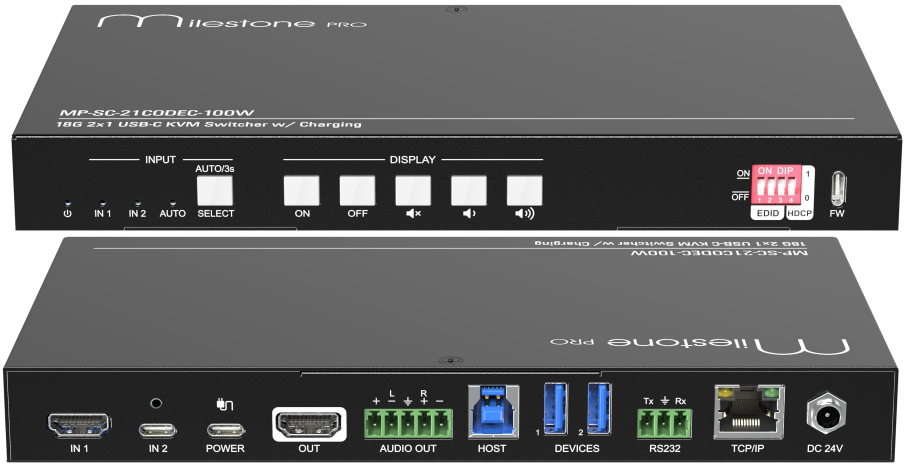
User Manual

Milestone PRO

MP-SC-21CODEC-100W

18G 2x1 USB-C KVM Switcher w/ Charging



Version: MP-SC-21CODEC-100W_2024V1.0

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 till July, 2024. 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 optical 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.

Table of Contents

1. Product Introduction

Thanks for choosing the 18G 2x1 USB-C KVM Switcher with charging. The switcher is designed to switch two inputs to one HDMI output. It supports video resolution up to 4K@60Hz 4:4:4. In addition, there is smart built-in EDID&HDCP setting can be selected by the 4-pin DIP switch on the front panel.

The switcher supports audio de-embedding to the balanced analog audio output. It also supports device extension by providing two type-A USB 3.2 gen1 ports for KVM devices such as camera, microphone, keyboard etc.

The switcher features multiple methods of control. In the AUTO mode, the switcher will automatically switch to the first detected source device，the switcher can be manually controlled by the front panel buttons and RS232 commands.

1.1 Features

- 18G 2x1 switcher with HDMI & USB-C inputs;
- Supports HDMI 2.0, 4K@60Hz 4:4:4, HDR 10, HDCP 2.2;
- Supports 5G data transfer rate;
- Support PD 3.0 charging;
- Support automatic 4K down-scaling to 1080P;
- Each device port provides 5V 900mA power supply;
- Support GUI and RS232 control;
- Balanced analog audio for output audio de-embedding;
- Smart EDID management capable for various applications and customized setting.

1.2 Package List

- 1x MP-SC-21CODEC-100W
- 1x Power Adapter (24V DC, 1.25A)
- 2x Mounting Ears with 4 Screws
- 1x 5-pin Terminal Block
- 1x RS232 Cable (3-pin terminal block to DB9)
- 4x Rubber Feet
- 1x User Manual

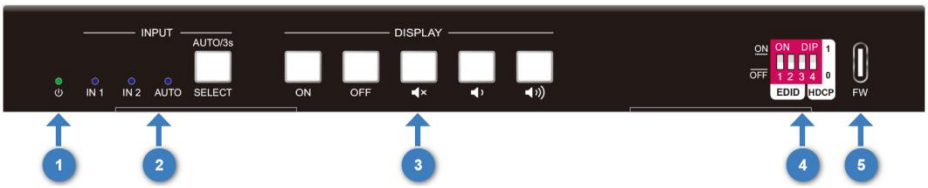
Note: *Please contact your distributor immediately if any damage or defect in the components is found.*

