

# NEXIS

## MS983A

**Multiple Inputs to HDMI/VGA Scaler**



## Operation Manual



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## SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply.

Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person to walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.

## REVISION HISTORY

VERSION NO.	DATE (DD/MM/YY)	SUMMARY OF CHANGE
VR0	27/06/13	Preliminary Release
VS1	24/07/13	Updated format/diagrams
VR2	08/04/15	RS-232 Command
VS3	22/06/16	Corrected RS-232 CR+LF command

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## 1. INTRODUCTION

This Multi Input Scaler has Composite Video, Component Video, PC (VGA), and HDMI inputs and can switch and scale the signal to HDMI or VGA with audio outputs. It supports HDMI output resolutions up to 1080p/WUXGA and Analog Digital Conversion (ADC) and Digital Analog Conversion (DAC) allowing a wide range of AV signals to be displayed on a HDMI or VGA display. Further, the On-screen Display (OSD), IR remote, RS-232, IP and on-panel controls make this product very versatile.

## 2. APPLICATIONS

- Analog and digital source integration
- Upscaling standard definition video for high-definition displays
- Conference centres
- Lecture halls
- Schools and universities

## 3. PACKAGE CONTENTS

- 1×Multiple Inputs to HDMI/VGA Scaler
- 1×15-pin D-Sub to 3 RCA Adaptor Cable
- 1×IR Extender Cable
- 1×Remote Control (CR-122)
- 1×5V/3A Power Adaptor
- 1×Operation Manual

## 4. SYSTEM REQUIREMENTS

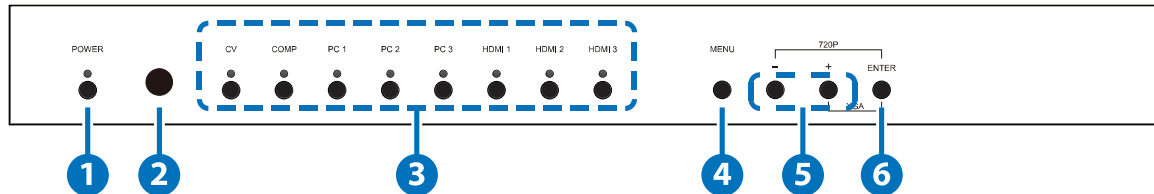
Source equipment such as Blu-ray/DVD players or PC/Laptop and output to displays, AV Receivers or active speakers.

## 5. FEATURES

- Supports switching and scaling of multiple AV inputs to HDMI or PC/HD outputs
- Supports EDID and HDCP
- Supports 3D de-interlace, noise reduction and 3D comb filter
- Supports frame rate conversion
- Supports RS-232, IP (Telnet/WebGUI) and IR controls
- Supports output timing hot keys switching
- HDMI compatible with DVI
- Supports Digital to Analog (DAC) and Analog to Digital (ADC) Audio conversion
- Supports non-HDCP signal of Apple computers

