KD-CAMUSB

PTZ USB 2.0 1080p Camera, IR/RS-232/VISCA Controllable

Key digital®

The Experts in Digital Video Technology and Solutions™

Table of Contents

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

Always follow the instructions provided in this Operating Manual.

About KD-CAMUSB

Key Digital® KD-CAMUSB is a professional USB Camera with pan, tilt, and 10x zoom functionality ideal for use in Huddle Spaces, Conference Rooms, Board Rooms, Lecture Halls, and more. KD-CAMUSB easily works with PCs by using generic USB drivers for Windows 7, 10, and Linux. Use KD-CAMUSB in systems with supported Key Digital Presentation Solutions Extenders and Switchers including for app-ready control and to provide a large room view or to focus in on meeting participants while using popular video conferencing software. Users may store & recall up to 12 presets for quick and easy viewing of the desired room perspectives and participants. KD-CAMUSB is RS-232 and VISCA controllable for integration with major control systems and camera control consoles.

Key Features

- **USB 2.0 Pan-Tilt-Zoom Camera:** Professional USB camera ideal for Video Conferencing and Capture applications in Huddle Spaces, Conference Rooms, Board Rooms, Lecture Halls, and more.

- **Compatible Operating Systems:** Generic USB Video Class Driver for effortless use on Windows 7, Windows 10, Mac OS X, and Linux machines

- **Video Conference Software Support:** Delivers professional PTZ features for popular video conference software such as Skype®, GoToMeeting®, Microsoft Teams®, Zoom™, RingCentral®, Google® Hangouts, and more

- **Soft Conference Enabling System:** Use with Key Digital Presentation Solutions family including KD-UPS52U, KD-X100MRx, KD-XUSB2, KD-PS42, and KD-X40MRx to add USB plug-in wall plates, USB/KVM routing and extension, Digital Video switching, integration with professional audio visual systems (use external microphones as KD-CAMUSB does not feature built-in mic), TCP/IP and KD-App ready control.

- **KDPlug & Present System:** Add KD-CX800 to build programming-free automation system for room display on / off, screen control, auto switching, KD-CamUSB PTZ camera, KD-Amp220 amp with mic mix, and common video source control

- **Multiple Mounting Options:** Wall, and ceiling mounting hardware included. May also be table surface mounted.

- **Recall & Store Position Presets:** Up to 12 presets may be created, with up to 12 presets accessed via IR remote control on Home, Privacy, and numeric buttons.

- **Auto Focus:** Fast and accurate auto focus via leading auto focus algorithm

- **Video Resolutions:** From 320x240p @ 30fps up to 1920x1080p @ 30fps. Adjustable via Windows camera viewer and conferencing software camera settings panels

- **Pan-Tilt-Zoom:** Pan = ±170⁰. Tilt = -30⁰ to +90⁰. Zoom = 10x Optical Zoom

- **User-Friendly IR Remote:** Provides intuitive and ergonomic control

- **RS-232:** Bi-Directional control to/from KD-CAMUSB

- **VISCA Controllable:** Responds to VISCA protocol for control by PTZ camera control consoles. Supports addressing for multi-camera systems.

- **Addressable:** Up to 7 unique addresses for discreet control by RS-232 and/or VISCA systems

- **Control System Support:** Compass Control® Pro ready. Fully controllable by all IR, and RS-232 supported control systems via open API.

- **KD-App Ready:** When integrated with supported Key Digital Presentation Solutions Extenders and Switchers including KD-UPS52U, KD-X100MRx, KD-PS42, and KD-X40MRx. Pre-built GUI populates offering PTZ controls as source selection and display/projector controls via CEC Manager™.

Accessories:

- (1) 6ft USB A to USB B cable

- (1) Mounting Bolt

- (1) Power Supply, KD-PS12V2ASC, 12V 2A with screw-in connector

- (1) Remote, KD-RMCAM

- (1) 3-pin phoenix terminal

- (1) Wall mounting bracket

- (4) Wall mounting screws

- (1) Ceiling mounting upper bracket

- (1) Ceiling mounting lower cover

- (4) Ceiling mounting screws

Quick Setup Guide

Begin with KD-CAMUSB, the Host Computer, and any/all USB extension, switching devices turned off with power cables removed. Ensure that all desired functionality is achieved before installing. Refer to "Mounting" section for wall and ceiling mount instructions.

CONNECT

1. Connect KD-CAMUSB to host Computer using USB A to B cable.

   a. If using Key Digital Presentation Solution system with USB, refer to setup instructions of that system

   b. Connect KD-CAMUSB to a USB Device port and connect Computer to a USB Host port of the Key Digital Presentation System

   c. Ensure that Key Digital Presentation Switcher has correct USB Mode selected using the slide switch on the Presentation Switcher unit.

2. BEFORE connecting power supply to power outlet, secure power into KD-CAMUSB's screw connector

3. Power on KD-CAMUSB and host Computer

4. Allow time after Computer has completed boot up for USB to be recognized

CONFIRM

1. Open Camera application on Computer to confirm Camera is working well with Computer. Use camera swap button to ensure KD-CAMUSB is being viewed instead of built-in web cam.

