Pocket Guide

AMIRA

Table of Contents

Overview

The AMIRA Camera – An Overview

ARRI's ALEXA Pocket Guide became a very popular tool on set, so we decided to accompany AMIRA with a Pocket Guide in the same way. This guide contains preproduction and production information for an AMIRA shoot.

Quick information on:
- What is new with the AMIRA?
- What is different from an ALEXA setup?
- How does AMIRA's color pipeline work?

We try to answer all those questions in here. Combining this guide with the AMIRA Camera Simulator or our other resources will make you "set ready" with AMIRA.

AMIRA is a versatile documentary-style camera that combines exceptional image quality and affordable CFast 2.0 workflows with an ergonomic design optimized for single-operator use and extended shoulder-mounted operation. Ready to pick up and shoot straight out of the camera bag, AMIRA is hardy enough to take anywhere and features in-camera grading, pre-loaded 3D LUTs and 200 fps slow motion.

AMIRA **AMIRA ADVANCED** **AMIRA PREMIUM**

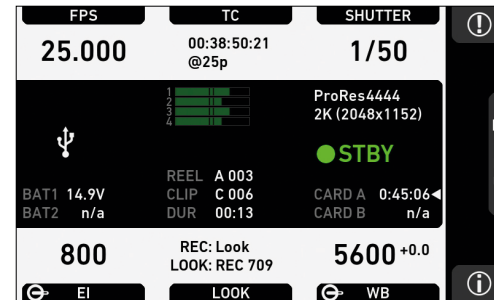# Displays & Information

MVF-1, electronic viewfinder and rotatable LCD display for menu and live image

AMIRA home screen

The home screen is AMIRA's main control display. It provides quick access to all image relevant parameters, status information and access to the menu. Depending on the LCD screen's rotation there's a left or a right orientation.
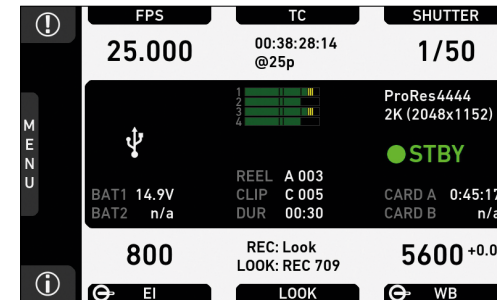
AMIRA home screen in "left-orientation"

Finding your way around the camera

View finder and LCD
menu control and viewfinder in one unit

Antennas
for Bluetooth and wifi

Switches
ND filter dial (front) as well as
EI, WB and User switches

Power, lock and user buttons
eight assignable user buttons

Audio menu
monitoring, setup and leveling

Card slots
USB and Ethernet connectors

Connectors
SDI, Power, Sync and Timecode

Audio I/O
XLR inputs & control, headphone out

New features in SUP 1.1

This first „big" firmware update for AMIRA brings a variety of useful functions and technical improvements:

Of this list, one feature is already known from our ALEXA camera: the pre-record function. AMIRA features up to 20 seconds pre-buffered recording at HD resolution (25fps/ProRes 422 HQ) or 4.9 seconds at 100fps sensor speed.
An other feature comes in handy when you're shooting documentary style and have to deal with multiple lighting situations: dynamic auto tracking white balance. This mode constantly monitors the over-all white balance and introduces slight adjustments if the color temperature changes within the scene.

Feature Overview

- EF and B4 lens – support for a even wider range of lenses
- Wifi remote – to control AMIRA'S basic functionality and menu settings via Wifi.
- Bluetooth audio monitoring
- Dynamic auto tracking white balance – this mode constantly monitors the over-all white balance and introduces slight adjustments if the color temperature changes within the scene.
- Pre-record function – cycles up to 20 seconds prior to pushing the REC button at HD resolution (25fps/ProRes 422 HQ) or 4.9 seconds at 100fps sensor speed.
- Faster boot-up time
- Color bars

- Waveform display
- Enhanced HD-SDI outputs – status overlays on SDI
- LDS functionality – tracking lens meta data for use in postproduction
- Image quality improvements – thanks to a new de-bayer algorithm
- Temporary licenses

For more information on the new features in SUP 1.1 and changes please have a look at our release notes which can be found at www.arri.de/camera/amira/downloads.

Working with AMIRA

Software Versions and Hardware Configuration

An AMIRA can be ordered in a basic, advanced or premium version, each providing a different level of camera features. In addition to the software, the customer can select from different, exchangeable hardware components to configure lens mount, battery mount and bottom plate. Whichever AMIRA camera set you purchase, it can be upgraded with additional functionality by buying an appropriate license at the ARRI website.

AMIRA CAMERA set

Features include: HD 1080i and 1080p; 0.75-100 fps; ProRes 422 and 422 (LT) recording in Rec 709; three looks; adjustable in-camera image parameters for knee, gamma and saturation; peaking for focus control; zebra and false color for exposure control.

AMIRA ADVANCED

Features additional to the economical AMIRA set: 100-200 fps; ProRes 422 (HQ) recording; Log C; unlimited look functions; import looks; ASC CDL in-camera grading; dynamic auto-tracking white balance; WiFi remote control; Bluetooth audio monitoring; pre-record function.

AMIRA PREMIUM

Features additional to the AMIRA Advanced: 2K (2048 x 1152) and ProRes 4444 recording; import custom 3D LUTs.

AMIRA License Shop

AMIRA customers can choose from a wide range of feature and accessory options to build their ideal package. Flexibility is the key: You can adapt an AMIRA to best fit your requirements with

- Temporary license upgrades
- Permanent license upgrades

Enabling either to go from

- Basic to advanced
- Basic to premium
- Advanced to premium

If a particular project requires a feature that is not available on your camera version, you can purchase a **temporary license (good for one week)** through the ARRI License Shop at https://alshop.arri.de. You can also temporarily down-grade a camera, by removing a certain license and re-installing it after the job is done.

AMIRA – ALEXA, the key differences

	AMIRA Premium	ALEXA XT Plus
Sensor type	35 format ARRI ALEV III CMOS	35 format ARRI ALEV III CMOS
Dynamic range	14+ stops	14+ stops
Sensitivity range	160-3200 ASA, base sensitivity 800 ASA	160-3200 ASA, base sensitivity 800 ASA
Behind the lens filters	Built-in sliding FSND filters with a density of 0.6, 1.2 and 2.1	User exchangeable FSND filter set, eight densities available
Frame rate range	0.75-200 fps	0.75-120 fps
Sensor Aspect	16:9	16:9, 4:3
ARRIRAW recording	Not available	ARRIRAW 16:9 (2880x1620) ARRIRAW 4:3 Full (2880x2160) and Crop (2578x2160) ARRIRAW Open Gate (3414x2198)
ProRes recording	16:9 HD (1920x1080) progressive & interlaced 16:9 2K (2048x1152)	16:9 HD (1920x1080) 16:9 2K (2048x1152) 4:3 2K (2048x1536)
ProRes codecs	ProRes 422, ProRes422 HQ, ProRes 4444	ProRes 422, ProRes422 HQ, ProRes 4444, ProRes 4444 XQ
Recording media	CFast 2.0 memory cards	SxS PRO, SxS PRO+, CFast 2.0 memory cards (using an adapter) and XR Capture Drive
Internal filters	Motorized filter mechanism holding three densities Full Spectrum Neutral Density filters (ND 0.6, 1.2 and 2.1)	Filter holder within the PL mount; eight different Full Spectrum Neutral Density filters available

	AMIRA Premium	ALEXA XT Plus
Lens mounts	PL LDS, EF and B4 mount available	PL-LDS mount
Lens motor support	With external lens motor controller like UMC-3, UMC-4,…	Built-in 3-axis lens motor support with ARRI accessories
Inputs	Genlock, HD-SDI, Timecode (In and Output), all BNC	HD-SDI Return-In, Timecode (In and Output) Lemo 5pin
Audio Inputs	1x XLR 5 pin, 2x XLR 3 pin; analog and digital signal supported; mic or line level and phantom power. 4 audio recording channels	1x XLR 5 pin analog
Outputs	2x HD-SDI 1,5G & 3G	2x HD-SDI 1,5G & 3G
Audio outputs	3,5mm headphone jack, Bluetooth audio	3,5mm headphone jack
Power outputs	Hirose 12pin (for ENG type zoom lenses); 12V: D-tab, Hirose 4pin, Lemo 2pin; 24V: RS 3pin	12VLemo 2pin and 24V: RS 3pin
Other Interfaces	USB 2.0 (for usersets, Looks etc.), Ethernet	Ethernet, LCS, LDD, EXT-Sync
Exposure control	Aperture and color Peaking, Zebra, False color	False color
Look management	AMIRA Look File: adjustable CDL (Color Decision List) parameters, adjustable Video Look Parameters (Knee, Gamma,…) and Custom 3D-LUT support	ARRI Look File (similar to CDL, 1D-LUT)
User buttons	4 (8, via shift button) buttons and one user switch	3 (6, assistant's side/menu only) buttons

ProRes recording

The AMIRA camera records HD (1920x1080) or 2K (2048x1152, requires Premium license) clips as QuickTime ProRes files. Clips are recorded internally onto CFast 2.0 cards (CompactFlash ATA Serial Transfer Standard 2.0, issued 2012), which are available in 64 GB and 128 GB capacity, offering 43 and 87 minutes of recording time (1080/25p ProRes 422 (HQ).

In addition to the ALEXA's recording capabilities covering the basic timecode standards (23.976p, 24p, 25p, 29.97p and 30p) in progressive scan, AMIRA is capable of recording high frame rate progressive scan standards such as 48p, 50p and 60p and the interlaced modes 50i, 59.94i and 60i.

ProRes 2K image aperture

When the ProRes recording resolution is switched from HD to 2K, the captured aperture changes from 2880 pixels / 23.76 mm / 0.935" width to 2868 pixels / 23.66 mm / 0.932" width. This allows the use of an optimized in-camera downscaler and provides the best possible 2K image output.

For more information on using ProRes 2K in different applications, please take a look at the "ProRes 2K in Editorial" white paper on ALEXA, available at www.arri.com/alexa/downloads.

Format	Sensor Mode	Resolution	Color Coding	Data Rate[1]	Data Volume[1]	Speed Range[3]
ProRes 422 (LT)	16:9 HD	1920 x 1080	10 bit YCbCr	78 Mbit/s	40 GB/h	0.75 – 200 fps
	16:9 2K	2048 x 1152	10 bit YCbCr	88 Mbit/s	45 GB/h	0.75 – 200 fps
ProRes 422	16:9 HD	1920 x 1080	10 bit YCbCr	111 Mbit/s	57 GB/h	0.75 – 200 fps
	16:9 2K	2048 x 1152	10 bit YCbCr	127 Mbit/s	65 GB/h	0.75 – 200 fps
ProRes 422 (HQ)	16:9 HD	1920 x 1080	10 bit YCbCr	167 Mbit/s	85 GB/h	0.75 – 200 fps
	16:9 2K	2048 x 1152	10 bit YCbCr	190 Mbit/s	90 GB/h	0.75 – 200 fps
ProRes 4444[2]	16:9 HD	1920 x 1080	12 bit RGB	251 Mbit/s	128 GB/h	0.75 – 200 fps
	16:9 2K	2048 x 1152	12 bit RGB	285 Mbit/s	146 GB/h	0.75 – 200 fps

[1] At Project Speed 24fps; ProRes is a variable bit rate codec. The actual data rate varies with the image content.
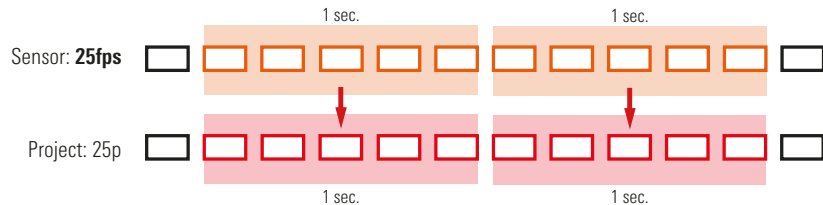[2] ProRes 4444 provides an alpha channel, which is not used by the AMIRA.
[3] All speeds adjustable with 1/1000 fps precision.