## 6. OPERATION CONTROLS AND FUNCTIONS

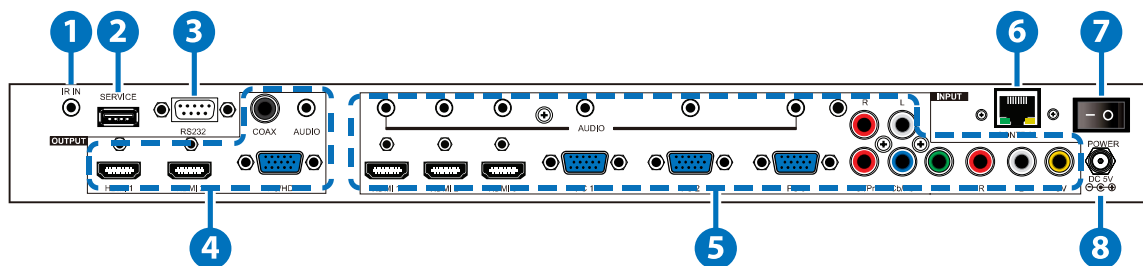
### 6.1 Front Panel



- 1 POWER & LED:** Press this button to switch the device on or to set it to standby mode. Once the device is connected to an active power supply and the Power Switch on the back panel is turned on, the LED will illuminate and the device will switch on automatically.
- 2 IR Window:** Receives only the IR signal from the remote control included in the package.
- 3 INPUT & LEDs:** Press these buttons to switch directly to the required source. An LED will illuminate to indicate the selected input source.
- 4 MENU:** Press this button to enter the On-screen Display (OSD) menu.
- 5 Plus/Minus (-/+):** Press these buttons to navigate down and up in the OSD menu.
- 6 ENTER:** Press this button to confirm the selection in the OSD menu.  
*Note: Press this button simultaneously with the '+' (plus) button to instantly switch the output to XGA resolution or with the '-' (minus) button to instantly switch the output to 720p resolution.*



## 6.2 Rear Panel



- 1 IR IN:** Connect the supplied IR extender to receive the IR signal from the included IR remote. Ensure that the remote is within the direct line-of-sight of the IR extender.
- 2 SERVICE:** Reserved for manufacturer use only.
- 3 RS-232:** Connect to a PC/Laptop or RS-232 control system to use RS-232 commands to control the device (See Section 6.5 for details).
- 4 OUTPUT**
  - (1) HDMI 1~2:** Connect to an HDMI display or AV Receiver for video and/or audio output.
  - (2) PC/HD:** Connect to a monitor/display for video output. For HD (Component) output, use the supplied D-Sub 9pin to 3 RCA adaptor cable for HD resolutions from 480p~1080p.  
*Note: When the selected HDMI input source signal has HDCP content the VGA/Component output will not display any image.*
  - (3) COAX:** Connect to an amplifier or active speakers for audio output in digital format.  
*Note: When the input audio source signal is in bitstream format and the AUDIO SOURCE setting is set to AUTO in the OSD menu, the coaxial output will bypass the input audio signal including compatible surround sound formats.*
  - (4) AUDIO:** Connect to an amplifier or active speakers for audio output in stereo format.
- 5 INPUT**
  - (1) HDMI 1~3:** Connect to HDMI sources such as Blu-ray/DVD player for both video and audio signal conversion.
  - (2) PC 1~3:** Connect to a PC/Laptop source for video signal input with a 15-pin D-Sub cable.

**(3) 3.5mm Mini-jacks:** Connect to source's L/R output with 3.5mm mini-jack for audio signal conversion.

*Note: For HDMI signals you can select in the OSD Menu whether you require audio from the HDMI (AUTO) or from the analog audio inputs (EXT)*

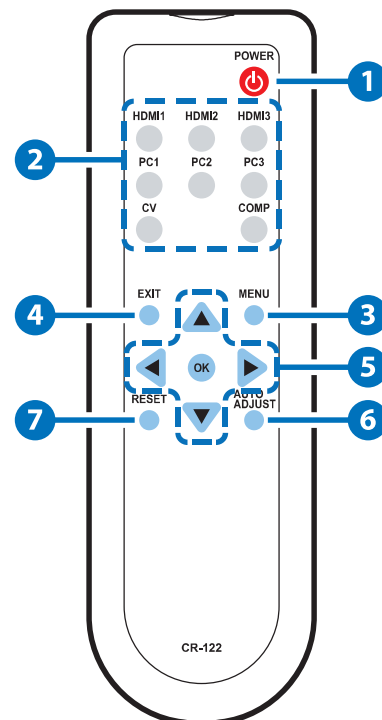
**(4) YCbCr/YPbPr + L/R:** Connect to source equipment such as a DVD player for both video and audio signal conversion.

**(5) CV + L/R:** Connect to a composite video source such as a video/DVD player for both video and audio signal conversion.

- 6 CONTROL:** This port is the link for Telnet or WebGUI controls, connect to an active Ethernet link with an RJ45 terminated cable
- 7 POWER:** Switch this power toggle to turn on and activate the device or turn off to shut it down.
- 8 DC 5V:** Connect the power adaptor included in the package to the device and plug it into an AC wall outlet for power supply.

