Linear®

Building On Innovation.

High Definition A/V Scaler
For HDMI™

Model # SCALER-2-1080P

U S E R   M A N U A L

1080P
PROGRESSIVE

HDMI
HIGH-DEFINITION MULTIMEDIA INTERFACE

HDTV

HD DVD

Blu-ray Disc™

www.linearcorp.com

RoHS

ASKING FOR ASSISTANCE

Technical Support:
Telephone   (800) 421-1587
                                         (760) 438-7000

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Technical Support Hours:
6:30 AM - 4:30 PM PST Monday through Friday.

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techsupport@linearcorp.com

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The Linear High Definition A/V Scaler for HDMI allows you to upscale and switch your standard definition or high definition Component and HDMI sources to resolutions up to 1080p. Anything from set-top boxes, DVD players to the next generation of gaming consoles can be plugged into the Linear High Definition A/V Scaler for HDMI.

The Linear High Definition A/V Scaler for HDMI supports one Component source with analog audio, one Composite or S-Video source with analog audio, and two HDMI sources with digital audio. The analog audio from the analog sources is digitized and outputted to the HDMI connection as well as the digital audio outs. The HDMI inputs also have separate digital audio inputs, so you can use DVI sources and separate digital audio and the High Definition A/V Scaler for HDMI will embed the digital audio into the HDMI output as well as the digital audio outs.

How It Works

You simply connect all your components and your display. Easy to use on-screen menus are accessible through the IR remote control. The IR remote control allows for effortless setup and image adjustment to accommodate different viewing modes and screen sizes to perfect your final picture.

OPERATION NOTES

**READ THESE NOTES BEFORE INSTALLING
OR OPERATING THE HIGH DEFINITION A/V SCALER FOR HDMI**

• When initially powering on HDMI sources, it is important to have the High Definition A/V Scaler for HDMI's output selected to that source to ensure that the EDID is relayed properly.

• Compatible with all HDMI and DVI* displays

• The Scaler to 1080P has a 15-foot limit on how far it can transmit the DDC (Display Data Channel) information out of the HDMI output jack to the display. Connections to displays at distances longer than 15 feet should use a true DDC re-clocking solution such as our CAT-5 based HDMI signal extender device (Linear part number HDMI-CAT5-EXT).

• HDMI/HDCP compliant

NOTE: *When used with a DVI to HDMI adapter

Features

- Both digital and analog inputs are format converted and pixel re-scaled through the Home Theater Scaler Plus. It outputs a large range of formats and resolutions that will easily match the native resolution/format of your display to ensure highest picture quality

- DVI/HDCP/HDMI compliant input: Operates up to 165MHz (Up to UXGA @60Hz)

- Supports digital HD output up to 1080p

- Integrated 8-bit triple-ADC/PLL

- Integrated DVI/HDCP/HDMI compliant receiver

- Dual high quality scaling engines

- Dual 3-D motion video adaptive de-interlacers with smooth low angle edge

- Automatic 3:2 pull-down & 2:2 pull-down detection and recovery

- High performance frame rate conversion engine

- The Proprietary Advanced Color Engine technology gives you brilliant and fresh color, intensified contrast and details, vivid skin tone, sharp edge, accurate and independent color control

- Option to select Audio input from HDMI or Optical/SPDIF audio source

- 3D noise reduction on analog inputs only

- Operates through on-screen menu control and remote control

- Aspect Ratio Control

- Digital Audio Delay to match audio/video timing

- Less than one frame delay for gaming devices

Includes:

(1) Scaler to 1080P
(1) 6 ft HDMI cable (M-M)
(1) 5V DC Power Supply
(1) RMT-SR-IR Remote control
(1) User's Manual

Front Panel

High Definition A/V Scaler for HƎMI
HDMI / HDCP COMPLIANT

Linear.

