ARRILASER

The Industry Standard in Film Recording

ARRILASER

The ARRILASER is the only film recorder to use laser technology. With this technology it has set industry standards in image quality, productivity and reliability, and has significantly reduced the cost of recording digital images onto film. It has even been recognized and honored by the Academy of Motion Picture Arts and Sciences (A.M.P.A.S) with a Technical Achievement Award in 2002.

From the time of its first introduction, the ARRILASER has had the ability to record in true 4K resolution and has continually adhered to the latest standards, such as DCI (Digital Cinema Initiative) specifications. The original Standard ARRILASER is now just one in a range of five different versions that meets the requirements of various postproduction business models.

The ARRILASER HD/DI represents an entry level system for emerging markets and start-up companies, while the ARRILASER Speed Performance and Speed twoK are mid-range options. At the top of the range are the ARRILASER High-Speed twoK and HighSpeed Performance models - the ultimate choice for clients who cannot compromise on speed of operation or image resolution.

2002

Scientific and Engineering Award (Academy of Motion Picture Arts and Sciences) for the design and development of the ARRILASER Film Recorder.

THE INDUSTRY STANDARD IN FILM RECORDING

ARRILASER Models

	HD/DI	Speed twoK	Speed Performance	HighSpeed twoK	HighSpeed Performance
Speed specification	Sec/frame	Sec/frame	Sec/frame	Sec/frame	Sec/frame
HD	3.4	1,9	1,9	approx. 1.0	approx. 1.0
2K 1:1.85	3.2	1,7	1,7		
2K Fullap	4.1	2,2	2,2		
4K 1:1.85	—	—	2,9	—	approx. 1.5
4K fullap	—	—	3,8		
Intermediate film stock	●	●	●	●	●
Camera negative stock	Optional	Optional	Optional	Optional	Optional
Resolution 2K	●	●	●	●	●
Resolution 4K	—	—	●	—	●
On-the-fly image processing	●	●	●	●	●
ARRICUBE color management	Optional	Optional	Optional	Optional	Optional
Optional module	HD, Native Academy, 3-Perforation				

The ARRILASER is designed as a modular system, so each model is fully upgradeable.
Please refer to the upgrade matrix at the end of this brochure.