2. You may now use KD-CAMUSB for your Conferencing and/or Capture software.

CONTROL

1. Use the included IR Remote to control the camera, create and call preset camera positions.

2. If installing with a Key Digital Presentation Solution for App-Ready integration, see "App Ready Installation with KD Presentation Switcher" section

3. Refer to full Operation Manual for RS-232 and VISCA control commands
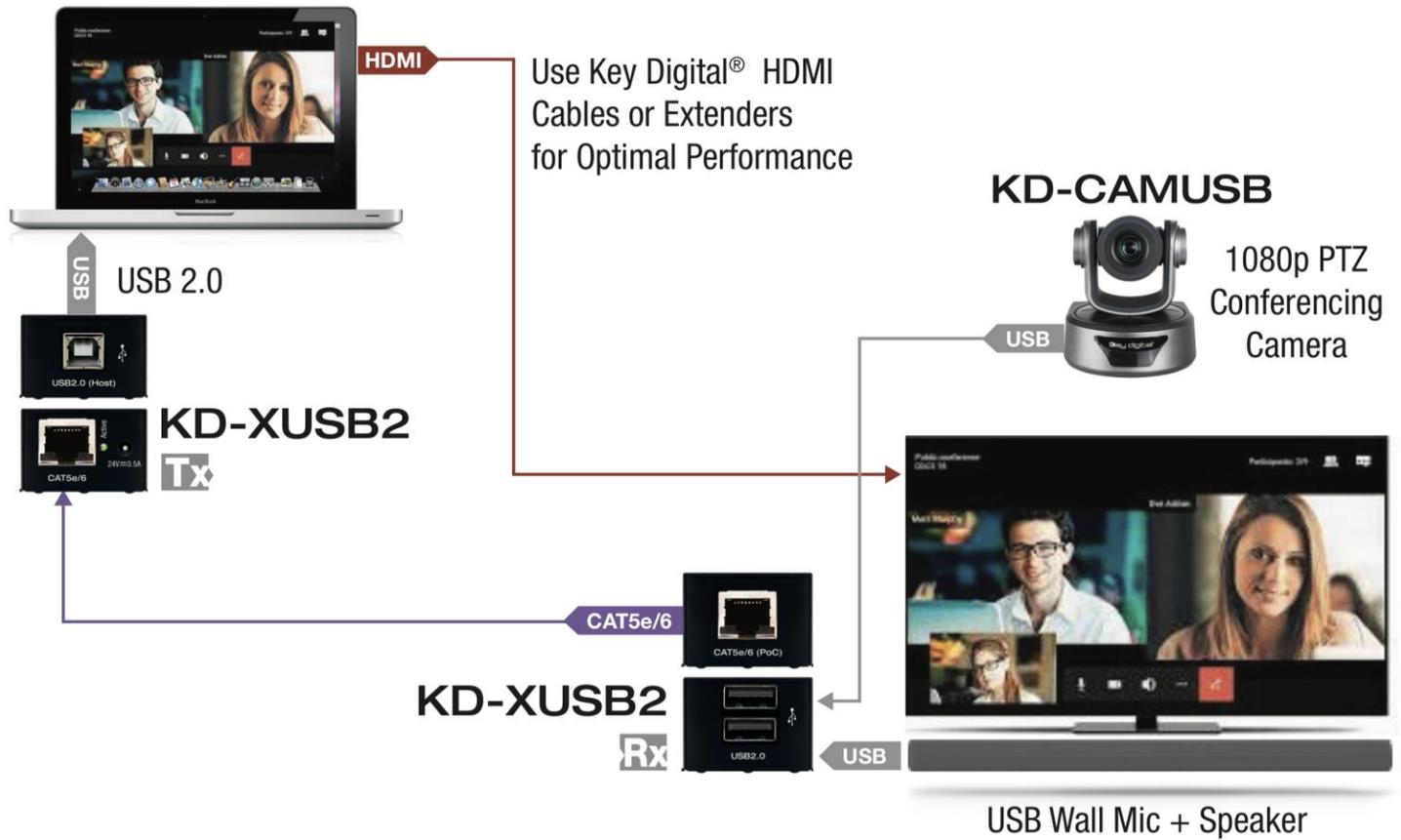
CREATE AND CALL CAMERA PRESETS

- Save camera's position to preset (0 - 9, Home, Privacy):

