User Manual

SCA21T-KVM

18Gbps HDMI+USB-C KVM Switcher KIT

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Version: SCA21T-KVM_2022V1.1

Preface

Read this user manual carefully before using the product. Pictures shown in this manual are for reference only. Different models and specifications are subject to real product.

This manual is only for operation instruction, please contact the local distributor for maintenance assistance. The functions described in this version were updated by April, 2022. In the constant effort to improve the product, we reserve the right to make functions or parameters changes without notice or obligation. Please refer to the dealers for the latest details.

FCC Statement

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference.

Any changes or modifications not expressly approved by the manufacture would void the user’s authority to operate the equipment.

SAFETY PRECAUTIONS

To ensure the best from the product, please read all instructions carefully before using the device. Save this manual for further reference.

- Unpack the equipment carefully and save the original box and packing material for possible future shipment.
- Follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burn.
- Using supplies or parts not meeting the products' specifications may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Do not put any heavy items on the extension cable in case of extrusion.
- Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards.
- Install the device in a place with fine ventilation to avoid damage caused by overheat.
- Keep the module away from liquids.
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
- Do not twist or pull by force ends of the cable. It can cause malfunction.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Unplug the power cord when left unused for a long period of time
- Information on disposal for scrapped devices: do not burn or mix with general household waste, please treat them as normal electrical wastes.

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1. Product Introduction

SCA21T-KVM is an 18Gbps switcher kit. It supports up to 4K/60/4:4:4, HDR10 and Dolby Vision, HDCP 2.2. It also supports uncompressed transmission of 18Gbps signals with a distance of up to 100m. At the same time, it can be connected to KVM equipment, which is very suitable for equipment connection and signal transmission in conference rooms. The switcher kit also supports RS232&CEC control and bidirectional 48V PoC

1.1 Features

- HDMI 2.0, highest support 4K@60HZ 4:4:4, HDR10 and Dolby Vision, HDCP 2.2,
- 1 x HDMI input, 1 x USB-B host, 1 x USB-C input, 1 x HDMI output and 1 x HDBaseT output
- HDBT 3.0, support 100m transmission and bidirectional 48V PoC
- Support RS232 control and CEC control
- USB-C input support 60W external charging
- Auto switch 5V or TMDS detection
- Support Dry Contact control

1.2 Packing List

1 x SCA21T-KVMT

4 x 3-pin terminal block

1 x 5-pin terminal block

1 x 3-pin to DB9 RS232 cable

2 x hangers

4 x screws

4 x foot pads

1 x SCU21T-KVMR

1 x 3-pin terminal block

1 x 5-pin terminal block

2 x hangers

2 x screws

4 x foot pads

1 x DC24V/5A power adapter

1 x English manual

1.3 Customer Service

We provide limited warranty for the product within **three years** counting from date of purchase (The purchase invoice shall prevail).

Note: *Please contact your distributor immediately if any damage or defect in the components is found.*

2. Specification

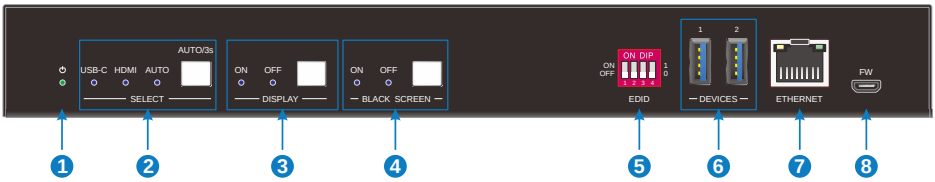
	Transmitter	Receiver
Video		
Video Input	(1) HDMI IN, (1) USB-C IN	(1) HDBT IN
Video Output Connector	(1) Type-A female HDMI (1) Type-C	(1) RJ45
Input Resolution	HDMI: Up to 4K@60Hz 4:4:4 HDR10, Dolby Vision USB-C: Up to 4K@60Hz 4:4:4	Up to 4K@60Hz 4:2:0
Video Output	(1) HDMI OUT (1) HDBT OUT	(1) HDMI
Video Output Connector	(2) Type-A female HDMI	(1) Type-A female HDMI
Output Resolution	HDMI: Up to 4K@60Hz 4:4:4 HDR10, Dolby Vision HDBT: Up to 4K@60Hz 4:2:0	Up to 4K@60Hz 4:4:4 HDR10, Dolby Vision
HDMI Standard	Up to HDMI 2.0b	Up to HDMI 2.0b
HDCP Version	Up to HDCP 2.2	Up to HDCP 2.2
Audio		
HDMI Embedded Audio Format	LPCM 7.1 audio, Dolby Atmos®, Dolby® TrueHD, Dolby Digital® Plus, DTS:X™, and DTS-HD® Master Audio™ pass-through.	
Audio Output Connector	(1) 5-pin terminal block	(1) 5-pin terminal block
Frequency Response	20Hz–20KHz, ±3dB	
Max Output Level	0.88 Vrms ± 0.5 dB. 2 V = 16 dB headroom above -10 dBV (316 mV) nominal consumer line level signal SPDIF: ±0.05dBFS	
THD+N	< 0.05% (-80 dB), 20 Hz – 20 kHz bandwidth, 1 kHz sine at 0 dBFS level (or max level)	
SNR	> 80dB, 20Hz-20 kHz bandwidth SPDIF: > 90dB, 20Hz-20 kHz bandwidth	
Crosstalk Isolation	< -80 dB, 10 kHz sine at 0 dBFS level (or max level before clipping)	
L-R Level Deviation	< 0.3 dB, 1 kHz sine at 0 dBFS level (or max level before clipping)	
Output Load Capability	1k ohm and higher (supports 10x paralleled 10k ohm loads)	
Noise Level	>70dB @ 1 kHz	
Control		

