

# Image PRO™

## Advanced Multi-Format Processor



### Convert any video format to any other video format

4:3 to 16:9	NTSC to HDSDI
NTSC to PAL	HDSDI to PAL
HDSDI to SDI	PAL to SDI
UXGA to NTSC	SDI to VGA
HDSDI to NTSC	NTSC to VGA

### Applications

- Down Converter
- Up Converter
- Seamless Switcher
- Frame Synchronizer
- SDTV to HDTV Scaler
- Multi-Format Synchronizer
- Signal Processor
- LED Wall Processing
- 24 Frame Per Second Playback
- Tiled display
- Transcoder
- Scaler
- NTSC/PAL Decoder
- NTSC/PAL Encoder

The Folsom ImagePRO™ is a powerful all-in-one signal processor that accepts a wide range of video input signals and process them into a number of different signal formats to meet the video requirements of virtually any application. Incorporating Folsom's Athena™ proprietary high performance image processing technology, the ImagePRO is available in two models; ImagePRO-SDI and the fully loaded model ImagePRO-HD.

Both units are high performance video scalers, scan converters, switchers and transcoders in one. The ImagePRO is the ideal solution for converting RGB, HDTV, component, s-video, composite (NTSC, PAL and SECAM), DVI, SDI and HD/SDI into a user selectable video format. ImagePRO supports a wide variety of analog and digital output formats including broadcast and VESA standards along with many native plasma formats. ImagePRO users may also create custom output formats to support unique display requirements.

The ImagePRO™ line has an advantaged feature set that includes: universal inputs, aspect ratio conversion, memory presets, test patterns, vertical lock (Genlock), picture adjustments, motion adaptive de-interlacing, and 3:2 and 2:2 pulldown detection to name a few.

## Technology Brief

### Folsom Athena™ Scaler

Athena™ is a proprietary, high performance image processing technology designed and developed by Folsom Research. The scaler has been designed from the ground up to provide the highest possible image quality while minimizing processing delays. The architecture supports 1:1 video sampling and processes video at 10-bits per color channel to maintain image fidelity. Proprietary horizontal and vertical filtering techniques are used to provide crisp, clean images to support both upconversion and downconversion operations. The Athena™ scaler also supports special functions such as continuous real-time pan and zoom operations, a wide variety of frame locking options (to eliminate motion artifacts) and adjustable filtering modes.

### Motion Adaptive De-Interlacing

Folsom's Motion Adaptive De-Interlacing technology optimizes image quality when interlaced images (such as standard NTSC and PAL images) are processed. Image content is analyzed over multiple input fields and filter coefficients are dynamically changed to provide crisp, clean output images without deinterlacing artifacts.

### 3:2 and 2:2 Pull-down Detection

ImagePRO automatically detects whether NTSC or PAL input source material is derived from film or standard video components such as cameras. When film-based source material is detected, a 3:2 pull-down algorithm is activated for NTSC inputs. Similarly, a 2:2 pull-down algorithm is activated if film-based material is input in PAL format. The 3:2 and 2:2 pull-down algorithms insure that frame integrity is maintained during intermediate image processing stages to prevent artifacts and preserve image detail and sharpness.

### Aspect Ratio Conversion and Control

Wide-screen formats are becoming increasingly popular. It is often necessary to convert video between formats with different inherent aspect ratios. For example, wide-screen material shot in 16:9 format is often converted for display on a standard television screen with a 4:3 aspect ratio. ImagePRO supports conversion between image formats in all common aspect ratios. In addition, user control of custom aspect ratios is provided.

## Standard Features

- Utilizes Athena™, Folsom's proprietary high performance image processing technology
- Three universal inputs accept RGBHV/RGBS/RGSB computer video, component video (SD or HDTV), s-video, or composite video with loop-through
- Four video outputs; (2) RGB or component video, (1) composite video, and (1) s-video
- User-defined aspect ratio conversion and adjustments
- Pan and zoom
- Freeze
- 10-bit processing

## Output Applications



NTSC/PAL Monitor



VGA/XVGA



Widescreen/HD

### Other Output Applications



Video Projector



NTSC/PAL/HD VTR

### Pan and Zoom

ImagePRO supports flexible pan and zoom operations. The Pan and Zoom controls can be used to see very fine detail in an area of interest of the input image or to compress an input image to form a very small output window.

