

# Extron® Electronics

INTERFACING, SWITCHING AND DISTRIBUTION



- Built-in video scaler
- Universal projector control
- Room control
- Accu-RATE Frame Lock™
- Dynamic Motion Interpolation™
- 3:2 and 2:2 pulldown detection
- IR learning capabilities
- Seven input, dual output
- Audio switching and control capabilities
- 350 MHz (-3dB) video bandwidth
- Remote control options



# DESCRIPTION

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Extron's System 7SC is a seven input, dual output, multi-format switcher with a built-in video scaler. The System 7SC features projector and room control along with RGB & video integration capabilities ideal for rental, staging, and permanent installations using plasma displays as well as CRT, LCD, and DLP projectors.

To optimize image quality as well as maintain maximum image brightness and detail, video inputs are scaled to match native resolution of the digital display being used. To scale any video input, the System 7SC uses Extron's latest up-conversion technologies with Dynamic Motion Interpolation (DMI™) technology and advanced film mode processing. RGB inputs are passed through.

The System 7SC provides Extron's patent-pending Accu-RATE Frame Lock (AFL™) technology. This exclusive feature solves frame rate conversion issues experienced by video scalars. When video input and output refresh rates differ, there are certain points in time when the two rates cross over each other. The result is a glitch or image freeze on the display, which is especially apparent during motion, such as panning by a camera. AFL solves this problem by locking the output frame rate to the input frame rate. Artifacts are eliminated, and disruptive video and audio synchronization problems within the system are minimized.

The System 7SC incorporates advanced film mode processing with 3:2 pulldown detection for NTSC and 2:2 film detection for PAL. This helps maximize image detail and sharpness for both NTSC and PAL sources that originated from film. When film is converted to NTSC or PAL video, the film frame rate has to be matched to the video frame rate (a process known as 3:2 pulldown for NTSC video). For film-originated material, conventional video processing techniques do not produce the best possible image. However, the System 7SC recognizes when video originated from film and applies optimal video processing algorithms—resulting in richly detailed images with sharply defined lines.

The System 7SC uniquely provides two methods of projector control, RS-232 or IR. There are also two methods of configuring the switcher for projector control. The first method consists of downloading pre-configured control drivers from the Extron Web site via the supplied control software. The second method is available for more customized configuration. The installer can customize the System 7SC by using IR learning or entering custom, unidirectional, RS-232 commands.

System switcher control is provided via front panel operation, included IR 701 remote control, RS-232 control, optional SCP 200 or SCP 250 hardwired control pad, or optional SCP/AAP A hardwired control Architectural Adapter Plate (AAP). The front panel buttons control video and audio input selection; picture adjustments; display functions; and internal relays for room controls, such as lowering or raising a screen. The IR 701, SCP 200, and SCP 250 duplicate most or all of the front panel functions. All functions are available through RS-232. The SCP/AAP A enables limited front panel operation and may be mounted on any of Extron's architectural interfaces or distribution amplifiers offering AAP openings.

