



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.

KD-X1000ProK

HDBaseT/HDMI/VGA/Audio via Single CAT5e/6 (Tx + Rx Set)
 Extenders, support Ultra HD/4K, EDID Control,
 Hot Plug Control, Long Range Mode, Full Buffer System,
 HDMI Pass-through, Ethernet, Up/Down IR & RS-232

Operating Instructions



Key digital®

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The Experts in Digital Video Technology and Solutions™

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**Ultra
HD/4K**



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.



Please read all instructions to insure safe operation of the product.

About KD-X1000ProK

KD-X1000ProK HDBaseT/HDMI/VGA/Audio Extenders (Tx + Rx Set) feature input selection of HDMI or VGA video with 3.5mm Stereo audio that is digitized and output as HDMI. 1080p/60, 1920x1200, 3D signals are extended up to 600 ft. via single Key Digital® KD-CAT6STP1X Super CAT6A shielded cable, or up to 500 ft. using a single third-party CAT5e/6 cable. 4K/UHD 24/25/30/60 (4:2:0) signals are extended up to 300 ft. using Key Digital® KD-CAT6STP1X Super CAT6A Shielded cable, or up to 250 ft. using a single third-party CAT5e/6 cable. In addition to HDMI video and audio signals, KD-X1000ProK carries Ethernet, IR and RS-232 for controlling remotely located equipment. Ethernet ports allow 10/100 LAN Network extension.

Key Features

- **HDBaseT via Single CAT5e/6 UTP/STP Extension:** With fully automatic adjustment of feedback, equalization, and amplification depending on cabling length
- **Signal Extension:**
 - » **Standard Mode (HDBaseT Class A).** Supports resolutions up to 4K/UHD.
 - » Up to 300 ft. @ 4K/24/25/30/60 using KD-CAT6STP1X cabling
 - » Up to 250 ft. @ 4K/24/25/30/60 using third-party CAT5e/6 UTP/STP
 - » Up to 400 ft. @ 1080p / 1920x1200 using KD-CAT6STP1X cabling
 - » Up to 300 ft. @ 1080p / 1920x1200 using third-party CAT5e/6 UTP/STP
 - » **Long Range Mode** (4K resolutions not supported):
 - » Up to 600 ft. @ 1080p / 1920x1200 using KD-CAT6STP1X cabling
 - » Up to 500 ft. @ 1080p / 1920x1200 using third-party CAT5e/6 UTP/STP
- **4K/Ultra HD:** Support for 4096x2160 or 3840x2160 24/25/30Hz at 4:4:4 or 60Hz at 4:2:0
- **Analog to Digital Video:** Converted VGA Video + Audio input signals active on HDMI pass-through (Tx unit) and HDMI output (Rx unit) ports
- **EDID Control:** Internal library features 15 default EDID configurations and native EDID data from Output/Display devices connected via Rx

- **Hot Plug Detection Control:** Enables integrator to choose if active signal voltage is forced to connected input device
- **Full Buffer System™:** Manages TMDS re-clocking / signal re-generation, HDCP authentication to source & display, and EDID Control handshake
- **IR Sensor:** Sensor powering via +5V on IR In ports collects line-of-sight IR from remote(s) without external IR connecting block
- **Up/Down IR:** Two channels of IR enable control to/from devices connected to Tx and Rx units
- **RS-232:** Bi-Directional control to/from Tx and Rx unit on DB9 connector
- **Ethernet:** Bi-Directional control and/or 10/100 LAN network via TCP/IP RJ45 port
- **3D:** Support for standard 3D stereoscopic signal formats
- **Intelligent Auto Sense (iAS™):** Input signal sensing enables auto switching to the active input
- **Deep Color Support:** 12bit Deep Color video / 8bit color for 4K/60.
- **Lossless compressed digital audio:** Support for Dolby® TrueHD, Dolby® Digital Plus and DTS-HD Master Audio™
- **CEC Support:** For inter-device control between main input and output HDMI channel
- **HDMI Pass-through:** Port on Tx unit connects additional devices up to 20 ft.
- **Daisy Chaining:** Connection of Tx and Rx units allows almost unlimited extension of HDMI, RS-232, IR and Ethernet signals
- **HDMI® and HDCP Licensing:** Fully licensed and compatible with all HDMI and HDCP technologies
- **I2C Communication:** EDID and HDCP authentication to Display and Source
- **Power Supplies:** Included with screw-in type connectors



