

USP 405

Universal Signal Processor

Model	Part #
USP 405	60-369-01
USP 405 DI (with SDI In)	60-369-02
USP 405 DO (with SDI Out)	60-369-03
USP 405 DI/O (with SDI In & Out)	60-369-04



DESCRIPTION

The Extron USP 405 Universal Signal Processor is the one box solution for all video signal conversion needs. It is an all-in-one, high-performance scaler, scan converter, transconverter, format converter, switcher, and transcoder. The USP 405 accepts a wide range of video signal formats, processes them, and outputs them all in one format directly to a digital display, projector, or editing device. The applications for the USP 405 are virtually infinite and include rental and staging environments, boardrooms, conference rooms, classrooms, auditoriums, and much more.

The USP 405 is especially useful for upconverting or downconverting video and computer signals. It can convert HDTV, component, S-video, composite (NTSC and PAL), RGB, and optional SDI (Serial Digital Interface) into a single video format—all while maintaining maximum image quality. RGB signals that are input into the USP 405 can be scaled to one of 35 output resolutions, or scan converted to component, S-video, composite (NTSC and PAL), and SDI. Video signals that are input as component, S-video, composite, and SDI can be transcoded by the USP 405 and output through all video connectors simultaneously. These video signals can also be scaled to one of 35 resolutions and output on 15-pin HD and BNC connectors.

There are five video inputs on the USP 405 (including optional SDI input), accessible through the rear panel: one female 15-pin HD connector for RGB/computer video (includes a buffered local monitor output); five female BNC connectors for RGBHV, component video (Y, R-Y, B-Y), S-video, or composite video; one 4-pin mini DIN for S-video (includes a buffered loop-through); one female BNC connector for composite video (includes a buffered loop-through); and one female BNC connector for the optional SDI video.

The USP 405 has six video outputs (including optional SDI output), also on the rear panel: one female 15-pin HD connector for RGB/computer video; five female BNC connectors for RGBHV/component video (Y, R-Y, B-Y); three female BNCs for component video; one 4-pin mini DIN for S-video; one female BNC for composite video; and one female BNC for the optional SDI video.

To maximize the quality of the output image, the USP 405 features several Extron proprietary video processing technologies: Dynamic Motion Interpolation (DMI™), 3:2 (NTSC) and 2:2 (PAL) pulldown detection, and the patented Accu-RATE Frame Lock (AFL™).

The USP 405 is available in four configurations: the standard USP 405 (without SDI), the USP 405 DI (with SDI In), the USP 405 DO (with SDI Out), and the USP 405 DI/O (with SDI In & Out). This universal signal processor comes with an easy-to-read LCD menu and back-lit, tactile buttons to simplify operation and control. It can also be controlled by IR remote with the optional Extron IR 801.

FEATURES

- **Aspect ratio conversion** - Ability to horizontally and vertically size any video input to meet a specific aspect ratio.
- **Output rates** - The USP 405 offers 35 scaled output rates, including these computer-video and plasma rates: 640 x 480, 800 x 600, 832 x 624, 848 x 480, 852 x 480, 1024 x 768, 1280 x 768, 1280 x 1024, 1360 x 765, and 1365 x 1024. NTSC, PAL, as well as HDTV rates of 720p, 1080p, and 1080i are also available.
- **Input and loop-through connectors** - Input one has a buffered local monitor output on a female 15-

pin HD connector, and inputs three and four include buffered loop-through connectors on a female BNC and a 4-pin mini DIN connector, respectively.

- **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.
- **3:2 (NTSC) and 2:2 (PAL) pulldown detection** - Advanced film mode processing techniques which help maximize image detail and sharpness for NTSC or PAL sources that originated from film (Patent Pending).
- **Accu-RATE Frame Lock (AFL)** - A patented technology exclusive to Extron that 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. AFL solves this problem by locking the output frame rate to the input frame rate.
- **Quad standard video decoding compatibility** - The USP 405 uses a digital, four-line adaptive comb filter to decode NTSC 3.58, NTSC 4.43, PAL, and SECAM for integration in systems all over the world.
- **Genlock** - All video outputs (NTSC and PAL) can be synchronized to an outside reference signal, enabling clean and precise transitions between sources.
- **Test patterns** - Ten test patterns are available, including a crop pattern, crosshatch, 16 bar gray scale, color bars, alternating pixels, ramp, 4 x 4 crosshatch for use with video walls, and three film aspect ratio patterns (1.78, 1.85, and 2.35) for setting up letterbox DVDs. It also features a blue-only mode for proper setup of the video scalar.
- **Freeze button** - Each input of the USP 405 can be frozen using the freeze button on the front panel. When the freeze button is pressed, it will light red and the input that is selected will flash. Once an input has been frozen, the input to the unit can be removed and the frozen output image will not be lost until another source has been selected.
- **Picture controls** - Brightness, contrast, centering, color, tint, detail, size, zoom, and panning can all be adjusted through the front panel. The USP 405 can zoom the image up to 200%.
- **Memory presets** - Inputs one and two support 32 auto recall memories each, based on incoming frequency. Information on sizing, centering, detail, contrast, and brightness is saved.
- **RS-232 control** - A rear panel, RS-232 control port provides connection of the USP 405 to a third-party control system.
- **Vertical blanking** - Variable top and bottom blanking eliminates edge noise caused by tapehead switching and captioning.
- **Simple Instruction Set (SIS™)** - Extron SIS is a set of basic ASCII code commands that provide simple control through a third-party control system. Instead of programming in long, obscure strings of code, SIS makes it easy to operate an Extron product using RS-232 control.
- **Front panel security lockout** - This feature locks out all front panel functions except basic switching; all functions, however, remain active through RS-232 control.
- **Rack-mountable** - The USP 405 is housed in a 1U, full rack width metal enclosure. Mounting brackets are included.
- **Internal international power supply** - The 100-240VAC, 50/60 Hz, autoswitchable internal power supply provides worldwide power compatibility.