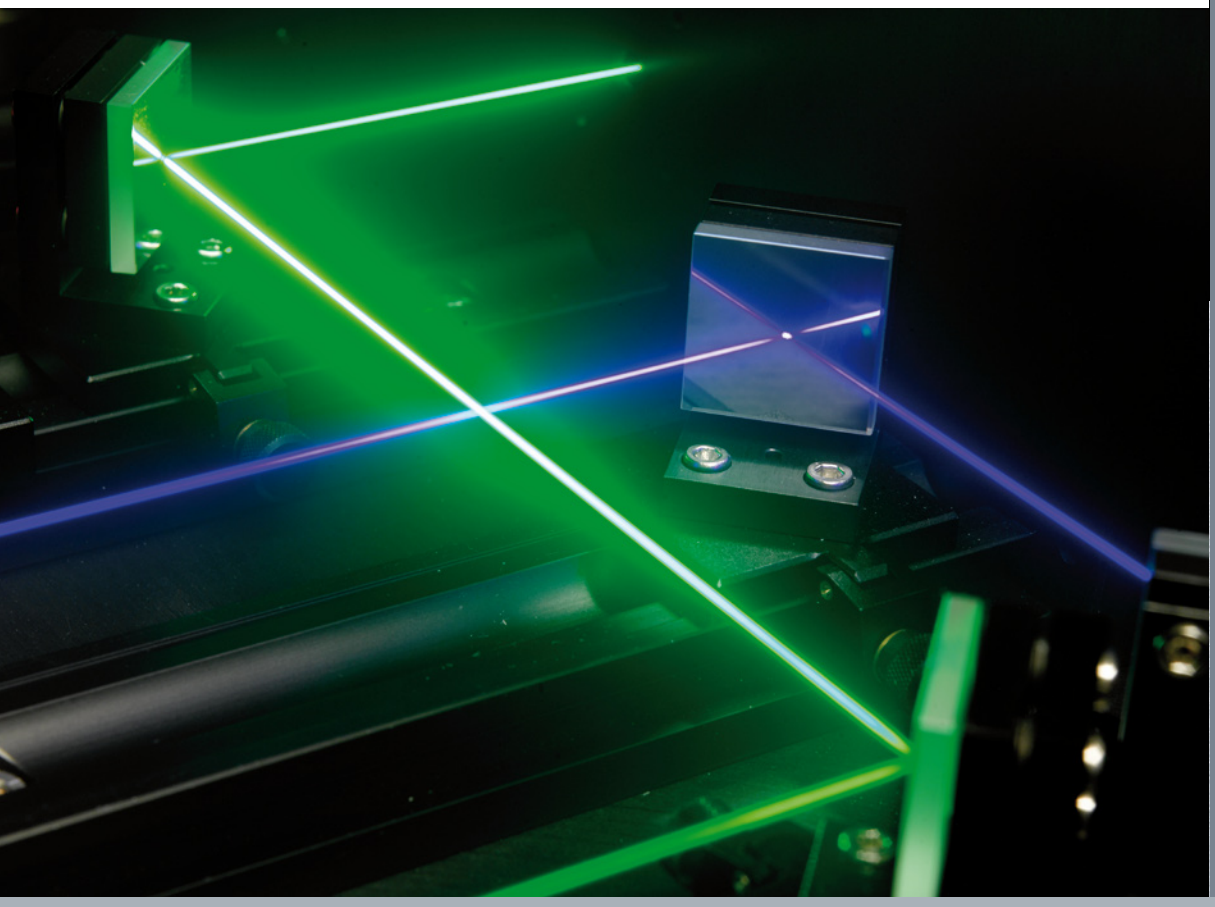
Laser Light Source

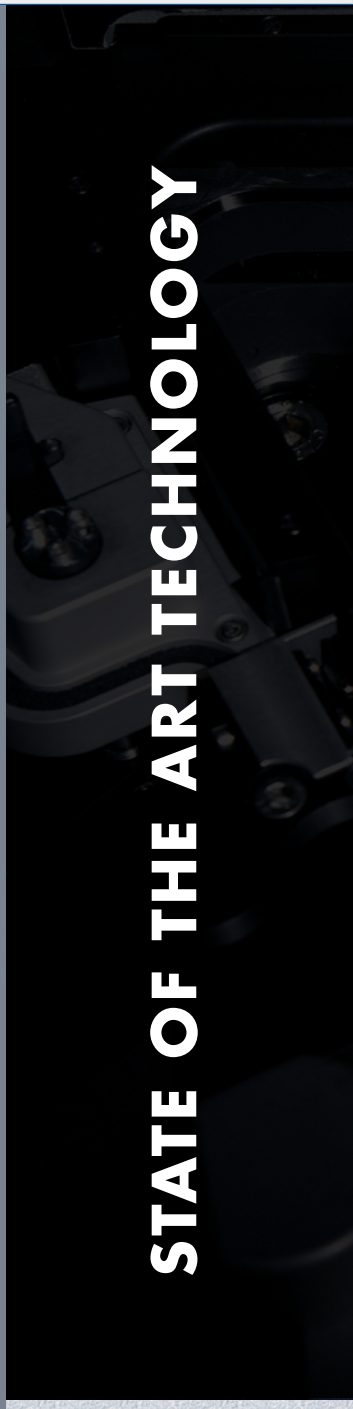
Three solid state lasers are used in the ARRILASER, producing monochromatic light beams in the colors red, green and blue. With a perfect Gaussian shape, very long life expectancy and minimal size as well as power consumption, they are the key to the ARRILASER's unrivalled image quality.