2. Specification

Video	
Video Input	(1) HDMI,(1) USB-C
Video Input Connector	(1) Type-A female HDMI,(1) Type-C USB
Video Input Resolution	Up to 4K@60Hz 4:4:4
Video Output	(1) HDMI
Video Output Connector	(1) Type-A female HDMI
Video Output Resolution	Up to 4K@60Hz 4:4:4
HDMI Version	2.0
HDCP Version	2.2
USB Version	USB 3.2 Gen1
HDR 10	Supported
CEC	Yes
HPD	Supported
Audio	
Audio Output	(1) AUDIO OUT (Stereo balanced L/R)
Audio Output Connector	(1) 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 Part	
Control	(1) EDID, (1) RS232, (1) TCP/IP
Control Connector	(1) 4-pin DIP switch, (1) 3-pin terminal block, (1) RJ-45
DEVICES	
Connector	(2)Type-A USB
USB Version	USB 3.2 Gen1
General	
HDMI 2.0 Cable Length	4K@60Hz 4:4:4 ≤ 5m 4K@60Hz 4:2:0 ≤ 10m 4K@30Hz 4:4:4 ≤ 10m 1080P ≤ 15m
Bandwidth	18Gbps
Operation Temperature	-5℃ ~ +55℃
Storage Temperature	-25℃ ~ +70℃
Relative Humility	10% ~ 90%
External Power Supply	DC 24V 1.25A
Dimension (W*H*D)	215.0mm x 24.5mm x 120.0mm
Net Weight	625g

3. Panel Description

3.1 Front Panel



① **Power LED:** The LED illuminates green when the device is power on.

② **INPUT:**

IN 1 LED: The LED illuminates blue when the IN 1(HDMI input) is selected.

IN 2 LED: The LED illuminates blue when the IN 2(USB-C input) is selected.

AUTO LED: When entering the automatic switching mode, the LED illuminates blue, otherwise it turns off.

SELECT AUTO/3s: 1x white non-luminous button, click to switch host, long press for 3 seconds to enter/exit automatic mode.

③ **DISPLAY:**

Press **ON** to turn on the display.

Press **OFF** to turn off the display.

Press  to mute/unmute display audio.

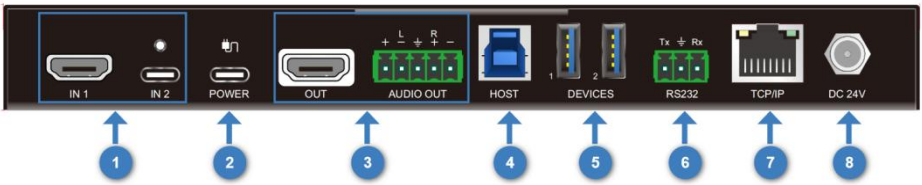
Press  to decrease the audio volume gradually, or press and hold it to decrease the audio volume constantly.

Press  to increase the audio volume gradually, or press and hold it to increase the audio volume constantly.

④ **EDID/HDCP:** 4-pin DIP switch for EDID/HDCP setting.

⑤ **FW:** USB-C port for firmware upgrade.

3.2 Rear Panel



① **IN1:** Type-A female HDMI input port to connect HDMI video source.

IN2: Type-C USB with charging capability to connect the source device.

② **POWER:** Type-C USB connect external PD PSU to charge USB-C IN.

③ **OUTPUT:**

OUT: Type-A female HDMI output port to connect video display.

AUDIO OUT: 5-pin terminal block for balanced audio output.

④ **HOST:** Type-B USB ports for host connection.

⑤ **DEVICES:** Two type-A USB ports to connect KVM devices (e.g. microphone and camera);

Each device port provides 5V 900mA power supply.

⑥ **RS232:** 3-pin terminal block to connect control device (e.g. PC) or third-party device for RS232 control.

⑦ **TCP/IP:** 1 x RJ45,GUI control.

