USB-C 2x1 Presentation Switcher

User Manual

500531

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1. Safety Precautions

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

- Follow basic safety precautions to reduce the risk of fire, electrical shock, and injury.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burns.
- Do not open or remove the housing of the device as you may be exposed to dangerous voltage or other hazards.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture and do not install this product near water. Keep the product 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 the housing, unplug the module immediately.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Using supplies or parts not meeting the product specifications may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- Install the device in a place with adequate ventilation to avoid damage caused by overheat.
- Unplug the power when left unused for a long period of time.
- Information on disposal of devices: do not burn or mix with general household waste, please treat them as normal electrical waste.

2. Introduction

The MuxLab USB-C 2x1 Presentation Switcher offers seamless switching of USB-C inputs to a single HDMI output, providing versatility and enhanced connectivity for presentation environments. It supports video resolution up to 4K@60Hz 4:4:4, delivering high-quality visuals for presentations and displays, as well as audio de-embedding on a balanced analog audio output, ensuring clear and synchronized audio playback.
The switcher features multiple methods of control, AUTO mode enables automatic switching to the first detected device source, and Manual control available through front panel buttons. RS232 commands are also supported, offering additional control flexibility.
The MuxLab USB-C 2x1 Presentation Switcher is designed to meet the demands of modern presentation setups, providing a user-friendly and feature-rich solution for enhanced connectivity and control.

3. Features

- 18Gbps 2x1 switcher with USB-C inputs
- Supports HDMI 2.0, 4K@60Hz 4:4:4, HDR 10, HDCP 2.2
- Support automatic 4K downscaling to 1080P
- Support 1G network pass-through.
- Guest mode control via TCP/IP and RS232
- Provides USB-C charging up to 100W
- Balanced analog audio for output audio de-embedding
- Smart EDID capabilities.

4. Package Contents

- One (1) USB-C 2x1 Presentation Switcher
- One (1) 100~240VAC 50/60Hz 24V-6.5A Power adapter
- Two (2) Mounting Ears with 4 Screws
- One (1) 5-pin Terminal Block
- One (1) RS232 Cable (3-pin terminal block to DB9)
- One (1) IR emitter
- Four (4) Rubber feet
- User Manual can be downloaded from MuxLab website.

5. Specifications

Video	
Video Input	2 x USB Type-C
USB-C Input Resolution	Up to 4K@60Hz 4:4:4
Video Output	1 x HDMI Type A Female
HDMI 2.0 Output Resolution	Up to 4K@60Hz 4:4:4
HDCP	Support Version 2.2
USB	USB Version 3.2 gen2 cable recommended
HDR 10	Supported
CEC	Supported
HDP	Supported
Audio	
Audio Output	1 x AUDIO OUT (Stereo balanced L/R)
Audio Output Connector	1 x 5-pin terminal block
HDMI Audio Format	LPCM 7.1 audio, Dolby Atmos®, Dolby® TrueHD, Dolby Digital® Plus, DTS: X™, and DTS-HD® Master Audio™ pass-through
Control	
Control	(1) EDID, (1) RS232, (3) USB, (1) IR
Control Connectors	(1) 4-pin DIP switch, (1) 3-pin terminal block, (1) Type-C USB 3.2 gen2, (2) Type-A USB 3.2 gen2, (1) 3.5mm interface
General	
HDMI 2.0 Cable Length	4K@60Hz 4:4:4 ≤ 5m, 4K@60Hz 4:2:0 ≤ 10m, 1080P ≤ 15m
Bandwidth	18Gbps
Operating Temperature	0°C ~ +55°C
Storage Temperature	-25°C ~ +70°C
Power Consumption	112W Max
Power Supply	DC 24VDC 6.5A
Dimension	228.0mm x 24.5mm x 135.0mm
Net Weight	810g
Warranty	2 years
Order Information	500531 USB-C 2x1 Presentation Switcher (UPC: 627699005316)

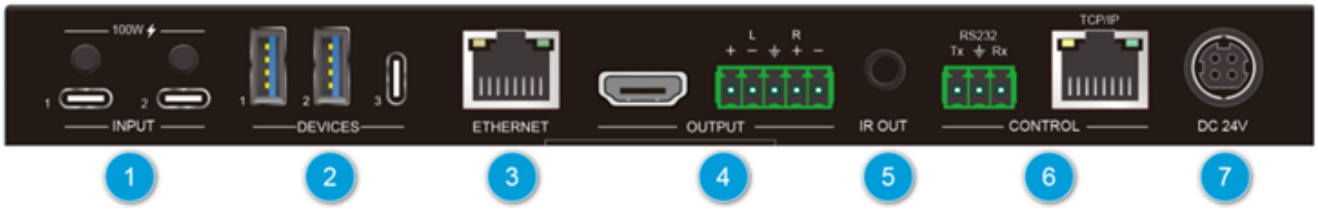
6. Operation Controls and Functions

6.1 Presentation Switcher Panel

Front Panel

No	Name	Function Description
1	Power LED	The LED illuminates green when the device is power on.
2	Input: IN 1	The LED illuminates blue when the USB-C input 1 is selected in AUTO mode, or illuminates red when the USB-C input 1 is selected in manual mode.
	Input: IN 2	The LED illuminates bule when the USB-C input 2 is selected in AUTO mode, or illuminates red when the USB-C input 2 is selected in manual mode.
	SELECT AUTO/3s	Press button to switch the input source. Press and hold the button 3 seconds to switch the switching mode. Note that the factory default switching mode is AUTO.
3	Display	Press ON to turn on the display, OFF to turn off the display.
4	EDID/HDCP	4-pin DIP switch for EDID/HDCP setting. refer to section 7.4 for the description.