Project rate and timecode base

When you configure the AMIRA for a shoot, it is crucial to define the project rate/speed before starting the project. The project rate defines the timecode base and the playback speed.
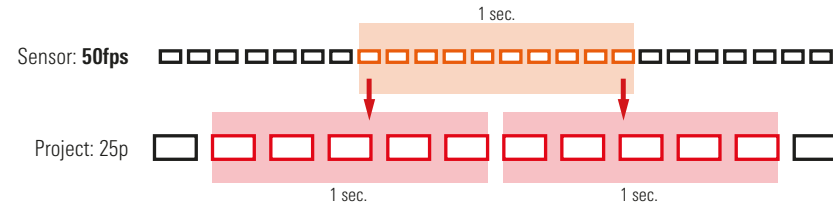
Shooting slow or fast motion will result in more or less frames inside the QuickTime file, but playback will be based on the project rate.

Slow Motion

Sensor: **50fps**

Project: 25p

1 sec.

1 sec.   1 sec.

50fps/25p (runtime = 2x realtime)

Normal Speed

Sensor: **25fps**

1 sec.   1 sec.

Project: 25p

1 sec.   1 sec.

25fps/25p (runtime = realtime)

Fast Motion

Sensor: **10fps**

1 sec.   1 sec.   1 sec.

Project: 25p

1 sec.
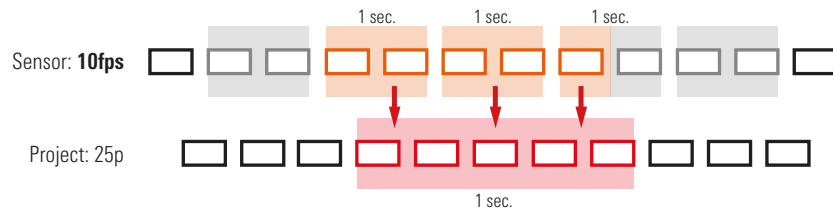
10fps/25p (runtime = 0.4x realtime)

18

19

Project rate and timecode base cont.

AMIRA can be set to the interlaced project rates 50i, 59.94i and 60i. In interlaced capture, only odd or even lines of a full frame are stored as so called upper or lower fields (in alternating manner). This principle bases on the afterglow of CRT phosphors and the characteristics of human vision, which results in two fields being perceived as a continuous image once the frequency is high enough. Due to the higher frequency of the fields, this scanning method provides a smooth motion representation.

Fast horizontal movement or quick pans, however, cause jagged vertical edges in the image, as the two fields composing a frame are captured one after another. This reduces the quality of keying or masking in postproduction and requires that the material is de-interlaced (field are interpolated to frames).


50 fps/50i (runtime = realtime)
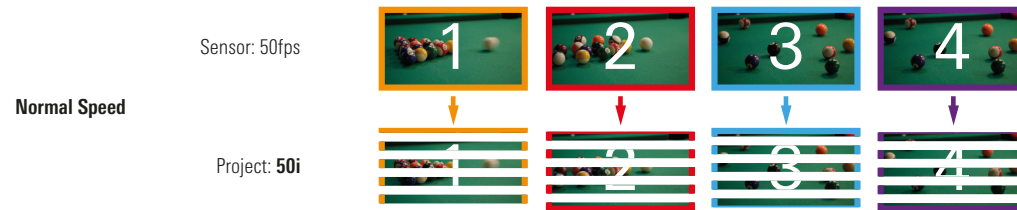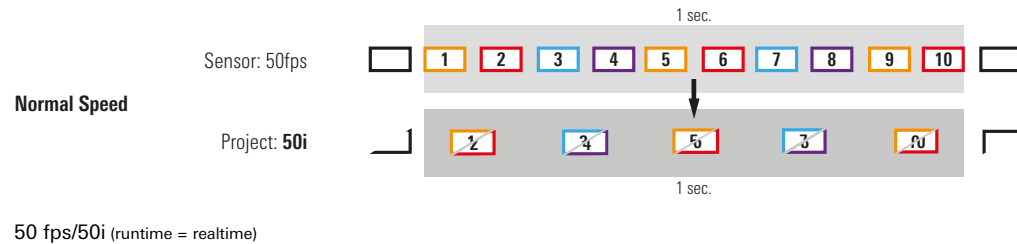
For interlaced recording, the even lines of image 1 are combined with odd lines of image 2.
The datarate is 50% of a 50 fps progressive signal (runtime = realtime).

p and psf

The SDI outputs of AMIRA can be set to interlaced (i), progressive (p) or progressive segmented frames (psf) output. The AMIRA sensor always captures progressive (full) frames. In psf mode each frame is split into two-line fields or segments, similar to interlaced mode. The two fields, however, originate from the same exposure in psf mode, whereas in interlaced mode they are created from two sequential exposures. The motion representation

and resolution of psf material therefore is exactly the same as in progressive scan material. The psf output enables compatibility to devices that only accept interlaced signals for certain frame rates. It has no influence on the internal recording.

Sensor: 25fps

Normal Speed

SDI Output: **25psf**

25 fps at 25psf output (runtime = realtime)
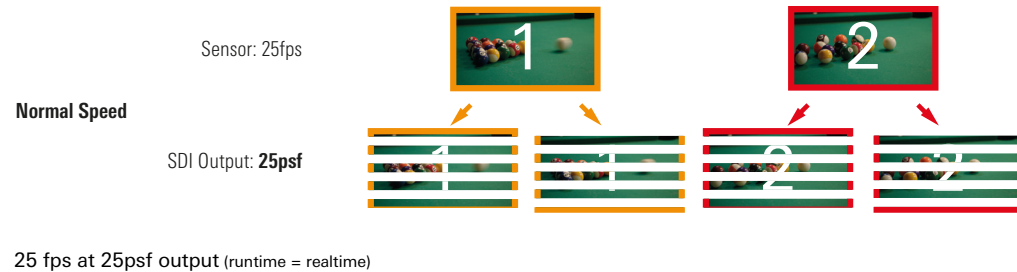
Color spaces

AMIRA records either to "Log C wide gamut" or the standard "Video/Rec 709" space. With AMIRA we have added a lot of options to tweak the image via custom 3D LUTs, Video Look Parameters or ASC Color Decision Lists. You can read about look management in detail . This chapter gives a basic introduction to Log C and Rec 709.

Video - Rec 709
"Rec 709" is short for the International Telecommunication Union's ITU-R Recommendation BT.709 - the output format for a traditional television workflow. Since the Video - Rec 709 encoding from an AMIRA follows this standard for displaying images on video monitors, AMIRA's Rec 709 images can be displayed directly on monitors or used for

editing and dailies review. Without the need for color space conversion, AMIRA Rec 709 images can be processed by HD video postproduction gear in real time. While providing somewhat reduced choices in color grading, Rec 709 maintains AMIRA's wide exposure latitude, cinematic look and natural color rendition, and offers the fastest workflow for any HD video-based infrastructure.

Due to improvements in color rendition from ALEXA to AMIRA, we've brought ALEXA's look to AMIRA as a selectable AMIRA look file with the Rec 709 LUT implemented. Users will benefit from the exact match when using this look in AMIRA in projects which are shooting AMIRA and ALEXA side by side.

Color comparison: split image Rec 709/Log C

Log C

The "C" in Log C derives from "Cineon", which was the digital film scanning, processing and recording system developed by Kodak in the 90s. It is also the name of a file format that contains density data from scanned negative film. Density is a logarithmic measure of the opacity of the film. The relation of the density to the film's exposure is called the characteristic curve of the film. Each stock has its own characteristic curve, but the overall shape is always the same.

ARRI introduced scene-based encoding for their camera data, which, because of the similarity to the Cineon standard, was named 'Log C'. With Log C encoding, the signal level increases by a fixed amount with each increase of exposure, measured in stops. This encoding gradually advanced, with an initial implementation for the ARRIFLEX D-21, a few upgrades for the ALEXA and its newest version in the AMIRA camera. Log C images offer the original AMIRA/ALEXA-specific wide gamut color space and are ideal for carrying the complete image information.

Viewing and monitoring Log C

Shooting images in Log C delivers the best basis for the colorist's work, as it provides the camera's full latitude in an unconfined color space. When viewed directly, Log C images look flat with desaturated colors. To correctly display Log C material on an HD monitor (Rec 709) or in a digital projection (P3), it needs to be tone-mapped and transformed into the target color space. This image conversion can be performed using a 3D Look Up Table (LUT).

When recording footage in Log C, the SDI output is typically set to display Rec 709 video with or without a certain look. In situations when an on-set color correction system is used to apply looks to the camera image, the SDI is typically set to Log C output. The color corrector then applies the settings onto the Log C and converts the output to Rec 709 video using a 3D LUT. ARRI provides these conversion LUTs through the online ARRI LUT Generator at www.arri.com/amira/tools.

Recording codecs

Log C material is best recorded using a 4:4:4 codec (ProRes 4444). The top quality 4:2:2 codec, ProRes 422 (HQ), will also provide acceptable results in Log C, but due to the higher compression ratio, grading images recorded with these codecs may result in artifacts.

Legal and extended range

A 10 bit legal range signal uses digital code values 64 to 940 to represent the camera's full contrast range from black to white. In an extended range signal, the same range is represented by code values 4 to 1019. Extended range encoding does not provide a higher dynamic range, nor does legal range encoding limit the dynamic range that can be captured. It is only the quantization (the number of lightness steps between the darkest and brightest image parts) that is slightly increased (about 0.2 bits). The same applies for 8 bit (0-256 range) or 12 bit (0-4096 range) signals.

AMIRA (and ALEXA) always records ProRes clips using legal range encoding, as required by the codec specifications. Most editing or postproduction tools automatically transform the legal range files to e.g. computer graphics RGB full range (0-1024) for display.

Please note: Some devices allow ProRes clips to be recorded in extended range. If this material is brought into an editing system, the application displays values outside the legal range as "superblack" and "superwhite", but as soon as an RGB filter layer is applied, those values are clipped.

Recording media and card reader

AMIRA solely uses the new CFast 2.0 cards, which are currently available in 64 GB and 128 GB versions. CFast 2.0 cards are professional-grade memory cards with a pinless design. Within the QuickTime clips AMIRA records up to five audio tracks, metadata and timecode.

