grass valley

A THOMSON BRAND

product data sheet

Viper FilmStream Camera System

Uncompromised Digital Cinematography

Grass Valley™ products from Thomson offer the industry's most comprehensive set of multi-format, high-quality solutions for acquisition, production, and post production. Our focus is on creating the most varied and flexible range of tools possible for digital cinema acquisition and production professionals.

We have a tradition of creating groundbreaking film-imaging technologies for directors, cinematographers, and post-production professionals. Today, whether you're shooting in digital or film, our broad line of products lets you work in the medium that perfectly suits your requirements.

To that end, our Viper FilmStream™ Camera System has no equal. While other manufacturers may claim to offer digital cinematography cameras, the Viper FilmStream camera is the only one designed from the ground up to capture every detail you need for brilliant, uncompromised, uncompressed output.

With three 9.2 million pixel Frame Transfer CCDs capturing 1920x1080 resolution, the Viper FilmStream camera system delivers an RGB 4:4:4 10-bit log output—uncompromised by electronic camera signal processing—to a field recorder. There is no color sub-sampling, color-space conversion, irreversible video manipulation, or compression. In short, nothing is done to the image: what the lens sees is what the Viper FilmStream camera delivers. Every pixel is there in full resolution.

Part of the Grass Valley FilmStream workflow, the Viper FilmStream camera delivers its output directly into the post-production process for finishing.

True Digital Cinematography

The Viper FilmStream camera system gives you the freedom to create a look that matches your artistic vision—and the confidence that it will capture that vision faithfully and perfectly. Best of all, the camera delivers these capabilities without changing the way you work.

There is no need, for example, to delve into video processing menus to create a particular look, using settings which may limit your choices in post production. Simply set the aperture and focus as you would using a film camera and let the wide latitude of the Viper FilmStream camera capture all the details of the scene you've created, as you envisioned it.

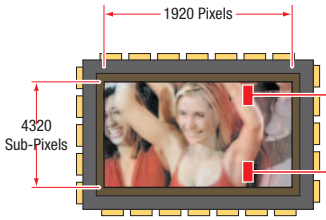
That's because the output of the Viper FilmStream Camera is not processed in any way: it is recorded as a stream of data in each of the three primary colors. This process

key features

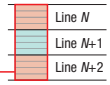
- 9.2 million pixel CCD sensor for each color channel
- Captures raw data directly from CCDs without video-style signal processing
- Unique 4:4:4 RGB dual link FilmStream output
- Native 16:9 or 2.37:1 aspect ratios without vertical resolution loss using Dynamic Pixel Management™ technology (HD-DPM)
- 12-bit linear A-D conversion, mapped to 10-bit logarithmic signals for downstream processing
- Patented Frame Transfer (FT) CCD technology
- Mechanical shutter guarantees no vertical smear
- Multiple format support:
  - —1080p @ 23.98, 24, 25, and 29.97 frames per second (fps)
  - —1080i @ 50 and 59.94 Hz
  - —720p @ 23.98, 24, 25, 29.97, 50, and 59.94 fps
- Electronic viewfinder focus assist tools: crawler and zoom
- Standard B4 lens mount for popular digital cinematography prime and zoom lenses
- Multiple field recording options:
  - —Solid-state, on-camera RAM recorder for cable-free operation
  - —High-capacity field recorder with exchangeable disk packs
  - —Third-party field recording support
- Full range of third-party accessories, including extension viewfinder tubes, matte boxes, filters, color viewfinders, additional power taps, Steadicam low/high mounts, and more

Dynamic Pixel Management

By grouping the 4320 vertical sub-pixels on the CCDs to map to the desired line rate, all popular video formats can be acquired without compromising image quality.

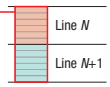


1080P



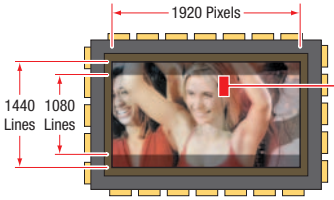
When four vertical sub-pixels are combined per scanning line, the total line count becomes 1080 lines (4320 / 4 = 1080). So, a 1920 x 1080 image is obtained with a 16:9 aspect ratio.

720P

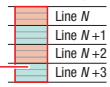


When six vertical sub-pixels are combined per scanning line, the total line count becomes 720 lines (4320 / 6 = 720). So, a 1920 x 720 image is obtained with a 16:9 aspect ratio.

The advantage of working with this lower line count is that higher frame rates can be used for creating slo-motion effects in post production.



