

USER MANUAL

AVG-SC121D Full HD Scaler Switcher 12x3

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Version: SC121D_2015V1.0



The AVG-SC121D-T is a full HD scaler switcher with 12 video, 6 audio & 2 MIC inputs. It scales & switches HDMI, VGA, YPbPr, C-Video & S-video to HDMI & VGA simultaneously, and audio to a 2x20W amplifier. It's controllable via the front panel, IR, RS232 & TCP/IP (where fitted)

Features

- 12 video Inputs: 4 HDMI, 4 VGA, 1 YPbPr, 2 C-video & 1 S-video
- 2 MIC inputs with level control and mixer function
- Upscale to HDMI & VGA simultaneously up to 1080P.
- Built-in 2x20Watt@4Ω digital amplifier (or 2x10Watt@8Ω)
- Output resolution is selectable
- Output display H/V size: adjustable to eliminate any overscale error
- Output display H/V position moveable.
- MIC volume and line volume adjustable
- Extensive OSD function with full control
- HDMI1.3 and HDCP compliant.
- Firmware updatable via USB
- Output freeze function
- Power PoC receiver (e.g. AVG-HD402PR) with PoC function
- Front panel lockout feature
- Controllable via receiver AVG-HD402PR at display end.
- Controllable via front panel, IR, RS232 & TCP/IP.

**PLEASE READ THIS PRODUCT MANUAL CAREFULLY
BEFORE USING THIS PRODUCT.**

This manual is only for operational instruction only, and not to be used for maintenance. The functions described in this version are current as at March 2015. Any changes of functions and operational parameters will be updated in future manual versions. Please refer to your dealer for the latest product details.

Version 1.0 1/3/15

SAFETY OPERATION GUIDE



In order to guarantee the reliable operation of the equipment and safety of the user, please abide by the following procedures in installation, use and maintenance:

1. The system must be earthed properly. Please do not use two blade plugs and ensure the alternating power supply ranges from 100v to 240v and from 50Hz to 60Hz.
2. Do not install the switcher in an environment where it will be exposed to extreme hot or cold temperatures.
3. This unit will generate heat during operation, please ensure that you allow adequate ventilation to ensure reliable operation.
4. Please disconnect the unit from mains power if it will be left unused for a long time.
5. Please **DO NOT** try to open the casing of the equipment, **DO NOT** attempt to repair the unit. Opening the unit will void the warranty. There are high voltage components in the unit and attempting to repair the unit could result in serious injury.
6. Do not allow the unit to come into contact with any liquid as that could result in personal injury and product failure.

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1. Introduction

1.1. Introduction to AVG-SC121D

The AVG-SC121D is a full HD scaler switcher with 12 video, 6 audio & 2 MIC inputs. It scales & switches any video signal HDMI, VGA, YPbPr, C-Video & S-video to HDMI & VGA simultaneously, and any audio to 2x20W amplifier. It's controllable via the front panel, IR, RS232 & optional TCP/IP.

It's a versatile scaler for use in education institutions, meeting rooms, conference rooms, etc.

1.2. Features

- 12 video Inputs: 4 HDMI, 4 VGA, 1 YPbPr, 2 C-video & 1 S-video.
- 2 MIC inputs with level control and mixer function.
- Upscale to outputs HDMI & VGA simultaneously up to 1080P.
- Built-in 2x20Watt@4Ω digital amplifier (or 2x10Watt@8Ω).
- Output resolution selectable to assure preferred output.
- Output display H/V size: adjustable to correct any overscale error.
- Output display H/V position moveable.
- MIC volume and line volume adjustable.
- Video parameter setting and preset.
- Extensive OSD function with full control.
- HDMI1.3 and HDCP compliant.
- Firmware updatable via USB.
- Output freeze function.
- Power PoC receiver (e.g. AVG-HD402PR) with PoC function
- Front panel lockout.
- Controllable via receiver AVG-HD402PR at display end.
- Controllable via front panel, IR, RS232 & TCP/IP.

1.3. What's in the Box

- 1 x AVG-SC121D
- 4 x Screws
- 3 x Captive Screw Connectors
- 1 x RS232 cable
- 4 x Plastic cushions
- 1 x IR remote (Cell battery is not included)
- 1 x Power Cord
- 1 x User Manual

Note: Please confirm if the product and the accessories are all included, if not, please contact with the dealers.

2. Panel Description

2.1. Front Panel



- ① Power indicating LED. It will illuminate red when the unit is connected with power.
- ② IR sensor, receive signals sent from of IR remote.
- ③ Video source selection buttons. You can select video/audio sources by pressing these buttons. And VIDEO source includes three different signals: YPbPr, C-Video and S-Video.
- ④ Signal channel selection buttons, 4 in total, correspond to the 4 input sources separately.
- ⑤ Resolution selection buttons. These including 1024×768, 1280×720p, 1280×800, 1360×768, 1920×1080p.
- ⑥ MIC volume control buttons. “MUTE” for mute MIC volume, “Δ”for MIC volume up, “∇”for MIC volume down, loop controlling.
- ⑦ Line volume control buttons. “MUTE” for muting line volume, “Δ”for line volume up, “∇”for line volume down.

Note: Pictures shown in this manual are for reference only, different models and specifications are subject to real product.

2.2. Rear Panel



- ① Two RCA connectors for stereo audio output;
One VGA output;
One HDMI output with audio embedded;
- ② Four VGA connectors for VGA inputs.
- ③ Four HDMI connectors for HDMI inputs.
- ④ Four 3.5mm audio connectors for VGA audio inputs.
- ⑤ One Component video input: Y/Pb/Pr, two composite video inputs: C-Video, one Separate video input: S-Video, two pairs L/R for analog audio input.
- ⑥ One RS232 port for control, one USB port for firmware update.
- ⑦ Two MIC connectors: MIC with pre-amplification, LINE for audio direct input.
One TCP/IP port (optional): for network controlling.
- ⑧ Amplifier with 2x10W@8Ω output.
- ⑨ Connector for POWER.
- ⑩ Grounding protection.