Accessories

- (2) 12V 1.25A DC Power Supplies (Screw-in Type) > (2) Mounting Brackets
- (3) Locking HDMI Cable Clips > (1) Grounding Wire
- (1) IR Emitter > (1) IR Sensor

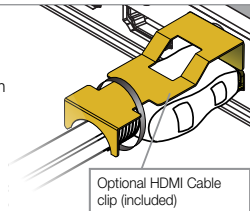
Quick Setup Guide

- Step 1:** Find a safe and convenient location to mount or place your KD-X1000ProK units
- Step 2:** Begin with the KD-X1000ProK Tx/Rx units and all input/output devices turned off with power cables removed
- Step 3:** Connect your HDMI and Analog video with audio sources to the input ports of your KD-X1000ProK Tx unit
- Step 4:** Connect your HDMI displays to the output port of your KD-X1000ProK Rx unit
- Step 5:** Connect KD-X1000ProK Tx unit to KD-X1000ProK Tx with CAT5e/6 cable
- Step 6:** Connect additional IR/RS-232 control connections, IR sensors, and Ethernet
- Step 6:** Connect power to the KD-X1000ProK Tx/Rx units
- Step 7:** Power on input/output devices

Installation and Operation

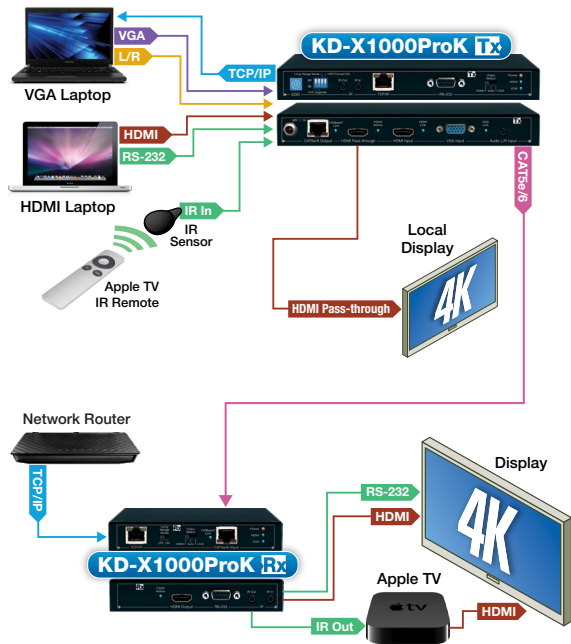
Before permanently securing the unit for final installation, test for proper operation of the unit and cables in your system. It is recommended that you leave enough ventilation space to provide sufficient airflow and cooling.

An optional HDMI cable clip (included) allows for a secure connection of HDMI cables to KD-X1000ProK units and helps prevent intermittent or complete signal loss due to poor connectivity.

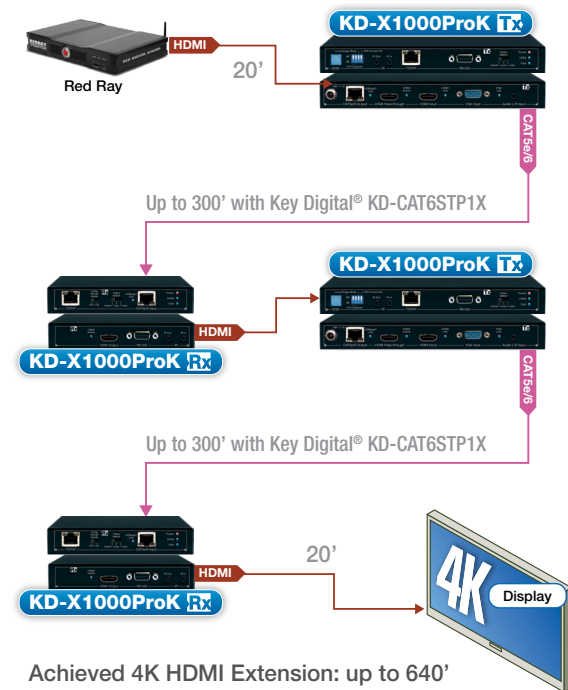


Optional HDMI Cable clip (included)

Application Example



Daisy-Chaining Example



Connections

Before making any connections, power off your source and display devices.

Tx Unit:

- Using a short HDMI cable, connect your source device to the HDMI port labeled “HDMI Input”. To connect DVI or Display Port, use appropriate adapters.



