CE RoHS COMPLIANT WEEE COMPLIANT

KD-IP120Tx

HDMI over IP Transmitter Extender, supports HDMI Pass-through

KD-IP120Rx

HDMI over IP Receiver Extender

KD-IP120POETx

HDMI over IP Transmitter Extender with Power Over Ethernet, supports HDMI Pass-through

KD-IP120POERx

HDMI over IP Receiver Extender with Power Over Ethernet

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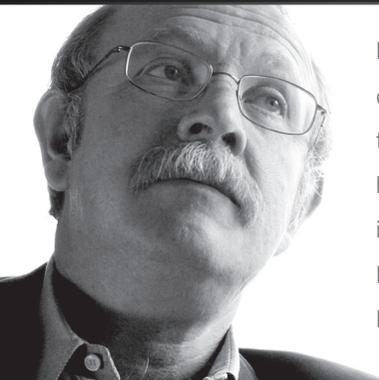
Key Digital®, led by digital video pioneer Mike Tsinberg, develops and manufactures high quality, cutting-edge technology solutions for virtually all applications where high-end video and control are important. Key Digital® is at the forefront of the video industry for Home Theater Retailers, Custom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

KD-IP120Tx

KD-IP120POETx

KD-IP120Tx

KD-IP120POERx

Key digital®

The Experts in Digital Video Technology and Solutions™

HDMI®
HIGH-DEFINITION MULTIMEDIA INTERFACE

Table of Contents

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

Introduction

Key Digital's HDMI over IP, KD-IP120 & KD-IP120POE, is an expandable HDMI system where video inputs and video outputs may be scaled to fit any installation. Add up to 1024 Tx units and an unlimited number of Rx units for the ultimate custom video solution.

Key Features

› **HDMI Pass-through:** Tx unit support HDMI Pass-through to receive video or extract audio on the transmit side
› **Custom System:** Add Tx and Rx extenders to an existing system to expand it up to 1024 Tx units and unlimited amount of Rx units
› **Resolution Support:** Supports up to 1080p@60 (2.25Gbps) and compatible with DVI1.0/HDMI1.3b/HDCP1.x
› **Audio Format:** Supports 2ch PCM at 44.1/48kHz
› **A/V Bitrate:** Supports Stream Bitrate up to 15Mbps.
› **Signal Extension:** Up to 400ft. @ 1080p@60 (2.25Gbps) using CAT5e/6 UTP/STP cable
› **KD-IP120POE:** Carry power to Tx and Rx units with a Power Over Ethernet enabled Smart Managed Switch.
› **Web Control Interface:** Reduces installation time and provides basic video setup.
› **Full Buffer System™:** Manages TMDS re-clocking / signal re-generation, HDCP authentication to source & display, and EDID Control handshake
› **EDID:** EDID libraries readily available to provide the best setup per source
› **TMDS re-clocking:** Support for long HDMI connectivity using Key Digital® HDMI cables
› **Deep Color Support:** Up to 12 bits/color
› **Licensing:** Fully licensed and compatible with all HDMI and HDCP technologies
› **Control:** UDP and Web Broswer Control through PC. Control System via Compass Control MC gateway.
› **Major Control System Support:** Compass Control®, AMX®, Control4®, Crestron®, Extron, Leviton®, RTI®, Savant, URC®, etc.

Accessories

› Power Supply: KDPS5V2ASC, 5V/2A, Screw-in type
  Power Supply Not Included with KD-IP120POE
› Shelf-mount L brackets
› Operating Instructions

> Warranty Card

Rack Mounting

> Use KD-RK120PLT (sold separately) to rack-mount up to 8 KD-IP120 units.
> Units can be secured with the connections facing outward or inward.

Recommended Equipment

An Ethernet switch with Internet Group Management Protocol (IGMP) is recommended to maximize the performance of the system. Please check the Key Digital Website for an updated list of supported IGMP Ethernet Switches.

Quick Setup Guide

One unit at a time, follow the below steps for initial configuration of your Tx and Rx units.

