

KD-Pro4x1X-3

4 Input 4K 18Gbps Pro Series HDMI Switcher with Web UI, Auto-Switching, Analog and Digital Audio De-Embedding



4K
@60Hz

18G

444

HDMI
AUDIO
DE-EMBEDDING

Default Static IP Address:
192.168.1.239, Port 23



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Operation Manual

Please visit www.keydigital.com for the latest product documentation, firmware, control drivers and software downloads. Product features and specifications are subject to change without notice

Always follow the instructions provided in this Operating Manual.

About KD-Pro4x1X-3

Key Digital® KD-Pro4x1X-3 is a 4K/18G HDMI switcher with analog and digital audio de-embedding, auto switching, web UI and iOS app-ready control. Designed for professional audio video installations in conference rooms, huddle spaces, classrooms, theater and gaming spaces, KD-Pro4x1X-3 enables multiple video sources to connect to a single video display while analog (3.5mm & balanced/unbalanced) and digital (optical & PCM) audio de-embed ports may feed audio of the selected source into an amplifier, DSP, or sound bar. KD-Pro4x1X-3 supports all SD, HD, VESA and Ultra HD/4K video standards with HDR header information included in a variety of 4K EDID handshakes. In addition to IR, RS-232, and TCP/IP control, KD-Pro4x1X-3 can also be controlled via trigger voltage and boasts a programming-free presentation system capability when integrated with KD-Amp220 and controlled via Web UI or free Key Digital iOS app.

Key Features

- **HDMI Switching:** 4 HDMI sources to 1 HDMI output/display
- **Ultra HD/4K:** Supports up to 4096x2160 or 3840x2160 24/25/30/60hz at 4:4:4 (signals up to 18Gbps bandwidth)
- **Audio De-embedding®:** Audio of the selected HDMI input is de-embedded at the analog (3.5mm stereo & L/R balanced/unbalanced) and digital (optical & PCM) connectors
- **Key Digital® App Ready:** Scan & detect population for pre-built GUI and TCP/IP control via Key Digital® App
- **Auto-Switching:** Automatic selection of newly detected source and switching from newly disconnected source via hot plug detection voltage when enabled
- **Surround Audio Support:** DTS-HD Master Audio™, DTS:X®, Dolby® TrueHD, Dolby Atmos®
- **Programming-Free Presentation System:** Add KD-Amp220, setup in KDMS Pro for a complete user interface in the web UI and KD iOS App including AV switching, volume control with microphone mix, and PTZ web cam control for an all-in-one user-friendly system.
- **Control:** Front panel button, serial IR, optical IR, RS-232, trigger in, and TCP/IP controllable with web UI and KD-App ready

Additional Features

- **Key Digital® App & KDMS® Pro Ready:** Scan & detect population for pre-built GUI and TCP/IP control via Key Digital® App and Key Digital Management Software™ Pro (KDMS™ Pro) PC setup Software
- **IP to RS-232 Command forwarding:** Commands received on the TCP/IP port may be output on the RS-232 port for controlling Key Digital KD-Amp220 and third-party RS-232 controllable devices with ASCII format commands.
- **HDCP Licensing:** Fully licensed and compatible with HDCP 2.2
- **HDR10 and Dolby Vision:** More life-like images through a greater range of luminance levels
- **Resolution Support:** Supports all SD, HD, and VESA (VGA, SVGA, XGA, WXGA, SXGA, UXGA) up to 4096x2160p
- **Deep Color Support:** Up to UHD/4K 30Hz 4:4:4/12 bits or 60Hz 4:4:4/8 bit

- **Full Buffer System™**: Manages TMDS re-clocking / signal re-generation, HDCP authentication to source & display, and EDID Control handshake
- **EDID Management**: Internal library with 15 internal EDID handshakes including 4K with HDR in addition to native EDID data copied from the output/display 1
- **TMDS re-clocking**: Support for long HDMI connectivity using Key Digital® HDMI cables

Accessories

- **Power supply**, KDPS12V2ASC / GMB36-120200-F, a 12V/2A desktop-type with screw-in connector.
- **(2) Rack Ears**, 1x long, 1x short for mounting in full-width rack
- **IR Remote Control**, model KD-RMSWPROK
- **(2) 6-pin terminal block**
- **USB Setup Cable**, USB Micro to USB A

Quick Setup Guide

Begin with the KD-Pro4x1X-3, all source, display devices, audio system, and any other connected peripherals powered off.

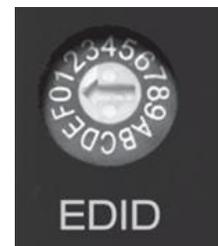
Connect

1. **Connect HDMI sources** to the input ports.
2. **Connect HDMI displays** to the output ports.
3. **Connect analog and/or digital audio outputs** to amplifiers/receivers.
4. **Connect Control System**. For KD-App control and/or IP control from a control system or PC, connect. TCP/IP port to network. RS-232 and IR control may also be utilized.
5. **Connect Power Supply**. Screw-in the power supply to KD-Pro4x1X-3, then plug-in to power outlet.
6. **Connect** from your PC using the **USB micro** port on the face of the unit to begin configuration steps.
7. **(Optional)** If integrating in a Programming-Free Presentation System with KD-Amp220 and/or KD-CamUSB, refer to the [Programming-Free Presentation System Wiring](#) section.