# FEATURES

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- **Universal projector control** – The System 7SC provides universal projector control via downloadable RS-232 or IR drivers, IR learning capabilities, or user-defined RS-232 commands.
- **Room control** – Room lighting, screen settings, and other device functions may be controlled through the System 7SC's room function, via internal relays.
- **Triple-Action Switching™ (RGB delay)** – Blanks the screen during switching to eliminate visible switching transitions.
- **Balanced/unbalanced audio** – Audio gain/attenuation adjustments for each input provided. Audio breakaway available through RS-232 only.
- **Dual audio output** – Simultaneous output available, one with fixed level and one with variable level. Input level adjustments made using the front panel knob or RS-232 affect both outputs.
- **Quad-standard video decoding compatibility** – NTSC 3.58, NTSC 4.43, PAL, and SECAM.
- **Inputs** – Seven versatile inputs. Six of the inputs are fully configurable for composite video, S-video, component video, or RGB. Located on the front panel, the seventh configurable input accepts composite video, S-video, or RGB on a 15-pin HD. The System 7SC also accepts and scales 480p component video signals to any of the available output rates.
- **Scaled outputs** – All composite video, S-video, and component video signals are scaled and output simultaneously on a 15-pin HD connector and five BNCs.
- **Accu-RATE Frame Lock (AFL™)** – Extron's patent-pending Accu-RATE Frame Lock technology eliminates the common problem of artifacts in scaled motion video. Accu-RATE Frame Lock eliminates frame rate conversion by locking the output frame rate to the input frame rate. Artifacts are eliminated, and disruptive video and audio synchronization problems within the system are minimized.
- **Dynamic Motion Interpolation (DMI™)** – DMI technology is an advanced motion detection and compensation method used to deliver the best aspects of still and motion algorithms. This process results in a superior level of image enhancement capability with no loss of image fidelity.
- **Advanced film mode processing** – The System 7SC provides advanced film mode processing with 3:2 pulldown detection for NTSC and 2:2 film detection for PAL. It helps maximize image detail and sharpness for NTSC or PAL sources that originated from film. When such sources are detected, the System 7SC applies video processing algorithms that optimize the conversion of film-based video—resulting in richly detailed images with sharply defined lines.
- **Pass-through outputs** – All RGB inputs are passed through and output simultaneously on a 15-pin HD connector and five BNCs.
- **Picture controls** – Horizontal and vertical shift, color, tint, brightness, contrast, detail (image sharpness), sizing, and top and bottom vertical blanking adjustments provided for each video input.

## FEATURES (Cont.)

- **High bandwidth** – 350 MHz (-3dB) video bandwidth maintains signal integrity.
- **Rack-mountable** – Housed in a 2U high, one rack width enclosure.
- **Included accessories** – IR 701 remote control, 50' Universal Projector Control (UC) Cable, 9-pin male to male gender changer, hardwired IR emitter, and rack-mount mounting kit.

## SPECIFICATIONS

### Video

Gain .....	Unity
Bandwidth .....	350 MHz (-3dB)
Differential phase error ....	0.01°, 0 to 10 MHz
Differential gain error .....	0.01%, 0 to 10 MHz
Crosstalk .....	-50dB @ 5 MHz

### Video input

Number/signal type .....	6 RGBHV/RGBS/RGsB/RsGsBs computer video, component video, S-video, or composite video 1 RGBHV/RGBS/RGsB/RsGsBs computer video, S-video, or composite video
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### Connectors

6 x 5 BNC female .....	RGB computer video, component video, S-video, or composite video
1 15-pin HD female ....	RGB computer video (input 7)
1 4-pin mini-DIN female..	S-video (input 7)
1 RCA female .....	composite video (input 7)
Minimum/maximum level(s)..	Analog: 0.3V to 2V p-p with no offset at unity gain
Impedance .....	75 ohms
Horizontal frequency .....	15 kHz to 150 kHz
Vertical frequency .....	30 Hz to 150 Hz
Return loss .....	-30dB @ 5 MHz
Maximum DC offset .....	1.5V

### Video processing

Decoder .....	9 bit digital
Digital sampling .....	24 bit, 8 bits per color; 13.5 MHz (interlaced signals) 24 bit, 8 bits per color; 27 MHz (480p signals)
Colors .....	16.78 million

### Video output

Number/signal type .....	2 RGBHV/RGBS/RGsB/RsGsBs* computer video (*RGsB, and RsGsBs will be output only if the input is RsGsBs.)
Connectors .....	1 x 5 female BNC 1 15-pin female HD
Minimum/maximum level(s)..	0.3V to 2.0V p-p
Impedance .....	75 ohms

## SPECIFICATIONS (Cont.)

Scaled VGA resolution.....	640x480 <sup>1,3,4,5</sup> , 800x600 <sup>1,3,4,5</sup> , 832x624 <sup>3,4,5</sup> , 848x480 <sup>3</sup> , 852x480 <sup>3</sup> , 1024x768 <sup>1,3,4,5</sup> , 1280x768 <sup>3</sup> , 1280x1024 <sup>1,3,5</sup> , 1360x765 <sup>3</sup> , 1365x1024 <sup>3,5</sup> , 480p <sup>3,5</sup> , 720p <sup>3,5</sup> , 1080p <sup>3,5</sup> , 1080i <sup>3,5</sup>
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<sup>1</sup> = at 50 Hz    <sup>2</sup> = at 56 Hz    <sup>3</sup> = at 60 Hz    <sup>4</sup> = at 75 Hz

<sup>5</sup> = locked to the current input's vertical refresh rate

Return loss .....	-30dB @ 5 MHz
DC offset .....	±5mV maximum with input at 0 offset
Switching type .....	Triple Action

### Sync

Input type .....	RGBHV, RGBS, RGSB, RsGsBs
Output type.....	RGBHV, RGBS, RGSB, RsGsBs* (*RsGsBs will be output only if the input is RsGsBs.)

