

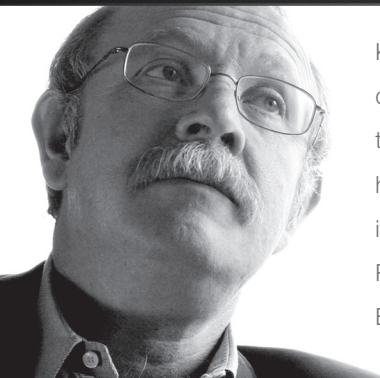
KD-IP922ENC

Enterprise AV™ over IP Encoder, supports 4K, 2 PoE ports LAN Switch, HDMI Pass-through, Audio In, Audio De-Embedding with Lip-Sync & DSP, KVM/USB

KD-IP922DEC

Enterprise AV™ over IP Decoder, supports 4K, 2 PoE ports LAN Switch, Local HDMI Switching, Audio De-Embedding, Video Wall Processing, KVM/USB

Operating Instructions



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.

» ENCODER



KD-IP922ENC

DECODER »



KD-IP922DEC

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Introduction

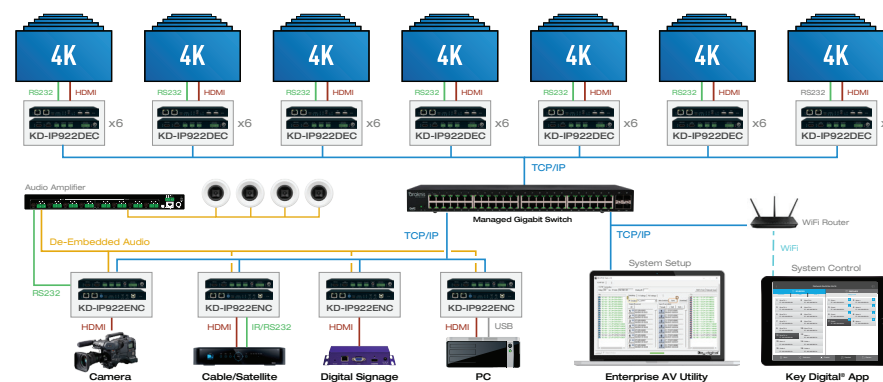
Enterprise AV™ Over IP Solutions - Key Digital's Enterprise AV™ over IP Encoders and Decoders create expandable HDMI over IP systems that can be scaled to fit any commercial installation:

- › Digital Video Matrix
- › Digital Video Distribution System
- › Digital Video Switcher
- › Video Wall Controller
- › Digital Video Extender
- › KVM Matrix
- › Master Controller



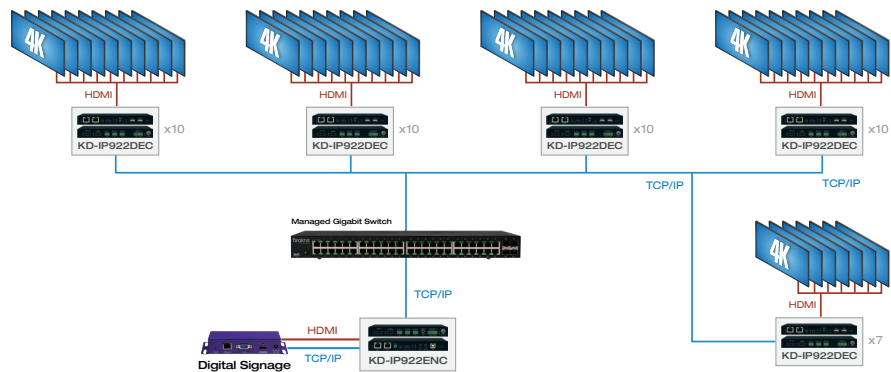
Add Encoder units to your system to integrate each video source/input and Decoder units for each video display/output. The I/O amounts are completely flexible with Enterprise AV with 1024 maximum sources and an unlimited amount of displays.

Digital Video Matrix

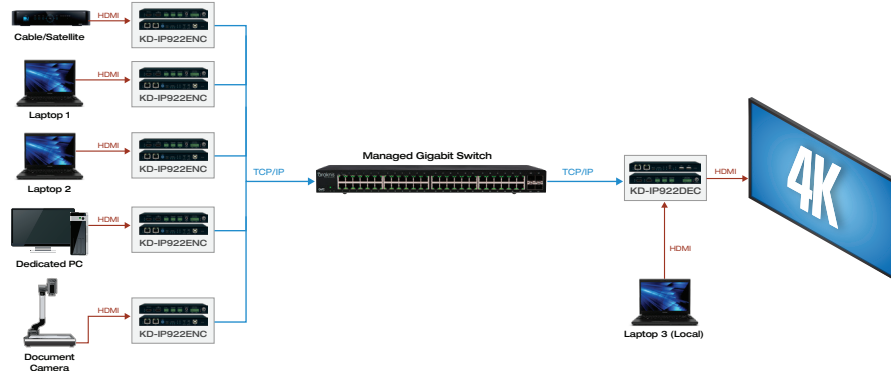


**Always follow the instructions provided in this Operating Manual.
Please check the Key Digital Website for the most up-to-date Manual.**

