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TRADEMARKS USED IN THIS MANUAL

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FCC RADIO FREQUENCY INTERFERENCE STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation



1.0 Introduction

1.1 General

Thank you for purchasing Hall Research's SC-1080R. The SC-1080R can switch and scale among 8 AV inputs (3 HDMI, 3 VGA, 1 YPbPr, and 1 Composite Video). It provides 3 simultaneous outputs (2 HDMI, 1 VGA). All outputs show the selected input. Inputs support various PC and HDTV resolutions (Composite Video input supports NTSC and PAL).

The output format and resolution can be specified as either PC (VGA to WUXGA), or HDTV (YPbPr/YCbCr from 480i to 1080p). Both Analog and Digital audio outputs are provided for convenience.

The Video Scaler can be controlled in many ways including: front panel pushbuttons, using the included IR remote control, Telnet (via LAN), WebGUI (via LAN), or RS-232 Serial interface.

The SC-1080R features an OSD menu for configuration, picture setup, system information and other advanced options. It is ideal for use with in boardrooms, classrooms, digital signage, and high-end home-theatre applications.

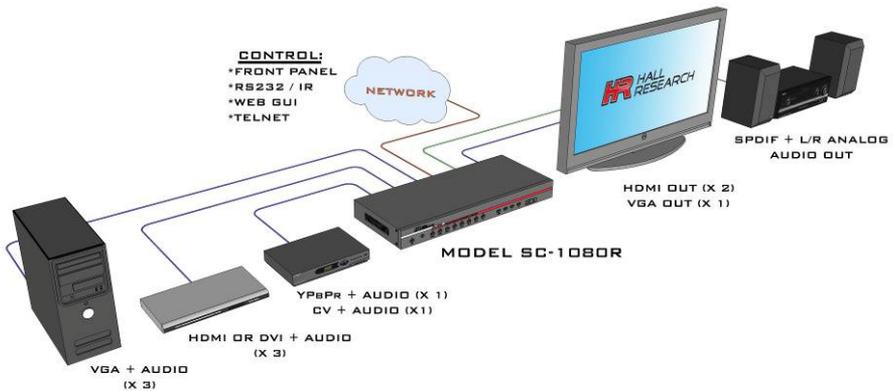
1.2 Features

- Switch and scale among 8 AV inputs
- 4 different types of inputs are supported HDMI, VGA, YPbPr, CV
- 3 simultaneous analog and digital outputs
- Separate analog and digital audio outputs
- IP enabled with user-friendly WebGUI and Telnet control
- Powerful and intuitive RS-232 Control Commands
- Individual buttons on the front panel for direct input selection
- Includes IR remote control
- Auto Scan Switching mode
- Any PC or HDTV video signal can be scaled any other resolution
- State-of-the-art video scaling for real-time frame rate conversion
- Programmable audio delay up to 150ms for lip-sync
- Front Panel IR detector, and IR detector cable for remote IR control

2.0 Installation

2.1 Connection Block Diagram

The output of the SC-1080R can be connected to any HDMI™ and VGA compatible LCD, Projector, or Plasma display by using the appropriate cable.



2.2 Package Contents

- (1) Model SC-1080R
- (1) 5V 3A DC Universal Power Supply (Do Not Substitute)
- (1) IR Detector Cable
- (1) Remote Control (CR-122)
- (1) HD15 to 3-RCA Component Video Input Cable
- (2) Rack Mount Brackets
- (1) User's Manual



3.0 Configuration & Operation

The video scaler accepts both TV and PC inputs and scales them to your desired high resolution format output. The TV inputs are composite video (CV), YPbPr input (3 RCA connectors), PC (HD15) and HDMI™.

3.1 Front Panel



Power Button: Press to switch the device ON. The LED will illuminate when the device is ON.

IR Receiver: Receives the IR signal from the remote control included

Inputs Buttons: Press to select the appropriate input.

Menu: Press to enter the On-Screen Display (OSD) menu.

▲/▼ Buttons: Navigate up and down in the OSD menu.

Enter: Press to confirm an option in the OSD.