Rear Panel



No	Name	Function Description
1	INPUT	Type-C USB with 100W charging capability to connect the USB-C source. Note: The USB 3.2 gen2 cable is recommended to be used.
2	DEVICES	Two type-A USB and one type-C USB ports to connect KVM devices (e.g. microphone and camera).
3	ETHERNET	1000BaseT network port, used for network pass-through and supports Internet access.
4	OUTPUT	HDMI OUT: Type-A female HDMI output port to connect video display. AUDIO OUT: 5-pin terminal block for balanced audio 2 Channel output.
5	IR OUT	Connect IR emitter, support guest mode control.
6	Control	RS232: 3-pin terminal block to control the device via RS232. TCP/IP: Connect to a PC for GUI control.
7	DC 24V	DC barrel port for power adapter connection.

7. Button Control

7.1 Manual Switching

When the switcher is in the manual switching mode, press the SELECT AUTO/3s button repeatedly to cycle through the two video inputs, and the corresponding source LED illuminates red immediately.

7.2 Automatic Switching

Press and hold the **SELECT AUTO/3s** button at least three seconds to enable automatic switching. The current input source will not be changed, and its source LED will turn blue.

When in the AUTO mode, the switcher will switch according to the following rules:

- Press and hold the **SELECT AUTO/3s** button at least three seconds again can exit AUTO mode, but the input source will not be changed, and the corresponding source LED will turn red.
- New input: Once detecting a new input, the switcher will automatically select the new input.
- Press the **SELECT AUTO/3s** button also can forcibly change the input source.
- Reboot: Once power is restored to the switcher, it will automatically reconnect the input before powered off.
- Source removed: When an active source is removed, the switcher will switch to the other active input.

7.3 Display Control

Manual Control: Press the below **DISPLAY** buttons on the front panel to simultaneously send RS232 commands to control the display device.

- ON: Display On.
- OFF: Display Off.

The RS232 command can be set by sending commands, please refer to the 9.2.3 section for **Third-party Device** Control for more details.

7. 4 EDID and HDCP Setting

The switch represents "**0**" when in the lower (**OFF**) position, and it represents "**1**" while putting the switch in the upper (**ON**) position.

7.4.1 EDID Setting

The Extended Display Identification Data (EDID) is used for the source device to match its video resolution with the connected display. By default, the source device obtains its EDID from the first connected display. Meanwhile, since the displays with different capabilities are connected to the switcher, pins 1~3 of the DIP switch on the front panel can be used to set the EDID to a built-in fixed value.

Switch Status	Video Resolution	Audio Format
000 (Default)	Get the EDID of the display device	
001	1920x1080p@60Hz 4:4:4 8bit	LPCM
010	1920x1080p@60Hz 4:4:4 8bit	DTS/Dolby
011	3840x2160p@30Hz 4:4:4 8bit	LPCM
100	3840x2160p@30Hz 4:4:4 8bit	DTS/Dolby
101	3840x2160p@60Hz 4:4:4 8bit	LPCM
110	3840x2160p@60Hz 4:4:4 8bit	DTS/Dolby
111	customize	

7.4.2 HDCP Setting

High-bandwidth Digital Content Protection (HDCP) is a copy-protection scheme to eliminate the possibility of capturing digital content from the source to the display. Pin4 of the DIP switch on the front panel can be used to set HDCP.

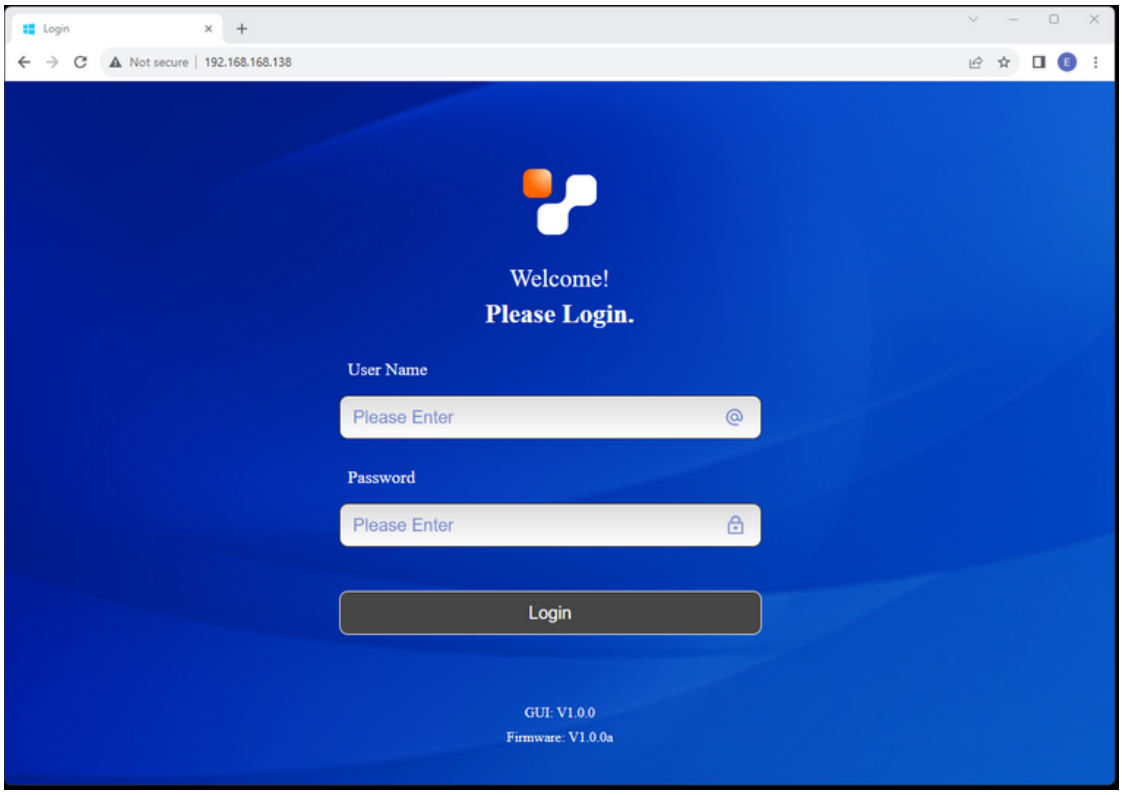
Switch Status	Description
1	Inform the source that the device does not support HDCP and request the source send content without HDCP.
0	Turn off HDCP management.

