Video to PC/HDTV Switching Scaler

Composite, S-Video, Component, PC and HDMI AV Inputs
HDMI AV Output with Separate Digital Audio Output
Front Panel, IR Remote, & RS-232 Serial Control

MODEL SC1080-H
UMA1165 Rev A

SUPPORT & ORDERING INFORMATION

For technical support, Call **714-641-6607** or fax **714-641-6698**
Order by phone: **toll-free** in the U.S. **800-959-6439**
Web site: **www.hallresearch.com**
Hall Research 1163 Warner Ave. Tustin, CA 92780

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FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been designed to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at there own expense will be required to take whatever measures may be necessary to correct the interference.
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

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1. Introduction

1.1 General

The SC1080-H is a multiple format switching video scaler. It has 5 different types of video inputs and a scaled digital output that can be switched to any of the inputs. The SC1080-H accepts various input formats and resolutions and scales to a specific output format and resolution.

Inputs are: HDMI (up to 1080i/p), PC (from VGA (640x480) to WUXGA (1920x1200), Component Video (SD and HD from 480p to 1080i/p), S-video (NTSC or PAL) and Composite Video (NTSC or PAL).

The output format and resolution can be specified as either PC (VGA (640x480) to WUXGA (1920x1200)) or Component Video (YPbPr from 480i/p to 1080i/p).

The Video Scaler can be controlled in many ways including: front panel lighted pushbuttons (with On-Screen Display menus), using the included IR remote control, or RS-232 Serial interface. The controls include: input switching, setting the output resolution, picture adjustment (color, brightness, contrast, and sharpness), aspect ratio (Standard, 16:9 or 4:3), digital noise reduction, 3D comb filter ON/Off, and many other advanced features.

The SC1080-H is ideal for use with in boardrooms, classrooms, digital signage, and high end home-theatre applications. Its output can be set for any LCD projector, PC LCD monitor, plasma, or HDTV displays.

The unit is shipped with (1) universal power supply, (1) DB15P-M-M cable, (1) 3 RCA to RCA (R-G-B) cable and (1) 3 RCA to RCA (Y-R-W) and IR remote.

1.2 Features

- HDMI 1.2, HDCP 1.1 and DVI 1.0 Compliant.
- 5 different inputs: HDMI, PC, YPbPr, S-video and Composite.
- Provides YPbPr HDTV outputs of 480i/p, 576i/p, 720p, 1080i, 1080p and up to WUXGA (1920x1200) PC resolutions
- Converts Digital and Analog audio signals into Digital Format for output on HDMI combined with the video or separate Coaxial S/PDIF.
- RS-232 interface allows control from an external device.
- OSD (On-Screen Display).
- Horizontal mirroring (X-axis flip)
- Easy to use IR remote control.
- EDID Support.
- Reverse 3:2/2:2 pull down provides clear and crisp de-interlacing of video originating from 24 fps film, such as DVD movies.
- Digital noise reduction.
- Brightness, Color, Contrast, Sharpness and Tint adjustment.
- Adaptive 3-D comb filter (3-D Motion and 3-D De-Interlacing) for composite input ensures jitter-free picture.
- Compatible with NTSC and PAL video input.

Figure 1 - Accessories

2. Installation

2.1 Connecting the Video inputs

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), S-Video (Mini-Din connector), YPbPr input (3 RCA connectors), PC (HD15) and HDMI™.

Figure 2 - Rear Panel

S-Video: Use an S-Video cable to connect the S-Video output of the source equipment to the connector labeled “S-Video” on the back of the Video Scaler. The format can be NTSC or PAL. This channel accepts stereo audio input via (2) RCA connectors.

Composite 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.

YPbPr: 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.

PC input: 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).

HDMI™ input: 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).

2.2 Connecting the Scaled Output

The output of the SC1080-H can be connected to any HDMI™ compatible LCD, Projector, or Plasma display by using the appropriate cable.

