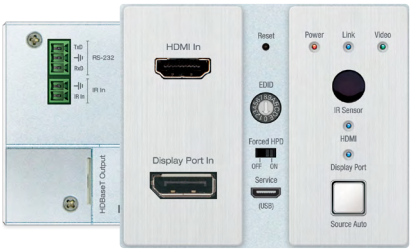
KD-X2x1WDTx

2x1 4K/18G 40m HDBT PoH Wall Plate Switcher with HDMI & DisplayPort, IR, RS-232 (Transmitter Only)

KD-X2x1WVTx

2x1 4K/18G 40m HDBT PoH Wall Plate Switcher with HDMI & VGA with Analog Audio, IR, RS-232 (Transmitter Only)

Operating Instructions



KD-X2x1WDTx

KD-X2x1WVTx

Key digital®

The Experts in Digital Video Technology and Solutions™

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

KD-X2x1WDTx

KD-X2x1WVTx

Always follow the instructions provided in this Operating Manual.

Introduction

Key Digital® KD-2x1WDTx / KD-X2x1WVTX are HDBaseT wall-plate transmitters + presentation switchers with one HDMI and one Display Port / VGA input, ideal for professional video installations in conference rooms, huddle spaces, class rooms, and more. KD-X2x1WDTx / KD-X2x1WVTX is natively received by KD-X40MRx black box HDBaseT Rx or by KD-PS42 Presentation Switcher. Both Rx options have audio de-embedding for ease of integration with audio systems. Additional Key Digital Presentation Switchers also support integration with KD-X2x1WDTx and KD-X2x1WVTX. KD-2x1WDTx / KD-X2x1WVTX is HDCP 2.2 compliant and supports 4K/UHD 24/25/30/60 (4:4:4) resolutions with up to 18Gbps bandwidth. 4K/UHD signals are extended up to 40m / 131ft and 1080p up to 70m / 230ft via single CAT5e/6 cable. In addition to AV signals, KD-X2x1WDTx / KD-X2x1WVTX extends IR and RS-232 for controlling remotely located equipment. The wall-plate unit fits in a standard US dual-gang box and is powered by the Rx unit / presentation switch or Presentation Switcher for convenient installation.

Key Features

- **Presentation Switching**: 1 HDMI and 1 Display Port / VGA with Analog Audio source selected by push button
- **Rx Options**: Native integration with KD-X40MRx black box HDBaseT Rx and KD-PS42 Presentation Switcher. Other Rx options available.
- **Ultra HD/4K**: Supports up to 4096x2160 or 3840x2160 24/25/30/60hz at 4:4:4 (signals up to 18Gbps bandwidth)
- **Auto-Sensing**: Automatic selection of newly detected source and switching from newly disconnected source when enabled
- **Converts (KD-X2x1WVTx only)**: VGA video and analog audio to HDMI
- **Video Scaling (KD-X2x1WVTx only)**: Aspect ratio, resolution set, image size, image position, image phase, and color tone processing of VGA signals ensures proper display
- **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
- **Power Over HDBaseT**: Wall-plate unit powered by Rx/Presentation Switch unit
- **Installation**: Tx unit designed for installation in standard US dual-gang box. Silver decora plate included.
- **Signal Extension**: For resolution and cable quality
  - **4K/UHD (18G):** Up to 40m / 131ft
  - **1080p:** Up to 70m / 230ft
- **Deep Color Support**: Up to UHD/4K 60Hz 4:2:0 12bits or 4:2:2 12bits
- **Full Buffer System™**: Manages TMDS re-clocking / signal re-generation, HDCP authentication to source & display, EDID Control handshake, and Hot Plug Detection Voltage
- **EDID Management**: Internal library with 15 internal EDID handshakes including 4K with HDR in addition to native EDID data copied from the Rx display/device
- **VGA EDID (KD-X2x1WVTX only)**: Unique EDID handshake provided to VGA source and HDMI source
- **IR Sensor**: Wall-plate collects line-of-sight IR from remote(s) without external IR wiring
- **RS-232**: Bi-Directional control to/from Tx and Rx/Presentation Switch unit
- **Unit Control**: via USB for initial installation steps
- **Lossless Compressed Digital Audio:** Dolby® TrueHD, Dolby® Digital Plus, DTS-HD Master Audio™, and Dolby® Atmos

Included Accessories

- Aluminum decora plate (qty 1) + Decora mounting screws with flat head (qty 4)
- Gang-box mounting screws (qty 4)
- Mounting bracket (qty 2)
- 3-pin phoenix terminal (qty 1)
- 2-pin phoenix terminal (qty 1)

Quick Setup Guide

Rx UNITS SOLD SEPARATELY. Go to http://www.keydigital.com/category_Presentation.html for compatible Rx models.