1. Begin with the KD-IP120 Tx/RX units, all input/output devices, and Smart Managed Switch powered off and power cables removed.
2. Connect power to the Smart Managed Switch. **Do not power on Tx/Rx units at once prior to setup.**
3. Connect an Ethernet cable from the PC to the Smart Managed Switch.
4. **Ensure proper setup of network router:** Using the PC, open the Smart Managed Switch web portal control and configure the switch by enabling IGMP. Using the PC, open the Smart Managed Switch web portal control and configure the switch by enabling IGMP properly.
5. Download the KD-IP120 Tool software from the Key Digital website under KD-IP120 product page.
6. Using the PC, run the KD-IP120 Tool application.
7. Connect only one KD-IP120 unit to the Smart Managed Switch and connect it to power, then click **Network Scan (Indicator A)**. Please wait until the green loading bar is complete before proceeding **(Indicator I)**. This process will make it easy to keep track of Rx and Tx locations.
8. Double click on the device, Tx or Rx, and the properties should appear **(Indicator G)**

KD-IP120 Tool

> » a. Set the KD-IP120 unit to a specific IP Address.
> ****Please be aware that IP Addresses cannot clash for all KD-IP120 Units. Please keep track of IP Address for setup****
> » b. Assign a Group ID for every Tx unit and number it as source input number
> ****Please be aware that Group ID's cannot clash for Tx Units. Each Tx Unit must have a unique Group ID. Treat Group ID as Source Input Number. Rx Unit Group ID's are not relevant to setup****
> » c. The Device Name may be changed to a friendly readable name.
> Example, "**Rx_Display1**" or "**Tx_AppleTV**". Don't forget to label the physical unit to keep track of it with the copy of the Group ID for Tx Units.
> » d. Click Update and the KD-IP120 unit will receive new settings and reboot **(Indicator H)**

9. After it resets, disconnect the KD-IP120 unit and repeat Step #7, Step #8, and Step #9 for the remainder units that are not configured yet.
10. Refer to the KD-IP120 Tool section for more information on the below. After all units are configured, all KD-IP120 units may be assigned to specific zones and sources in the system while in the Switching tab. Connect HDMI sources to the desired KD-IP120 Tx units and the HDMI displays to the desired KD-IP120 Rx units. Power may also be applied.
11. Using the KD-IP120 Tool software, click **Network Scan (Indicator A)** and all inputs/outputs will be visible.
12. Set up is complete and switching controls may be done by selecting an output number and then an input number.
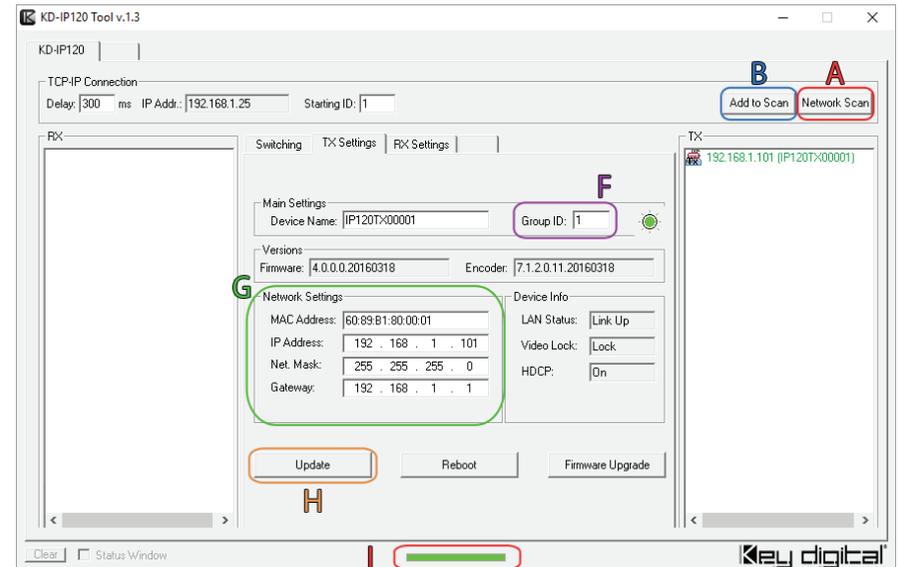
Setup of Tx unit
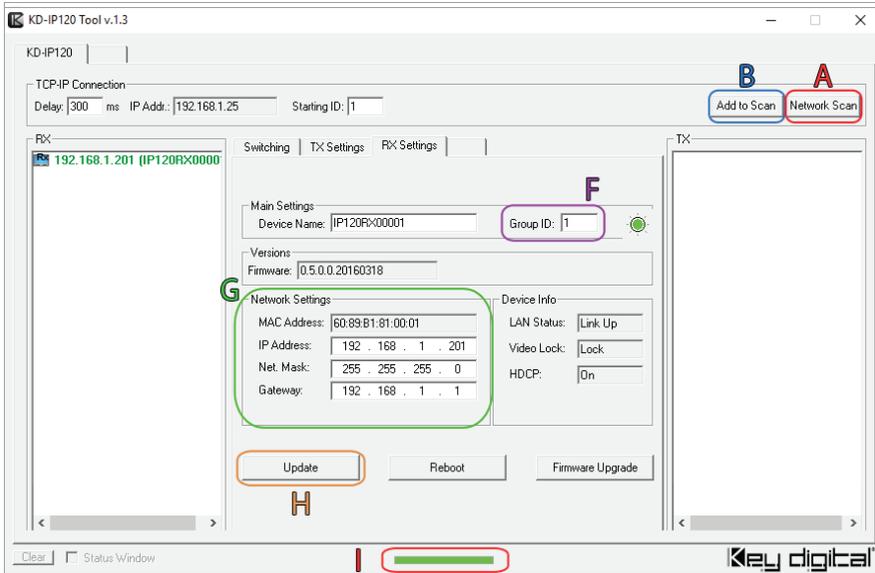
Setup of Rx unit