Cinemascope-Style Aspect Ratio



When three vertical sub-pixels are combined per scanning line, the total line count becomes 1440 lines (4320 / 3 = 1440).

By using the center 1080 lines, a 2.37:1 aspect ratio is achieved without the need for anamorphic lenses while maintaining full 1920 x 1080 resolution.

ensures that every pixel is accurately rendered into the post-production process, giving colorists an uncompromised signal with which to work. There is no irreversible camera processing such as gamma, knee, contouring, white balance, or clipping. From this stream of digital data, the colorist, using a workstation such as the Grass Valley Specter Virtual DataCine, has a full-resolution image with which to work.

Like a professional 35 mm film camera, you focus the Viper FilmStream camera by measuring the camera-to-object distance and setting the lens. The camera offers both a “crawler” tool and an instantaneous 2x electronic viewfinder zoom to provide a quick and easy confirmation of focus without affecting the picture at the main output.

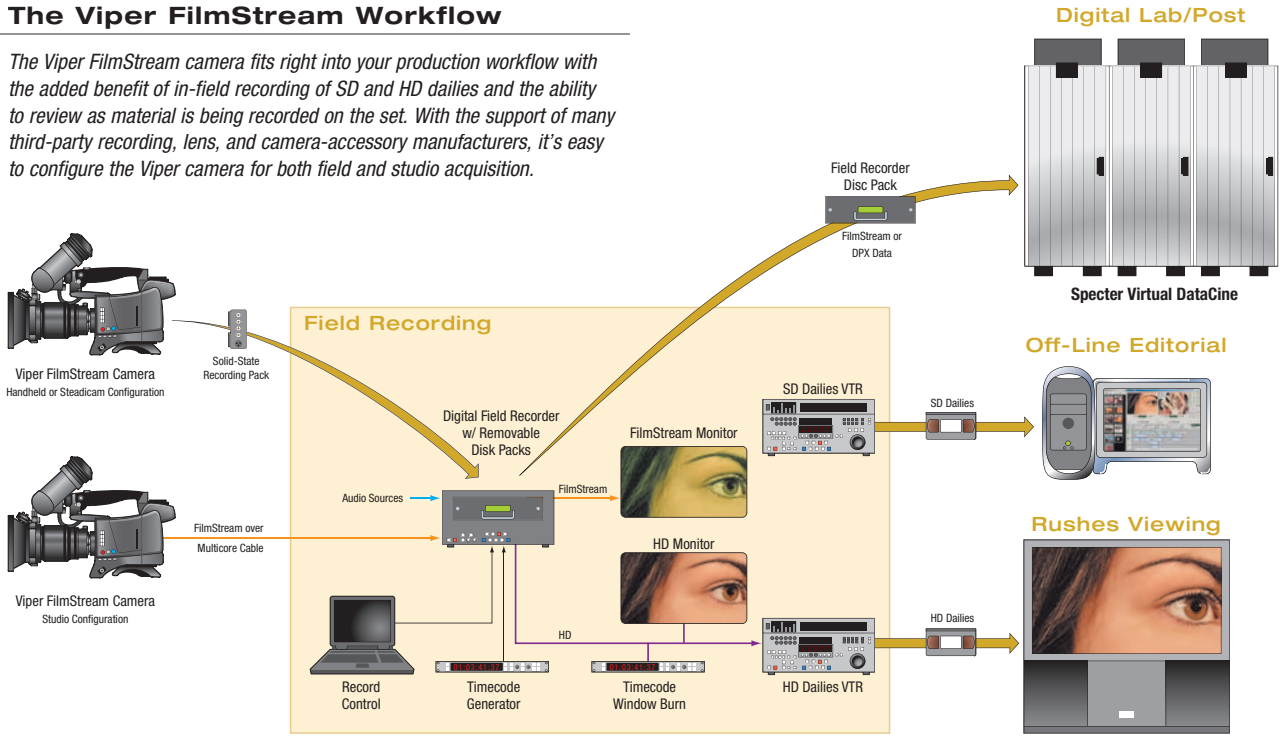
Providing a perfect complement for theatrical release motion pictures, the Viper FilmStream camera system supports the 2.37:1, Cinemascope-style aspect ratio without the need for anamorphic lenses. There is no need to crop the image and lose vertical resolution to get this aspect ratio. By using our unique HD-DPM sensor technology, the height of the individual pixel grouping can be changed, letting you switch the camera from 16:9 to 2.37:1, while maintaining full vertical resolution.