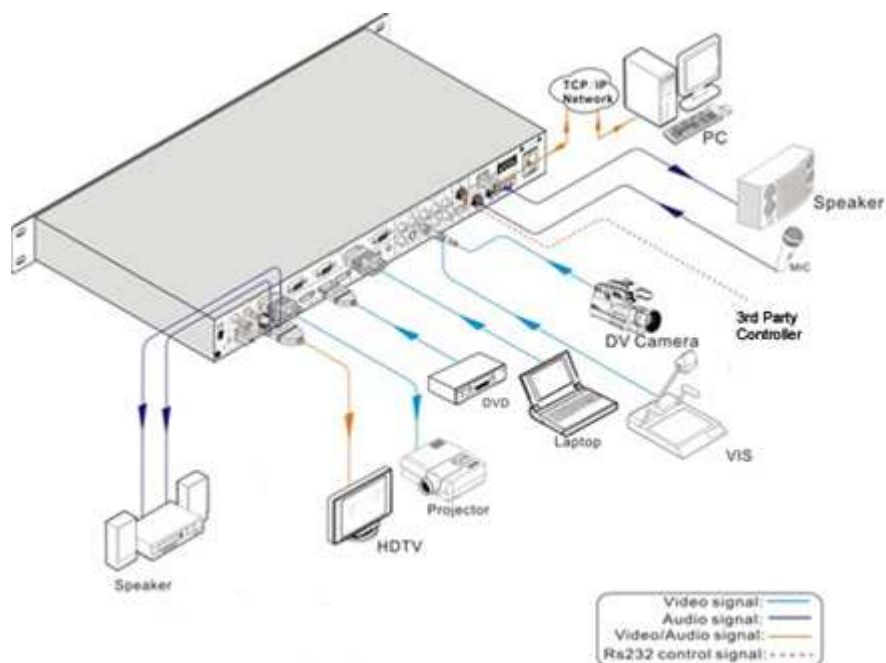
Note: Pictures shown in this manual are for reference only

3. System Connection

3.1. Usage Precautions

1. The system should be installed in a clean environment and has proper temperature and humidity.
2. All of the power switches, plugs, sockets and power cords should be insulated and safe.
3. All devices should be connected before power on.

3.2. System Diagram



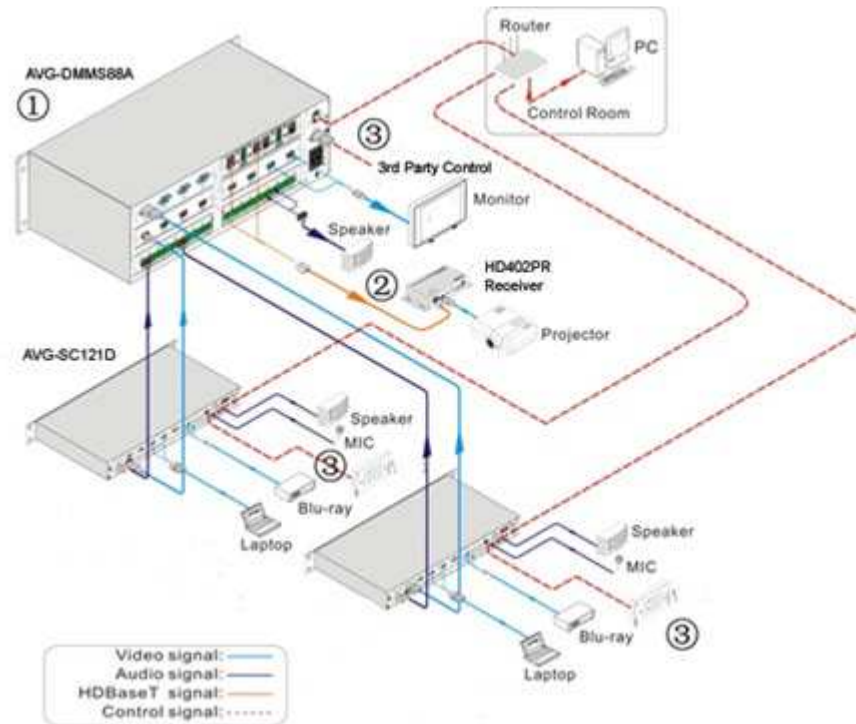
3.3. Connection Procedures

- Step 1.** Connect source devices (e.g. PC, DVD) to video input ports with corresponding cables. For example, connect VGA INPUTS ports and the VGA ports of source devices via VGA cable.
- Step 2.** Connect the corresponding audio source to the corresponding AUDIO INPUT port of AVG-SC121D with audio cable separately. C-VIDEO1 shares the same audio input port with S-VIDEO3; YPbPr shares the same audio input port with C-VIDEO4, you can select either side as audio input port.
- Step 3.** Connect a microphone to the MIC input port; plug an audio source device or a wireless microphone to the LINE port.

- Step 4.** Connect a control device (e.g. a PC) to the TCP/IP ports or RS232 sockets of AVG-SC121D. Send commands to control AVG-SC121D via control software.
- Step 5.** Connect display devices to video output ports; connect earphones/amplifiers to audio output ports. (Abiding by the color instruction on output sockets)
- Step 6.** Connect the output ports of amplifiers to stereo equipment.
- Step 7.** Plug the power cable of AVG-SC121D to an AC100V~240V power supply.

3.5. Complimentary Products

AVG-SC121D usually works with other devices to deliver multiple video & audio sources. Here are the most common ancillary products.