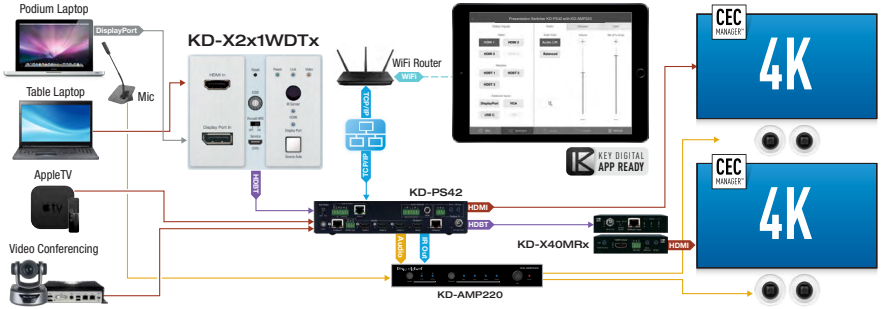
CONNECT:

Begin with the Tx, Rx unit / presentation switch, and all input/output devices turned off with power cables removed. Ensure that all desired functionality is achieved before installing units.

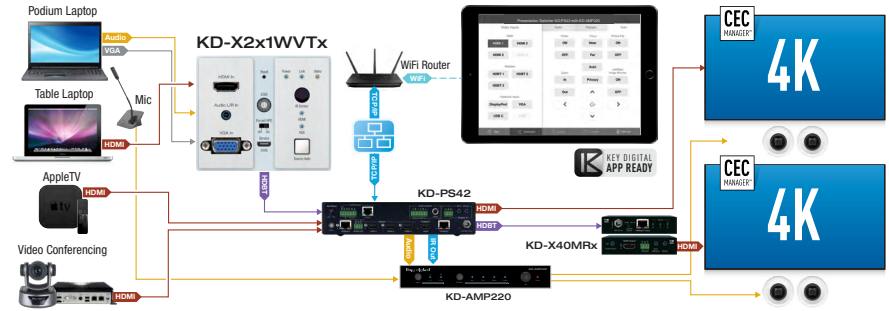
1. Connect HDMI and/or Display Port / VGA with analog audio sources to the input port(s) of the Tx unit
2. Connect HDMI display to the output port of Rx unit / presentation switch
3. Connect CAT5e/6 cabling to Tx and Rx unit / presentation switch. Use 568-B standard termination on both ends, avoiding couplers, and excess CAT cable length
4. If controlling external devices or collecting a hard-wired IR signal, connect to the rear Phoenix connectors from your control system.
5. To send audio of the selected source into audio systems, connect from the audio de-embed outputs of the Rx unit / presentation switch.
6. **BEFORE** connecting power supply to power outlet, secure power into screw connector on Rx unit / presentation switch
7. **AFTER** all connections are made, plug-in power supply to power outlet
8. Power on input/output devices

Application Examples

KD-X2x1WDTx:



KD-X2x1WDTx:



Connections, Buttons, and LEDs

Tx Unit:

- **HDMI Input**: Using an HDMI cable, connect your HDMI source. For DVI-D/DVI-I sources, use appropriate adapters.
  - Supports up to UHD/4K @ 50/60 fps [4:4:4], 18Gbps
    - See Supported Standard 4K Video Formats table
  - Supports HDR10 and Dolby Vision
  - Compliant with HDCP 2.2 and previous
  - Supports lossless compressed audio formats including Dolby® TrueHD, Dolby® Digital Plus, DTS-HD Master Audio™, and Dolby® Atmos
  - Supports CEC pass through from display connected to Rx unit / presentation switch

Supported standard 4K Video Formats:

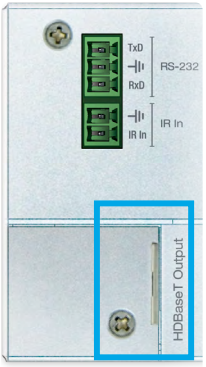
	Resolution	Bandwidth
1	4K@24/25/30 [4:4:4] 8bit	< 10.2Gbps
2	4K@24/25/30 [4:2:2] 8/10/12bit	< 10.2Gbps
3	4K@50/60 [4:2:0] 8bit	< 10.2Gbps
4	4K@24/25/30 [4:4:4] 10/12bit	< 18Gbps
5	4K@50/60 [4:2:2] 8/10/12bit	< 18Gbps
6	4K@50/60 [4:2:0] 10/12bit	< 18Gbps
7	4K@50/60 [4:4:4] 8bit	< 18Gbps

› **Display Port Input (KD-X2x1WDTx only)**:
Using a Display Port cable, connect your source.
  » Supports up to UHD/4K @ 50/60 fps [4:4:4], 18Gbps
    » Supports HDR
  » Supports Display Port version 1.3 and previous
  » Compliant with HDCP 2.2 and previous

› **VGA Input (KD-X2x1WVTx only)**:
Using a 15pin VGA cable, connect your source.
  » Supported resolutions: 640x480@60/75, 800x600@56/60/75, 1024x768@60/75, 1280x720@60, 1280x768@60/75, 1366x768@60/75, 1280x1024@60/75, 1440x900@60/75, 1600x900@60, 1600x1200@60, 1920x1080@60, 1920x1200@60s
  » Video Scaler built-in for up-scale & down-scale to desired output resolution
  » Default video output is 1920x1080p / 60fps

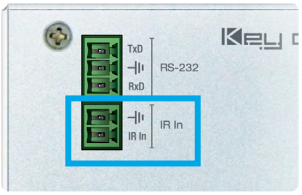
› **Analog L/R Input (KD-X2x1WVTx only)**: Using a 3.5mm stereo cable, connect your audio source to be associated with the VGA video input.
  » Embedded with VGA Input
  » 2 VRMS line audio
  » Sampling Frequency: 48kHz, Data Length: 24Bits

› **HDBaseT Output (rear)**: Connect a CAT5e/6 cable to the Rx unit / presentation switch at the port labeled “HDBaseT In”
  » Up to 130 ft using CAT5e/6 at 4K@30 4:4:4 8bit / 4K@60 4:2:0 8bit
  » Up to 230 ft using CAT5e/6 at 1080p@60
  » Must connect with KD-PS42, KD-X40MRx, KD-UPS52U, or KD-X100MRx only.
  » Not compatible with third-party HDBaseT Rx.

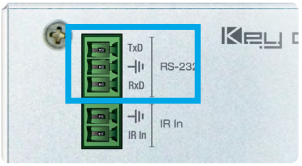


› **IR Sensor**: Collects line of sight infrared from remotes without external connecting block
  » Signal is output on Rx unit / presentation switch's IR Out port
  » KD-X2x1WDTx / KD-X2x1WVTx is **NOT** controllable via IR
  » IR and RS-232 supported simultaneously

› **IR In**: Connect to the IR In terminals from a control system or an IR connecting block.
  » Signal is output on Rx unit / presentation switch's IR Out port simultaneously as any IR input collected by the IR Sensor
  » KD-X2x1WDTx / KD-X2x1WVTx is **NOT** controllable via IR
  » IR and RS-232 extension not supported simultaneously



› **RS-232 Terminal (rear)**: Connect with control system for pass-thru of bi-directional RS-232 signals to/from controlled device.
  » Supports baud rate up to 115,200bps
  » KD-X2x1WDTx / KD-X2x1WVTx is not controllable via RS-232



› **Input Select Button**: Used to toggle between Display Port / VGA or HDMI source input or to activate Auto Switch mode
  » Press and hold for 3 seconds to active Auto switching. Solid illumination of the backlighting indicates mode has been set
  » HDMI LED (**blue**) active if HDMI is selected source
  » Display Port / VGA LED (**blue**) active if Display Port / VGA is selected source

› **EDID Handshaking Rotary**:
EDID authentication is provided from the unit to the connected HDMI and Display Port inputs/ sources.