IR | Power | CV | SV | Comp | 1 | 2
| | | | HDMI

IR Eye — Power LED

LED INDICATORS

Composite S-Video Component HDMI 1 HDMI 2

Back Panel

Linear.
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Component Audio Input

Composite Audio Input
Composite Video Input

Component Video Input

5V DC Input

Component Input

S-Video Input

S-Video Audio Input

SPDIF In 1 | Optical In 1 | HDMI In 1
SPDIF In 2 | Optical In 2 | HDMI In 2
SPDIF Out | Optical Out | HDMI Out | Reset

HDMI Input 1
SPDIF Input 1 | Optical Input 1

HDMI Input 2
SPDIF Input 2 | Optical Input 2

SPDIF Output | Optical Output | HDMI Output

Reset Button

3

How to Connect the High Definition A/V Scaler for HDMI

1. Connect the HDMI output on the High Definition A/V Scaler for HDMI to the display using the supplied HDMI cable.

2. Connect either the digital SPDIF or digital Optical audio output to the display or an external audio processor using user supplied digital audio cables.

3. Connect the sources to the High Definition A/V Scaler for HDMI using user supplied cables.

    •   Connect up to two HDMI sources with optional digital SPDIF/Optical audio using HDMI cables and digital audio cables.

    •   Connect one Component source with analog audio using a 3 RCA Component video cable and a 2 RCA analog audio cable.

    •   Connect one S-Video source with analog audio using a S-Video cable and a 2 RCA analog audio cable.

    •   Connect one Composite source with analog audio using a 1 RCA Composite video cable and a 2 RCA analog audio cable.

4. Plug the 5V DC power supply into the High Definition A/V Scaler for HDMI.

5. Press the POWER button on the RMT-SR-IR remote to begin operation of the High Definition A/V Scaler for HDMI.

6. Power on the display.

7. Power on the source(s).

NOTE: When initially powering on HDMI sources, it is important to have the High Definition A/V Scaler for HDMI's output selected to that source to ensure that the EDID is relayed properly.

OPERATING THE HIGH DEFINITION A/V SCALER FOR HDMI
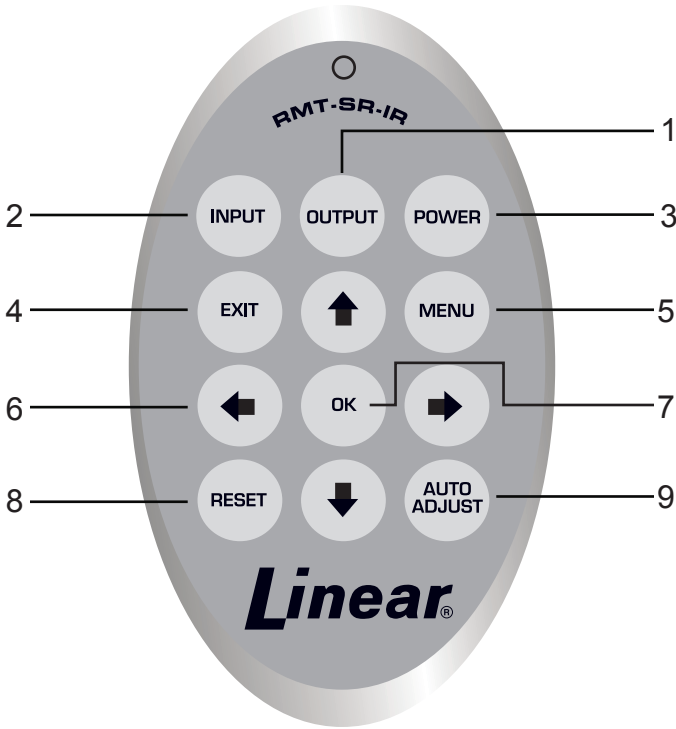
The High Definition A/V Scaler for HDMI has a built in GUI for navigating the various functions. The GUI is navigated by the included IR remote control. Please see the RMT-SR-IR Remote Description on the next page for functional information.

1. Output - Cycles through the available output resolutions. Please see the section HIGH DEFINITION A/V SCALER FOR HDMI CONFIGURATION / Output on page 8 for the output resolution table.