- Using a short VGA video and 3.5mm stereo audio cable, connect your analog source device to the 15pin port labeled “VGA Input” and “Audio L/R Input”. See Specifications section for supported analog video input resolutions. NOTE: Analog audio must always be accompanied by a present analog video source to achieve output HDMI source on Rx unit.



- Choose HDMI or VGA input with “Video Select” switch. “Auto” selection will defer to setting of Rx unit or utilize Intelligent Auto Sensing when both Tx and Rx have selected “Auto”



- Connect the CAT5e/6 cable that attaches to the Rx unit at the port labeled “CAT5e/6 Output”.



- Use the port labeled “HDMI Pass-Through” to connect (up to 20 ft.) your AVR, display or other device to the Tx unit. Active signal corresponds with the current video selection dictated by current video selection (HDMI or VGA).



- Make IR In and Out connections to receive (IR In port) or send (IR Out port) control signals. Refer to the “Extending Ethernet, IR & RS-232 Control” for more information.



- Connect a 10/100 Ethernet LAN cable to the TCP/IP port to carry network information for control, internet, or intranet.



- Connect a DB9 cable for bi-directional RS-232 control. Refer to the “Extending Ethernet, IR & RS-232 Control” for more information.

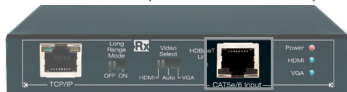


Rx Unit:

- Using a short HDMI cable, connect your output / display device to the HDMI port labeled "HDMI Output".



- Connect the CAT5e/6 cable at the port labeled "CAT5e/6 Input".



- If you are sending or receiving IR, connect it at this time



- For Ethernet, connect the cable to TCP/IP RJ45 port.



- If you are transmitting or receiving RS-232, connect to the RS-232 port



- Connect power to the Tx and Rx using the included power supplies and then power up your source and display equipment.

Extending Ethernet, IR and RS-232 Control

Ethernet

- 10/100BaseT LAN data (10/100Mbps)
- Use TIA 568B or TIA 568A termination

RS-232:

Three different modes of usage are available, determined by the position of the Control dipswitches.

→ RS-232 Pass-through Mode

- » Send and receive (bi-directional) RS-232 commands for controlling remote equipment.
- » Requires the use of a null-modem cable on one (either) side.
- » Maximum baud rate = 115,200 bits per second

→ Firmware Upgrade Mode

- » Periodically, firmware updates may be available for updating the HDBaseT (extension over CAT5e/6) software of the unit.

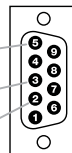
RS-232 cable pin out

RS-232 Mode	Pin 2	Pin 3	Pin 5
Pass-through	Tx	Rx	Ground
F/W HDBaseT	Tx	Rx	Ground

Pin 5 – Ground

Pin 3 – Receive

Pin 2 – Transmit



IR

- IR In and IR Out ports utilize 3.5mm Stereo connectors
- Up/Down (two-way) IR control extension is supported.
 - » "IR In" port on the Tx unit extends to the "IR Out" port of the Rx unit
 - » "IR In" port on the Rx unit extends to the "IR Out" port of the Tx unit

→ **IR In:** IR In ports support IR sensors only, not hard-wired IR from Master Controllers or IR Connection Blocks

» IR Sensor:

- » IR Sensors can be connected directly into IR In port, without the need for an external IR distribution block
- » 5V powering of the IR sensor on the Tip, IR signal on the Ring.

IR In	Tip	Ring	Sleeve
IR Sensor	IR In	5V	Ground

→ **IR Out:**

- » Pass-through from signal of corresponding IR In port
- » Driving power: 5V with 32mA minimum current
- » Typically connected with an IR emitter

IR Out	Tip	Ring	Sleeve
Serial IR	IR Out	N/C	Ground

- » The sleeve of the 3.5mm Male connector must have good physical contact with 3.5 mm Female input/output on the KD-X1000ProK.



Some 3.5mm Male plugs feature a plastic sleeve that extends longer than an average sleeve. This may cause poor grounding contact. See the example on the left.

Using Intelligent Auto Sense™

iAS INTELLIGENT AUTO SENSE™ Intelligent Auto Sense (iAS™) will automatically switch inputs when Hot Plug Detect voltage becomes active on an input. iAS™ is enabled when the "Video Select" switch is set to "Auto" on both the Tx and Rx units. If the Tx and Rx units do not correspond, the Rx unit settings will override the Tx unit.

