

SHD-310SM Switcher Scaler Quick Start Guide

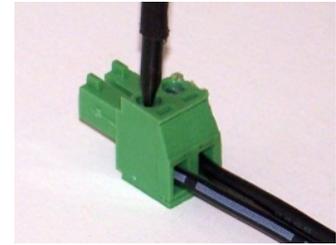
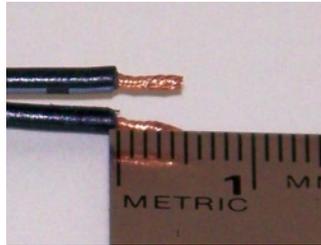


Thank you for purchasing the Luxi Electronics® SHD-310SM switcher scaler. Please read through this manual before using the product.

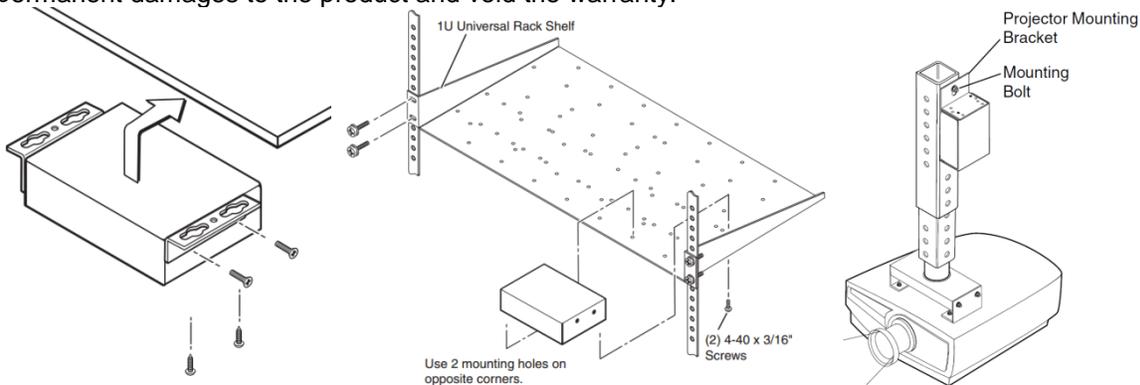
How the product functions: Please refer to the “Video signal path” and “Audio signal path” sections in the right column of the specs on page 4 for details.

Power options: This product draws power from an external 12 V power supply sold separately (Luxi P/N 69-002-01). Do NOT plug the power supply connector into any other connectors; this could cause permanent damages to the product and void the warranty.

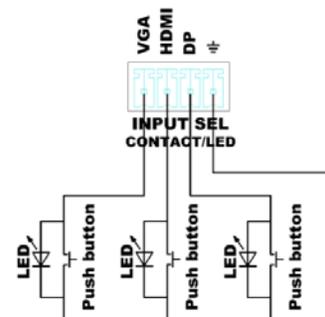
Captive screw plug termination: The captive screw plugs for power, audio, RS-232 and contact controls are supplied with the unit. Separate the wires about 1” (2.5 cm) long; strip off the wire insulation precisely 3/16” (5 mm) from the end. Identify the positive and negative leads for power; Luxi power supply has a white stripe on the positive wire. If not sure, use a multi meter to verify.



Mounting options: Luxi has the under desk mount sold separately (Luxi P/N 78-002-01); the product also fits many other mounting hardware from Extron, Middle Atlantic, etc. Only use the type 4-40, 3/16” (5 mm) long screws supplied with the mounting hardware to screw onto the product. Wrong type of screw could strip the threads; too long screw could touch and short the internal circuit, cause permanent damages to the product and void the warranty.