Standards .....	TTL (RGB) NTSC 3.58, NTSC 4.43, PAL and SECAM (S-video and composite video)
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Input level .....	0.5V to 5V p-p
Output level .....	0.5V to 5V p-p
Input impedance .....	510 ohms
Output impedance .....	75 ohms
Max input voltage .....	5V p-p
Max. propagation delay ....	20 nS
Polarity .....	Positive or negative (follows input)

### Audio

Gain .....	-15dB (min.) to +9dB (max.) adjustable per channel in 0.5dB increments
Frequency response .....	20 Hz to 20 kHz, ±0.05dB
THD + Noise .....	< 0.03% @ 1 kHz at rated maximum output drive
S/N .....	> 90dB, 21dBu output
Adjacent input crosstalk ..	> 80dB @ 1 kHz
Stereo channel separation..	> 90dB @ 1 kHz
CMRR .....	> 75dB @ 20 Hz to 20 kHz

### Audio input

Number/signal type .....	6 stereo, balanced/unbalanced (rear panel) 1 stereo, unbalanced (front panel)
Connectors .....	6 3.5 mm captive screw connectors, 5 pole, and 1 3.5 mm mini stereo jack (unbalanced), or 2 female RCA (white = L, red = R)
Impedance .....	>12.5 kohms balanced, 25 kohms unbalanced, DC coupled
Maximum level .....	+19.5dBu, (balanced or unbalanced) @ stated %THD+N
Input gain adjustment .....	-15dB to +9dB, adjustable per input via RS-232 or front panel

### Audio output

Number/signal type .....	1 line-level stereo, balanced/unbalanced
Connectors .....	1 3.5 mm captive screw connector, 5 pole
Gain .....	+0dBu, unbalanced; +6dBu, balanced
Impedance .....	50 ohms, unbalanced; 100 ohms, balanced

# SPECIFICATIONS (Cont.)

## Attenuation

- Fixed output ..... 0%
- Variable output ..... 0% to 100%
- Maximum level (Hi-Z) .... > +21dBu, balanced or unbalanced at stated %THD+N
- Maximum level (600 ohm).. > +15dBm, balanced or unbalanced at stated %THD+N

## Control/remote - switcher

- Serial control port ..... RS-232, 9-pin female D connector, dual port
- Baud rate and protocol .... 9600, 8-bit, 1 stop bit, no parity
- Serial control pin configurations ..... 2 = TX, 3 = RX, 5 = GND
- Contact closure ..... 1 3.5 mm, 10-pole captive screw connector
- Contact closure pin configurations ..... 1 = input 1; 2 = input 2; 3 = input 3; ... ; 7 = input 7; 8, 9, 10 = GND
- IR controller module ..... 30 kHz to 60 kHz input frequency compatibility
- Program control ..... Extron's control program for Windows Extron's Simple Instruction Set (SIS™)

## Control - room relay

- Number/type ..... 2 momentary or latching
- Connectors ..... 2 3.5 mm captive screw connectors, 5 pole
- Contact rating ..... 24V, 1 A

## Control - projector

- Projector control port RS-232 ..... 1 3.5 mm captive screw connector, 10 pole
- IR ..... 1 3.5 mm captive screw connector, 5 pole

