ALEXA LF Software Update Package 2.0
for ALEXA LF cameras (SUP_AlexaLF_2.0_ 41118)

RELEASE NOTES

March 29, 2018

A. Introduction

We are happy to announce the availability of Software Update Package LF SUP 2.0 for the ARRI ALEXA LF camera. The ALEXA LF is part of a complete large-format system, including ALEXA LF camera, ARRI Signature Prime lenses, LPL lens mount and PL-to-LPL-adapter.

This document describes new features and changes for all ALEXA LF cameras that are part of ALEXA LF SUP 2.0 in contrast to ALEXA SXT cameras with ALEXA SXT SUP 2.0. Please note that there is no ALEXA LF SUP 1.0; for internal reasons the first SUP for ALEXA LF is LF 2.0.

New Features Overview

A more detailed description of each feature is given in the section 'New Features and Changes'.

• **Large format sensor modes**
  - Three different sensor modes for ARRIRAW and ProRes.

• **LPL Lens Mount**
  - New, larger lens mount with PL lens compatibility and LDS-1, LDS-2 and /i metadata.

• **6G SDI monitor outputs**
  - For UHD preview up to 30 fps

• **Fast sensor mode switching**
  - No reboot or factory reset needed

• **One additional RS accessory power connector**

• **More robust WRS radio (EMIP400)**

Downgrading

As ALEXA LF SUP 2.0 is the first ALEXA LF Software Update Package, it is not possible to revert to a previous release version.

Additional Software

When recording SXR Capture Drives in an ALEXA LF, one must always use the Codex Production Suite 4.1 software for downloading. The older Codex dts 3.x software should not be used anymore. The ARRIRAW Converter and ARRIRAW SDK 5.3 and later are not affected and do not cause a problem.

Customers can download Codex Production Suite (https://codex.online/software) and request a free Full functionality trial license for 60 days, after which time the software will revert to permanent Basic VFS functionality. A 12-month Codex Connect subscription can be purchased to continue with Full functionality.

Customers who purchase a new SXR Thunderbolt Capture Drive Dock will receive a Full functionality license for the Codex Production Suite. Owners of older Capture Drive Docks can receive a free Basic VFS license or purchase a 12-month Codex Connect subscription for a Full functionality license.

Notice

While the ALEXA LF camera with the initial software release LF SUP 2.0 will work with 1TB and 2TB SXR Capture Drives, there is an issue that results in intermittent behavior when using SxS cards.

Do not use SxS cards with the ALEXA LF with Software Update Packet LF SUP 2.0 at this time.

While we understand that this is a great inconvenience, we felt it more important to release the otherwise finished camera than to delay its release. We are working on a fix and will inform you as soon as it is available.

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B. New Features and Changes

Accessories

On-board batteries and battery adapter plates

In order to provide ALEXA best image quality at higher pixel counts, ALEXA LF has a higher power draw than previous ALEXA cameras and its input voltage range has been set for 19.5V to 34V. Therefore, the current ALEXA Gold mount (BAB-G K2.72003.0 and BAT-G K2.72006.0) and V Lock (BAB-V K2.72010.0 and BAT-V K2.72011.0) battery adapters will not work with the ALEXA LF.

The power draw of the ALEXA LF is no problem for the existing 24V or 26V block batteries that are attached with a cable to the ALEXA LF BAT connector, so the ALEXA LF can be powered with existing block batteries.

We are working on a number of solutions for on-board batteries, the first being that we will sell the Hawk-Woods RP-CFA1 Battery Adapter so the Hawk-Woods 26V Reel Power on-board batteries can be used on ALEXA LF. This is a proven solution that has been used successfully on the ALEXA 65 over the last years.

- Please note that the camera will automatically switch to the power source with the highest voltage. When both a 26V block battery and a 26 V Hawk-Woods on-board battery are connected to the camera, both will be drained simultaneously. When the camera is connected to a mains power supply and a 26V on-board battery is mounted, it will drain the battery first.

Additionally, we are working on a solution that would support bebob 12V ACine and VCine High Load on-board batteries and we are looking into a dual battery mount (aka T-piece or shark-fin) solution that would support traditional 12V Gold Mount and 12V V Lock on-board batteries. As soon as we know more, we will inform you.