On the output side, the Viper FilmStream camera can record onto a field digital disk recorder. The camera supports a variety of third-party field-recording technologies. Removable disk packs are available in capacities up to more than an hour, providing far more recording time than a film magazine. This extended recording time makes for fewer reloads that interrupt the flow of shooting and make special-purpose shoots—such as those in helicopters or underwater—far more practical and efficient. For hand-held or tight shots, the compact and lightweight Viper FilmStream camera supports a third-party solid-state RAM recorder which clips onto the back of the camera for cable-free shooting.

In other words, with its small size and weight and its flexible recording modes, you can take a Viper FilmStream camera anywhere.

The Viper FilmStream Workflow

The Viper FilmStream camera fits right into your production workflow with the added benefit of in-field recording of SD and HD dailies and the ability to review as material is being recorded on the set. With the support of many third-party recording, lens, and camera-accessory manufacturers, it’s easy to configure the Viper camera for both field and studio acquisition.



Viper FilmStream Workflow

If you're used to shooting 16 mm or 35 mm film, your on-set workflow remains the same with a Viper FilmStream camera. That's because the camera is as convenient to set up as a film camera. And because it delivers uncompromised, wide-latitude output to post production, it has no equal in digital cinematography. It intercuts very well with 16 mm and 35 mm film, allowing you to get the shot the way you want in the medium most effective for your vision.

On set with the Viper FilmStream camera, a cinematographer uses his or her experience and skill to create the look as envisioned for that production. The camera captures that look: digitally and completely. The filmmakers can then look at its output—either instantly with an on-set monitor or via digital dailies—to ensure that every shot meets their exacting standards.

This scenario is far different from workflows based around high-definition (HD) HD cameras for digital cinematography. The biggest difference is that the RGB 4:4:4 10-bit log output of the Viper FilmStream camera is untouched by any video signal processing. By capturing exactly what the camera sees there is no risk of making irreparable changes to image quality that can tie a filmmaker's hands downstream. Work on set is also faster using a Viper FilmStream camera because it eliminates the interruptions and delays caused by engineers needing to make adjustments to an HD camera's video processing.

As in traditional film post production, the director and cinematographer have the chance to adjust the color balance of the Viper FilmStream camera's output in a timing session, but with instant and precise results: there is no waiting for answer prints to be struck. And with digital intermediate post becoming increasingly common, the Viper FilmStream camera system delivers right into the heart of the process, bypassing negative processing and film scanning.

Operational Modes

The Viper FilmStream camera can be operated in four different modes: a FilmStream 4:4:4 log output, which offers uncompressed, uncompromised, unprocessed output; a 4:4:4 RGB video output that adds video processing to create a full-bandwidth, full-resolution camera with color balance, colorimetry, gamma, highlight handling, and detail enhancement at the camera; an HDStream mode, which still benefits from the wide-latitude image capture, but provides an output as 4:2:2 HD, which is very similar to the FilmStream output, but with color balancing to true 3200° or 5600°; and a YUV mode, which offers superior image quality for fully processed HD productions.

In FilmStream mode, because there is no video signal processing, the output on a monitor appears flat and with a pronounced green cast. To view this output on set, the camera includes digital HD and analog standard-definition monitoring outputs. You can color correct these outputs using the color temperature switch on the camera, thus creating an appealing HD-image for the untrained eye. This correction has absolutely no effect on the FilmStream output, which remains unprocessed and uncompromised.

What the Professionals Are Saying

The Viper FilmStream camera system is already receiving critical acclaim among film professionals in Hollywood and around the world.

"From the first day of shooting 'Indoor Fireworks' until its premiere screening on 35mm film, the Viper FilmStream camera and its uncompressed images performed superbly. On set and in post production it handled very much like film. It was a joy to play with the wide dynamic range during our digital color timing session. From the deepest blacks to the brightest highlights, it was all there."
—Hans van Helden, producer and post-production supervisor

"I found my experiences shooting with Viper FilmStream camera to be an easy transition from shooting with traditional film cameras. I was impressed at how variable we could make its raw images appear. We could easily create the soft, low-contrast look of the kids, and moments later torque the fight images around to match the film."
—Bill Bennett, cinematographer

"The Viper FilmStream camera has proven to be the most advanced digital camera available. It is very capable of satisfying the rigorous requirements of blue- and green-screen photography. The output capabilities fit well into the film visual effects workflow, and Thomson is willing and eager to develop and improve this already very capable camera." *—David Stump ASC, visual effects supervisor and DoP*