### Genlock/Vertical Lock

True blackburst genlock capability with SCH-phase adjustment is provided for the broadcast quality NTSC and PAL output. All output formats including HDTV, may be vertically locked to the blackburst signal. HV Lock capability is provided to allow the output to be locked to externally applied high resolution sync signals. When a non-broadcast output is selected, the Vertical Lock feature can be enabled to lock the output frame rate to the input frame rate or an externally supplied vertical sync. Vertical locking eliminates frame rate conversion problems that would otherwise result in motion artifacts or allows multiple units to have their outputs timed together.

### Memory Presets

ImagePRO has 64 independent memory presets. The memories save sizing, centering, detail, contrast, and brightness information.

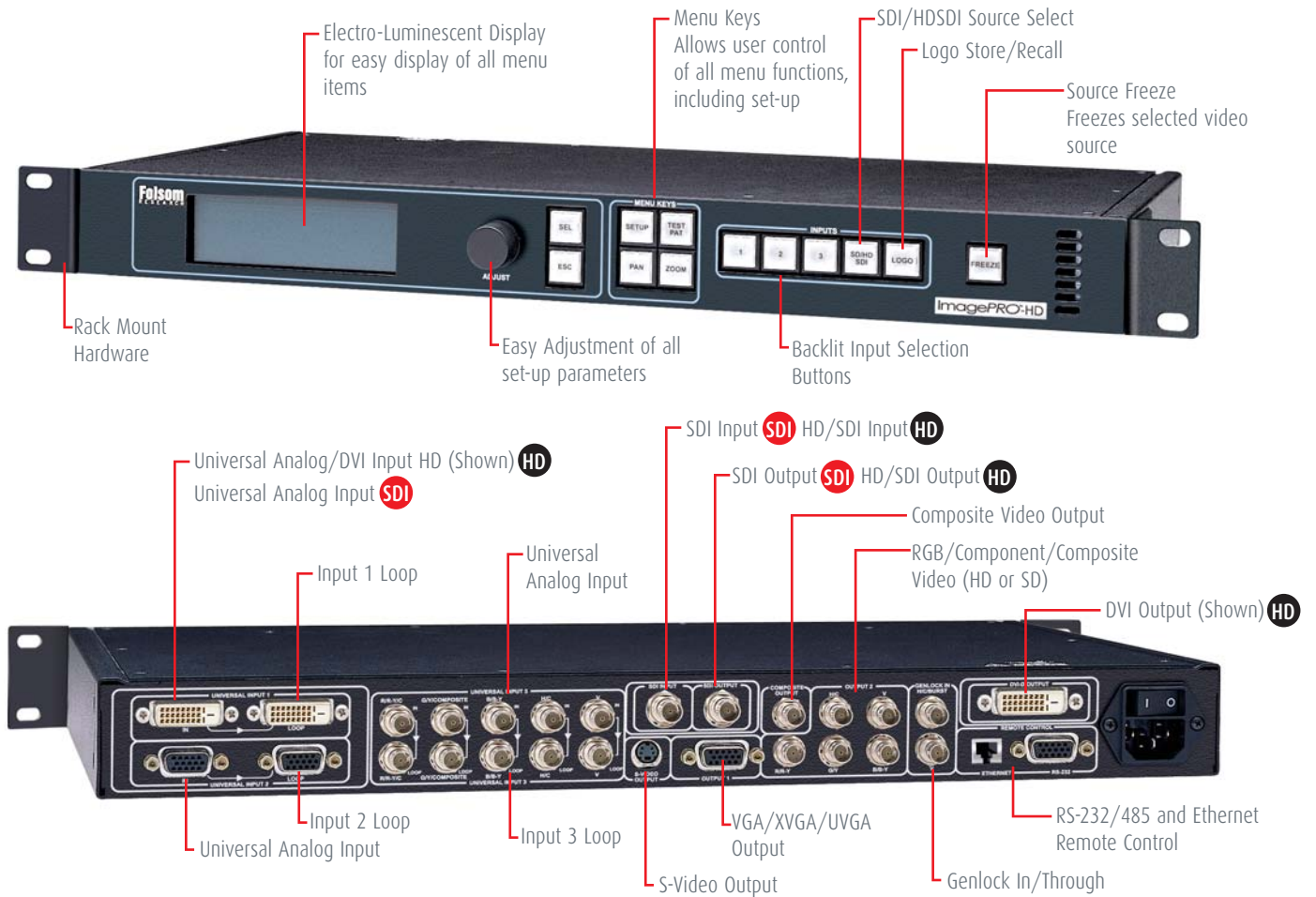
### Enhanced Digital Processing

10-Bit processing provides improved signal-to-noise ratio and preserves dynamic range to improve image fidelity. This is especially apparent in dark regions and areas of smooth, slightly varying tonal values.

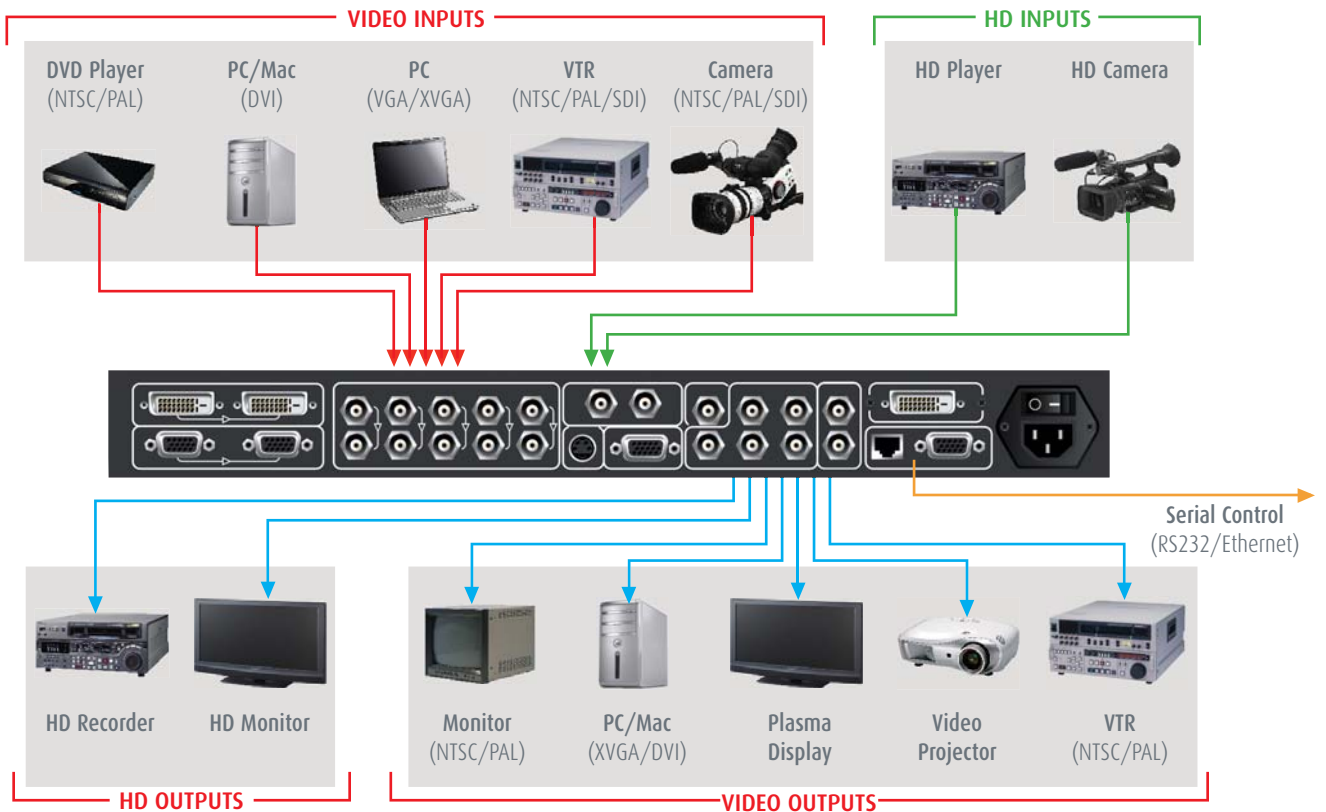
- Motion Adaptive and Field to Frame de-interlacing modes
- 3:2 pulldown detection for NTSC and 2:2 film detection for PAL video sources
- Decodes NTSC, PAL and SECAM
- Ethernet for real-time control
- Encodes NTSC and PAL
- Genlock, H/V Lock and VLock
- Executive mode: protects system configuration settings during use
- 64 independent memory presets
- Backed by three-year warranty