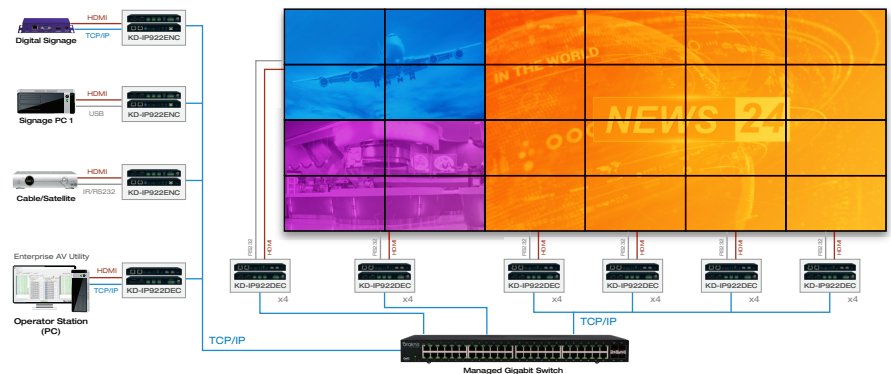
Digital Video Distribution System



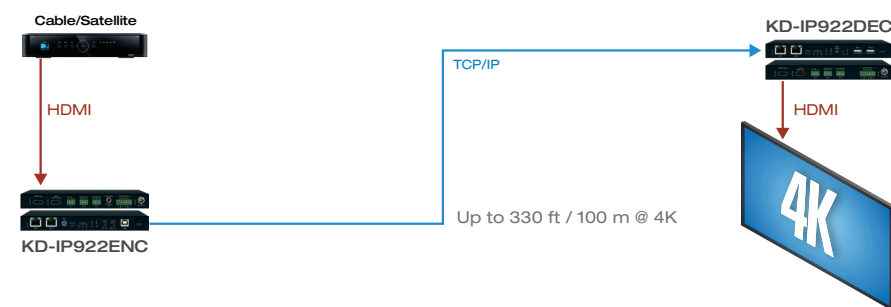
Digital Video Switcher



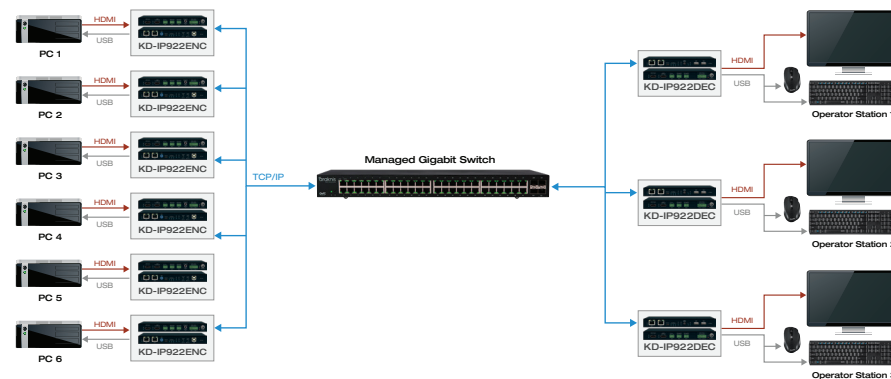
Video Wall Controller



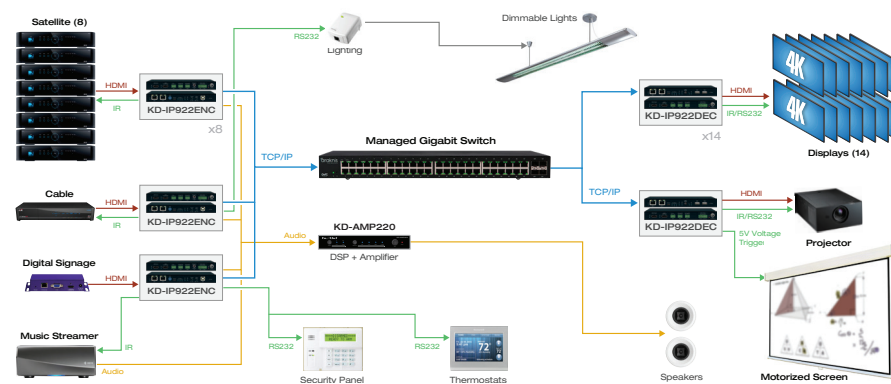
Digital Video Extender



KVM Matrix



Master Controller



Key Features

- › **Enterprise AV Over IP:** Utilizes a managed gigabit network switch to enable video distribution, matrix switching, and extension.
- › **Video Wall Processing:** Encoder + Decoder systems create video walls with up to 10V and 10H monitors
- › **HDCP 2.2:** Compliancy up to HDCP 2.2 and backward compliant
- › **4K/Ultra HD Resolution:** Support for 4096x2160 or 3840x2160 24/25/30Hz at 4:4:4/8 Bit or 60Hz at 4:2:0/8 Bit
- › **Signal Extension:** Up to 330 ft. / 100 m @ 4K 24/25/30(4:4:4)/60(4:2:0) into network switch or point-to-point
- › **Power over Ethernet:** Does not require power supply when integrated with compatible PoE network switch
- › **Dual LAN:** Enable system expansion beyond a 48 port system
- › **Redundant Power Supply:** Added reliability for non-PoE integration
- › **Audio De-Embedding:** Audio from the HDMI input is de-embedded through Analog L/R Balanced/Unbalanced phoenix terminal to enable external audio connectivity with audio distribution systems and amplifiers
- › **Audio DSP:** Volume, muting, 3-band EQ, and lip-sync delay controllable on audio de-embed port
- › **HDMI Pass-Through:** Enables connection to local monitor or additional devices up to 75 ft.
- › **HDMI® and HDCP Licensing:** Fully licensed and compatible with HDCP 2.2 and HDMI latest technology such as 4K/UHD 4:2:0/8bit at 60f/s
- › **Control:** 3 multi-function ports controllable via KeyCode open API, as Compass Control® master controller, or as control extension via IP
- › **USB 2.0:** Supports synchronous and isochronous connections
- › **EDID Control:** Internal library features 15 default EDID configurations and native EDID data from Output/Display devices connected to Decoder
- › **Hot Plug Detection Control:** Enables integrator to choose if active signal voltage is forced to connected input devices
- › **Full Buffer System™:** Manages TMDS re-clocking / signal re-generation, HDCP authentication with source & display, EDID Control handshake, and Hot Plug control
- › **IR Sensor:** Sensor powering via +5V IR In port 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 Encoder and Decoder units
- › **RS-232:** Bi-Directional control to/from Encoder and Decoder unit on Phoenix connector
- › **RS-232/TCP-IP Control Mode:** Provides control of unit as well as connectivity status
- › **Lossless compressed digital audio:** Support for Dolby® TrueHD, Dolby® Digital Plus, Dolby Atmos®, and DTS-HD Master Audio™

- › **I2C Communication:** EDID and HDCP authentication to Display and Source
- › **Control System Support:** Controllable by all IR, RS-232 & TCP/IP supported control systems via open API: Compass Control®, AMX®, Control4®, Crestron®, KNX®, RTI®, Savant, URC®, Leviton® etc.
- › **Key Digital® App Ready:** Can be controlled over TCP/IP via Key Digital® iOS App
- › **Data Stream Bandwidth:** < 900Mbps
- › **Latency:** <40ms at 4K. Less at lower resolution.

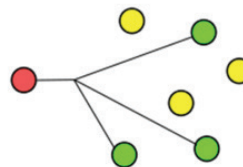
Considerations and Preparations

Technology Overview:

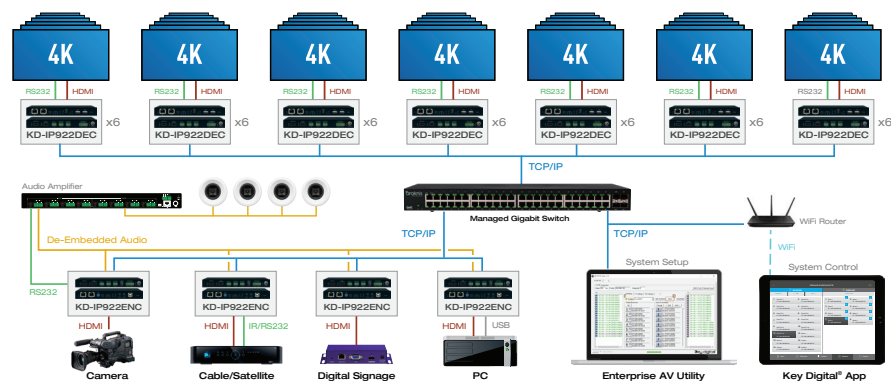
Key Digital's Enterprise AV over IP products enable distribution, switching, and extension of HD Video and other media using managed network switches as the central hub of the system.

Enterprise AV utilizes multicasting technology to broadcast (encode) the source media (ie HD video, audio, IR and RS-232 control, USB) to connected network devices. Decoders receive the desired source by setting a Group ID that corresponds with the ID of the desired encoder.

The network switch must support IGMP v2 (Internet Grouping Management Protocol) and 8K Jumbo Frame in order to prevent a broadcasted signal from being received at an undesired decoder or interrupting other non-Enterprise AV network devices.



System Design:



Enterprise AV is different from traditional fixed-chassis video matrixing systems (ie 4x4, 8x8, 16x16). For each video source/input, add an Encoder unit. For each video display/output,

add a Decoder unit. Up to 1024 encoders can be integrated with an unlimited amount of displays.


For example, if your system requires 4 video sources to be distributed to 42 displays, you may build a system using (4) KD-IP922ENC, (42) KD-IP922DEC, and the appropriate IGMP network switch.

You must ensure that all units are fully configured before connecting all units to your network switch. Refer to the Unit and System Setup using KD Wizard Utility section for more information.

Product Compatibility:

Key Digital Enterprise AV product family consists of many different models. Not all models are compatible together.

Model	Function	Max Video Res	Rack Mount	Note
KD-IP922ENC	Encoder (Tx)	UHD/4K	KD-RKSMS12	Not compatible with KD-IP1080/ KD-IP120 systems
KD-IP922DEC	Decoder (Rx)			
KD-IP1080Tx	Encoder (Tx)	1080p	KD-RK120PLT	Not compatible with KD-IP922 systems
KD-IP1080Rx	Decoder (Rx)			
KD-IP120Tx	Encoder (Tx)	1080p	KD-RK120PLT	
KD-IP120Rx	Encoder (Tx)			
KD-IP120POETx	Decoder (Rx)			
KD-IP120POERx	Decoder (Rx)			

 **KD-IP922ENC + KD-IP922DEC systems are not compatible with KD-IP1080Tx + KD-IP1080Rx systems**

Choosing the right network equipment:

Enterprise AV requires a Full Gigabit network switch with IGMP v2 (Internet Group Management Protocol), and 8K Jumbo Frame support.

An up to date list of verified network switches is available on all Enterprise AV product pages the Key Digital web page:

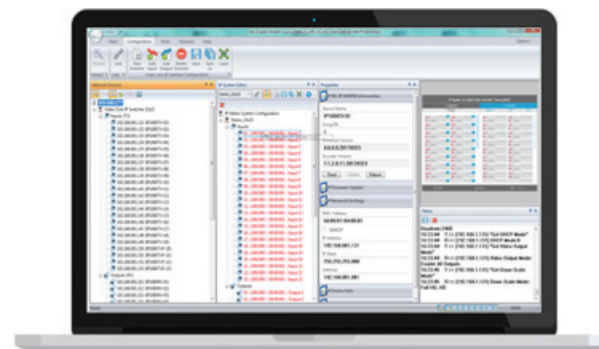
<http://www.keydigital.com/Items.asp?ItemCode=KDIP922ENC&Company=KEY>

Choosing the right control interface for Enterprise AV

Enterprise AV has a variety of control options, ensuring that the right interface is presented to the end-user.

PC software

- » The KD Wizard software is downloaded from Enterprise AV product pages: <http://www.keydigital.com/Items.asp?ItemCode=KDIP922ENC&Company=KEY>
- » The software can be used for control and configure Enterprise AV systems
- » Screen layout presets can be called or customized to provide a user-friendly interface that does not give access to system configuration options.



Key Digital App

- » The Key Digital app for iOS devices is downloaded from Apple's App Store
- » The Key Digital app provides video switching control, preset creation, displays the friendly names defined in system setup, and even has demo systems for a test drive.
- » The Key Digital app offers control of other Key Digital App Ready devices
- » Once launched, the Key Digital app auto-scans to find the Enterprise AV systems on the local area network



Compass Control® Pro

- » The most modern professional control system in the market and the native choice for controlling Enterprise AV systems
- » In addition to Enterprise AV, control audio, video, automation, climate, lighting, shade, security devices and more within a single app.
- » Custom naming of inputs and outputs and status-indicating graphical element provide a rich user environment
- » Drag and drop modular or fully custom GUI programming
- » iOS and Android controllers communicate with Key Digital MC gateway via IP for control of Enterprise AV system. Email tech@keydigital.com for model information on the gateway



Third-Party Control Systems

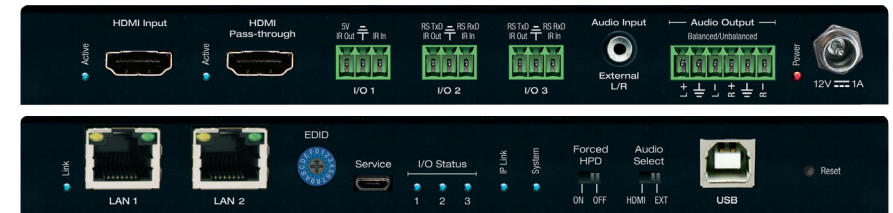
- » Enterprise AV is fully controllable by RS-232 supported control systems with the use of a Key Digital control gateway. Email tech@keydigital.com for model information on the gateway
- » Enterprise AV systems use the same switching command as all Key Digital matrix switches:
 - » SPOxxSly

There are many other methods to control your Enterprise AV system. See the TCP/IP, RS-232, and IR Control section for more information.

Connections, LEDs, and Controls

IMPORTANT: Please ensure that each unit has been configured properly one-at-a-time before connecting multiple units to your network switch.

