

HR HALL RESEARCH

PC / HDTV to TV Scan Converter

Convert VGA or High Definition Video to Standard Definition TV

IR Remote, RS-232 Serial Control & Component I/O



Model VHD-180

**CUSTOMER
SUPPORT
INFORMATION**

Order toll-free in the U.S. 800-959-6439

FREE technical support, Call 714-641-6607 or fax 714-641-6698

Mail order: **Hall Research**, 1163 Warner Ave. Tustin, CA 92780, CA 92704

Web site: www.hallresearch.com • E-mail: info@hallresearch.com

UMA1117 Rev B

TRADEMARKS USED IN THIS MANUAL

Hall Research, HR, and  (logo) are trademarks of Hall Research, Inc.

Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

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 intended 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 their 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.



Contents

1. Introduction 3
 1.1 General..... 3
 1.2 Features..... 3
2. Installation 4
 2.1 Package Contents..... 4
 2.2 Connecting the Video Inputs and Outputs..... 4
 2.3 Front Panel Controls 6
 2.4 IR Remote Controls 7
3. RS-232 Serial Control 8
4. Free PC Control Software..... 9
5. Troubleshooting..... 9
 Contacting Hall Research 9
6. Specifications..... 10

1. Introduction

1.1 General

The model VHD-180 is a PC/HD Component down Converter that generates a standard analog NTSC or PAL video signal from an HD component or PC video signal. Output is either composite or S-Video or standard definition component (YPbPr) format. Both the PC and the HD component inputs have pass-thru connections. The unit can convert any analog component video signal up to 1080i can be converted to standard analog video. The VHD-180 also handles computer VGA resolutions up to UXGA (1600 x 1200) at 60Hz refresh rate.

The Model VHD-180 settings can be controlled via front panel push-buttons, an included IR remote or any RS-232 serial control device.

Applications for this device include displaying your PC's image on a standard definition TV, or making DVD recordings of PC software for training purposes. Additionally most satellite receivers and HD set-top boxes do not provide simultaneous HD and SD outputs. In order to display the HD signal on TVs with composite or S-Video, the VHD-180 is the ticket.

1.2 Features

- Professional-quality Video Scan Converter (down converter)
- PC (VGA) and HDTV (Component) Inputs
- Composite (CVBS), S-Video (Y/C), or Component (YPbPr) outputs
- Supports PC inputs up to 1600x1200 & HDTV inputs up to 1080i
- Loop-thru outputs for both PC VGA and HDTV Component
- Image Controls: Pan, Position, Aspect Ratio, Zoom, Freeze
- Easy to use IR Remote
- Includes VGA, Component, S-Video, and Composite Cables
- Universal Power Supply
- RS-232 interface allows control from an external device.
- OSD (On Screen Display) for easy setup
- Free PC Control Software (through the RS232 port)

2. Installation

2.1 Package Contents

The package includes the following items:

- The VHD-180 main unit
- Cables: VGA, Component (3 RCA) , S-Video, and Composite
- IR Remote Control
- Universal Power Supply
- Application Software (may need to be downloaded from website)



Figure 2.1 – Items included with the VHD-180

2.2 Connecting the Video Inputs and Outputs



Figure 2.2 – Rear Panel Connections & Controls

PC Input (HD15): Connect a PC's VGA output to this port. Set the HD/PC slide switch on bottom right corner to Right (PC) to enable this input

PC Bypass (HD15): Connect a local VGA monitor to this loop-thru output if needed (can be left unconnected)

HD Input (3 RCA): Connect a DVD, Satellite Receiver, or Set-top Box HD component video output to this port. Set the HD/PC slide switch on bottom right corner to Left (HD) to enable this input

HD Bypass (3 RCA): Connect a local HDTV to this loop-thru output if needed (can be left unconnected)

S-V Output: This is the down converted S-Video output. This connector and the composite video outputs are active at the same time and you can use both if you wish. However, the HD output and the CV/SV outputs are mutually exclusive. This means that you have to select the type of output that you want via the IR remote (Press the "Output" key on the remote), or Serial port using the PC software.

C-V Output: This is the down converted Composite Video output. This connector and the S-Video outputs are active at the same time and you can use both if you wish. However, the HD output and the CV/SV outputs are mutually exclusive. This means that you have to select the type of output that you want via the IR remote (Press the "Output" key on the remote), or Serial port using the PC software.

YCbCr Output: This is the down converted Component Video output. It is sometimes referred to as YPbPr. However, this output and the CV/SV outputs are mutually exclusive. This means that you have to select the type of output that you want via the IR remote (Press the "Output" key on the remote), or Serial port using the PC software. This output is available for pass-through when the Video Scaler is in the PC Input (Bypass) mode or if unit is turned off.

RS-232: This is the serial control port. You can use the PC software to control it from a PC, or write your own control software and control the unit from any serial control device. Only RX and TX pins are used.