  o Preset --> 0 - 9 / Home / Privacy

- Restore all Presets to default (including Home and Privacy):
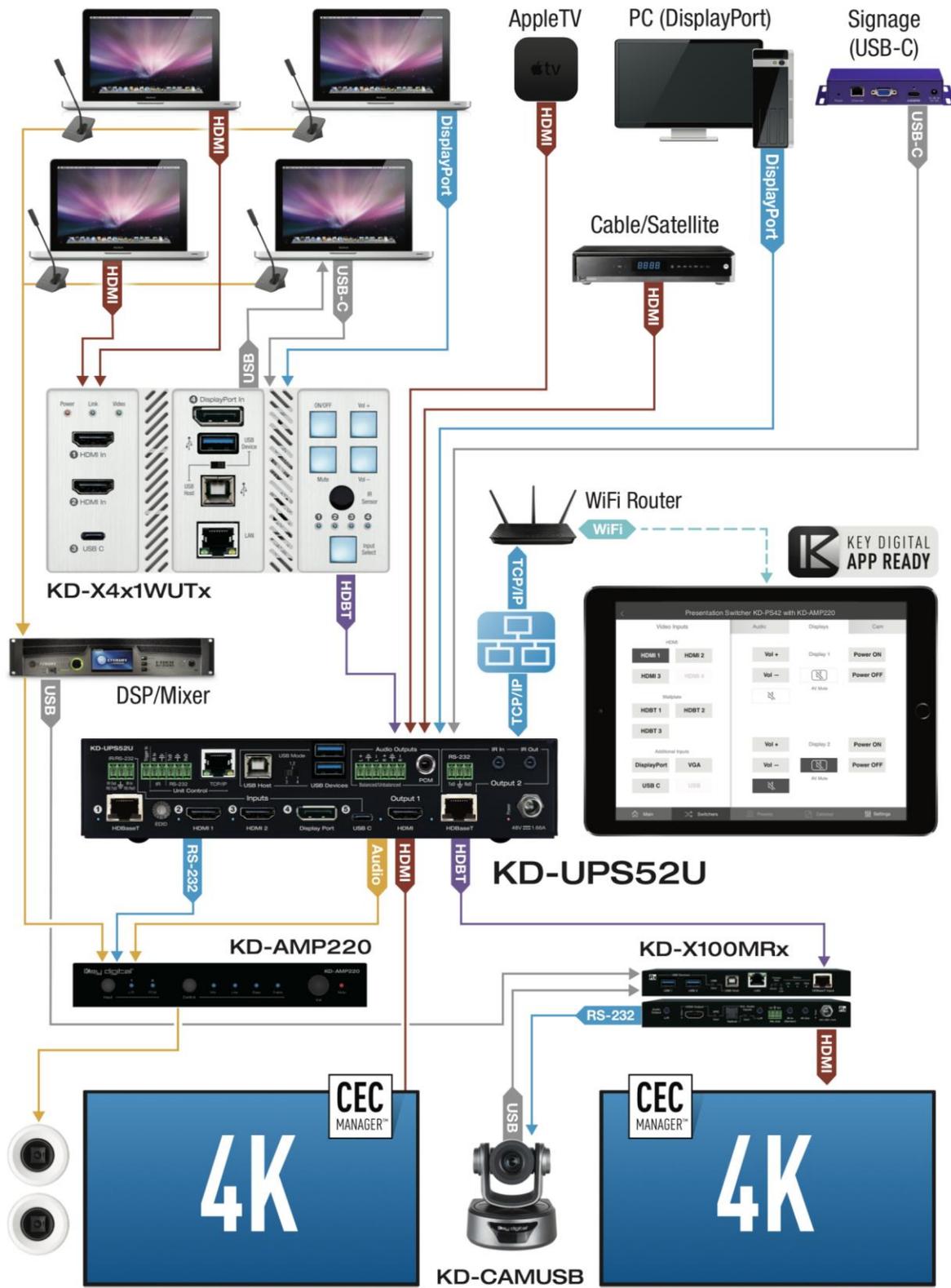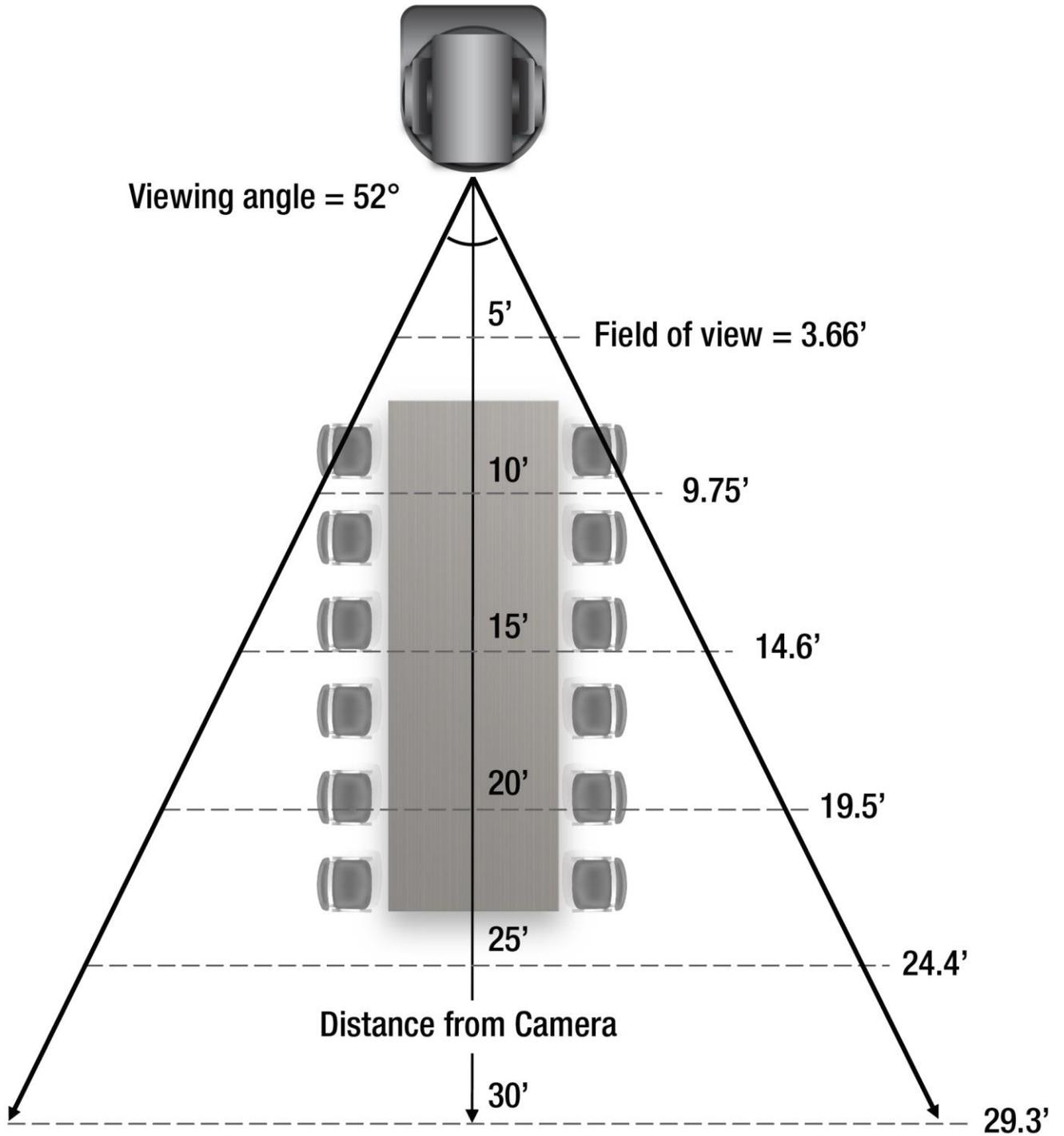
  o Preset --> R1 --> 1