## 6.3 Remote Control

- 1 POWER:** Press this button to switch the device on or to set it to standby mode.
- 2 HDMI 1~3, PC 1~3, CV & COMP:** Direct source selection keys. Press one of these keys to switch to the required source.
- 3 MENU:** Press this button to enter the OSD menu.
- 4 EXIT:** Press this button to exit the menu or the current selection in the OSD menu.
- 5 OK & ▲/▼/◀/▶:** Press OK to confirm the selection or press the arrow buttons to navigate the OSD menu. When the OSD menu is not active, use the LEFT/RIGHT (◀/▶) to control the volume level.
- 6 AUTO ADJUST:** Press this button when the image being outputted does not correctly fit the display's screen. The device will auto adjust the image to fill the screen.
- 7 RESET:** Press this button to reset the device back to the default settings.



## 6.4 OSD Menu

MAIN MENU	SUB MENU	3RD MENU	4TH MENU
DISPLAY	OUTPUT	640×480 60	
		800×600 60	
		1024×768 60	
		1280×768 60	
		1360×768 60	
		1280×720 60	
		1280×800 60	
		1280×1024 60	
		1440×900 60	
		1400×1050 60	
		1680×1050 60	
		1600×1200 60	
		1920×1080 60	
		1920×1200 60	
		<b>1280×720P 60*</b>	
		1920×1080I 60	
		1920×1080P 60	
		720×576P 50	
		1280×720P 50	
		1920×1080I 50	
		1920×1080P 50	

MAIN MENU	SUB MENU	3RD MENU	4TH MENU
DISPLAY	SIZE	OVER SCAN	
		<b>FULL*</b>	
		FOLLOW INPUT	
		PAN SCAN	
		LETTER BOX	
		UNDER 2	
		UNDER 1	
	MODE INFO	OFF	
		<b>INFO*</b>	
		ON	
	INPUT HDCP (HDMI source only)	OFF	
		<b>ON*</b>	
	PC (PC source only)	AUTO SETUP	
		H_POSITION	
		V_POSITION	
		PHASE	
		CLOCK	
		WXGA/XGA	<b>XGA*</b>
			WXGA
		RESET	
	TIMING SHIFT	<b>OFF*</b>	
		ON	

MAIN MENU	SUB MENU	3RD MENU	4TH MENU
COLOR	CONTRAST	0~60 (30)	
	BRIGHTNESS	0~60 (30)	
	COLOR	R 0~1023 (512)	
		G 0~1023 (512)	
		B 0~1023 (512)	
		R OFFSET 0~1023 (512)	
		G OFFSET 0~1023 (512)	
		B OFFSET 0~1023 (512)	
	HUE	0~60 (30)	
	SATURATION	0~60 (30)	
	SHARPNESS	0~30 (0)	
	NR.	<b>OFF*</b>	
		LOW	
		MIDDLE	
		HIGH	
AUDIO	VOLUME	0~100 (100)	
	DELAY	<b>OFF*</b>	
		40ms	
		110ms	
		150ms	
	SOUND	<b>ON*</b>	
		MUTE	
	SOURCE (HDMI mode only)* <sup>1</sup>	<b>AUTO*</b>	
		EXT.	

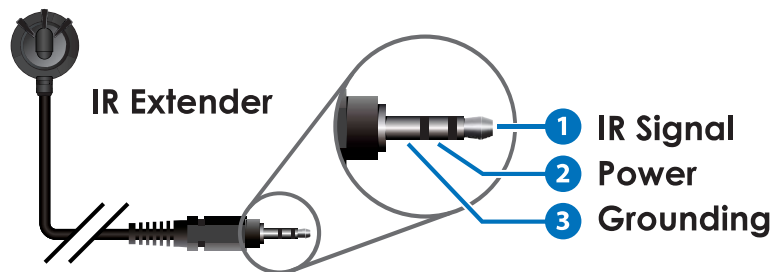
MAIN MENU	SUB MENU	3RD MENU	4TH MENU
SETUP	FACTORY RESET* <sup>2</sup>		
	KEY LOCK	OFF*	
		ON	
	POWER SAVE	OFF*	
		ON	
	IP MODE	DHCP*	
		STATIC	
	SET STATIC IP	IP ADDRESS	0.0.0.0.~ 255.255.255.255* <sup>3</sup>
		SUBNET MASK	0.0.0.0.~ 255.255.255.255* <sup>4</sup>
		DEF.GETWAY	0.0.0.0.~ 255.255.255.255* <sup>5</sup>
INFORMATION	FREERUN COLOR	BLACK	
		BLUE*	
	INPUT		
	OUTPUT		
	REVISION		
	IP ADDRESS		

Note:

- When AUDIO SOURCE sets to 'AUTO', if the selected HDMI input port is connected to an HDMI source, audio signal of the source will be used for output; if the selected HDMI input port is connected to a DVI source, audio signal from the 3.5mm phone-jack on top of the selected HDMI input port will be used. When AUDIO SOURCE sets to 'EXT', only the audio signal from the 3.5mm phone-jack on top of the selected HDMI input port will be used for output.