Control port	(1) EDID switch, (2) DEVICES (1) ETHERNET, (1) FW, (1) HOST, (2) GR, (2) RS232 (1) TCP/IP	(4) DEVICE, (1) ETHERNET (1) RS232
Control Connector	(1) 4-pin DIP switch (2) USB Type-A, (1) RJ45 (1) Micro-USB, (1) USB Type-B (2) 3-pin terminal block (2) 3-pin terminal block, (1) RJ45	(3) USB Type-A, (1) USB Type-C (1) RJ45, (1) 3-pin terminal block
General		
Operation Temperature	-5 ~ +55℃	
Storage Temperature	-25 ~ +70℃	
Relative Humidity	10% ~ 90%	
External Power Supply	Input: AC 100~240V, 50/60Hz; Output: 24V DC 5A.	
Power Consumption	76.5W (Max)	
USB-C Power Charging	60W(Max)	
Dimension (W*H*D)	265W x 150D x 32H mm	173W x 95D x 24.5H mm
Net Weight	1020g	410g

3. Panel Description

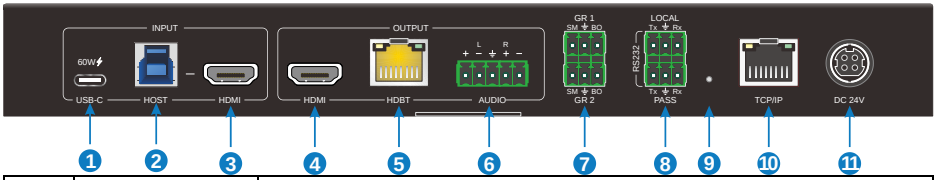
3.1 Transmitter

Front Panel



No.	Name	Description
①	Power LED	1 x green indicator light, the light is always on when the machine is working, and it goes out when the power is off
②	SELECT	● 1 x White non-backlit button, 3 x blue indicator lights, ● Click the button to select the input source (HDMI or USB-C), press and hold for 3 seconds to enter or exit automatic switching mode, and the corresponding indicator is always on
③	DISPLAY	● 1 x white non-backlit button, 2 x blue indicator lights; ● Press the button to send the DISPLAY ON/OFF CEC and RS232 commands to control the TX and RX display terminal switches at the same time, and the corresponding indicator light is always on;
④	BLACK SCREEN	● 1 x white non-luminous button, 2 x blue indicator lights; ● Press the button to enter or exit the output black screen state, and the corresponding indicator light is always on;
⑤	EDID	1 x 4-pin DIP switch for EDID management
⑥	DEVICES	2 x USB-A 3.0, connect keyboard, mouse, microphone, printer and other equipment
⑦	ETHERNET	1 x RJ45, used for network passthrough transmission
⑧	FW	1 x Micro-USB, used for MCU firmware upgrade

Rear Panel



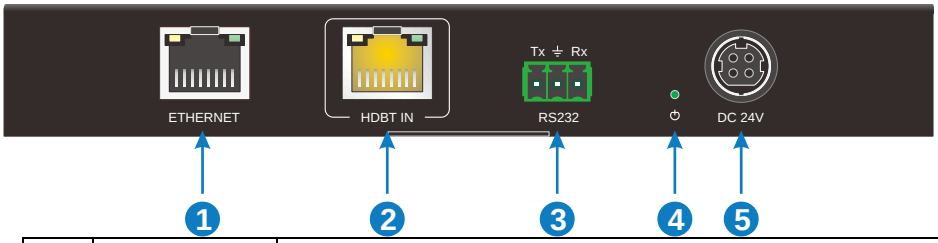
No.	Name	Description
①	USB-C	1 x USB-C 3.0 input, support external 60W charging
②	HOST	1 x USB-B 3.0, connect to HOST devices such as laptops
③	HDMI IN	1 x HDMI input, connect to HOST devices such as laptops
④	HDMI OUT	1 x HDMI loop output
⑤	HDBT	1 x HDBT output, the green light is always on when the signal is with HDCP, flashes when the input signal is without HDCP; the yellow light is always on after the TX and RX are connected;
⑥	AUDIO	1 x 5-pin balanced audio output, output audio de-embedding
⑦	Grommet	GR1: Correspond the USB-C GR2: Conrrespond the HDMI SM: Switch to the current source BO: Print a black screen to all outputs.
⑧	RS232	LOCAL: Connect the control devices to control the transmitter PASS: Bidirectional passthrough transmission with Receiver
⑨	Upgrade	1 x Built-in short-handled buttons, press and hold for 3s to enter the upgrade mode, and the power indicator flashes. At this time, you can upgrade the firmware through the serial port, and press the button again to exit the upgrade mode
⑩	TCP/IP	1 x RJ45, TCP/IP control
⑪	DC 24V	Connect DC24V5A power adapter

3.2 Receiver

Front Panel

No.	Name	Description
①	OUTPUT	● 1 x HDMI output; ● 1 x 5-pin balanced audio output, HDMI output audio de-embedding
②	DEVICES	3 x USB-A 2.0, 1 x USB-C, connect keyboard, mouse, microphone, printer, camera and other equipment

Rear Panel



No.	Name	Description
	ETHERNET	1 x RJ45, used for network passthrough transmission
②	HDBT IN	1 x RJ45 interface, the green light is always on when the signal is with HDCP, flashes when the input signal is not HDCP; the yellow light is always on after the TX and RX are connected
③	RS232	1 x 3-pin phoenix head, RS232 passthrough transmission
④	Power LED	1 x green indicator light, always on when machine is working
⑤	DC 24v	Connect DC24V5A power adapter