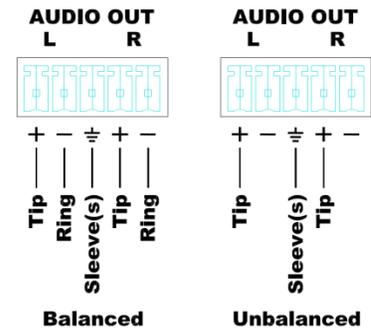


Control options: When auto switching off, pressing the “Input Sel.” button on the front panel will toggle thru the 3 video inputs. 3 sets of external contact closure push buttons and LEDs can select inputs discretely with the LED indication, see wiring diagram on the right side; when a button is pressed, the associated LED would blink once, then stay on. A RS-232 host connected to the rear panel can control all functions, see page 3 for the RS-232 commands and responses.



Auto input switching: The default is auto switching on, front panel button defeated. When the button pressed, the 3 LEDs next to it will blink 3 times. To turn off auto switching, press and hold the button for more than 5 seconds until the LEDs blink twice, or use RS-232 command. When auto switching off, use the button or contact closure buttons or RS-232 to select input. To engage auto switching again, press and hold the button for more than 5 seconds until the LEDs blink 3 times, or use RS-232 command.

Audio output connector wiring: refer to the diagrams on the right for the wiring to the 5-pin captive screw connector. Do NOT connect the sleeve (audio cable shield) to the “-” pin of the audio output; this could cause permanent damages to the product and void the warranty.



RS-232 controls: Only the input selections can be controlled by front panel or external buttons; all other functions can only be controlled by RS-232. See the RS-232 Setup Guide on Luxi website for more information: http://luxielectronics.com/attachments/File/Luxi_RS-232_setup_guide.pdf. Refer to page 3 for RS-232 commands.

Input select commands: Command “s” is to check the current selected input; “0s” is to enable auto switching; “1s” is to select VGA input, “2s” HDMI input; “3s” DP input. There will be a blank screen for a brief period of time during input switching. The duration depends on the handshake time of the display and the source device, and the input and output resolutions, generally around 2 seconds or less.

Front panel and contact closure lockup: Command “A” is to check the current front panel switch status; “0A” is to turn off auto switching and defeat front panel and contact closure controls; “1A” is to turn off auto switching and allow front panel and contact closure controls; “2A” (default) is to turn on auto switching and defeat front panel/contact closure controls.

Auto image settings: Command “a” is to initiate auto image settings.

Scaler output video format settings: Refer to RS-232 “o” series commands on page 3 for more details.

Image size (zoom) adjustments: Many displays made by consumer electronics manufacturers tend to set the image on the screen in overscan even fed by computer signals, making the menu icons on the sides cut off or disappear. Use the “z” commands to set (shrink) the proper picture size on screen. Command “z” is to check the current zoom level; “1z” is to set the zoom level to 1 (default, same size as the original in a non-overscan display), “2z”, “3z”, ... “6z” are to set the zoom levels to 2, 3, ... 6, respectively.

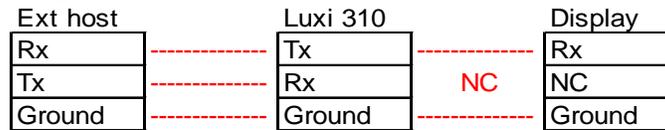
Video output commands: Refer to RS-232 “m” series commands on page 3 for more details. If the monitors can go to sleep without input signal and can wake up with input signal, use RS-232 command “1m” to enable this feature. If your projector needs screen saver to prevent burn in, use command “2m” to turn on OSD (On Screen Display) when no input signal.

Audio commands: Refer to RS-232 “M” series commands on page 3 for more details. Use RS-232 command “0M” to mute all audio outputs; “1M” to set digital audio pass thru for preserving the movie surround sound; “2M” to mix the 3.5 mm audio to input digital audio; “3M” to pair the 3.5 mm audio with VGA input only; “4M” to use the 3.5 mm audio all the time (for wireless microphone).

Resetting the product to factory defaults: Use the RS-232 command “r” to reset the product to factory defaults. See page 3 for the default values.