Description:

1. DMMS88A

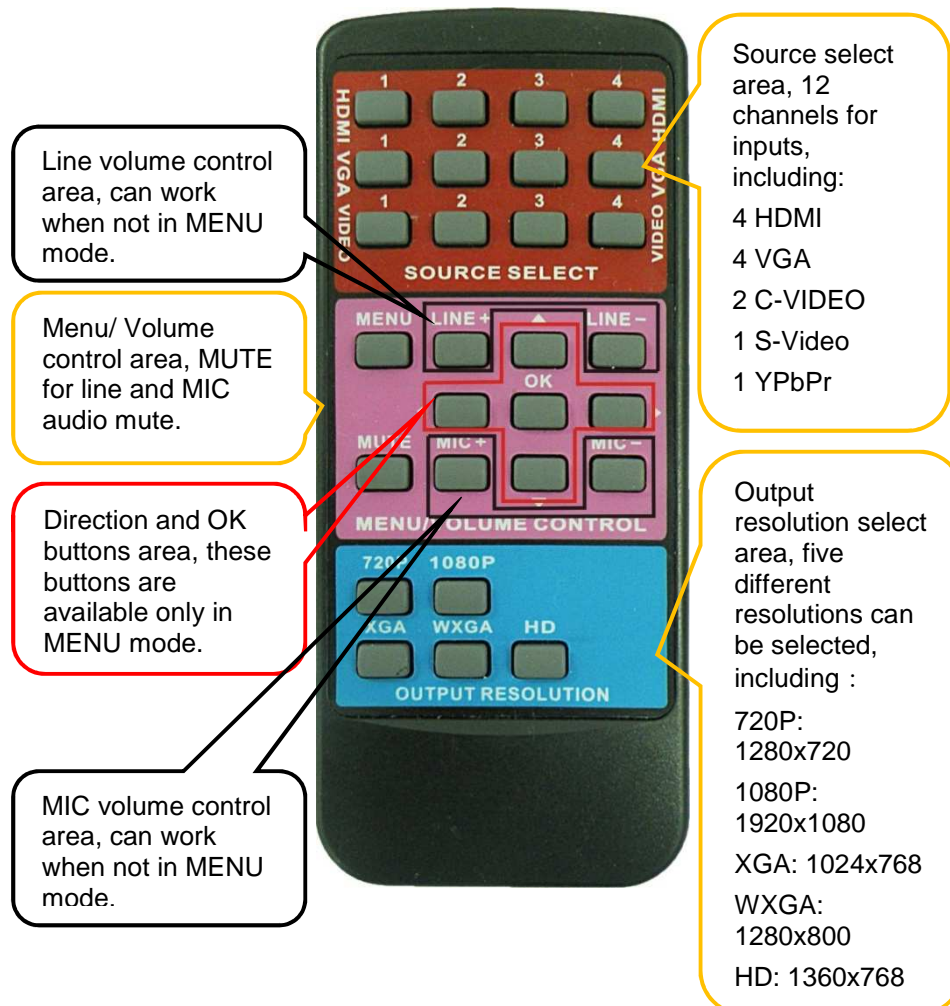
- Various I/O cards, includes HDMI, HDBaseT, SD/HD/3G-SDI, DVI and VGA cards (Compatible with YUV, YC & CVBS.) to configure any matrix.
- Support HDMI1.4a, support 3D.
- Integrated HDBaseT technology.
- Controllable via button, RS232 & optional TCP/IP, also compatible with 3rd parties control.
- LCD display.

2. AVG-HD402PR (HDMI twisted pair Receiver with PoC)

- 60m transmission distance in max over single CAT5e/CAT6 cable.
- Supports 1080P@60Hz,48b/pixels,3D & 4Kx2K.
- Supports PoC & CEC.
- Bi-directional and simultaneous RS232 & IR control.

4. Operations

4.1. Operations of the IR Remote



4.2. OSD Operations

AVG-SC121D provides an OSD operation menu, with various functions and languages.

The operation introduction is shown as follows.

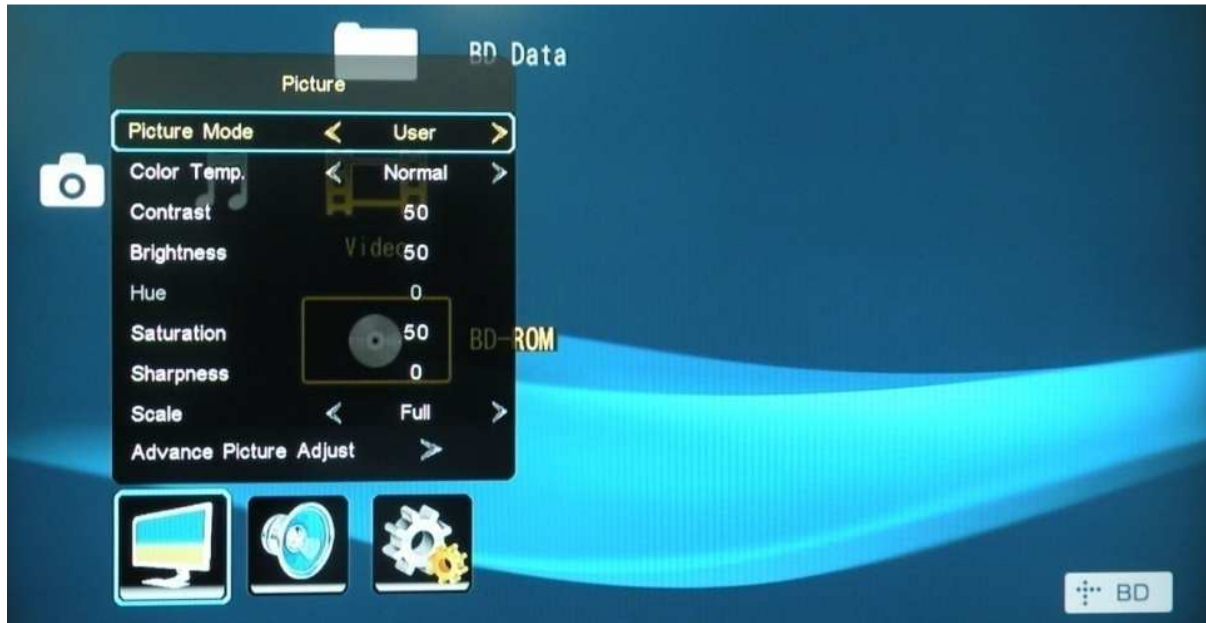
4.2.1. Picture Setting

The first icon from left of the OSD menu is to set the picture parameter. It includes picture mode, color temperature, contrast, brightness, hue, saturation, sharpness, scale, and Advance picture adjust.