To offer fast transfer speeds, we asked CODEX to build a rock-solid card reader for AMIRA. It's a USB bus powered device (no external power supply needed) that takes one card at a time and offloads to Mac OS X, Linux or Windows workstations. It offers instant access to the card's content for download to other hard disk or solid state drives, at up to 435 MB/s.

Format[1]	Resolution	fps Range[4]	64GB CFast 2.0 card Recording Time[2] at 25p/50i / 29,97fps/59,94i	64GB CFast 2.0 card Recording Time[2] at 120fps	128GB CFast 2.0 card fps Range[4]	128GB CFast 2.0 card Recording Time[2] at 25p/50i / 29,97fps/59,94i	128GB CFast 2.0 card Recording Time[2] at 200fps
ProRes 422	HD (1920x1080)	0.75 – 200 fps	65 min / 54 min	13 min	0.75 – 200 fps	130 min / 109 min	16 min
	2K (2048x1152)	0.75 – 200 fps	57 min / 47 min	11 min	0.75 – 200 fps	114 min / 95 min	14 min
ProRes 422 (HQ)	HD (1920x1080)	0.75 – 200 fps	43 min / 36 min	9 min	0.75 – 200 fps	87 min / 72 min	10 min
	2K (2048x1152)	0.75 – 200 fps	38 min / 31 min	7 min	0.75 – 200 fps	76 min / 63 min	9 min
ProRes 4444[3]	HD (1920x1080)	0.75 – 120 fps	29 min / 24 min	6 min	0.75 – 200 fps	58 min / 47 min	7 min
	2K (2048x1152)	0.75 – 120 fps	25 min / 21 min	5 min	0.75 – 200 fps	51 min / 42 min	6 min

Please note that on AMIRA, current 64 GB cards have a reduced maximum frame rate of 120/140 fps at ProRes 4444 recording.
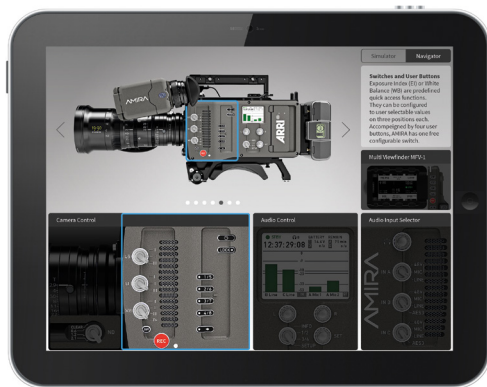
[1] ProRes 422 (LT) recording is also supported, just not listed here.
[2] ProRes is a variable bit rate codec. The actual data rate varies depending on the image content.
[3] ProRes 4444 provides an alpha channel, which is not used by AMIRA or ALEXA.
[4] All speeds adjustable with 1/1000 fps precision

All data is subject to change without notice.

AMIRA Camera Simulator

AMIRA Camera Simulator

AMIRA Camera Simulator

To have a look at the camera, for training purposes or just to check up a menu setting, we've designed the AMIRA Camera Simulator. Make yourself familiar with the camera online or offline at www.arri.com/amira/tools.

Screenshot of the AMIRA Camera Simulator

AMIRA Camera Simulator
The AMIRA Camera Simulator is an interactive training tool to familiarize yourself with the menu and button navigation of the AMIRA Digital Camera. The main user interfaces show an identical simulation of the current software version (SUP) 1.0.

AMIRA Camera Navigator
Use the navigator to locate the shown user interfaces and controls on the camera.
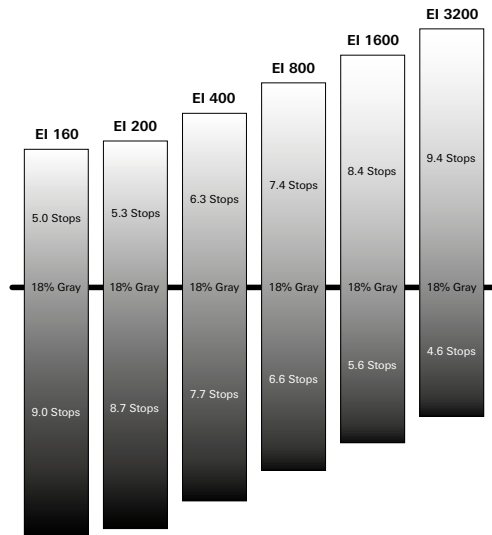
On Set

Exposure index

While AMIRA's 14+ stops of exposure latitude and unique highlight handling approaches that of film, there is one major difference between the way film and digital cameras behave: with digital cameras, a change in EI will shift how many stops are available above and below 18% grey – each EI step shifts the location of 18% grey. What is special about AMIRA, however, is that its wide exposure latitude is available at all EI settings.

	EI 160	EI 200	EI 400	EI 800	EI 1600	EI 3200
						9.4 Stops
				7.4 Stops	8.4 Stops	
			6.3 Stops			
	5.0 Stops	5.3 Stops				
18% Gray	18% Gray	18% Gray	18% Gray	18% Gray	18% Gray	
						4.6 Stops
				6.6 Stops	5.6 Stops	
			7.7 Stops			
	9.0 Stops	8.7 Stops				

As a shortcut, we have come up with the following method of writing AMIRA's exposure index:

$$EI\ 160^{+5.0}_{-9.0} \quad EI\ 200^{+5.3}_{-8.7} \quad EI\ 400^{+6.3}_{-7.7} \quad EI\ 800^{+7.4}_{-6.6} \quad EI\ 1600^{+8.4}_{-5.6} \quad EI\ 3200^{+9.4}_{-4.6}$$

Values next to the exposure index are the number of stops above and below 18% grey. These values are for Log C. Rec 709 has 0.5 stops fewer in the low end at EI 160, 0.4 stops fewer in the low end at EI 200, and 0.2 stops fewer in the low end at EI 400. Otherwise they are the same.
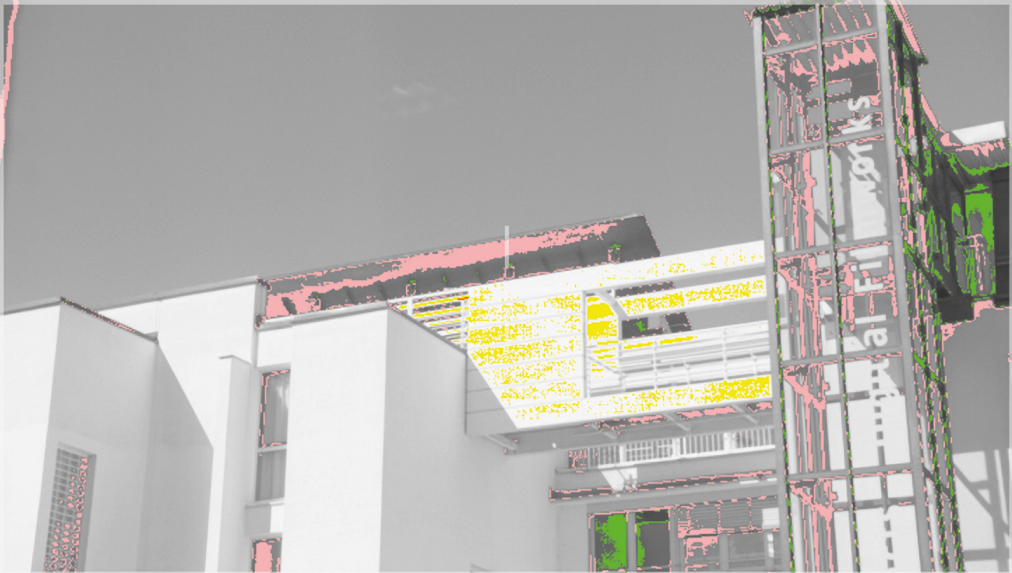
Exposure and focus check options

False color exposure check

The false color exposure check for the electronic viewfinder and/or LCD display measures the camera image, tints certain signal levels in a distinct color and shows the rest as a black-and-white image. The false color exposure check is based on the color processing set for the respective signal path. You can choose between Log C and Look. Choosing Look/Rec 709, the false color exposure check measurements will be based on the Rec 709 image.

Color	Level	Description
red	99 – 100%	White clipping
yellow	97 – 99%	Just below white clipping/white shoulder
pink	52 – 56%	One stop over medium gray (Caucasian skin)
green	38 – 42%	18% neutral gray
blue	2.5 – 4.0%	Just above black clipping/black slope
purple	0 – 2.5%	Black clipping

Slightly overexposed image, false color

Exposure and focus check options cont.

Zebra Exposure Tool
As an additional exposure tool, AMIRA includes a powerful zebra function with high and mid zebra, which can be configured in values for range, intensity and color.

Slightly overexposed image, high (black) and mid (white) zebra

Color peaking focus tool
The color peaking amplifies in-focus edges with a colored line. You can choose between red, green, blue, cyan, magenta, yellow or white.

Red color peaking on the pigeon defense spikes

Aperture peaking focus tool
The aperture peaking enhances the edges of in-focus objects, this increases the visible sharpness for easy focusing.


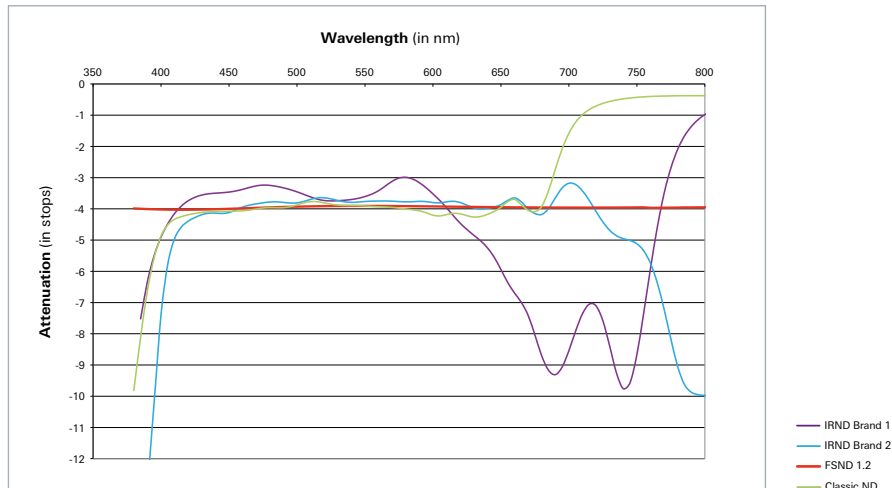Aperture peaking (enhanced edges)
on pigeon defense spikes

Integrated ND filters

The AMIRA camera has a built-in motorized and sealed filter stage for Full Spectrum Neutral Density filters (FSND) with densities of 0.6, 1.2 and 2.1 (and an optical clear filter). In comparison to other IRNDs, which have an uneven spectral behavior, or to an ordinary ND, which opens up at about 675 nm, the FSNDs offer a true, even reduction over the whole spectrum (see next page).