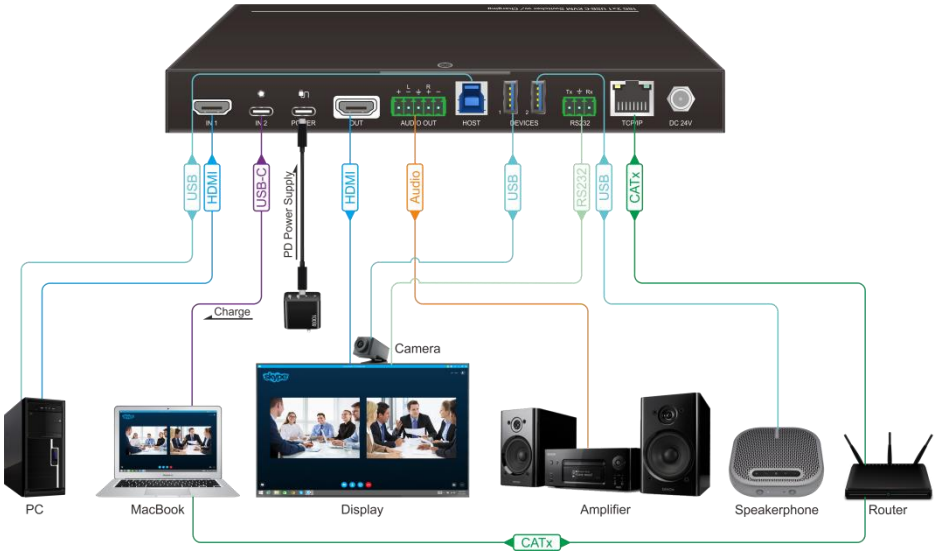
⑧ **DC 24V:** DC barrel port for power adapter connection.

4. System Connection

4.1 Usage Precaution

- Make sure all components and accessories included before installation.
- System should be installed in a clean environment with proper temperature and humidity.
- All of the power switches, plugs, sockets, and power cords should be insulated and safe.

4.2 System Diagram



5. Button Control

5.1 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 blue immediately.

5.2 Automatic Switching

Press and hold the **SELECT AUTO/3s** button at least 3 seconds to enable automatic switching.

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.
- New input: Once detecting a new input, the switcher will automatically select the new input.
- 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.

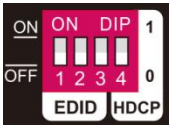
5.3 Display Control

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.*
-  **:** Mute/Unmute display audio.
-  **:** Volume down display audio.
-  **:** Volume up display audio.

5.4 EDID&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.



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, pins1~3 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/HD
111	User Defined	

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	HDCP follow display.

6. GUI Control

The MP-SC-21CODEC-100W can be controlled via TCP/IP. The default IP settings are:

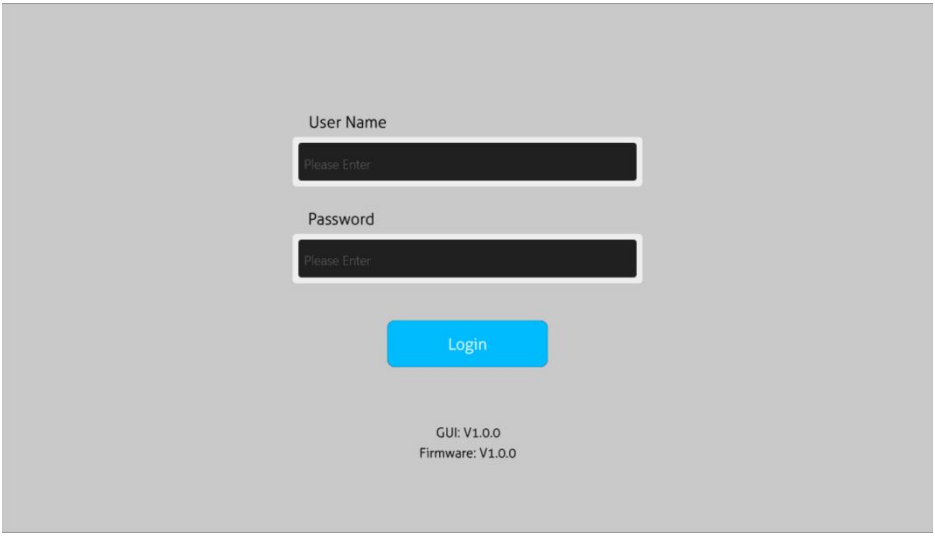
IP Address: 192.168.0.178

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 web page.