3.2 Rear Panel



IR DETECT: Connect an IR detector to this jack. The pin configuration is Tip:Data, Ring:3.3V, Sleeve-GND. Hall Research's IR receiver cable CIR-DET-D1 is included.

Service USB: Reserved for firmware upgrade. The slot can be used to power a USB device. You can use this port for powering USB powered devices such as chrome-cast etc.

RS-232: Connect to a PC/Laptop or RS-232 control system to send the serial commands using a straight-thru DB9 cable to control the device. Pin 2 - TX and Pin 3 – RX.

LAN: The RJ45 port is reserved for Telnet or WebGUI control. Connect to an Ethernet link with RJ45 cable.

DC 5V: Use only the 5V 3A DC power input (center positive 2.1 mm jack) supplied with the unit to power ON the device.

INPUTS

Video (CV): Use a Composite video cable to connect the composite video output of the source equipment to the connector labeled "CV" on the back of the Video Scaler. The format can be NTSC or PAL. This channel accepts stereo audio input via (2) RCA connectors.

HDMI inputs: Use an HDMI™ cable to connect the HDMI™ output of the source equipment to the device. This channel accepts digital audio input via HDMI or stereo audio via a 3.5mm audio jack (TRS – Tip, Ring, and Sleeve).

VGA inputs: Connect the source computer's VGA output signal to the HD15 connector labeled "PC" on the device. This channel accepts stereo audio input via a 3.5mm audio jack (TRS – Tip, Ring, and Sleeve).

L/R: Connect to source's L/R output with 3.5mm mini-jack for selected VGA or HDMI™ inputs.

YPbPr+L/R: Use a 3 RCA-to-3 BNC YPbPr cable to connect the YPbPr output of the source equipment to the device. The format can be NTSC or PAL. This channel accepts stereo audio input via (2) RCA connectors.

CV+LR: Connect to a composite video source such as a DVD player for both audio and video signal conversion.

OUTPUTS

- HDMI™ 1&2:** Connect to an HDMI™ display or an AV receiver.
- VGA:** Connect to a monitor for video output. For HD output resolutions from 480p~1080p, use the supplied HD15 to 3-RCA Cable.
- SPDIF:** Connect to an amplifier or speakers for digital audio output.
- L/R:** Connect to an amplifier or speakers for audio output in stereo format.

NOTES

AUDIO INPUTS – 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). If your source is from DVI (cannot have embedded audio), then select EXT.

AUDIO OUTPUTS – There is a digital (coax) output as well as an analog (3.5mm).If the embedded HDMI input audio is in bitstream (multi-channel) format, the coaxial output will have the same audio in digital format to connect to compatible surround sound systems.The 3.5mm (L/R) output works if HDMI audio input is 2-channel (PCM).

3.3 OSD Menu

Pressing the Menu button will bring up the OSD menu controls on the screen. Select the up and down arrows to your desired item, then press MENU to select and enter into sub menu. Select EXIT from a submenu to go back to the main menu or from the main menu to exit the OSD.

Top Menu	Sub-Menu	3 rd Menu	4 th Menu
DISPLAY			
	OUTPUT	640x480@60, 800x600@60, 1024x768@60, 1280x768@60 1360x768@60, 1280x720@60, 1280x800@60, 1280x1024@60, 1440x900@60, 1400x1050@60, 1680x1050@60, 1600x1200@60, 1920x1080@60 , 1920x1200@60, 1280x720p@60, 1920x1080i@60, 1920x1080p@60, 640x480p@60 720x576p@50, 1280x720p@50, 1920x1080i@50, 1920x1080p@50	
	SIZE	OVER SCAN, FULL, FOLLOW INPUT , PAN SCAN, LETTER BOX, UNDER 2, UNDER 1	
	MODE INFO	OFF , INFO, ON	
	INPUT HDCP (HDMI ONLY)	OFF, ON	
	PC	AUTO SETUP	
		H_POSITION (30)	
		V_POSITION (30)	
		PHASE (15)	
		CLOCK (1652)	
		WXGA/XGA	XGA
		RESET	
	TIMING SHIFT	OFF , ON	
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	OFF , LOW, MIDDLE, HIGH	
AUDIO			
	VOLUME	0~100 (100)	
	DELAY	OFF / 40ms / 110ms / 150ms	
	SOUND	ON / MUTE	