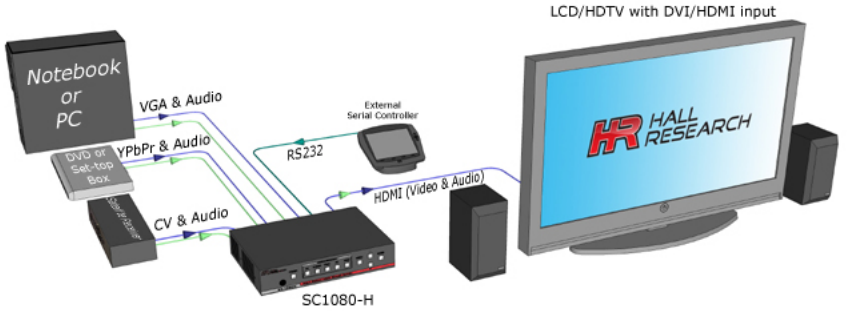


Figure 3 - Block Diagram

2.3 Other Connections

RS-232: Connect a serial control device to the 9-pin D-sub connector labeled “RS-232”

Power: Use only the 5V 2.6A DC power input (center positive 2.1 mm jack) supplied with the unit.

3. Configuration & Operation

3.1 Front Panel

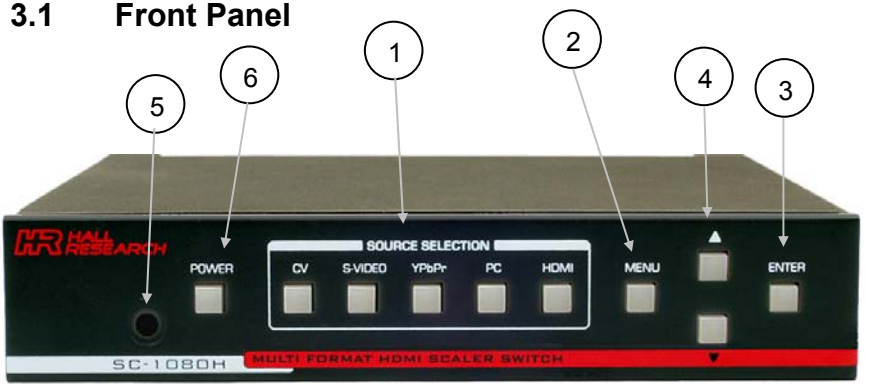


Figure 4 - Front Panel

1. Source Selection: Press the appropriate button to output that connected audio and video selection.

2. Menu: Press the menu button to bring up the OSD operation menu.

3. Enter: Press the button to confirm selections made in the OSD.

4. ▲or▼: Press to toggle through various adjustment controls to alter the settings.

5. IR Sensor: Infrared remote control sensor.

6. Power Button: Press once to power on the unit, press again to turn off.

3.2 OSD Menu for VGA Input Signal

Top Menu	Sub-Menu	Value
PC		
	CONTRAST	0 to 100%
	BRIGHTNESS	0 to 100%
	H-POSITION	0 to 100%
	V-POSITION	0 to 100%
	CLOCK	0 to 100%
	PHASE	0 to 100%
	SCALE	FULL, OVERSCAN, UNDERSCAN, LETTERBOX, PANSCAN
	MIRROR	OFF or ON
COLOR		
	COLOR TEMP	NORMAL, USER, COOL, WARM
Only in USER Mode	RED	0 to 100%
Only in USER Mode	GREEN	0 to 100%
Only in USER Mode	BLUE	0 to 100%
OUTPUT		
		NATIVE / VGA / SVGA / XGA / SXGA / UXGA / SXGA+ / WXGA / WSXGA / WUXGA / WXGA+ / 480i / 480p / 576i / 576p / 720p @ 60Hz 1080i @ 50Hz 1080i @ 60Hz 1080p @ 50Hz 1080p @ 60Hz
OSD		
	H-POSITION	0 to 100%
	V-POSITION	0 to 100%
	TIMEOUT	0 to 100%
	BACKGROUND	0 to 8
AUDIO		
	SOURCE	HDMI / L/R4 / COAXIAL
	DELAY	OFF / 40ms / 110ms / 150ms
	SOUND	ON / MUTE
INFORMATION		
		SOURCE (Input Interface) INPUT (Input Resolution) OUTPUT (Output Resolution) VERSION (Firmware Version)