Configure

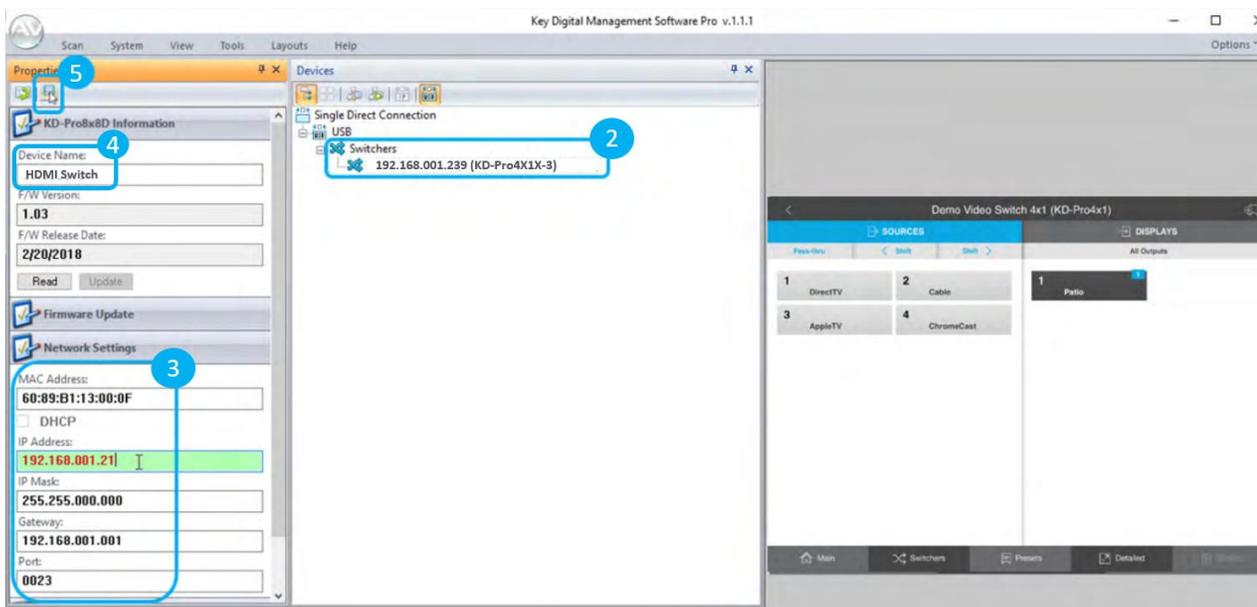
EDID

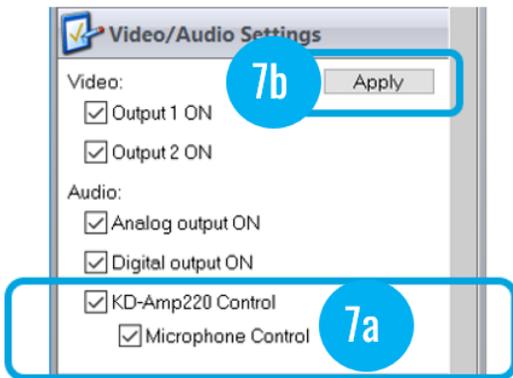
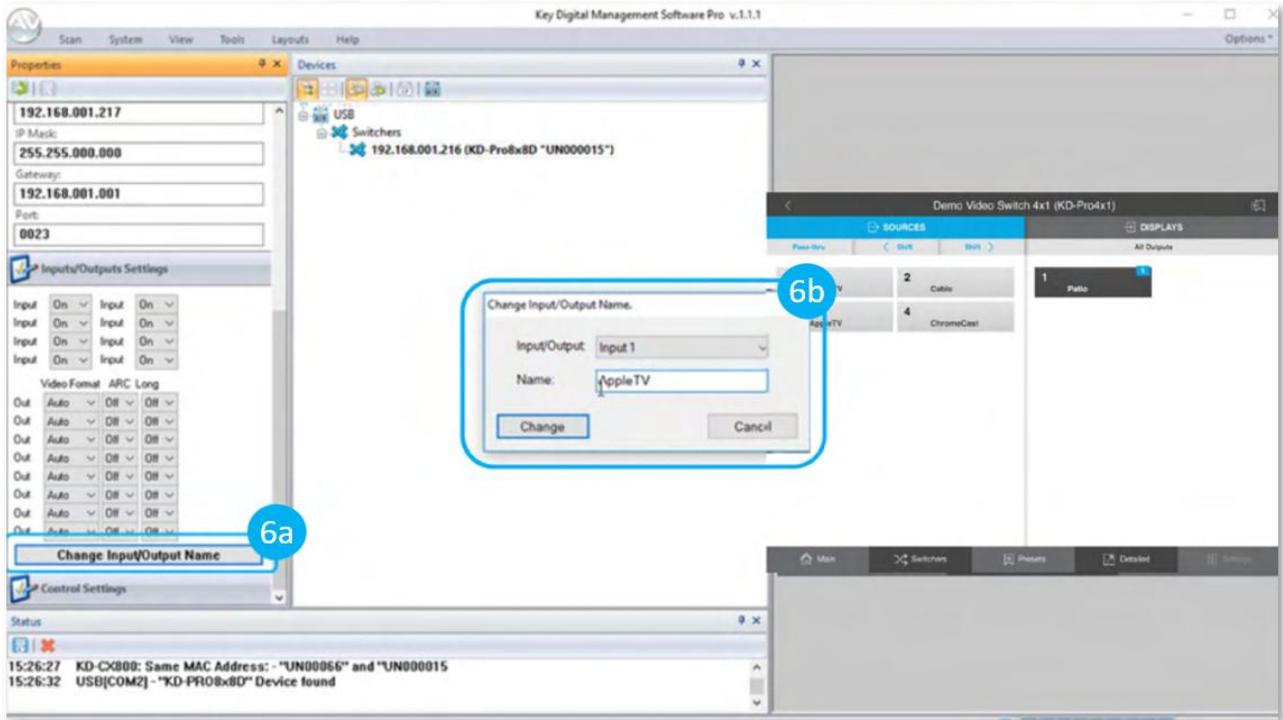
Use the EDID rotary dial to choose the desired handshake (video resolution and audio format information) that will be provided to the connected source.



Configure KD-PRO4X1X-3 with Key Digital Management Software Pro (KDMS Pro). Download [HERE](#)

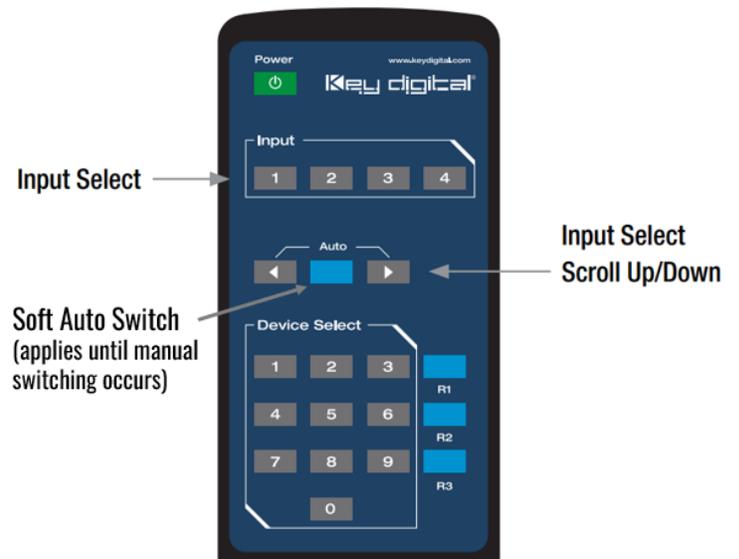
1. Open the Key Digital® Management Software™ Pro software and perform a USB scan (fig. 1)
2. Choose the detected device from the Devices window.
3. In the Network Settings section of the Properties window, enter the desired IP settings.
 - IP Address (default is 192.168.1.239)
 - Subnet Mask (default is 255.255.255.0)
 - Gateway (default is 192.168.1.1)
 - Port (default is 23)
 - Note: If using KD-App, please do not change the port number.
4. Enter the desired name for the KD-Pro4x1X-3. I.e “HDMI Switch” or “Conference Room”.
5. Save.
6. If using the Key Digital iOS app (AKA KD-App), Web UI, or other 2-way control systems, set the desired Input/Output names by entering the Input/Output Settings section of the properties window, and selecting the Change Input/Output Name button (fig. 3a), selecting the desired input / output and entering the name (fig. 3b).
7. If utilizing Programming-Free Presentation System, choose the KD-AMP220 Control selection box (fig. 5a) in the Audio/Video properties section. To control the mix level of KD-AMP220’s microphone input, choose the selection box for Microphone Control (fig. 5b)
 - Note: Controlling more than two cameras will require the use of active third-party RS-232 signal distribution. Maximum of seven cameras is supported.