"I thought the concept of making an uncompressed, unprocessed digital negative was promising, and when I saw the 35 mm print of Dave Stump's composite it looked excellent. The matting of the woman's blond hair and the glass of water were perfect. I was also impressed with the clever idea that allows 2.4:1 aspect ratio with no loss of quality without the need for anamorphic optics."
—Robert Primes ASC, cinematographer

"In the Viper FilmStream camera, we found a digital way to come as close as possible to the film look. Nothing comes as close as this uncompressed digital medium."
—Marc Felperlaan, cinematographer

On the set of Red Riding Hood *with cameraman Joe Di Gennaro, SOC and the very configurable Viper Filmstream camera*

Specifications

Power: 12V DC nominal (11.5 – 17V); ~44W (including 2" viewfinder and FilmStream adapter)

Weight: 4.3 kg including 2" viewfinder and FilmStream adapter

Overall dimensions: 197 x 117 x 349 mm (HxWxD)

Operating temperature: -20˚C to +40˚C

Storage temperature: -20˚C to +60˚C

Viewfinder resolution: 2" monochrome; >600 television lines (center)

Camera head: 3 x 2/3" HD-DPM 9.2 million pixel CCDs with no vertical smear; effective pixels 1920 x 4320; aspect ratio 16:9 (1.77:1) in 1080 and 720 line modes, or 2.37:1 in 1080p mode

Optical filters: f1.4 prism system; first filter wheel clear, 2-stop, 4-stop, 6-stop ND; second filter wheel clear, 4-point star, 6-point star, soft focus

Exposure: variable shutter 90˚ to 310˚; electronic exposure down to 1/500 sec

Digital quantization: 12-bit linear; digital signal processing >22 bits (not active in FilmStream mode)

Sensitivity: 2000 lux (186 ft. cd) at f9.0 (typical, 1080p24 video mode); effective ASA 320 in FilmStream mode

Gain: -3 dB to +12 dB in 3 dB steps in video modes; -6 dB to +12 dB in 6dB steps in the viewing channel only in FilmStream mode

Electronic color filters: RGB and YCrCb modes 3200K, 4700K, 5600K, 7200K, auto white; HDStream mode 3200K, 5600K, native (no correction); FilmStream mode viewing channel only 3200K, 4700K, 5600K, 7200K native (no correction)

Signal to noise ratio: 54 dB in Y channel typical in video modes

Connectors: Microphone input XLR-3 female, balanced, +48V phantom power; viewfinder 20-pin connector; lens 12-pin connector, RS-232 remote control

LDK 5490 FilmStream Adapter

Dual-Link HD-SDI: 2 x BNC SMPTE 372M, 0.8V, 75Ω, 1.5 Gb/s (FilmStream or 10-bit 4:4:4 RGB)

HD-SDI: BNC SMPTE 292M, 0.8V, 75Ω, 1.5 Gb/s

SD color viewing output: BNC analog 1.0V, 75Ω

Viewfinder: BNC analog 1.0V, 75Ω, Y component of viewfinder or external video

Power: Input XLR-4, 12V; output 4-pole Fischer, 12V @ 1.5A unregulated

Local control panel: 12-pole Hirose connector for dedicated local control panel

Multicore: 23 + 3-pole – record start, return video (SD) in, genlock, DC in, camera control, tally, viewing output, audio output, HD-SDI output, dual link HD-SDI output

Ordering Information

LDK 7500/00
Viper FilmStream Camera

LDK 5490/00
FilmStream adapter

LDK 5302/60
2" HDTV Viewfinder, 50/60 Hz

LDK 8175/01
Multicore HD cable, full function, 10 meters

LDK 8175/11
Multicore HD cable, standard, 10 meters

LDK 8175/04
Multicore HD cable, full function, 40 meters

LDK 8175/14
Multicore HD cable, standard, 40 meters

LDK 8275/01
HD multicore breakout box

Customer Service Commitment

The Thomson Broadcast & Media Solutions Service Team delivers complete service solutions that enhance our line of Grass Valley products. Let our experienced professional staff help you build a state-of-the art network and deliver the best content possible for your advertisers and viewers.

Our suite of SupportPRO Services provides support throughout the product life cycles:

- Networking and consulting services
- StartPRO and on-site support
- Preventative maintenance packages
- Training and educational programs
- Technical support services and centers
- Parts, kits and repair services
- Support agreement
  - TechPRO all-inclusive package with software, hardware and on-site support coverage
  - ServicePRO semi-inclusive with software and part coverage
  - PartsPRO with advance exchange of parts only
- Software and documentation

For more information contact Service Sales in your region or visit us online at www.thomsongrassvalley.com/support.

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