3.3 OSD Menu for CV, SV, YPbPr & HDMI Input Signals

Top Menu	Sub-Menu	Value
VIDEO		
	PICTURE MODE	STANDARD, MOVIE, VIVID, USER
Adj only in USER PICTURE MODE	CONTRAST	0 to 100%
Adj only in USER PICTURE MODE	BRIGHTNESS	0 to 100%
Adj only in USER PICTURE MODE	HUE	0 to 100%
Adj only in USER PICTURE MODE	SATURATION	0 to 100%
Adj only in USER PICTURE MODE	SHARPNESS	0 to 100%
	SCALE	FULL, OVERSCAN, UNDERSCAN, LETTERBOX, PANSCAN
	MIRROR	OFF or ON
	NR	OFF or ON
COLOR		
	COLOR TEMP	NORMAL, USER, COOL, WARM
Only in USER Mode	RED	0 to 100%
Only in USER Mode	GREEN	0 to 100%
Only in USER Mode	BLUE	0 to 100%
OUTPUT		
		NATIVE / VGA / SVGA / XGA / SXGA / UXGA / SXGA+ / WXGA / WSXGA / WUXGA / WXGA+ / 480i / 480p / 576i / 576p / 720p @ 60Hz 1080i @ 50Hz 1080i @ 60Hz 1080p @ 50Hz 1080p @ 60Hz
OSD		
	H-POSITION	0 to 100%
	V-POSITION	0 to 100%
	TIMEOUT	0 to 100%
	BACKGROUND	0 to 8
AUDIO		
	SOURCE	HDMI / L/Rx / COAXIAL Where 'x' is 1 for CV, 2 for SV, 3 for YPbPr and 5 for HDMI
	DELAY	OFF / 40ms / 110ms / 150ms
	SOUND	ON / MUTE
INFORMATION		
		SOURCE (Input Interface) INPUT (Input Resolution) OUTPUT (Output Resolution) VERSION (Firmware Version)

3.4 Infra-Red Remote control (IR Remote)

1. **Power**: Power unit ON/OFF.

2. **Input**: Toggle through input sources.

3. **HD**: Select Component Input.

4. **PC**: Select PC input.

5. **HDMI/DVI**: Select HDMI Input.

6. **Output Resolution**: Select various output resolutions directly. Others are available via the OSD.

7. **EXIT**: Select to exit OSD menu

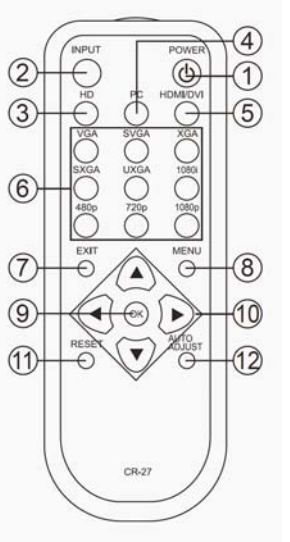
8. **MENU**: Select to show OSD

9. **OK**: Select to confirm a selection.

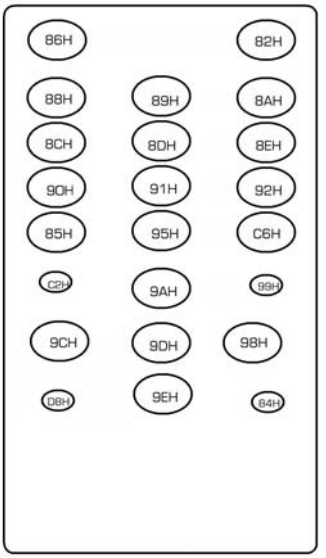
10. **UP/DOWN/LEFT/RIGHT**: Select to move in OSD menu or to change a selection.

11. **RESET**: Press and hold for 5 seconds to reset firmware to factory defaults.

12. **AUTO ADJUST**: Select to automatically optimize picture centering on the screen.



Custom Code: 807F



3.5 Front Panel Lockout

Under certain circumstances it may be desirable to disable the front panel controls (e.g. to prevent unauthorized or accidental changes to the settings while the unit is in use). To disable the front panel controls you must use the RS-232 port (see Serial Control section for details).

It is still possible to remove the lockout from the front panel by performing a full factory default reset operation!

To reset to the factory default settings press the RESET button on the IR remote control for 5-10 seconds. The SC1080-H led's will turn on while the reset button is depressed and turn back off when the software reset has completed.

4. Serial Control

The video input selection and signal parameter settings for the SC1080-H can be controlled via an external control system by using the 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 RS232 port operates at 19200 baud, no parity and 1 stop bit. In response to a valid command, the SC1080-H will respond with CR, LF, >, SPACE and then the listed response. Commands may be entered as uppercase or lowercase.

With most commands, the SC1080-H will reply immediately, but other commands may take a few seconds to complete. The user must wait for the full response before issuing more commands to the unit.