Control

Option 1: Control via Remote Control



Option 2: Control via KD-App, KDMS Pro™

KD-Pro4x1X-3 is controllable by Key Digital’s user-friendly [iOS App](#) (downloadable in the App Store) or Key Digital® Management Software™ Pro ([downloadable here](#)).

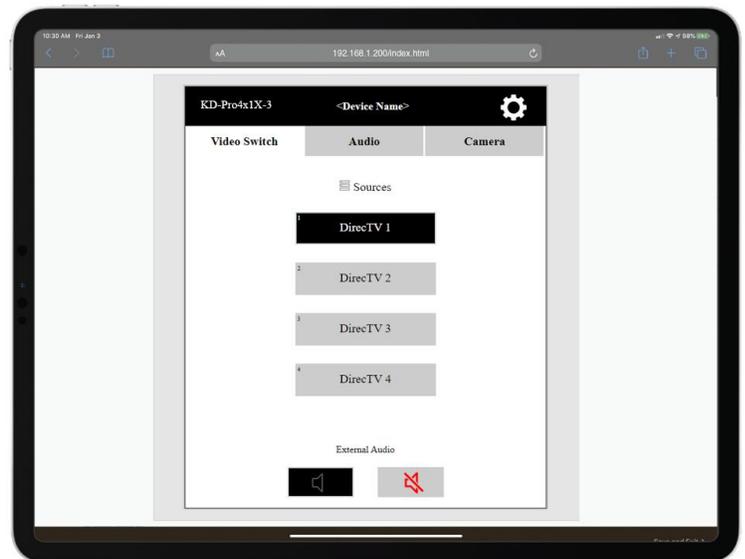
1. Connect and Configure your KD-Pro4x1X-3 as described in the Connect & Configure sections
2. Download and open KD-App and/or KDMS™
3. Ensure the iOS device and/or PC computer are on the same network with KD-Pro4x1X-3
4. Perform a network scan in the KD-App/KDMS™ and select the unit.
5. Select and control the selected KD-Pro4x1X-3.
6. Enter the Video Switching, Camera Control, and/or Audio Control tabs to control the respective features of the system. The Camera and Audio tabs are only visible if those control settings have been applied.
7. (Optional) To enter end-user mode in KDMS Pro, type CTRL + ALT + N after selecting the unit in the devices tree. This provides a view without any configuration settings visible.



Option 3: Control via web UI

Access KD-Pro4x1X-3’s web UI from any phone, tablet, or PC. The web UI shows the input, output, and unit name for a user-friendly experience and the Web UI may also be used to integrate and control KD-CAMUSB PTZ webcam and KD-AMP220 amplifier via RS-232 to create a complete system with HDMI switching, volume control, microphone level mix, camera PTZ and preset control.

1. Connect and Configure your KD-Pro4x1X-3 as described in the Connect & Configure sections
2. Ensure the PC, phone, or tablet are on the network with KD-Pro4x1X-3
3. Enter IP Address of KD-Pro4x1X-3 unit into the web browser search bar. The default IP address is 192.168.1.239.
4. Enter password. Default password is “admin”
5. Use the web UI to control switching
6. Press the Settings gear icon button to access naming, control and network settings.



7. Enter the Video Switching, Camera Control, and/or Audio Control tabs to control the respective features of the system.

KD-Pro4x1X-3 <Device Name>

Naming Settings | Control Settings | Network Settings

Device Name:

Input Naming

Input1:

Input2:

Input3:

Input4:

Output Naming

Output1:

Apply

KD-Pro4x1X-3 <Device Name>

Naming Settings | Control Settings | Network Settings

Audio Control: Off

Audio MIC Mix: Off

Camera Control: Off

Output Debug: Off

Apply

KD-Pro4x1X-3 <Device Name>

Naming Settings | Control Settings | Network Settings

Network Configuration

Mac Address:

Host IP Address:

Subnet Mask:

Router IP Address:

TCP Port:

Apply

Admin Password

Old Password:

New Password:

Confirm Password:

Apply

KD-Pro4x1X-3 <Device Name>

Video Switch | Audio | Camera

Sources

1 DirecTV 1

2 DirecTV 2

3 DirecTV 3

4 DirecTV 4

External Audio

KD-Pro4x1X-3 <Device Name>

Video Switch | Audio | Camera

Audio Input: Balanced L/R

Volume:

Mic (Pre-Amp):

KD-Pro4x1X-3 <Device Name>

Video Switch | Audio | Camera

Power: ON OFF

Focus:

Positions:

Zoom:

L/R Invert: Invert Off

NOTES:

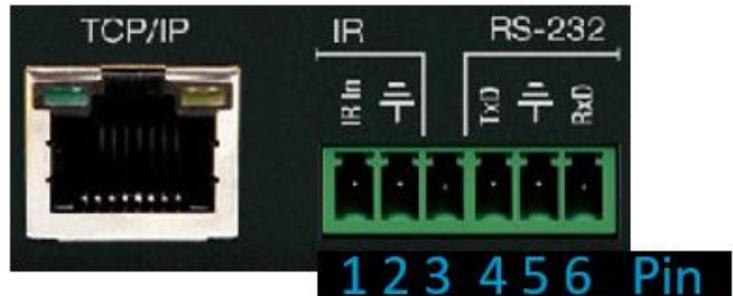
- See the [Programming-Free Presentation System Wiring](#) section for RS-232 wiring instructions for optional Amplifier control wiring.
- If setting Audio Control for the system in the Web UI, you must also manually send command SPCRSB3 to the KD-Pro4x1X-3 to manually set the baud rate to 9600 as required. Alternatively, setting Camera and/or Audio Control in KDMS will automatically set the baud rate as required.