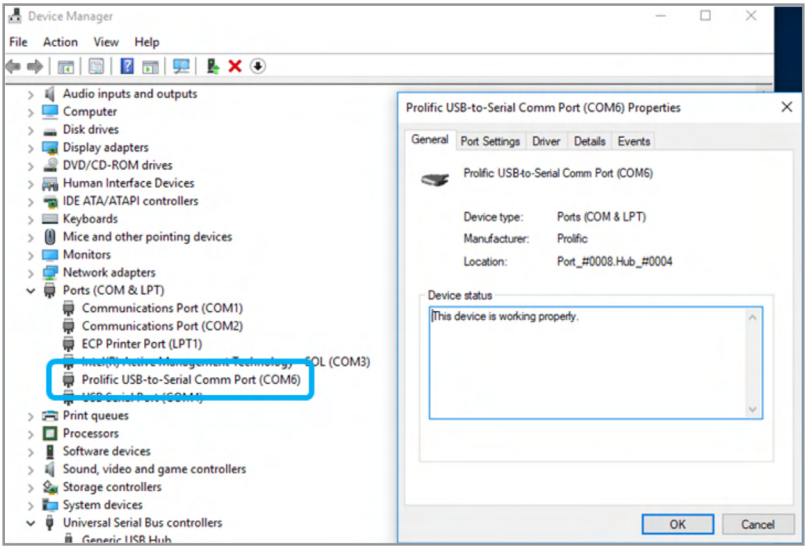
» Note: VGA EDID is set via front USB from KDMS Pro software or by command terminal.
» The EDID file (AKA “handshake”) is selected using the EDID rotary on the unit and provides a list of compatible video and audio formats as well as digital data, informing the source device what it should output.
» Most sources will comply with a new EDID file without a power-cycle, but devices do behaves differently
» Adjustments may speed up sync time during source selection.

Position	EDID Handshake Description	EDID Rotary
0	Copy EDID from HDMI Output 1	 Note: Default position is “**A**”
1	1080i, 2CH AUDIO	
2	1080i, DOLBY/DTS 5.1	
3	1080i, HD AUDIO	
4	1080p, 2CH AUDIO	
5	1080p, DOLBY/DTS 5.1	
6	1080p, HD AUDIO	
7	4Kx2K@60, 10.2G, HDR, 2CH AUDIO	
8	4Kx2K@60, 10.2G, HDR, DOLBY/DTS 5.1	
9	4Kx2K@60, 10.2G, HDR, HD AUDIO	
A	4Kx2K@60, 18G, HDR, 2CH AUDIO	
B	4Kx2K@60, 18G, HDR, DOLBY/DTS 5.1	
C	4Kx2K@60, 18G, HDR, HD AUDIO	**IMPORTANT: Please apply light pressure to the EDID rotary when making your selection.**
D	1280x720p@60 DVI (no audio)	
E	1920x1080p@60 DVI (no audio)	
F	4Kx2K@30, 10.2G, HDR, 2CH AUDIO	

› **Forced HPD**: Troubleshooting tool for correction of failed signal detection at display/output

» When **ON**, Hot Plug Detection voltage is fixed ON to the connected display
» Standard HPD behavior when set to **OFF** position

- **USB Service Port**: Used for initial setup, control, and firmware upgrades
  - Micro USB connector
  - Used for configuration and control from PC via KDMS Pro, KDMS, or third-party control terminal
  - Used for firmware updates (consult with Key Digital tech support before updating firmware)
  - Supports USB driver for Windows 10, 7, XP, Mac, Linux
  - 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 bits per second.



- **Reset Pin**: Performs a soft reboot of the wall-plate transmitter
  - Press and hold for 5 seconds and the HDMI and Display Port Input lights will blink twice to confirm the reset is complete

- **Power, Link, Video LEDs**: Indicate system connectivity status
  - Power (**red**) illuminates solid with proper powering from Rx unit / presentation switch
  - Link (**blue**) illuminates solid from healthy HDBaseT connectivity with Rx unit / presentation switch
  - Video (**green**) illuminates solid with active HDMI/Display Port signal.