2. The **FACTORY RESET** option in the OSD menu will only reset part of settings. For a complete reset of the system, please use the reset button on the remote control.
3. 192.168.0.1 (Default setting).
4. 255.255.255.0 (Default setting).
5. 192.168.0.254 (Default setting).
6. Items in **BOLD** with an asterisk (\*) are the Factory default settings. Items in brackets are the default values for those settings.

## 6.5 IR Cable Pin Assignment



## 6.6 RS-232 Protocols

SCALER		REMOTE CONTROL	
Pin	Assignment	Pin	Assignment
1	NC	1	NC
2	Tx	2	Rx
3	Rx	3	Tx
4	NC	4	NC
5	GND	5	GND
6	NC	6	NC
7	NC	7	NC
8	NC	8	NC
9	NC	9	NC

Baud Rate: 19200bps

Data bit: 8 bits

Parity: None

Flow Control: None

Stop Bit: 1

## 6.7 RS-232 and Telnet Commands

COMMAND	DESCRIPTION
<b>S POWER 0/1</b>	0=OFF                      1=ON
<b>R POWER</b>	Reports the numeric equivalent for POWER setting (as above)
<b>S SOURCE 1~8</b>	1=HDMI 1                      5=VIDEO 2=HDMI 2                      6=PC 1 3=HDMI 3                      7=PC 2 4=YpPr                      8=PC 3
<b>R SOURCE</b>	Reports the numerical equivalent for SOURCE setting (as above)



COMMAND	DESCRIPTION
<b>S OUTPUT 0~21*<sup>1</sup></b>	0=640×480                      11=1600×1200 1=800×600                     12=920×1080 2=1024×768                   13=1920×1200 3=1280×768                   14=480p 4=1360×768                   15=720p6@0 5=1280×720                   16=1080i@60 6=1280×800                   17=1080p@60 7=1280×1024                  18=576p 8=1440×900                   19=720p@50 9=1400×1050                  20=1080i@50 10=1680×1050                21=1080p@50
<b>R OUTPUT</b>	Reports the numerical equivalent for OUTPUT setting (as above)
<b>S SIZE 0~6</b>	0=OVERSCAN                   4=LETTER BOX 1=FULL                         5=UNDER 2 2=FOLLOW INPUT              6=UNDER 1 3=PAN SCAN
<b>R SIZE</b>	Reports the numerical equivalent for SIZE setting (as above)
<b>S INPUT HDCP 0/1</b>	0=ON                              1=OFF
<b>R INPUT HDCP</b>	Apple Computers Only. Reports the numerical equivalent for INPUT HDCP setting (as above)
<b>S SYNCSHIFT 0/1</b>	0=ON                              1=OFF
<b>R SYNCSHIFT</b>	Reports the numerical equivalent for SYNCSHIFT setting (as above)
<b>S CONTRAST 0~60</b>	Sets the numerical equivalent for CONTRAST setting (0~60)
<b>R CONTRAST</b>	Reports the numerical equivalent for CONTRAST setting
<b>S BRIGHTNESS 0~60</b>	Sets the numerical equivalent for the BRIGHTNESS setting (0~60)