Some parameters are available depending on different inputs.

In the item Advanced Picture Adjust, users can set Digital Noise Reduction, dynamic color, skin tone and Adaptive Luma adjustment function.

Please check the picture below:



4.2.2. Audio Setting

The Second icon from left of the OSD menu is to set the audio/sound parameter. It includes the sound effect preset, bass, treble, balance, scene mode, surround and smart volume setting. Some parameters are available depending on different inputs.

Please check the picture below:



4.2.3. System Setting

The Third icon from left of the OSD menu is the system setting, which includes OSD language setting, listen, freeze, VGA setting, output adjustment etc.

- **Listen:** Audio output only. To resume video output, please press button “MENU”.
- **VGA setting:** Adjust the H/V signal of VGA input, includes auto adjustment.
- **Output adjustment:** Adjust H/V size and H/V position of the output. This function is available only with HDMI and VGA inputs.



4.3. Firmware Update

AVG-SC121D supports firmware field-updating by USB flash disk. The operation procedures are:

1. Copy the file “MT23ATV.bin” to a USB flash disk. (The “MT23ATV.bin” file is provided/ authorized by AV GEAR engineering department)
2. Plug the USB flash disk to the USB port on AVG-SC121D.
3. Pressing the button “HDMI” on the front panel for 6 seconds or sending RS232 command 0698% for updating, then press the button “OK” on the remote or send RS232 command 0609% to confirm update. AVG-SC121D will capture the new firmware from USB flash disk.
4. After finishing update, reboot and send the command “0617%” to reset to factory settings.
5. After reset, reboot again.

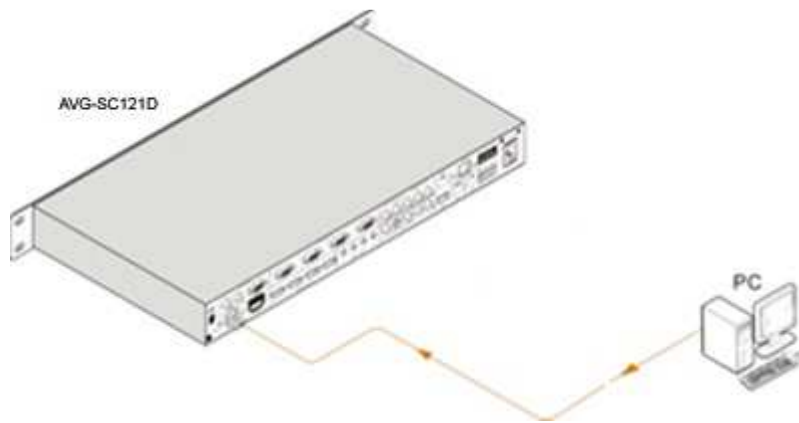
Notice: The name of the update file must be MT23ATV.bin.

4.4. RS232 Control

RS232 signals can be transmitted to the AVG-SC121D to allow control of the unit.

Control local device from remote:

Connect the RS232 ports of the AVG-SC121D and AVG-HD402PR, and connect a control device (e.g. a PC) to AVG-HD402PR, then it's able to send corresponding commands to control the AVG-SC121D from the remote.



4.4.1. Installation/Removal of RS232 Control Software

- **Installation:** Copy the control software file to the computer connected with AVG-SC121D.
- **Removal:** Delete all the control software files in corresponding file path.

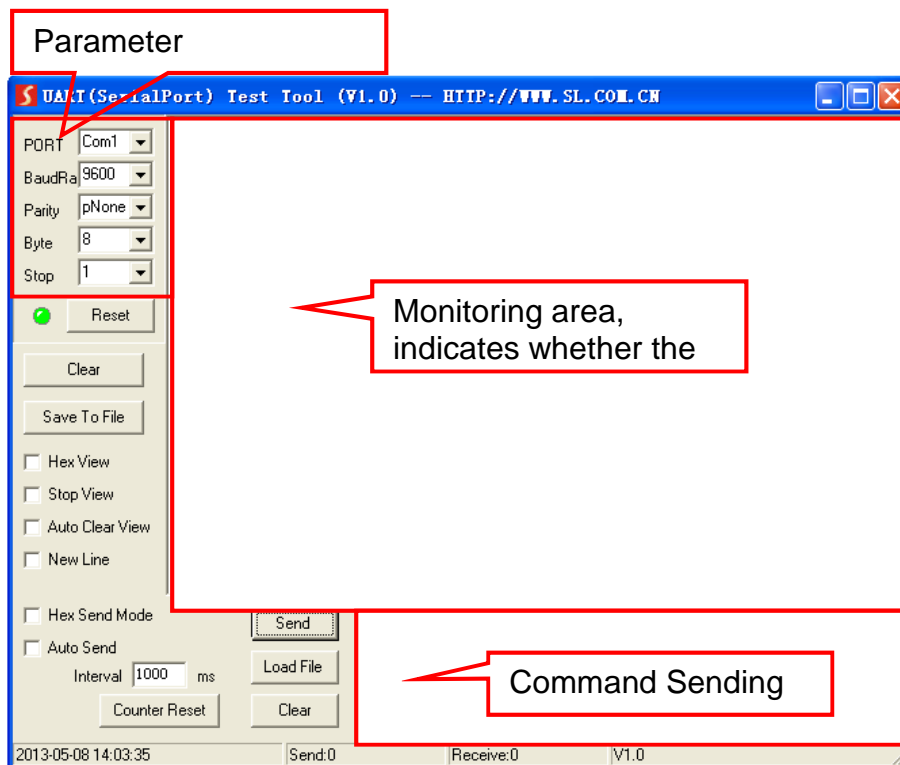
4.4.2. Basic Settings

Firstly, connect the AVG-SC121D with all input devices and output devices needed, then connect it with a computer which is installed with RS232 control software. Double-click the software icon to run this software.