Option 4: Control via professional control system

KD-Pro4x1X-3 allows control over serial interface for bi-directional communication.

- **For RS-232 control** use pins 4, 5, and 6 of the Unit Control port. Baud Rate is 57,600
- **For TCP/IP control** the default static IP address is 192.168.1.239, with port 23.

Default static IP address:
192.168.1.239, port 23



- KD-Pro4x1X-3 supports KD’s standard matrixing protocol, so if you have controlled a KD switcher with a third-party control system before, you will likely have success with the same driver/module.

Switching HDMI AV + External Audio together

- SPOxxSlyy xx = output (01), yy = input (01-04)
- SPOSlyy xx = output (01-04), yy = input (01-04)

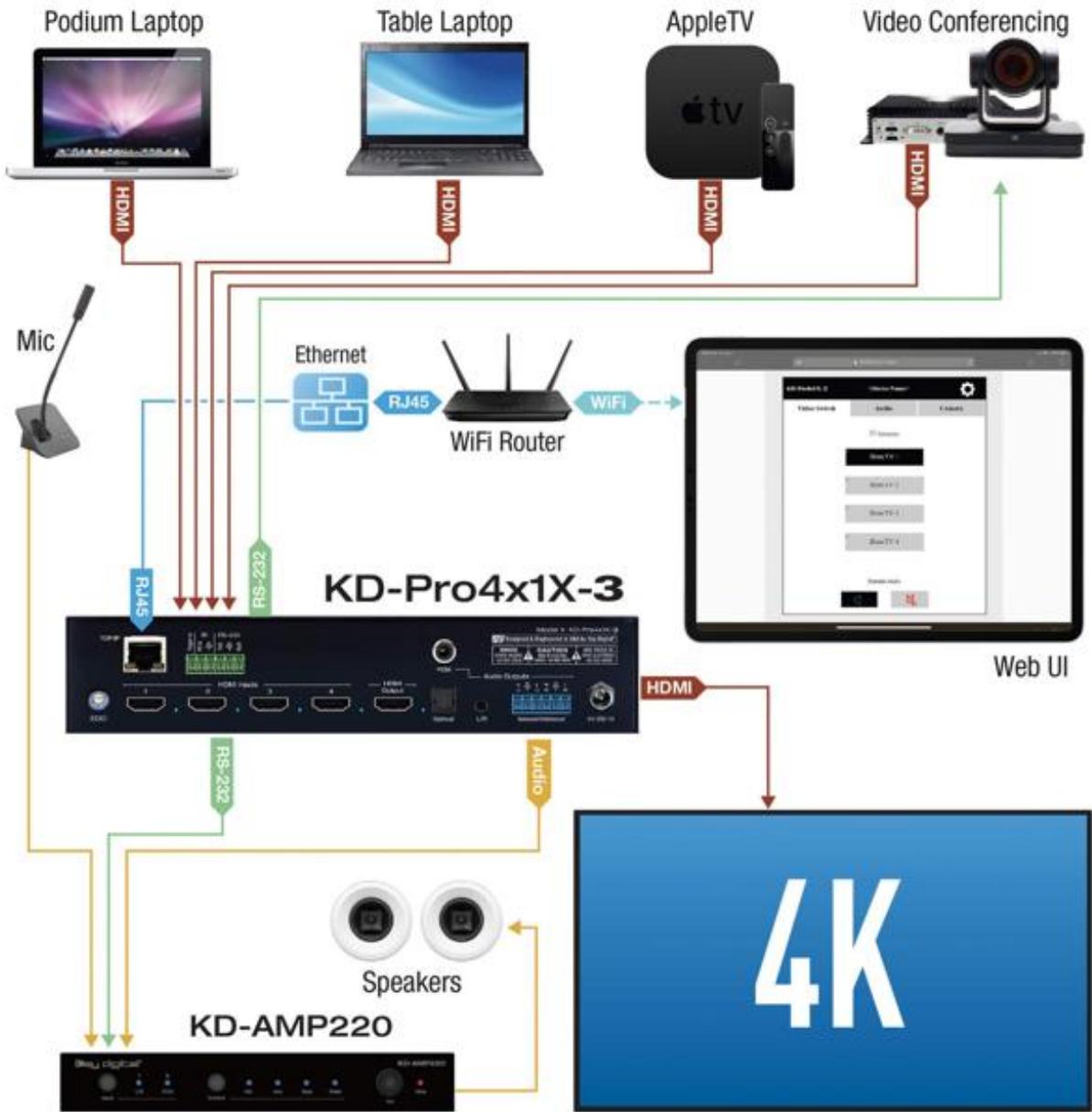
- A **carriage return** is required at the end of each string. See the TCP/IP and RS-232 Commands section for full command set and protocol.



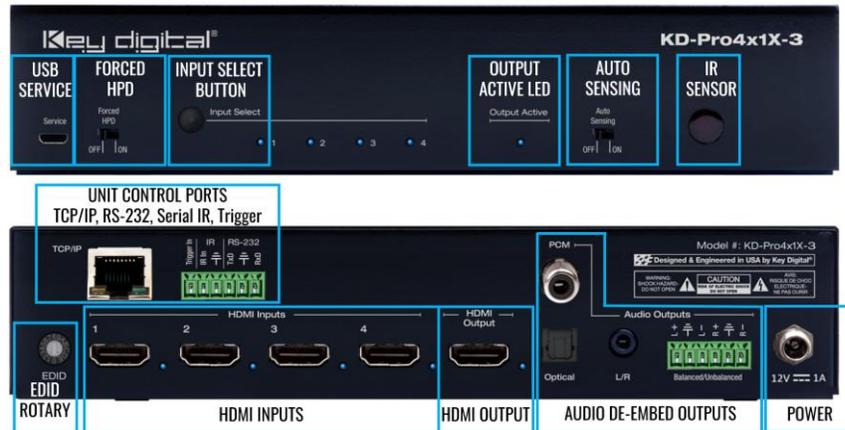
Test for proper operation of the unit and cables in your system before permanently securing the unit for final installation. Ensure that you leave enough ventilation space to provide sufficient airflow and cooling

Application Example

Conference Room AV switching system with Key Digital amplifier and PTZ web cam integrated and controlled via web UI without any programming required.



Connections, Buttons, and LEDs



REAR CONNECTIONS and ROTARY

HDMI Inputs (4)

- The 4 HDMI inputs are located on the left side of the back panel.
- **Blue** LED illuminates solid to indicate an active HDMI signal is incoming.