COMMAND	DESCRIPTION
<b>R BRIGHTNESS</b>	Reports the numerical equivalent for the BRIGHTNESS setting
<b>S HUE 0~60</b>	Sets the numerical equivalent for the HUE setting (0~60)
<b>R HUE</b>	Reports the numerical equivalent for the HUE setting
<b>S SATURATION 0~60</b>	Sets the numerical equivalent for the SATURATION setting (0~60)
<b>R SATURATION</b>	Reports the numerical equivalent for the SATURATION setting
<b>S SHARPNESS 0~30</b>	Sets the numerical equivalent for the SHARPNESS setting (0~60)
<b>R SHARPNESS</b>	Reports the numerical equivalent for SHARPNESS setting
<b>S NR 0~3</b>	0=OFF 1=LOW 2=MIDDLE 3=HIGH
<b>R NR</b>	Reports the numerical equivalent for the NOISE REDUCTION setting (as above)
<b>S VOLUME 0~100</b>	Sets the numerical equivalent for VOLUME setting (0~100)
<b>R VOLUME</b>	Reports the numerical equivalent for VOLUME setting
<b>S AUDIO DELAY 0~3</b>	0=OFF 1=40ms 2=110ms 3=150ms
<b>R AUDIO DELAY</b>	Reports the numeric equivalent for the AUDIO DELAY setting (as above)
<b>S AUDIO MUTE 0/1</b>	0=ON 1=MUTE
<b>R AUDIO MUTE</b>	Reports the numeric equivalent for the AUDIO MUTE setting (as above)
<b>S HDMI AUDIO 0/1</b>	0=AUTO 1=EXT
<b>R HDMI AUDIO</b>	Reports the numeric equivalent for HDMI AUDIO setting (as above)
<b>S KEY LOCK 0/1</b>	0=ENABLE 1=DISABLE

COMMAND	DESCRIPTION
<b>R KEY LOCK</b>	Reports the numeric equivalent for KEY LOCK setting (as above)
<b>S FREERUNCOLOR 0/1</b> <b>R FREERUNCOLOR</b>	0=BLACK                      1=BLUE Reports the numerical equivalent for the free run color setting (as above)
<b>S RESET 1</b>	Sets the numerical equivalent for RESET setting (as left)
<b>PORT 0~8</b>	0=LAST MEMORY              5=VIDEO 1=HDMI 1                      6=PC 1 2=HDMI 2                      7=PC 2 3=HDMI 3                      8=PC 3 4=YPbPr
<b>ST</b>	Checks the FIRMWARE version and SOURCE information: 0.00~x.xx SOURCE: HDMI ~ PC3 PORT ON: LAST ~ PC3
<b>VOL +</b>	Raises the volume level (VOLUME * IS SET)
<b>VOL -</b>	Lowens the volume level (VOLUME * IS SET)
<b>QUIT</b>	Exit. (Telnet Only)

Note:

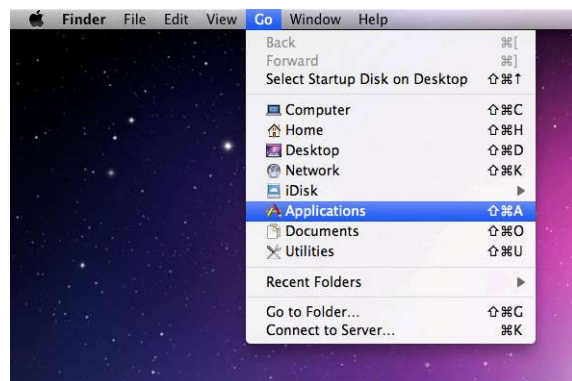
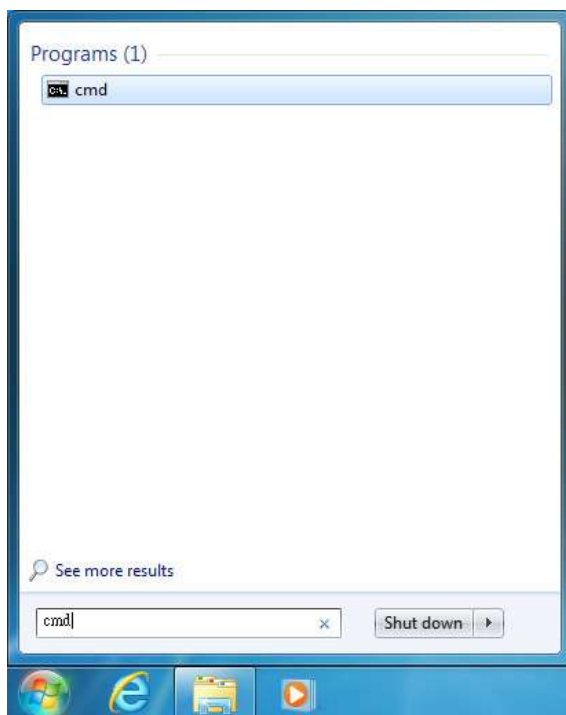
1. Resolution settings 0~13 are RGB encoded. Resolution settings 14~21 are YUV encoded.
2. RS-232 commands will be not executed unless followed with a carriage return (CR) command and a Line feed (LF) command. Commands are case-insensitive.