2. Input - Cycles though all of input sources. The selectable inputs are Composite, S-Video, Component, HDMI 1, and HDMI 2.

3. Power - Turns the unit on and off (standby).

4. Exit - Exits the current menu option and menu system.

5. Menu - Displays the menu system for adjustment of options.

6. Navigation Keys - These include up, down, left, and right buttons for navigating the menu system.

7. The OK button will select specific menu options for adjustment and will also confirm/cycle-through selections (Output/Input).

8. Reset - Resets the input and output resolutions to factory default.

9. Auto Adjust - Sets the display for optimal resolution and aspect ratio based on the display's EDID information and the currently selected sources output resolution.

Entering the Menu System

Pressing the Menu button on the included RMT-SR-IR remote control will display the GUI (graphical user interface) for adjustment options.

The GUI is overlaid onto the outgoing video to the display. Therefore, the selected source must be outputting a compatible resolution for viewing on the display. If video is not visible on the display, the GUI will also fail to be displayed. To correct this, please follow the steps below.

1. Verify that the source is on and outputting a video signal.

2. Verify that the RMT-SR-IR remote channel is in the default position (page 13).

3. Verify that the High Definition A/V Scaler for HDMI is selected to the chosen source.

4. Press the Output button on the RMT-SR-IR remote control to cycle through output resolutions until video is displayed. Please see page 8 for a listing of the available output resolutions and cycle order.

Navigation

Use the directional buttons to navigate the menu system. Press the OK button to enter a sub category and also to select a menu item for adjustment. Use the Left and Right buttons to adjust the selected menu item. Press the EXIT or OK button to return to the previous menu. Use the LEFT and RIGHT buttons to adjust selected options. Pressing the EXIT button while in the main menu will exit out of the menu system.

MAIN MENU

The following are the main menu options. Use the UP and DOWN buttons to choose your desired subcategory and press OK to enter it.

VIDEO
COLOR
OUTPUT
OSD
AUDIO
INFORMATION

VIDEO

Picture Mode
Preset and user configurable settings for different viewing scenarios. Preset settings will not allow user adjustment. **Only the USER option will allow customized video settings. The USER settings are saved.**

Options:
- Standard - useful for general content
- Movie - useful for dimly lit environments
- Vivid - useful for accentuating colors for a more vibrant image
- User - user configurable settings

NOTE: User settings are saved. However, user settings for the digital inputs (HDMI 1 and 2) are linked and user settings for the analog inputs (Composite, S-Video, and Component) are linked. i.e. adjustments to video user settings made on HDMI 1 will be reflected in HDMI 2.

VIDEO CONTINUED

Press OK to begin adjusting settings. Use the LEFT and RIGHT buttons to change settings. Press the OK button once the desired settings are made.

Contrast
Adjusts the contrast in increments of 1 on a scale of 1 to 100 (default 50).

Brightness
Adjusts the brightness in increments of 1 on a scale of to 100 (default 50).

Hue
Adjusts the hue in increments of 1 on a scale of 1 to 100 (default 50).

Saturation
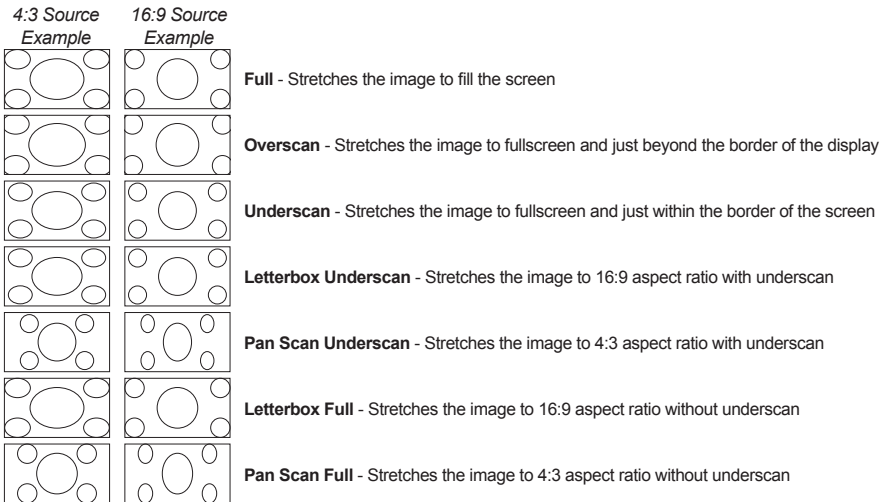Adjusts the saturation in increments of 1 on a scale of 1 to 100 (default 50).