4. EDID Management

EDID are control by the EDID DIP switch, the specific description is as follows:

0000 Learn the display EDID in the default mode: read the EDID of the TX HDMI output and RX HDMI output, and output the EDID with the lower resolution of the two, if you can't learn it, then use the built-in 1920x1080@60 8bit Stereo

0001 1920x1080@60 8bit High Definition Audio

0010 3840x2160@60Hz Deep Color Stereo Audio

0011 3840x2160@30Hz 8bit Stereo Audio

0100 3840x2160@30Hz Deep Color High Definition Audio

0101 3840x2160@60Hz 4:2:0 Deep Color Stereo Audio

0110 3840x2160@60Hz Deep Color High Definition Audio

0111 3840x2160@60Hz Deep Color HDR LPCM 6CH

1011 Custom EDID1

1100 Custom EDID2

1101 Custom EDID3

1110 Custom EDID4

1111 EDID management

5. GUI Control

The SCU21T-KVM can be controlled via TCP/IP. The default IP settings are:

IP Address:192.168.0.178

Subnet Mask:255.255.255.0

Gateway:192.168.0.1

Please type the IP Address of the control PC in the internet browser, and it will enter the below log-in webpage.

Username: admin

Password: admin

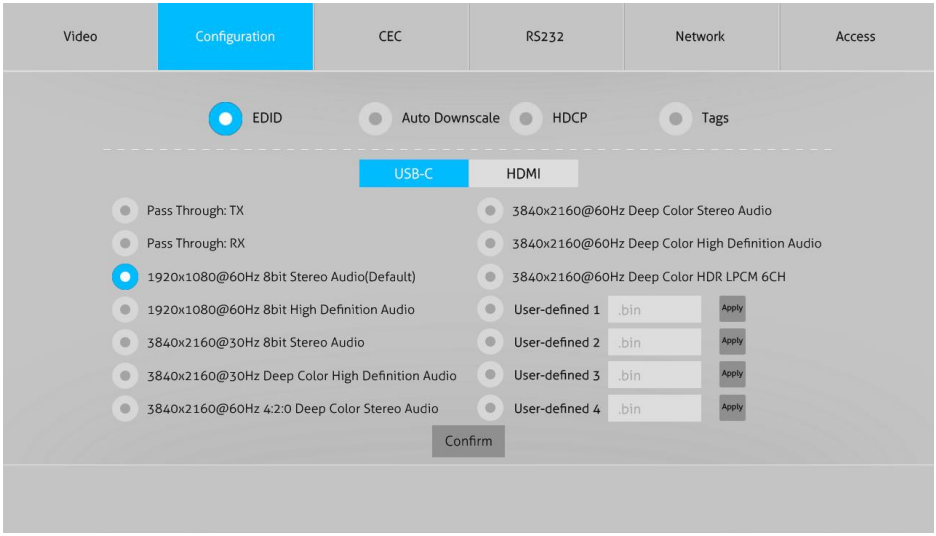
Please type the username and the password, and then click **LOGIN**.

5.1 Video Tab

- Choose the HDMI, USB-C or Auto source according to actual usage.

5.2 Configuration Tab

5.2.1 EDID

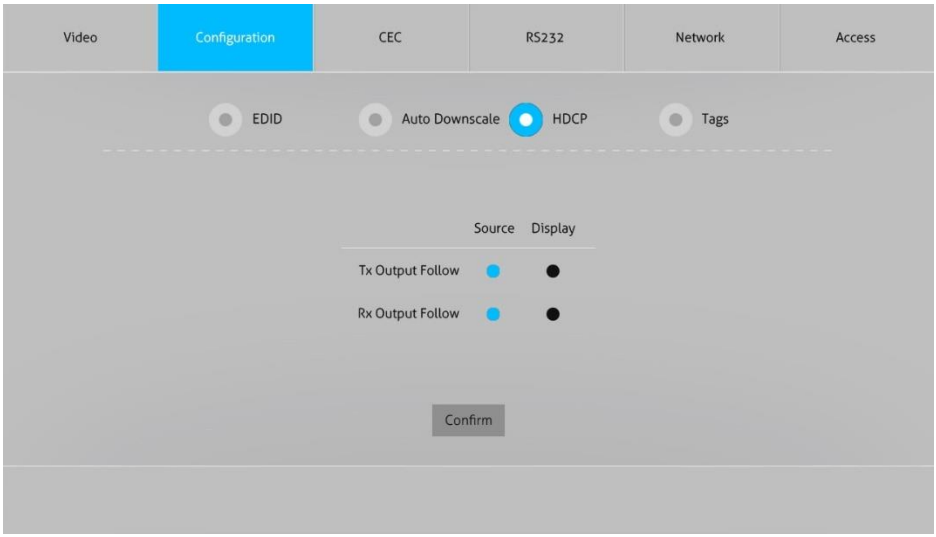


- Choose the desired EDID format or define the appropriate EDID format.

5.2.2 Auto Downscale

- Enable or disable the auto Downscale in TX or RX output.