## 6.8 Telnet Control

Before attempting to use the Telnet control, ensure that both the Scaler (via the LAN port) and the PC/Laptop or control system being used are connected to the same active network.

To access the Telnet control in Windows 7, click on the 'Start' menu and type 'cmd' into the Search field then press Enter (see below for reference). Under Windows XP, go to the 'Start' menu and click on 'Run', type 'cmd' then press Enter.

Under Mac OS X, go to the file menu then navigate to Go→Applications→Utilities→Terminal (see below for reference).



Once in the command line interface (CLI) type 'telnet' along with the IP address of the unit you wish to control (see below for reference). This will bring us into the device which we wish to control.

```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>telnet 192.168.5.80 23
```

*Note: The IP address can be obtained from the OSD menu under Information. If the IP is changed then the IP Address required for Telnet access will also needs to be change accordingly.*

Type '?' to list all the available commands (see below for reference).

```

S POWER n          // n:0~1 ,0:Off 1:On
R POWER           //
S SOURCE n         // n:1~8
R SOURCE          //
S OUTPUT n         // n:0~21
R OUTPUT          //
S SIZE n           // n:0~6
R SIZE            //
S INPUTHDCP n      // n:0~1 ,0:On 1:Off
R INPUTHDCP       //
S CONTRAST n       // n:0~60
R CONTRAST        //
S BRIGHTNESS n    // n:0~60
R BRIGHTNESS      //
S HUE n            // n:0~60
R HUE             //
S SATURATION n     // n:0~60
R SATURATION       //
S SHARPNESS n      // n:0~30
R SHARPNESS        //
S NR n             // n:0~3
R NR              //
S VOLUME n         // n:0~100
R VOLUME          //
S AUDIODELAY n     // n:0~3
R AUDIODELAY       //
S AUDIOMUTE n      // n:0~1 ,0:On 1:Mute
R AUDIOMUTE        //
S HDMIAUDIO n      // n:0~1 ,0:Auto 1:Ext.
R HDMIAUDIO        //
S KEY LOCK n       // n:0~1 ,0:On 1:Off
R KEY LOCK         //
S FREERUNCOLOR n   // n:0~1 ,0:Black 1:Blue
R FREERUNCOLOR     //
S RESET n          // n:1
PORT n             // n:0~8
ST                // Show Status & fw version
VOL +              // Volume Up
VOL -              // Volume Down

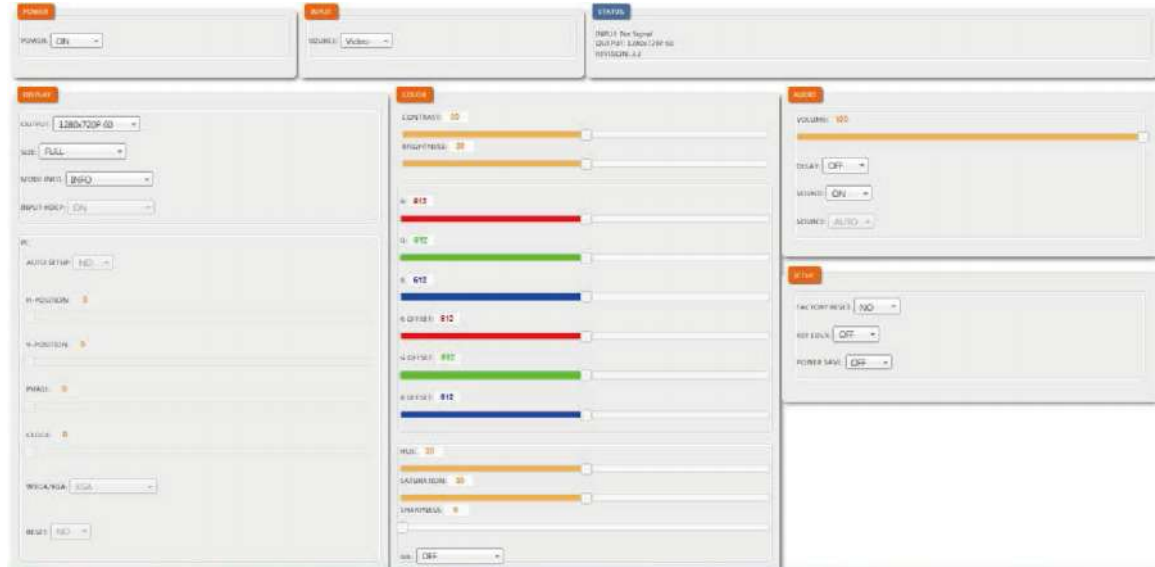
```