Multi-Format Switcher & Scaler

Top Menu	Sub-Menu	3 rd Menu	4 th Menu
	SOURCE(HDMI ONLY)	AUTO, EXT.	
SETUP			
	FACTORY RESET		
	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
		SUBNET MASK	0.0.0.0~255.255.255.255
		DEF. GATEWAY	0.0.0.0~255.255.255.255
	FREERUN COLOR	BLACK, BLUE	
INFORMATION			
	INPUT		
	OUTPUT		
	REVISION		
	IP ADDRESS		

- Items in bold are default values

3.4 IR Remote

Custom Code: 807F



IR Key Codes for RS-232

*IR Codes shown here use NEC Extended Protocol
Custom Code 807F (entered in reverse as h7F h80 in Hall Research Programmable IR emitters)*

88H	89H	8AH
8CH	8DH	8EH
90H		92H
C2H	9AH	99H
9CH	9DH	98H
D8H	9EH	84H

1. **Power:** Power unit ON/OFF.
2. **HDMI 1:** Select HDMI 1 Input.
3. **HDMI 2:** Select HDMI 2 Input.
4. **HDMI 3:** Select HDMI 3 Input.
5. **PC 1:** Select VGA1 input.
6. **PC 2:** Select VGA2 input.
7. **PC 3:** Select VGA3 input.

8. **CV**: Select the composite input.
9. **COMP**: Select the YPbPr input.
10. **EXIT**: Select to exit OSD menu.
11. **MENU**: Select to show OSD.
12. **OK**: Select to confirm a selection.
13. **UP/DOWN/LEFT/RIGHT**: Move in menu or change selection.
14. **RESET**: Press to reset firmware to factory defaults.
15. **AUTO ADJUST**: Select to automatically optimize picture centering on the screen (Valid for active VGA inputs).

3.5 Setting the Output Resolution

3.5.1 Obtaining an image on the screen

As shipped from the factory, or after a factory default reset, the unit output resolution setting should be “1920x1080@60”. This means that upon power up the device will read the EDID of your display and output the default resolution resulting in a picture.

If there is no picture on the display, you can use one of two preset button combinations to set a resolution that your display supports. Two options are available (depending on the display device):

1. If the display is HDTV compatible (with an HDMI connection); then a resolution of 720p should result in an image.
2. If the display is PC compatible (DVI), then XGA (1024x768) should result in an image.

Once you have an image, you can call up the OSD menu to make further changes as necessary.

Setting Resolution using **Quick Select** buttons

*At any time, press the **UP ARROW** ↑ and **MENU** buttons together to directly set the output resolution to 1024x768 @ 60 Hz.*

*Press the **MENU** and **DOWN ARROW** ↓ together to set the output resolution to 720P @ 60 Hz.*

If connected to an HDTV via HDMI™ input, then use the highest resolution your display supports from among 480p, 720p50/60 or 1080i/p. If a DVI LCD is used, you have a wide range of PC resolutions available (see section 6 for a complete listing).

3.6 Recalling Factory Defaults

Factory defaults may be recalled the following methods:

1. Press the MENU button to display the OSD. Using the **↓↑** arrows buttons, move to highlight the 'FACTORY RESET' option under 'SETUP'
2. sub-menu and press the **ENTER** button. The unit will reset all parameters to the factory defaults. The output resolution will be set at '1920x1080@60, which should result in a picture being displayed.
3. Press and hold the **UP ARROW ↑** and **DOWN ARROW ↓** button on the front panel simultaneously for 3 seconds. This causes all parameters to revert to factory defaults.
4. Factory reset can be done via Web GUI, IR remote, RS232 or Telnet command.

4.0 Serial and Telnet Control

The video input selection and signal parameter settings for the SC-1080R can be controlled via an external control system by using the Telnet (Port 23) or RS-232 port on the unit.