KD-IP922ENC Encoder Unit:



HDMI Input

- » Used to connect video source
- » Compatible with latest HDMI technologies and resolutions up to 4096x2160 or 3840x2160 24/25/30Hz at 4:4:4/8 Bit or 60Hz at 4:2:0/8 Bit with HDR10
- » Supports audio formats up to Dolby® TrueHD, Dolby® Digital Plus, Dolby Atmos®, and DTS-HD Master Audio™
- » Supports HDCP.2.2
- » LED light illuminated when active HDMI signal link (TMDS) from source is present

HDMI Pass-through

- » Used to connect local video monitor, audio systems, etc
- » Same supported video and audio formats as HDMI Input connection
- » Audio corresponds with current Audio Select source (see External Audio Input below)
- » LED light illuminated when active voltage link (HPD) from connected display/output device is present

Multifunction I/O's

- » Supports four usage modes:
 - » Control gateway for Enterprise AV Over IP system
 - » Compass Control Master Controller
 - » Third-party control via KeyCode Open API
 - » Control extension via IP
- » Configurable as IR sensor, IR input, IR emitter, RS-232, voltage trigger, or voltage sensor. Some limitations apply per port. See KeyCode Open API Specification section for more information
- » I/O Status lights blink as voltage passes through the I/O ports

External Audio Input

- » Used to integrate external analog audio sources
- » 3.5mm stereo connection
- » Each Encoder can select either HDMI audio or the external audio input via toggle switch or TCP/IP or RS-232 commands.
- » Audio Select switch determines audio source upon unit boot up. Newly received commands or toggles of Audio Select switch will override current setting
- » It is not possible to input both (HDMI + External) audio connections to the Enterprise AV system

Audio Output

- » Used to integrate with peripheral amplifiers and audio distribution systems
- » Balanced/Unbalanced 6-pin phoenix terminal
- » Features variable volume, muting, bass, mid, treble, and lip-sync level adjust controllable via TCP/IP or RS-232 command strings

Power

- » Redundant power connection for backup in case PoE network switch is not used or PoE port fails
- » 12V/1A (12W) screw-type power supply included
- » PoE supported on either LAN port
- » OK to connect external power supply plus PoE

LAN Ports

- » Used to connect with Network Switch (WiFi not supported) and peripheral devices needing network connectivity and/or TCP/IP control
- » Default IP Address = 192.168.1.100
- » May be used with Key Digital Wizard software for unit configuration
- » Supports 10/100BaseT up to 100Mbps
- » Act as an unmanaged network switch
 - » Respective LED blinks during active network communication
 - » See Key Digital's Verified Network Switch document for list of network switches verified to support Enterprise AV HD Over IP systems

EDID Control Rotary

- » Used to select the desired EDID handshake provided to the connected video source
- » See EDID and Hot Plug Detection Control section for more information
- » Service Micro USB
- » Used as primary unit configuration method and for firmware updates.
- » Not used for USB data or KVM

IP LED

- » Indicates healthy audio/video system status
 - » Encoder: At least one Decoder partner is viewing signal
- » Steady blink during boot up

System LED

- » Indicates healthy control system status
- » Steady blink during bootloader mode and firmware updates

Forced HPD Switch

- » Used to activate voltage from the HDMI input connection regardless of a connected sync device.
- » See EDID and Hot Plug Detection Control section for more information

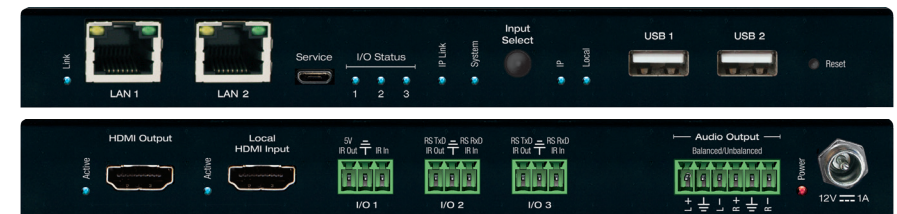
USB-B

- » Used to connect USB Host / Computer
- » Not used for connecting USB endpoints (ie keyboard, mouse)
- » USB input/output relationship automatically follows video input/output relationship

Reset Pin

- » Press and hold for 5 seconds to reset unit to factory default settings, indicated by blink System LED
 - » IP Address = 192.168.1.100
 - » Selected audio source = Corresponds with Audio Select switch
 - » Group ID = 0000
 - » Control mode = Control gateway for Enterprise AV Over IP system

KD-IP922DEC Decoder Unit:



HDMI Output

- » Used to connect video display
- » LED light illuminated when active voltage from display (HPD) is present
- » Local HDMI Input
- » Used to connect video source for local presentation, etc
- » Same supported video and audio formats as KD-IP922ENC HDMI Input connection

- » Selectable via Input Select button or via TCP/IP or RS-232 command
- » LED light illuminated when active HDMI signal link (TMDS) from source is present

Audio Output

- » Variable settings are independent of KD-IP922ENC
- » Features variable volume, muting, bass, mid, treble, and lip-sync level adjust controllable via TCP/IP or RS-232 command strings

LAN Ports

- » Default IP Address = 192.168.2.100

IP LED

- » Indicates healthy audio/video system status
 - » Decoder: Successful connection with selected Encoder
- » Steady blink during boot up

System LED

- » Indicates healthy control system status
- » Steady blink during bootloader mode and firmware updates

USB-A Ports

- » Used for connecting USB endpoints (ie keyboard, mouse)
- » Not used to connect USB Host / Computer
- » Supports connectivity to USB hubs but may not exceed 15 endpoint devices
- » USB input/output relationship automatically follows video input/output relationship

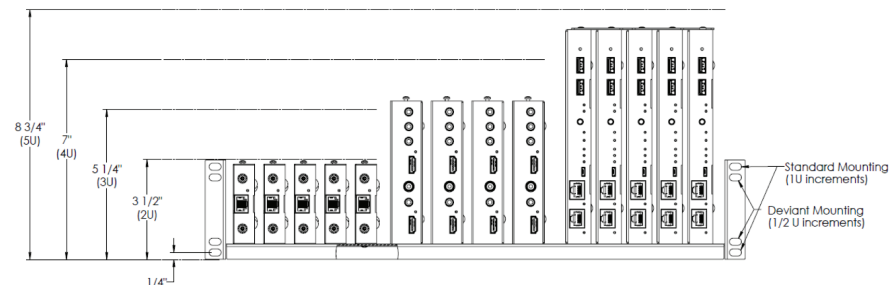
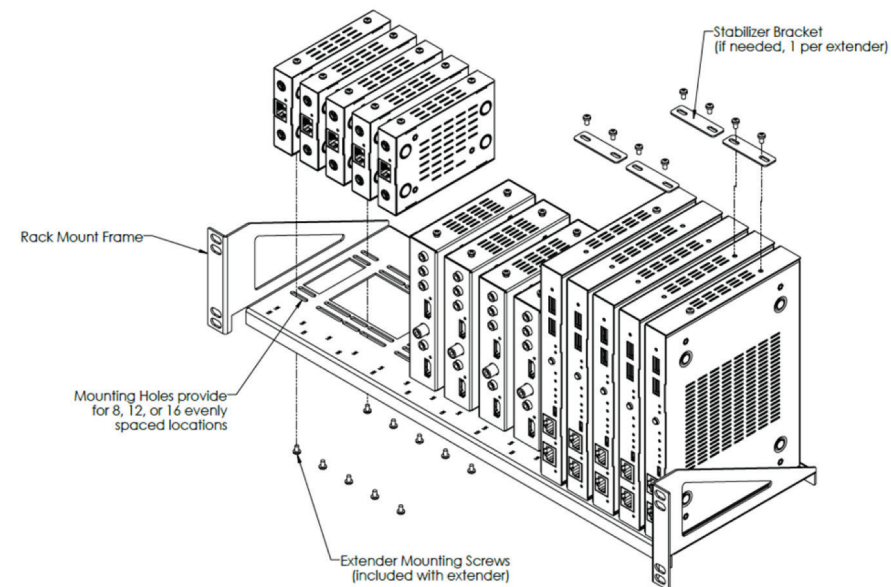
Reset Pin

- » Press and hold for 10 seconds to reset unit to factory default settings:
 - » IP Address = 192.168.2.100
 - » Selected video input source = Must be established

Rack Mounting KD-IP922

Key Digital KD-SMS16 is a universal rack shelf that can hold up to 16 KD-IP922 units utilizing the side mounting screws.

KD-SMS16 supports any Key Digital unit with side mounting screw spacing of 2.912", 2.582", or 2.252".




EDID and Hot Plug Detection Control

EDID Control

EDID authentication is provided from the Encoder units to the connected input/source device. The EDID file (AKA handshake) is selected using the EDID Control rotary and provides a list of compatible video and audio formats as well as digital data informed the video source what is should output. Most sources will comply with a new EDID file without a power-cycle, but each source may behave differently.

Default EDID Control Table, selected via EDID Control rotary

Position	EDID Description	EDID Control Rotary
0	Copy EDID from CAT5e/6 Output	
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@30, 2CH AUDIO	
8	4Kx2K@30, DOLBY/DTS 5.1	
9	4Kx2K@30, HD AUDIO	
A	4Kx2K@60, 2CH AUDIO	
B	4Kx2K@60, DOLBY/DTS 5.1	
C	4Kx2K@60, HD AUDIO	
D	1280x720p@60 DVI (no audio)	
E	1920x1080@30 DVI (no audio)	
F	3840x2160p@30 DVI (no audio)	

Forced Hot Plug Detection

Hot Plug Detection (HPD) may be forced on the Encoder unit in order to provide connected devices with necessary voltage to inform the device that a partner (ie display) is connected and active. If the Forced HPD switch is set to OFF, HPD signals from the output to the input device will pass as normal. In cases of many layers of connectivity, HPD may be lost leading to no signal at the display. In those cases, fix the switch to Forced HPD ON.

Dual Network Switch Systems

You may utilize the dual LAN ports of KD-IP922ENC units to create an expanded system using two network switches.

This presents a huge cost-savings as compared to systems requiring expensive custom and card-slot based network switches.

To build an expanded system, connect each KD-IP922ENC LAN port to each network switches.

There is no need to use the link ports on the network switch. The KD-IP922ENC will serve as the network bridge between the two switches.