DC Power Input: Only connect regulated 5v DC to this 2.1mm input. If you connect any other voltage it will damage the unit.

Power ON/OFF Switch: This is the main power control. After you connect your inputs and outputs, place this switch to ON position. There is a front panel power switch as well as through the IR remote or RS-232. However those will place the unit from standby to power on mode.

2.3 Front Panel Controls

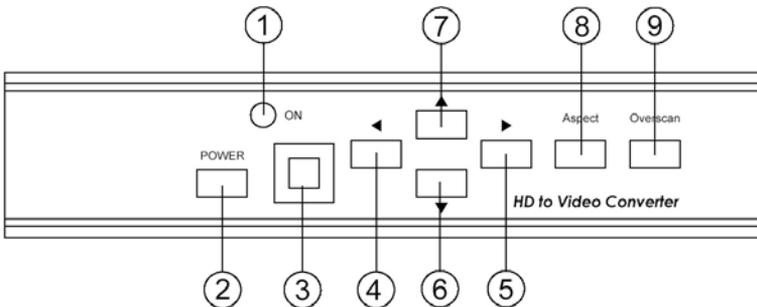
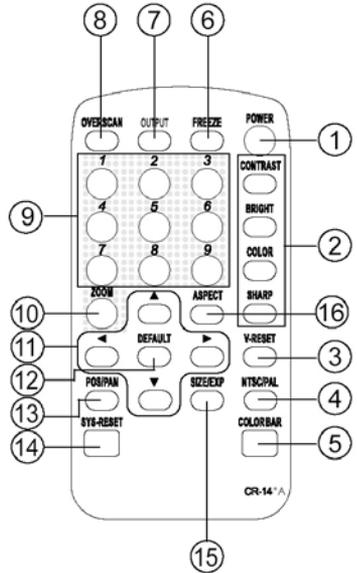


Figure 2.3 – Front Panel Controls and Indicators

1. Standby/On indicator: The indicator illuminates in red when it is in Standby mode, illuminates in green when it is in ON mode.
2. Power button: Push the button to turn power ON or Standby.
3. Remote control sensor.
4. Left Button: Push the button to adjust the picture leftward under the Position, Pan or Zoom mode.
5. Right Button: Push the button to adjust the picture rightward under the Position, Pan or Zoom mode.
6. Down Button: Push the button to adjust the picture downward under the Position, Pan or Zoom mode.
7. Up Button: Push the button to adjust the picture upward under the Position, Pan or Zoom mode.
8. Aspect button: Push the button to select the screen aspect- Full > Pan & Scan > Letterbox.
9. Overscan button: Push the button to set Overscan or Underscan of the picture.

2.4 IR Remote Controls

1. Power ON/OFF
2. Video setting adjustments for picture contrast, bright, color and sharpness.
3. V-Reset: Press the button to reset picture adjustment (2) to factory default values.
4. NTSC/PAL: Press the button to select NTSC or PAL as video output.
5. Color bar pattern ON/Off
6. Image freeze ON/Off
7. Output format: Press the button to select your desired output format. Toggles between CV/SV & YCbCr
8. Under/Over Scan: Press to enlarge or shrink the image on output
9. Region selection (Zoom): Under zoom mode press one of the buttons to select its corresponding sub-area.
10. Zoom ON/Off: Press the button to zoom in on a picture, press again to zoom out.
11. Horizontal/Vertical Adjust: Adjust the size or position of an image when it is under Zoom, Pan/Position, or Size/EXP mode.
12. Default: Press the button to revert the following parameters to factory preset values: Zoom, Position, Size, and Picture Adjust
13. Pos/Pan: When a picture is in Underscan mode, press the button to do position adjustment. When a picture is in Overscan mode, press the button to do pan adjustment.
14. System reset: Press the button to revert all system parameters back to factory preset values. The system parameters are default as follows: Overscan, NTSC output, Full aspect, Video settings Reset, Position, Pan, Size and Expand reset.
15. Size/EXP: When a picture is in Underscan mode, press the button to do size adjustment. When a picture is in Overscan mode, press the button to do expand adjustment.
16. Aspect: Press the button to switch between full, Pan & Scan or letterbox.



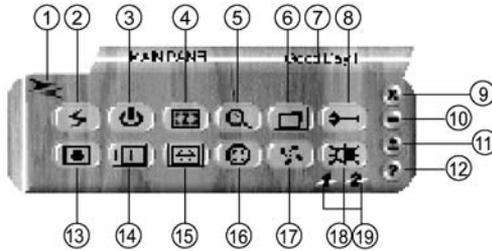
3. RS-232 Serial Control

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. Set port operates at 9600 baud, no parity and 1 stop bit. Control codes are 6 bytes long. The unit echoes the commands back. “Ready State” values in the table below are sent back for those commands that require excessive processing time. So either insert a wait after those commands, or wait until you receive the Ready State response.