Electronic Viewfinder and/or MON OUT

6G SDI monitor outputs

- Users can select either 422 1.5G SL (Single Link) or 422 6G SL as settings for MON OUT 1a/b and MON OUT 2. the 422 6G SL setting allows for monitoring of UHD (3840 x 2160) output resolution up to 30 fps.
- MON OUT 3 is 422 1.5G only.

Anamorphic monitoring

MON OUT 1, MON OUT 2, MON OUT 3 and EVF can be de-squeezed with factors of 1.25x, 1.3x, 1.5x, 2.0x. The 2.0x de-squeeze exists in a native version and a slightly magnified version (2.0xmag).

- Please note that some monitors or other devices may not interpret a lens squeeze factor of 1.25 or 1.5 in SDI metadata correctly. If available from the manufacturer, please make sure your external devices have a recent software installed.

MENU>MONITORING>MON OUT 1		
Format	42	Off
Scan format		1.25x
Frame lines + status inf		1.3x
Peaking		1.5x
False color		2.0x
Anamorphic desqueeze		2.0xmag

Framelines

A number of framelines for large format and Super 35 shooting are by default accessible from the ALEXA menu under MONITORING>FRAMELINES. Custom framelines can be created with the online ARRI Frameline Composer at:

www.arri.com/camera/alexa/tools/arri_frameline_composer

M>MONITORING>FRAME LINES	
Frame line 1	ARRI 1.78>
Frame line 2	Off>
User rectangles	Off>
Color	White
Intensity	4

DELETE	ADD
FRAME LINES	
ARRI 2.00	
ARRI 2.39	
ARRI S35 16X9 2.8K	
ARRI S35 16X9 3.2K	
ARRI S35 6X5 2.6K SCOPE 2X	

General

Fast sensor mode switching

Changing sensor modes takes about 20 seconds and does not require a reboot or reset of the camera.

MENU>SYSTEM>IMAGING	
Sensor mode	LF 16:9
Noise reduction	LF 2.39:1
Image transform	LF Open Gate
User Pixel Masking	>

Incompatible Accessories

The following accessories are not compatible with ALEXA LF cameras (in contrast to ALEXA SXT W) running LF SUP 2.0:

- Current 12V on-board battery adapters for 12V Gold mount (BAB-G K2.72003.0 and BAT-G K2.72006.0) and 12V V Lock (BAB-V K2.72010.0 and BAT-V K2.72011.0)

- Viewfinder Cable Long (2.00m/6.6ft) KC 152-S (K2.72014.0). The length of this viewfinder cable is such that proper functioning cannot be guaranteed at all times.
- Internal S35 FSND filters
  - Use internal LF FSND filters instead (included with ALEXA LF Pro sets)
  - Note: S35 ALEXA cameras equipped with LPL lens mount need special "LPL S35 FSND filters"
- XR Capture Drives
- All CFast 2.0 cards
- All SxS PRO and SxS PRO+ cards
- ARRI Ultra 16 lenses collide with the LF FSND filters

Imaging

No changes.

Image Processing

Enhanced noise-reduction option

Temporal noise reduction, as used in the ALEXA SXT, looks at the frame before and after the target frame to reduce noise. Enhanced Motion Detection (EMD) additionally checks the pixel behavior around each pixel and thereby avoids temporal artifacts in high motion areas. This feature is newly introduced with the ALEXA LF to make the noise reduction more robust for footage with high motion.

Noise reduction, when turned on, is baked into ProRes but not baked into ARRIRAW. It is, however, recorded as metadata in ARRIRAW.
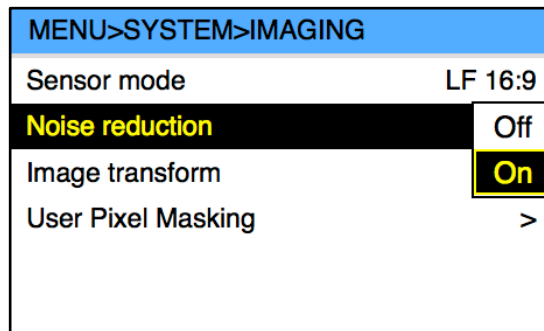
Inputs

Power input voltage range

The power input range through the BAT connector and the on-board battery adapter interface is from 19.5V to 34V DC.