8. GUI Control

The USB-C 2x1 Presentation Switcher 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
- Telnet port: 4001

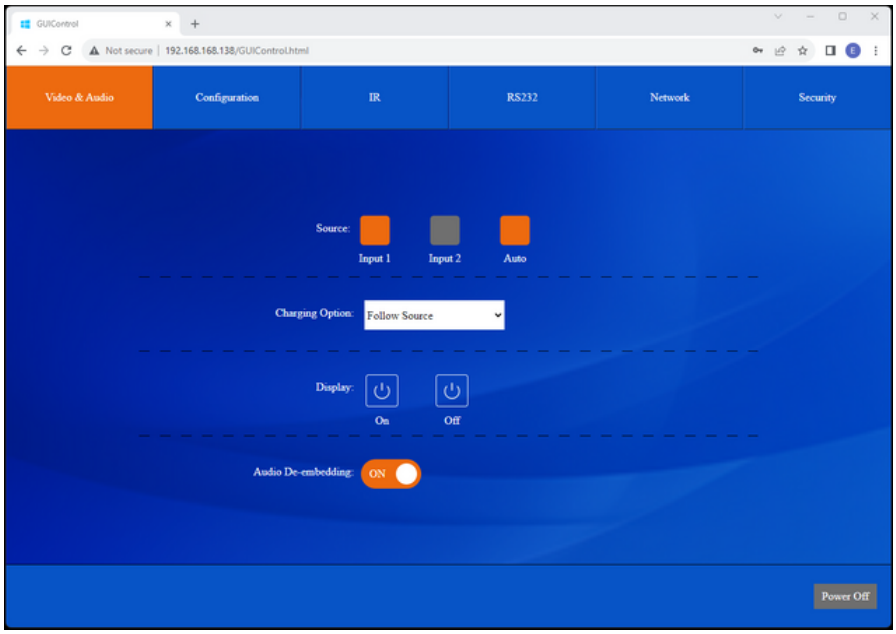
Please type the IP Address of the control PC in the internet browser, and it will enter the below log-in webpage.



- **Username: admin**
- **Password: admin**

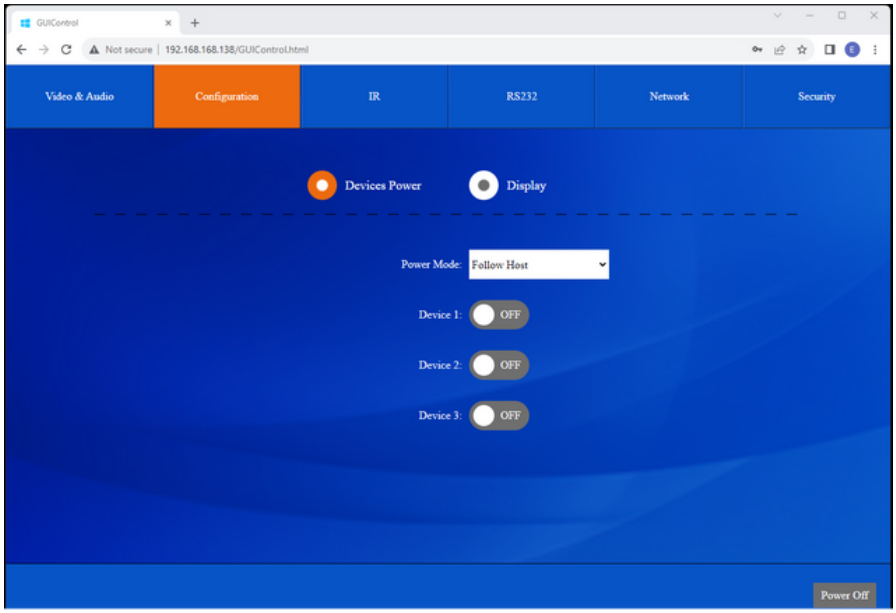
Please type the username and the password, and then click **LOGIN.**