Use with third-party HDBaseT Tx or Rx

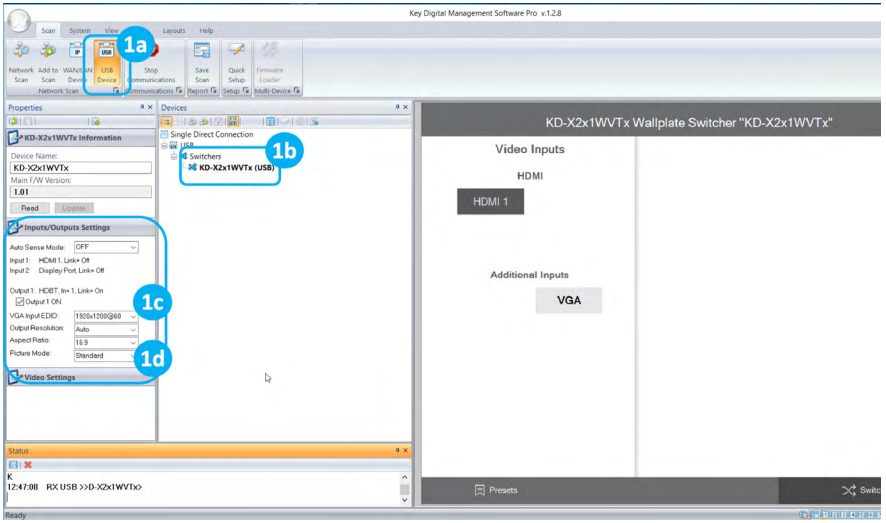
KD-X2x1WDTx and KD-X2x1WVTx are **NOT** compatible with third-party HDBaseT or other Key Digital HDBaseT products, because of their unique PoH (Power over HDBaseT) feature

Unit Configuration with KDMS™ Pro

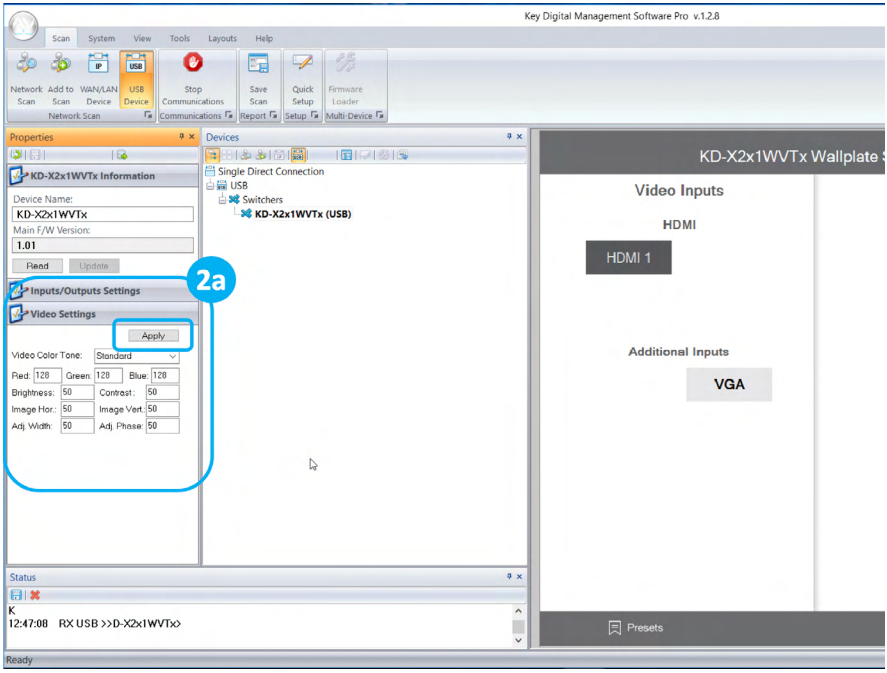
KD-X2x1WVTX's video scaling features are most easily configured using Key Digital® Management Software™ Pro (KDMS™ Pro) that can be downloaded here: **https://goo.gl/ZcyHui**

KD-X2x1WDTx also may be configured used KDMS™ Pro, however most settings are easily accessed using the physical rotaries and slide switches on the unit.

1. Connect to KD-X2x1WVTx / KD-X2x1WDTx from your PC using the USB micro port on the face of the unit



2. Open the Key Digital® Management Software™ Pro software and perform a USB scan (fig. 1a)
3. Choose the detected device from the Devices window (fig. 1b)
4. In the Input/Output Settings window, choose the following settings,
   - a. Set the desired EDID handshake that will be provided to the VGA source (fig. 1c)
     - Note: Use the EDID rotary on the face of the unit to choose the desired handshake that will be provided to the connected HDMI source.
   - b. Set the desired output video resolution, aspect ratio, and picture mode that will be applied to the VGA source (fig. 1d)



5. Use the Video Settings window to apply color and sizing adjustments to the VGA source (fig. 2a). Press the Apply button to apply settings.
6. Additional settings may be adjusted in the KDMS™ software. Full access to all settings/commands is achieved via terminal session using Tera Term or PuTTy software.
7. Your unit is now ready to control from the KDMS™ Control Panel, KD-App, or by professional control system.