Recording

Large format sensor modes

ALEXA LF cameras offer three large format sensor modes to provide the most efficient recording options for any production. All sensor modes are available in ARRIRAW and ProRes.

- To see which lenses cover the different sensor modes, go to the online Lens Illumination Guide at:
  www.arri.com/camera/alexa/tools/arri_lens_illumination_guide
- All three sensor modes are netflix approved:
  backlothelp.netflix.com/hc/en-us/articles/360000579527-Cameras-and-Image-Capture

Sensor mode LF Open Gate

LF Open Gate sensor mode provides the maximum sensor area and maximum resolution. This sensor mode is covered by full frame lenses and some Super 35 lenses, most notably some longer focal lengths and the Master Macro 100. The maximum frame rate is 90 fps.
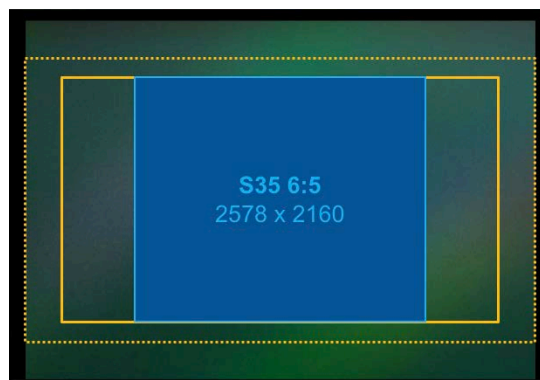

Sensor mode LF 16:9

LF 16:9 sensor mode is covered by full frame lenses, but the use of many Super 35 lenses is also possible, maximizing lens options. This sensor mode allows recording ARRIRAW and ProRes in 3840 x 2160 resolution, but also a down-sampled recorded resolution of 2K (2048 x 1152 pixels) and HD (1920 x 1080 pixels) in ProRes. Surround view (4448 x 2502 pixels) is available, indicated by the dotted yellow line in the drawing below. The maximum frame rate is 90 fps.
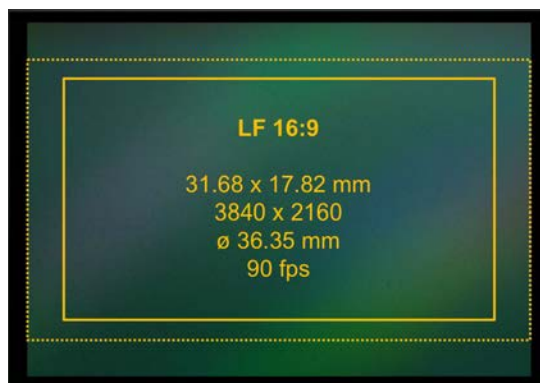
• Please note that the LF 16:9 sensor mode (3840 x 2160) has the same height as the ALEXA S35 6:5 sensor mode (2578 x 2160), which is used for shooting with anamorphic lenses.


• Based on the ARRI online Lens Illumination Guide, the following ARRI lenses cover the LF 16:9 sensor mode:
  - Ultra Primes ≥ 20 mm
  - Master Primes ≥ 35 mm
  - Master Macro 100
  - Ultra Wide Zoom 9.5 – 18 ≥ 10 mm

- Alura LWZ 15.5 – 45 with Alura Extender 1.4x
- Alura LWZ 30 – 80 mm
- Alura Studio zoom 18 – 80 from 40 mm on without extender
- Alura Studio zoom 18 – 80 with Alura Extender 1.4x
- Alura Studio zoom 45 – 250 from 100 mm on
- Alura Studio zoom 45 – 250 with Alura Extender 1.4x