8.1 Video and Audio

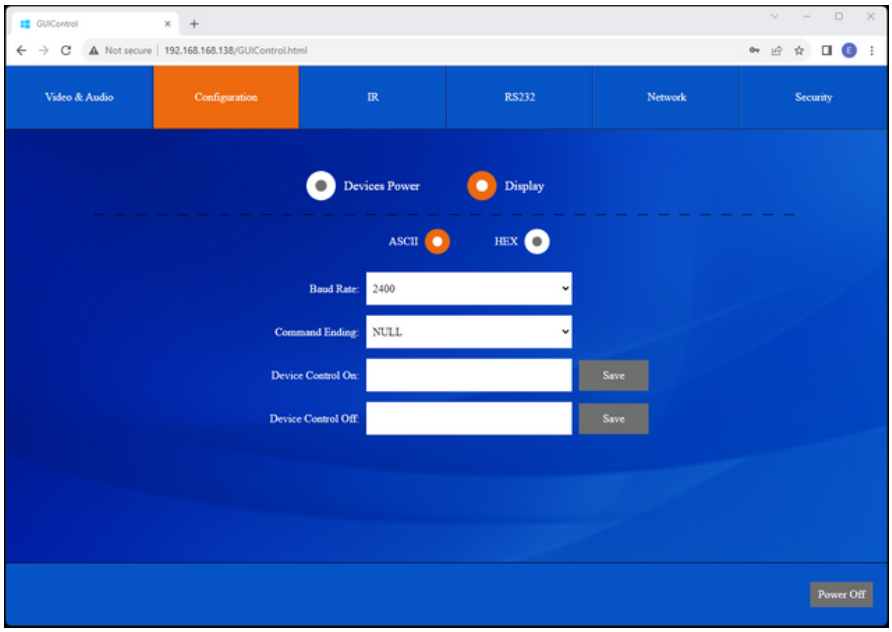


- Source: select input1 or input2, turn on/off Auto switching mode.
- Charging Option: Follow Source / Always input 1 / Always input
- Display: ON/OFF (Note: Display command setting in configuration page.)
- Audio De-embedding: ON/OFF

8.2 Configuration

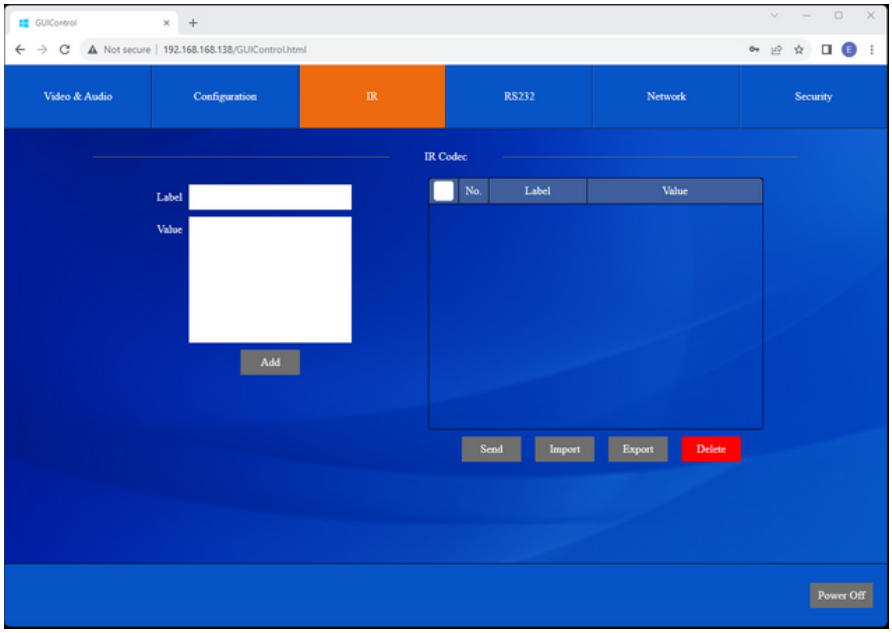


- Power mode: Follow Host / Always on
- Turn on/off the device 1 to 3.



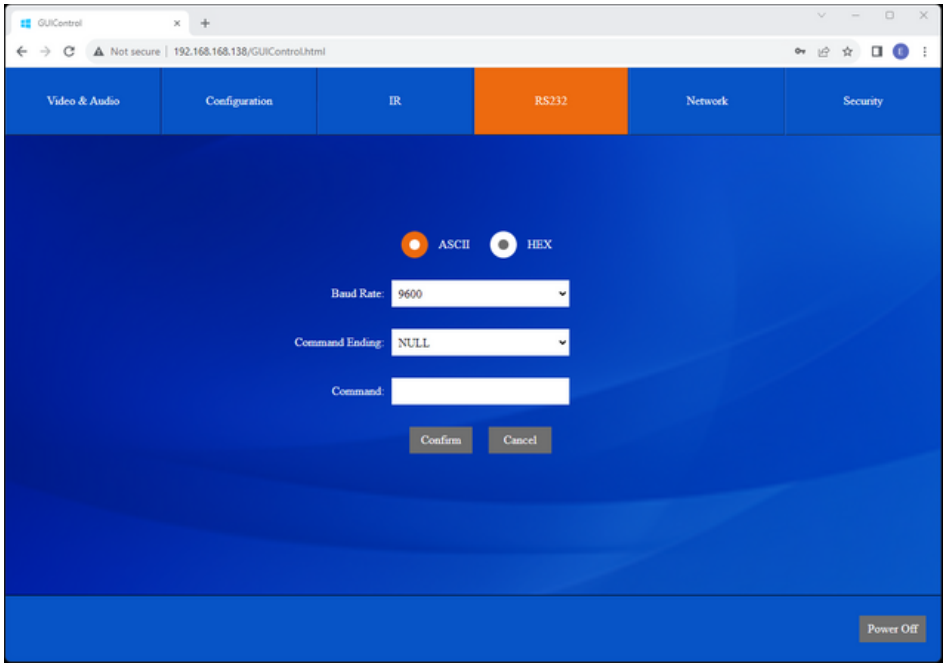
- Setting the RS232 command send to display when press the front panel button.