Display power controls: The switcher with rev 4.04 and later MCU firmware has the configurable display power control feature to enable fully automated system operations without any operator or 3rd party

control devices. The switcher will send a display power off command via RS-232 port with a set delay time (1 to 60 minutes) after the last input signal disappears; and will send a display power on command as soon as the first input signal detected, and will automatically select that input. The switcher uses one RS-232 port to connect both external host (optional; only required for setup) and display in parallel with the display in "listening" mode only (only display's Rx pin connected). Here's the wiring diagram:



NC = Not Connected

Use the "2{xxx}R" and "1{yyy}R" commands listed in next page to setup the display power on and off commands respectively, then use the "1*zR" command to enable the display power control feature while setting the power off delay time at "z" minutes. Use "0R" command to disable the display power control feature. The system reset command "r" will not erase the stored display power on and off commands, but will disable the display power control feature (factory default).

Support: Please contact your reseller directly for local support; or Luxi using the contact info in the header. See Luxi website for additional and more updated documents.

Luxi switcher SHD-310SM RS-232 commands Rev 4.02

Function	Command	Response	Notes	Factory default
Product information commands				
Query device part number	<i>p</i>	71-003-02¶	Numeric and dash only	
MCU firmware version	<i>1P</i>	x.xx¶	Numeric only	
Scaler firmware version	<i>2P</i>	x.xx¶	Numeric only	
Splitter firmware version	<i>3P</i>	x.xx¶	Numeric only	
Reset command				
Reset to factory defaults	<i>r</i>	Reset		
Input selection commands				
Select local input x	<i>xs</i>	Input x live¶	x has 3 possible values, 1 thru 3	2s (HDMI input)
Set auto switch on	<i>0s</i>	Auto sw on¶	Will release by new input selection	
Query local input status	<i>s</i>	Input x live¶ Auto sw on (or off)¶ Input x signal present¶ Input x signal present¶	Send all 3 groups of status to "s" command, only one group of status to the one just changed	
Defeat front panel input selection	<i>0A</i>	Front panel sw off¶ Auto sw off¶	When front panel switch pressed, the LED fast blinking twice	Press and hold front panel switch for more than 5 seconds will toggle the auto sw on or off; LED fast blinking 3 or 2 times respectively
Allow front panel input selection	<i>1A</i>	Front panel sw on¶ Auto sw off¶		
Allow auto switching and defeat front panel input selection	<i>2A</i>	Front panel sw off¶ Auto sw on¶	When front panel switch pressed, the LED fast blinking 3 times	2A (auto sw on, front panel sw off)
Query front panel switch status	<i>A</i>	Front panel sw off (or on)¶ Auto sw on (or off)¶		



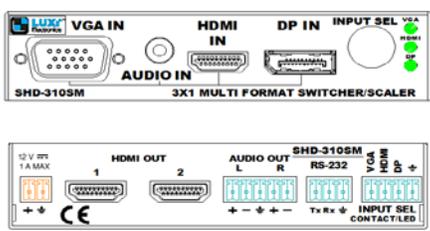
Website: www.luxielectronics.com
 Email: xlu@luxielectronics.com