INCLUDED ACCESSORIES

- Rack/desk mounting kit 70-077-03

OPTIONAL ACCESSORIES

- SDI Output Card VSC 700/900 70-065-02
- IR 801 70-153-01
- SDI Input Card USP 405, DVS 204 & DVS 406, & MGP 462 70-168-01

SPECIFICATIONS

Video

Gain Unity
Crosstalk -50dB @ 5 MHz

Video input

Number/signal type 1 RGBHV/RGBS/RGsB computer video with 1 local monitor loop-through
1 RGBHV/RGBS/RGsB, RGBcV computer video, component video, S-video, or composite video
1 S-video
1 composite video

Connectors	1 SDI (optional) (2) 15-pin HD female: RGB computer video input and loop-through 1 x 5 BNC female: RGB computer video, component video, S-video, or composite video input 2 BNC female: composite video input and loop-through (2) 4-pin mini DIN female: S-video input and loop-through 1 BNC female: SDI input (optional)
Nominal level	1V p-p for Y of component video and S-video, and for composite video 0.7V p-p for RGB and for R-Y and B-Y of component video 0.3V p-p for C of S-video
Minimum/maximum levels	Analog: 0.3V to 2V p-p with no offset
Impedance	75 ohms
Horizontal frequency	
Input 1	24 kHz to 100 kHz
Input 2 RGB, HD component video	24 kHz to 100 kHz
Input 2 RGBS, RGBcV, component video, S-video, composite video	
Inputs 3 & 4	15 kHz
Input 5	15 kHz
Input 5	CCIR 601/ITU-R BT.601 (270 Mbps)
Vertical frequency	30 Hz to 120 Hz
Resolution range	Autoscan 640 x 480 to 1600 x 1200
Return loss	<-30dB @ 5 MHz
Maximum DC offset	0.5V
External sync (genlock)	0.3V to 1.0V p-p
Video processing	
Decoder	9 bit digital
Encoder	10-bit digital
Digital sampling	24 bit, 8 bits per color; 140 MHz
Colors	16.78 million
Horizontal filtering	8 levels
Vertical filtering	8 levels
Video output	
Number/signal type	6 RGBHV, RGBS, component video, digital component video (CCIR 601/ITU-R BT.601), S-video, composite video Connectors: 1 x 6 BNC female (RGB, HD component video) (1) 15-pin HD female: (RGB, HD component video) 3 BNC female (component video) (1) 4-pin mini DIN (S-video) 1 BNC female (composite video) 1 BNC female (optional SDI digital component video)
Nominal level	1V p-p for Y of component video and S-video, and for composite video 0.7V p-p for RGB and for R-Y and B-Y of component video 0.3V p-p for C of S-video
Minimum/maximum levels	0V to 2.0V p-p
Impedance	75 ohms
Scaled resolutions	640x480 ^{1,3,4,5} , 800x600 ^{1,3,4,5} , 832x624 ^{3,4,5} , 848x480 ³ , 852x480 ³ , 1024x768 ^{1,3,4,5,6} , 1280x768 ² , 1280x1024 ^{1,3,5} , 1360x765 ³ , 1365x1024 ^{3,5} , 480p ^{3,5} , 720p ^{3,5} , 1080p ^{3,5} ,

	1080i ^{3,5}
	¹ = at 50 Hz: ² = at 56 Hz ³ = at 60 Hz: ⁴ = at 75 Hz ⁵ = locked to the current input's vertical refresh rate (up to 60 Hz), ⁶ = at 85 Hz
Return loss	-30dB @ 5 MHz
DC offset	These data are for output with input at 0 offset: ±25mV maximum for RGB 350±25mV maximum for Y of component video/S-video, composite video 650±25mV maximum for R-Y & B-Y of component video, C of S-video
Switching type	Triple-Action
Sync	
Input type	Autodetect RGBHV, RGBS, RGsB
Output type	RGBHV, RGBS
Standards	NTSC 3.58, NTSC 4.43, PAL, and SECAM
Input level	0V to 5V p-p
Output level	0V to 5V p-p, unterminated
Input impedance	510 ohms
Output impedance	75 ohms
Max input voltage	5V p-p
Polarity	Positive or negative (selectable)
Control/remote – switcher/scaler	
Serial control port	RS-232, 9-pin female D connector
Baud rate and protocol	9600, 8-bit, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND
Contact closure	9-pin female D connector
Contact closure pin configurations	1 = input 1, 4 = input 2, 6 = input 3, 7 = input 4, 8 = input 5
IR controller module	IR 801 (optional)
Program control	Extron's control program for Windows® Extron's Simple Instruction Set™ _ SIS™
General	
Power	100VAC to 240VAC, 50/60 Hz, 30 watts, internal, autoswitchable
Temperature/humidity	Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, non-condensing Operating +32° to +122°F (0° to +50°C) / 10% to 90%, non-condensing
Rack mount	Yes
Enclosure type	Metal

DIAGRAM