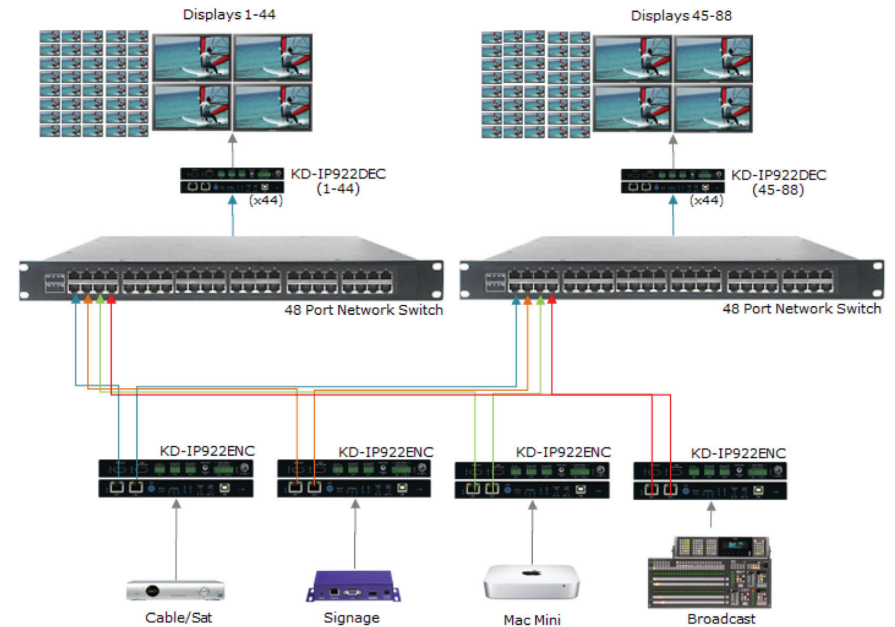
Remember that each encoder unit will occupy 2 total ports on your network switches. The formula for calculating your possible Encoders and Decoders is:

$$(\text{Encoders} * 2) + \text{Decoders} = \text{Net Switch Ports}$$

Example:

4 Encoders would allow for up to 88 Decoders if using two 48 port network switches.

$$(4 * 2) + 88 = 96$$



Other common configurations that can be achieved due to the dual LAN port feature include:

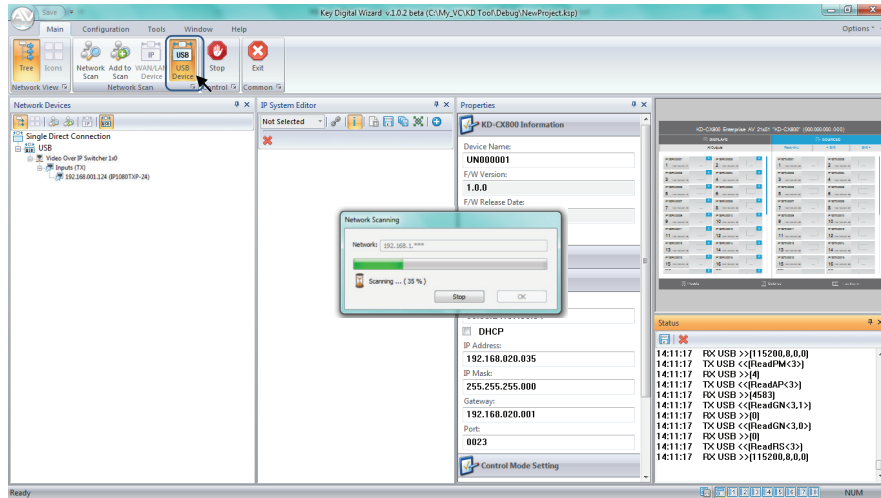
- 8 video sources may have up to 80 displays/outputs if using two 48 port network switches
 - » $(8*2) + 80 = 96$
- 16 video sources may have up to 64 displays/outputs if using two 48 port network switches
 - » $(16*2) + 64 = 96$
- 24 video sources may have up to 48 displays/outputs if using two 48 port network switches
 - » $(24*2) + 48 = 96$
- 32 video sources may have up to 32 displays/outputs if using two 48 port network switches
 - » $(32*2) + 32 = 96$

Larger systems are possible with Enterprise AV using 10G and 100G SFP network switches.

Unit and System Setup using KD-Wizard Software

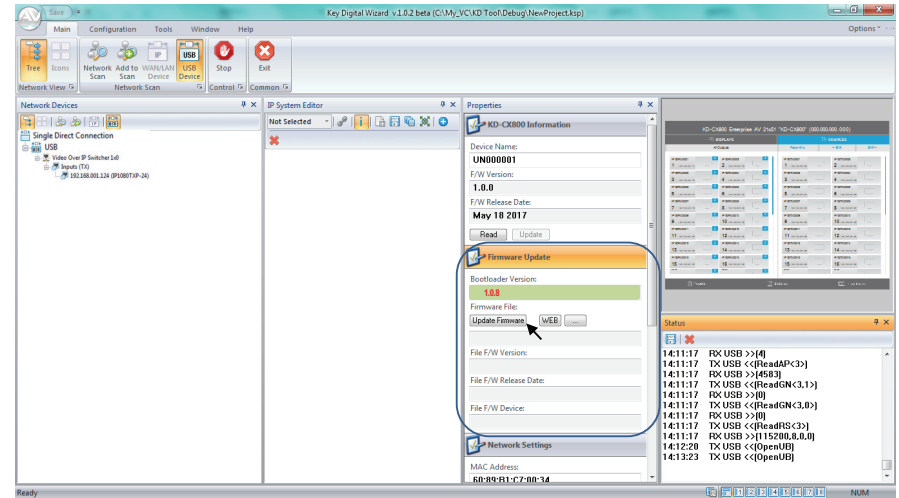
- **IMPORTANT:** Configure units after properly configuring your network switch according to Key Digital's Verified Network Switch document. Document is found on the KD-IP922 product pages: <http://www.keydigital.com/Items.asp?ItemCode=KDIP922ENC&Company=KEY>
- **Organize and label all units before configuring**

1. Download, install, and open Key Digital® Wizard software
2. Connect USB from PC to Encoder #1
3. Press USB Device to begin scan for connected unit

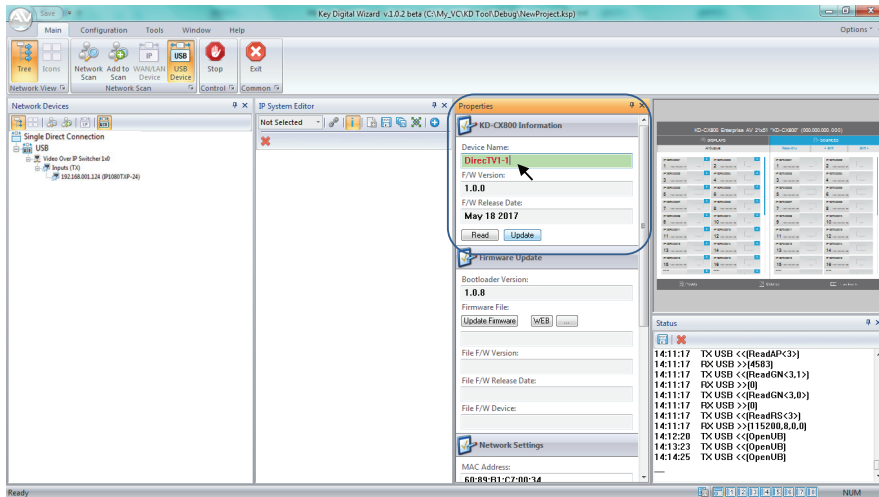


4. Properties Window

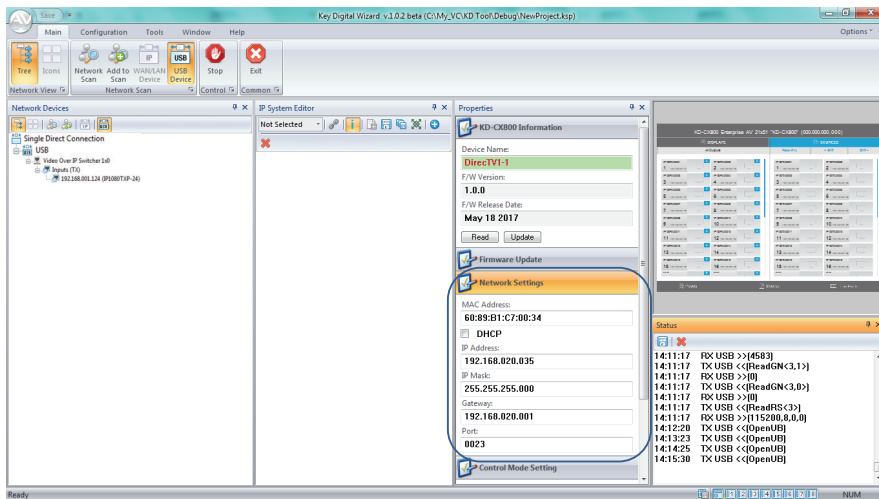
- » a) FW Version and Release Date text will be RED if a newer firmware is available
 - » b) Update firmware by expanding Firmware Update workspace and select Update Firmware button
 - » c) Firmware Update dialog popup will show progress. Close dialog popup after completion.
- Note: KD-IP922ENC and KD-IP922DEC feature two firmware types and two buttons for updating firmware. Be sure to update both firmware files



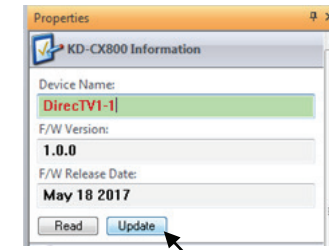
- » d) Set desired Device name with up to 16 characters (ie "DirecTV 1", "Conf Projector")
- » i) Do not use special characters such as !, @, \$, ?
- » e) Set desired System Group ID according to desired Input (encoder) or Output (decoder) number assignment for unit within virtual matrix system



- » f) Enter Network Settings workspace to set desired IP settings
- » i) IP Address is static IP assigned to unit
- » ii) Gateway is IP address of router



- » g) After all property updates are entered, press Update button in Unit Information workspace