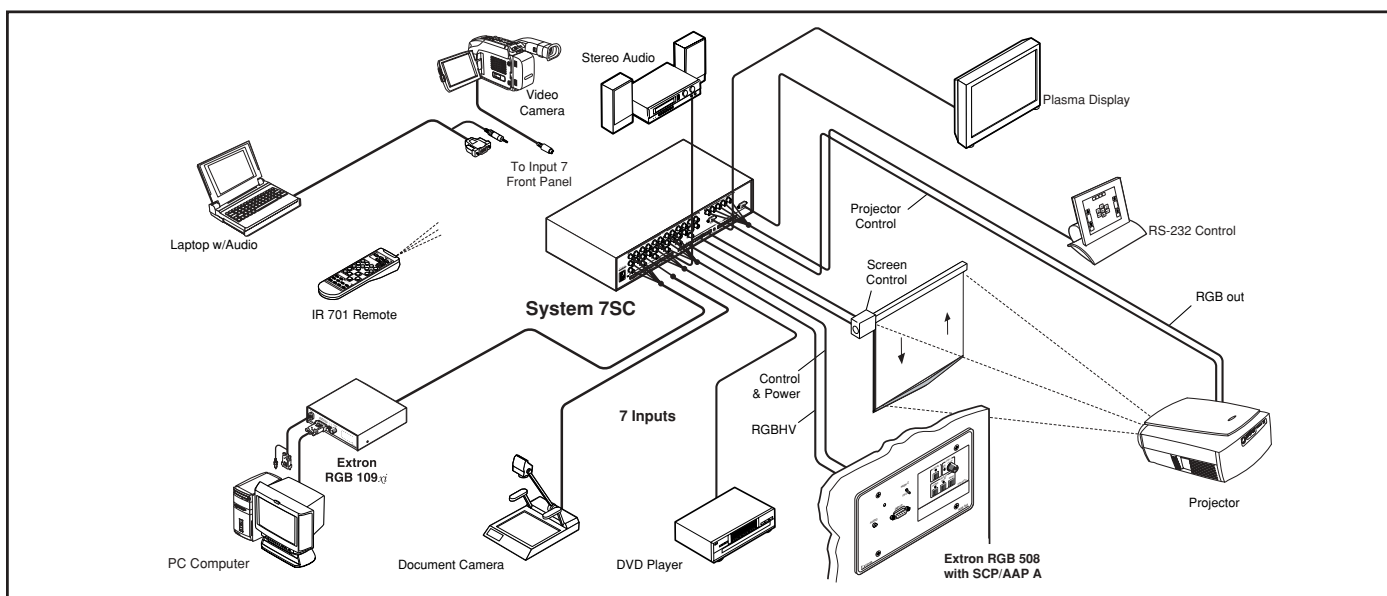
## General

- Power ..... 100VAC to 240VAC, 50/60 Hz, 30 watts, internal, auto-switchable
- Temperature/humidity Storage ..... -40° to +158°F (-40° to +70°C) / 10% to 90%, non-condensing
- Operating ..... +32° to +104°F (0° to +40°C) / 10% to 90%, non-condensing
- Rack mount ..... Yes, with included brackets, (2U high)
- Enclosure type ..... Metal
- Enclosure dimensions ..... 3.5" H x 17" W\* x 9.5" D  
8.9 cm H x 43.2 cm W\* x 24.1 cm D  
(Depth excludes connectors. \*Front panel is 19" wide.)
- Shipping weight ..... 17 lbs (7.7 kg)
- Vibration ..... ISTA/NSTA 1A in carton (International Safe Transit Association)
- Approvals ..... UL, CUL, CE, FCC Class A
- MTBF ..... 30,000 hours
- Warranty ..... 2 years parts and labor
- Part number ..... 60-340-01

## OPTIONAL ACCESSORIES

- IR 701 remote control (spare) ..... 70-145-01
- SCP 200 control pad, grey ..... 60-338-01
- SCP 200 control pad, black ..... 60-338-02
- SCP 200 control pad, white ..... 60-338-03
- SCP 250 control pad, grey ..... 60-356-01
- SCP 250 control pad, black ..... 60-356-02
- SCP 250 control pad, white ..... 60-356-03
- SCP/AAP A control pad, grey ..... 60-339-01
- SCP/AAP A control pad, black ..... 60-339-02
- SCP/AAP A control pad, white ..... 60-339-03
- UC50' (50 feet/15 meters) (spare) ..... 26-518-01
- UC100' (100 feet/30 meters) ..... 26-518-02
- UC200' (200 feet/61 meters) ..... 26-518-03

## APPLICATION DIAGRAM



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