PL LDS lens mount

FSND filters
Clear, 0.6, 1.2, 2.1

Low pass filter

Sensor
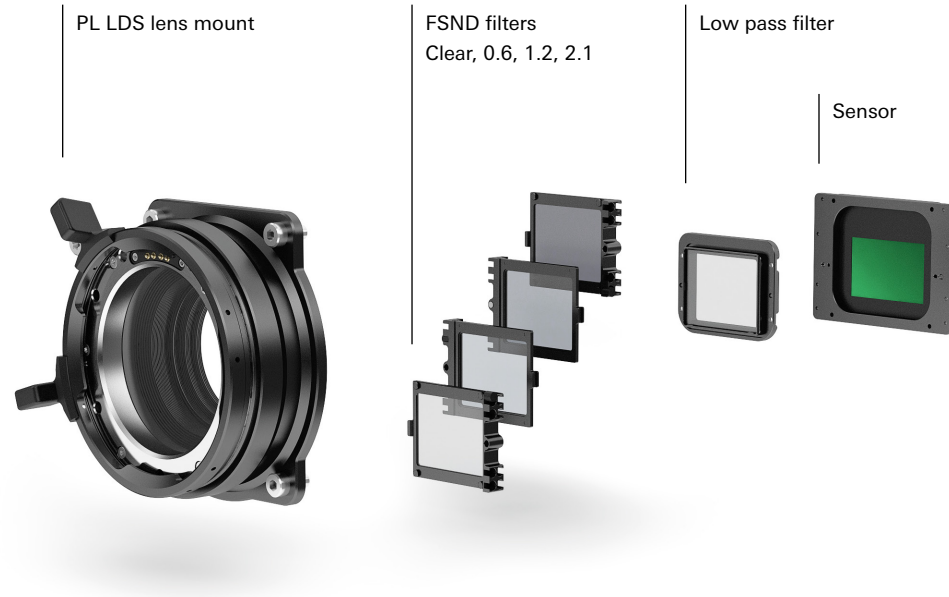
AMIRA's internal FSND filter slider mechanism

FSNDs in comparison

Wavelength (in nm)

Comparing the 1.2 FSND to other common filters

—— IRND Brand 1
—— IRND Brand 2
—— FSND 1.2
—— Classic ND

User buttons

AMIRA offers intuitive and customizable access to camera functions in order to allow most ergonomic camera operation: e.g. the white balance switch can be configured manually by Kelvin and CC values (or with auto white balance), on the exposure index button any available EI value can be configured.

On top there are 4 + 4 freely configurable user buttons (the second 4 used by pushing the "shift" button) and there is a user switch that can be used for quickly switching frame rates (fps), looks or shutter values. On the viewfinder there are another 2 user buttons (beside the exposure and focus control buttons) which can serve for viewfinder oriented functions.

USB Flash Drive

On the AMIRA camera USB sticks are used for importing/
exporting AMIRA Look Files, camera setup files, frame
line files, feature license keys and more; they are used for
installing software update packets (SUPs) and capturing
frame grabs, tool (*.jpg and *.dpx files).

AMIRA Look Management

AMIRA Look Management

With the AMIRA camera ARRI introduces a wide variety of in-camera image manipulation possibilities. To get to know all the options you have, let's begin with some vocabulary to find your way around the terms used later on:

AMIRA Look File (file extension: *.aml) – look file format for use in AMIRA camera.

The AMIRA Look File contains:

- **Video Look Parameters** (short: VLP) – a set of adjustment parameters designed for television and video application. You can alter gamma, black gamma, knee, overall saturation and saturation for red, yellow, green, cyan, blue and magenta.
- **Color Decision List** (short: CDL) – color alternation parameters for feature film and cinema applications (defined by the American Society of Cinematographers; contains Slope, Offset, Power and Saturation controls).
- **3D Look Up Table** (short: 3D LUT) – a descriptive table for color changes or color-space mappings usually generated by colorists and post facilities for on-set use.
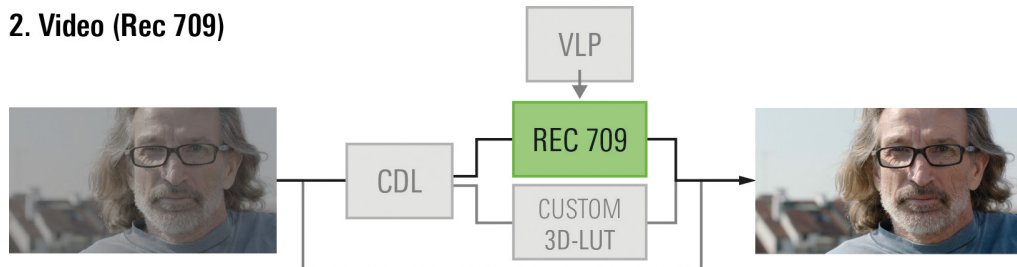
1. Log C
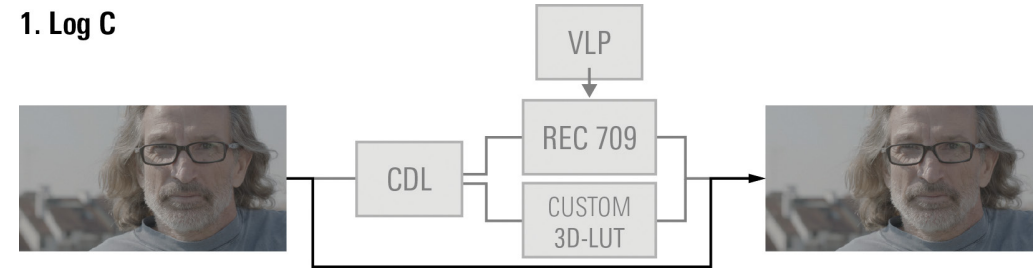
When you decide not to alter the image at all a flat Log C encoded image will be recorded. The look path is being by-passed.
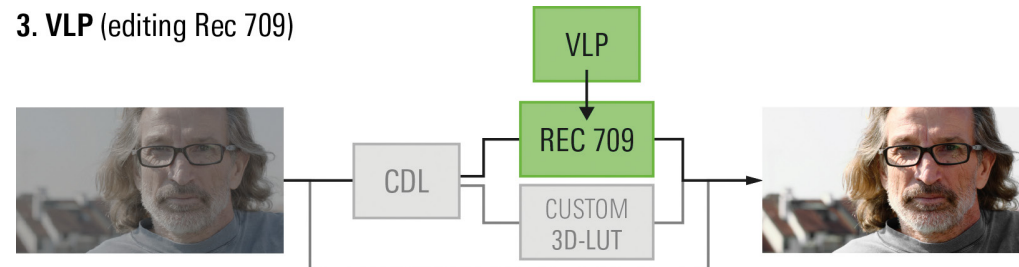
AMIRA Look Management cont.

2. Video (Rec 709)

Choosing the "Rec 709" look converts the image
to the default HD video color space Rec 709. This
conversion is being done using a built-in 3D-LUT.
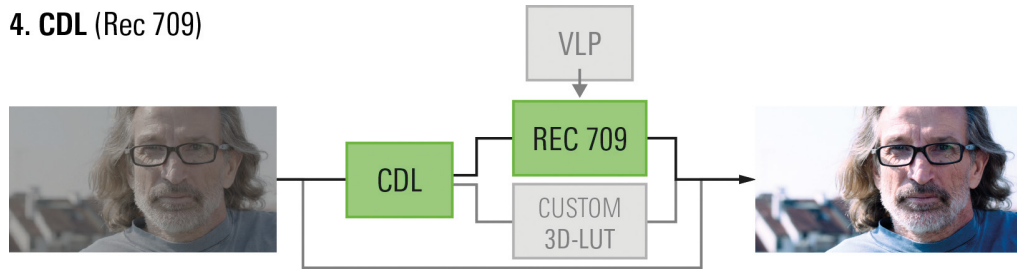This conversion is achieved by a built-in 3D-LUT.

3. VLP (editing Rec 709)

The Video Look Parameters ("broadcast-style
parameters") directly change the built-in 3D-LUT
which does the Rec 709 conversion. The target color
space stays Rec 709.

AMIRA Look Management cont.

4. CDL (Rec 709)

If you have a cinema background you might have come in contact with the ASC's Color Decision List. So this could be your tool of choice. The image is being altered on a Log C basis and will be converted to Rec 709/Video color space using the build-in 3D-LUT in a second step.
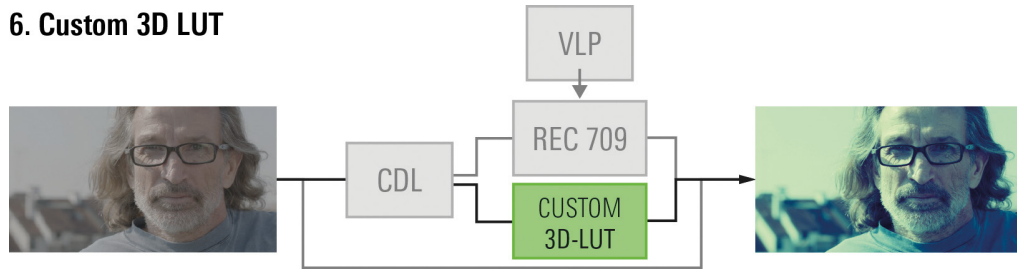
5. VLP & CDL (editing Rec 709)
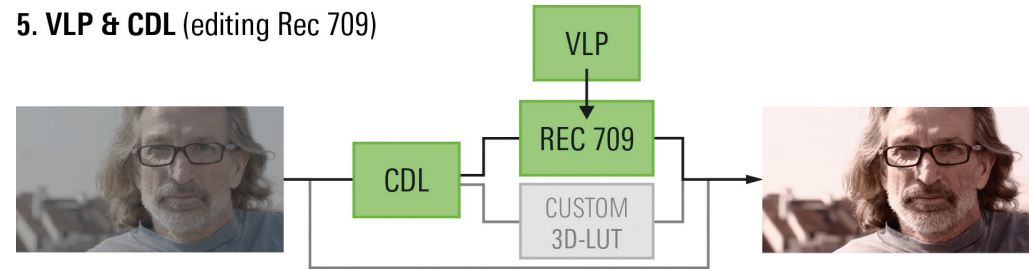
Combining CDL and VLP is also possible: this may be necessary to achieve certain looks. In the example image, the same Video Look Parameters as in "3. VLP" are being used. In addition CDL saturation has been lowered while "CDL power" green and blue are increased and red is lowered.

AMIRA Look Management cont.
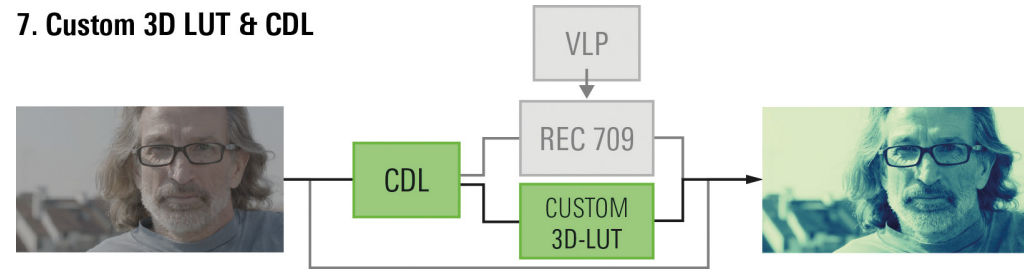
6. Custom 3D LUT

Way more complex color alternations (also possible for example is a negative image) can be achieved utilizing a Custom 3D-LUT. Because of the complexity of 3D-LUTs it is not possible to alter a custom LUT using the Video Look Parameters.