The data for each color channel and pixel is fed to an Acousto-optical Modulator (AOM) as a light intensity value, according to which the beam intensity is controlled. The AOM translates the digital data of each pixel into beam intensity in less than 17 nanoseconds.

Deflection System

Moving parts on the ARRILASER are designed to sustain a minimum of wear. A new aerostatic bearing motor, which encounters no mechanical friction during operation, is used to achieve the speed required for the deflection of the beam. Line by line is written on film in an ultra precision linear stage. A linear induction motor moves the stage through direct magnetic induction without any additional moving parts such as gears.





STATE OF THE ART TECHNOLOGY

Camera and Film Transport

The increased CPU capacity of the new ARRILASER camera electronics enables more sophisticated control of motors in the camera and magazines. In addition, the display and the camera buttons now offer expanded and improved features.

Control of the ARRILASER using the display and the camera buttons has been simplified to allow more intuitive camera operation and film loading. The two camera buttons now function as soft keys and can be used to make all necessary setup entries. At every stage the display indicates exactly what will be achieved by pressing either of the buttons.

The operator can now specify what film type/emulsion has been loaded into the feed magazine. With these parameters in place, the ARRILASER is able to calculate the amount of remaining negative in the magazines and display these quantities in either feet or meters. This gives the operator an accurate idea of the remaining film stock in the feed magazine and therefore minimizes film wastage.