Phone: +1 (949) 654-2047
 Address: Irvine, CA, USA

Scaler commands				
Initiate auto image	<i>a</i>	Auto image on¶		
Set output format to pixel to pixel	<i>0o</i>	Output format pixel to pixel¶	Only supports 7 preset resolutions: 720p, 1080p, 1280x800, 1920x1200, 1024x768, 1280x1024, 1600x1200	
Set output format to 720p	<i>1o</i>	Output format 720p¶		
Set output format to 1080p	<i>2o</i>	Output format 1080p¶		2o (output 1080p)
Set output format to 1280x800	<i>3o</i>	Output format 1280x800¶		
Set output format to 1920x1200	<i>4o</i>	Output format 1920x1200¶		
Set output format to 1024x768	<i>5o</i>	Output format 1024x768¶		
Set output format to 1280x1024	<i>6o</i>	Output format 1280x1024¶		
Set output format to 1600x1200	<i>7o</i>	Output format 1600x1200¶		
Query output format	<i>o</i>	(One of the responses from cell C30 to C37)		
Set zoom level on	<i>xz</i>	Zoom level <i>x</i> ¶	x has 6 possible values, 1 thru 6	1z (zoom level 1)
Query zoom level	<i>z</i>	Zoom level <i>x</i> ¶		
Video output commands				
Video mute	<i>0m</i>	Video mute on¶	Kill all video	
Video off OSD off when no input	<i>1m</i>	Video off OSD off when no input¶	This would enable monitor sleep mode	
OSD on when no input	<i>2m</i>	OSD on when no input¶	This would enable screen saver	2m (OSD on when no input)
Query video output mode	<i>m</i>	(One of the responses from cell C43 to C45)		
Audio commands				
Audio mute on	<i>0M</i>	Audio mute on¶	Both analog and HDMI audio muted	
Digital audio pass thru	<i>1M</i>	Digital audio pass thru¶	HDMI/DP audio pass thru; HDMI/DP audio de-embedded to analog output	
Audio mixing and embedding	<i>2M</i>	Audio mixing and embedding¶	3.5 mm audio mixed with HDMI/DP audio to both analog and HDMI outputs	2M (3.5 mm audio mixed with HDMI/DP audio)
3.5 mm audio with VGA only	<i>3M</i>	3.5 mm audio with VGA only¶	3.5 mm audio is only active when VGA input selected	
3.5 mm audio only	<i>4M</i>	3.5 mm audio only¶	3.5 mm audio is always active; all other audio muted in all inputs	
Query audio mode	<i>M</i>	(One of the responses from cell C49 to C53)		
Display power control commands				
Store display power on command xxx	<i>2{xxx}R</i>	Display power on command stored¶		
Erase display power on command	<i>2}R</i>	Display power on command erased¶		
Query display power on command	<i>2R</i>	Display power on command is xxx¶		
Store display power off command yyy	<i>1{yyy}R</i>	Display power off command stored¶		
Erase display power off command	<i>1}R</i>	Display power off command erased¶		
Query display power off command	<i>1R</i>	Display power off command is yyy¶		
Enable display power control and set power off delay to z minutes	<i>1*zR</i>	Display power control enabled¶ Display power off delay y minutes¶	z can be any number between 1 to 60	
Disable display power control	<i>0R</i>	Display power control disabled¶		0R (display power control disabled)
Query display power control status	<i>R</i>	Display power control enabled (or disabled)¶ Display power off delay y minutes¶	Only when the status is enabled	
Scaler firmware update	<i>2u</i>	Check monitor's OSD for status¶	Authorized engineers only	

RS-232 baud rate/protocol **9600 baud, 8 data bits, 1 stop bit, no parity**
 RS-232 port pin configurations **1 = Tx, 2 = Rx, 3 = GND**

Note: The italic and underlined letters represent decimal numeric numbers Not all firmware revisions have all the functions
 ¶ is CR/LF (carriage return/line feed) (HEX value 0D 0A) Copyright © 2016 Luxi Electronics Corp

Product Specifications	Part Number: 71-003-02
VGA/HDMI/DP/audio 3x2 switcher with scaler	Model: SHD-310SM (rev 2)
Product Image	Product Drawing
	