Sharpness
Adjusts the sharpness in increments of 1 on a scale of 1 to 100 (default 50).

Scale
Adjusts the aspect ratio of the video.

Options: Full, Overscan, Underscan, Letterbox Underscan, Pan Scan Underscan, Letterbox Full, Pan Scan Full

4:3 Source Example   *16:9 Source Example*

Full - Stretches the image to fill the screen

Overscan - Stretches the image to fullscreen and just beyond the border of the display

Underscan - Stretches the image to fullscreen and just within the border of the screen

Letterbox Underscan - Stretches the image to 16:9 aspect ratio with underscan

Pan Scan Underscan - Stretches the image to 4:3 aspect ratio with underscan

Letterbox Full - Stretches the image to 16:9 aspect ratio without underscan

Pan Scan Full - Stretches the image to 4:3 aspect ratio without underscan

N.R. (Noise Reduction) - Only for Composite and S-Video Inputs
Reduces video noise inherent in analog video signals.

Options:
- Off - default
- Low
- Middle
- High

VIDEO CONTINUED

H-Pos (Horizontal Position)
Adjusts the image's horizontal position on the screen.

• Adjusts in increments of 1 on a scale of 1 to 100 (default is 50)

V-Pos (Vertical Position)
Adjusts the image's vertical position on the screen.

• Adjusts in increments of 1 on a scale of 1 to 100 (default is 50)

Y/C Separation - Only for Composite Input
Selects the method in which the brightness and color are separated from the composite video signal.

Options:

- Auto - automatically selects the optimal method (default)
- 2D - Separation based on single frame analysis
- 3D - Motion adaptive color separation based on multiple frame analysis

Coring - Only for Composite Input
Adjusts the threshold level for pixel noise evaluation. This relates to how much of the image is processed in regards to noise reduction.

• Adjusts in increments of ~6.5 on a scale of 1 to 100. (default is 20)

OUTPUT

This menu sets the output resolution for all video sources. Use the directional buttons to choose your desired output resolution and press the OK button to set it. These outputs can be cycled through in the numbered order below when not in the menu system by pressing the OUTPUT button on the RMT-SR-IR remote control.

1	VGA	6	480i	11	576i	16	WXGA
2	SVGA	7	480p	12	576p	17	WSXGA
3	XGA	8	720p 60	13	720p 50	18	WUXGA
4	SXGA	9	1080i 60	14	1080i 50		Native
5	UXGA	10	1080p 60	15	1080p 50		

Native
This option will select the native resolution of the connected display based on the EDID from the display.

NOTE: If a resolution that is not supported by the display is selected, the menu GUI will not longer be visible. To correct this, press the OUTPUT button on the RMT-SR-IR remote control and cycle through the output resolutions until a supported mode is displayed.

COLOR

Press OK to begin adjusting settings. Use the LEFT and RIGHT buttons to change settings. Press the OK button once the desired settings are made.

Color Tone
Sets the color for the appearance of white. Only the USER option will allow customized settings. The USER settings are saved.

- Normal - Normal white color appearance (default)
- Warm - Slight red shift to white appearance
- Cool - Slight blue shift to white appearance
- User - User adjustments to Red, Green, and Blue

Red
Adjust the red color in regards to the appearance of white for the USER setting.

- Adjustments are in increments of 1 from 1 to 100 (default is 50)

Green
Adjusts the green color in regards to the appearance of white for the USER setting.