ARRI
ARRI

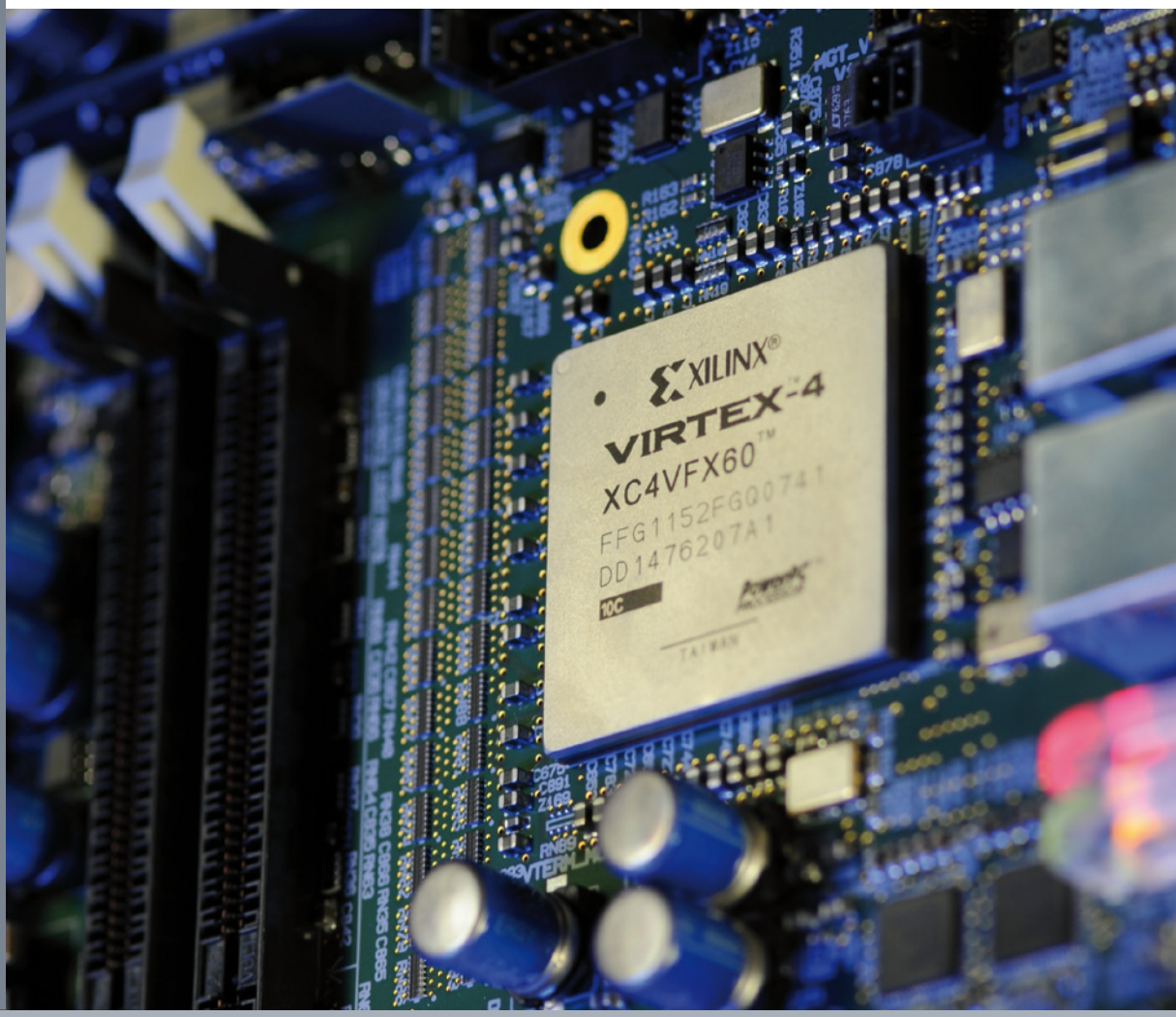
HIGH PERFORMANCE

TOP LEVEL DESIGN

Internal Electronics and Processing

Newly designed electronics now allow the bit depth of the internal processing to be raised from 10-bit to 16-bit, thereby rendering additional bit depth conversion unnecessary. This enables the processing of all 16-bit image data without any compression, from the file loader all the way down the data path to the D/A converter (digital-to-analog converter).

The implementation of commonly-used FPGAs (field-programmable gate arrays) on the electronics board results in improved data handling and eliminates image transfer errors. In combination with the CAN bus protocol, this speeds up both internal communication and processing, while also making the system safer.



ARRILASER Software

The new ARRILASER Trillian interface, which replaces the current AL GUI, offers unprecedented flexibility of operation and is itself capable of speeding up daily operations. Trillian's main advantage is its ability to control and operate multiple lasers with the ease of just one application.

Job Editor

A single, centralized job database allows multiple reel recording with just one click and greatly simplifies both job and calibration management. The new job editor allows easier access to recording jobs and also permits greater control of all image processing options.

Image Courtesy of EFilm Hollywood

ImageBooster

The existing ARRILASER Image Processing Engine is being replaced by the new ARRILASER ImageBooster software that is also used in the ARRISCAN film scanner and ARRIFLEX D-21 camera. The ImageBooster utilizes not only the Host PC's CPU (Computer Processing Unit), but also – in line with the latest developments – permits rendering to be carried out entirely with the GPU (Graphics Processing Unit).

Real-Time Image Viewer

A new image viewer with A/B comparison fully visualizes the image manipulation to avoid any unpleasant surprises after a recording has finished. With the new GPU-based rendering, all image manipulations made by the ARRILASER ImageBooster can be played back in real-time.

Status Monitor

New software modules such as the Status Monitor allow everyone involved to have a constant overview of the progress of each individual recorder. There is no need to install any software to access the Status Monitor as it is simply an HTML broadcast and therefore runs on any internet browser that has access to the company's network.

Additional Options

ARRICUBE for Videolook – *ARRILASER Color Management*
ARRILASER Color Management offers the option to perfectly match all colors of the film projection with the colors of a video monitor as part of the ARRILASER image processing workflow.

Camera Negative Module – *Recording onto Camera Negative Material*
The camera negative option enables the ARRILASER to shoot onto camera negative film stock. Please see the ARRILASER technical specification sheet for details of supported film stocks.