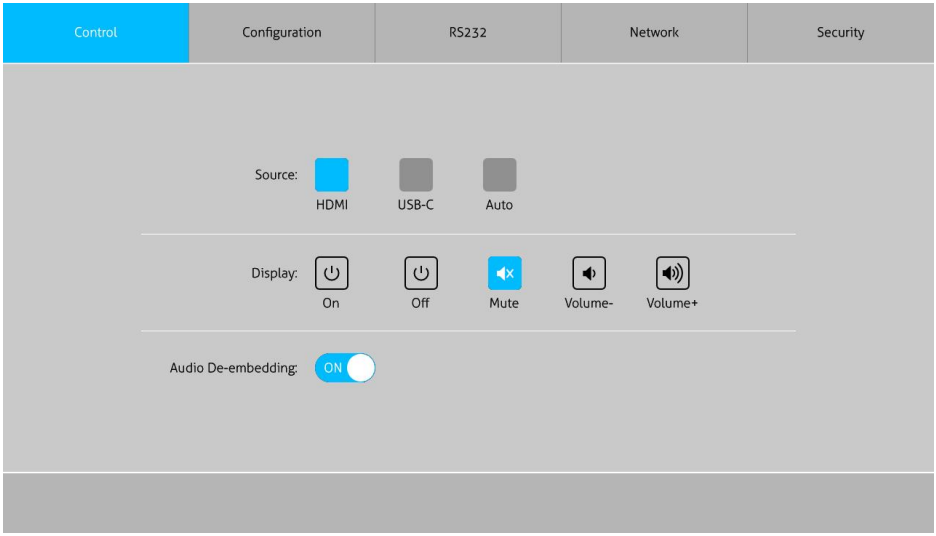


Username: admin

Password: admin

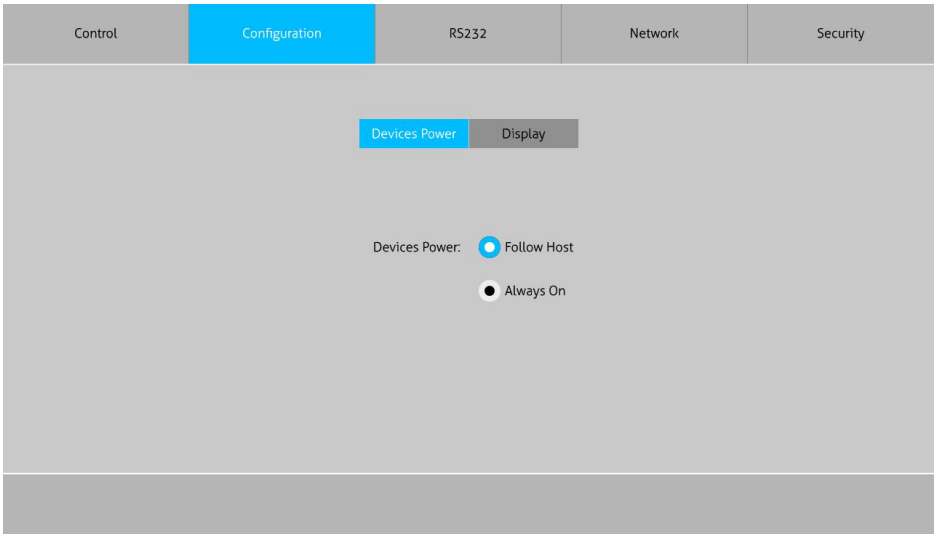
Please type the username and the password, and then click **Login**.