Use a straight thru M/F DB9 serial cable to connect the unit to the PC. Only the TX, RX and GND pins are implemented in the connector.

The RS-232 port operates at 19200 baud, no parity and 1 stop bit. In response to a valid command, the SC-1080R will respond with the commands with each line terminated by a CR and LF.

4.1 RS-232 and Telnet Commands

Command	Response	Description
S POWER 0	S POWER 0 Power Off	POWER OFF
S POWER 1	S POWER 1	POWER ON
R POWER	POWER 0~1	SHOW POWER STATUS
S SOURCE 1-8	S SOURCE 1-8	SOURCE SELECT 1=HDMI 1 5=VGA 2 2=HDMI 2 6=VGA3 3=HDMI 3 7=YpPr 4=VGA 1 8=CV
R SOURCE	SOURCE 1 ~8	SHOW SOURCE STATUS

Command	Response	Description
S OUTPUT 0~21	S OUTPUT 0~21	SET OUTPUT RESOLUTION 0=640x480@60 11= 1600x1200@60 1= 800x600@60 12= 1920x1080@60 2=1024x768@60 13= 1920x1200@60 3=1280x768@60 14= 640x480p@60 4= 1360x768@60 15= 1280x720p@60 5= 1280x720@60 16= 1920x1080i@60 6= 1280x800@60 17= 1920x1080p@60 7= 1280x1024@60 18= 720x576p@50 8=1440x900@60 19= 1280x720o@50 9=1400x1050@60 20= 1920x1080i@50 10= 1680x1050@60 21= 1920x1080p@50
R OUTPUT	OUTPUT 0~21	SHOW OUTPUT RESOLUTION
S SIZE 0~6	S SIZE 0~6	SET OUTPUT SIZE
R SIZE	SIZE 0~6	0=OVERSCAN 4=LETTER BOX 1=FULL 5=UNDER 2 2=FOLLOW INPUT 6=UNDER 1 3=PAN SCAN
S INPUT HDCP 0~1	S INPUT HDCP 0~1	SET HDCP FOR ACTIVE INPUT (0=OFF 1=ON)
R INPUT HDCP	INPUT HDCP 0~1	SHOW HDCP STATUS
S SYNCSHIFT 0~1	S SYNCSHIFT 0~1	SET TIMING SHIFT (Default = 0)
R SYNCSHIFT	SYNCSHIFT 0~1	SHOW TIMING SHIFT STATUS
S CONTRAST 0~60	S CONTRAST 0~60	SET CONTRAST (Default =30)
R CONTRAST	CONTRAST 0~60	SHOW CONTRAST STATUS
S BRIGHTNESS 0~60	S BRIGHTNESS 0~60	SET BRIGHTNESS (Default=30)
R BRIGHTNESS 0~60	BRIGHTNESS 0~60	SHOW BRIGHTNESS
S HUE 0~60	S HUE 0~60	SET HUE (Default=30)
R HUE	HUE 0~60	SHOW HUE STATUS
S SATURATION 0~60	SATURATION 0~60	SET SATURATION (Default=30)
R SATURATION	SATURATION 0~60	SHOW SATURATION
S SHARPNESS	S SHARPNESS 0~60	SET SHARPNESS (Default=0)
R SHARPNESS	SHARPNESS 0~60	SHOW SHARPNESS
S NR 0~3	S NR 0~3 NR 0~3	SET NOISE REDUCTION (Default=OFF)
R NR		SHOW NOISE REDUCTION STATUS (0=OFF 1=LOW 2=MIDDLE 3=HIGH)
S VOLUME 0~100	S VOLUME 0~100	SET VOLUME LEVEL(Default=100)
R VOLUME	VOLUME 0~100	SHOW VOLUME LEVEL STATUS
S AUDIO DELAY 0~3	S AUDIO DELAY 0~3	SET AUDIO DELAY (0=OFF 1=40ms 2=110ms 3=150ms)
R AUDIO DELAY	AUDIO DELAY 0~3	SHOW AUDIO DELAY STATUS
S AUDIO MUTE 0/1	S AUDIO MUTE 0/1	SET AUDIO MUTE (0=DISABLE 1=ENABLE)
R AUDIO MUTE	AUDIO MUTE 0/1	SHOW AUDIO MUTE