HD Module – *Recording of 1920 Pixel per Line*
This software plug-in allows the recording of native 1920 pixels per line (HD Format) across the full aperture or Academy area without any rescaling.

Native Academy Module – *Recording of Full Aperture Images*
This software plug-in allows the recording of native full aperture images (2048 or 4096 pixels per line) across the Academy area without any rescaling.

3-Perforation Module – *Recording of 3-perf Material*
This allows the ARRILASER to generate a 3-perf negative with image frames that are three perforations high.

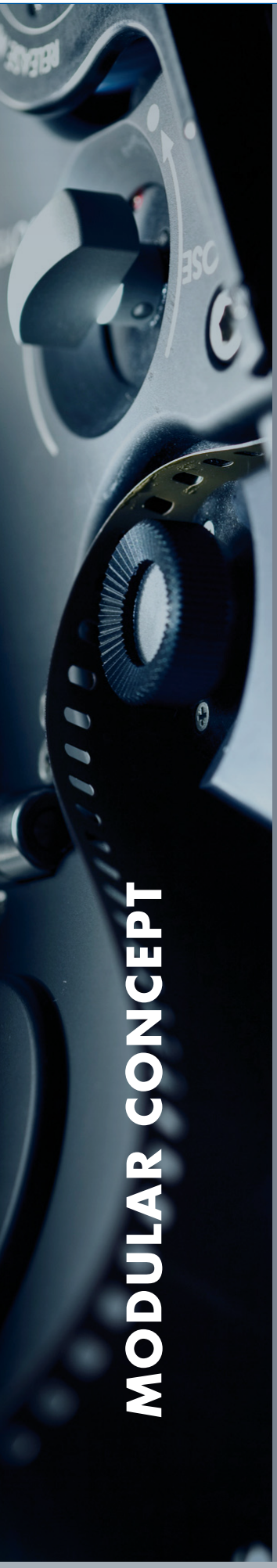
ARRILASER Aquamat – *ARRILASER Quality Control*
The ARRILASER Aquamat is an automated image analysis system for 35 mm film. It is a portable device that measures ARRILASER image quality (geometry, photometry, MTF, flare, signal-to-noise gamma and shading), and recalculates compensation parameters. A statistic function allows it to monitor performance over time.

Aquamat Lab – *Film Printer Quality Control*
The Aquamat Lab is an automated film printer analysis system for 35 mm film. It is a portable device that measures field uniformity, image sharpness, format and anamorphic distortion, and delivers results directly to the user. Measurements may be extracted from film printers (contact and optical) at each step in the printing process.

Technical Data

Dynamic range	2.046 status M density above D_{min} on intermediate film stock	
MTF	40 % @ 40 lp/mm horizontal and vertical	
Film transport	2000' magazines, supply and take-up separate	
Shuttle mode	10 frames per second	
Supported filmstocks	Kodak Vision Color Intermediate Film 5242/2242; Fuji ETERNA-RDI 8511/4511; EASTMAN Fine Grain Duplicating Panchromatic Negative Film 5234/5366; Separation Material 2238 optional: Kodak Vision 2 100; Kodak Vision 2 50D 5201; Fuji 64D 8522; Fuji ETERNA Vivid 160 8543	
Host computer	Linux Redhat distribution with graphical user interface and machine and job database	
Network interface	Gigabit Ethernet, others upon request	
Physical dimensions	size weight	115 x 115 x 65 cm approx. 285 kg
Electrical requirements	operating voltage power consumption frequency	100–120 V/200–240 V < 1 KW incl. host computer 50 Hz /60 Hz
Operating environment	room temperature rel. humidity	19–24° Celsius 20–75 % non condensing
Warranty	12 months all inclusive Laser product Class 1 according to IEC825-1 and EN 60825-1:1997 Class 1 Laser product conforms to 21 CFR 1040.10 6 1040.11, FDA Accession Number 9911131	

Technical data are subject to change without notice.