## The must have for your video toolbox

Features on this illustration are available on both ImagePRO models, unless noted as follows: **SDI** Available on ImagePRO-SDI **HD** Available on ImagePRO-HD  
Rear panel shown is the ImagePRO-HD model.



## ImagePRO-HD connectivity diagram



## Specifications

INPUTS	
Universal Analog Input Types	(3) high bandwidth video channels support RGBHV/RGBS/RGB computer video, component video (SD or HDTV), S-video, or Composite video
Universal Analog Input Connectors	Inputs 1 and 2 on HD-15 connectors and Input 3 on a five BNC connectors on ImagePRO-SDI. Input 1 on a DVI-I connector, Input 2 a HD-15 connector and Input 3 on a five BNC connectors on ImagePRO-HD. All inputs on both models are with buffered loop-throughs
Digital Serial Video Input (SDI)	(1) SDI input on ImagePRO-SDI model, or SDI/HDSDI input on ImagePRO-HD on a BNC
Digital Video (DVI) Input	(1) Input 1 on DVI-I connector supports both universal analog and DVI input with loop-through
Input Resolution Range	VGA (640x480), SVGA(800x600), XGA(1024x768), SXGA(1280x1204), UXGA(1600x1200), HDTV 480p, 720p, 1080p, 1080i, 875 RS-343, 525 RS-170
Standard Resolution Video Input	NTSC, PAL or SECAM
Horizontal Frequency	15 kHz to 120 kHz
Vertical Frequency	25 Hz to 120 Hz
Input Termination	75 Ohm
Input Sync	Sync-on-Video, Separate C or H/V
External Sync (Genlock) Input	Blackburst, Computer H/V Sync or C-sync, or tri-level at HD on a BNC
OUTPUTS	
	(1) RGB or component video (SD or HDTV) on HD-15
	(1) RGB or component video (SD or HDTV) or composite video on five BNC
	(1) Composite video on BNC
	(1) S-video on 4-pin mini-DIN connector
	(1) SD SDI on BNC on ImagePRO-SDI, or SD/HD SDI on ImagePRO-HD
	(1) DVI output on DVI-D connector on ImagePRO-HD model only
Standard resolution video output	NTSC, PAL
High resolution output supported	VGA (640x480), SVGA(800x600), XGA(1024x768), SXGA(1280x1204), UXGA(1600x1200) For Plasma Displays 1280x768, 1365x768, 1365x1024. HDTV 480p, 720p, 1080p, 1080i. 875 RS-343, 525 RS-170 User definable video output formats supported
Sync	RGBHV, RGBS, RGB, TTL level, Polarity selectable, HDTV Tri-level Sync supported
Output Impedance	75 ohm
OTHER	
Remote Control	Ethernet connection (with TCP/IP) or RS-232 serial port for real-time control
Physical	Height: 1.5"; Width: 17" (43.2 cm) or 19" (48.3 cm) with rack-mount option; Depth: 14"; Weight: 9lbs.; Shipping Weight: 13 lbs
Input Power	100-240 VAC, 47-63 Hz
Environmental	Temperature: 0-40 degrees C; Humidity: 0-95% noncondensing
Warranty	All video products are designed and tested to the highest quality standards and are backed by a full three-year parts and labor warranty.