*Note: All commands will not be executed unless followed by a carriage return. Commands are case-insensitive.*



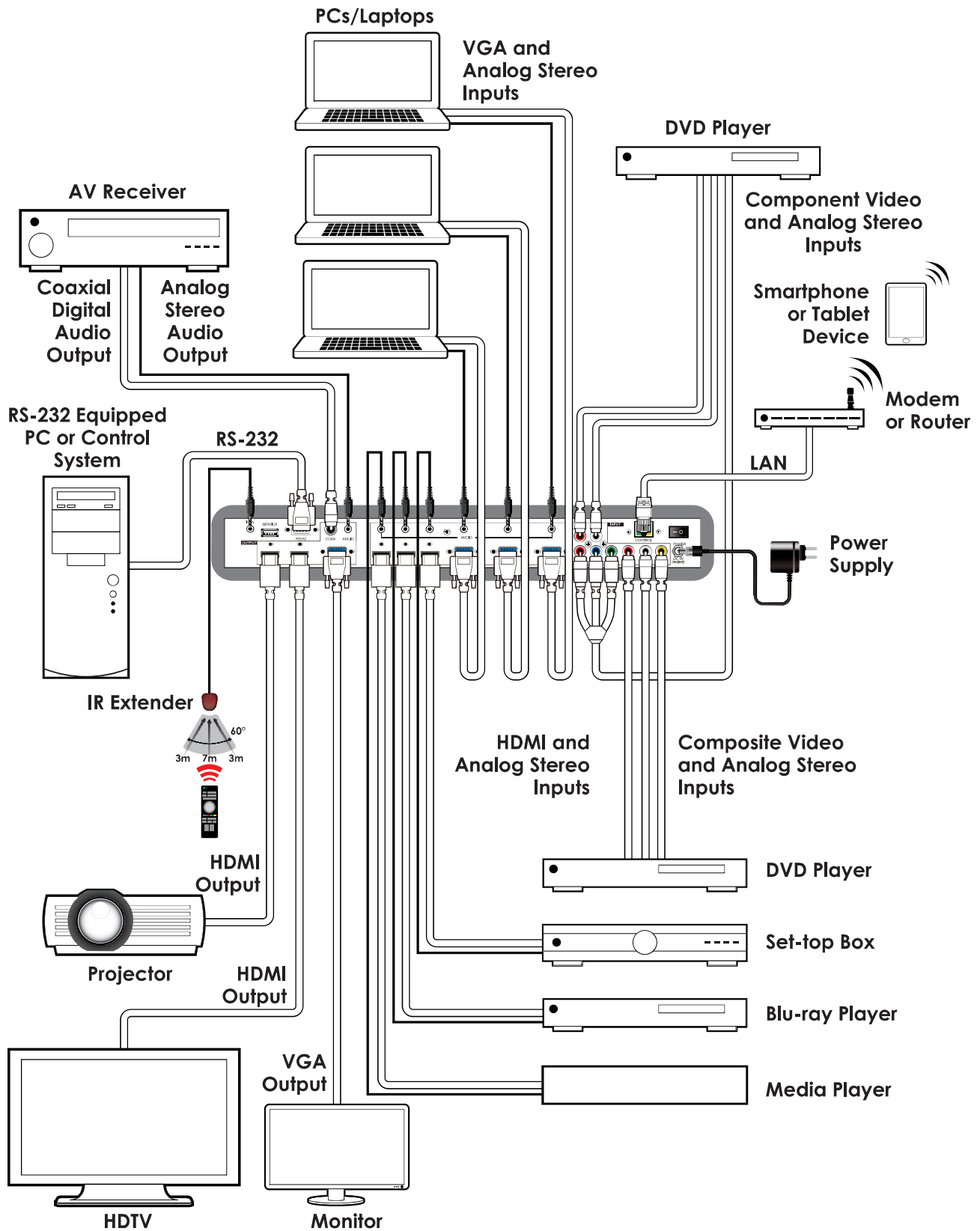
## 6.9 WebGUI Control

On a PC/Laptop that is connected to same active network as the Scaler, open a web browser and type device's IP address on the web address entry bar. The browser will bring up the control page of the Scaler (see below for reference).



*Note: The IP address can be obtained from the OSD menu under Information. If the IP is changed then the IP Address required for Telnet access will also needs to be changed accordingly.*

## 7. CONNECTION DIAGRAM



## 8. SPECIFICATIONS

### 8.1 Technical Specification

<b>Input Ports</b>	3×HDMI, 3×VGA (15-pin D-sub), 1×Component Video, 1×Composite Video, 6×3.5mm Stereo Audio, 4×RCA Stereo Audio, 1×IR Extender (3.5mm), 1×RS-232 (9-pin D-sub), 1×IP Control (RJ45), 1×USB (Service)
<b>Output Ports</b>	2×HDMI, 1×VGA (15-pin D-sub), 1×Coaxial Audio, 1×3.5mm Stereo Audio
<b>Input Resolution</b>	Up to 1080p/UXGA
<b>Output Resolution</b>	Up to 1080p/WUXGA (RB)
<b>Power Supply</b>	5 V/3 A DC (US/EU standards, CE/FCC/ UL certified)
<b>Dimensions</b>	432mm (W)×183mm (D)×47mm (H)
<b>Weight</b>	2,140g