Sensor mode LF 2.39:1

LF 2.39:1 sensor mode is for all who want to shoot cinematic widescreen with spherical full format lenses. The maximum frame rate is 150 fps.
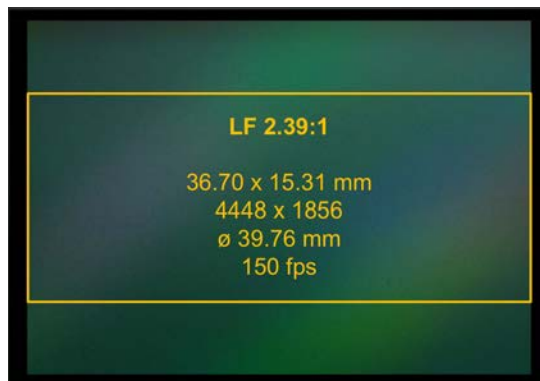
• Please note that the 2.39:1 sensor mode (4448 x 1856 pixels) has almost the same height as the ALEXA S35 3.2K sensor mode (3200 x 1800 pixels).
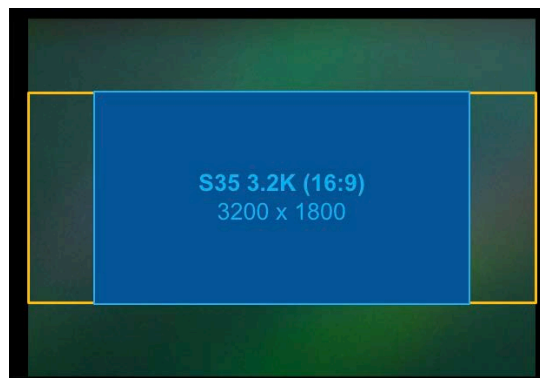
Pre-Recording

In contrast to ALEXA SXT SUP 2.0, ALEXA LF SUP 2.0 does not support Pre-Recording.

Lenses

LPL Lens Mount

LPL stands for Large Positive Lock. The LPL Lens Mount is a crucial element of the new large format camera system, optimized for large format sensors. A wider diameter of 62 mm and shorter flange focal depth of 44 mm allows the ARRI Signature Prime lenses and all future large-format optics to be small and lightweight, with a fast T-stop and pleasing bokeh - a combination of features that would not be possible within the confines of the PL lens mount. The LPL mount will also be available for other ARRI cameras such as the ALEXA Mini, and is being licensed to third-party lens and camera manufacturers.

The LPL Lens Mount is based on the robust and reliable design of ARRI's 54 mm PL mount and has one set of LDS contacts at the 12:00 position. The mount can be easily distinguished from a PL lens mount through its blue "ears".

PL-to-LPL-Adapter

The PL-to-LPL-adapter allows fast switching between PL and LPL lenses on set and works with existing full frame or Super 35 PL mount lenses. It provides a secure fit when mounted on the LPL Lens mount. Using the PL-to-LPL Adapter on a LPL Lens mount results in the same flange depth of 52 mm as using a PL Lens mount on the camera. The adapter can be inserted into the LPL mount in two different orientations, 12:00 and 3:00. In both orientations, the adapter is compatible with LDS-1 and /i metadata.

Media Access

No changes.

Metadata/Time Code

New Lens Data System LDS-2

The new Lens Data System LDS-2 is currently available in ARRI Signature Prime lenses and ARRI LPL Lens mounts. LDS-2 offers high precision and high data rate through the contacts, which are always in the 12:00 position. The system works with absolute encoders in the lens, therefore no movement of lens rings is needed to initialize lens data. LDS-2 is network capable and allows using extenders, adapters or further lens accessories.
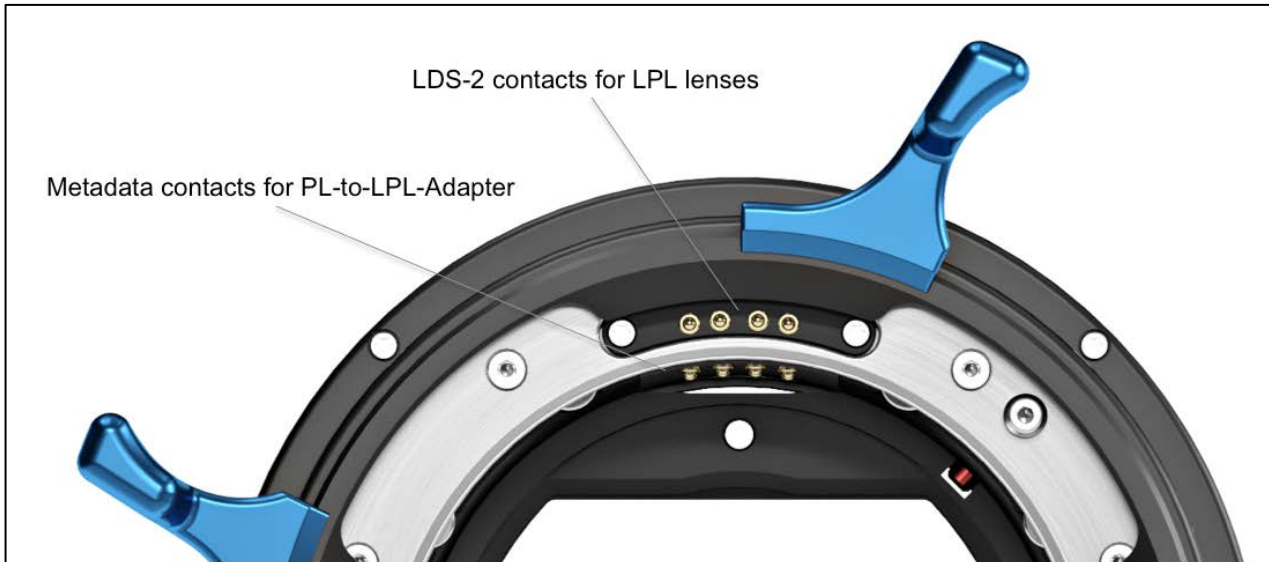
Optical Viewfinder