8.3 IR



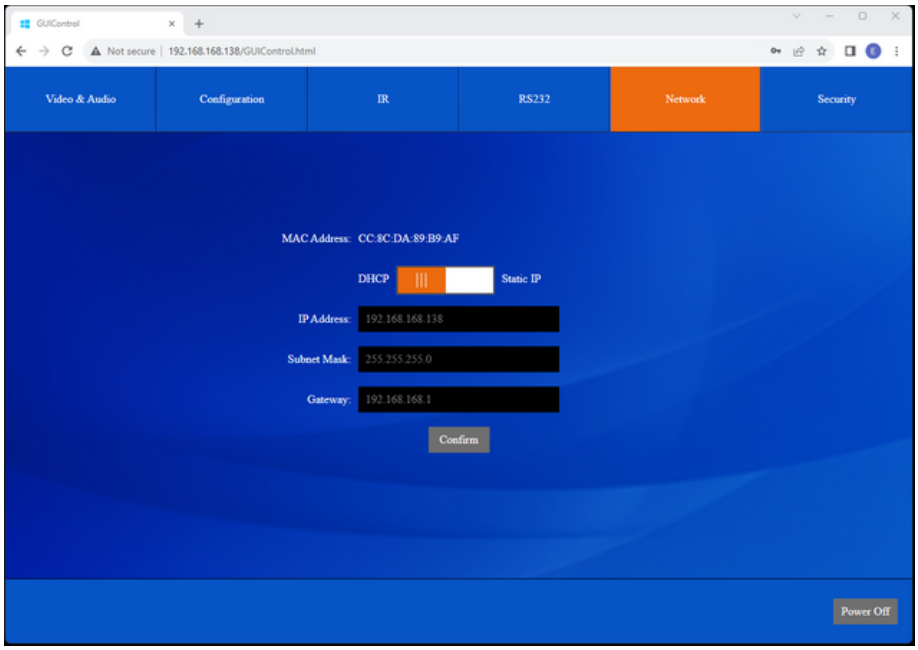
- Label and Value: Adding the IR command page.
- Select the commands and then press the button to perform different operations.

8.4 RS232



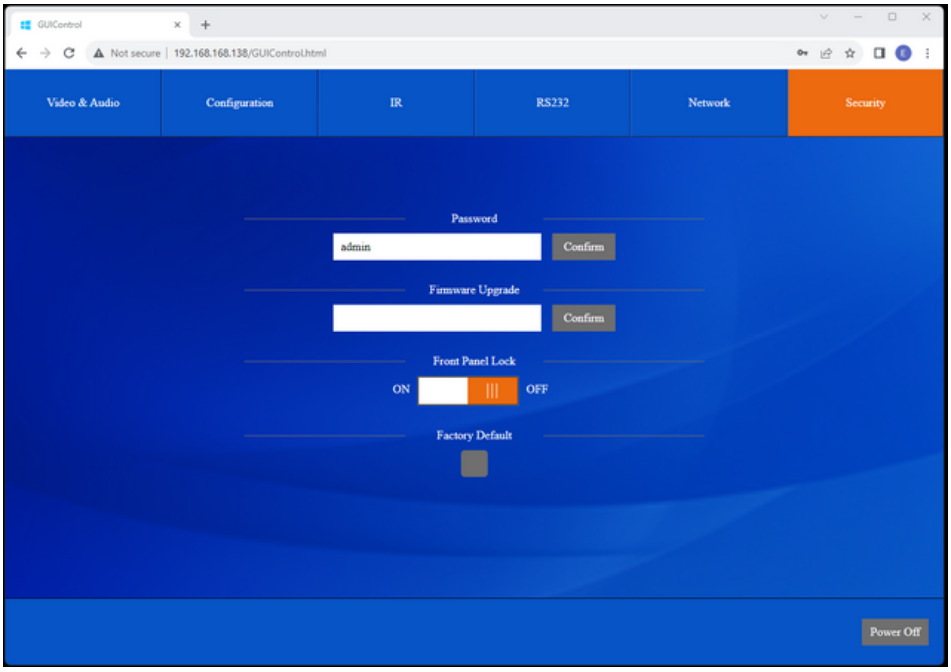
- Baud Rate: Supports 9600, 19200, 38400, 57600, 115200
- Command Ending: NULL, CR, LF or CR+LF can be chosen.
- Command: Type the command in the box to control the third-party device which is connected to the RS232 port of the 500531.