Connections

All connections to the KD-IP120 are found on the rear panel of the unit. Refer to the illustrations below for port assignments while making connections.

KD-IP120 Tx Unit - Back Panel Operation

A. Input Connections
❯ HDMI Input
  » Compatible with DVI1.0/HDMI1.3b/HDCP1.x
  » Video Resolution supports up to 1080p@60 (2.25Gbps)
  » Audio format support up to 2ch PCM at 44.1/48kHz

» Active link (Blue LED) illuminated when active HDMI/DVI Signal is present
» Does not support CEC

B. Output Connections
❯ HDMI Pass-through
  » Compatible with DVI1.0/HDMI1.3b/HDCP1.x
  » Video Resolution supports up to 1080p@60 (2.25Gbps)
  » Audio format support up to 2ch PCM at 44.1/48kHz
  » Active link (Blue LED) illuminated when HPD signal is present from display
  » Does not support CEC
❯ Ethernet
  » Compatible with CAT5e/6 UTP/STP cable
  » Supports up to 400ft extension over CAT5e/6 UTP/STP cable
  » Video Resolution supports up to 1080p@60 (2.25Gbps)
  » Audio format support up to 2ch PCM at 44.1/48kHz
  » A/V Stream Bitrate is up to 15Mbps

C. Power Port
  » KD-PS5V2ASC 5V/2A Power Supply with Screw Plug
    » Acts as backup power connection for POE model

KD-IP120 Tx Unit - Front Panel Operation

A. LED Light
❯ IP Link
  » Active link (Blue LED) illuminated when Tx Unit is connected to Smart Managed Switch and A/V stream data is transmitting

B. Factory reset
❯ Reset
  » Push Button. When pressed and held for 3 seconds, unit will factory reset with IP address at 192.168.1.101

KD-IP120 Rx Unit - Back Panel Operation

A. Input Connections
› Ethernet
  » Compatible with CAT5e/6 UTP/STP cable
  » Supports up to 400ft extension over CAT5e/6 UTP/STP cable
  » Video Resolution supports up to 1080p@60 (2.25Gbps)
  » Audio format support up to 2ch PCM at 44.1/48kHz
  » A/V Stream Bitrate is up to 15Mbps

B. Output Connections
› HDMI Output
  » Compatible with DVI1.0/HDMI1.3b/HDCP1.x
  » Video Resolution supports up to 1080p@60 (2.25Gbps)
  » Audio format support up to 2ch PCM at 44.1/48kHz
  » Active link (Blue LED) illuminated when HPD signal is present from display
  » Does not support CEC