Multi-Format Switcher & Scaler

Command	Response	Description
S HDMI AUDIO 0/1	S HDMI AUDIO 0/1	SET HDMI AUDIO (0=AUTO 1=EXT.)
R HDMI AUDIO	HDMI AUDIO 0/1	SHOW HDMI AUDIO STATUS
S KEYLOCK 0/1	S KEYLOCK 0/1	SET FRONT PANEL LOCK (0=DISABLE 1=ENABLE)
R KEYLOCK	KEYLOCK 0/1	SHOW FRONT PANEL LOCK STATUS
S FREERUNCOLOR 0~1	S FREERUNCOLOR 0~1	SET BLANK SCREEN COLOR (0=BLACK 1=BLUE)
R FREERUNCOLOR	FREERUNCOLOR 0~1	SHOW BLANK SCREEN COLOR STATUS
PORT 0~8	PORT 0~8	SET PORT SELECTION WHEN POWERED UP 0=LAST MEMORY 5=VGA2 1=HDMI1 6=VGA3 2=HDMI2 7=YpPr 3=HDMI3 8=CV 4=VGA1
R IPCONFIG	xxx.xxx.xxx.xxx	SHOW IP ADDRESS
S DHCP	S DHCP 0~1	SET DHCP (0=DISABLE 1=ENABLE)
R DHCP	DHCP 0~1	SHOW DHCP STATUS
S SCAN 0~1	S SCAN 0~1	SET AUTO SCAN INPUT(0=DISABLE 1=ENABLE)
R SCAN	SCAN 0~1	SHOW AUTO SCAN INPUT STATUS
S AUTOADJUST 1	S AUTOADJUST 1	ADJUST VGA DISPLAY
S OSD 0~2	S OSD 0~2	SET OSD (0=OFF 1=INFO 2=ON)
R OSD	OSD 0~2	SHOW OSD STATUS
ST	FW: X.XX SOURCE: HDMI1~CV / PORT On: Last OK	
VOL +	VOL XX	
VOL -	VOL XX	
QUIT		

Note:

- An incorrect command will respond with “Invalid Command<CR><LF>”.
- Items in bold are default values.
- Resolution settings 0~13 are RGB encoded. Resolution 14~21 are YUV encoded.
- RS232 commands must be followed by a Carriage Return <CR> and for some systems a Line Feed <LF> command should be added.
- Commands may be entered as uppercase or lowercase.

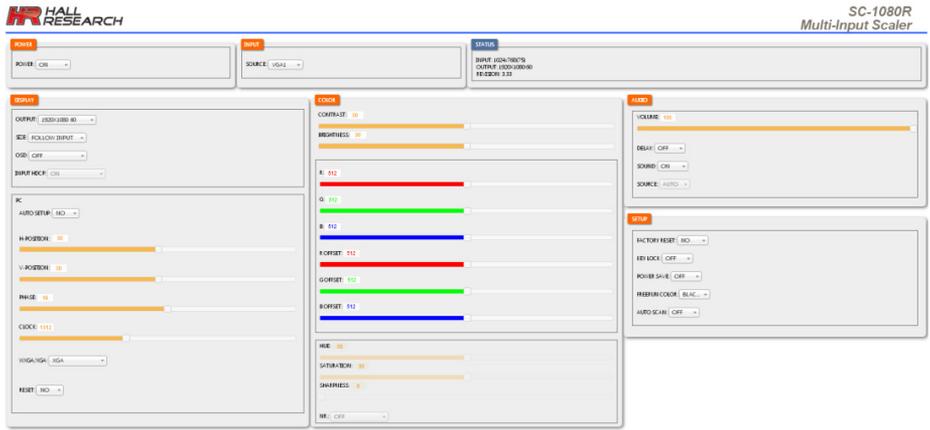
5.0 Web GUI Operation

As shipped from the factory (or after factory default reset), the SC-1080R IP address is set for DHCP, meaning that it does not have an assigned static

IP address and when connected to a router on a LAN, the router will assign an IP address to the device. This can speed up the setup process in most instances, the device will get a valid IP address that matches your network, and the last octet will be unique so it does not conflict with any other existing IP address on the network. A user can find the IP address using the following method, and once access is established, the IP address can be changed to STATIC (rather than DHCP) if desired.