5.2.3 HDCP



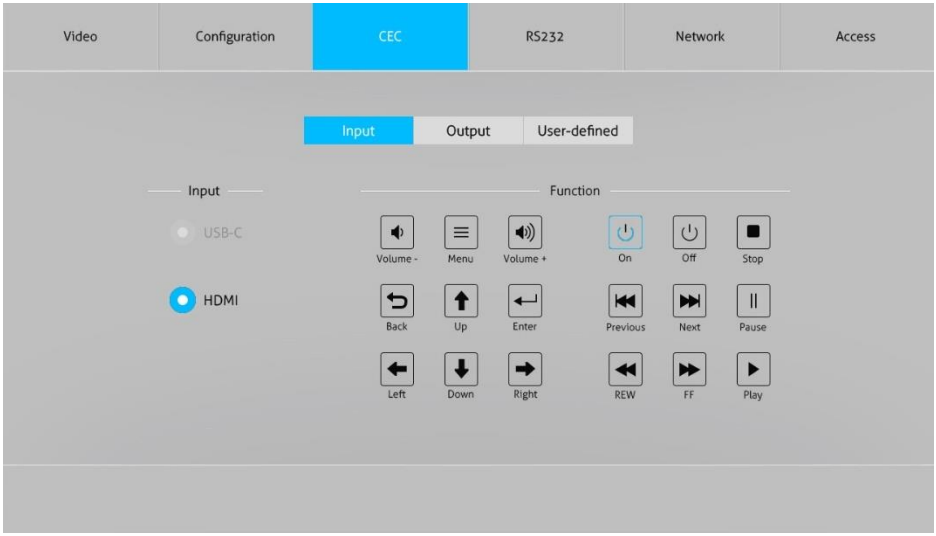
- Choose the HDCP follow the souse or display.

5.2.4 Tags

- Choose and enter the tags, then click confirm to change the tags.

5.3 CEC Tab

5.3.1 Input

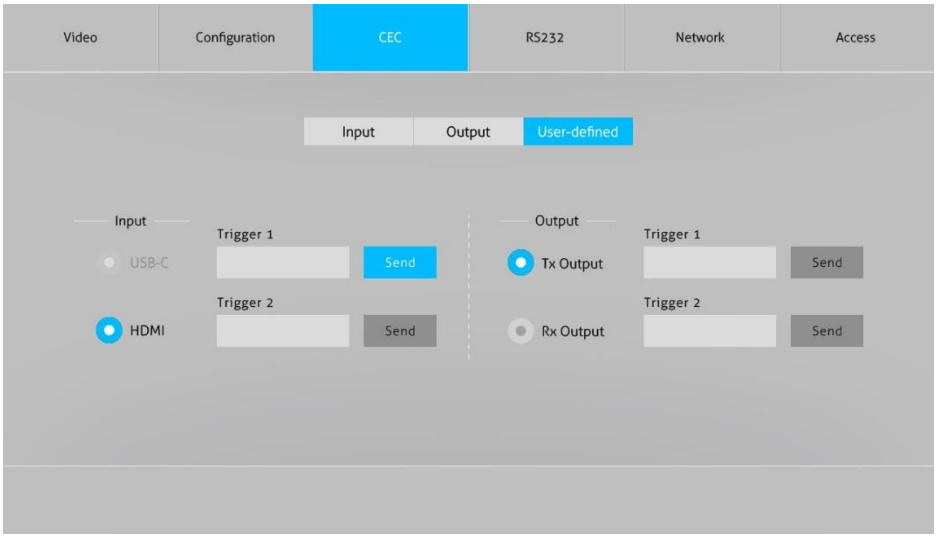


- Select the function and press to control the input

5.3.2 Output

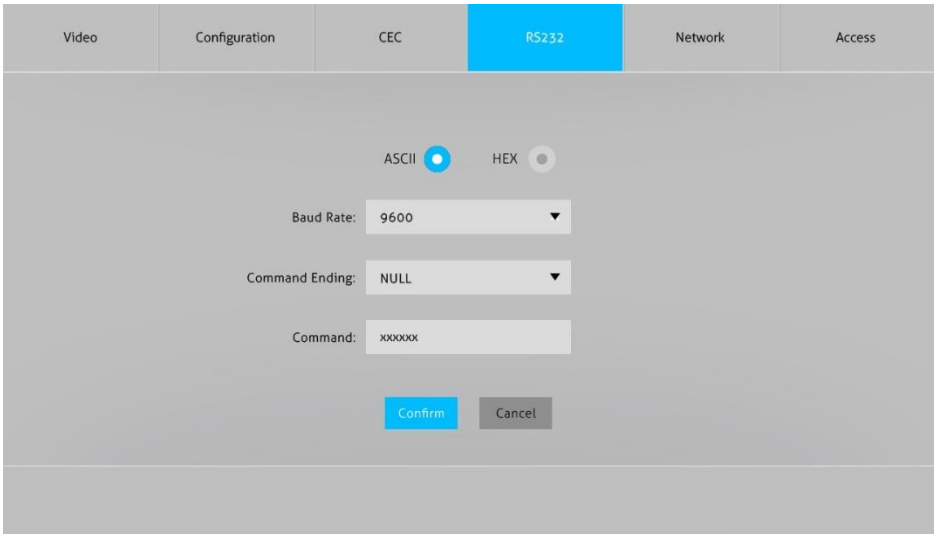
- Select the function button and press to control the output