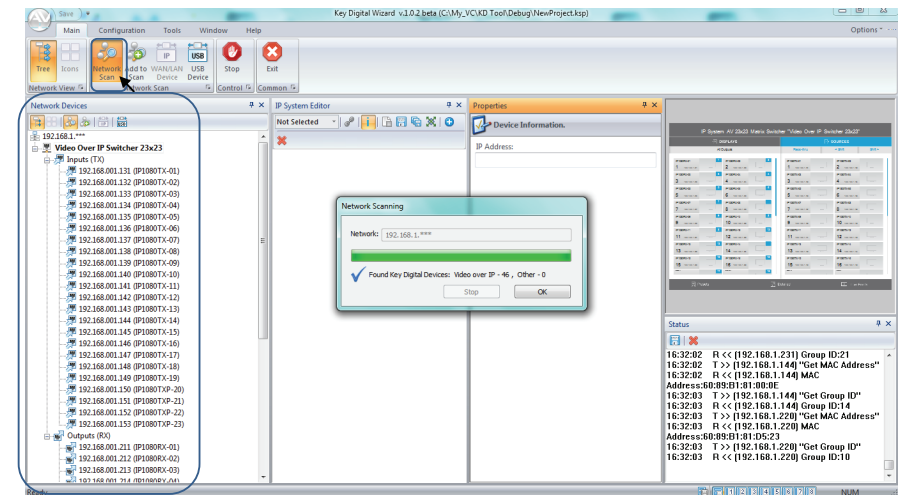


5. Repeat for each unit

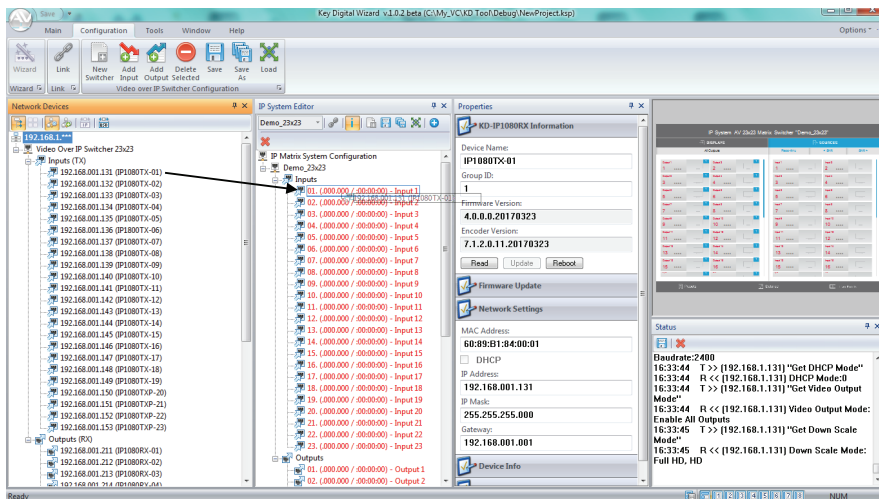
Note: For advanced configuration of features such as audio, control, and video wall please visit product pages for the latest guides:
<http://www.keydigital.com/Items.asp?ItemCode=KDIP922ENC&Company=KEY>

6. Virtual Matrix System Configuration

- » a) Connect all units to network switch via LAN port
- » b) Hardwire PC computer to the Enterprise AV network and turn off WiFi antenna
- » c) Press Network Scan
- » d) In Network Devices window, all detected Encoders and Decoders will appear

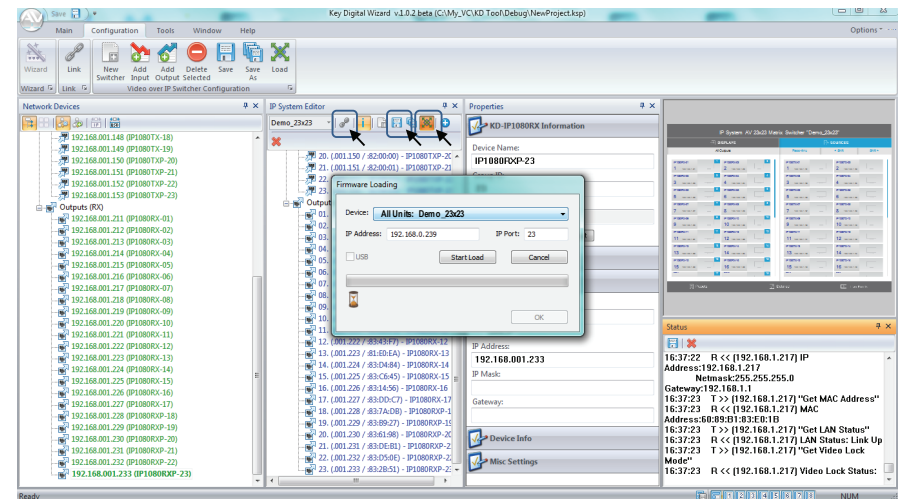


- » e) Choose CONFIGURATION » NEW SWITCHER
 - » i) Enter desired system file name
 - » ii) Recommended Starting Group ID is 1 (group ID for first Encoder)
 - » (1) If multiple switcher systems exist on the same network, they should have unique starting Group ID
 - » iii) Enter desired number of Input and Outputs according to the number of physical units currently connected
 - » (1) System file is easily updated if additional units will be added/removed in the future
 - » iv) Press OK to advance to IP System Editor window
- » f) Drag scanned devices from Network Devices window to the desired Input / Output assignment in the IP System Editor window



- » g) After providing all Input/Output assignment, press Link button to finalize assignments
- » h) Press Save button
- » i) Press Load button to the virtual matrix file
 - » i) At top of Device list (default) you may select ALL UNITS for automatic loading to each encoder and decoder, one-by-one.
 - » (1) The process is long, but requires only one button press for entire system.

- » ii) Beneath ALL UNITS, each unit will be individually itemized in case a replacement unit is being inserted to existing system and it requires the loaded file.



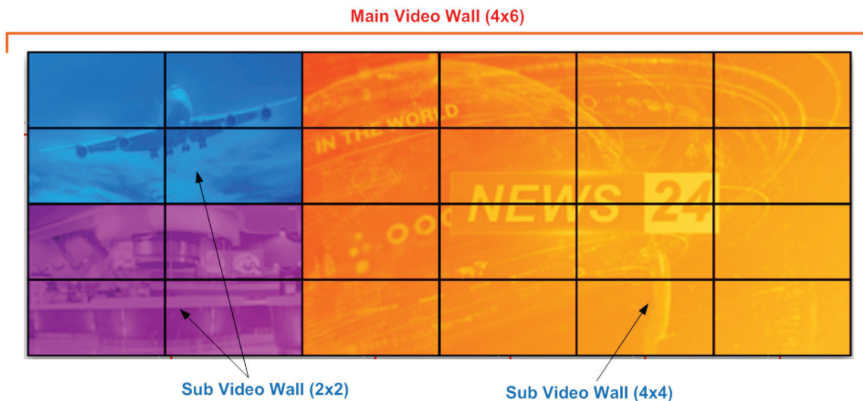
7. Future software updates will include automatic unit and virtual matrix configuration

Video Wall Processing

KD-IP922DEC decoders may be used to build video walls up to 10 displays wide and 10 displays high (10x10). A KD-IP922DEC unit is needed at each display.

- › Configuring each Decoder's Video Wall settings is achieved via TCP/IP, RS-232, or using the KD-Wizard software. Video wall settings will remain if Video Wall mode is toggled.
- › Video walls are created by specifying the following:
 - › Video Wall ID
 - › Number of vertical displays
 - › Number of horizontal displays
 - › Position of the display within the configuration
 - › Position begins at 1
 - › Position moves from left to right, top to bottom. Just like reading an English language book
- › KD-IP922 systems support advanced video wall assignment options to enable building of advanced GUI control layouts:
 - › Video Walls must be assigned a unique ID number
 - › This is helpful for controlling specific video walls when multiple walls are installed on site
 - › Decoders may be given a Main and Sub video wall assignment
 - › This is helpful for breaking up a large video wall into smaller video wall segments
 - › All displays within a main video wall must be assigned the same Main Group ID

Example: 4Vx6H main video wall containing two 2Vx2H and one 4Vx4H sub video walls



- › For the Main Wall:
 - › Video Wall ID = 01
 - › Number of horizontal displays = 6
 - › Number of vertical displays = 4
 - › Position of each display = 001 ~ 024
- › For the sub video walls within the main video wall:
 - › Number of horizontal displays = 2
 - › Number of vertical displays = 2
 - › Position of each display = 001 ~ 004
 - ›

A. Commands to configuring video wall

- › With Video Wall mode enabled, each decoder is informed of the number of horizontal and vertical displays in the overall video wall, the ID assignment of the video wall, and the decoder's position within the video wall

B. Commands for bezel adjustment

- › KD-IP922DEC can perform automatic bezel adjustment based on the each display's overall dimensions (including bezel) and screen dimensions

C. Commands for fine tuning

- › If needed, KD-IP922DEC can also move the image up, down left or right
- › Horizontal or Vertical Zoom may also be applied

D. Commands for screen rotation

- › Images may be rotated 0°, 180°, and 270°

```
-- Video wall Setup Command xxxx=[0-1024], yyyy=[0-9999] )
-- SPO xxxx VWE/D : Set video wall E=Enable/D=Disable
-- SPO xxxx VID yy : Set Group ID of Video wall
A. -- SPO xxxx MWH yy : Set Number of Horizontal Main Display y=[1-10]
-- SPO xxxx MWV yy : Set Number of vertical Main Display y=[1-10]
-- SPO xxxx MWP yyy : set Position of Main Display yyy=[1-100]
-- SPO xxxx SWH yy : Set Number of Horizontal sub Display y=[1-10]
-- SPO xxxx SWV yy : Set Number of vertical sub Display y=[1-10]
-- SPO xxxx SWP yyy : set Position of Sub Display yyy=[1-100]
B. -- SPO xxxx BWL yyyy : Set Bezel width(mm) by yyyy=[1-9999]
-- SPO xxxx BHL yyyy : Set Bezel Height(mm) by yyyy=[1-9999]
-- SPO xxxx SWL yyyy : Set Screen width(mm) by yyyy=[1-9999]
-- SPO xxxx SHL yyyy : Set Screen Height(mm) by yyyy=[1-9999]
C. -- SPO xxxx MSL yyy : Move Screen Position to Left yyy=[0-480]
-- SPO xxxx MSR yyy : Move Screen Position to Right yyy=[0-480]
-- SPO xxxx MSU yyy : Move Screen Position to Up yyy x=[0-270]
-- SPO xxxx MSD yyy : Move Screen Position to Down yyy=[0-270]
-- SPO xxxx SUH yyyy : Scale Up Horizontal Screen by yyyy=[0-9999]
-- SPO xxxx SUV yyyy : Scale Up Vertical screen by yyyy=[0-9999]
D. -- SPO xxxx SRR y : Set Screen Rotation by y=[0:0', 1:180', 2:270']
```

TCP/IP, RS-232, and IR Control

KD-IP922 systems may be controlled via TCP/IP, RS-232, or IR:

- » Each KD-IP922 unit may receive system commands (ie. matrix switching)
- » Each KD-IP922 unit may receive unit-specific commands (ie. audio DSP and video wall commands)
- » Any unit-specific command received is forwarded to the appropriate unit

As with other Key Digital products, a full **Help** (set/listing of all possible commands to send the Enterprise AV system) and **Status** (get/feedback of current system status) is possible.