Application Examples
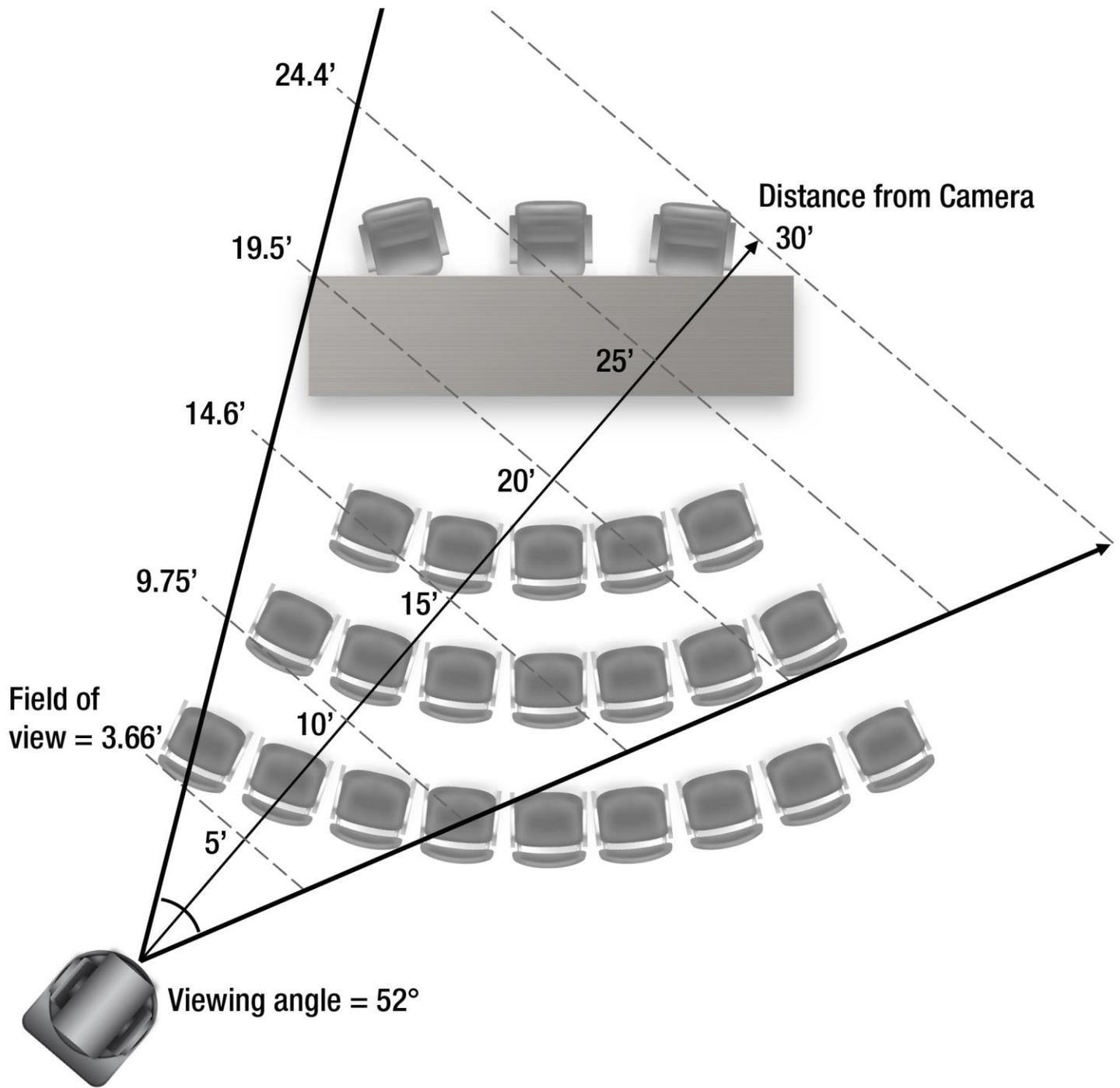
KEY DIGITAL USB EXTENDER INTEGRATION

KEY DIGITAL CONFERENCE ROOM PRESENTATION SYSTEM

VIDEO CONFERENCING – LINE OF SIGHT

Viewing angle = 52°

Field of view = 3.66'

5'

10' — 9.75'

15' — 14.6'

20' — 19.5'

25' — 24.4'

Distance from Camera

30' — 29.3'

LECTURE CAPTURE – LINE OF SIGHT

24.4'

19.5'

Distance from Camera

30'

25'

14.6'

20'

9.75'

15'

Field of
view = 3.66'

10'

5'

Viewing angle = 52°

Camera Attributes

CAMERA

- Supported Video Resolutions:

    o 320x240p @ 30fps

    o 640x360p @ 30fps

    o 640x480p @ 30fps

    o 1280x720p @ 30fps

    o 1920x1080p @ 30fps

- Optical Zoom = 10X

- Viewing Angle = 52 degrees

- Effective Pixels = 2.1 Megapixels, 16:9

MOTOR

- Pan = Horizontal Angle: ±170° (Maximum speed: 100° /s)

- Tilt = Vertical Angle: -30° to +90° (Maximum speed: 60° /s)

- Variable PTZ speed setting

- 12 definable presets, including Home and Privacy

- +/- 0.01° precise location algorithm for quick and accurate preset recall

- Upon bootup, KD-CAMUSB will shift position from bottom-left to bottom-right, ensuring camera's proper center coordinates.

- **Note: Do not physically shift the motor.** Doing so may cause motor damage. Motor will lose Home and Preset coordinates. Power cycle camera if so.

IR SENSOR

- Collects line of sight infrared from remotes without external connecting block

- Receives signals from a 90° angle at up to 30 ft.

- Accepts maximum IR burst frequency of 55kHz

Connections, Switches, and LEDs

FRONT LED

- **GREEN** solid illumination when power is ON
- **RED** solid illumination when power is OFF

UNIT REAR

USB

- Effortless use on Windows 7, Windows 10, Mac OS X, and Linux machines
- Generic USB Video Class 1.1 Driver
- USB-B 2.0 with Female connector type
- Video stream bandwidth = < 100Mbps
- Use KD-XUSB2 if USB extension is needed beyond 5m / 16.4ft. KD-XUSB2 extends USB2.0 signals up to 50m / 164ft via single CAT5e/6.