The example image is altered using a "Film Style Cross Process" 3D-LUT.

Please note: *Custom 3D-LUT functionality is only supported with AMIRA Premium; CDL parameters are only supported with AMIRA Advanced and Premium license.*

7. Custom 3D LUT & CDL

Nevertheless, in contrast to VLP, the upstream CDL values can be altered. As done for the example image: CDL saturation is lowered to almost zero. So Video Look Parameters cannot alter the Custom 3D-LUT – That's why it is either VLP or Custom 3D-LUT.

AMIRA Look File

The AMIRA Look File combines information on all edits done to achieve the desired look.

AMIRA Look File
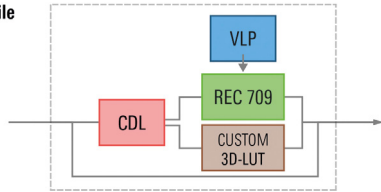
The look file itself can be created by alternating a look present in the AMIRA camera or by using the AMIRA Color Tool on your computer. When you're planning to use a 3D LUT in your look file, you have to import it in the AMIRA Color Tool in order to marry it to a look file. The camera itself cannot handle 3D LUTs natively.

Let's assume you have created a look in the AMIRA Color Tool, what's the next step? Besides copying the file to an USB flash drive: utilization – which presents us the following options:

1. Utilization in-camera
   Each look can be altered in camera (preferably you use a copy of the look): Video Look Parameters or CDL values can be altered freely, the Custom 3D-LUT itself cannot be changed in-camera.

a. Destructive use of a look ("burn-in")
   The look file has to be imported to the camera's internal memory. Once loaded it can be activated. If you choose "Look" for the gamma setting of the recording path the image manipulations will be applied to the image in a non-reversible way. Additionally the look file you used will be embedded in each clip's file header.
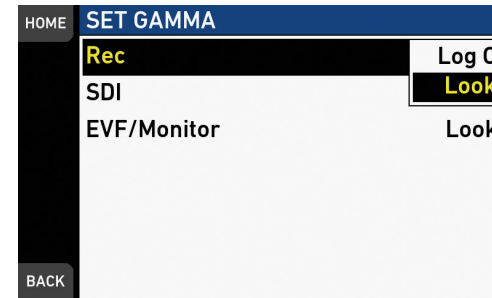
b. Non-destructive use ("just metadata")
   If you are not on a tight schedule or the color grading will be done in post-production, set the gamma to "Log C". The look will not be used to alter the recorded image but travel with its metadata and can be applied the downstream pipeline.

2. Utilization off-camera
a. Extract embedded looks from the clips by using ARRI's Color Tool
   Each clip that comes with an embedded look file can be viewed in the AMIRA Color Tool with the look applied. The look file can be exported as a separate *.aml file or be converted to 3D LUT.
b. Import clips to an AMIRA Look File aware 3rd party application
   Just like in the Color Tool 3rd party applications are offering "AMIRA Look File awareness" which means the application will recognize the embedded look file and apply the alternations automatically. If you've opted for a destructive path or do not want to use the look at all there's no limitation: the clip can be handled like an ordinary QuickTime-wrapped ProRes clip.

Overview on the available parameters

For a good overview of the AMIRA color controls, we just follow the image path of the camera. As a first step the sensor data is balanced for the color temperature of the light source. This ensures neutral representation of the R, G, and B values of objects - it is not part of the look settings. As second step, a Log C image is created. The Log C transform is controlled by the exposure index (EI), which is also not part of the look.

The ASC (American Society of Cinematographers) has standardized all relevant color transformation parameters in the ASC CDL policy, in order to allow for an standardized exchange of color transform data between the postproduction systems of different manufacturers. Image parameters can multiply the image data, adding an offset or raising to an exponent, independently of each of the color channels, which results in nine parameters plus

color saturation as the 10th. In AMIRA the ASC CDL transforms are applied to the Log C image before the image is transformed for display on the viewfinder or monitor. This conversion can be done with the integrated AMIRA 3D LUT (to Rec 709) or a custom 3D LUT included in a look. Using the standard AMIRA 3D-LUT additionally allows for modification of Video Look Parameters.
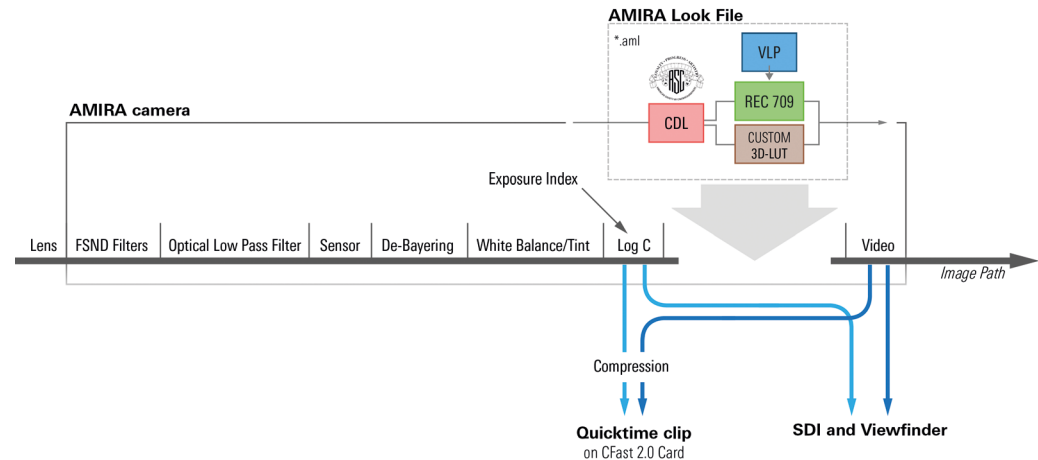
AMIRA's image path (simplified)

CDL

- **Slope (RGB, Master)**

  This parameter affects the inclination of the Log C curve. The slope of the linear part of the Log C curve is equivalent to the gamma of the camera negative. The Log C curve has a gamma of approx. 0.51. Hence, using a slope parameter of 1.2 will have a similar effect to using a negative stock having a gamma of 0.6 (= 1.2 * 0.5). A parameter of less than 1.0 will lower the gamma accordingly. Note: Often it is assumed that the typical camera negative gamma is 0.6. Some motion picture films, however, have gamma values in the range from 0.45 to 0.6.

- **Offset (RGB, Master)**

  The CDL offset parameter is the most intuitive of the CDL parameters. Adding an offset to the Log C image has a similar effect to increasing the exposure index. For people familiar with the motion picture print film process, it's the same as printer lights.

- **Power (RGB, Master)**

  The CDL power parameter has no equivalent in the motion picture film process. It can be used to raise or lower the mid tones in the Log C domain. The effect of the numerical value of power is reversed compared to the slope parameter. A power value smaller than 1.0 will increase the brightness and a value greater than 1.0 will decrease the brightness of the mid tones.

- **Saturation**

  The saturation parameter is used to in- or decrease the colorfulness of the image. One can go all the way down to a de-saturated grey-scale image at a value of 0 or add up another 100% color at a level of 2.0.

Video Look Parameters

Tone map parameters

- **Gamma**

  This is a standard parameter in video processing; it affects the mid tones while leaving black and white unchanged. Values below 1.0 will darken the image, higher values will brighten the image.

- **Black Gamma**

  The parameter black gamma controls the toe of the tone map curve. Lower values of black gamma cause shadows to be darker (lower values cause the lower part of the curve to be steeper, higher values cause a more linear start). This parameter leaves the level of the mid grey unchanged over a wide range. Only for the lowest value of black gamma is the mid grey raised.

- **Knee**

  The parameter knee controls the roll-off of the tone map curve. Lower knee values cause highlights to be brighter, while higher values produce an image showing dimmer and flatter highlights (lower values cause the upper part of the curve to be steeper, higher values cause a linear ending). This parameter leaves the level of the mid grey unchanged.

Video Look Parameters cont.

Saturation by hue parameters

AMIRA allows saturation to be controlled along the six color vector: red, yellow, green, cyan, blue, and magenta.

- Red saturation
- Yellow saturation
- Green saturation
- Cyan saturation
- Blue saturation
- Magenta saturation

Saturation (overall)

Besides CDL saturation the AMIRA also offers a video parameter to control the color saturation. It affects the image in a way that is very similar to the former.

Custom 3D-LUT

AMIRA allows custom 3D-LUTs from grading or on-set tools to be used in the camera (requires AMIRA Premium license). These 3D-LUTs need to be converted to an AMIRA Look File using the AMIRA Color Tool, before they can be loaded into the camera.
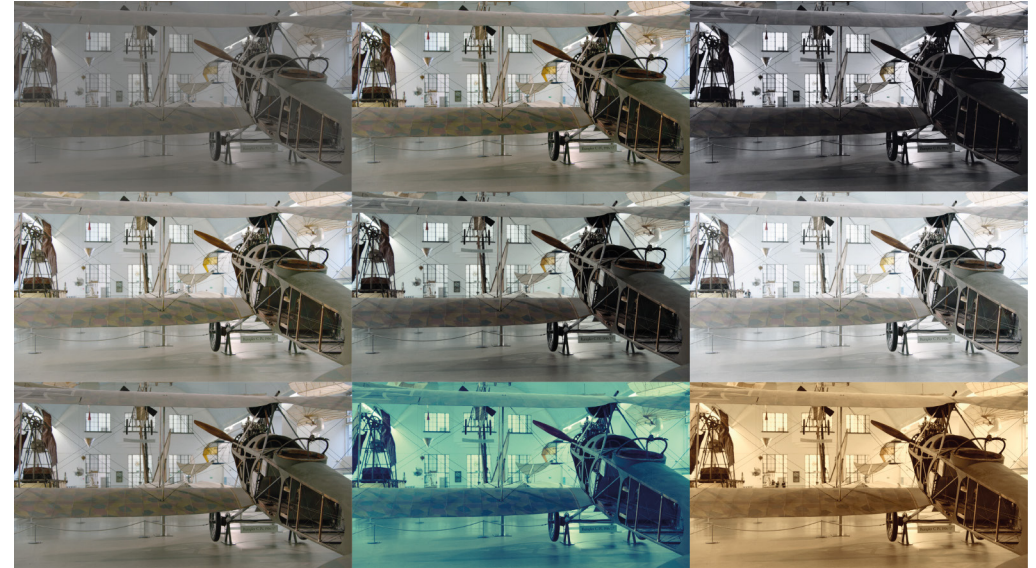
A selection of different looks applied side-by-side.

AMIRA Look File in use

If you have a look at the bigger picture, you can see how and where the AMIRA look file sits in the workflow and how it is embedded in each clip's file header.

Besides the AMIRA look file the clip's file header holds a combined 3D-LUT. It holds all color changes from the look file, but combined to a 3D-LUT. Adobe Premiere CC 2014 for example makes use of this combined 3D-LUT: when you load AMIRA footage to the viewer, Premiere auto-applys a Lumetri effect with this LUT to the clip.

For an in-depth read on AMIRA's color management have a look at the "Color By Numbers" document at www.arri.de/camera/amira/downloads.