- Adjustments are in increments of 1 from 1 to 100 (default is 50)

Blue
Adjusts the blue color in regards to the appearance of white for the USER setting.

- Adjustments are in increments of 1 from 1 to 100 (default is 50)

OSD (ON SCREEN DISPLAY)

Press OK to begin adjusting settings. Use the LEFT and RIGHT buttons to change settings. Press the OK button once the desired settings are made.

H-Pos (Horizontal Position)
Adjusts the OSD's horizontal position on the screen.

- Adjustments are in increments of 1 from 1 to 100 (default is 50)

V-Pos (Vertical Position)
Adjusts the OSD's vertical position on the screen.

- Adjustments are in increments of 1 from 1 to 100 (default is 50)

Time Out
Adjusts the amount of idle time, **in seconds**, before the OSD is automatically exited.

- Adjustments are in increments of 1 from 1 to 100 (default is 10)

Background
Sets the transparency level of the OSD background.

- Adjustments are in increments of ~12.5 on a scale of 1 to 100 (default is 50)

OSD (ON SCREEN DISPLAY) CONTINUED

Remote Channel
Sets the remote channel for use with the RMT-SR-IR remote control. If the selected channel in this menu and does not match the channel set in the RMT-SR-IR remote, the unit will cease to respond to IR commands from the remote.

• Selectable remote channel from 1 to 4 (default is 1)

AUDIO
Press OK to begin adjusting settings. Use the LEFT and RIGHT buttons to change settings. Press the OK button once the desired settings are made.

Source
Sets the audio source for current input.

Options for Composite:

• L/R1 - Composite analog audio input (default)

Options for S-Video:

• L/R2 - S-Video analog audio input (default)

Options for Component:

• L/R3 - Component analog audio input (default)

Options for HDMI 1:

• HDMI1 - HDMI 1 internal audio (default)
• Optical1 - Optical input 1
• Coaxial1* - SPDIF input 1

Options for HDMI 2:

• HDMI2 - HDMI 2 internal audio (default)
• Optical2 - Optical input 2
• Coaxial2* - SPDIF input 2

Delay
Sets the audio delay for lip syncing correction.

• Off - No delay (default)
• 40ms - 40 millisecond audio offset
• 110ms - 110 millisecond audio offset
• 150ms - 150 millisecond audio offset

Sound
Select general audio output function

• On - Use selected audio source (default)
• Mute - No sound output

*Coaxial is also know as SPDIF

INFORMATION

This menu will allow the user to view general information. There are no configurable options in this menu.

- Source - Displays current source
- Input - Displays current input source resolution
- Output - Displays current output resolution
- Version - Displays current firmware revision

1. Remove battery cover from the back of the RMT-SR-IR remote.

2. Verify that dip switches 1 & 2 are in the down (OFF) position. (See page 13)

3. Insert the battery, hold the battery so that you can see the positive side facing up. The side that is not marked must be facing down.

4. Test the RMT-SR-IR remote by pressing ONLY one button at a time. The indicator light on the remote will flash once each time you press a button.

WARNING:
Do not press multiple buttons simultaneously and do NOT press buttons rapidly. These actions will cause the remote to reset and steps 1-4 will have to be repeated.

Note: The RMT-SR-IR ships with two batteries. Only one battery is required for operation, the other battery is complimentary.
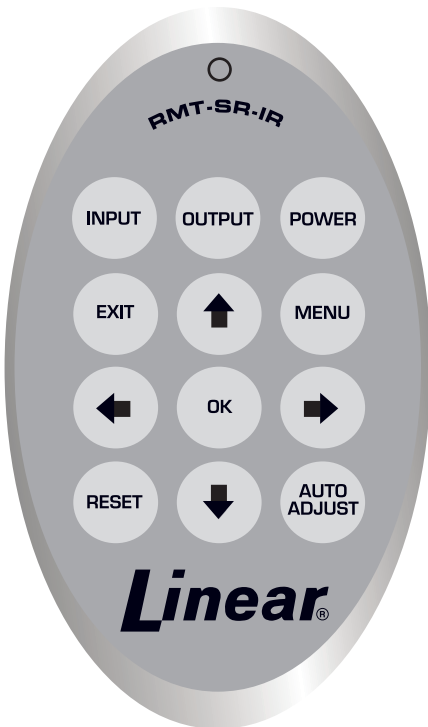
The optional IR extender allows you to relocate your HDMI Switcher and still retain IR control. Linear part# IR-EXTENDER