USB (RS-232) Commands

KD-X2x1WDTx / KD-X2x1WVTx allows control over USB for bi-directional communication.

Connection Protocol:

- Baud Rate = 115,200 bits per second
- Data Bits = 8
- Stop Bits = 1
- Parity = Non
- Flow Control = None
- Carriage Return: Required at end of string

Notes:

- 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

KD-X2x1WVTx Help Command (H). Returns entire API in readable format:

```
KD-X2x1WVTx> H
--------------------------------------------------------------------------------
--                      Key Digital Systems HELP                              --
--------------------------------------------------------------------------------
--  KD-X2x1WVTx                                        F/W Version : 1.00  --
--                                                                             --
-- H          : Help                                                           --
-- STA        : Show Global System Status                                      --
--                                                                             --
-- VGA Input Setup Commands:                                                   --
-- SPV EDID x : Set VGA EDID to x,                                             --
        [0=1920x1080@60, 1=1920x1200@60, 2=1360x768@60, 3=1280x720@60]--
-- SPV RES x  : Set Output Resolution (Video Scale) x                          --
--       [0=Auto, 1=1080p@50, 2=1080p@60, 3=720p@50, 4=720p@60,]               --
--       [5=1280x1024@60, 6=1024x768@60, 7=1360x768@60, 8=1920x1200@60]--
-- SPV AR x   : Set Aspect Ratio x, [0=Auto, 1=16:9, 2=4:3]                    --
-- SPV PM x   : Set Picture Mode x,                                            --
--              [0=Standard, 1=Natural, 2=Dynamic, 3=Movie]                    --
-- SPV CT x   : Set Color Tone x, [0=Standard, 1=Cool, 2=Warm, 3=User]         --
-- SPV CTR xxx : Set Red Color Tone xxx = [1-255]                              --
-- SPV CTG xxx : Set Green Color Tone xxx = [1-255]                            --
-- SPV CTB xxx : Set Blue Color Tone xxx = [1-255]                             --
-- SPV PB xxx  : Set Picture Brightness xxx = [0-100]                          --
-- SPV PC xxx  : Set Picture Contrast xxx = [0-100]                            --
-- SPV MIH xxx : Move Output Horizontal Image xxx = [0-100]                    --
-- SPV MIV xxx : Move Output Vertical Image xxx = [0-100]                      --
-- SPV AHS xxx : Adjust Output Horizontal(Width) Size to xxx = [0-100]         --
-- SPV AP xxx  : Adjust Output Phase to xxx = [0-100]                          --
--                                                                             --
```

```
-- Video Output Setup Commands: yy = [01-02,U,D], U=Up, D=Down          --
-- 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                        --
--                                                                      --
-- System Control Setup Commands:                                       --
-- SPC AS x    : Set Auto Sense Mode x = [0:OFF,1=AUTO,2=FORCED ON]     --
-- SPC FB E/D  : Enable/Disable Front Panel Buttons                     --
-- SPC DF      : Reset to Factory Defaults                              --
------------------------------------------------------------------------
```

KD-X2x1WDTx Help Command (H). Returns entire API in readable format:

```
KD-X2x1WDTx> H
------------------------------------------------------------------------
--                     Key Digital Systems HELP                       --
------------------------------------------------------------------------
--  KD-X2x1WDTx                                    F/W Version : 1.00  --
--                                                                      --
-- H          : Help                                                   --
-- 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                        --
--                                                                      --
-- System Control Setup Commands:                                       --
-- SPC AS x    : Set Auto Sense Mode x = [0:OFF,1=AUTO,2=FORCED ON]     --
-- SPC FB E/D  : Enable/Disable Front Panel Buttons                     --
-- SPC DF      : Reset to Factory Defaults                              --
------------------------------------------------------------------------
```