HDMI Output

- 1 HDMI located on the right-center of the back panel.
- **Blue** LED illuminates solid when Hot Plug Detection (HPD) is received from the connected display / output device.

HDMI Input & Outputs Port Specifications

- Supports up to UHD/4K @ 50/60 fps [4:4:4], 18Gbps signals
 - See Supported standard 4K Video Formats table
- Supports HDR10
- Compliant with HDCP 2.2 and previous
- Supports lossless compressed audio formats including Dolby® TrueHD, Dolby® Digital Plus, Dolby Atmos®, and DTS-HD Master Audio™, DTS:X®, Dolby® TrueHD, Dolby Atmos®
- Does not support CEC
- CEC pass-through from display to selected HDMI source
- For Display Port sources/monitors, use active converters

Supported standard 4K Video Formats

	Resolution	Bandwidth
1	4K@24/25/30 [4:4:4] 8bit	< 10.2Gbps
2	4K@24/25/30 [4:2:2] 8/10/12bit	< 10.2Gbps
3	4K@50/60 [4:2:0] 8bit	< 10.2Gbps
4	4K@24/25/30 [4:4:4] 10/12bit	< 18Gbps
5	4K@50/60 [4:2:2] 8/10/12bit	< 18Gbps
6	4K@50/60 [4:2:0] 10/12bit	< 18Gbps
7	4K@50/60 [4:4:4] 8bit	< 18Gbps

EDID Handshaking Rotary

- EDID authentication is provided from the unit to the selected input/source.
- The EDID file (AKA “handshake” is selected using the EDID rotary on the unit and provides a list of compatible video and audio formats as well as digital data, informing the source device what it should output.
- Most sources will comply with a new EDID file without a power-cycle, but devices do behave differently.
- Adjustments may speed up sync time during source selection.

Position	EDID Handshake Description	EDID Rotary
0	Copy EDID from HDMI Output	 <p>IMPORTANT: Please apply LIGHT PRESSURE to EDID rotary when making selection.</p>
1	1920x1080p, 2ch Audio	
2	1920x1080p, Dolby/DTS 5.1	
3	1920x1080p, HD Audio	
4	1920x1200p, 2ch Audio	
5	1920x1200p, Dolby/DTS 5.1	
6	1920x1200p, HD Audio	
7	4K 10.2G 3840x2160p @ 60, 2ch Audio	
8	4K 10.2G 3840x2160p @ 60, Dolby/DTS 5.1	
9	4K 10.2G 3840x2160p @ 60, HD Audio	
A	4K 18G 3840x2160p @ 60, 2ch Audio	
B	4K 18G 3840x2160p @ 60, Dolby/DTS 5.1	
C	4K 18G 3840x2160p @ 60, HD Audio	
D	1280x720p @ 60 DVI (No Audio)	
E	1920x1080p @ 60 DVI (No Audio)	
F	1920x1080i, 2ch Audio	

Balanced / Un-balanced Analog Audio Output:

- 6-pin phoenix connector
- Provides 2ch balanced or un-balanced analog audio output from the selected HDMI input source
- The Pin assignment for the audio is as follows:
 - Left + is Pin 1; Left - is Pin 3; Left Ground is Pin 2.
 - Right + is Pin 4; Right - is Pin 6; Right Ground is Pin 5.
- For un-balanced audio, use the + and Ground pins of each channel
- Drives audio signals up to 2VRMS with a sampling rate of 192KHz

L/R Analog Audio Output:

- 3.5mm stereo jack with de-embedded audio from the selected HDMI source
- Drives audio signals up to 1 VRMS with a sampling rate of 192KHz
- Automatically mutes if incoming audio format is not PCM 2ch

Optical Digital Audio Output

- Provides digital audio output from the selected HDMI input source.
- Supports PCM, SPDIF (IEC 60958), Dolby Digital®, and DTS™ up to 5.1 / 6.1
- Compatible with sampling rates up to 96KHz

PCM Digital Audio Output

- Provides digital audio output from the selected HDMI input source.
- Supports PCM, SPDIF (IEC 60958), Dolby Digital®, and DTS™ up to 5.1 / 6.1
- Compatible with sampling rates up to 96KHz

Note for All Audio De-Embed Ports

- There are no volume or tone control features
- There are no format conversion features. For example, to achieve 2ch analog audio output, the selected HDMI input source audio format must be 2ch.

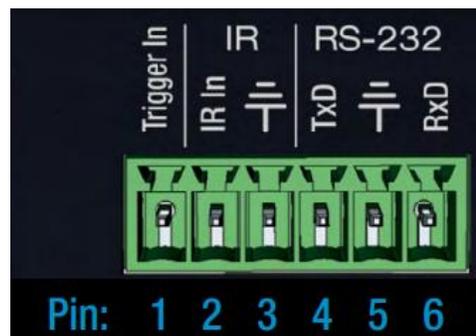
Audio Input Signal Format	Audio L/R Output	Digital Audio Output (Optical)
2ch PCM	Pass-Through	Pass-Through
Multi-Channel PCM	Front L/R Pass-Through	MUTE
Dolby DTS	MUTE	Pass-Through
HD Audio	MUTE	MUTE

TCP/IP Unit Control: Used for unit control from a control system and/or PC

- **Default static IP address is 192.168.1.239, port 23**
- Connect ethernet cable from the KD-Pro4x1X-3 to a network router or connect a straight through cable directly from a PC
- Unit configuration, control, and firmware updates are achieved with Key Digital Management Software™ Pro (KDMS™ Pro) downloaded [HERE](#).
- See TCP/IP and RS-232 Commands section for full API

Main Control Port: Used for unit control from a control system and/or PC

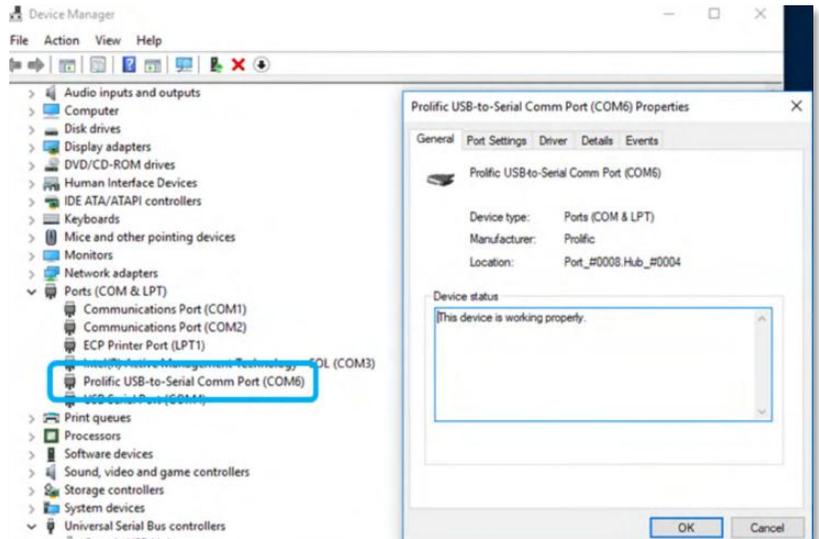
- 6-Pin Terminal Block for Trigger In, IR and RS-232
- Pin out:
 - Pin 1 = Trigger In
 - Pin 2 = IR In
 - Pin 3 = IR/Trigger Ground
 - Pin 4 = RS-232 Tx Data
 - Pin 5 = RS-232 Ground
 - Pin 6 = RS-232 Rx Data
- See TCP/IP RS-232 Commands section for full API