RS-232 Port

- Default baud rate = 9,600.
  - May also be set to 4,800 via dipswitch setting
- Pinout:
  - Pin 1 = TxD
  - Pin 2 = Ground
- Pin3 = RxD
  - See RS-232 Control section

Power

- 12V/2A (24W) Power Supply. Center-in positive
- First connect KD-CAMUSB side, then connect wall outlet side
- **GREEN** LED indicator light illuminates solid with active power connection

UNIT BOTTOM

Dipswitches

- 8 dipswitches
- Used for setting unit address, RS-232 baud rate, and loading firmware
- Default position = Up, Down, Down, Down, Down, Down, Down, Up
- Enables up to 7 unique unit addresses for discrete RS-232 and/or VISCA control
- Note: Changing dipswitch settings must be done when KD-CAMUSB's power is OFF. Then, power ON unit for changes to apply.

Camera ID	Pin #							
	1	2	3	4	5	6	7	8
Address 1	↑	↓	↓	-	-	-	-	↑
Address 2	↓	↑	↓	-	-	-	-	↑
Address 3	↑	↑	↓	-	-	-	-	↑
Address 4	↓	↓	↑	-	-	-	-	↑
Address 5	↑	↓	↑	-	-	-	-	↑
Address 6	↓	↑	↑	-	-	-	-	↑
Address 7	↑	↑	↑	-	-	-	-	↑
9,600 Baud Rate	-	-	-	-	↓	-	-	↑
4,800 Baud Rate	-	-	-	-	↑	-	-	↑
FW Update	-	-	-	-	-	-	-	↓

Dimensions and Mounting

DIMENSIONS

Length = 6.93in / 176mm, Width = 6.14in / 156mm, Height = 6.69in / 170mm
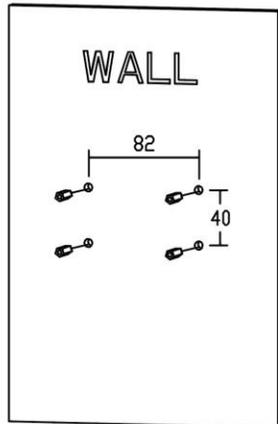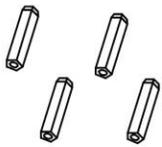
Weight = 2.2lbs / 1.0kg

MOUNTING

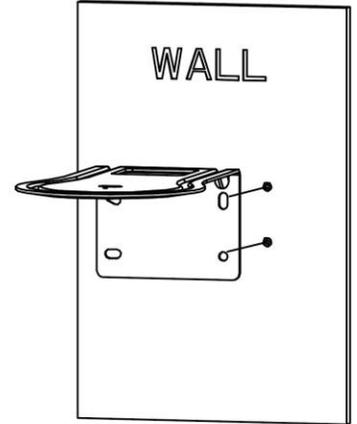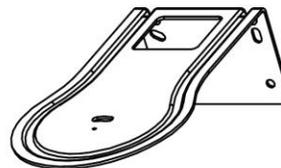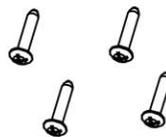Tripod style mounting bolt: 1/4-20 UNC screw (included)

NOTE: Do not install on drop ceiling / plasterboard.
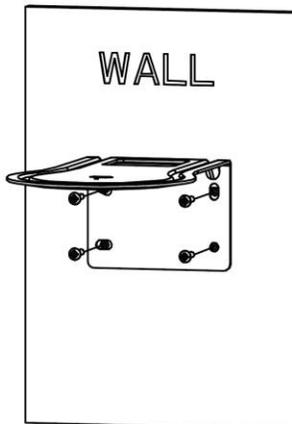
Wall Mounting:

Ceiling Mounting:

1.

2.

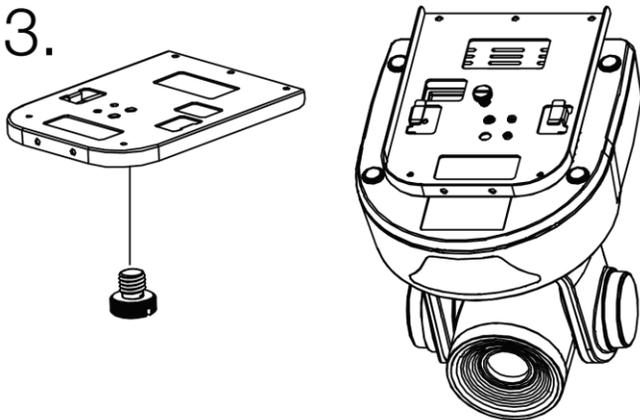3.

4.
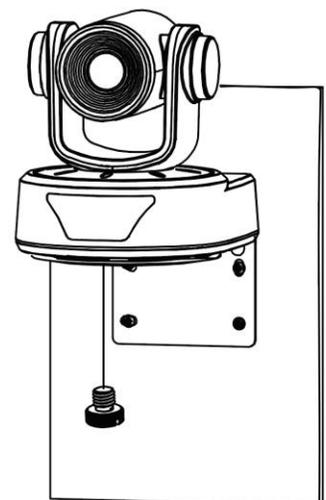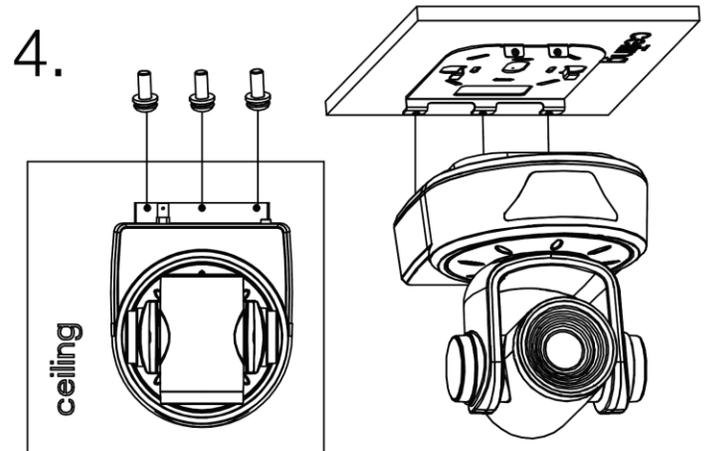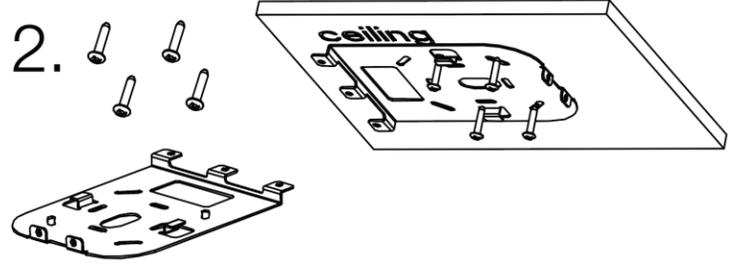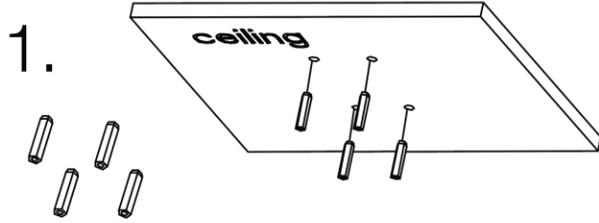
Settings and Adjustments via Remote