RS-232 connection protocol:

- » Baud Rate = 57600 bits per second
- » Data Bits = 8
- » Stop Bits = 1
- » Parity = None
- » Flow Control = None
- » Carriage Return: Required
- » Line Feed: Required

Control notes:

- » Commands are not case-sensitive
- » Spaces are shown for clarity; commands should NOT have any spaces
- » Carriage return and line feed is required at the end of each string
- » If a new command is received, a confirmation is transmitted from the unit

Help Command (H) returns entire API in readable format:

```
-----
--                               Key Digital Systems HELP                               --
-----
--      KD-IP922ENC                F/W Version : BV1.00, MV1.00, AV1.00                --
--
-- PN          : Power On                                                    --
-- PF          : Power Off                                                    --
-- H           : Help                                                         --
-- STA        : Show Global System Status                                     --
-- STPIxx     : Show Video Input xx Status                                    --
-- STPIxxxx  : Show Video Input xxxx Status                                  --
-- STPOxx     : Show Video Output xx Status                                   --
-- STPOxxxx  : Show Video Output xxxx Status                                 --
--
-- Video Output Setup Command ( xxxx=[0-1024], yyyy=[1-1024] )                --
-- SPO xxxx SI yyyy : Set Output xxxx to Video Input yyyy                    --
-- SPO xx yy       : Set Output xx to Video Input yy                          --
-- xxByy.         : Set Output xx to Video Input yy                          --
-----
```

```
-- Bxxyy        : Set Output xx to Video Input yy                            --
-- SPO xxxx SIU : Set Output xxxx Video Input Up                             --
-- SPO xxxx SID : Set Output xxxx Video Input Down                           --
-- SPOASI yyyy  : Set All Outputs to Video Input yyyy                         --
-- SPO A yy     : Set All Outputs to Video Input yyyy                         --
-- yyAll.       : Set All Outputs to Video Input yy                           --
-- SPOASIU     : Set All Outputs to Video Input Up                           --
-- SPOASID     : Set All Outputs to Video Input Down                           --
-- SPOAPT      : Set All Outputs to Pass Through                             --
-- SPO xxxx VM E/D : Set Output xxxx Video Mute Enabled/Disabled             --
-- SPO xxxx ON/OFF : Set Output xxxx ON/OFF                                   --
-- SPO xxxx DBG ON/OFF : Set Output xxxx Debug Mode ON/OFF                   --
-- SPOA VM E/D   : Set All Outputs Video Mute Enabled/Disabled               --
-- SPOA ON/OFF   : Set All Outputs ON/OFF                                     --
-- SPOA DBG ON/OFF : Set All Outputs Debug Mode ON/OFF                       --
--
-- Video Wall Setup Command xxxx=[0-1024], yyyy=[0-9999] )                    --
-- SPO xxxx VWE/D : Set Video Wall E=Enable/D=Disable                         --
-- SPO xxxx VID yy : Set Group ID of Video Wall                               --
-- SPO xxxx MWH yy : Set Number of Horizontal Main Display y=[1-10]           --
-- SPO xxxx MWV yy : Set Number of Vertical Main Display y=[1-10]           --
-- SPO xxxx MWP yyy : set Position of Main Display yyy=[1-100]               --
-- SPO xxxx SWH yy : Set Number of Horizontal Sub Display y=[1-10]           --
-- SPO xxxx SWV yy : Set Number of Vertical Sub Display y=[1-10]             --
-- SPO xxxx SWP yyy : set Position of Sub Display yyy=[1-100]               --
-- SPO xxxx BWL yyyy : Set Bezel Width(mm) by yyyy=[1-9999]                 --
-- SPO xxxx BHL yyyy : Set Bezel Height(mm) by yyyy=[1-9999]                --
-- SPO xxxx SWL yyyy : Set Screen Width(mm) by yyyy=[1-9999]                 --
-- SPO xxxx SHL yyyy : Set Screen Height(mm) by yyyy=[1-9999]               --
-- SPO xxxx MSL yyy : Move Screen Position to Left yyy=[0-480]               --
-- SPO xxxx MSR yyy : Move Screen Position to Right yyy=[0-480]              --
-- SPO xxxx MSU yyy : Move Screen Position to Up yyy x=[0-270]                --
-- SPO xxxx MSD yyy : Move Screen Position to Down yyy=[0-270]               --
-- SPO xxxx SUH yyyy : Scale Up Horizontal Screen by yyyy=[0-9999]           --
-- SPO xxxx SUV yyyy : Scale Up Vertical Screen by yyyy=[0-9999]             --
-- SPO xxxx SRR y   : Set Screen Rotation by y=[0:0', 1:180', 2:270']         --
--
-- IP922ENC Audio Setup Command ( xxxx=[0-1024,A] A=All )                     --
-- SPE xxxx AS y   : Set Input xxxx Audio Source to y [1=HDMI, 2=EXT.]       --
-- SPE xxxx AV yy  : Set Input xxxx Audio Volume to yy=[00-99],U,D           --
-- SPE xxxx AB yy  : Set Input xxxx Audio Balance to yy=[00-40],U,D          --
-- SPE xxxx AL yy  : Set Input xxxx Audio Bass to yy=[00-24],U,D             --
-- SPE xxxx AM yy  : Set Input xxxx Audio Middle to yy=[00-24],U,D           --
-- SPE xxxx AH yy  : Set Input xxxx Audio Treble to yy=[00-24],U,D           --
-- SPE xxxx AD yy  : Set Input xxxx Audio Delay to yy=[00-99],U,D            --
-- SPE xxxx A E/D : Set Input xxxx Audio Mute E=Enabled/D=Disabled           --
-----
```

```

-- IP922DEC Audio Setup Command ( xxxx=[0~1024,A] A=All ) --
-- SPD xxxx AV yy : Set Output xxxx Audio Volume to yy=[00~99],U,D --
-- SPD xxxx AB yy : Set Output xxxx Audio Balance to yy=[00~40],U,D --
-- SPD xxxx AL yy : Set Output xxxx Audio Bass to yy=[00~24],U,D --
-- SPD xxxx AM yy : Set Output xxxx Audio Middle to yy=[00~24],U,D --
-- SPD xxxx AH yy : Set Output xxxx Audio Treble to yy=[00~24],U,D --
-- SPD xxxx AD yy : Set Output xxxx Audio Delay to yy=[00~99],U,D --
-- SPD xxxx A E/D : Set Output xxxx Audio Mute Enabled/Disabled/Toggle --
--
-- IP922DEC Video Setup Command ( xx/xxx/xxxx=[0000~1024,A] A=All ) --
-- SPD xxxx VS y : Set Output xxxx Video Source to y [1=IP, 2=Local] --
--
-- Network Setup Command ( xxx=[000~255], zzzz=[0001~9999], y=[1~3] ) --
-- 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 --
-- SPCETDCP E/D : Set DHCP E=Enable/D=Disable --
-- SPCETIPB : Apply New Network Config --
-- SPCETLN1 y : Set LAN Port1 by y [1=1G-BaseT, 2=100BaseT, 3=Auto] --
-- SPCETLN2 y : Set LAN Port2 by y [1=1G-BaseT, 2=100BaseT, 3=Auto] --
--
-- Control I/O Port Setup Command ( x=[0~3], y=[0~9], z=[0001~9999] ) --
-- SPB x CM y : Set Control Mode of I/O Port x=[1~3] by y --
-- [1=IP922 Control, 2=Compass Control, 3=Open API, 4=Control Ext.] --
-- SPB x PC y : Set Port Configuration of I/O Port x=[1~3] by y --
-- [0=None, 1=IR IN, 2=IR OUT, 3=RS232, 4=TRIGGER IN, 5=TRIGGER OUT] --
-- SPB 1 IRS y : Set IR Source by y [1=IR Sensor, 2=Serial IR ] --
-- SPB x RSB y : Set RS232 Baud Rate of I/O Port x=[2~3] by y bps --
-- [0=115200, 1=57600, 2=38400, 3=19200, 4=9600, 5=4800] --
-- SPB x RSL y : Set RS232 Data Length of I/O Port x=[2~3] by y=[7~8] --
-- SPB x RSP y : Set RS232 Parity Bit of I/O Port x=[2~3] by y=[0~2] --
-- [0=None, 1=Odd, 2=Even] --
-- SPB x RSS y : Set RS232 Stop Bit of I/O Port x=[2~3] by y=[0~2] --
-- SPB x OSL y : Set Output Level of I/O Port x by y [1=MIN ~ 7=MAX] --
-- SPB x TCP zzzz : Set TCP Port of I/O Port x[0=I/O Port Cfg.] by zzzz --
-- SPB x IGD zzz : Set IR IN/RS232 RxID Group ID of I/O Port x by zzz --
-- SPB x OGD zzz : Set IR OUT/RS232 TxID Group ID of I/O Port x by zzz --
--
-- System Control Setup Command ( xx=[0000~1024], y=[1~4], z=[0~4] ) --
-- SPC DN cccccccccccccc : Set Device Name --
-- SPC SID xxxx : Set System ID xxxx for Multicast,[0000=Unicast] --
-- SPCFB E/D : Set Panel Button E/D (E=Enable,D=Disable) at IP922DEC --
-- SPCDF : Reset to Factory Default All --
-----