Here we take the software **CommWatch.exe** as an example. The icon is showed as below:



The interface of the control software is showed 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 commands in Command Sending Area.

4.4.3. RS232 Commands

Communication protocol: RS232 Controlling Protocol **Command Type:** ASCII

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

Command	Function Description	Feedback Example
0600%	MUTE Line	LINE Mute On
0601%	UnMute Line	LINE Mute Off
0602%	Audio turn up, XX ranges from 00 to 99.	LINE Volume: xx (xx=0~99)
0603%	Audio turn down, XX ranges from 00 to 99.	LINE Volume: xx (xx=0~99)
0604%	Lock the front panel button	Panel Locked
0605%	Unlock the front panel button	Panel UnLocked
01XX%	Preset the volume. The XX is ranging from 00 to 99	Volume: XX
02XX%	Preset the brightness. XX ranges from 00 to 99.	Brightness: XX
03XX%	Preset the contrast. The XX is ranging from 00 to 99	Contrast: XX

Command	Function Description	Feedback Example
04XX%	Preset the saturation. The XX is ranging from 00 to 99	Saturation: XX
05XX%	Preset the sharpness. The XX is ranging from 00 to 07	Sharpness: XX
0606%	Auto-adjust the input signal(VGA only)	VGA Adjustment
0607%	Auto-adjust the color temperature	Color Temp: XX
0608%	ZOOM the image, set the aspect ratio	Aspect Ratio: XX
0609%	OK, for OSD selection	OK
0610%	Left of OSD	Left
0611%	Right of OSD	Right
0612%	Up of OSD	Up
0613%	Down of OSD	Down
0614%	Set the picture mode	Picture Mode : XX (
0615%	SM Mode	Sound Mode: XX
0616%	MENU of OSD	MENU
0617%	Command to reset to factory defaults	Factory reset
0618%	Change the resolution to 1360X768 HD	Resolution: HD 1360X768
0626%	Change the resolution to 1024X768 XGA	Resolution: XGA 1024X768
0627%	Change the resolution to 1280X720 720P	Resolution: 720P 1280X720
0628%	Change the resolution to 1280X800 WXGA	Resolution: WXGA 1280X800
0629%	Change the resolution to 1920X1080 1080P	Resolution: 1080P 1920X1080
0630%	Check the volume level	LINE Volume: XX/MIC Volume: XX
0631%	Check the input source	Source: XXXXXX
0632%	Check the output resolution	Resolution: XXXXXXXX
0633%	Check the image mode	Picture Mode : XX
0634%	Check the audio mode	Sound Mode: XX
0635%	Check the image aspect ratio	Aspect Ratio: XX
0636%	Check the brightness	Brightness: XX
0637%	Check the contrast	Contrast: XX
0638%	Check the saturation	Saturation: XX
0639%	Check the sharpness	Sharpness: XX
0640%	Check the color temperature	Color Temp: XX
0644%	OSD CHANNEL display able	OSD Source: Display
0645%	Shield OSD CHANNEL	OSD Channel (Source): No Display
0646%	Volume Bar display able	Volume Bar: Display
0647%	Volume Bar display unable	Volume Bar: No Display

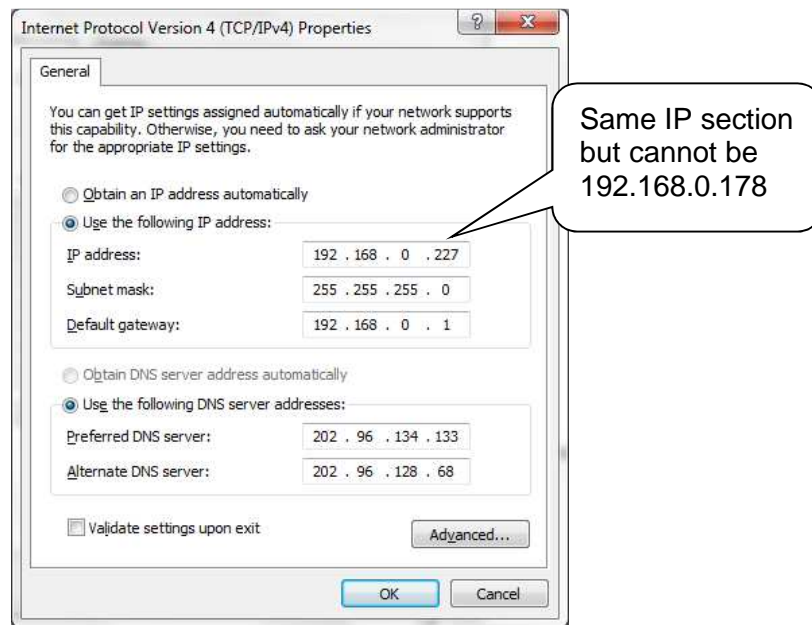
Command	Function Description	Feedback Example
0648%	Digital audio (HDMI and SPDIF) output able	Digital Sound Output: Enable
0649%	Shield digital audio (HDMI and SPDIF) output	Digital Sound Output: Disable
0650%	Check OSD CHANNEL display status	OSD Source: Display
0651%	Check Volume Bar display status	Volume Bar: Display
0652%	Check Digital audio output status	Digital Sound Output: Enable
0655%	Freeze output image	Freeze: Enable
0656%	Cancel the freezing of output image	Freeze: Disable
0698%	Firmware update	
0701%	Switching to HDMI1 input	Source: HDMI 1
0702%	Switching to HDMI2 input	Source: HDMI 2
0703%	Switching to HDMI3 input	Source: HDMI 3
0704%	Switching to HDMI4 input	Source: HDMI 4
0705%	Switching to VGA1 input	Source: VGA1
0706%	Switching to VGA2 input	Source: VGA2
0707%	Switching to VGA3 input	Source: VGA3
0708%	Switching to VGA4 input	Source: VGA4
0709%	Switching to composite video AV1 input	Source: CVIDEO1
0710%	Switching to YPbPr input	Source: YPbPr
0711%	Switching to S-Video input	Source: SVIDEO
0712%	Switching to composite video AV2 input	Source: CVIDEO2
0720%	Mute Line and MIC	Mute On
0721%	UnMute Line and MIC	Mute Off
0722%	MUTE MIC	MIC Mute On
0723%	UnMute MIC	MIC Mute Off
0724%	MIC volume turn up	MIC Volume: XX
0725%	MIC volume turn down	MIC Volume: XX
08XX%	Preset MIC volume	MIC Volume: XX