C. Power Port
  » KD-PS5V2ASC 5V/2A Power Supply with Screw Plug
    » Acts as backup power connection for POE model

KD-IP120 Rx Unit - Front Panel Operation

A. LED Light
› IP Link
  » Active link (Blue LED) illuminated when Tx Unit is connected to the Rx Unit via IP

B. Factory reset
› Reset
  » Push Button. When pressed and held for 3 seconds, unit will factory reset with IP address at 192.168.1.201

KD-IP120 Tool

The Key Digital KD-IP120 Tool software is required for setting up the KD-IP120. For unit setup instructions, please refer to the "Quick Setup Guide" section.

Creating and saving a new system file:

To create a new system file after configuring all Tx and Rx units, first, click "**Network Scan**" while connected to the IP Video network **(Indicator A)**. Use "**Add to Scan**" to add any additional units after doing an original scan **(Indicator B)**.

Make sure to click "**Detailed**" on to view information for KD-IP120 units **(Indicator E).**
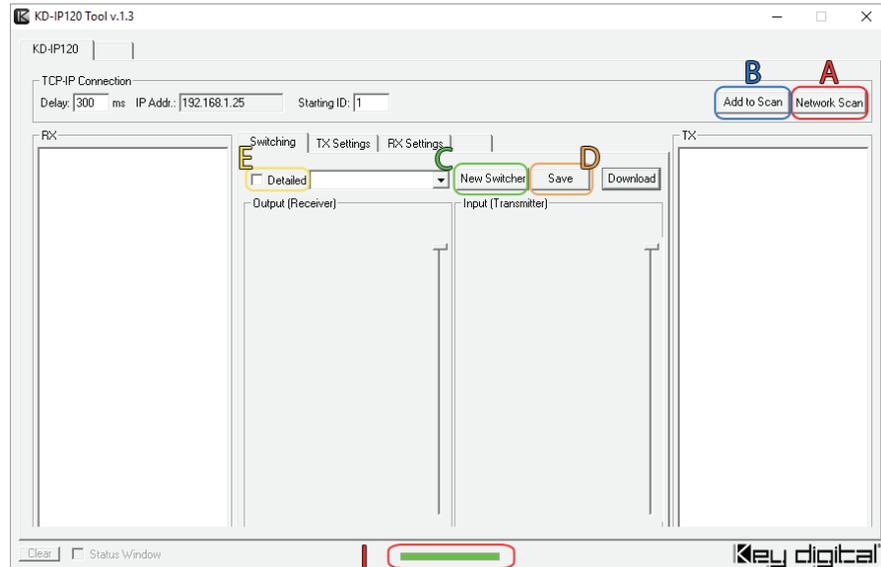
After scanning is complete **(the status bar must be green, Indicator I)**, select "New" **(Indicator C)** and a pop-up window will appear. Insert a name for the system **(Indicator F)**, example: switcher_8x24, and insert the number of inputs/outputs in its respective text field then click "OK".
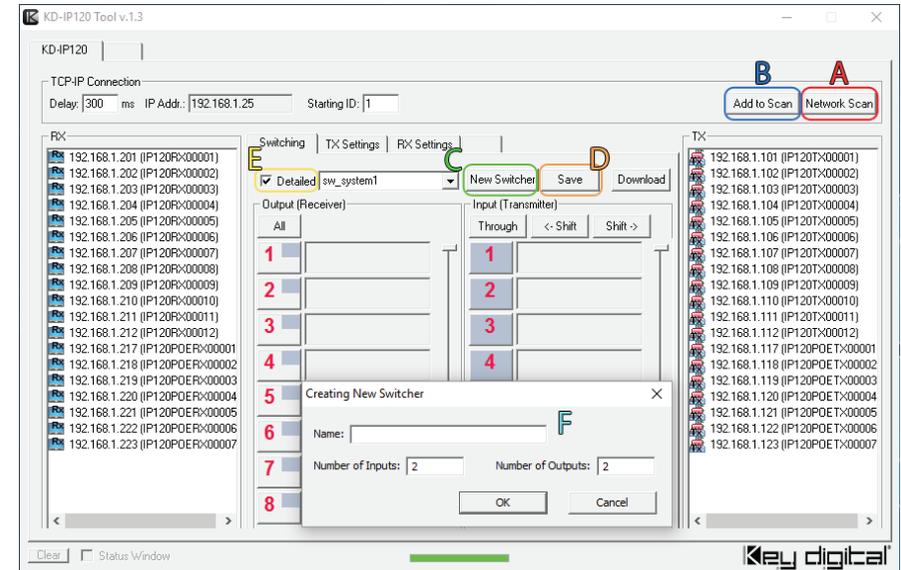
Once the file is created, all inputs/outputs will auto populate. Drag and drop Rx units into an Output Number and Tx units into an Input Number.