Note: Menu, Return, and Select buttons have no current functionality

Button Sequences

- Write to Preset (0 - 9, Home, Privacy)
  - Preset --> 0 - 9 / Home / Privacy
- Restore all Presets to default (including Home and Privacy)
  - Preset --> R1 --> 1

App Ready Installation with KD Presentation Switcher & KDPlug & Present System

KD-CAMUSB may be integrated with compatible Key Digital Presentation Switcher products for a complete App Ready solution. The current compatible Presentation Switchers are KD-PS42 and KD-UPS52U.

Additionally, KD-CAMUSB is part of the KDPlug & Present System and may be integrated with KD-CX800 to build a programming-free system for KD-CAMUSB PTZ control via the Key Digital app.
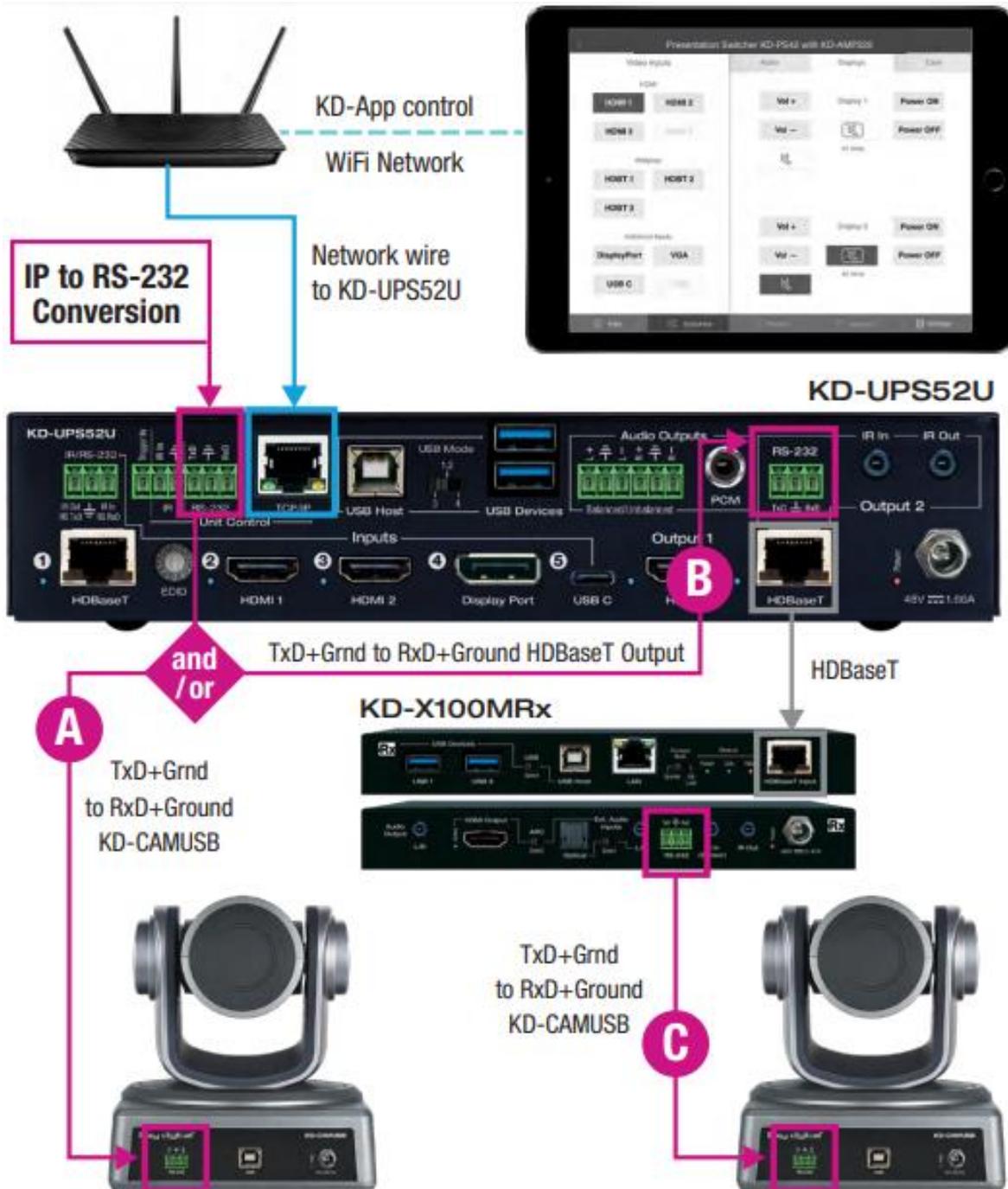
CONNECT

KD-CAMUSB is controlled via RS-232 from the Presentation Switcher (PS). Multiple (up to 7, currently) KD-CAMUSB units may be installed with App Ready control. Third-party RS-232 repeaters may be required in systems with more than 2 KD-CAMUSBs.