4.5. TCP/IP Control

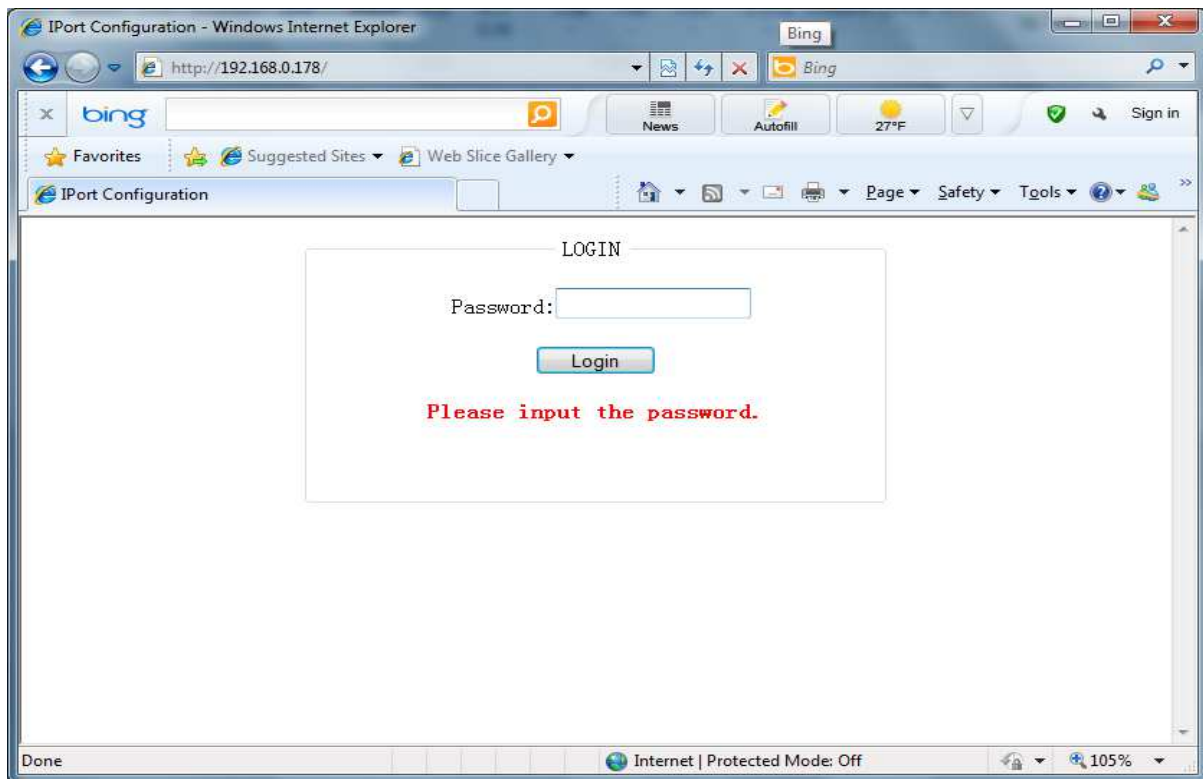
The TCP/IP RJ45 port of AVG-SC121D is used for TCP/IP control. And all the control commands are the same as the RS232 command list. Here is a detailed introduction.

4.5.1. IP Configuration

1. Connect a computer to the TCP/IP port, set its IP to the same IP range as the default IP of the AVG-SC121D (192.168.0.178). As per picture below:

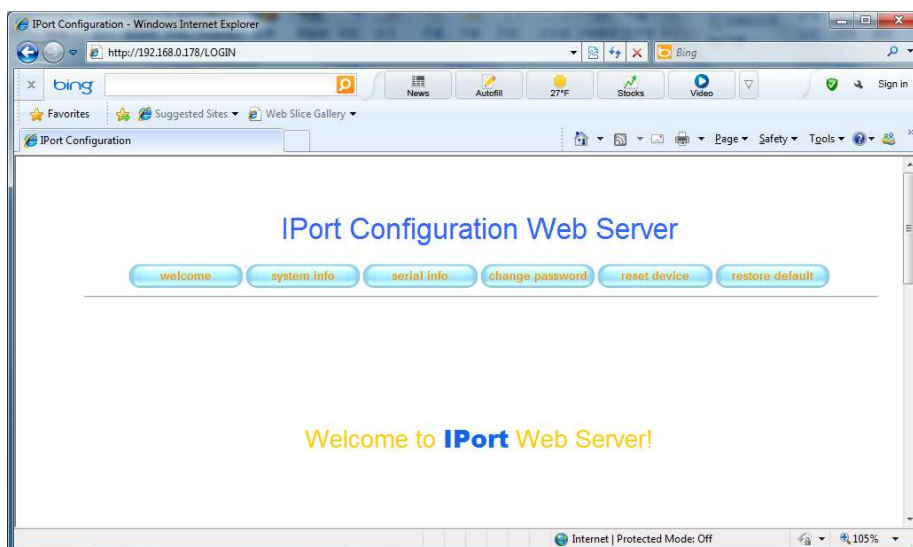


2. Enter the 192.168.0.178 into a browser window, you will see the LOGIN page as below:



3. Enter the password "88888", and then you can enter the configuration page to configure the IP port, including the IP reset, PW reset etc. As picture below:

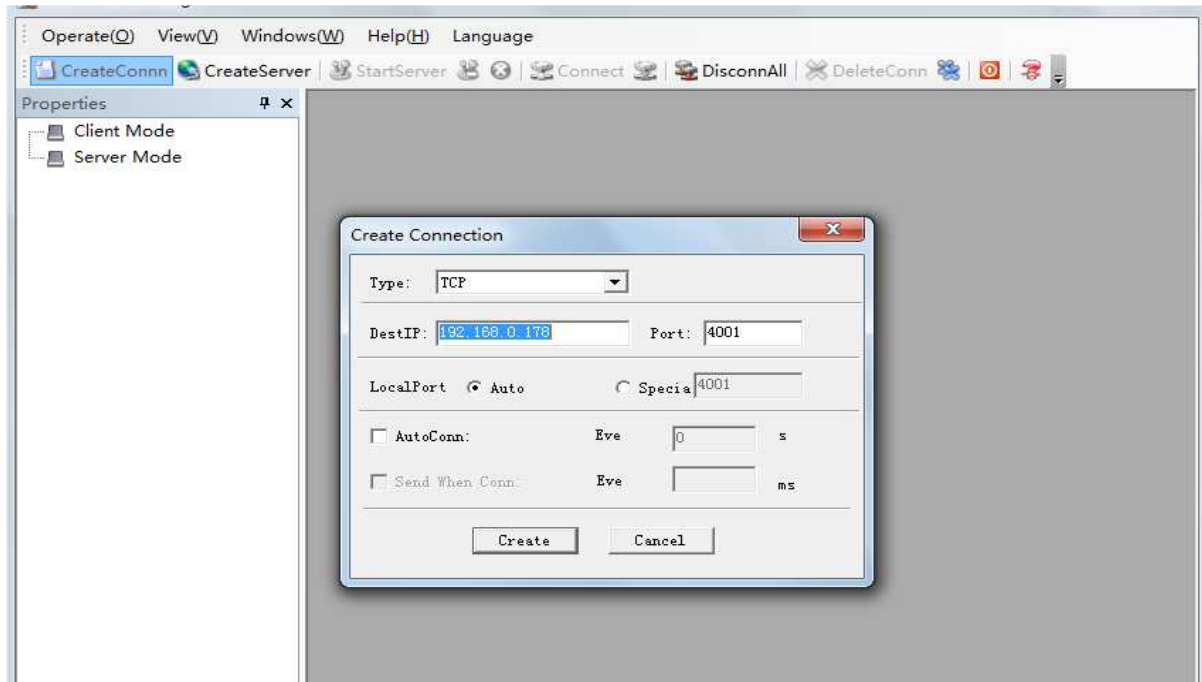
Notice: Serial configuration must be fixed to match the AVG-SC121D, so it cannot be changed.



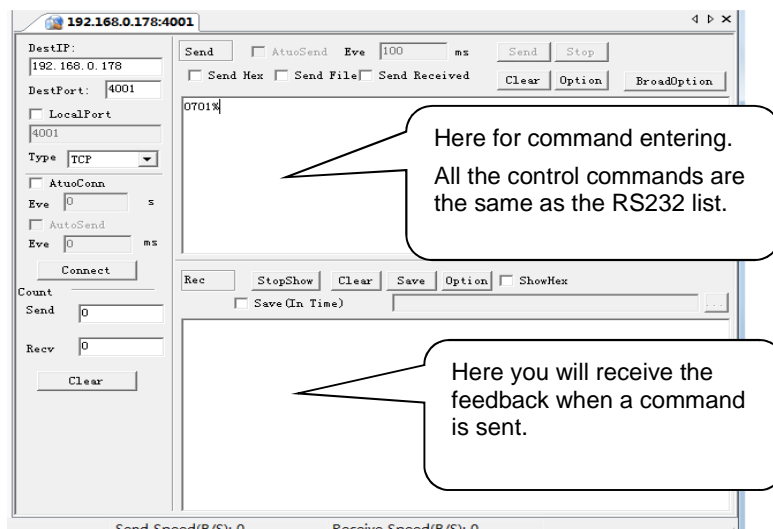
After configuration, reset device, then you can use the new IP address for control.

4.5.2. Connection Introduction

1. Connect a computer and AVG-SC121D to the same network. Open software (any TCP/IP communication software) and create a connection, enter the IP address and port of AVG-SC121D (default IP: 192.168.0.178, port:4001):