For Example

Sending a POWER ON Command (“S POWER 1<CR>”) results in the following response from the SC1080-H:

```
SENT
53 20 50 4F 57 45 52 20 31 0D
S     P  O  W  E  R     1  CR

RECEIVED
0D 0A 3E 20 50 4F 57 45 52 20 4F 4E 0D 0A
CR LF >     P  O  W  E  R     O  N  CR LF
```

The unit must be powered on with either the front panel push button or by sending the POWER ON Command before the unit will respond as listed. Sending any commands with the unit powered off will result in the following response from the unit.

```
Please turn on power. ( K POWER / S POWER ON ).
```

4.1 Read Commands

Command	Response	Description
R POWER	> POWER ON	SHOW POWER STATUS
R SOURCE	> SOURCE CV~HDMI	SHOW SOURCE STATUS
R OUTPUT	> OUTPUT NATIVE~WUXGA	SHOW OUTPUT STATUS
R SIZE	> SIZE FULL or OVERSCAN or UNDERSCAN or LETTERBOX or PANSCAN	SHOW SIZE STATUS
R PICTUREMODE	> PICTUREMODE STANDARD or MOVIE or VIVID or USER	SHOW PICTURE MODE STATUS (default = Standard)
R CONTRAST	> CONTRAST 0~100	SHOW CONTRAST STATUS (default=50)
R BRIGHTNESS	> BRIGHTNESS 0~100	SHOW BRIGHTNESS STATUS(default=53)
R HUE	> HUE 0~100	SHOW HUE STATUS (default=50)
R SATURATION	> SATURATION 0~100	SHOW SATURATION STATUS (default=53)
R SHARPNESS	> SHARPNESS 0~100	SHOW SHARPNESS STATUS (default=48)
R NR	> NR OFF or LOW or MIDDLE or HIGH	SHOW NR STATUS (default=OFF)
R PCHPOSITION	> PCHPOSITION 0~100	SHOW PC H-POSITION STATUS (default=50)
R PCVPOSITION	> PCVPOSITION 0~100	SHOW PC V-POSITION STATUS (default=100)
R PCCLOCK	> PCCLOCK 0~100	SHOW PC COLOK STATUS (default=2)
R PCPHASE	> PCPHASE 0~63	SHOW PC PHASE STATUS (default=61)
R COLORTEMP	> COLORTEMP NORMAL or WARM or COOL or USER	SHOW COLOR TEMP STATUS (default=Normal)
R RED	> RED 0~100	SHOW COLOR TEMP RED STATUS (default=47)
R GREEN	> GREEN 0~100	SHOW COLOR TEMP GREEN STATUS (default=47)
R BLUE	> BLUE 0~100	SHOW COLOR TEMP BLUE STATUS (default=47)
R OSDHPOSITION	> OSDHPOSITION 0~100	SHOW OSD H-POSITION STATUS (default=50)
R OSDVPOSITION	> OSDVPOSITION 0~100	SHOW OSD V-POSITION STATUS (default=50)
R OSDTIMEOUT	> OSDTIMEOUT 0~100	SHOW OSD TIMEOUT STATUS (default=10)
R OSDBACKGROUND	> OSDBACKGROUND 0~8	SHOW OSD BACKGROUND STATUS (default=5)
R AUDIOMUTE	> AUDIOMUTE OFF or ON	SHOW AUDIO MUTE STATUS (default=OFF)
R AUDIODELAY	> AUDIODELAY OFF or 1 to 150MS	SHOW AUDIO DELAY STATUS (default=OFF)
R MIRROR	> MIRROR OFF or ON	SHOW MIRRORING STATUS
R KEYLOCK	> KEYLOCK OFF or ON	SHOW FRONT PANEL LOCK STATUS
R RESET	> RESET ON	SHOWS RESET STATUS

An invalid command will respond with “R-[??]”<CR>

4.2 Key Commands

Command	Response	Description
K POWER	> POWER	PRESS POWER BUTTON
K MENU	> MENU	PRESS MENU BUTTON
K UP	> UP	PRESS UP BUTTON
K DOWN	> DOWN	PRESS DOWN BUTTON