5.3.3 User-defined



- Define the Trigger of input and output

5.4 RS232 Tab



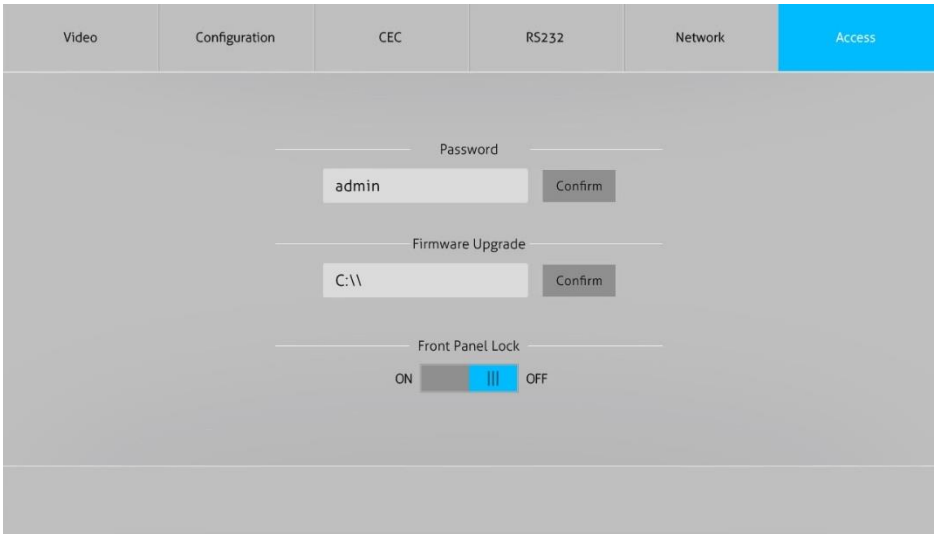
- Baud Rate: Supports 9600, 19200, 38400, 57600, 115200

- Command Ending: NULL, CR, LF or CR+LF can be chosen.
- Command: Type the command in the box to control the third-party device which is connected to the RS232 port of the SCU21T-KVM.

5.5 Network Tab

- Static IP or Dynamic Host Configuration Protocol (DHCP).
- Modify the static IP Address, Subnet Mask, and Gateway.

5.6 Access Tab



- Modify the login password
- Choose the firmware upgrade file and click confirm to upgrade the firmware
- Lock or unlock the front panel buttons

6. RS232 control

6.1 RS232 control software

Installation: Copy the control software file to the control PC

Uninstallation: Delete all the control software files in corresponding file path.

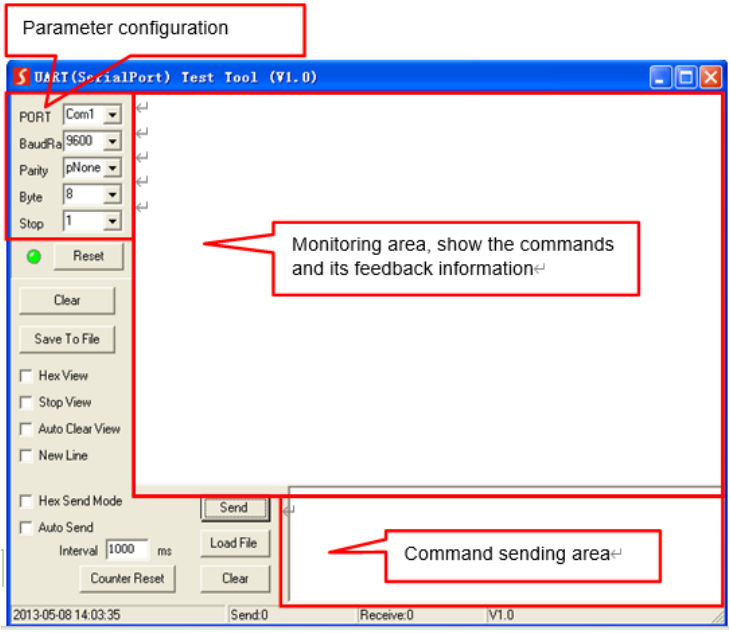
Basic Setting:

Connect the switcher kit with all input devices and output devices needed, then to connect it with a PC which is installed with RS232 control software. Double-click the software icon to run this software.

Here takes the software **CommWatch.exe** as example:

The main view is shown as below:

Please set the parameters of COM number, bound rate, data bit, stop bit and the parity bit correctly, and then you are able to send command in command sending area.



6.2 RS232 Command

Communication protocol: RS232 Communication Protocol

Baud rate: 9600 Data bit: 8 Stop bit: 1 Parity bit: none

6.2.1 System control

Command	Description	Command & Feedback Example
PHDBTON.	HDBaseT OUT POC power on	HDBT 01 Power ON!
PHDBTOFF.	HDBaseT OUT POC power off	HDBT 01 Power OFF!
HDMIA.	Auto-switch mode on	HDMI Out Switch Auto Mode!
HDMIM.	Manual-switch mode on	HDMI Out Switch Manual Mode!
HDMI[x].	HDMI input source selection. x = 1 & 2 1 – Type-C 2 – HDMI	HDMI Out Switch To 01! HDMI Out Switch To 01!
POWON.	Turn off standby mode	Power ON!
POWOFF.	Turn on standby mode	Power OFF!
SIGNALTRG[xx]MODE.	When setting the detection mode xx=1, it is 5V detection, and when it is 2, it is TMDS detection.	Set Trigger Mode To 5V.
SIGNALTRGSTA.	Query the method of signal detection (TMDS or 5V)	Get Trigger Mode Is 5V.
RST.	Restore Factory	Factory Default!
Lock.	Turn on front panel lock	Front Panel Locked!

Unlock.	Turn off front panel lock	Front Panel UnLock!
STA.	Status query	SCU21T-KVM V1.0.0 PWON! HDBT 01 Power ON! HDMI OUT 01 Down Scale OFF! HDMI OUT 02 Down Scale OFF! HDMI Out Switch Auto Mode! Get Trigger Mode Is 5V. System Unlock! Baudrate9600! GUI_IP:192.168.0.200! HDMI Out Switch To 02! Set Output Black Screen ON! IN 1 2 LINK Y Y OUT 1 2 LINK Y Y Input 1 EDID From 1 User Define EDID! Input 2 EDID From 1 Internal EDID! OUT 01 HDCP MAT DISPLAY! OUT 02 HDCP MAT DISPLAY! Set POFF Delay To 600 Second(s)!
RS232ONSAVE:[Y],[xxx].	Save the display terminal boot command sent when the input is detected. Y is the baud rate, 1--2400; 2--4800; 3--9600; 4--19200; 5--	Save PON Command:YYYYY,Baudrate Is 9600!