How to Resolve IR Code Conflicts

In the event that IR commands from other remote controls conflict with the supplied RMT-SR-IR remote control, changing the remote channel will alleviate this issue. The RMT-SR-IR remote control has DIP SWITCHES for configuring the remote channel. The High Definition A/V Scaler for HDMI must match the remote channel set in the RMT-SR-IR remote control. Please see page 10 for instruction on how to configure the channel on the High Definition A/V Scaler for HDMI. By default, both the High Definition A/V Scaler for HDMI and the RMT-SR-IR remote control are set to Channel 1.

Remote

Remote Channel 1: Default

1   2

Remote Channel 2:

1   2
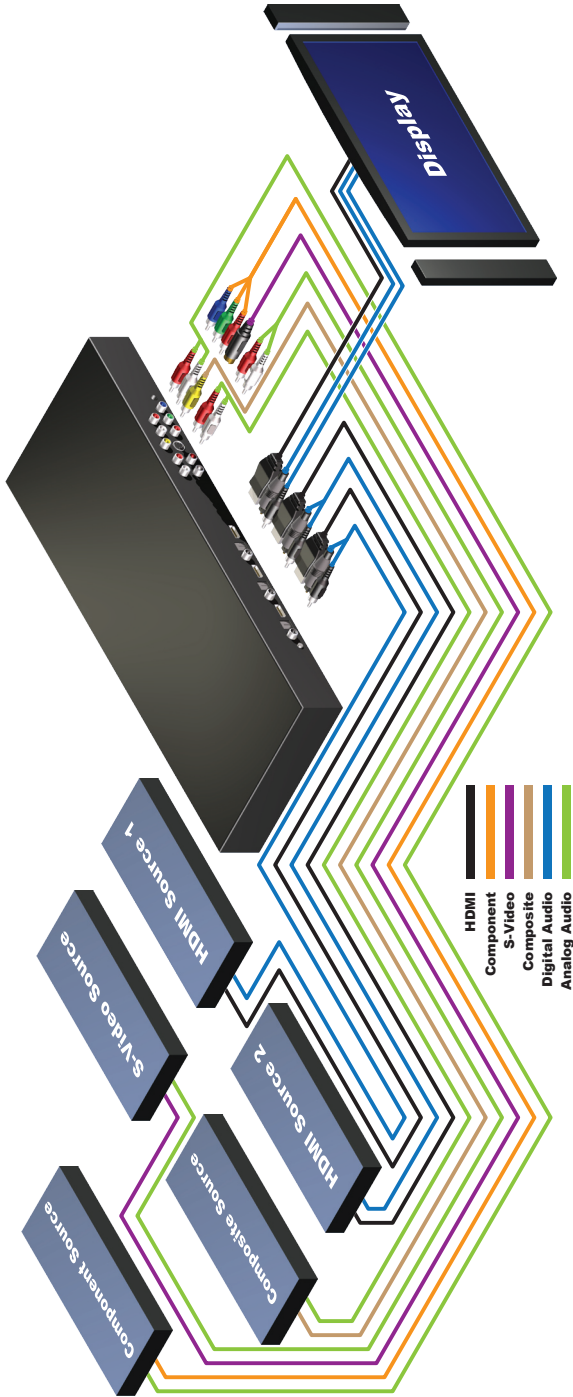
Remote Channel 3:

1   2

Remote Channel 4:

1   2

Maximum HDMI cable length is 15 ft at 1080P resolution without the use of an HDMI-SB or HDMI-CAT5-EXT