To connect from the PS's RS-232 Unit Control port:

    a. Connect wires from the PS's RS-232 TxD and Ground pins into the KD-CAMUSB's RS-232 RxD and Ground pins. See wire **A** in above diagram.

To connect from the PS's HDBaseT Receiver RS-232 Control port:

    a. Connect wires from the PS's RS-232 TxD and Ground pins into the PS's HDBaseT (Output 2) RxD and Ground pins. See wire **B** in above diagram.

    b. Connect from the HDBaseT Receiver's TxD and Ground pins into the KD-CAMUSB's RxD and Ground pins. See wire **C** in above diagram.

CONFIGURE

Use Key Digital Management Software™ Pro (KDMS™ Pro)

1. Connect your Presentation Switcher to your PC via the front USB
2. Press SCAN ➔ USB DEVICE **2** and select the Presentation Switcher found in the Device's window
3. In the Properties window, scroll down to the Video/Audio Settings section and use the CAMUSB Control dropdown **3a** to select the amount of KD-CAMUSBs integrated with your Key Digital Presentation Switch Control checkbox, then press APPLY **3b**

KDMS™ Download Page
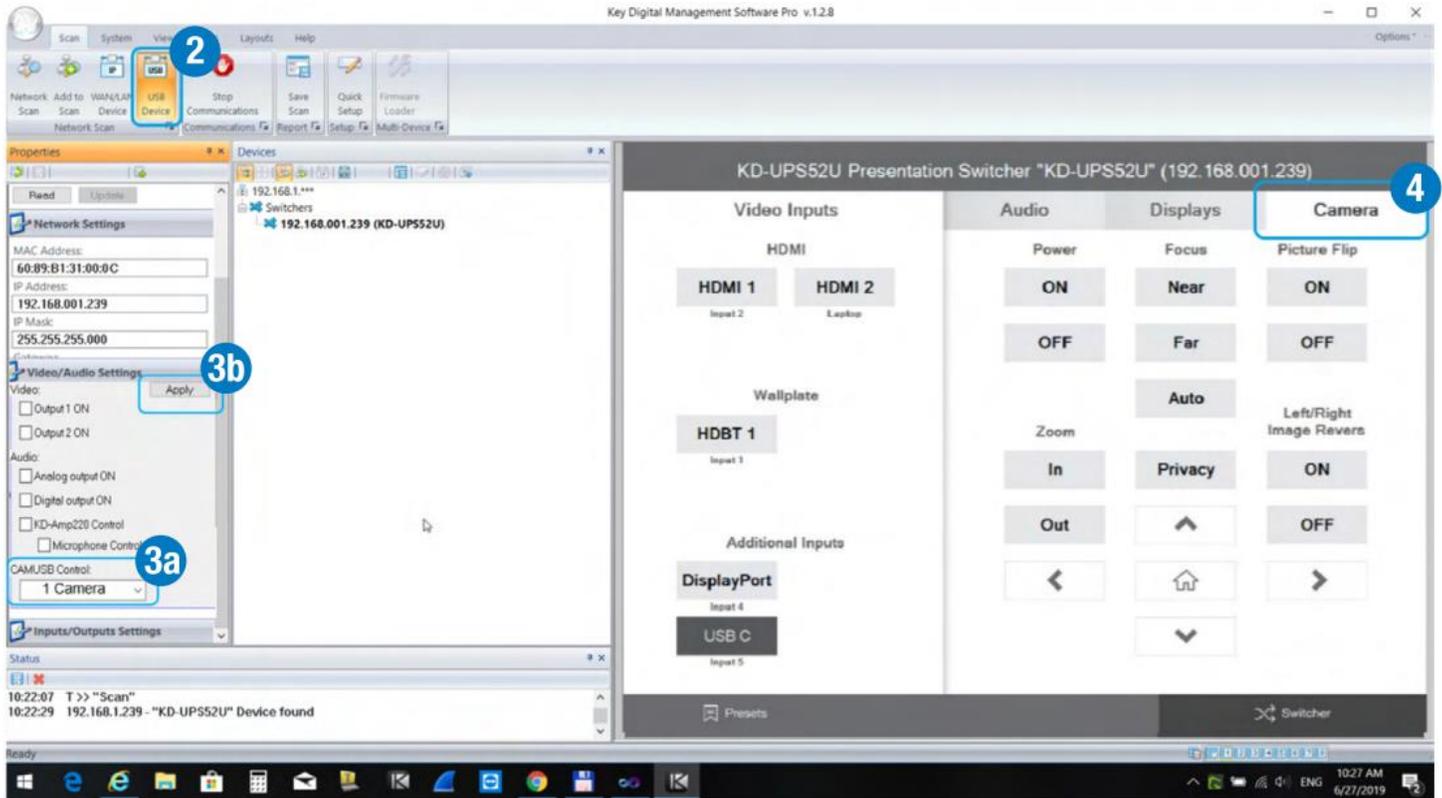
CONTROL

4. In KDMS™ Pro, select the Camera tab **4** to enter the camera controls page
5. For iOS control, download the Key Digital App.
6. With the iOS device on the same network as the Presentation Switcher, open the KD-App, and press DEVICES to perform a network scan for your system.
7. Once the system has been detected, you may enter the control page and choose the Camera tab to enter the camera controls page

Key Digital® App on the App Store

RS-232 and VISCA Control

RS-232 cable pinout

Master Controller	KD-CAMUSB
Tx	Rx
Rx	Tx
Ground	Ground

RS-232 and VISCA Command Protocol

- Baud Rate = 9600 bits per second
- Data Bits = 8
- Stop Bits = 1
- Parity = None
- Flow Control = None
- Commands should be sent in all caps.
- Underscore ("_") character at end of each RS-232 command must be included
- Carriage return and line feed is required at the end of each string.