No changes.

Outputs

Additional RS accessory power connector

Compared to ALEXA SXT cameras, ALEXA LF cameras have one more RS accessory power connector. ALEXA LF cameras therefore do not have an LDD-FP connector. LF cameras have 4x RS (24 V), 1x 12V (12V), 1x EXT (24V) and 1x ETH (24V) connectors to power accessories.

Recording Media

Supported Recording Media

Supported recording media for all ALEXA LF cameras with LF SUP 2.0 include:

• SXR Capture Drives 1 TB (CDX-37019)

• SXR Capture Drives 2 TB (CDX-37021)

Recording Format				Max fps (media duration in hr:min at max fps/at 24 fps)	
Sensor Mode	Recording File Type	Recording Resolution	Recording File Setting	SXR Capture Drive 1 TB	SXR Capture Drive 2 TB
LF Open Gate	ProRes	4.5K	422	**60** (00:28/01:11)	**60** (00:57/02:22)
			422 HQ	**60** (00:18/00:47)	**60** (00:37/01:34)
			4444	**60** (00:12/00:31)	**60** (00:24/01:02)
			4444 XQ	**40** (00:12/00:20)	**40** (00:24/00:40)
	ARRIRAW	4.5K		**90** (00:08/00:32)	**90** (00:17/01:04)
LF 16:9	ProRes	HD	422	**60** (03:12/08:02)	**60** (06:25/16:04)
			422 HQ	**60** (02:08/05:21)	**60** (04:16/10:42)
			4444	**60** (01:25/03:33)	**60** (02:50/07:07)
			4444 XQ	**60** (00:56/02:22)	**60** (01:53/04:44)
		2K	422	**60** (02:48/07:01)	**60** (05:37/14:03)
			422 HQ	**60** (01:52/04:40)	**60** (03:44/09:21)
			4444	**60** (01:14/03:06)	**60** (02:29/06:13)
			4444 XQ	**60** (00:49/02:04)	**60** (01:39/04:08)
		UHD	422	**60** (00:47/01:59)	**60** (01:35/03:59)
			422 HQ	**60** (00:31/01:19)	**60** (01:03/02:28)
			4444	**60** (00:20/00:52)	**60** (00:41/01:44)
			4444 XQ	**60** (00:13/00:34)	**60** (00:27/01:09)
	ARRIRAW	UHD		**90** (00:14/00:53)	**90** (00:28/01:47)
LF 2.39:1	ProRes	4.5K	422	**100** (00:28/01:59)	**100** (00:57/03:59)
			422 HQ	**100** (00:19/01:19	**100** (00:38/02:38)
			4444	**100** (00:12/00:52)	**100** (00:25/01:45)
			4444 XQ	**60** (00:13/00:34)	**60** (00:27/01:09)
	ARRIRAW	4.5K		**150** (00:08/00:53)	**150** (00:17/01:47)

Recording Media not supported

• XR Capture Drives 512 GB (CDX-3730)

• all SxS PRO and SxS PRO+ cards

• all CFast 2.0 cards

Remote Control/3D

More robust WRS radio (EMIP400)

ALEXA LF cameras have a new white coded radio module EMIP400. This new radio has improved interference resistance and expanded wireless region settings.