```

Status command (STA) returns current state and settings of the unit:

```

-----
-- Key Digital Systems STATUS --
-----
-- KD-IP922ENC F/W Version : BV1.00, MV1.00, AV1.00 --
--
-- Device Name = IP922ENC0001 , System ID = 0001 --
-- Power = ON, Panel Button = Enable, Forced HPD = OFF --
--
-- Network Setting Status --
-- MAC Address = 60:89:B1:90:00:01 --
-- Host IP Address = 192.168.001.100 --
-- Net Mask = 255.255.000.000 --
-- Router IP Address = 192.168.001.001 --
-- TCP Port = 0023, DHCP = Disable, Link = ON --
-- LAN1 = AUTO, LAN2 = AUTO --
--
-- Control I/O Ports Status --
-- Main : TCP = 4580 --
-- I/O1: CM=IP922 , CFG=IR IN ,OSL=7, RS=57600-8-0-1 , IRS=1 --
-- TCP=4581, IGD=0001, OGD = 0002 --
-- I/O2: CM=IP922 , CFG=NONE ,OSL=7, RS=57600-8-0-1 , IRS=2 --
-- TCP=4582, IGD=0003, OGD=0004 --
-- I/O3: CM=IP922 , CFG=RS232 ,OSL=7, RS=57600-8-0-1 , IRS=2 --
-- TCP=4583, IGD=0005, OGD=0006 --
--
-- IP922ENC Video/Audio Status --
-- 0001: DN=IP922ENC0001 , MAC=60:89:B1:90:00:01, GID=0001, LINK=ON --
-- IP=192.168.001.101 , VA=HDMI , HPD=ON ,HCP=ON , AUD=2CH PCM --
-- AS=HDMI, AV=99, AB=20, AL=12, AM=12, AH=12, AD=00, MUTE=OFF --
-- 0002: DN=IP922ENC0002 , MAC=60:89:B1:90:00:01, GID=0002, LINK=ON --
-- IP=192.168.001.102 , VA=HDMI , HPD=ON ,HCP=ON , AUD=2CH PCM --
-- AS=HDMI, AV=99, AB=20, AL=12, AM=12, AH=12, AD=00, MUTE=OFF --
-- 0003: DN=IP922ENC0003 , MAC=60:89:B1:90:00:01, GID=0003, LINK=ON --
-- IP=192.168.001.103 , VA=HDMI , HPD=ON ,HCP=ON , AUD=2CH PCM --
-- AS=HDMI, AV=99, AB=20, AL=12, AM=12, AH=12, AD=00, MUTE=OFF --
-- 0004: DN=IP922ENC0004 , MAC=60:89:B1:90:00:01, GID=0004, LINK=ON --
-- IP=192.168.001.104 , VA=HDMI , HPD=ON ,HCP=ON , AUD=2CH PCM --
-- AS=HDMI, AV=99, AB=20, AL=12, AM=12, AH=12, AD=00, MUTE=OFF --
--
-- IP922DEC Video/Audio/Video Wall Status --
-- 0001: DN=IP922DEC0001 , MAC=60:89:B1:92:00:01, GID=0001, LINK=ON --
-- IP=192.168.002.101, IN=0001, OUT=ON , HPD=ON ,HCP=ON , DG=ON --
-- AV=99, AB=20, AL=12, AM=12, AH=12, AD=00, MUTE=OFF --
-- VW=OFF, VID=00, MWH=01, MWV=01, MWP=001, SWH=01, SWV=01 --
-- SWP=001, BWL=0001, BHL=0001, SWL=0001, SHL=0001, MSL=000 --
-- MSR=000, MSU=000, MSD=000, SUH=0000, SUV=0000, SRR=0 --
-----

```

```

-- 0002: DN=IP922DEC0002 , MAC=60:89:B1:92:00:02, GID=0002, LINK=ON --
-- IP=192.168.002.102, IN=0002, OUT=ON , HPD=ON ,HCP=ON , DG=ON --
-- AV=99, AB=20, AL=12, AM=12, AH=12, AD=00, MUTE=OFF --
-- VW=OFF, VID=00, MWH=01, MWV=01, MWP=001, SWH=01, SWV=01 --
-- SWP=001, BWL=0001, BHL=0001, SWL=0001, SHL=0001, MSL=000 --
-- MSR=000, MSU=000, MSD=000, SUH=0000, SUV=0000, SRR=0 --
-- 0003: DN=IP922DEC0003 , MAC=60:89:B1:92:00:03, GID=0003, LINK=ON --
-- IP=192.168.002.103, IN=0003, OUT=ON , HPD=ON ,HCP=ON , DG=ON --
-- AV=99, AB=20, AL=12, AM=12, AH=12, AD=00, MUTE=OFF --
-- VW=OFF, VID=00, MWH=01, MWV=01, MWP=001, SWH=01, SWV=01 --
-- SWP=001, BWL=0001, BHL=0001, SWL=0001, SHL=0001, MSL=000 --
-- MSR=000, MSU=000, MSD=000, SUH=0000, SUV=0000, SRR=0 --
-- 0004: DN=IP922DEC0004 , MAC=60:89:B1:92:00:04, GID=0004, LINK=ON --
-- IP=192.168.002.104, IN=0004, OUT=ON , HPD=ON ,HCP=ON , DG=ON --
-- AV=99, AB=20, AL=12, AM=12, AH=12, AD=00, MUTE=OFF --
-- VW=OFF, VID=00, MWH=01, MWV=01, MWP=001, SWH=01, SWV=01 --
-- SWP=001, BWL=0001, BHL=0001, SWL=0001, SHL=0001, MSL=000 --
-- MSR=000, MSU=000, MSD=000, SUH=0000, SUV=0000, SRR=0 --
-----

```

IR Control is possible using remote model KD-REMOTEHM88 (sold separately)

Use the numerical keypad for X, Y, and Z values below. X, Y, and Z values may be up to four button presses.

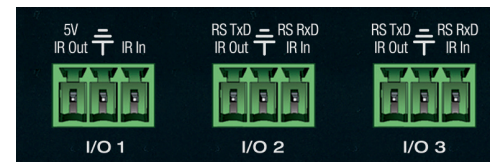


All unit setup should be completed in the KD Wizard software found on www.keydigital.com

Command	Sequence
Audio Input Setup	
Set Analog Input x by y [1=Unbalanced, 2=Balanced]	R2, X, Audio Mode, Y
Output Video Setup	
Set Output x to Video Input y	R1, X, X, X, X, Video Mode, Y, Y, Y, Y
Set Output x Video Input Up	R1, X, X, X, X, Video Mode, UP
Set Output x Video Input Down	R1, X, X, X, X, Video Mode, DOWN
Set All Outputs to Video Input y	R1, Video Mode, Y, Y
Set All Outputs to Video Input Up	R1, Video Mode, UP
Set All Outputs to Video Input Down	R1, Video Mode, DOWN
Set Analog Input xx by y [1=Unbalanced, 2=Balanced]	R2, X, Audio Mode, Y
Set Output x to Video Input y	R1, X, Video Mode, Y
Set Output x Video Input Up	R1, X, Video Mode, UP
Set Output x Video Input Down	R1, X, Video Mode, DOWN
Set All Outputs to Video Input y	R1, Video Mode, Y,
Set All Outputs to Video Input Up	R1, Video Mode, UP
Set All Outputs to Video Input Down	R1, Video Mode, DOWN
Set All Outputs to Pass Through	R1, Video Mode, Audio Mode
Set Output x Video Mute Enabled/Disabled	R1, X, Video Mode, Mute/Restore
Set Output x ON/OFF	R1, X, Video Mode, R2, Restore/Mute
Set Output x Debug Mode ON/OFF	R1, X, Video Mode, R3, Restore/Mute
Set All Outputs Video Mute Enabled/Disabled	R1, Video Mode, Restore/Mute
Set All Outputs ON/OFF	R1, Video Mode, R2, Restore/Mute
Set All Outputs Debug Mode ON/OFF	R1, Video Mode, R3, Restore/Mute
Audio Output Setup	
Set Analog De-Embed Source to y [1=HDMI, 2=EXT. AUDIO L/R]	R2, Audio Mode, Y
Set Output x Audio Volume to yy yy=[00-99]	R1, X, Volume, Y, Y
Set Output x Audio Balance to yy, yy=[00-40],U,D	

Set Output x Audio Volume Up	R1, X, Volume, UP
Set Output x Audio Volume Down	R1, X, Volume, DOWN
Set Output x Audio Bass Freq. to yy, yy=[00-24],U,D	R1, X, Bass, Y, Y
Set Output x Audio Middle Freq. to yy, yy=[00-24],U,D	R1, X, Middle, Y, Y
Set Output x Audio Treble Freq. to yy, yy=[00-24],U,D	R1, X, Treble, Y, Y
Network Setup	
Set Output x Audio Delay to yy yy=[00-99],U,D	R1, X, LipSync, Y, Y
Set Output x Audio Mute Enabled/Disabled	R1, X, Mute/Restore
Set Host IP Address to xxx.xxx.xxx.xxx	R3, Bass, X, X, X, Video Mode, X, X, X, Video Mode, X, X, X, Video Mode, X, X, X
Set Net Mask to xxx.xxx.xxx.xxx	R3, Middle, X, X, X, Video Mode, X, X, X, Video Mode, X, X, X, Video Mode, X, X, X
Set Router IP Address to xxx.xxx.xxx.xxx	R3, Treble, X, X, X, Video Mode, X, X, X, Video Mode, X, X, X, Video Mode, X, X, X
Set TCP/IP Port to zzzz	R3, Volume, X, X, X, X
Apply New Network Config	R3, All Restore
Set LAN Port1 by y [1=1G-BaseT, 2=100BaseT, 3=Auto]	R3, 1, Audio Mode, X
Set LAN Port2 by y [1=1G-BaseT, 2=100BaseT, 3=Auto]	R3, 2, Audio Mode, X
Set Group ID xxxx for Multicast, [0000=Unicast]	R4, Video Mode, X, X, X, X
Set Front Panel Button E/D (E=Enable,D=Disable) xxx	R4, R2, Mute (Disable), R4, R2, Restore (Enable)
Set RS232 Baud Rate to z bps [0=115200, 1=57600, 2=38400, 3=19200, 4=9600]	R4, R2, Bass, Z
Rest Unit to Factory Default	R4, R3, R2, R1, All Restore

Multi-Function I/O Ports



The three multi-function I/O ports can be configured as IR sensor, IR input, IR emitter, RS-232, voltage trigger, or voltage sensor. However, there are limitations per port:

I/O Port	IR Sensor	IR Input	IR Emitter	Serial RS-232	Trigger
1	Yes	Yes	Yes	No	Yes
2	No	Yes	Yes	Yes	Yes
3	No	Yes	Yes	Yes	Yes

I/O port configurations:

› IR sensor

- › Compatible port: I/O Port 1
- › Used for IR input or IR learning
- › Supported signal level: 0V – 5V
- › Supported IR frequency: 20kHz – 60kHz
- › IR Sensor (included) pinout:

Note: Unit must be set to Compass Control® Master Controller mode if you wish to learn IR remote

Pin # (Phoenix)	Wire Color	Wire Signal
1	Red	Power 5V
2	Black	Ground
3	White	IR Signal



› Hardwired IR input

- › Compatible ports: 1, 2, and 3
- › Supports serial (hardwired) IR input with modulated IR signal
- › Supported signal level: 0V – 12V
- › Supported IR frequency: 20kHz – 100kHz
- › NOTE: Supports maximum of one (1) IR input at any time (sensor and hardwired)

> IR output

- » Compatible ports: 1, 2, and 3
- » Supported signal level: 0V – 11.4V
- » Supported IR frequency: 20kHz – 100kHz

> RS-232

- » Compatible ports: 2 and 3
- » Supported output signal level: 0V – 11.4V
- » Supported input signal level: -12V – 12V
- » Does not support H/W Flow Control
- » Maximum baud rate is 115200bps
- » Supports up to 2 real-time ports

> Voltage Trigger:

- » Compatible ports: 1, 2, and 3
- » Supported signal level:
 - » Low: 0V (ground) fixed
 - » High: 3.3V – 11.4V
- » Does not support relay or contact closure functionality
- » Does not support extension of digital data

> Voltage Sensor

- » Compatible ports: 1, 2, and 3:
- » Supported signal level:
 - » Low: -12V – 2V
 - » High: 2V – 12V
- » Uninterrupted voltage sensing updated every 5ms
- » Voltage trigger is very low bandwidth. Does not support extension of digital data.

KeyCode Open API Specification

If a KD-IP922ENC or KD-IP922ENC port is configured for use in KeyCode Open API mode, the device will listen on a dedicated TCP port for that particular I/O port.

The user application can then make a TCP connection to that port and send to and/or receive data from that I/O port.

The default TCP port 4580 is used for I/O port configuration commands. The Configuration port assignment is flexible, and can be adjusted using the SetTCPC:<TCP port#>\r.

Separate TCP ports are used for I/O port traffic data. IP Port number assignments for I/O ports are flexible, and assigned using the SetTCPP:<port#>,<TCP port#>\r.

It is recommended that TCP Port assignments always be no lower than 1024.

All I/O port traffic is limited to only one TCP connection at a time.

Available TCP Ports

TCP Port	Usage
4580	I/O Configuration Port
4581	Port 1 Traffic Data
4582	Port 2 Traffic Data
4583	Port 3 Traffic Data

Command Protocol

- > All commands/responses are in ASCII text and are terminated with a (\r) carriage return.
- > All commands written in the following format:
 - » **COMMAND:<port#>,[<parameter 1>,<parameter 2>,...]\r**
- > Here COMMAND is the command name and <port#> is the I/O port number from 1 to 3. <parameter> will vary depending on the command.
 - » For example, to set port 1 to IR sensor mode, the command is
 - » **SetIRL:1\r**
- > All commands are case sensitive
- > All commands do not include "<", and ">" characters
- > All commands contain no spaces

Configuration Commands

Command	Parameter Description	Usage
SetIRL: <port#>	<port#>: Multi-function I/O port number	Set I/O Port to IR Sensor Mode Ex: SetIRL:1\r
SetIRO: <port#>	<port#>: Multi-function I/O port number	Set I/O Port to Emitter Mode Ex: SetIRO:3\r
SetIRIN: <port#>	<port#>: Multi-function I/O port number	Set I/O Port to IR Input Mode Ex: SetIRIN:3\r
SetRS: <port#>, , <char length>, <stop bit>, <parity>, <timeout>	<port#>: Multi-function I/O port number : I/O Port baud rate. Ranges from 4800 and 115200. <char length>: 5- 5 bits, 6- 6 bits, 7- 7 bits 8- 8 bits <stop bit>: 1- 1 bit, 2- 1.5 bit, 3- 2 bit <parity>:Parity of RS. 0- no parity, 1- odd, 2- even, 3-mark, 4- space, 5- multidrop <timeout>: Time in milliseconds that the I/O port will be open. More info in the notes section.	Set I/O Port to RS-232 Mode Ex: SetRS:2,57600,8,1,0,6000\r
SetTR: <port#>, <time interval>	<port#>: Multi-function I/O port number <time interval>: Frequency in milliseconds that the I/O port will return current voltage state. More info in the notes section.	Set I/O Port to Trigger Mode Ex: SetTR:3,1000\r
SetTCPC: <tcp port#>	<TCP port#>: Desired TCP port number for configuration port	Sets the configuration port for KD-CX800 Ex: SetTCPC:4766\r
SetTCPP: <port#>,<TCP port #>	<port#>: I/O port (1 – 3) <TCP port#>: Desired TCP port number	Sets the TCP port number for specified I/O port Ex: SetTCPP:1,4767

TRO: <port#>, <level>	<port#>: Multi-function I/O port number <level>: HIGH, LOW	Set I/O Port Trigger Output High or Low Ex: TRO:2,HIGH
GetRS: <port#>	<port#>: Multi-function I/O port number	Get I/O Port RS-232 Configuration Ex: GetRS:3\r
GetTR: <port#>	<port#>: Multi-function I/O port number	Get I/O Port Trigger State Ex: GetTR:2\r
TRIN: <port#>	<port#>: Multi-function I/O port number	Get I/O Port Trigger Input Level Ex: TRIN:3\r
GetCFG: <port#>	<port#>: Multi-function I/O port number	Get I/O Port Configuration Ex: GetCFG:1\r

Parameters

All parameters that may be part of a configuration command or a control or configuration response.

Command Field	Parameter	Possible Value
<port>	Port number	1: KD-CX800 I/O Port 1. 2: KD-CX800 I/O Port 2. 3: KD-CX800 I/O Port 3.
 	RS-232 baud rate	Baud rates supported by KD-CX800 RS-232 mode are: 2400, 4800, 9600, 19200, 38400, 57600,115200.
<char length>	RS-232 character length	5: Character length is 5 bits. 6: Character length is 6 bits. 7: Character length is 7 bits. 8: Character length is 8 bits.

<stop bit>	RS-232 stop bit setting	1: 1 stop bit. 1.5: 1.5 stop bits. 2: 2 stop bits.
<parity>	RS-232 parity type	PAR_NONE: No parity. PAR_ODD: Odd parity. PAR_EVEN: Even parity. PAR_MARK: Parity force to 1(Mark). PAR_SPACE: Parity force to 0(Space). PAR_MULTIDROP: Multidrop mode.
<time interval> / <timeout>	This value sets the time interval / timeout value for a port timer. -For Trigger usage, time interval is the frequency that the port will return its current sensed voltage state. -For RS-232 usage, timeout is the amount of time in milliseconds that Rx data is stored in the buffer	From 0 to 65535 milliseconds
<TCP port>	TCP port number	From 0 to 65535
<port level>	Trigger port level	LEVEL_HIGH: I/O port trigger input pin is high state. LEVEL_LOW: I/O port trigger input pin is low state.

<set level>	Trigger level to set	HIGH: Change I/O port trigger output pin to high state. LOW: Change I/O port trigger output pin to low state.
<CFG_RSP>	Standard configuration command response	See table below: " Possible Responses "
<port mode>	Port mode	IRL: I/O port is IR Sensor mode. IRIN: I/O port is Serial IR Input mode. IROUT: I/O port is IR Output mode. RS: I/O port RS-232 mode. TR: IO port is Trigger Input/output mode.

Possible Responses

Response	Meaning
ERR_OK	Command executed successfully
ERR_CMD	Command not recognized
ERR_PORT	I/O Port doesn't match the command received
ERR_PARAM	Bad parameter in command
ERR_MODE	I/O Port doesn't match the command received
ERR_CONF	Port not configured for KeyCode Open API Mode
LEVEL_HIGH	Trigger Input High Level
LEVEL_LOW	Trigger Input Low Level

Specifications

Technical:

- » Inputs ENC (Each): 1 HDMI, 1 External Audio, 3 Multifunction Control (IR, Bi-Directional RS-232, Trigger), 2 TCP/IP, 1 USB B
- » Outputs ENC (Each): 1 HDMI, 1 Analog Audio
- » Inputs DEC (Each): 1 HDMI, 3 Multifunction Control (IR, Bi-Directional RS-232, Trigger), 2 TCP/IP, 2 USB A
- » Outputs DEC (Each): 1 HDMI, 1 Analog Audio
- » DDC Signal (Data): 5 Volts p-p (TTL)
- » HDMI Video/Audio Signal: Input Video Signal: 1.2 Volts p-p
- » HDMI Connector: Type A, 19 Pin Female
- » Audio Connector: Balance/Unbalanced 6-Pin Phoenix, 3.5mm Stereo
- » RJ45 Connector: Shielded TCP/IP 1G/100 BaseT, PoE
- » Control Connectors: 3-Pin Phoenix

General:

- » **Regulation:** CE, RoHS, WEEE
- » **Enclosure:** Black Metal
- » **Power:** KD-PS12V1ASC, 12V/1A, 100-240VAC, 50-60Hz, Interchangeable head, screw-in connector
- » **Product Dimensions:** 6.25" x 1.1" x 3.1"
- » **Packaging Dimensions:** 9.8" x 4.5" x 3.35"
- » **Product Weight:** 0.9 lb
- » **Shipping Weight:** 1.5 lb



Important Product Warnings:

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



Safety Instructions:

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

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



Power Supply Use:

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

How to Contact Key Digital®

System Design Group (SDG)

For system design questions please contact us at:

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

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 3 Year Product Warranty Policy. <http://www.keydigital.com/warranty.htm>