Please note that many common HDMI sources, such as a cable or satellite boxes, will emit Hot Plug Detect signals when in stand-by mode and may prevent full functionality of iAS™.

→ Newly active signal selection

- » Selection is made regardless of if a current active signal is selected
- » Newly active signal is automatically selected when both Tx and Rx are set to "Auto"
- » If Tx unit is set to "Auto", user can manually select "HDMI" or "VGA" using "Video Select" switch on the Rx unit.


→ Newly inactive signal

- » Automatic switch to the next available active input

Settings

EDID Control

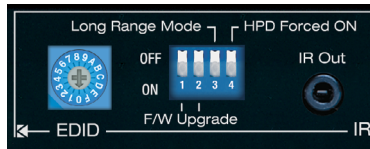
EDID authentication is provided from the KD-X1000ProK Tx unit to the connected input / source device. The EDID file (AKA “handshake”) is selected using the EDID Control rotary on the Tx unit and provides a list of compatible video and audio formats as well as digital data, informing the source device what it should output. Most sources will comply with a new EDID file without a power-cycle, but each source may behave differently. Adjustments may be necessary to help achieve desired video and audio formatting and may speed up sync time.

0	Copy EDID from CAT5e/6 Output	A	4Kx2K@60, 2CH AUDIO
1	1080i, 2CH AUDIO	B	4Kx2K@60, DOLBY/DTS 5.1
2	1080i, DOLBY/DTS 5.1	C	4Kx2K@60, HD AUDIO
3	1080i, HD AUDIO	D	1280x720p@60 DVI (no audio)
4	1080p, 2CH AUDIO	E	1920x1080p@60 DVI (no audio)
5	1080p, DOLBY/DTS 5.1	F	3840x2160p@30 DVI (no audio)
6	1080p, HD AUDIO	 Rotary EDID Switch:	
7	4Kx2K@30, 2CH AUDIO		
8	4Kx2K@30, DOLBY/DTS 5.1		
9	4Kx2K@30, HD AUDIO		

IMPORTANT! Please apply light pressure to the EDID rotary when making your selection.

Control Dipswitches

The Control dipswitch enables the integrator to choose the desired setting for RS-232 Mode, Extension Mode, and Hot Plug Detection Control.



Dipswitches are set to “On” in the down position and indicated in the below table as “1”. Dipswitches are set to “Off” in the up position and indicated in the below table as “0”

Desired Extension Mode settings must always match on the Tx and Rx units. If not, the HDBaseT Link light will steadily blink on the Tx and Rx units.

Control Dipswitches – Tx Unit

Position	RS-232 Mode	Extension Mode	Hot Plug Detection Control
0000	Pass-through	Standard	Bypass
1000	F/W Upgrade(Tx)	Standard	Bypass
0100	F/W Upgrade(Rx)	Standard	Bypass
1100	NONE	Standard	Bypass
0010	Pass-through	Long Range	Bypass
1010	F/W Upgrade(Tx)	Long Range	Bypass
0110	F/W Upgrade(Rx)	Long Range	Bypass
1110	NONE	Long Range	Bypass
0001	Pass-through	Standard	Forced HPD ON

Position	RS-232 Mode	Extension Mode	Hot Plug Detection Control
1001	F/W Upgrade(Tx)	Standard	Forced HPD ON
0101	F/W Upgrade(Tx)	Standard	Forced HPD ON
1101	NONE	Standard	Forced HPD ON
0011	Pass-through	Long Range	Forced HPD ON
1011	F/W Upgrade(Tx)	Long Range	Forced HPD ON
0111	F/W Upgrade(Rx)	Long Range	Forced HPD ON
1111	NONE	Long Range	Forced HPD ON

Long Range Mode Switch – Rx Unit

Must correspond with selected Extension mode of the Tx unit. If selected Extension Mode settings do not match on the Tx and Rx units, the CAT5e/6 Input and Output LEDs will consistently blink and signal extension will fail.



Forced Hot Plug Detection (HPD)

Hot Plug Detection (HPD) may be forced on the Tx unit in order to provide connected devices with necessary voltage to inform the source device that a partner (display) is connected and active. If the Control dipswitches are set to any HPD Bypass setting, HPD signals from the output to the input device will pass as standard. In cases of many layers of connectivity, HPD may be lost leading to no signal at the display. In those cases, fix the Control dipswitches to any Forced HPD setting.