Code	Ready State	Comment	
PWR000			
PWR001	RDY005	POWER	power off power on Inquire status
PWR999			
NPO000			
NPO001			
NPO999			
FRZ000		FREEZE	freeze image off freeze image on Inquire status
FRZ001			
FRZ999			
SCN000		SCAN	underscan overscan Inquire status
SCN001			
SCN999			
ZOM000	RDY006	ZOOM	zoom off zoom on Inquire status
ZOM001	RDY006		
ZOM999			
MVU000		Move UP	move UP button release move UP button press
MVU001			
MVD000		Move DOWN	move DOWN button release move DOWN button press
MVD001			
MVL000		Move LEFT	move LEFT button release move LEFT button press
MVL001			
MVR000		Move RIGHT	move RIGHT button release move RIGHT button press
MVR001			
SZU000		Size UP	shorter height image button release shorter height image button press
SZU001			
SZD000		Size DOWN	higher height image button release higher height image button press
SZD001			
SZL000		Size LEFT	narrower width image button release narrower width image button press
SZL001			
SZR000		Size RIGHT	wider width image button release wider width image button press
SZR001			
RST000	RDY000	RESET	system reset reset image position reset image size reset video settings
RST001			
RST002			
RST003	RDY003		
PAT000	RDY007	PATTERN	test pattern off test pattern on Inquire status
PAT001			
PAT999			
FMT000		Output Format	CV / SV YsUV Inquire status
FMT001			
FMT999			
ARA001-ARA009		Zoom AREA	zoom area1~ area9 Inquire status
ARA999			
ASP000		ASPECT	aspect is full-screen aspect is pan&scan aspect is letterbox Inquire status
ASP001			
ASP002			
ASP999			
CON001-CON063		CONTRAST	range = 0 ~ 63 Inquire status
CON999			
BRI000-BRI255		BRIGHTNESS	range = 0 ~ 255 Inquire status
BRI999			
SAT000-SAT063		SATURATION	range = 0 ~ 63 Inquire status
SAT999			
FLK000-FLK021		FLICKER	range = 0 ~ 21 Inquire status
FLK999			
VER???		VERSION	unit firmware version response inquire unit firmware version
VER999			

4. Free PC Control Software

Hall Research makes available on line free RS-232 PC control software for the VHD-180. Please visit the product's page on www.hallresearch.com to obtain your software.



- | | | | |
|----------------------|--------------------|------------------|---------------------|
| 1. Connection Status | 6. Over/Under scan | 11. System tray | 16. Output Format |
| 2. Power | 7. Prompt | 12. About | 17. Screen freeze |
| 3. System reset | 8. Option | 13. Aspect | 18. Video Settings |
| 4. Zoom | 9. Close | 14. Pan/Position | 19. RS-232 Com Port |
| 5. Magnifier | 10. Minimize | 15. Expand/Size | |

5. Troubleshooting

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 by pressing functions 3 and 14 on the remote (V-Reset..... & Default)

Contacting Hall Research

If you determine that your scaler is malfunctioning, do not attempt to repair the unit. Contact Hall Research Technical Support department at 714-641-6607.

Before you do, make a record of the history of the problem and a complete problem description.

If you need to transport or ship your Scaler:

Package it carefully. We recommend that you use the original container.

Contact Hall Research to get a Return Authorization (RMA) number.

6. Specifications

Input Terminals	PC on HD-15, HDTV or SDTV on 3 RCA (YPbPr or YCbCr) – HDTV or SDTV on 3 RCA (YPbPr or YCbCr)
Input Resolutions	PC resolutions: VGA@60Hz up to 140Hz refresh rate, SVGA@60Hz up to 120Hz refresh rate, XGA@60Hz up to 85Hz refresh rate, SXGA@60Hz refresh rate, UXGA@60Hz refresh rate HDTV resolutions: 480i & 480p @ 60Hz, 576i & 576p @ 50Hz, 720p @ 50 & 60Hz, 1080i @48, 50 & 60Hz
Output Terminals	Composite video on RCA, S-Video on mini-din, Component on 3RCA (YCbCr) PC pass through on HD-15, HDTV pass through on 3 RCA (YPbPr / YCbCr)
Output System	NTSC or PAL interlaced video. YCbCr component.
Controls	Front panel control, IR remote control, RS-232 control.
Accessories	HD-15(male) to HD-15(male) VGA cable x 1, Component video 3 RCA to 3 RCA cable x 1, Video cable x 1, S-Video cable x 1 IR remote control x 1
Power	DC 5V/2A, center positive.
Dimensions	8.0" Wide x 6.1" (Deep) x 2.0" (High) (205x155x50mm)
Weight	2.2 pounds (1 Kg)

Notes

Notes



© Copyright 2010. Hall Research, Inc.
All rights reserved.

1163 Warner Ave., Tustin, CA 92780
Ph: (714)641-6607, Fax: (714)641-6698