Wireless region settings specify where the wireless function can be used in compliance with local regulations. It may be illegal to use the wireless function in a region other than specified in the setting. Please ensure that the region is configured correctly, e. g. when traveling.

To change the region setting, press the WRS button on the camera right side. Choose RADIO > WRS REGION and select the region.

You have the following options:

• Australia

• Canada

• China

• Egypt

• Europe

• Hong Kong

• India

• Israel

• Japan

• New Zealand

• Philippines

• Singapore

• South Africa

• South Korea

• Taiwan

• Thailand

• United Arab Emirates

• USA

• World

In case of doubt please contact ARRI Service to ensure that you can set the appropriate wireless region. Note that all wireless region settings fulfill FCC requirements.

DHCP

ALEXA LF cameras support Dynamic Host Configuration Protocol (DHCP). When using the built-in WiFi radio of the camera, clients that connect via WiFi get an IP address assigned automatically.

No 3D Sync

In contrast to former ALEXA SUP versions, ALEXA LF SUP 2.0 does not support 3D Sync functionality.

User Interface

Battery warning levels

- The default battery warning voltage level for BAT 1 (BAT connector) is set to 22V.
- The default battery warning voltage level for BAT 2 (on-board battery) is set to 24V.
- The default battery warning percent for BAT 2 (on-board battery) is set to 20%. If the battery can communicate with the camera, the camera will display the (more accurate) percentage level.

  Note: Hawk-Woods Reel Power on-board batteries do not communicate with the camera and therefore cannot make use of the percentage warning level.

These levels can be changed manually in the following menu:

```
MENU>SYSTEM>POWER

BAT1 (Plug) warning            22 V
BAT2 (Onboard) warning         24V
BAT2 warning percent           20%
```

C. Known Issues

Frame Grab

Lazy grab icon on EVF and MON OUT.
When you trigger a frame grab, the MON out and EVF status bars will not show a grab icon for the first few seconds. If in doubt, please check the home screen on the camera menu, which immediately shows when the camera takes a frame grab.

No warning if frame grab failed.
If a frame grab is triggered with one of the User buttons (assignable to button 1-3) while no SD card is inserted, the camera will not show a warning.

Frame grabs to a full SD card
When the SD card is full and another frame grab is attempted, the camera will store it as a corrupted frame grab file on the SD card.

ARRIRAW Framegrabs cannot be properly debayered
Because of erroneous metadata in ARRIRAW frame grabs, it is not possible to properly debayer ARRIRAW frame grabs currently. Please note that this also affects the User Defect Pixel Mapping.

Imaging

Noise Reduction can lead to slight change in black level
The noise reduction feature of the ALEXA LF can lead to a minimal lift in the black level.

LDS/LDA

Alura LDS information drops out during fast adjustments.
If the Iris, Zoom or Focus ring on an LDS Alura Zoom is turned very quickly, the corresponding LDS information is lost and the camera will show 'Turn Lens rings!' A slow or normal ring turn recalibrates the lens and brings back the LDS information. Thresholds are (rotation of lens ring end to end) FOCUS: 1.0sec, ZOOM: 0.4sec and IRIS: 0.2sec.

Camera does not detect lens
On rare occasions it is possible for the camera to not detect a connected LDS or /i lens. This can be fixed with a reboot of the camera.

Monitoring

Changing EI in Viewfinder is slow
Changing the Exposure Index (EI) through the viewfinder interface can be very slow.

Duplicate frames/TC on 422 6G SDI when MON OUT FPS larger than 24
When setting MON OUT frame rate higher than 24 fps at 422 6G setting, it is possible to see duplicated frames and TC.

SDI output has 1 frame more delay than ALEXA SXT
The ALEXA LF SDI output has 1 frame more delay than the ALEXA SXT SDI output.