8.5 Network



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

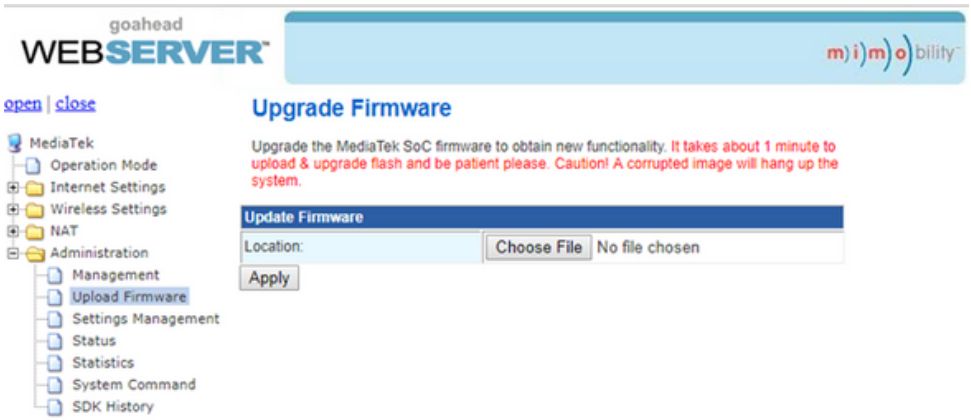
8.6 Security



- Password: Modify the GUI login password
- Choose the firmware upgrade file and click confirm to upgrade the firmware
- Lock or unlock the front panel buttons
- Factory Default the 500531

8.7 GUI Upgrade

Please visit at http://192.168.0.178:100 for GUI online upgrade.
Type the username and password (the same as the GUI log-in setting, modified password will be available only after rebooting) to login the configuration interface. After that, click Administration in the source menu to get to Upload Firmware as shown below:



Select the update file and click Apply button, and then it will start upgrade process.

9. RS232 Control

Connect the RS232 port to control device (e.g. PC) with RS232 cable. The switcher can be controlled by sending RS232 commands.

9.1 RS232 Control Software

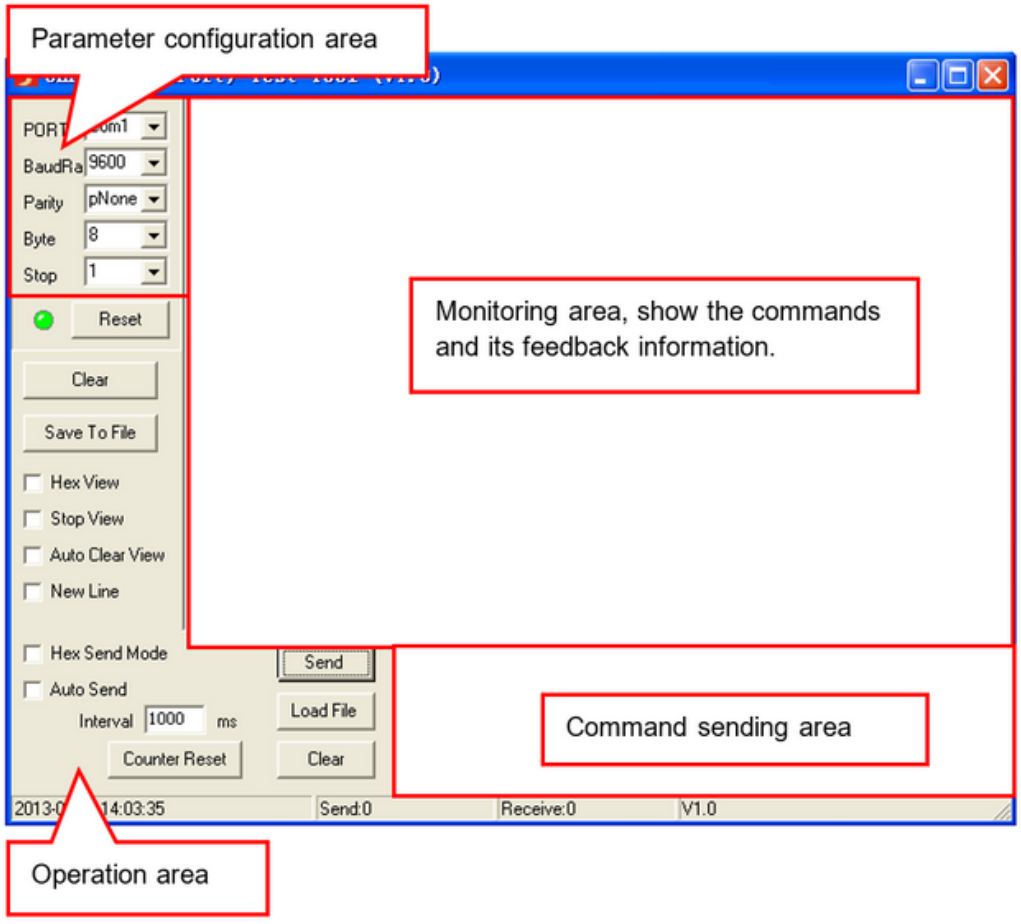
- **Installation**: Copy the control software file to the control PC.
- **Uninstallation**: Delete all the control software files in corresponding file path.

Basic Setting:

Connect the switcher 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 an example:

The main view is shown as below:



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

9.2 RS232 Command

Communication protocol: RS232 Communication Protocol
Baud rate: 9600 Data bit: 8 Stop bit: 1 Parity bit: none

Note:

- All commands need to be ended with "<CR><LF>".
- 1. Commands are not case-sensitive.
- 2. The "0" in front of the effective value can be ignored.
- 3. Spaces between instructions and variables can be ignored.