> » **Green text** for Output and Input means that the unit has been successfully added. The Output/Input Number will show black text for Name of unit and MAC Address when successfully added.

> » **A red Output/Input Number** with no unit name and a red MAC Address means that the unit was added to the file but cannot be found in the system.

> » **A red Output/Input Number** with no unit name and no MAC Address means that the position is open and a Tx/Rx unit may be added to it.

To save all changes, click **Save**.
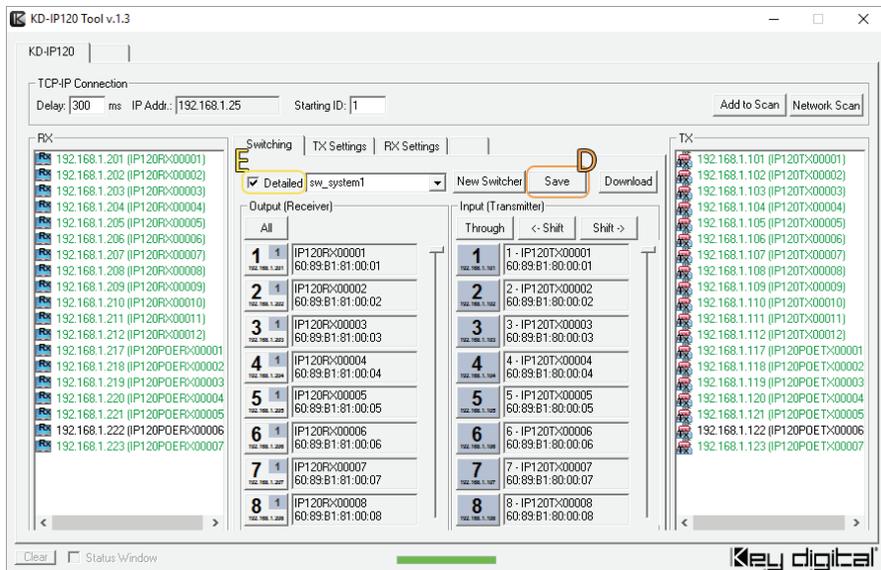
Once all units are discovered and configured, click "Detailed" to be checked off to have basic control of the matrix system (Indicator E). To switch sources, select a Output first then select an Input.
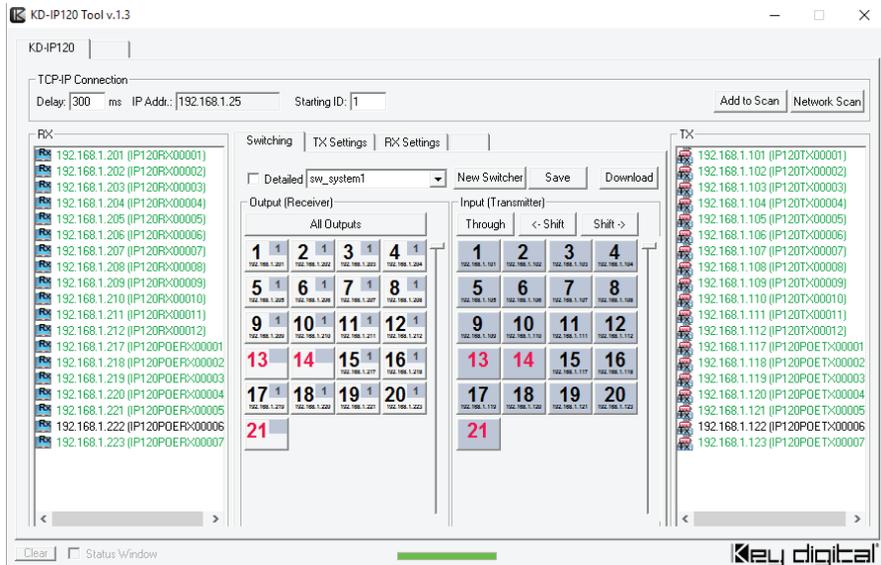
Web Interface

The KD-IP120 Web Interface provides basic configuration settings for operation.