	38400; 6-57600; 7 --115200; xxx is the command data	
RS232OFFSAVE:[Y],[xxx].	Save the display terminal shutdown command sent when no input is detected. Y is the baud rate, 1--2400; 2--4800; 3--9600; 4--19200; 5--38400; 6-57600; 7--115200; xxx is the command data	Save POFF Command:TTTTTT.,Baudrate Is 9600!
RS232DLYOUT[xx]:[yy].	Set the delayed sending time of the display terminal shutdown command sent when no input is detected, the default is 10 minutes, 600S	Set POFF Delay To 10 Second(s)!

6.2.2 Source control

Command	**Description**	**Command & Feedback Example**
TVON.	Turn on TV by CEC control	CEC_TV_POWON! CEC Output 01 Send Success. CEC Output 02 Send Success.
TVOFF.	Turn off TV by CEC control	CEC_TV_POWOFF! CEC Output 01 Send Success. CEC Output 02 Send Success.
TVVOL+.	TV volume plus by CEC control	CEC_TV_VOLUP! CEC Output 01 Send Success. CEC Output 02 Send Success.
TVVOL-.	TV volume down by CEC control	CEC_TV_VOLDOWN! CEC Output 01 Send Success. CEC Output 02 Send Success.

TVMUTE.	TV mute by CEC control	CEC_TV_VOLMUTE/UNMUTE! CEC Output 01 Send Success. CEC Output 02 Send Success.
HDCP[x]PAS.	The output HDCP follows the input. [x] The value is 0-2 or 00-02, and 0 means all outputs.	OUT 01 HDCP PASSIVE! OUT 02 HDCP PASSIVE!
HDCP[x]MAT.	HDCP output follow the display [x] Value 0-2 or 00-02, 0 means all output	OUT 01 HDCP MAT Display! OUT 02 HDCP MAT Display!
HDCP[x]ON.	Forced to open the output HDCP, output HDCP1.4. [x] Value 0-2 or 00-02, 0 means all output	OUT 01 HDCP ON! OUT 02 HDCP ON!
HDCP[x]OFF.	Forcibly close the output HDCP. [x] Value 0-2 or 00-02, 0 means all output	OUT 01 HDCP OFF! OUT 02 HDCP OFF!
DS[x]ON.	Turn on the DOWN SCALE of the HDMI output. (Compatible with [X]/[XX]) [x] Value 0-2 or 00-02, 0 means all output	HDMI OUT 01 Down Scale ON! HDMI OUT 02 Down Scale ON!
DS[x]OFF.	Turn off the DOWN SCALE of the HDMI output. (Compatible with [X]/[XX]) [x] Value 0-2 or 00-02, 0 means all output	HDMI OUT 01 Down Scale OFF! HDMI OUT 02 Down Scale OFF!
STA_IN.	Source connection status	IN 1 2 LINK N N
/+[X]/[YY]:XXX.	RS232 sends commands to control	123456

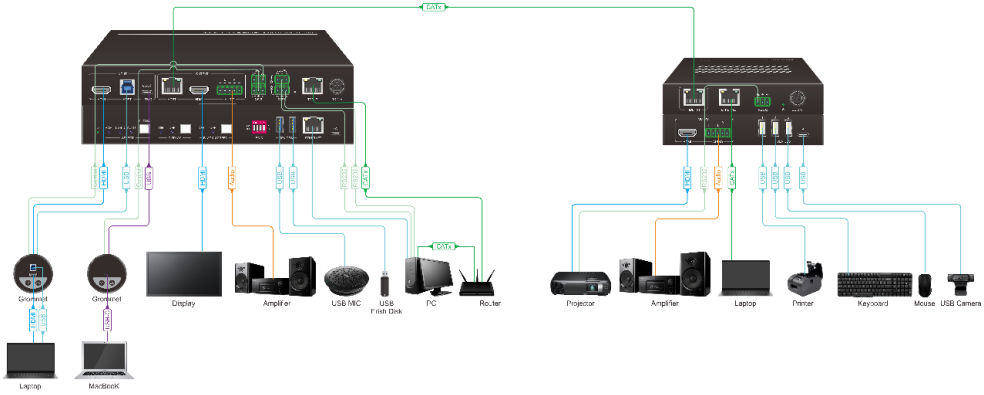
	peripheral devices. [YY]The value is 00 or 01; [X] is 1--2400; 2--4800; 3--9600; 4--19200; 5--38400; 6-57600; 7--115200	
@OUT[xx].	Turn on the HDMI 5V of the output port. [xx] The value 00-01,00 means all outputs.	Set Output Black Screen ON!
$OUT[xx].	Turn off the HDMI 5V of the output port. [xx] The value 00-01,00 means all outputs.	Set Output Black Screen OFF!
GETGUIIP.	Query GUI IP	GUI_IP:192.168.0.173!
SetGuiIP_DHCPON.	Dynamic DHCP	GUI IP DHCP ON!
SetGuiIP_DHCPOFF:xxx.xxx.x.xxx.	Static DHCP+set IP (default is 192.168.0.178)	GUI IP DHCP OFF!SETGUIIP:192.168.0.123!
EDIDUpgrade[xx].	The serial port upgrades EDID data. 1. [xx] represents the input port, the value is 00-02 and U. [xx]=00-02 means to customize the EDID of the corresponding input port (EDID is switched to the custom EDID after customization, and will not be saved in the machine), 00 means to operate on all input ports, 01-02 Means input 01-02, 2. [xx]=U1-U4 means custom built-in EDID (can be saved in the machine and recalled at any time), only one built-in EDID can be customized, and the current EDID still used after the customization is completed will not	Input XX/User Define EDID Upgrade OK By RS232 Or GUI!