<b>Chassis Material</b>	Metal
<b>Silkscreen Color</b>	Black
<b>Operating Temperature</b>	0°C~40°C/32°F~104°F
<b>Storage Temperature</b>	-20°C~60°C/-4°F~140°F
<b>Relative Humidity</b>	20~90%RH (non-condensing)
<b>Power Consumption</b>	11 W



## 8.2 Input Resolution

RESOLUTION	CV	YCbCr/YPbPr	PC	HDMI
NTSC/PAL	✓	-	-	-
480i/576i	-	✓	-	✓
480p/576p	-	✓	-	✓
720p@50/60	-	✓	-	✓
1080i@50/60	-	✓	-	✓
1080p@50/60	-	✓	-	✓
VGA@60/72/75	-	-	✓	✓
SVGA@56/60/72/75	-	-	✓	✓
XGA@60/70/75	-	-	✓	✓
SXGA@60/75	-	-	✓	✓
UXGA@60	-	-	✓	✓
1280×800@60	-	-	✓	✓
1680×1050RB@60	-	-	✓	✓
1920×1080@60	-	-	✓	✓
1920×1200@60 (RB)	-	-	✓	✓



## 8.3 Output Resolution

RESOLUTION	PC/HD	HDMI
480p/576p	HD	✓
720p@50/60	HD	✓
1080i@50/60	HD	✓
1080p@50/60	HD	✓
VGA@60	✓	✓
SVGA@60	✓	✓
XGA@60	✓	✓
SXGA@60	✓	✓
UXGA@60	✓	✓
1280×768@60	✓	✓
1280×800@60	✓	✓
1360×768@60	✓	✓
1400×1050@60	✓	✓
1440×900@60	✓	✓
1680×1050@60	✓	✓
1920×1200@60(RB)	✓	✓

## 9. ACRONYMS

ACRONYM	COMPLETE TERM
<b>COMP</b>	Component Video
<b>CV</b>	Composite Video
<b>RGB</b>	Red Green Blue
<b>VGA</b>	Video Graphics Array
<b>UXGA</b>	Ultra Extended Graphics Array
<b>WUXGA</b>	Widescreen Ultra Extended Graphics Array

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**NEXIS**

Model-MS983A