6.1 Control

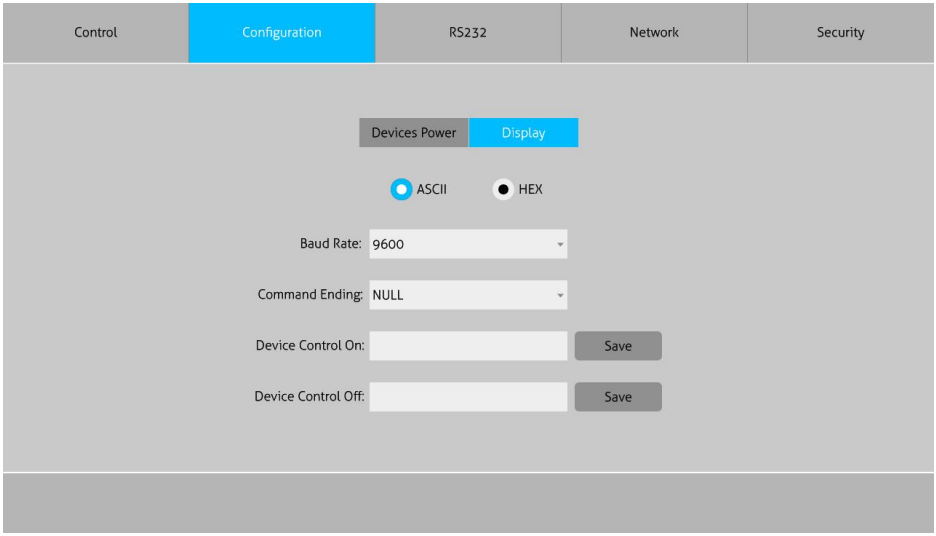


- Source: select HDMI or USB-C, turn on/off auto switching mode;
- Display(Note: Display command setting in configuration page.):
  ON / OFF / Mute / Volume down / Volume up;
- Audio De-embedding: ON/OFF.

6.2 Configuration

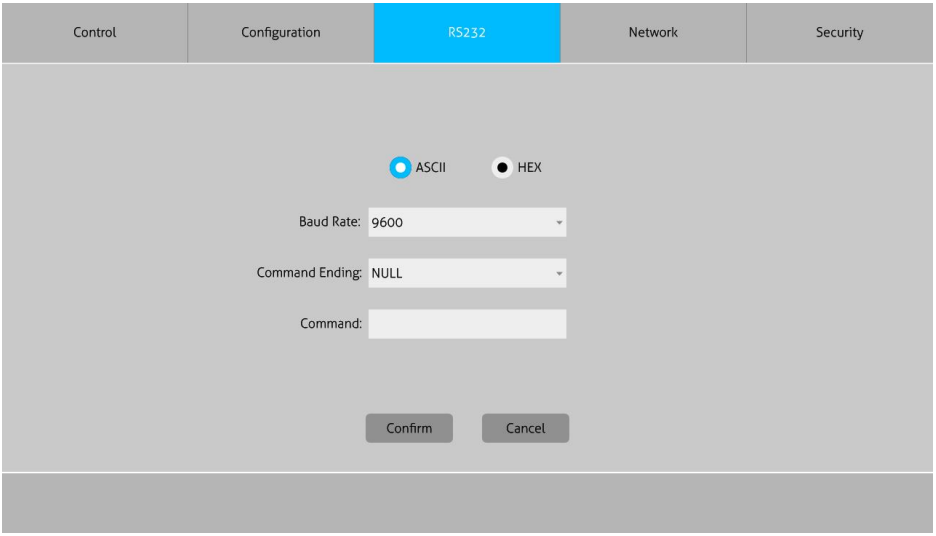


- Power mode: Follow Host / Always On.



- Setting the RS232 command send to display when press the front panel button(ON/OFF).