An invalid command will respond with “K-[??]”<CR>

4.3 Set Commands

Command	Response	Description
S POWER 0	> POWER OFF	POWER OFF
S POWER 1	> POWER ON	POWER ON
S SOURCE 0	> SOURCE CV	CV INPUT
S SOURCE 1	> SOURCE SV	SV INPUT
S SOURCE 2	> SOURCE COMP	COMP INPUT
S SOURCE 3	> SOURCE PC	PC INPUT
S SOURCE 4	> SOURCE HDMI	HDMI INPUT
S OUTPUT 0	> OUTPUT NATIVE	NATIVE RESOLUTION OUTPUT
S OUTPUT 1	> OUTPUT VGA	VGA RESOLUTION OUTPUT
S OUTPUT 2	> OUTPUT SVGA	SVGA RESOLUTION OUTPUT
S OUTPUT 3	> OUTPUT XGA	XGA RESOLUTION OUTPUT
S OUTPUT 4	> OUTPUT SXGA	SXGA RESOLUTION OUTPUT
S OUTPUT 5	> OUTPUT UXGA	UXGA RESOLUTION OUTPUT
S OUTPUT 6	> OUTPUT 480I	480I RESOLUTION OUTPUT
S OUTPUT 7	> OUTPUT 480P	480P RESOLUTION OUTPUT
S OUTPUT 8	> OUTPUT 720P	720P 60HZ RESOLUTION OUTPUT
S OUTPUT 9	> OUTPUT 1080I	1080I 60HZ RESOLUTION OUTPUT
S OUTPUT 10	> OUTPUT 1080P	1080P 60HZ RESOLUTION OUTPUT
S OUTPUT 11	> OUTPUT 576I	576I 60HZ RESOLUTION OUTPUT
S OUTPUT 12	> OUTPUT 576P	576P 60HZ RESOLUTION OUTPUT
S OUTPUT 13	> OUTPUT 720P	720P 50HZ RESOLUTION OUTPUT
S OUTPUT 14	> OUTPUT 1080I50	1080I 50HZ RESOLUTION OUTPUT
S OUTPUT 15	> OUTPUT 1080P50	1080P 50HZ RESOLUTION OUTPUT
S OUTPUT 16	> OUTPUT WXGA	WXGA RESOLUTION OUTPUT

S OUTPUT 17	> OUTPUT WSXGA	WSXGA RESOLUTION OUTPUT
S OUTPUT 18	> OUTPUT WUXGA	WUXGA RESOLUTION OUTPUT
S OUTPUT 19	> OUTPUT WXGA+	WXGA+ RESOLUTION OUTPUT
S OUTPUT 20	> OUTPUT SXGA+	SXGA+ RESOLUTION OUTPUT
S SIZE 0	> SIZE FULL	SCALER FULL OUTPUT
S SIZE 1	> SIZE OVERSCAN	SCALER OVERSCAN OUTPUT
S SIZE 2	> SIZE UNDERSCAN	SCALER UNDERSCAN OUTPUT
S SIZE 3	> SIZE LETTERBOX	SCALER LETTERBOX OUTPUT
S SIZE 4	> SIZE PANSCAN	SCALER PANSCAN OUTPUT
S PICTUREMODE 0~3	> PICTUREMODE STANDARD~USER	0:STANDARD; 1:MOVIE; 2:VIVID; 3:USER, PICTURE MODE OUTPUT
S CONTRAST 0~100	> CONTRAST 0~100	CONTRAST 0~100 ADJUST [Default:50]
S BRIGHTNESS 0~100	> BRIGHTNESS 0~100	BRIGHTNESS 0~100 ADJUST [Default:53]
S HUE 0~100	> HUE 0~100	HUE 0~100 ADJUST [Default:50]
S SATURATION 0~100	> SATURATION 0~100	SATURATION 0~100 ADJUST [Default:53]
S SHARPNESS 0~100	> SHARPNESS 0~100	SHARPNESS 0~100 ADJUST [Default:48]
S NR 0~3	> NR OFF~HIGH	0:OFF; 1:LOW; 2:MIDDLE; 3:HIGH, NR CONTROL [Default:Off]
S PCHPOSITION 0~100	> PCHPOSITION 0~100	H POSITION 0~100 ADJUST [Default:50]
S PCVPOSITION 0~100	> PCVPOSITION 0~100	V POSITION 0~100 ADJUST [Default:100]
S PCCLOCK 0~100	> PCCLOCK 0~100	PC MODE COLCK 0~100 ADJUST [Default:2]
S PCPHASE 0~63	> PCPHASE 0~63	PC MODE PHASE 0~63 ADJUST [Default:61]
S COLORTEMP 0~3	> COLORTEMP NORMAL~USER	0:NORMAL; 1:WARM; 2:COOL; 3:USER, COLOR TEMP SETTING [Default:NORMAL]
S RED 0~100	> RED 0~100	COLOR TEMP "RED" ADJUST [Default:47]
S GREEN 0~100	> GREEN 0~100	COLOR TEMP "GREEN" ADJUST [Default:47]
S BLUE 0~100	> BLUE 0~100	COLOR TEMP "BLUE" ADJUST [Default:47]