To use the Web Interface, connect a PC to the Smart Managed Switch and ensure that the IP address is on the same subnet as the KD-IP120 unit.

First method of connection to a KD-IP120 unit may be done by using a crossover network cable directly from your computer. Second method is using a straight cable from KD-IP120 to the Smart Managed Switch to the computer. **The default TCP-IP address of a KD-IP120 Tx unit is 192.168.1.101 and KD-IP120 Rx is 192.168.1.201.**

To enter the Web Interface, ensure that your computer is on the same network as the KD-IP120. Connection may also be made directly to the unit with a cross-over cable for Tx units, or a straight cable for Rx units. Open your web browser and enter the IP address of the KD-IP120 into the web cell.
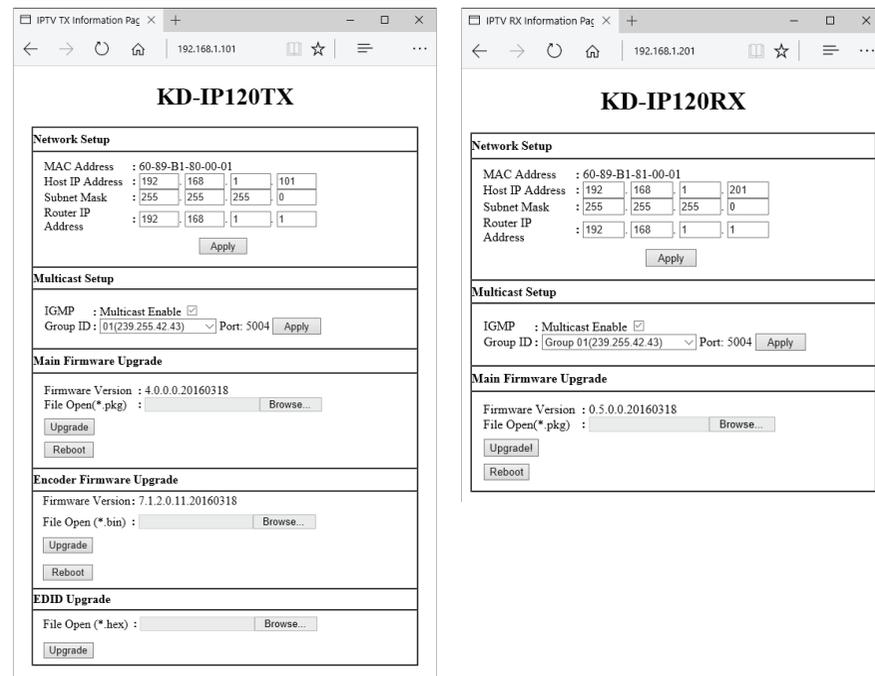
Once connected, the KD-IP120 web interface would look like this **(Tx on left, Rx on Right)**.

Network Setup, Multicast Setup, and Main Firmware Upgrade are the same for both Tx and Rx units.

For KD-IP120 Tx and Rx

› **Network Setup** is where the IP Addresss, Subnet Mask, and Router IP Address may be changed when. Click Apply to save changes

› **Multicast Setup** is where the Group ID may be changed and IGMP may be enabled or disabled. ****Please be aware that Group ID's cannot clash for Tx Units. Each Tx Unit must have a unique Group ID. Treat Group ID as Source Input Number. Rx Unit Group ID's are to connect to a Tx to view video from that source****

› **Main Firmware Upgrade** is where the firmware of the unit may be upgraded by file. Reboot may also be accessed from here.