Command Notes

- For VISCA control, the first byte of each command is 8x, where x is the address of the camera as assigned by the dip switch position
- For RS-232 commands, the character y is the address of the camera, as assigned by the dip switch position
- Some commands contain parameter values, as indicated by p, p1, p2

Command List

RS-232 Command	Response	Description	VISCA Command
KD**y**CAMON_	DONE_CAMON_	System Power On	8x,01,04,00,02,FF
KD**y**CAMOFF_	DONE_CAMOFF_	System Power Off	8x,01,04,00,03,FF
KD**y**CAMZI**p**_	DONE_CAMZIp_	Zoom In (p = 0 slow - 7 fast)	8x,01,04,07,2**p**,FF
KD**y**CAMZO**p**_	DONE_CAMZO**p**_	Zoom Out (p = 0 slow - 7 fast)	8x,01,04,07,3**p**,FF
KD**y**CAMZS_	DONE_CAMZS_	Zoom Stop	8x,01,04,07,00,FF
KD**y**CAMFF_	DONE_CAMFF_	Focus Far	8x,01,04,08,02,FF
KD**y**CAMFN_	DONE_CAMFN_	Focus Near	8x,01,04,08,03,FF
KD**y**CAMFS_	DONE_CAMFS_	Focus Stop	8x,01,04,08,00,FF
KD**y**CAMFA_	DONE_CAMFA_	Auto Focus	8x,01,04,38,02,FF
KD**y**CAMUP_	DONE_CAMUP_	Picture Flip On	8x,01,04,66,02,FF
KD**y**CAMDN_	DONE_CAMDN_	Picture Flip Off	8x,01,04,66,03,FF
KD**y**CAMLF_	DONE_CAMLF_	Left/Right Reverse On	8x,01,04,61,02,FF
KD**y**CAMRT_	DONE_CAMRT_	Left/Right Reverse Off	8x,01,04,61,03,FF
KD**y**CAMTUxx_	DONE_CAMTUxx_	Tilt Up p1 = pan speed [01 (slow) – 18 (fast)] p2 = tilt speed [01 (slow) – 14 (fast)]	8x,01,06,01,**p1**,**p2**,03,01,FF

KD**y**CAMTDxx_	DONE_CAMTDxx_	Tilt Down p1 = pan speed [01 (slow) – 18 (fast)] p2 = tilt speed [01 (slow) – 14 (fast)]	8x,01,06,01,**p1**,**p2**,03,02,FF
KD**y**CAMPLxx_	DONE_CAMPLxx_	Pan Left p1 = pan speed [01 (slow) – 18 (fast)] p2 = tilt speed [01 (slow) – 14 (fast)]	8x,01,06,01,**p1**,**p2**,01,03,FF
KD**y**CAMPRxx_	DONE_CAMPRxx_	Pan Right p1 = pan speed [01 (slow) – 18 (fast)] p2 = tilt speed [01 (slow) – 14 (fast)]	8x,01,06,01,**p1**,**p2**,02,03,FF
KD**y**CAMTS_	DONE_CAMTS_	Pan Tilt Stop	8x,01,06,01,04,04,03,03,FF
KD**y**CAMPV_	DONE_CAMPV_	Move the camera to Privacy position	
KD**y**CAMHM_	DONE_CAMHM_	Move the camera to Home position	
KD**y**CAMSPH_	DONE_CAMSPH_	**Save Home preset:** Set Preset to Home position with the current camera position	
KD**y**CAMSPP_	DONE_CAMSPP_	**Save Privacy preset:** Set Preset to Privacy position with the current camera position	

KD**y**CAMSP**p**_	DONE_CAMSP**p**_	**Save preset p:** Set Preset to p (p = 0-9) with the current camera position	
KD**y**CAMRP**p**_	DONE_CAMRP**p**_	**Call saved p preset:** Run p (p = 0-9) Preset	
KD**y**CAMRST_	DONE_CAMRST_	**Factory Default:** Reset (Remove) all presets and set the default current position of Home and Privacy.	
KD**y**CAMVER_	DONE_CAMVERxxx_	xxx : firmware version (000-999)	

Specifications

Technical:

- Pan = ±170º
- Tilt = -30º to +90º
- Zoom = 10x Optical Zoom
- Viewing Angle: 52°
- Supported Resolutions: 1080p 30fps, 720p 30fps, 800x400p 30fps, 640x480p 30fps, 320x240p 30fps
- 10 camera presets plus home and privacy position
- Effective Pixels: 2.1 Megapixels, 16:9
- HOV: 47° - 5.3°
- Minimum Illumination: 0.1 Lux
- White Balance: Auto
- Focus: Auto
- Signal to Noise Ratio: >52db
- Sensor: 1 / 2.8" HD CMOS Sensor
- Video Output: USB 2.0
- USB Protocol: UVC 1.1

General:

- Unit Length = 6.93in / 176mm
- Unit Width = 6.14in / 156mm
- Unit Height = 6.69in / 170mm
- Unit Weight = 2.2lbs / 1.0kg
- Package Length = 11.02in / 280mm
- Package Width = 10.63in / 260mm
- Package Height = 10.63in / 270mm
- Package Weight = 6.17lbs/ 2.8kg
- Mounting: 1/4-20 UNC screw, wall mount and ceiling mount hardware all included.

Power:

- Power supply = 12V 2A with screw-in connection

Warranty Information

All Key Digital® products are built to high manufacturing standards and should provide years of trouble-free operation. They are backed by a Key Digital Limited 3 Year Product Warranty Policy.

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

Product Warnings & Safety Instructions

⚠️ Important Product Warnings:

1. Connect all cables before providing power to the unit.

2. Test for proper operation before securing unit behind walls or in hard to access spaces.

3. If installing the unit into wall or mounting bracket into sheet-rock, provide proper screw support with bolts or sheet-rock anchors.

⚠️ Safety Instructions:

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

1. Read and follow all instructions.

2. Heed all warnings.

3. Do not use this device near water.

4. Clean only with dry cloth.

5. Install in accordance with the manufacturer's instructions.

6. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

7. Only use attachments/accessories specified by the manufacturer.

8. Refer all servicing to qualified service personnel. Servicing is required when the device has been damaged in any way including:

   o Damage to the power supply or power plug

   o 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.