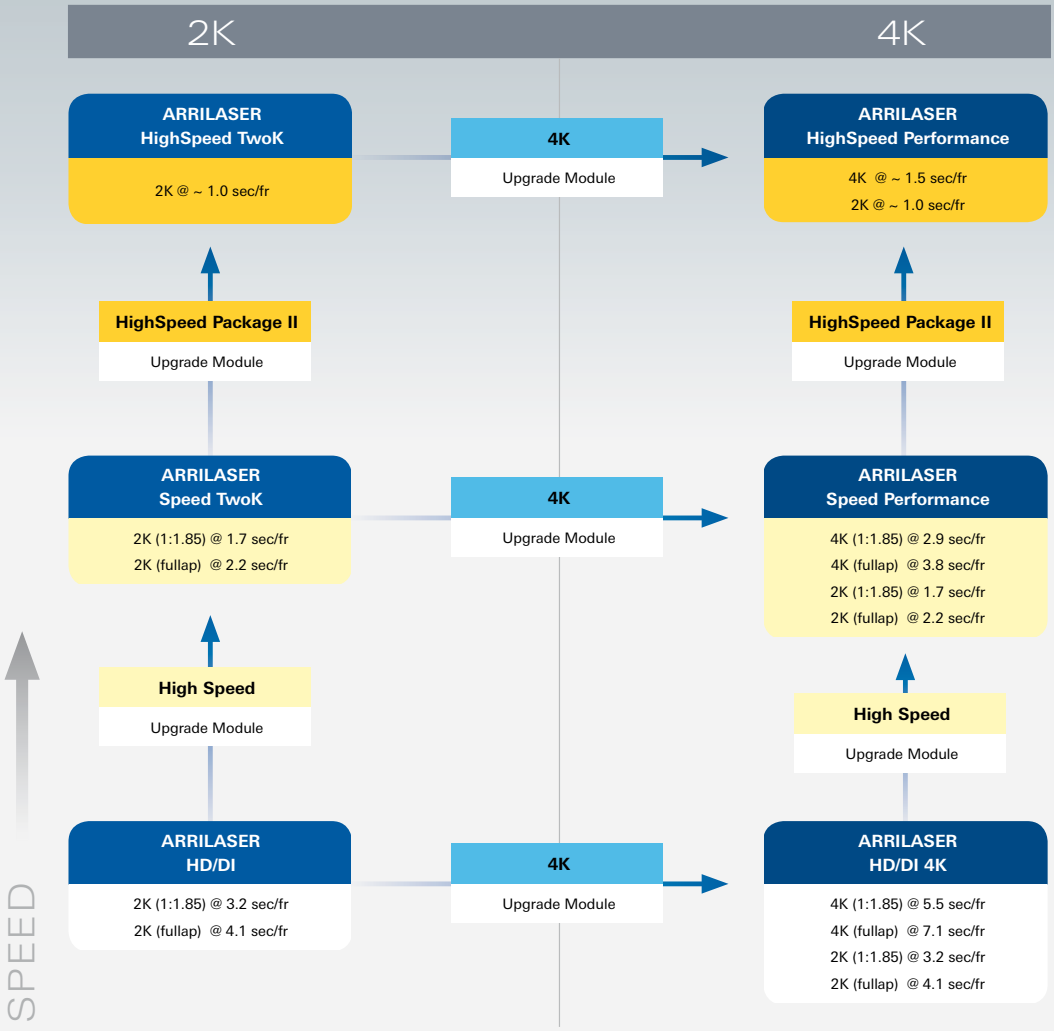


MODULAR CONCEPT

Upgrade any Model

The ARRILASER is designed as a fully modular system and each model in the range is fully upgradeable. This protects the investment made by ARRILASER customers by ensuring that they can change and update their film recorders as and when the focus of their business shifts.

All models come with the same renowned image quality, performance and reliability. They are separated only by recording speeds and maximum image resolution. All models are also fully compatible with any of the additional options.



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