For KD-IP120 Tx Only

› **Encoder Firmware Upgrade** is where the encoder may be upgraded by file. Encoder feature may be rebooted from here.

› **EDID Upgrade** is where the EDID settings may be changed by file. Update the EDID per specific Tx source to ensure the optimal video resolution is output by your source. Default EDID file of KD-IP120 units is 1080p with 2ch audio.

» Email tech@keydigital.com for additional EDID files.

Protocol: RS-232 and TCP/IP Commands

With the companion of a KD-MC1000 or other Compass Control MC gateways, 3rd party integrators may control the switching capabilities of the KD-IP120 system with a few simple commands.

Connection to the KD-IP120 via KD-MC1000 plugged into the same network may be done through RS-232 or TCP/IP.

For RS-232 control, the only Multi-Function I/O port that supports a RS-232 connection for KD-IP120 control is the Zigbee RS-232 I/O port on the rear of the KD-MC1000, model KD-3.5MDB964C.The KD-MC1000 comes with a special 3.5 to RS-232 cable that has 3 rings, 4 conductors. This is the only cable that may be used in the Zigbee RS-232 I/O port.

› RS-232 Protocol:
  » Baud Rate = 57600 bits per second
  » Data Bits = 8
  » Stop Bits = 1
  » Parity = None
  » Flow Control = None
  » Carriage Return: Required
  » Line Feed: Required
› Commands are not case-sensitive. Spaces shown below may be excluded.
› Carriage return and line feed is required at the end of each string.

RS-232 cable pin out

Pin 5 – Ground

Pin 3 – Receive

Pin 2 – Transmit
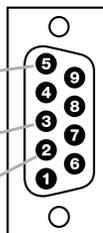
For TCP/IP control, make sure the TCP/IP client is on the same network as the KD-MC1000 and the KD-IP120. The port for control is telnet (23).

Commands:

SPO xxxx SI yyyy Switches the desired Video Input to the desired Output

xxxx = the Output number [0000 to 9999] –or– [A] for all

Value for xxxx/yyyy may range from 2 to 4 characters long (xx to xxxx).

yyyy = the Input number [00 to 1024] –or– [U, D] for "Up" and "Down" respectively

[U, D] will increase/decrease the input number from its current position

This command will switch Inputs to your desired Output

Example: To switch Output 8 to Input 4, issue the command: SPO08SI04

Example: To increment the Input Up on Output 14, issue the command: SPO14SIU

Example: To switch All Outputs to Input 9, issue the command: SPOASI09

STA Gets Status of KD-IP120 System

STPI xxxx Gets Video Status of Tx Input
xxxx = the Input number [00 to 1024]

STPO xxxx Gets Video Status of Rx Input
xxxx = the Output number [0000 to 9999]

SPCDF Reset All to Factory Default

Specifications

Technical:

» Inputs (each): 1 HDMI connector, Type A, 19 pin female; 1 HD

» Outputs (each): 2 HDMI connectors, Type A, 19 pin female;

» TMDS Bandwidth: 2.25 Gb/s per Channel

» Deep Color Support: Supports digital video formats in Deep Color Mode up to 12 bits/color with all HDMI and HDCP technologies

» Link: Single Link

» DDC Signal (Data): Input DDC signal – 5 Volts p-p (TTL)

» HDMI Video/Audio Signal: 1.2 Volts p-p

» DDC Communication: EDID and HDCP buffering between source and display

» Power: KD-PS5V2ASC, 5V/2A, 100-240VAC, 50-60Hz, Interchangeable head, screw-in connector

## General:

» Regulation: CE, RoHS, WEEE

» Enclosure: Black Metal

» Rack Mount: 1U, full rack-width (rack ears included)