FRONT CONNECTIONS, BUTTONS, SWITCHES

Service USB (1):

- Micro USB port
- Used for configuration and control from PC via KDMS Pro, or third-party control terminals
- Used for firmware updates (consult with Key Digital tech support before updating firmware).
 - **Note:** After updating firmware, all unit settings are restored to defaults except IP information. Please collect all customized settings info before loading firmware.
- Supports USB driver for Windows, Mac
- Will register as “Prolific USB-to-Serial Comm Port in Device Manager
- Can be used as RS-232 control port. Baud rate is 115,200.



Forced HPD Troubleshooting Tool:

- When ON, Hot Plug Detection voltage is fixed to the high state to the connected display.
- Standard HPD behavior when set to OFF position.

Input Select Button:

- Used to choose which connected source is output to the connected display/device
- Selecting a source with the Input Select button or IR remote will disable Auto Sensing Mode IF Auto sensing has not been set via the front switch.
- To factory reset the unit, press and hold for approx. 10 seconds until the front LEDs blink twice

Output Active LED:

- Blue LED illuminates solid when Hot Plug Detection (HPD) is received from the connected display/output device.

Auto Sensing

- ON: Unit will automatically select a newly detected active source. If current source is disconnected or becomes inactive, auto sensing will sequentially advance to an active input/source
- OFF: Unit is in normal mode and regular switching functionality will occur
- Manual source selection via push-button, IR, or RS-232 is still possible when enabled.
- Auto Switching mode is only disabled via IR or RS-232. It is not disabled via manual source switching/selection.

IR Sensor: Mount IR an IR emitter from control system or IR connection block. Refer to IR Remote Control section for correct button press sequence

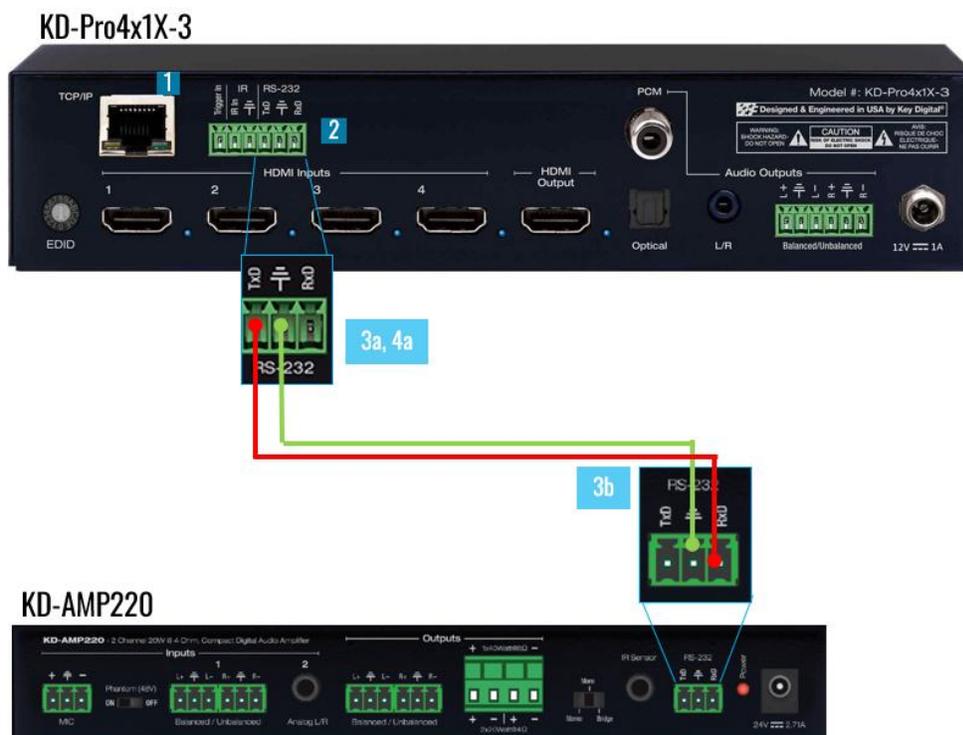
Programming-Free Presentation System Wiring

KD-Pro4x1X-3 can forward commands received on the TCP/IP port to the RS-232 port to control Key Digital’s KD-CamUSB PTZ web cam and KD-Amp220 pre-amp / amplifier to build a complete integration system for presentation and meeting spaces without any programming. After enabling Camera and/or Amplifier control in the web UI or KDMS Pro, follow the below RS-232 wiring instructions.

1. Control originates on the TCP/IP network port from Web UI
2. IP is forwarded to RS-232 and output at the Unit Control TxD and Ground pins
3. For KD-Amp220 control, connect unit Control Port TxD and Ground into KD-AMP220 RS-232 port RxD and Ground. Do not connect from the Control Port RxD pin into the KD-AMP220 TxD pin.
4. For KD-CAMUSB control, connect unit Control Port TxD and Ground into KD-CAMUSB RS-232 port RxD and Ground. Do not connect from the Control Port RxD pin into the KD-CAMUSB TxD pin.

NOTES:

- It is OK to insert 2 wires into KD-Pro4x1X-3’s RS-232 pins to achieve control of the Amplifier and an additional device.
- Ensure that the TxD wire(s) do not contact the Ground wire(s)



TCP/IP and RS-232 Commands

TCP/IP Connection Protocol

- Default IP address = 192.168.1.239
- TCP/IP Port Number = 23
- **Notes:** Use Raw / Other service, not Telnet.
Maximum of two TCP/IP socket supported at a time.
Simultaneous TCP/IP and web sockets are supported. Multiple web sockets are supported.