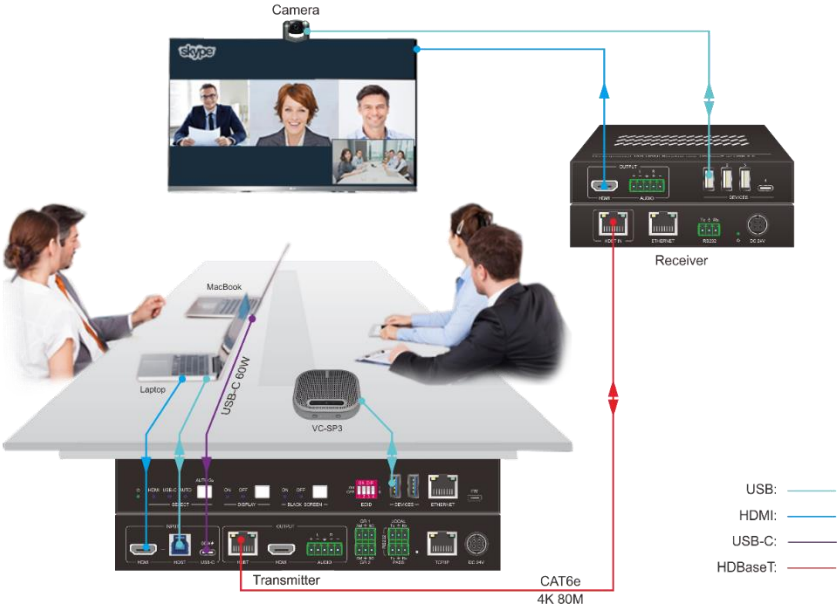
	switch to the customized EDID . After receiving the instruction, the machine will prompt to send the EDID file. The file format must be .bin within 10s (in order to ensure normal data reception, all HDBaseT must be disconnected before sending the instruction)	
EDID/[xx]/[yy].	The input port xx uses the built-in EDID numbered yy. [xx] represents the input port, the value 00-02, 00 represents all input ports, 01-02 separately represents input 1-2; [yy] represents the built-in EDID number, the value is 01-12, 01-08 represents the built-in EDID that cannot be customized, and 09-12 represents the customized EDID	Input 02 EDID Upgrade OK By 01 Internal EDID!
EDIDM[x]B[y].	The input port learns the EDID of the output port. [X] represents the output port number, [X] takes the value 1-2 (or 01-02 Note: 01-02 must be used in conjunction with 00-02 below), 1-2 represents output 1-2.1 represents output 1, 2 represents Output 2. [y] represents the input port, the value is 0-2 (00-02), 0 represents all input ports, and 1-2 separates represents input 1-2;	Input 01 EDID Upgrade OK By 02 EXT EDID!
Baudrate[XXX].	Set control baud rate. [XXX] Support 115200, 57600, 38400, 19200, 9600	Set Local RS232 Baudrate Is 9600!
CEC[I/O][AA][BB][CC][DD].	I/O: means input or output port, AA, BB, CC, DD are all hexadecimal data; AA: indicates the port number, the	CEC Input 01 Send Success! CEC Output 01 Send Success!

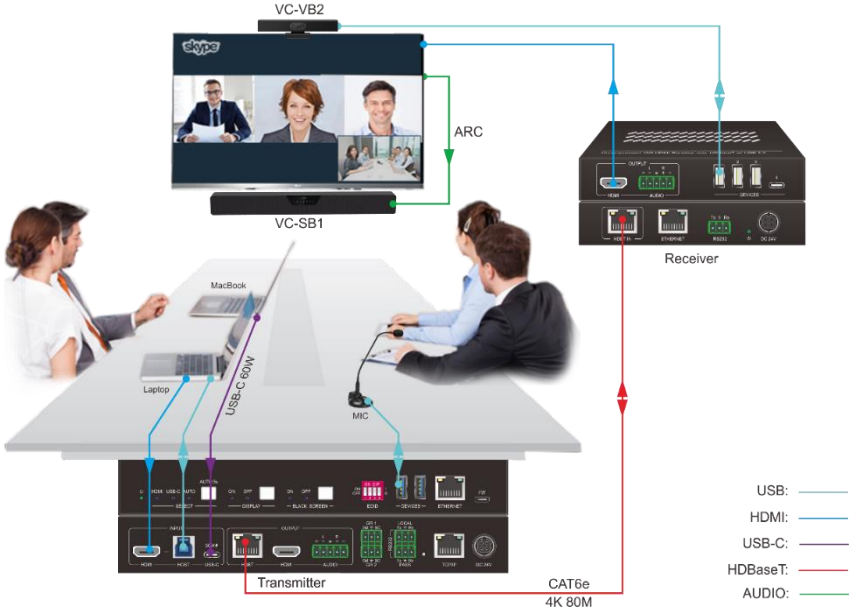
	input is 01-02, the output is 01-02, and FF means all; BB: Indicates the device type (TV: 40, 20, 80, disc player 04, 08, etc.); CC: indicates the CEC function category (for example, 44 indicates the remote control function) DD: indicates the specific data under the function (for example: 41, representing the volume plus), this can send combined data such as two or three groups, or not, up to 9 groups;	CEC Output 01 Send Success!