S OSDHPOSITION 0~100	> OSDHPOSITION 0~100	OSD H POSITION 0~100 ADJUST [Default:50]
S OSDVPOSITION 0~100	> OSDVPOSITION 0~100	OSD V POSITION 0~100 ADJUST [Default:50]
S OSDTIMEOUT 0~100	> OSDTIMEOUT 0~100	OSD TIMEOUT 0~100 SETTING [Default:10] SECONDS
S OSDBACKGROUND 0~8	> OSDBACKGROUND 0~8	OSD OSDBACKGROUND 0~8 ADJUST [Default:5] 0 = Darkest Background; 8 = Transparent Background
S AUDIOMUTE 0~1	> AUDIOMUTE OFF~ON	0:OFF; 1:ON, AUDIO MUTE CONTROL [Default:Off]
S AUDIODELAY 0~1	> AUDIODELAY OFF~ON	0:OFF; 1:ON, AUDIO DELAY CONTROL [Default:Off]
S MIRROR 0~1	> MIRROR OFF~ON	0:OFF;1:ON, MIRRORING [Default:Off]
S KEYLOCK 0~1	> KEYLOCK OFF~ON	0:OFF;1:ON, FRONT PANEL LOCK [Default:Off]
S RESET 0~1	> RESET ON	0:OFF;1:ON, RESET to DEFAULTS [Default:Off]

An invalid command will respond with “S-[??]-[xx]”<CR>

5. Troubleshooting

Hall Research highly recommends that all products be assembled, configured and tested prior to the final installation to eliminate the possibility of problems on site.

There are no field serviceable parts or circuits in the device. If you think that the device is malfunctioning, please first try to reset to factory default settings:

5.1 Resetting the SC1080-H to Factory Defaults

There are no field serviceable parts or circuits in the device. If you think that the device is malfunctioning, please first try to reset to the factory default settings (using the RESET button on the IR remote control), and set the output either to XGA (Press MENU + ▲) or 480p (Press MENU + ▼) to obtain an image on your LCD.

5.2 Calling Hall Research

If you determine that your SC1080-H is malfunctioning, do not attempt to repair the unit. There are no user serviceable parts inside the unit. Opening the unit will void the warranty.

Contact the Hall Research Technical Support department at 714-641-6607 to obtain an RMA (Return Authorization) number.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description.

5.3 Shipping and Packaging

If you need to transport or ship your device:

- Package it carefully. We recommend that you use the original container if possible.
- Before you ship the units back to Hall Research for repair or return, contact us to get a Return Authorization (RMA) number.

6. Specifications

6.1 Supported Input Formats

Resolution	DVI / HDMI™	VGA (PC)	YPbPr
480i/576i	✓		✓
480p/576p	✓	✓	✓
720p@(60/50)	✓	✓	✓
1080i@(60/50)	✓	✓	✓
1080p@(60/50)	✓	✓	✓
VGA@(60/72/75/85)	✓	✓	
SVGA@(56/60/72/75/85)	✓	✓	
XGA@(60/70/75/85)	✓	✓	
SXGA@(60/75/85)	✓	✓	
UXGA@60	✓	✓	
WXGA@60(1280X800)	✓	✓	
WXGA+(1440x900)	✓	✓	
SXGA+(1400x1050)	✓	✓	
WSXGA@60(1680X1050)	✓	✓	
WUXGA@60(1920X1200)	✓	✓	

6.2 Available Output Formats

Resolution	DVI / HDMI™
480i/576i	✓
480p/576p	✓
720p@(60/50)	✓
1080i@(60/50)	✓
1080p@(60/50)	✓
VGA@60	✓
SVGA@@60	✓
XGA@@60	✓
SXGA@@60	✓
UXGA@60	✓
WXGA@60(1280X800)	✓
WXGA+(1440x900)	✓
SXGA+(1400x1050)	✓
WSXGA@60(1680X1050)	✓
WUXGA@60(1920X1200)	

Dimensions: 8.24 inch (Wide) x 5.63 inch (Deep) x 1.66 inch (High)
Weight: 2 Pounds (910 g)
Input Power: 90 ~ 264 VAC, 50 ~ 60 Hz (7.5 watts max)

1163 Warner Ave., Tustin, CA 92780
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