Default static IP address:
192.168.1.239, port 23

RS-232 Connection Protocol

- Baud Rate = 57,600 bits per second as default
- Data Bits = 8
- Stop Bits = 1
- Parity = None
- Flow Control = None

Notes:

- **Carriage Return is required at end of each string**
- Commands are not case-sensitive
- Spaces are shown for clarity; commands should NOT have any spaces
- After a new command is received, a prompt should be sent back
- HDMI Input selections via front button, IR remote, serial IR In, USB service port, trigger in, or RS-232 all respond with the following message via TCP/IP:
 - [INPUT=x]
 - x = the currently selected input (1-4)
 - The response terminates with a carriage return followed by a line feed

Help Command (H). Returns entire API in readable format:

```
-----
--                               Key Digital Systems HELP                               --
-----
-- KD-Pro4x1X-3                               F/W Version : 1.00 --
--
-- H      : Help                               --
-- PF     : Power Off                           --
```

```

-- PN          : Power ON          --
-- STA         : Show Global System Status --
--
-- Video Output Setup Commands: yy = [01-02,U,D] --
-- SPO SI yy    : Set Output to Video Input yy --
-- SPO01 SI yy  : Set Output to Video Input yy --
-- SPO ON/OFF   : Set Output ON/OFF --
-- SPO DBG ON/OFF : Set Output Debug Mode ON/OFF --
--
-- Audio Output Setup Commands: [E=Enable, D=Disable] --
-- SPO AA E/D  : Enable/Disable External Analog Audio Output --
-- SPO DA E/D  : Enable/Disable External Optical Audio Output --
-- SPO CAM ON/OFF : Set CAMUSB Control Mode ON/OFF --
-- SPO AMP ON/OFF : Set AMP220 Control Mode ON/OFF --
-- SPO MIC ON/OFF : Set AMP220 MIC Mode ON/OFF --
--
-- Input/Output/Device Naming Commands (Max. 16 Chars) --
-- SPI xx WN cccccccccccccccc : Write Input xx Name --
-- SPI xx RN                   : Read Input xx Name --
-- SPO xx WN cccccccccccccccc : Write Output xx Name --
-- SPO xx RN                   : Read Output xx Name --
-- SPC WN cccccccccccccccc    : Write Device Name --
-- SPC RN                      : Read Device Name --
--
-- Network Setup, ( xxx=[000-255], zzzz=[0001~9999] ) --
-- SPCETIPA xxx.xxx.xxx.xxx : Set Host IP Address to xxx.xxx.xxx.xxx --
-- SPCETIPM xxx.xxx.xxx.xxx : Set Net Mask to xxx.xxx.xxx.xxx --
-- SPCETIPR xxx.xxx.xxx.xxx : Set Route IP Address to xxx.xxx.xxx.xxx --
-- SPCETIPP zzzz            : Set TCP/IP Port to zzzz --
-- SPCETIPB                 : Apply New Network Config --

```

```
--
-- System Control Setup Commands:
-- SPC AS x   : Set Auto Sensing Mode x = [0:OFF, 1=ON]
-- SPC FB E/D : Enable/Disable Front Panel Buttons
-- SPC RSB z   : Set RS232 Baud Rate to z bps, z=[0-4]
--             [0:57600, 1:38400, 2:19200, 3:9600, 4:4800]
-- SPC DF     : Reset to Factory Defaults
-- SPC DF00   : Reset to Factory Defaults without Network Reset
-- FWD(xxxxxxxx): Forward ASCII string xxxxxxxxxx received on IP port to RS-232 port
-- Reset to Factory Defaults without Network Reset
```

Status Command (STA). Returns unit status and settings in readable format:

```
-----
--                               Key Digital Systems STATUS                               --
-----
-- KD-Pro4x1X-3,                Device Name: PR04x1X-2_0001
-- F/W Version : 1.00
-- Power : ON
-- Front Panel Button : Enabled
-- Auto Sensing Mode : OFF
-- RS232 : Baud Rate=57600bps, Data=8bit, Parity=None, Stop=1bit
--
-- Network Setting(Telnet Server) Status
-- MAC Address = 60:89:B1:23:20:01
-- Host IP Address = 192.168.001.239
-- Net Mask = 255.255.255.000
-- Router IP Address = 192.168.000.001
-- TCP Port = 0023
--
-- Video Input 01 : EDID = DEFAULT A, LINK = ON
-- Video Input 02 : EDID = DEFAULT A, LINK = ON
-- Video Input 03 : EDID = DEFAULT A, LINK = ON
-- Video Input 04 : EDID = DEFAULT A, LINK = ON
--
-- Video Output   : Input = 01, Output = ON, LINK = ON , DBG = OFF
--
-- Audio Output   : Analog = Enabled, Optical = Enabled
--
-- Control : CAMUSB Mode = OFF, AMP220 Mode = OFF, MIC Mode = OFF
-----
```

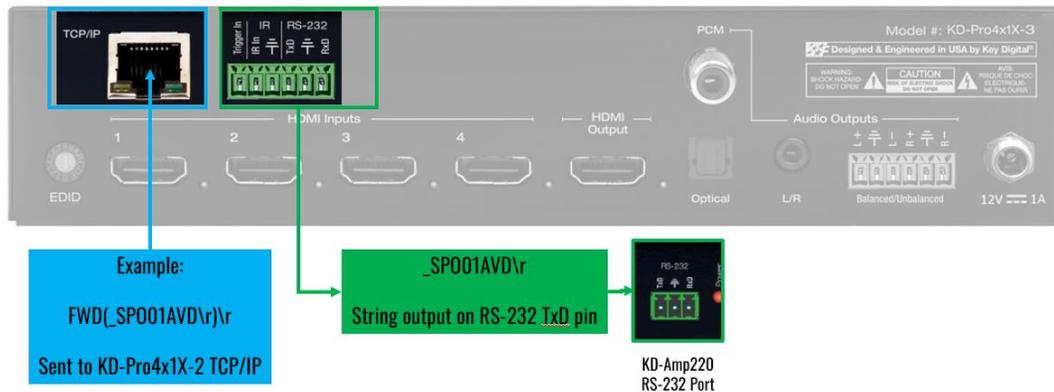
IP to RS-232 Command Forwarding

KD-Pro4x1X-3 can forward ASCII strings received on the TCP/IP port to the RS-232 port for one-directional control of RS-232 device(s) without using ports from a master controller.

This feature is how KD-Pro4x1X-3's Programming-Free Presentation System is achieved and may also be utilized in other systems.

Send the command `FWD(XXXXXXXXXXXXXXXXXX)` to KD-Pro4x1X-3 via IP connection and the characters within the parenthesis will be output on the RS-232 port, with `XXXXXXXXXXXXXXXXXX` being a maximum of 16 supported ASCII characters.

