. Key Digital provides a resource database for downloadable control modules at: *www.keydigital.com/controlmain.aspx*

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
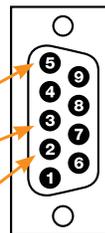
For a complete list of all available RS-232 commands please see the "Downloads" section on the KD-HDMSW4X4 product page at www.keydigital.com.

NOTE: All commands are case-insensitive. Spaces are shown for clarity; all commands should not

---
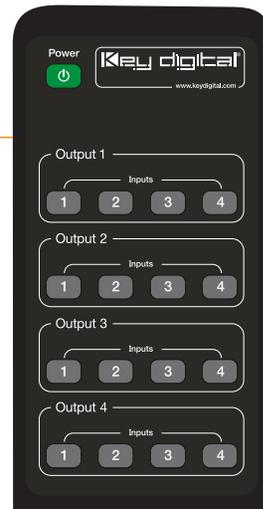
have any spaces. Every command below requires a carriage return at the end of the string for the command to be executed. If a new line character is received, a prompt should be sent back.

Values for 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, IR Input selected for each Output, and EDID selected for each Input.
- › **PF:**   **Power Off** - Power Off command

System Commands:

Video Switch:

- » **'SP O xx SI yy'** To switch the desired Video Input to the desired Output:
- » Where xx = the Output number [01-04] –OR- [A] for 'All'
- » Where 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 Input 3 to Output 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'**

IR Routing:

- » **'SP O xx SR yy'** To rout Serial IR signals
- » Where xx = Output numbers [01-04] –OR- [A] for 'All' Outputs
- » Where yy = Serial IR Input numbers [01-04] or [U, D] for 'Up',' Down' respectively. 'U/D' will increase or decrease the IR input number from its current position.
- » This command will rout the selected Serial IR Input number [1-4] to the desired Output number over the CAT5e/6 connection.
- » Example: **'SPOASR02'**: Will carry IR from IR Input port 2, to 'All' Outputs.
  'SPO02SR01': Will carry IR from IR Input port 1 to Output 2.

EDID Copy and Default EDID Library:

- » **'SP C EDID xx H/C/D yy':** To Copy EDID to Input from Output via HDMI or CAT5e/6, or from a Default Library
- » Where xx = Input numbers [01=04] –OR- [A] for 'All' Inputs
- » Where H = EDID Copy from HDMI Output
- » Where C = EDID Copy from CAT5e/6 Output
- » Where D = Default EDID Library selection (see list below)
- » Where yy = Output numbers [01-04] when 'H or 'C' variables are selected
  –OR-
  Default EDID library settings [01-08] 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).

Key digital®

» *Example:* To copy the EDID information from HDMI Output 2 to Input 4, issue the command: **'SPCEDID04H02'**

» *Example:* To copy the EDID information from CAT5 Output 2 to All Inputs, issue the command: **'SPCEDIDAC02'**

» *Example:* To write the EDID information from the built-in default EDID library using default EDID 1 to Input 2, issue the command; **'SPCEDID02D01'**

» **Below are listed the Default EDID Library selections 01-09:**

01	1080i w/ PCM 2ch Digital Audio
02	1080i w/ HD Audio
03	1080p w/ PCM 2ch Digital Audio
04	1080p w/ HD Audio
05	3D w/ PCM 2ch Digital Audio
06	3D w/ Dolby Audio
07	3D w/ HD Audio
08	DVI VESA 1280x1024
09	DVI VESA 1920x1200

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'**

» Where 'xx' = [01-08] 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 PCM, issue the command; **'SPCDF01'**

» *Example:* To reset the unit to factory default with an EDID setting of 3D 1080p 2CH PCM, issue the command; **'SPCDF07'**

Specifications

Technical:

» **Input (Each):** 1 HDMI; 1 wired IR or RS-232 on 3.5 mm stereo jack connector per slot

» **Output (Each):** 1 HDMI; 2 CAT5e/6 on RJ-45 connectors;

» **Bandwidth:** TMDS bandwidth 10.2 Gb/s

» **Control:** Front panel push buttons and LED's; IR sensor front/rear; RS-232 Tx/Rx lines with full bi-directional operation

» **Video/Audio Matrix Switching:** Full matrix switching for HDMI/DVI Video matrix

» **RS-232 Control Matrix:** Full bi-directional RS-232 input/output

» **Wired IR Control Matrix:** Each input/output section wired IR and unit wired IR can be switched into matrix in bi-directional operation to any of the inputs/outputs

» **EQ adjustment:** Precise auto-adjustment, distance measurement on Rx Balun or CAT5e/6 Input.

» **Link and Range:** 1080p/60, 1920x1200 max. up to 75 ft. 1080i/60, 720p, 1080p/24 up to 100 ft.

» **Deep Color Support:** Digital video formats in Deep Color Mode at up to 10 bits/color

» **HDMI® and HDCP Licensing:** Fully licensed and compatible with all HDMI and HDCP techologies

» **EDID Control:** Each input EDID is either a choice of any of the active zone displays connected via HDMI/DVI or CAT5e/6 to the outputs or form internal library of 9 default EDID's

» **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

» **KD-HDMSW4x4 Product Dimensions:** 17.125" W x 5.50" D x 1.75" H

» **KD-CATHD4x4Rx Product Dimensions:** 3.25" W x 1.875" D x .875" H

» **KD-HDMSW4x4 Product Weight:** 4.05 lb.

» **KD-CATHD4x4Rx Product Weight:** .25 lb

» **Shipping Weight:** 10 lb

Key digital®

⚠️ **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

⚠️ **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 two-year parts and labor warranty.
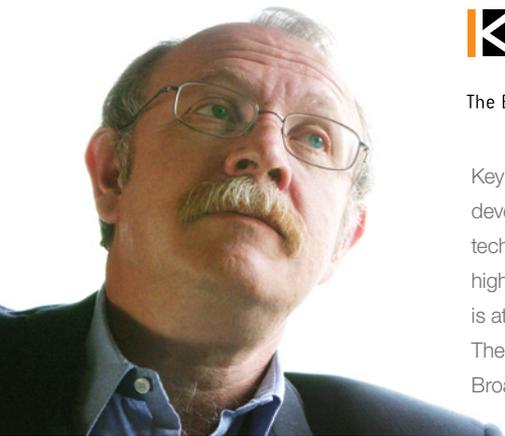
Key digital®

Key digital®

The Experts in Digital Video Technology and Solutions™

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.

521 East 3rd Street, Mount Vernon, NY 10553
Phone :: 914.667.9700   Fax :: 914.668.8666
Web :: www.keydigital.com