Maximum analog audio and video cable length is 50 ft

HDMI
Component
S-Video
Composite
Digital Audio
Analog Audio

Display

HDMI Source 1

S-Video Source

HDMI Source 2

Composite Source

Component Source

SPECIFICATIONS

Digital Video Amplifier Bandwidth .... 165 MHz

Component Video Bandwidth .... 350 MHz

Input DDC Signal .... 5 Volts p-p (TTL)

Input Video Signal .... 1.2 Volts p-p

Single Link Range .... 1080p/1920 x 1200

Input/Output HDMI Connector .... Type A 19 pin female

Analog Video In Connector 1... 3 RCA Component

Analog Video In Connector 2.. 1 RCA Composite

Analog Video In Connector 3 ....1 S-Video

Digital Audio In Connector .... 2 Optical and 2 SPDIF

Digital Audio Out Connector .... 1 Optical and 1 SPDIF

Analog Audio In Connector .... 3:2 RCA R+L

Power Consumption .... 20 Watts (max)

Dimensions .... 6.875"W x 2.125"H x 6.875"D

Shipping Weight .... 4 lbs.

WARRANTY

Note: These products are designed to be installed and serviced by trained professional installation companies.

Linear LLC warrants this product to be free from defects in material and workmanship. For the term of the warranty, see the list of products below. The Warranty Expiration Date is reflected by a date code that is affixed to all of Linear's products. This warranty extends only to wholesale customers who buy direct from Linear or through Linear's normal distribution channels. Linear does not warrant this product to consumers. Consumers should inquire from their selling dealer as to the nature of the dealer's warranty. There are no obligations or liabilities on the part of Linear LLC for consequential damages arising out of or in connection with use or performance of this product or other indirect damages with respect to loss of property, revenue, or profit, or cost of removal, installation or reinstallation. All implied warranties, including implied warranties for merchantability and implied warranties for fitness, are valid only until warranty expiration date as labeled on the product. This Linear LLC Warranty is in lieu of all other warranties express or implied. Some states and countries do not allow limitations or how long an implied warranty lasts or the exclusion or limitation or incidental or consequential damages, so the above exclusions may not apply. The Linear LLC warranty gives specific legal rights in addition to other rights, which may exist and vary from state to state and country to country.

All products returned for warranty service require a Return Product Authorization Number (RPA#). Contact Linear Technical Services at 1-800-421-1587 for an RPA# and other important details.

Consumers: If you have trouble locating your installing company, please contact Linear LLC at 1-800-421-1587 and we will assist you with locating a service and Installation Company.

The following warranty period applies to this set of Linear branded products.

1.   Linear High Definition Video products — Two (2) years. There is no warranty offered on the batteries supplied with the IR remote Control.

The warranty is limited to repair or replacement of products returned, freight prepaid, to Linear LLC. There is NO PROVISION FOR LABOR COST OR OTHER REIMBURSEMENTS OF ANY KIND.

1.   Failures due to product abuse, negligence, improper installation, improper use, and electrical surge including damage from lightning, water damage or other damage due to natural disasters are not covered by the warranty.

2.   The warranty shall also be voided by any tampering with the date code, labels or other markings on the product.

3.   Products that are damaged in transit to Linear LLC due to improper packaging or by the carrier (shipping company) will not be covered under the warranty. If the product was damaged or lost by the carrier, it is the sender's responsibility to create a claim against the carrier.

4.   The user is responsible for all labor costs associated with removing, reinstalling and returning the product to Linear LLC.

5.   Linear LLC, at its option, will repair or replace the defective product.

6.   Replacements will be made from B-Stock. If an exact replacement is not available Linear LLC, at its option will select the nearest equivalent product. The user is responsible for freight charges to Linear LLC.

7.   Linear LLC will return warranted repaired or replacements by UPS Ground or an equivalent service. A customer may pay the additional costs for second day or next-day service.

SCALER-2-1080P

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Rev A