422 6G MON OUT may freeze when changing settings
If one MON OUT is set to 422 6G SDI, and the other one is switched from 422 1.5G to 422 6G, it is possible, that the image on the first MON OUT freezes. If this state remains for more than a minute, power the camera off and on again.

Anamorphic de-squeeze 2.0xmag cuts left & right edges of image in EVF and MON OUT

ANAMORPHIC DESQUEEZE = 2.0xmag does not show the full width of your target aspect ratio in the EVF and on MON OUT. In other words: you may find objects in the final release of your project you never saw in the viewfinder. Use with caution.

RETURN IN image is covered by Status Info

When Status Info = ON, the RETURN IN signal is partially covered by the status info. Turn status info off to see the full RETURN IN image.

Sensor mode switch turns Surround View off

ALEXA LF sensor mode LF 16:9 is capable of displaying Surround View, the sensor modes LF Open Gate and LF 2.39:1 are not. When switching from LF 16:9 to either LF Open Gate or LF 2.39:1 and then back to LF 16:9, Surround View is always turned off and has to be manually turned back on.

No frame border left & right in LF 2.39:1 sensor mode

In LF 2.39:1 sensor mode there is a frame line at the top and bottom of the frame, but not at the left and right sides on EVF and MON OUT.

Wireless video artifacts when peaking is on

On rare occasions an image artifact can occur when using wireless video with peaking on.

Wireless video transmission image artifact

On rare occasions will the red and blue colors be reversed for the wireless video.

Recording Media

Warning is not cleared

Warning "W:Media: Temperature high, be careful when handling drive" is not cleared when drive is ejected.

Reboot needed after interrupted media access

If the camera is being interrupted while accessing a recording medium, as can be the case when power fails or the medium is removed while recording or erasing, the camera has to be rebooted.

Do not use SxS cards with ALEXA LF running LF SUP 2.0

Intermittently SxS cards will not get properly recognized (mounted) by the camera. This can happen upon card insertion, after a reboot, after switching the recording mode or after switching from record to play or vice-versa. This can result in the card not being available for record or playback even though it is inserted into the camera ("No Media"), it can result in a problem with the ACOM board ("ACOM down") or it can result in the media becoming unavailable once the REC button is pushed ("Media Error").

Power interruption can lead to playback problems and clip number jumps

In rare circumstances it is possible that, after a power interruption, an SxS PRO+ 256 GB card (Rev D) shows erratic playback behavior and jumps clip numbers when recording.

Remote Control

Webremote shows LF Open gate when LF 16:9 is selected

The webremote shows sensor mode "LF OPEN GATE" when really sensor mode "LF 16:9" is selected.

Switching surround view with webremote will toggle the frame border

Switching surround view on or off with the webremote will toggle the frame border.

Camera can have problems booting with multiple webremotes connected

When multiple web browser/webremote instances are connected to the camera it may not boot properly e.g. after a battery change. We suggest not to use more than a single webremote on a camera.

User Button 1, 2, 3 do not show feature state on WCU-4

User Button 1, 2, 3 do not show feature state on WCU-4.

Timecode

Time Code INT Free Run reset to 00:00:00.

With asynchronous recording, i.e. "Project frame rate" NOT EQUAL to "Sensor fps" and time code set to INT FREE RUN, the time code will be reset to 00:00:00 after a reboot.

Usability

Camera gets stuck during power up

Sometimes the camera does not boot correctly and is stuck at the "Starting User Interface" screen. Usually another reboot helps.

Color bars take long after reboot

The first time that color bars are activated after the camera has been powered on, it may take up to 6 seconds for color bars to appear.

iPhone can loose WiFi connection

In some circumstances it is possible for the webremote on an iPhone to loose connection about every 30 seconds to a minute for about 20 seconds.

ALEXA webremote does not work with Safari browser on a Mac

The ALEXA webremote may not work with the Safari browser on a Mac, but will work with Firefox.

BAT PERCENTAGE has no meaning for Hawk-Woods batteries

Setting a MENU > SYSTEM > POWER > BAT2 WARNING PERCENT value has no meaning when using Hawk-Woods Reel Power on-board batteries as the batteries do not communicate with the camera. Use the MENU > SYSTEM > POWER > BAT2 (ONBOARD) WARNING value in Volts instead.