Included sample Look files in AMIRA:

- LCC: a Rec 709 alternative to LogC for quick and easy grading
- Commercial: A brighter Look for nice skintones
- Vibrant: Boost color saturation but not red and yellow
- Landscape: Steeper contrast curve
- Blue saturation
- X 2 ALEXA: (3DLUT, Premium only) for a perfect match to ALEXA Rec709
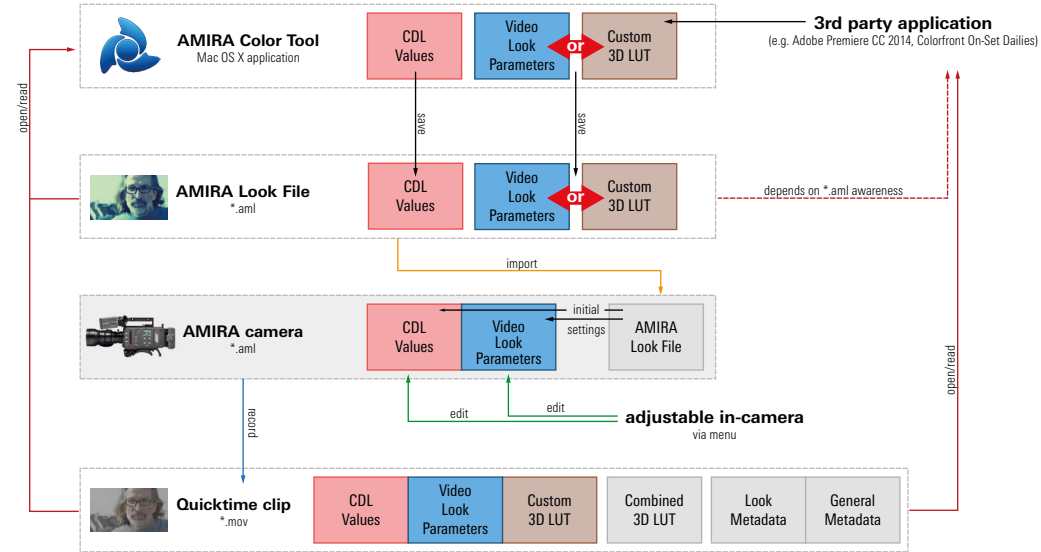
AMIRA look workflow

AMIRA Color Tool

Along with AMIRA, ARRI offers the AMIRA Color Tool (ACT), a free utility to assist in the process of look creation. The software completes the AMIRA look workflow: AMIRA Look Files can be created for use in camera, but also extracted from recorded AMIRA clips for further grading purposes.

Because the AMIRA Color Tool uses a similar user interface as the ARRIRAW Converter 3.0 (ARC), some users will have a quick learning curve. The GUI design is straightforward and every function is basically just a click away.

First-time users should have a look at our ACT tutorial to get started. The ARRI Color Tool is available as a free download at www.arri.com/amira/downloads.
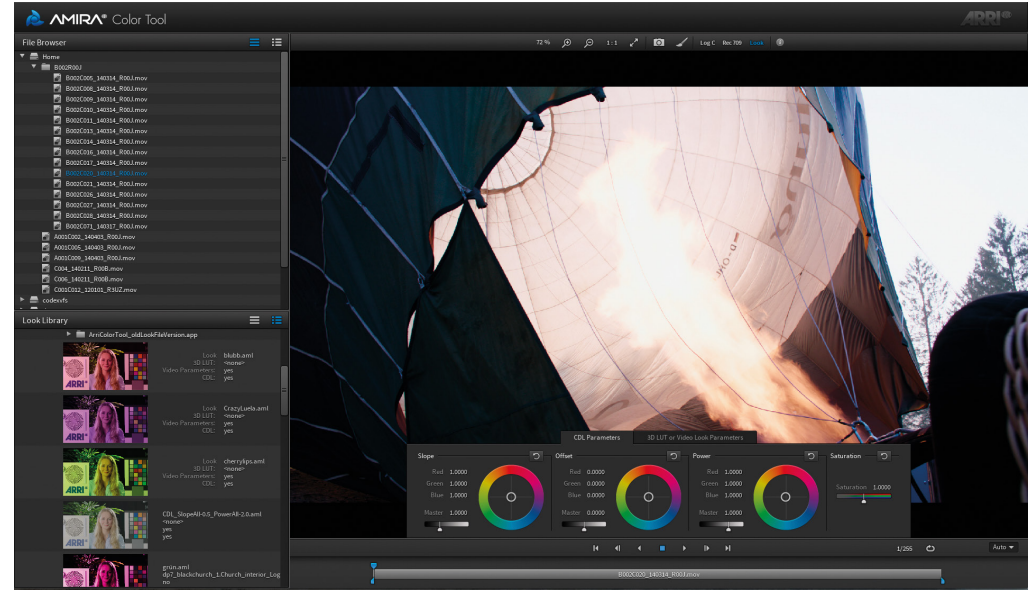
AMIRA Color Tool

In Postproduction

AMIRA in Post

AMIRA's QuickTime/ProRes clips are compatible with all QuickTime compatible applications, some of which support the AMIRA Look Files and automatically apply the color transformations to the Log C clips. Adobe's Premiere Pro CC 2014 and Apple's Final Cut Pro X 10.1.2 are the first non-linear editing systems to support the color management of AMIRA QuickTime/ProRes files, allowing full LUT control and automatic conversion from Log C to Rec 709 within an easy, fail-safe system.

Similar announcements from other major developers like Avid (in Media Composer 8), Blackmagic Design (Resolve 11) and Colorfront (in OnSetDailies) are expected soon. See http://www.arri.de/camera/amira/workflow for a recent list of supported tools.

Log C in editorial
All major editing tools in their current versions support basic Log C editing. You can select a Log C-to-video conversion LUT and apply it to Log C footage, so the editor can work with a video image. As mentioned in the chapter "Look Management", the AMIRA takes this concept a step further. The camera embeds the used look in the metadata of each clip as a 3D LUT. This LUT can be read and immediately applied to the footage without further conversions.
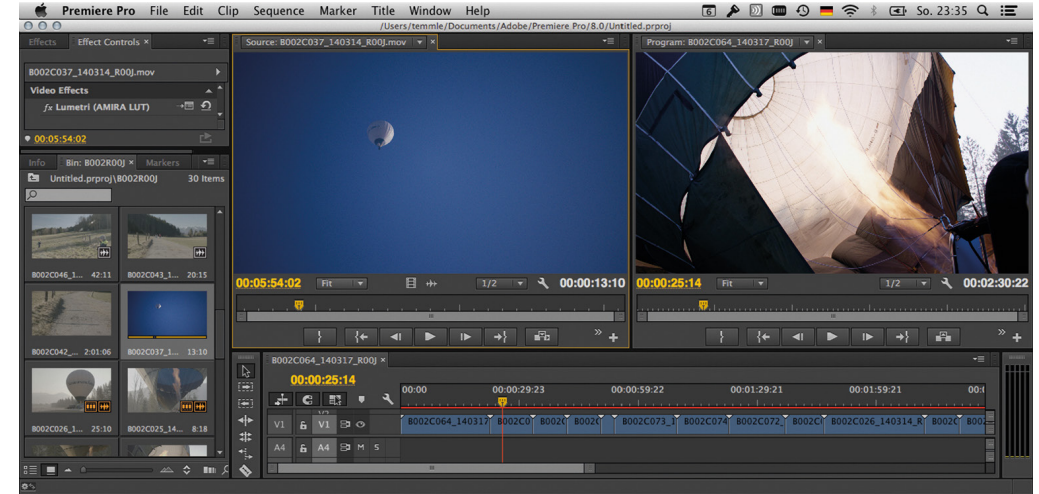
Editing AMIRA footage in Adobe Premiere CC

AMIRA's Ecosystem

Lens mounts

PL-LDS lens mount (K2.0001107)
AMIRA PL-LDS lens mount for PL mount lenses.
Includes 12 pin Hirose connector for ENG style
lenses.

B4 lens mount (K2.0001237)
AMIRA B4 lens mount with optical, mechanical and
electronic interfaces for B4 mount 2/3" lenses.

EF lens mount (K2.0001103)
AMIRA EF lens mount with interface for iris control.

PL to B4 lens adapter (K2.0001238)

EF lens mount

PL to B4 lens adapter

PL-LDS lens mount

B4 lens mount

Lenses for AMIRA

ARRI/Fujinon Alura Light Weight Zoom Lenses

The ARRI/FUJINON Alura 15.5-45/T2.8 and 30-80/T2.8 both feature the high optical performance and robust build quality shared by the Alura studio zooms (18-80/T2.6 and 45-250/T2.6). Designed for handheld, Steadicam, small camera setups and 3D rigs, they are lightweight (around 2 kg/4.4 lbs) and compact in size. The built-in ARRI Lens Data System (LDS) delivers metadata that is useful for tasks both on set and in post.

Name	Lens Mount	Focal Length *Wide*	Focal Length *Long*	Focal Length *Ratio*	Aperture	Close Focus	Magnification Ratio	Length	Weight
Alura Zoom 15.5-45/T2.8	PL LDS	15.5	45	2.9	T2.8 - T22	0.6 m / 2'0"	1:8.1	228 mm / 9.0"	2.2 Kg / 4.9 lb
Alura Zoom 30-80/T2.8	PL LDS	30	80	2.7	T2.8 - T22	0.6 m / 2'0"	1:4.9	228 mm / 9.0"	2.2 Kg / 4.9 lb

ARRI/FUJINON Alura LDS Extender

The 1.4x and 2.0x Alura LDS Extenders allow the focal length range of zoom and prime lenses to be extended. Small and lightweight, they mount easily between the camera's PL mount and the zoom or prime lens PL mount. They feature high quality optical elements and are able to transfer lens metadata from appropriate lenses to the camera, based on the protocol of the ARRI Lens Data System (LDS).

Name	Weight	Diameter without knobs	Length (mm) without knobs
Alura LDS Extender 1.4x	300 g / 0.66 lb	77 mm / 3.03″	44 mm / 1.73″
Alura LDS Extender 2.0x	530 g / 1.17 lb	77 mm / 3.03″	60 mm / 2.36″

Combining the Alura and Fujinon Zooms with Alura Extenders

Alura Zoom	Alura Extender	Resulting Combination
Alura 15.5-45/T2.8	Alura LDS Extender 1.4x	Alura 22-63/T4.0
Alura 15.5-45/T2.8	Alura LDS Extender 2.0x	Alura 31-90/T5.6
Alura 30-80/T2.8	Alura LDS Extender 1.4x	Alura 42-112/T4.0
Alura 30-80/T2.8	Alura LDS Extender 2.0x	Alura 60-160/T5.6
Fujinon Cabrio ZK 14-35 (2.5x14)/T2.9	Alura LDS Extender 1.4x	Cabrio 19.6-49/T4.1
Fujinon Cabrio ZK 14-35 (2.5x14)/T2.9	Alura LDS Extender 2.0x	Cabrio 28-70/T5.8
Fujinon Cabrio ZK 19-90 (4.7x19)/T2.9	Alura LDS Extender 1.4x	Cabrio 26.6-126/T4.1
Fujinon Cabrio ZK 19-90 (4.7x19)/T2.9	Alura LDS Extender 2.0x	Cabrio 38-180/T5.8
Fujinon Cabrio ZK 85-300 (3.5x85)/T2.9 85-220/T2.9 300/T4.0	Alura LDS Extender 1.4x	Cabrio 119-420/T4.1 119-308/ T4.1 420/ T5.6
Fujinon Cabrio ZK 85-300 (3.5x85)/T2.9 85-220/T2.9 300/T4.0	Alura LDS Extender 2.0x	Cabrio 170-600/T5.8 170-440/T5.8 600/T8.0

ARRI/Zeiss Ultra Wide Zoom UWZ 9.5-18

The new Ultra Wide Zoom UWZ 9.5-18/T2.9 is a wide-angle zoom lens; it has an image circle of 34.5 mm and is built using a telecentric design that ensures uniform field illumination. Distortion is at a level of less than 1% at 9.5 mm and less than 0.1% at 18 mm, while a new multilayer, anti-reflective coating reduces flare and veiling glare to a minimum. Built-in ARRI Lens Data System (LDS) functionality provides precise lens metadata for zoom, focus and aperture settings.