KD-X2x1WVTx Status Command (STA). Returns unit status and settings in readable format:

```
KD-X2x1WVTx> STA

------------------------------------------------------------------------
--                   Key Digital Systems STATUS                       --
------------------------------------------------------------------------
--  KD-X2x1WVTx                                    F/W Version : 1.00  --
-- Front Panel Button : Enabled                                         --
-- Auto Sensing Mode  : OFF                                            --
-- RS232 : Baud Rate=57600bps, Data=8bit, Parity=None, Stop=1bit        --
--                                                                      --
-- HDMI Input 01  : EDID = DEFAULT A, LINK = ON                         --
-- VGA Input 02   : EDID = DEFAULT 0, LINK = OFF                        --
--   RES=2, AR=1, PM=0, CT=1, CTR=128, CTG=128, CTB=128, PB=50, PC=50,  --
--   MIH=50, MIV=50, AHS=50, AP=50                                      --
--                                                                      --
-- HDBaseT Output : Input = 01, Output = ON , LINK = ON , DBG = OFF     --
------------------------------------------------------------------------
```

KD-X2x1WDTx Status Command (STA). Returns unit status and settings in readable format:

```
KD-X2x1WDTx> STA
--------------------------------------------------------------------------------
--                   Key Digital Systems STATUS                               --
--------------------------------------------------------------------------------
--  KD-X2x1WDTx                                          F/W Version : 1.00   --
-- Front Panel Button : Enabled                                                --
-- Auto Sensing Mode  : OFF                                                    --
-- RS232 : Baud Rate=57600bps, Data=8bit, Parity=None, Stop=1bit               --
--                                                                             --
-- HDMI Input 01  : EDID = DEFAULT A, LINK = ON                                --
-- DP   Input 02  : EDID = DEFAULT A, LINK = OFF                               --
--                                                                             --
-- HDBaseT Output : Input = 01, Output = ON , LINK = ON , DBG = OFF            --
--------------------------------------------------------------------------------
```

Specifications

Technical:

- **KD-X2x1WDTx Inputs:** 1 HDMI, 1 Display Port, 1 IR Sensor, 1 Serial IR
- **KD-X2x1WVTx Inputs:** 1 HDMI, 1 DB15, 1 3.5mm Stereo Audio, 1 IR Sensor, 1 Serial IR
- Outputs: 1 CAT5e/6 UTP/STP, 1 Bi-Directional 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
- KD-X2x1WVTx VGA Video Signal: Input Video Signal: 1.2 Volts p-p
- KD-X2x1WVTx Analog Audio Input: 2 VRMS line audio, 3.5mm Stereo Female
- KD-X2x1WDTX Display Port Video/Audio Signal: Input Video Signal: 1.2 Volts p-p
- HDMI Connector: Type A, 19 Pin Female
- KD-X2x1WVTx VGA Connector: 15 Pin, Female
- KD-X2x1WDTx Display Port Connector: Full Size, 20 Pin Female
- RJ45 Connector: Shielded Link Connector, HDBaseT
- IR Connectors: 1 IR Sensor, 1 2-pin phoenix terminal
- RS-232 Connector: 3-pin phoenix terminal

General:

- Regulation: CE, RoHS, WEEE, EAC
- Enclosure: Tx unit: Brushed aluminum face with black metal backing
- Dimensions: 3.21” x 2.06” x 0.787” (Wall-plate)
- Product Weight: 0.7 lbs
- Packaging: 10.6” x 5.9” x 2.1” (270x150x55mm)
- Packaging Weight: 1.3 lbs
- Accessories:
  - Aluminum decora plate (qty 1) / Decora mounting screws with flat head (qty 4)
  - Gang-box mounting screws, (qty 4)
  - Mounting bracket (qty 2)
  - 3-pin phoenix terminal (qty 1)
  - 2-pin phoenix terminal (qty 1)

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.

Contacting Key Digital®

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:

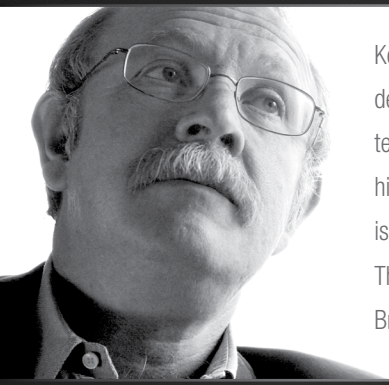
- Phone: 914-667-9700
- E-mail: rma@keydigital.com

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

Rev 1 – Jan 2020



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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