» Product (Each): 4.74" x 3.11" x 1.16", Weight: 0.6 lbs

» Packaging: 6.2" x 4.2" x 3.7"; Weight 2 lbs

System Examples

Enterprise AV
HD Over IP System
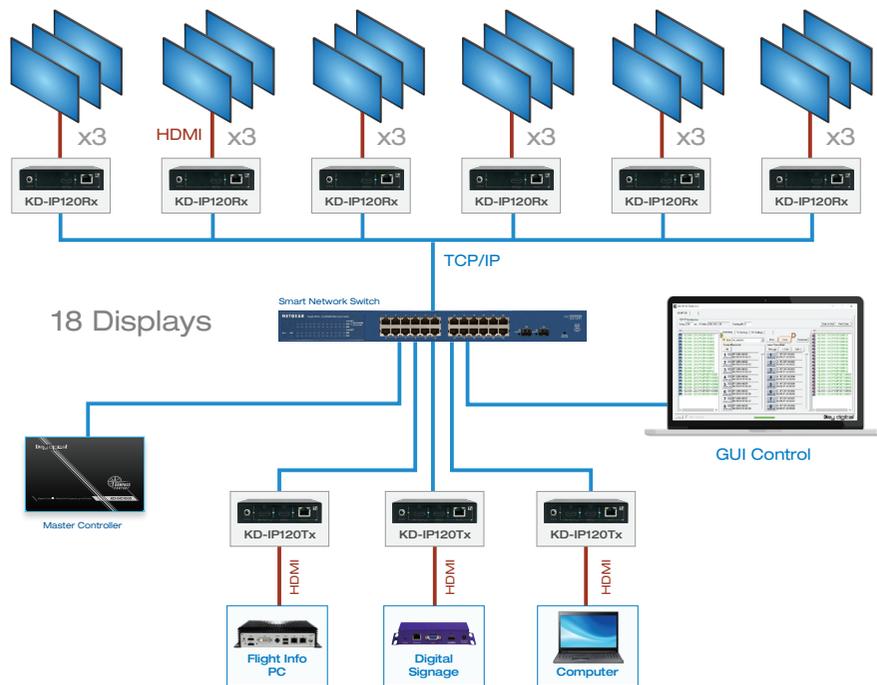
Enterprise AV
Large Scale HD Over IP System
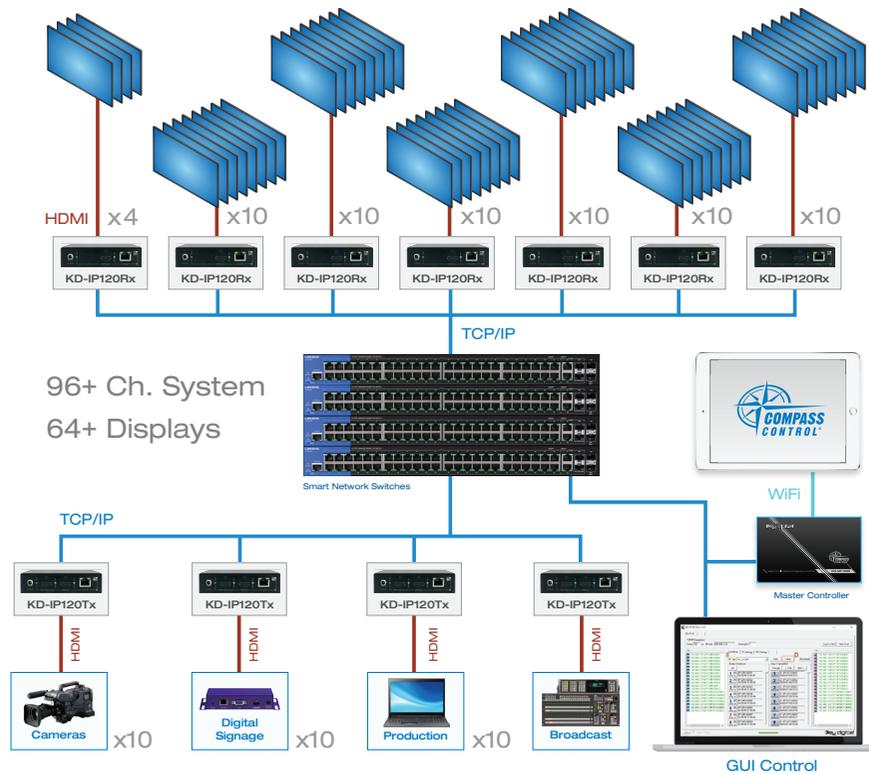
⚠ Important Product Warnings:

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

LIMITED **10 YEAR** WARRANTY

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 10 Year Product Warranty Policy.

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