Name	Lens Mount	Focal Length *Wide*	Focal Length *Long*	Focal Length *Ratio*	Aperture	Close Focus	Magnification Ratio	Length	Weight
UWZ 9.5-18	PL LDS	9.5	18	1.9	T2.9 - T22	0.55 m / 1'9"	1:10.7	335.5 mm / 13.2"	4.8 Kg / 10.5 lb

ARRI/Zeiss Ultra Prime Lenses

The Ultra Prime lens series has the widest focal range of any cine prime lens set on the market, from the Ultra Prime 8R extreme wide-angle lens to the Ultra Prime 180 mm telephoto lens. Optically matched to the Master Primes and other ARRI lenses, the Ultra Primes are standard speed lenses that are often selected for their compact size and light weight.

Name	Lens Mount	Aperture	Close Focus	Length	Front Diameter	Weight
Ultra Prime 8R/T2.8	PL	T2.8 to T22	0.35 m / 13.8"	130 mm / 5.1"	134 mm / 5.3"	2.0 Kg / 4.4 lb
Ultra Prime 12/T2.0	PL	T2.0 to T22	0.30 m / 11.8"	140 mm / 5.5"	156 mm / 6.1"	2.0 Kg / 4.4 lb
Ultra Prime 14/T1.9	PL	T1.9 to T22	0.22 m / 8.7"	112 mm / 4.4"	114 mm / 4.5"	1.8 Kg / 4.0 lb
Ultra Prime 16/T1.9	PL	T1.9 to T22	0.25 m / 9.8"	94 mm / 3.7"	95 mm / 3.7"	1.2 Kg / 2.6 lb
Ultra Prime 20/T1.9	PL	T1.9 to T22	0.28 m / 11"	91 mm / 3.6"	95 mm / 3.7"	1.2 Kg / 2.6 lb
Ultra Prime 24/T1.9	PL	T1.9 to T22	0.30 m / 11.8"	91 mm / 3.6"	95 mm / 3.7"	1.0 Kg / 2.2 lb
Ultra Prime 28/T1.9	PL	T1.9 to T22	0.28 m / 11"	91 mm / 3.6"	95 mm / 3.7"	1.0 Kg / 2.2 lb
Ultra Prime 32/T1.9	PL	T1.9 to T22	0.35 m / 13.8"	91 mm / 3.6"	95 mm / 3.7"	1.1 Kg / 2.4 lb
Ultra Prime 40/T1.9	PL	T1.9 to T22	0.38 m /15"	91 mm / 3.6"	95 mm / 3.7"	1.0 Kg / 2.2 lb
Ultra Prime 50/T1.9	PL	T1.9 to T22	0.60 m / 23.6"	91 mm / 3.6"	95 mm / 3.7"	1.0 Kg / 2.2 lb
Ultra Prime 65/T1.9	PL	T1.9 to T22	0.65 m / 25.6	91 mm / 3.6"	95 mm / 3.7"	1.1 Kg / 2.4 lb
Ultra Prime 85/T1.9	PL	T1.9 to T22	0.90 m / 35.4"	91 mm / 3.6"	95 mm / 3.7"	1.2 Kg / 2.6 lb
Ultra Prime 100/T1.9	PL	T1.9 to T22	1.00 m / 39.4"	91 mm / 3.6"	95 mm / 3.7"	1.2 Kg / 2.6 lb
Ultra Prime 135/T1.9	PL	T1.9 to T22	1.50 m / 59.1"	119 mm / 4.7"	95 mm / 3.7"	1.6 Kg / 3.5 lb
Ultra Prime 180/T1.9	PL	T1.9 to T22	2.60 m / 102.4"	166 mm / 6.5"	114 mm / 4.5"	2.6 Kg / 5.7 lb

ARRI/Zeiss LDS Ultra Prime Lenses

Ultra Prime lenses were the first to be kitted out with ARRI's Lens Data System (LDS). The LDS Ultra Prime series consists of Ultra Prime optical elements transplanted into specially designed housings that allow each lens to communicate with the camera electronically, easing tasks on set and providing valuable metadata for postproduction.

Name	Lens Mount	Aperture	Close Focus	Length	Front Diameter	Weight
LDS Ultra Prime 12/T2.0	PL LDS	T2.0 to T22	0.30 m / 11.8"	140 mm / 5.5"	156 mm / 6.1"	2.0 Kg / 4.4 lb
LDS Ultra Prime 14/T1.9	PL LDS	T1.9 to T22	0.22 m / 8.7"	112 mm / 4.4"	114 mm / 4.5"	1.8 Kg / 4.0 lb
LDS Ultra Prime 16/T1.9	PL LDS	T1.9 to T22	0.25 m / 9.8"	94 mm / 3.7"	95 mm / 3.7"	1.2 Kg / 2.6 lb
LDS Ultra Prime 20/T1.9	PL LDS	T1.9 to T22	0.28 m / 11"	91 mm / 3.6"	95 mm / 3.7"	1.2 Kg / 2.6 lb
LDS Ultra Prime 24/T1.9	PL LDS	T1.9 to T22	0.30 m / 11.8"	91 mm / 3.6"	95 mm / 3.7"	1.0 Kg / 2.2 lb
LDS Ultra Prime 28/T1.9	PL LDS	T1.9 to T22	0.28 m / 11"	91 mm / 3.6"	95 mm / 3.7"	1.0 Kg / 2.2 lb
LDS Ultra Prime 32/T1.9	PL LDS	T1.9 to T22	0.35 m / 13.8"	91 mm / 3.6"	95 mm / 3.7"	1.1 Kg / 2.4 lb
LDS Ultra Prime 40/T1.9	PL LDS	T1.9 to T22	0.38 m /15"	91 mm / 3.6"	95 mm / 3.7"	1.0 Kg / 2.2 lb
LDS Ultra Prime 50/T1.9	PL LDS	T1.9 to T22	0.60 m / 23.6"	91 mm / 3.6"	95 mm / 3.7"	1.0 Kg / 2.2 lb
LDS Ultra Prime 65/T1.9	PL LDS	T1.9 to T22	0.65 m / 25.6	91 mm / 3.6"	95 mm / 3.7"	1.1 Kg / 2.4 lb
LDS Ultra Prime 85/T1.9	PL LDS	T1.9 to T22	0.90 m / 35.4"	91 mm / 3.6"	95 mm / 3.7"	1.2 Kg / 2.6 lb
LDS Ultra Prime 100/T1.9	PL LDS	T1.9 to T22	1.00 m / 39.4"	91 mm / 3.6"	95 mm / 3.7"	1.2 Kg / 2.6 lb
LDS Ultra Prime 135/T1.9	PL LDS	T1.9 to T22	1.50 m / 59.1"	119 mm / 4.7"	95 mm / 3.7"	1.6 Kg / 3.5 lb
LDS Ultra Prime 180/T1.9	PL LDS	T1.9 to T22	2.60 m / 102.4"	166 mm / 6.5"	114 mm / 4.5"	2.6 Kg / 5.7 lb

Accessories

WPA-1 Wedge Plate Adapter

Shoulder base plate, compatible with standard broadcast tripod adapters. Fits to AMIRA dovetail. Offers 15 mm LWS rod support, shoulder cushion and rosette mounts.
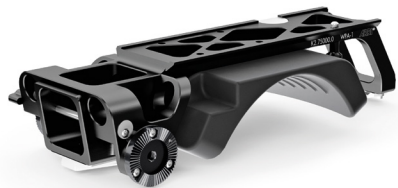
BPA-3 Bridge Plate Adapter

Base plate for AMIRA dovetail featuring 15 mm LWS rod support, shoulder cushion and offset rosette mounts. Natively compatible with studio bridge plates BP-8 and BP-9, and most quick-release plates, such as Touch & Go plates.

QRP-1 Quickrelease Base Plate

Lightweight tripod adapter plate, compatible with standard quick-release attachments found on many broadcast cameras. The rear clamping mechanism ensures a solid and reliable interface between camera and tripod.
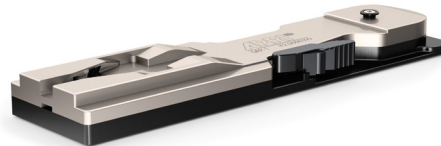
SBA-1 Shoulder Belt Adapter

Fits to any 3/8-16" thread and offers compatibility with standard broadcast quick-release belts.

UAP-2 Cheeseplate/Steadycam

Adapter plate for AMIRA dovetail, offering optically centered 15 mm LWS rod mounts to camera top and bottom. Used as low mode adapter with interfaces for handles CCH-1 / CCH-2, ALEXA viewfinder mounting brackets VMB-2/3 and viewfinder accessory bracket VAB-1. Mounts to the AMIRA bottom dovetail to offer Steadicam support and compatibility to most quick-release plates, such as Touch & Go plates.

VAB-1 Viewfinder Attachment Bracket
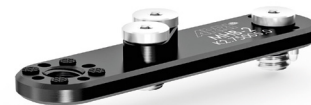
Bracket to attach the viewfinder on 15 mm rods.

VFA-2 Viewfinder Adapter

Adapter from viewfinder dovetail to 3/8" and 1/4" mounting points for flexible positioning of the viewfinder via e.g. a Noga-Arm.

MHB-2 Microphone Holder Bracket

Offset bracket designed to mount standard microphone brackets with 1/4" and 3/8" interface.

Specifications and Reference

Technical specs

Camera type	35 format film-style digital camera with integrated shoulder arch and receptacles for 15 mm lightweight rods.
Sensor type	35 format ARRI ALEV III CMOS
Sensor pixel count Source for recording:	**2880 x 1620 (HD 16:9)** **2868 x 1612 (2K 16:9)**
Source for monitoring and Surround view:	**3168 x 1782 (HD 16:9)** **3154 x 1764 (2K 16:9)**
Image processing	16 bit linear internal image processing. Target color spaces for ProRes and SDI OUT: Log C and Rec 709. For Rec 709, a customized look can be applied during record and playback with AMIRA look files.