6.3 RS232



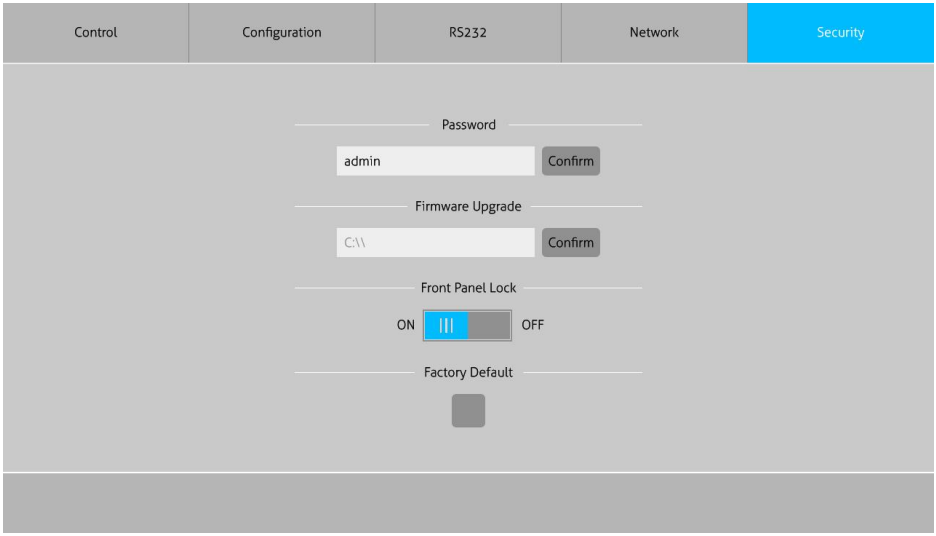
- Baud Rate: Supports 2400, 4800, 9600, 19200, 38400, 57600, 115200;
- Command Ending: NULL, CR, LF or CR+LF can be chosen;

- Command: Type the command in the box to control the third-party device which is connected to the RS232 port of the MP-SC-21CODEC-100W.

6.4 Network

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

6.5 Security



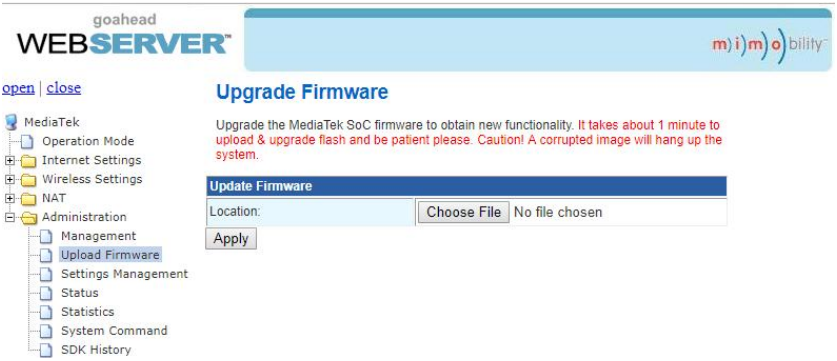
- Password: Modify the GUI login password;

- Choose the firmware upgrade file and click confirm to upgrade the firmware;
- Lock or unlock the front panel buttons;
- Factory Default the MP-SC-21CODEC-100W.

6.6 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.

7. RS232 Control

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

7.1 RS232 Control Software

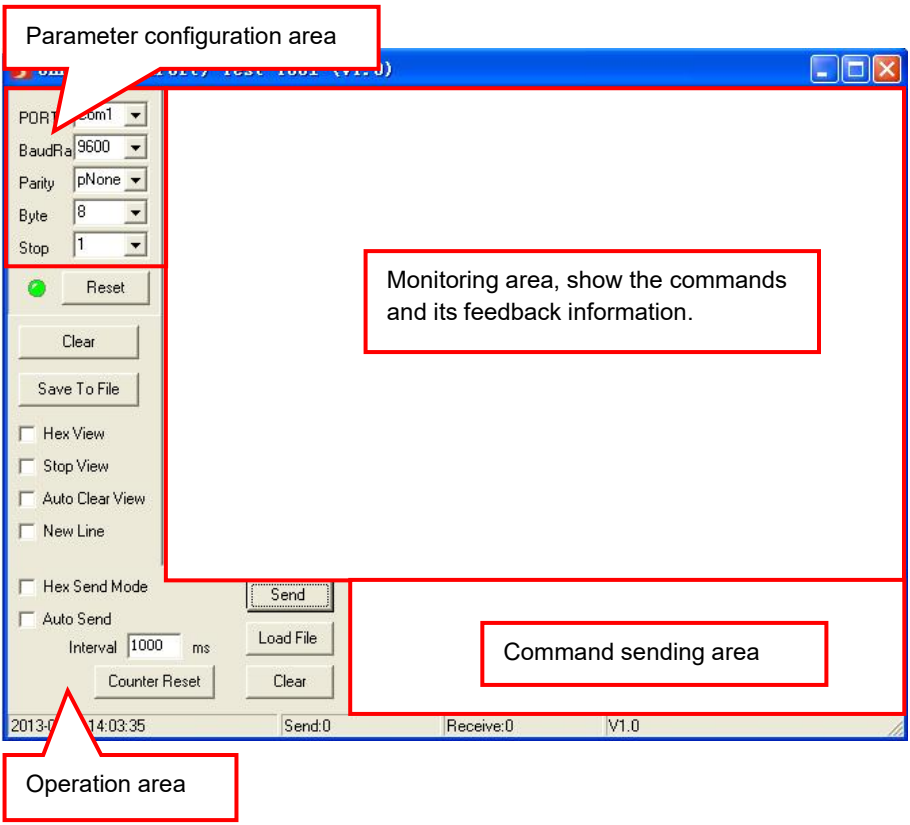
- **Installation:** Copy the control software file to the control PC.
- **Uninstallation:** Delete all the control software files in corresponding file path.