Features and Benefits	Mechanical
<ul style="list-style-type: none"> > Universal interface, compatible with all source signal formats > World's smallest high performance all purpose signal converter, scaler, switcher, splitter, mixer, HDCP compliant > VGA, HDMI, DP input, auto switch or front panel, RS-232, contact controllable with discrete input LED indications > Configurable display power controls via RS-232 enables fully auto operation systems without any 3rd party controller > Independent analog audio input, can be coupled with any video input, mixed with audio de-embedded from HDMI or DP outputs to bal/unbal analog output, or embedded to HDMI > Dual mirrored HDMI outputs, drive both big screen/projector and local monitor simultaneously, with or without OSD or screensaver, enable monitor sleep/wake up (energy saving) > Unique RS-232 controlled picture zoom (out) adjustments to compensate for common display overscan > RS-232 selectable video resolutions of common 16:9, 16:10, 4:3 or pixel to pixel modes > High efficiency fanless design for ultimate reliability > Rack mountable, under-table mountable, above-projector mountable metal enclosures 	<p>Enclosure material: steel Enclosure size: 4.29" x 1.00" x 3.00" (10.9 x 2.5 x 7.6 cm)</p>
Package	Electrical
<p>One piece in one color cardboard box; with captive screw plugs and quick start guide no power supply</p>  <p>Box size: 5.9" x 4.8" x 1.1" (15.0 x 12.2 x 2.8 cm) Weight: package, 0.63 lb (0.29kg); product, 0.49 lb (0.22kg) 30-pc box size: 12.4" x 11.6" x 9.5" (31.5 x 29.5 x 24 cm) 30-pc box weight: 21 lb (9.6 kg)</p>	<p>Video signal path: There are 3 video inputs and 2 video outputs. The analog RGB video from the VGA input goes to the scaler's analog input; the DisplayPort (DP) input signal is first converted to HDMI, then switched with the HDMI input signal, the selected signal goes to the digital input of the scaler. The scaler converts all video to LVDS, feeds to a HDMI encoder, then a 1x2 HDMI splitter for dual outputs. VGA input: 0.7 Vp-p analog RGBHV, 75 ohm impedance HDMI input: HDMI 2.0, 4k 30 Hz, max 10.2 Gbps DP input: DP 1.3, 4k 30 Hz, max 10.2 Gbps Video processing: 36-bit decoding, sampling, 225 MHz clock Video input resolution range: from 800x600 to 1920x1200 Scaled video output resolution presets: 720p, 1080p, 1280x800, 1920x1200, 1024x768, 1280x960, 1600x1200, pixel to pixel HDCP compliance: HDCP 1.2</p> <p>Audio signal path: There are 3 audio inputs and 3 audio outputs. The digital audio embedded in HDMI and DP inputs are selected by a HDMI switcher, then goes to the scaler. The scaler produces both SPDIF digital audio and de-embedded analog audio. The latter is mixed with the analog audio input and goes to the bal/unbal analog audio outputs, and an analog to digital converter. The HDMI encoder can select this mixed audio, or the digital audio from HDMI/DP and directly pass it thru to dual HDMI outputs. Analog audio input: stereo on 3.5 mm mini jack, nominal level -10 dBV (316 mV), max +3.5 dBV (1.5 V), 22k ohms Analog audio output: stereo on 5-pin 3.5 mm captive screw connector, balanced output nominal -4 dBV (632 mV), unbalanced output nominal -10 dBV (316 mV), 60 ohms Audio gain: 0 dB (x1) to unbal, +6 dB (x2) to bal output Controls: Front panel button toggle thru all 3 inputs RS-232 on 3-pin 3.5 mm captive screw, 9600/8-N-1 Contact port on 4-pin 3.5 mm captive screw, discrete pin for each input, dual function (switch to select, LED for indication)</p>
Connections	Power consumption: 12 V DC, 0.2 A
<p>Input connectors: 1 VGA, 1 HDMI, 1 DP, 1 mini jack (audio) Output connector: 2 HDMI, (1) 5-pin captive screw (audio) Power connector: 2-pin 3.5 mm captive screw receptacle Control connectors: (1) 3-pin RS-232, (1) 4-pin contact</p>	<p>Optional power supply: Not included. Luxi 69-002-01 Auto switching 100-240 V AC input on US plug, 12 V DC 1 A max on bare wires, wall ward type, UL, PSE, CE, FCC Mounting: Not included. Luxi under desk mount 78-002-01 compatible with several Extron and Middle Atlantic mounts Regulatory compliance Safety: CE, cUL, UL (power supply only) EMI/EMC: CE, FCC Class A MTBF: 30,000 hours Warranty: 3 years parts and labor</p>
Other Related Products	
<p>Power supply, 100-240 V in on US plug, 12 V out, P/N 69-002-01</p>  <p>Under desk mount, P/N 78-002-01</p>  <p>Presenter transmitter, P/N 74-017-01, model TPR-110CR</p> 	