Extension Modes

KD-X1000ProK supports two different modes of signal extension selectable using the Control dipswitches.

- › **Standard Mode (HDBaseT Class A):** Supports resolutions up to 4K/UHD
- › **Long Range Mode:** 4K resolutions not supported

The desired Extension Mode must always match on the Tx and Rx units.

- › **Note: Distance performance is significantly increased when using Key Digital KD-CAT6STP1X Super CAT6/STP cabling.**

Range and Resolution:

- **Standard Mode (HDBaseT Class A).** Supports resolutions up to 4K/UHD.
 - › Up to 300 ft. @ 4K/24/25/30/60 using KD-CAT6STP1X cabling
 - › Up to 250 ft. @ 4K/24/25/30/60 using third-party CAT5e/6 UTP/STP cabling
 - › Up to 400 ft. @ 1080p / 1920x1200 using KD-CAT6STP1X cabling
 - › Up to 300 ft. @ 1080p / 1920x1200 using third-party CAT5e/6 UTP/STP cabling
- **Long Range Mode (4K resolutions not supported):**
 - › Up to 600 ft. @ 1080p / 1920x1200 using KD-CAT6STP1X cabling
 - › Up to 500 ft. @ 1080p / 1920x1200 using third-party CAT5e/6 UTP/STP cabling



NOTE: Use shielded metal RJ45 connectors with soldered ground wires when terminating shielded CAT5e/6. Key Digital part: KD-RJ45SC (compatible with KD-CAT6STP1X and other third-party CAT6/STP)

LED Indicator Lights

Power:

- » **Color:** Green
- » Solid illumination during power on state, as provided by healthy connection with power supply.

HDMI and VGA Selection:

- » **Color:** Green
- » Solid illumination indicates current video selection either HDMI or VGA.

HDMI Link (HDMI Input):

- » **Color:** Blue
- » Solid illumination during active link (voltage + data link) with connected HDMI input/output device

VGA Link (VGA Input):

- » **Color:** Blue
- » Solid illumination during active video signal sync (H & V) with connected analog video source

HDMI Active (HDMI Output & Pass-through):

- » **Color:** Blue
- » Solid illumination during active HPD (voltage) link with connected HDMI output device

CAT5e/6 Input/Output:

- » **Color:** Blue
- » Solid illumination during healthy linking to Rx unit and/or if HPD is forced at Rx unit.
- » Will consistently blink if Extension mode is mismatched between Tx and Rx units.

Specifications

Technical:

- Inputs Tx (Each): 1 HDMI, 1 HD analog video 15-pin Female, 1 analog audio, 1 IR In, 1 RS-232, 1 TCP/IP
- Outputs Tx (Each): 1 CAT5e/6 UTP/STP, 1 HDMI pass-through, 1 IR Out
- Inputs Rx (Each): 1 CAT5e/6 UTP/STP, 1 IR In
- Outputs Rx (Each): 1 HDMI, 1 IR Out, 1 TCP/IP, 1 RS-232
- DDC Signal (Data): Input DDC Signal: 5 Volts p-p (TTL)
- HDMI Video/Audio Signal: Input Video Signal: 1.2 Volts p-p
- HDMI Connector: Type A, 19 Pin Female
- VGA Connector: 15-pin HD Female
- Analog Audio Connector: 3.5mm Stereo
- RJ45 Connector: Shielded Link Connector, HDBaseT
- Ethernet RJ45 Connector: Shielded TCP/IP 10/100 BaseT
- IR Connector: 3.5 mm monaural mini jack
- RS-232 Connector: D-Sub 9 Pin

General

- Regulation: CE, FCC, RoHS, WEEE
- Enclosure: Black Metal
- Product (Tx): 9.45" x 4.9" x 1", Weight: 1.5 lbs
- Product (Rx): 6.7" x 4.8" x 1", Weight: 1 lbs
- Shipping Carton: 15.4" x 8.7" x 3.6", Weight: 4 lbs
- Power: (2) UL Certified Power Supplies – 12V / 1.25A, 110-240 VAC, 50-60 Hz
- Accessories: (2) Mounting Brackets, (3) Locking HDMI Cable Clips, (1) Grounding Wire, (1) IR Emitter, (1) IR Sensor

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

Customer Support

For customer support questions please contact us at:

→ Phone: 914-667-9700

→ E-mail: customersupport@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 Key Digital Limited Lifetime Product Warranty Policy.

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