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.

7.2 RS232 Command

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

- *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.*

7.2.1 System Control

Command	Description	Command & Feedback Example
POWON.	Power on	Power ON!
POWOFF.	Power off	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	HDMI1. HDMI Out Switch To 01!
SIGNALTRG[xx]MODE.	When setting the detection mode xx=1, it is 5V detection, and when it is 2, it is TMDS detection.	SIGNALTRG01MODE. 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	GUI Or RS232 Query Status: MP-SC-21CODEC-100W V1.0.0a Power ON! Front Panel UnLock! Local RS232 Baudrate Is 9600! GUI_IP:192.168.0.178! GUI IP DHCP:OFF! HDMI Out Switch Auto Mode! HDMI Out Switch To 01! HDMI Out HDCP OFF! Trigger Mode To 5V! Audio De-embedding ON! EDID07! Input 01 EDID From 01 User De fine EDID! Input 02 EDID From 01 User De fine EDID! Display Key Command CEC An d RS232! Device Power Mode: Follow Ho st! Set POFF Delay To 3 Second(s) !
KEYCOMMAN D[X].	Set display key command(CEC,RS232)	KEYCOMMAND1. KEYCOMMAND2. KEYCOMMAND3.
		Display Key Command CEC And RS232! Display Key Command Only CEC! Display Key Command Only RS232!
SetDevicePo werMode[XX].	Set the device power supply mode. XX = 00-01 00: Follow Host	SetDevicePowerMode 00.
		SetDevicePowerMode: Follow Host!

	01: Always On	
SETSTANDBYTIME[yy].	Set the delay time for disconnecting 5V output after no source :3-1800(unit: seconds)	SETSTANDBYTIME10
		Set POFF Delay To 10 Second(s)!

7.2.2 Source Control

Command	Description	Command & Feedback Example
TVON.	Turn on TV by CEC control	CEC_TV_POWON!
TVOFF.	Turn off TV by CEC control	CEC_TV_POWOFF!
TVVOL+.	TV volume plus by CEC control	CEC_TV_VOLUP!
TVVOL-.	TV volume down by CEC control	CEC_TV_VOLDOWN!
TVMUTE.	TV mute by CEC control	CEC_TV_VOLMUTE/UNMUTE!
/+[X]:XXX.	RS232 sends commands to control peripheral devices. [X] = 1~7 (Baud Rate) 1--2400；2--4800；3--9600；4--19200；5--38400；6--57600；7--115200 XXX: Any ASCII code (up to 48 bytes).	/+3:123456.
		123456
CMDON/+[X]:XXX.	Set the ASCII RS232 command XXX to be sent to control the third-party device when the **DISPLAY ON** button is pressed. [X] = 1~7 (Baud Rate) 1--2400；2--4800；3--9600；4--19200；5--38400；6--57600；7--115200 XXX: Any ASCII code (up to 48	CMDON/+3:455665.
		CMD_ON Save Success!