9.2.1 System Control

Command	Description	Example & Command Feedback
>PON	Power on	>PON
		<PON
>POFF	Standby	>POFF
		<POFF
>Lock	Set front panel key lock	>Lock
		<Lock
>Unlock	Set to unlock the front panel keys	>Unlock
		<Unlock
>Reset	Reset	>Reset
		<Factory Reset <500531 <V1.0.0a <PON <Video 01

		<Aout On <AutoSwitch On <DetMode 5V <UnLock <RS232Baud: 9600 <SetUSBCPowerMode: Follow Selected Source <Device Power Mode: Follow Host <DevicePower Device 1 2 3 Power 1 1 1 <StandByTime: 3s <DHCP Off <GuiIP: 192.168.0.178. <GuiMask: 255.255.255.0. <GuiGate: 192.168.0.1.
>Reboot	Reboot	>Reboot
		<Reboot
>GetStatus	Query device status	>GetStatus
		<500531 <V1.0.0 <Lock <Video 01 <AutoSwitch On <Aout On <DetMode 5V <RS232Baud: 9600 <USBCPowerMode: Follow Selected Source <DevicePowerMode: Always On

		<DevicePower Device 1 2 3 Power 1 1 1 <StandByTime 60s <GuiIP: 192.168.0.178 <GuiMask: 255.255.255.0 <GuiGate: 192.168.0.1
>SetVideo	"HDMI input switch >SetVideo [Param1] param1 = 01-02 01: HDMI In 1 02: HDMI In 2"	>SetVideo 01 <SetVideo 01
>SetAutoSwitch	"Auto switch >SetAutoSwitch [Param1] Param1 = On, Off"	>SetAutoSwitch On >SetAutoSwitch Off <SetAutoSwitch On <SetAutoSwitch Off
>SetDetMode	"Set automatic switching detection mode >SetDetMode [Param1] Param1 = 5V, DP"	>SetDetMode 5V >SetDetMode DP >SetDetMode 5V >SetDetMode DP
>SetAout	"Set the Audio Out switch >SetAout [Param1] Param1 = On, Off"	>SetAout On >SetAout Off <SetAout On <SetAout Off
>EDIDUpdate	"Set to save custom EDID >EDIDUPDATE"	>EDIDUPDATE <Please Upload The EDID File Through RS232 in 10s <Save failed, The EDID File Was Not Uploaded Within 10s.

		/<Invalid file or file not received. /<Saved Successfully, User EDID is Ready.
>SetRS232 Baud	"Set the RS232 baud rate >SetRS232Baud [Param1] Param1 = 2400, 4800, 9600 (Default) , 19200, 38400, 57600, 115200"	>SetRS232Baud 9600 <SetRS232Baud: 9600
>SetStandByTime	"Set the time to disconnect the back-end 5V output when there is no input source connected (unit: second) >SetStandByTime [Param1] param1 = 3-1800"	>SetStandByTime 60 <SetStandByTime: 60s
>SetDevicePower	"Set Device power switch >SetDevicePower [Param1] [Param2] Param1 = 00-03 00: All USB Devices 01-03: USB Device 1-3 Param2 = On, Off"	>SetDevicePower 00 <SetDevicePower Device 1 2 3 Power 0 0 0
>SetDevicePowerMode	"Set Device power supply mode >SetDevicePowerMode [Param1] Param1 = 00-01 00: Follow Host 01: Always On"	>SetDevicePowerMode 00/01 <SetDevicePowerMode: Follow Host <SetDevicePowerMode: Always On
>SetUSBCPowerMode	"Set USB-C charging mode >SetUSBCPowerMode [Param1] Param1 = 01-03 01: Follow Selected Source	>SetUSBCPowerMode 01/02/03 <SetUSBCPowerMode: Follow Selected Source <SetUSBCPowerMode: Always

	02: Always Input 1 03: Always Input 2"	Input 01 <SetUSBCPowerMode: Always Input 02
>Display	"Turn on/off the display >Display [Param1] Param1 = On, Off"	no feedback

9.2.2 GUI Control

Command	Description	Example & Command Feedback
>SetGuiIP:xxx.xxx.xxx.xxx	"Set the IP address of the GUI Set the IP to access GUI SetGuiIP:xxx.xxx.xxx.xxx."	>SetGuiIP:192.168.0.176 <SetGuiIP: 192.168.0.178.
>SetGuiMask:xxx.xxx.xxx.xxx	"Set the Mask address of the GUI Set the Mask to access GUI SetGuiMask:xxx.xxx.xxx.xxx."	>SetGuiMask:255.255.255.0 <SetGuiMask: 255.255.255.0
>SetGuiGate:xxx.xxx.xxx.xxx	"Set the Gate address of the GUI Set the Gate to access GUI SetGuiGate:xxx.xxx.xxx.xxx."	>SetGuiGate:192.168.0.1 <SetGuiGate: 192.168.0.1
>GetGuiIP	"Query the IP address of the GUI Get the IP to access GUI"	>GetGuiIP <GuiIP: 192.168.0.178
>GetGuiMask	"Query the Mask address of the GUI Get the Mask to access GUI"	>GetGuiMask <GuiMask: 255.255.255.0
>GetGuiGate	"Query the Gate address of the GUI Get the Gate to access GUI"	>GetGuiGate <GuiGate: 192.168.0.1

9.2.3 Third-party Device Control

Connect a third-party device (e.g. projector) to the RS232 port of switcher, the third-party device can be controlled simultaneously by the below RS232 commands while press the front panel button (ON, OFF).