Finding the SC-1080R on the compatible LAN network

- The OSD Menu and RS-232/Telnet command “R IPCONFIG” can locate the SC-1080R’s IP address on the network.



6.0 Troubleshooting

There are no field serviceable parts or circuits in the device. If you think the device is malfunctioning (or you have no picture output), please try to use the methods described in [Section 3.5](#) to obtain a picture first.

6.1 Contacting Hall Research

If you determine that your SC-1080R is malfunctioning, do not attempt to repair the unit. Instead, contact Hall Research Technical Support at 714-641-6607. To return the unit to Hall Research you must first get a Return Authorization (RMA) number. Package the unit carefully, if returning. We recommend that you use the original container.

7.0 Specifications

Input Ports	3 x HDMI, 3 x VGA, 1 x Component, 1 x Composite, 6 x 3.5mm audio, 2 x RCA (Analog stereo L/R , 1 x IR IN, 1 x RJ45, 1 x USB (Service only)
Output Ports	2 x HDMI, 1 x VGA or YPbPr(compatible HD15 to 3-RCA cable), 1 x SPDIF, 1 x 3.5mm audio
Power Supply	5 VDC @ 3A DC (US/EU Standard, CE/FCC/UL Certified)
Input Resolution	Up to 1080p & WUXGA@60
Output Resolution	Up to 1080p & WUXGA@60
Mounting	Brackets at each end with screw holes provided for rack mounting
Dimensions	17" (432mm) W x 7.2" (183mm) D x 1.9" (47mm) H
Weight	Product: 4.71 lbs. (2.14 kg)
Chassis Material	Metal
Operating Temperature	+32 to +104 °F (0 to 40 °C) 20%~90%, non-condensing
Power Consumption	11W
ESD Protection	Human Body model: ±8 kV (air-gap discharge) ±6 kV (contact discharge)
MTBF	90,000 estimated



Notice

Use only regulated 5v DC supply (center positive) as supplied with the unit. Use of any other voltage will cause damage to the unit and **void warranty**.

8.0 Supported Input Resolutions

Input Resolution	CV	Component	PC	HDMI
NTSC/PAL	<input checked="" type="checkbox"/>			
640x480 (VGA) @60/72/75/85			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
800x600 (SVGA)@50/60/72/75			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1024x768 (XGA)@60/70/75			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1280x800 (WXGA)@60			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1440x900 (WXGA+)@60			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1600x900@60			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1280x1024 (SXGA)@60/75			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1400x1050 (SXGA+)@60			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1600x1200 (UXGA)@60			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1680x1050 (WSXGA)@60			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1920x1200 (WUXGA)@60			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
480i		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
576i		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
480P		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
576P		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
720p@50/60		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
1080i@50/60		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
1080p@50/60		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>

9.0 Supported Output Resolutions

Output Resolution	PC	HDMI
640x480 (VGA) @60	☑	☑
800x600 (SVGA)@60	☑	☑
1024x768 (XGA)@60	☑	☑
1280x768@60	☑	☑
1280x800 (WXGA)@60	☑	☑
1360x768@60	☑	☑
1440x900 (WXGA+)@60	☑	☑
1600x900@60	☑	☑
1280x1024 (SXGA)@60	☑	☑
1400x1050 (SXGA+)@60	☑	☑
1600x1200 (UXGA)@60	☑	☑
1680x1050 (WSXGA)@60	☑	☑
1920x1200 (WUXGA)@60	☑	☑
480P	HD	☑
576P	HD	☑
720p@50/60	HD	☑
1080i@50/60	HD	☑
1080p@50/60	HD	☑



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