Flange focal depth	LDS PL: 52.00 mm nominal, EF: 44 mm, B4: 48 mm
Lens mounts	PL mount with Hirose connector and LDS, B4 mount with Hirose connector, EF mount
Frame rate	0.75 - 200 fps (depending on the used license)
Shutter	Electronic shutter, 5.0° to 356.0°
Base sensitivity	Exposure Index (EI) 800
White balance	Separate red/blue and green/magenta balance available through Auto White Balance or manual setting. Red/blue: 2,000 to 11,000 Kelvin, adjustable in 100 K steps, with presets of 3,200 (tungsten), 4,300 (fluorescent), 5,600 (daylight), 7,000 (daylight cool). Green/magenta: -8 to +8 color correction (CC), 1 CC = 035 Kodak CC values or 1/8 Rosco values.

Exposure latitude	14+ stops over the entire sensitivity range from EI 160 to EI 3,200 as measured with the ARRI Dynamic Range Test Chart (DRTC-1).	**Audio inputs**	1x XLR 5 pin and 2x XLR 3 pin AUDIO IN connector for 2 channel, line level balanced audio input, 24 bit/48 kHz A/D conversion, works at 23.976, 24, 25, 29.97, 30, 50, 59,94 and 60 fps.
Integrated motorized ND Filters	ND 0.6, 1.2, 2.1	**Video and other input**	Genlock, HD-SDI, timecode (in and output), all BNC
Viewfinder	AMIRA Multi Viewfinder MVF-1 (OLED and LCD)	**Others**	USB 2.0 (for user settings, look files etc.), Ethernet
In-camera recording	Records Apple QuickTime files with ProRes encoding onto one CFast 2.0 card at a time. All codecs maintain legal range levels with embedded audio, timecode.	**Power out sockets**	Hirose 12 pin (for ENG type zoom lenses); 12 V: D-tab, Hirose 4 pin, Lemo 2 pin; 24V: RS 3 pin.
Recording media	CFast 2.0 memory cards	**Power In**	BAT connector, optional V-Lock or Gold mount battery adapter on the back. Camera accepts 10.5 to 34 V DC on these inputs.
Playback	QuickTime/ProRes playback from CFast 2.0 to MVF-1 and SDI OUT. Playback audio embedded in the SDI signal and on the headphones jack.	**Sound level**	< 20 dB(A)
Video outputs	2x HD-SDI out 1.5G and 3G 444: uncompressed HD video with embedded audio and metadata.	**Weight**	4.1 kg / 9.04 lbs (camera body with PL lens mount)
Audio outputs	3.5 mm headphone jack and Bluetooth audio.	**Dimensions**	Length: 309 mm/12.17″, width: 139 mm/5.47″, height: 149 mm/5.87″

Licensed features

Feature / License	AMIRA	AMIRA with Advanced license	AMIRA with Premium License
		Includes all features of AMIRA	Includes all features of Advanced license
Recording formats	HD 1920x1080 (interlaced and progressive)	HD 1920x1080 (interlaced and progressive)	HD 1920x1080 (interlaced and progressive) 2K 2048x1152 (interlaced and progressive)
Recording frame rates	0.75 - 100 fps	0.75 - 200 fps (> 100 fps: progressive only)	0.75 - 200 fps (> 100 fps: progressive only)
Recording codecs	ProRes 422, 422 (LT)	ProRes 422 (HQ), 422, 422 (LT)	ProRes 4444, 422 (HQ), 422, 422 (LT)
Pre-record function	–	Supported	Supported
Rec 709/Log C	Rec 709	Rec 709 and Log C	Rec 709 and Log C
Looks	3 fixed looks (adjustable in camera)	AMIRA Look File without user 3D LUT	Full AMIRA Look File
Adjustable image parameters	Knee, gamma, saturation, black gamma, saturation by hue	ASC CDL parameters	ASC CDL parameters
ASC CDL parameter (slope, offset, power, saturation)	–	Supported	Supported
Import of custom 3D LUTs	–	–	Supported
Focus and exposure control	Peaking, zebra, false color	Peaking, zebra, false color	Peaking, zebra, false color
White balance	Auto WB	Auto WB, dynamic auto tracking WB	Auto WB, dynamic auto tracking WB
WiFi camera remote control	–	Supported	Supported
Audio monitoring	Headphone output (mini jack)	Headphone output (mini jack), Bluetooth audio monitoring	Headphone output (mini jack), Bluetooth audio monitoring
Pre-record function	–	Supported	Supported

Sensor 35 format ALEV III CMOS sensor with Dual Gain Architecture (DGA) and Bayer pattern color filter array.

AMIRA Output Formats

AMIRA Sensor (3200 x 1800 Photosites)

ProRes HD – 2880 x 1620 Photosites
23.76 x 13.37 mm / 0.935 x 0.526", ø: 27.26 mm / 1.073"
ProRes 2K – 2868 x 1612 Photosites
23.66 x 13.30 mm / 0.931 x 0.524", ø: 27.14 mm / 1.069"

MVF-1/MON OUT
HD Surround View – 3168 x 1772 Photosites
26.14 x 14.62 mm / 1.029 x 0.576", ø: 29.95 mm / 1.179"
2K Surround View – 3154 x 1764 Photosites
26.02 x 14.55 mm / 1.024 x 0.572", ø: 29.81 mm / 1.174"
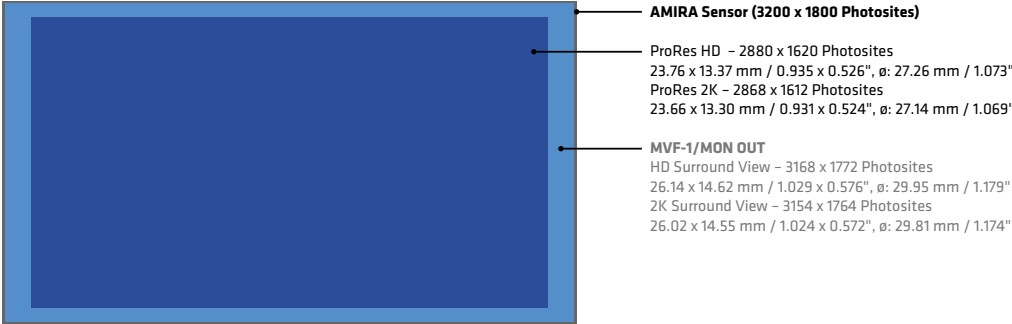
Resolution 2880 x 1620 pixels for HD recording formats
2868 x 1612 pixels for ProRes 2K recording

Please note: *All technical data based on Software Update Packet (SUP) 1.1.*
All data is subject to change without notice.

Resources and Contacts

ARRI Sales Contacts

Europe, Middle East, Africa, India

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ARRI Service Contacts

Zone	Availability	Service Center	E-Mail	Telephone Hotline
1	Monday – Friday: 09:00 – 17:00 (CET)	**Munich, Germany** Arnold & Richter Cine Technik	service@arri.de	+49 89 3809 2121
	Monday – Friday: 09:00 – 17:30 (CMT)	**London, Great Britain** ARRI CT Limited	service@arri-ct.com	+44 1895 457 051
	Monday – Friday: 09:00 – 18:00 (CET)	**Rome, Italy** ARRI Italia S.r.l.	service@arri.it	+39 335 749 00 70
	Monday – Saturday 09:00 - 18:00 (MSK)	**Moscow, Russia** Bars-Pro Ltd.	arri@bars-pro.ru	+7 (495) 415-98-13 +7 (495) 415-98-14 +7 (495) 415-98-15
	Monday – Saturday: 10:00 – 18:00 (IST)	**Mumbai, India** CINEOM Broadcast India Pvt. Ltd.	service@cineom.com	+91 22 42 10 9000
2	Monday – Friday: 08:15 – 17:00 (PST)	**Burbank, USA** ARRI Inc. West Coast	service@arri.com	+1 877 565 2774
	Monday – Friday: 08:00 – 17:30 (EST)	**New York, USA** ARRI Inc. East Coast	service@arri.com	+1 877 565 2774
	Monday – Friday: 08:30 – 17:00 (EDT)	**Mississauga, Canada** ARRI Canada Limited	service@arri.com	+1 416 255 3335
3	Monday – Friday: 09:00 – 18:00 (HKT)	**Hong Kong** ARRI Asia Limited	service@arriasia.hk	+852 2537 4266
	Monday – Friday: 09:00 – 18:00 (CST)	**Beijing, China** ARRI China Co. Limited	service@arrichina.com	+86 10 5900 9680
	Monday – Friday: 08:00 – 18:00 (AEST)	**Sydney, Australia** ARRI Australia Pty Limited	service@arri.com.au	+61 2 9855 4305

Zone 2   Zone 1   Zone 3
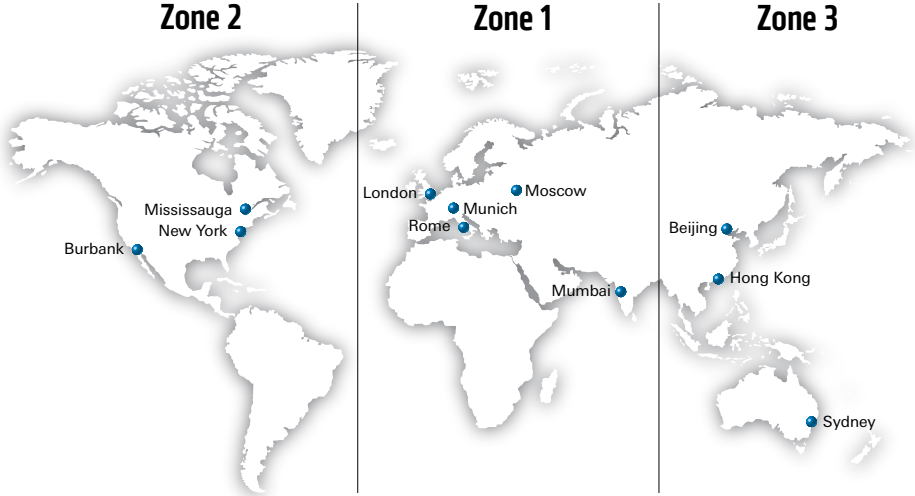
ARRI Service is the first port of call for all questions concerning not only the ALEXA cameras, but all ARRI cameras ever made, with worldwide service centers and 24h availability on Monday to Friday.

Well trained technicians cover all hardware- and software-related issues, upgrades or e.g. the recovery of cards that have been accidentally erased.

ARRI Digital Workflow Solutions

The Digital Workflow Solutions (DWS) group deals
with all workflow related issues, including shooting,
data copying, backups, quality check, editing,
grading, LUTs, metadata or working with Log C files.
In addition the DWS group provides support for tools
like the AMIRA Color Tool, ARRIRAW Converter and
AMIRA Camera Simulator.

Feel free to contact DWS at digitalworkflow@arri.de

Online Resources

AMIRA Manual   www.arri.com/amira/downloads
AMIRA Quick Guide   www.arri.com/amira/downloads
Frequently Asked Questions   www.arri.com/amira/learn
AMIRA Software Update Packets   www.arri.com/amira/downloads

AMIRA Camera Simulator   www.arri.com/amira/tools
AMIRA Frameline Composer   www.arri.com/amira/tools

AMIRA Pocket Guide WebApp   www.arri.com/amira/apg

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