Note: The below commands don't need ending mark

Command	Description	Command & Feedback Example
>SaveDisplay On	"Save the RS232 command XXXX of Display ON >SaveDisplayOn [Param1] [Param2]:[Param3] param1 = a: ASCII, h: HEX param2 = 1: 2400, 2: 4800. 3: 9600, 4: 19200, 5: 38400, 6: 57600, 7: 115200 param3 = Commands data	>SaveDisplayOn a 3: 1234567 >SaveDisplayOn a 3: 1234567
>SaveDisplay Off	Save the RS232 command of Display Off XXXX >SaveDisplayOff [Param1] [Param2]:[Param3] param1 = a: ASCII, h: HEX param2 = 1: 2400, 2: 4800. 3: 9600, 4: 19200, 5: 38400, 6: 57600, 7: 115200 param3 = Commands data	>SaveDisplayOff a 3: 1234567 >SaveDisplayOff a 3: 1234567
>SendA	Directly send commands in ASCII format	>SendA 3:1234567

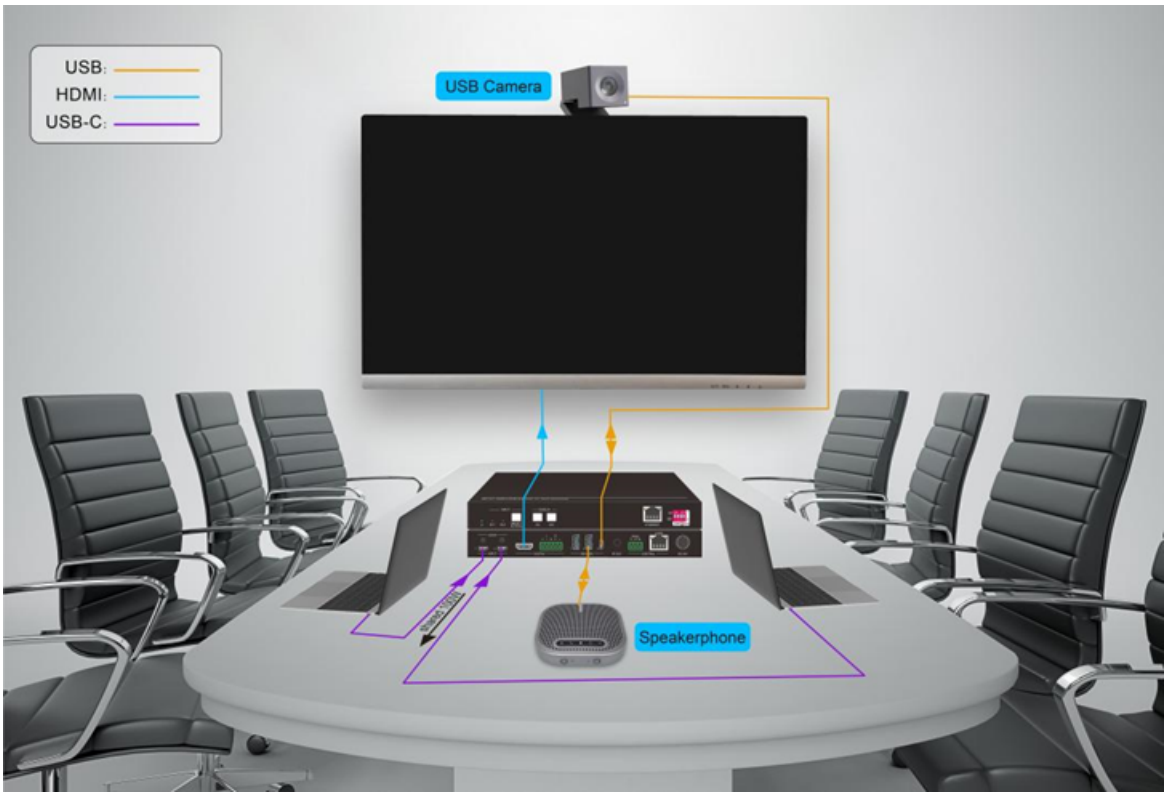
	to the local RS232 >SendA [Param1]:[Param2] param1 = 1: 2400, 2: 4800. 3: 9600, 4: 19200, 5: 38400, 6: 57600, 7: 115200 param2 = Commands data	1234567
>SendH	Directly send commands in HEX code format to local RS232 >SendA [Param1]:[Param2] param1 = 1: 2400, 2: 4800. 3: 9600, 4: 19200, 5: 38400, 6: 57600, 7: 115200 param2 = Commands data	>SendH 3:F0 0F 01 03 01 AA F0 0F 01 03 01 AA
>SendIR	Send IR HEX code >SendIR [Param1] param1 = IR HEX Data"	>SendIR ----------

10. Troubleshooting & Maintenance

Problems	Potential Causes	Solutions
Output image with snowflake	Bad quality of the connecting cable.	Try another high quality cable.
	Fail or loose connection.	Make sure the connection is good
No output image when switching	No signal at the input / output end.	Check with oscilloscope or multimeter if there is any signal at the input/ output end.
	Fail or loose connection.	Make sure the connection is good.
	The switcher is broken.	Send it to authorized dealer for repairing.
POWER indicator doesn't work or no respond to any operation	Fail connection of power cord.	Make sure the power cord connection is good.
Static becomes stronger when connecting the video connectors	Bad grounding.	Check the grounding and make sure it is connected well.
Cannot control the device by control device (e.g. a PC) through RS232 port	Wrong RS232 communication parameters.	Type in correct RS232 communication parameters.
	Broken RS232 port.	Send it to authorized dealer for checking.

Note: If your problem still remains after the above troubleshooting steps, please contact MuxLab technical support for further assistance.

11. Application Diagram



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