7. System Connection

The following diagram illustrates typical input and output connections that can be utilized with the Distribution Amplifier:



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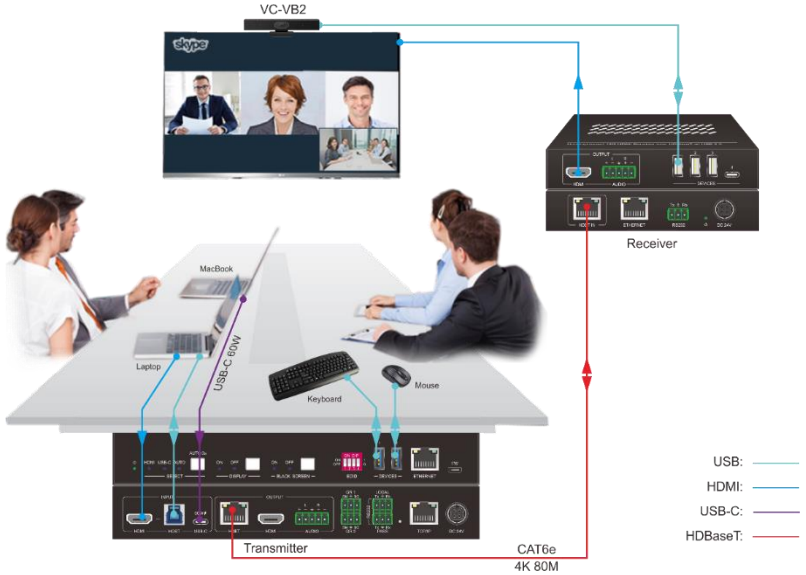
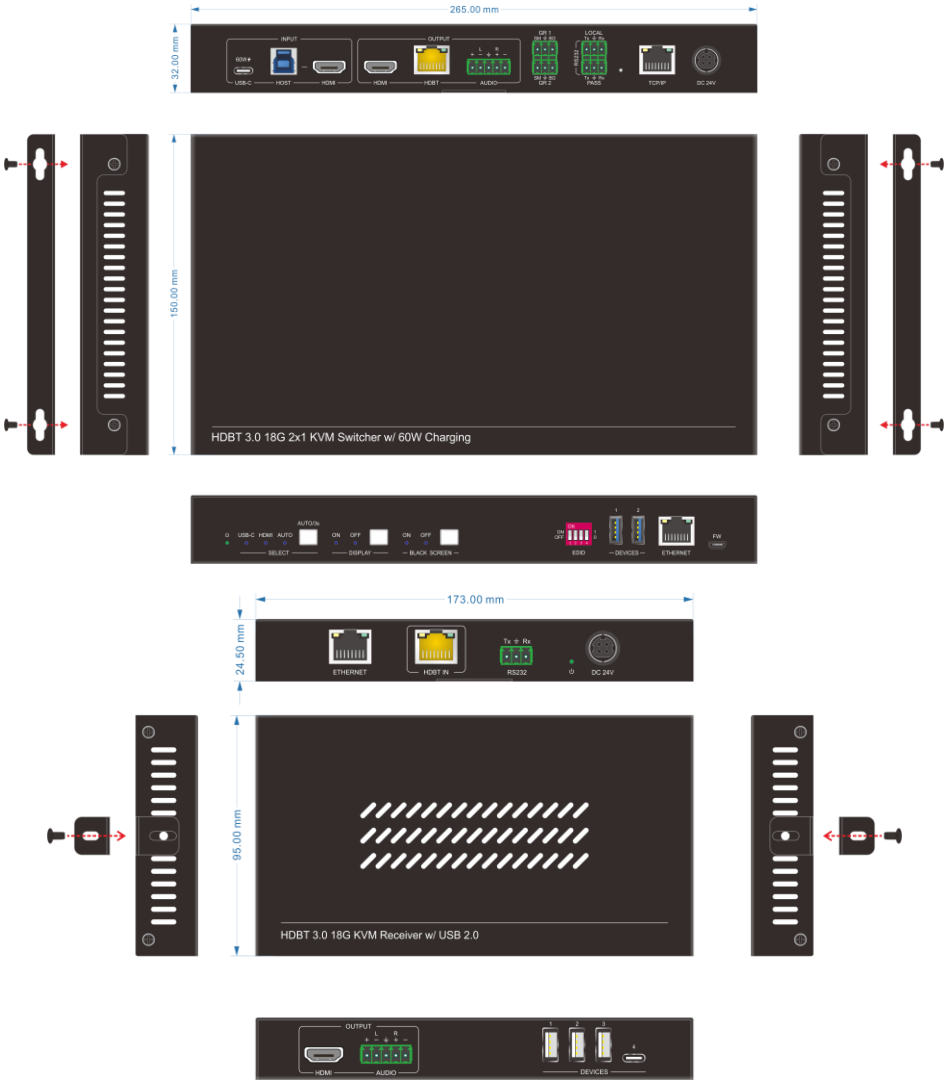
ARC
VC-SB1
Receiver
MacBook
Laptop
USB-C 60W
MIC
Transmitter
CAT6e
4K 80M
USB:
HDMI:
USB-C:
HDBaseT:
AUDIO:


VC-VB2
Receiver
MacBook
Laptop
USB-C 60W
Keyboard
Mouse
Transmitter
CAT6e
4K 80M
USB:
HDMI:
USB-C:
HDBaseT:

8. Panel Drawing