Like all TCP/IP commands sent to KD-Pro4x1X-3, a carriage return is required at the end of the command. Use KDMS Pro or PuTTY terminal to set KD-Pro4x1X-3's baud rate to match the RS-232 controlled device.



Examples:

1. The TCP client device sends `FWD(_SPI01AVU\r)\r`
 - a. `_SPI01AVU\r` string comes out via the RS-232 port
2. The TCP client device sends `FWD(hello123@#\r)\r`
 - a. `hello123@#\r` string comes out via the RS-232 port
3. The TCP client device sends `FWD(KD1CAMRP5_)\r`
 - a. `KD1CAMRP5_` message comes out via the RS-232 port.

Supported ASCII Characters

The characters within the blue rectangles are supported

0	00	NUL	25	19	EM	51	33	3	77	4D	M	103	67	g
1	01	SOH	26	1A	SUB	52	34	4	78	4E	N	104	68	h
2	02	STX	27	1B	ESC	53	35	5	79	4F	O	105	69	i
3	03	ETX	28	1C	FS	54	36	6	80	50	P	106	6A	j
4	04	EOT	29	1D	GS	55	37	7	81	51	Q	107	6B	k
5	05	ENQ	30	1E	RS	56	38	8	82	52	R	108	6C	l
6	06	ACK	31	1F	US	57	39	9	83	53	S	109	6D	m
7	07	BEL	32	20	space	58	3A	:	84	54	T	110	6E	n
8	08	BS	33	21	!	59	3B	;	85	55	U	111	6F	o
9	09	HT	34	22	"	60	3C	<	86	56	V	112	70	p
10	0A	LF	35	23	#	61	3D	=	87	57	W	113	71	q
11	0B	VT	36	24	\$	62	3E	>	88	58	X	114	72	r
12	0C	FF	37	25	%	63	3F	?	89	59	Y	115	73	s
13	0D	CR	38	26	&	64	40	@	90	5A	Z	116	74	t
14	0E	SO	39	27	'	65	41	A	91	5B	[	117	75	u
15	0F	SI	40	28	(	66	42	B	92	5C	\	118	76	v
16	10	DLE	41	29	)	67	43	C	93	5D	]	119	77	w
17	11	DC1	42	2A	*	68	44	D	94	5E	^	120	78	x
18	12	DC2	43	2B	+	69	45	E	95	5F	_	121	79	y
19	13	DC3	44	2C	,	70	46	F	96	60	`	122	7A	z
20	14	DC4	45	2D	-	71	47	G	97	61	a	123	7B	{
21	15	NAK	46	2E	.	72	48	H	98	62	b	124	7C	|
22	16	SYN	47	2F	/	73	49	I	99	63	c	125	7D	}
23	17	ETB	48	30	0	74	4A	J	100	64	d	126	7E	~
24	18	CAN	49	31	1	75	4B	K	101	65	e	127	7F	DEL
			50	32	2	76	4C	L	102	66	f			

Specifications

Technical

- Input (Each): 1 HDMI Connector, Type A, 19 Pin Female
- Output (Each): 1 HDMI Connector, Type A, 19 Pin Female
- Output (Each): Balanced/unbalanced line level audio on 6-pin terminal block. Drives 2VRMS line audio input with a sampling rate of 192KHz
- Output (each): Toslink optical digital audio following SPDIF format (IEC 60958). Supports sampling rate up to 192KHz
- Video Bandwidth: TMDS bandwidth 18 Gbps
- 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 buffering to Display and Source
- Analog Audio Max Output Level: 4dBu on 150kΩ, DC coupling
- Audio Bandwidth: 20Hz to 20kHz @ 0dBu
- TND + Noise: 0.33% @0dBu @ 1kHz
- Optical Max Output Level: 1Vpp on 75Ω, DC coupling
- Wired IR: modulated IR signal input, 0-5V TTL or -10 to +10V
- Power: 12V/2A desktop-type with screw-in connector, 100-240VAC, 50-60Hz

General

- Regulation: CE, RoHS, WEEE, EAC
- Product Dimensions (LxWxH): 8.54 x 4.05 x 1.57" (216.8 x 102.9 x 39.9 mm)
- Product Weight: Weight: 1.71 lbs / 0.776 kg
- Packaging Dimensions (LxWxH): 12.01 x 10.24 x 3.23" (305 x 260 x 82 mm)
- Packaging Weight: 3.26lbs / 1.48 kg

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 Key Digital Limited 3 Year Product Warranty Policy.

<http://www.keydigital.com/warranty.htm>

Product Warnings & Safety Instructions



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.

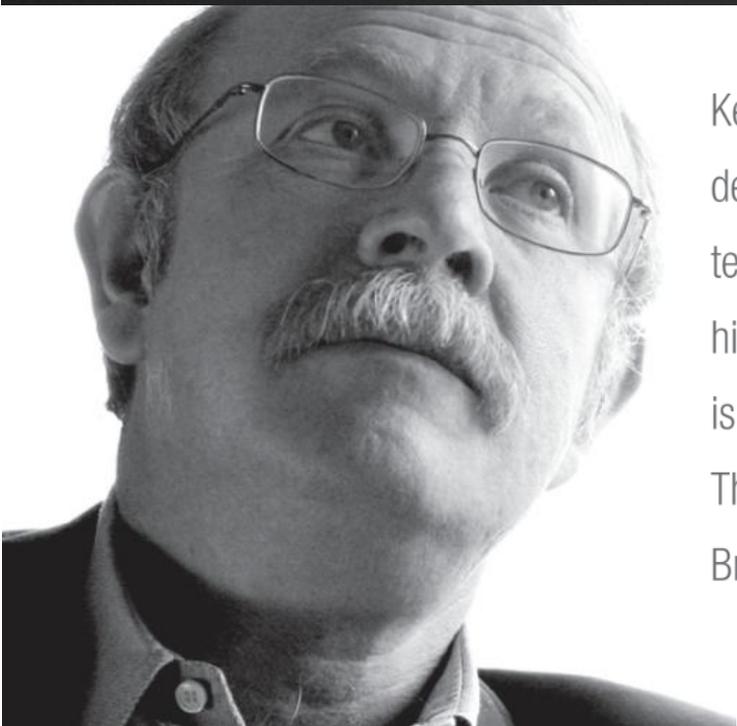
1. Read and follow all instructions.
2. Heed all warnings.
3. Do not use this device near water.
4. Clean only with dry cloth.
5. Install in accordance with the manufacturer's instructions.
6. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including 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.

NOTES



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

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Engineered for Your Success[™]