2. After connecting successfully, we can enter commands to control the AVG-SC121D, as below:



5. Specification

5.1. Specifications of AVG-SC121D

Video Input		Video Output	
Input	4 HDMI 4 VGA 1 YPbPr 2 C-Video 1 S-Video	Output	1 HDMI 1 VGA
Input Connector	HDMI female connector VGA(15 pin HD), female connector RCA female connector 4 pin mini DIN connector	Output Connector	HDMI female connector VGA(15 pin HD), female connector RJ-45 connector
Video Signal	HDMI 1.3, RGBHV, RGBs, RGsB, RsBsGs, NTSC 3.58, NTSC 4.42,PAL,SECAM	Video Signal	HDMI 1.3 VGA
Video General			
Resolution Range	1080P,1920*1080 ; HD, 1360*768 720P, 1280*720; WXGA,1280*800 ; XGA, 1024*768.	Bandwidth	HDMI: 4.95Gbps(1.65Gbps per color) C-Video/S-Video: 150MHz YPbPr: 170MHz VGA: 375MHz
Maximum Pixel Clock	145MHz	Video Impedance	75Ω
Gain	0dB	I/O Level	0.5V~2.0Vp-p
HDCP management	Compliant with High-bandwidth Digital Content Protection(HDCP) with DVI & HDMI 1.3 standards		
Audio Input		Audio Output	
Input	6 Stereo Audio for line audio 2 MIC audio	Output	Stereo audio for line audio 2x10W @8Ω/2x20W @4Ω amplifier
Input Connector	4 RCA female connector for YPbPr, C-Video & S-Video audio 4 3.5mm jack for VGA audio HDMI for HDMI embedded audio	Output Connector	RCA connector Amplifier connector

Audio Input Impedance	>10kΩ	Audio Output Impedance	75Ω
Audio General			
CMRR	>90dB @20Hz to 20K Hz	Stereo Channel Separation	>80dB @1KHz
Frequency Response	20Hz~20K Hz		
Control Parts			
Control / Remote	IR remote, Buttons & RS-232, TCP/IP	Pin Configurations	2 = TX, 3 = RX, 5 = GND
General			
Temperature	-10 ~ +40℃	Humidity	10% ~ 90%
Power Supply	100VAC ~ 240VAC, 50/60Hz	Power Consumption	65W
Dimension (W* H*D)	483 x 44x 235mm	Weight	2.2Kg

5.2. Specifications of Video/Audio Input/Output

5.2.1. C-Video and S-Video Input

- Supports PAL/SECAM/NTSC format
- Changeable aspect ratio. (Full-screen, wide screen, 4:3)
- Color RGB adjustable

5.2.2. YPbPr Input

Input Resolution	Display Parameter				
	Frame Frequency		Frame Frequency		Frame Frequency
720x480 I	2:1	525	15.75	60	4:3
720x480 P	1:1	525	31.5	60	4:3
720x576 I	2:1	625	15.625	50	4:3
720x576 P	1:1	625	31.25	50	4:3
1280x720P	1:1	750	45	60	16:9
1280x720P	1:1	750	37.50	50	16:9
1920x1080 I	2:1	1125	28.125	50	16:9
1920x1080 I	2:1	1125	33.75	60	16:9
1920x1080 I	2:1	1250	31.25	50	16:9
1920x1080 p	1:1	1250	62.5	50	16:9
1920x1080 p	1:1	1250	67.5	60	16:9

The bandwidth is up to 170MHz

- Adjustable aspect ratio. (Full-screen, wide screen, 4:3, auto-adjust)
- Supports HDTV input

5.2.3. VGA Input

The VGA resolution is VESA standard, supporting:

No.	Resolution	No.	Resolution
1	640×480@60 Hz	8	1024×768@70 Hz
2	640×480@72 Hz	9	1024×768@75 Hz
3	720×400@70 Hz	10	1280×1024@75 Hz
4	800×600@60 Hz	11	1280×768@60Hz
5	800×600@72 Hz	12	1360×768@60 Hz
6	800×600@75 Hz	13	1920×1080
7	1024×768@60 Hz		

- The bandwidth is up to 375MHz.
- The following audio can adjust bass/treble
- Changeable aspect ratio. (Full-screen, 4:3)

5.2.4. HDMI Input

HDMI resolution support:

No.	Resolution	No.	Resolution
1	640×480@60Hz	9	1024×768@70 Hz
2	640×480@72Hz	10	1024×768@75 Hz
3	640×480@75Hz	11	1280×1024@75Hz
4	800×600@56Hz	12	1360×768@60Hz
5	800×600@60 Hz	13	1920×540@60Hz
6	800×600@72 Hz	14	1920×1080I@60Hz
7	800×600@75Hz	15	1920×1080P@60Hz
8	1024×768@60 Hz		

- Digital embedded audio decoding.
- Adjustable aspect ratio (Full-screen, wide screen, 4:3, auto-adjust).
- Support HDCP1.3, compatible with DVI signal.

5.3. Audio Input/Output

- 2 pairs of L/R analog audio input, 4 VGA audio and 2 MIC audio inputs
- 2x10W@8Ω amplifier output. L/R stereo audio output and HDMI embedded audio.
- Volume/Bass/Treble adjustable
- Audio status presets, changeable scene mode (Wall-mounted, Desk)

6. Panel Drawing



7. Troubleshooting & Maintenance

Problems	Causes	Solutions
Color loss or no video signal output in HDMI display	The connecting cables may not be connected correctly or may be faulty	Check whether the cables are connected correctly and in working condition.
No HDMI signal output in the device while local HDMI input is in normal working state		
Output images in display show ghosting	Incorrect setting on the display	Check the display's setting
	A cable of poor quality	Try another high quality connection cable
No output image when switching	No signal at the input / output end	Check with oscilloscope or multimeter if there is any signal at the output end.
	Fail or loose connection	Make sure the connection is good
	The extender is faulty	Send it to authorized dealer for repair.
Cannot control the device with IR remote	The battery is flat	Change for another battery.
	The IR remote is out of range or faulty	Send it to authorized dealer for repair.
Cannot control the device via control device (e.g. a PC) through RS232 port	Wrong RS232 communication parameters	Make sure the RS232 communication parameters are correct.
	The device is broken	Send it to authorized dealer for repairing.
Static becomes stronger when connecting the video connectors	Poor grounding	Check the grounding and make sure it is connected well.

If your problem persists after following the above troubleshooting steps, seek further help from an authorized dealer or our technical support.