	bytes).	
CMDOFF/+[X]:XXX.	Set the ASCII RS232 command XXX to be sent to control the third-party device when the **DISPLAY OFF** button is pressed. [X] = 1~7 (Baud Rate) 1--2400；2--4800；3--9600；4--19200；5--38400；6--57600；7--115200 XXX: Any ASCII code (up to 48 bytes).	CMDOFF/+3:455665. CMD_OFF Save Success!
CMDVOLMUTE/+[X]:XXX.	Set the ASCII RS232 command XXX to be sent to control the third-party device when the **VOLUME MUTE** button is pressed. [X] = 1~7 (Baud Rate) 1--2400；2--4800；3--9600；4--19200；5--38400；6--57600；7--115200 XXX: Any ASCII code (up to 48 bytes).	CMDVOLMUTE/+3:455665. CMD_VOLMUTE Save Success!
CMDVOLDOWN/+[X]:XXX.	Set the ASCII RS232 command XXX to be sent to control the third-party device when the **VOLUME DOWN** button is pressed. [X] = 1~7 (Baud Rate) 1--2400；2--4800；3--9600；4--19200；5--38400；6--57600；7--115200 XXX: Any ASCII code (up to 48 bytes).	CMDVOLDOWN/+3:455665. CMD_VOLDOWN Save Success!
CMDVOLUP/+[X]:XXX.	Set the ASCII RS232 command XXX to be sent to control the third-party device when the	CMDVOLUP/+3:455665. CMD_VOLUP Save Success!

	VOLUME UP button is pressed. [X] = 1~7 (Baud Rate) 1--2400；2--4800；3--9600；4--19200；5--38400；6--57600；7--115200 XXX: Any ASCII code (up to 48 bytes).	
AOUTON.	Audio de-embedding on	Audio De-embedding ON!
AOUTOFF.	Audio de-embedding off	Audio De-embedding OFF!
HDCP_ON.	Forced to open the output HDCP, output HDCP1.4.	HDMI Out HDCP ON!
HDCP_DIP.	Select HDCP definition of DIP Switch	HDCP_DIP.
		DIP Passive, HDCP Follow Display! DIP Active, HDCP Not Support!
STA_HDCP.	Query the current HDCP status	STA_HDCP.
		DIP Passive, HDCP Follow Display!
SetGuiIP_DHCPON.	Dynamic DHCP	SetGuiIP_DHCPON.
		GUI IP DHCP ON!
SetGuiIP_DHCPOFF:xxx.xxx.x.xxx.	Static DHCP+set IP (default is 192.168.0.178)	SetGuiIP_DHCPOFF:192.168.0.123.
		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	EDIDUpgrade01. EDIDUpgradeU1.
		Input XX/User Define EDID Upgrade OK By RS232 Or GUI!

	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 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 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).	
Baudrate[XXX].	Set control baud rate. [XXX] Support 2400, 4800, 9600, 19200, 38400, 57600, 115200.	Baudrate9600. Set Local RS232 Baudrate Is 9600!

8. Panel Drawing

9. 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 remain after following the above troubleshooting steps, please contact your local dealer or distributor for further assistance.*

10. Customer Service

The return of a product to our Customer Service implies the full agreement of the terms and conditions hereinafter. There terms and conditions may be changed without prior notice.

1) Warranty

The limited warranty period of the product is fixed three years.

2) Scope

These terms and conditions of Customer Service apply to the customer service provided for the products or any other items sold by authorized distributor only.

3) Warranty Exclusion

- Warranty expiration.
- Factory applied serial number has been altered or removed from the product.
- Damage, deterioration or malfunction caused by:
  - ✓ Normal wear and tear.
  - ✓ Use of supplies or parts not meeting our specifications.
  - ✓ No certificate or invoice as the proof of warranty.
  - ✓ The product model showed on the warranty card does not match with the model of the product for repairing or had been altered.
  - ✓ Damage caused by force majeure.
  - ✓ Servicing not authorized by distributor.
  - ✓ Any other causes which does not relate to a product defect.
- Shipping fees, installation or labor charges for installation or setup of the product.

4) Documentation

Customer Service will accept defective product(s) in the scope of warranty coverage at the sole condition that the defeat has been clearly defined, and upon reception of the documents or copy of invoice, indicating the date of purchase, the type of product, the serial number, and the name of distributor.

Remarks: Please contact your local distributor for further assistance or solutions.