

ALEXA Software 3.0

Release Notes February 11a, 2011

Introduction

The ALEXA Software Update Packet (SUP) 3.0 provides a number of exciting new features and numerous improvements based on the many, many suggestions we have received from customers. The most important new features are:

- In-camera playback of QuickTime clips from SxS PRO cards
- In-camera audio recording
- A new optional (smooth) viewfinder display mode
- EI 3200
- Improved color processing
- False color exposure check
- Single frame grabs
- HD-SDI 3G Single Link (4:2:2 up to 60 fps over one BNC cable)
- HD-SDI Variflag
- Additional frame line options

All new ALEXAs will have SUP 3.0 installed, and all existing cameras can be upgraded to SUP 3.0. This document contains a detailed description of the changes, a list of known issues and instructions for upgrading. Please take some time to read through this document to familiarize yourself with the new features.

Update Recommendation

As this update contains important new features and improves stability, we highly recommend for all ALEXA owners to update. However, since this update contains new color processing, we recommend against carrying out the update during an ongoing production.

Providing Feedback

Should you encounter any issues with the software, please email your feedback to service@arri.de and our engineers will evaluate the issue and use your feedback to make the software more stable and functional in the future.

Downgrading

Even though we do not recommend it, it is possible to downgrade back to 2.1.2 from a camera that has SUP 3.0 installed. Before and after the downgrade a 'reset to factory settings' should be performed.

Because there is an issue with the upgrade process in 2.1, we strongly recommend not to downgrade from 2.1.2 to 2.1.

It is not possible to downgrade back to 2.0 or earlier software versions and should not be attempted.

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Changes

Imaging

'Tropical' Sensor Temperature

The ALEXA sensor is actively cooled or heated to stay at a constant 35 degrees Celsius. When shooting in very hot and humid conditions, in rare cases it is possible for condensation to build on the inside of the filter pack in front of the sensor. In this case the sensor can be switched to 'Tropical Temperature' in the 'System>Sensor' menu, which will heat the sensor to 40 degrees. Running the sensor at 40 degrees will not affect the image quality during normal operation but will use slightly more power, which is why we recommend to normally run the sensor at its standard temperature. Tropical mode will be indicated with a palm tree icon in the camera right display, and by the 'i' information icon in the viewfinder.

QuickTime/ProRes

Playback

QuickTime clips can be played back from SxS PRO cards.

- Clips are played back on the EVF-1, MON OUT and REC OUT outputs at the chosen project speed (23.976, 24, 25, 29.97 or 30 fps).
- The playback mode can be accessed by pushing the PLAY button on the camera left or right side.
 - Upon pushing the camera right PLAY button, a playback screen will appear on the camera right display with various playback controls and options. It is possible to immediately play the last recorded clip or to choose any clip from either card (the clip list shows all clips on both cards). Each clip can be played once or in a loop. By turning the jog wheel it is possible to jog through the clip frame by frame or to shuttle in one-second intervals. The two modes are toggled by pushing the jog wheel when in playback mode.
 - Since there is no camera left display, the camera left PLAY button has some extra functionalities: pressing it again after the first press starts the playback of the last clip recorded. Each further press of the button toggles PAUSE and PLAY. Once the clip has played to the end, it will go back to the beginning and into PAUSE, ready to be played again. Pressing the camera left PLAY button for more than 2 seconds will exit the playback mode.
- Frame lines can be optionally superimposed.
- Clip information is always visible in the viewfinder above and below the image, and can be optionally superimposed on the MON OUT output.
- Through the User menu (push USER button camera right) it is possible to designate the USER 1, 2 or 3 button to the 'Check last clip' function, which will play back the last 5 seconds recorded.
- Please note that currently audio cannot be played back yet - that comes in a future update.

Outputs

HD-SDI 3G Single Link

The REC OUT outputs can be switched to '422 3G SL' (= Single Link) in the 'Recording>REC OUT>HD-SDI Format' menu. This allows sending a 4:2:2 signal at 48, 50, 59.94 or 60 fps over one BNC cable. In that case both REC OUT BNC connectors will output the same signal. Please note that this option is only available for 4:2:2, not for 4:4:4. This output is supported already by the Codex Onboard recorder, and can also be used with a splitter-box to run only one cable from the camera to other recorders that don't support this yet.

Variflag

The REC OUT HD-SDI outputs now can include a Variflag. This allows easier off-speed recording (for example 18 fps on a 25 fps REC OUT) when using an external recorder that can read the Variflag signal. Variflag can be turned on in the 'Recording>REC OUT' menu.

Independent Gamma Output Options

It is now possible to choose gamma settings individually for viewfinder (EVF-1), MON OUT, REC OUT and SxS from 3 different settings: Rec 709, Log C and DCI P3.

- Please note, however, that there are some restrictions based on an interdependency of the REC OUT and SxS outputs as summarized in the tables below. If you set REC OUT or MON OUT to a gamma setting that would not be permitted, the other output will be switched to the same setting.

REC OUT Setting	Possible SxS Setting
Log C	Rec 709, Log C or DCI P3
Rec 709	Rec 709 or Log C
DCI P3	Log C or DCI P3

SxS Setting	Possible REC OUT Setting
Log C	Rec 709, Log C or DCI P3
Rec 709	Rec 709 or Log C
DCI P3	Log C or DCI P3

- The MON OUT and the EVF images are independent from each other. However, the EVF-1 image cannot be set to DCI P3.

Audio Output

The audio that is being recorded can be monitored via the AUDIO OUT mini headphones connector on the camera right side. Volume can be set to a maximum of 2.5 dBm in the audio menu accessible via the 'Audio' button on the home screen.

Inputs

Audio Input

The XLR 5-pin connector on the camera's right side can now accept a 2 channel, line level balanced audio input. A/D conversion occurs at 24 bit/48 kHz. Audio can be recorded at 23.976, 24, 25, 29.97 and 30 fps. The camera records this audio into the QuickTime/ProRes file and embeds it into all HD-SDI outputs and the ARRIRAW data stream. Playback of audio is planned for a future software update.

Electronic Viewfinder







Smooth Mode

If the camera is set to any frame rate equal to or less than 30 fps, and any shutter angle equal to or less than 180 degrees, smooth mode can be turned on. This eliminates shuttering in the viewfinder image, but the appearance of the viewfinder image is then different from a projected image. Please note that Smooth Mode will use slightly more power. Smooth mode can be activated in 'MENU>Monitoring>EVF'.

False Color Exposure Check

Pushing the EXP button on the viewfinder will activate the false color exposure check as long as the button is pushed. By pushing the ZOOM button at the same time, the false color display will remain visible on the EVF-1. Pushing EXP again turns false color mode off. The false color exposure check changes the image to black and white and certain signal levels are indicated by a specific color.

Please note that currently the false color check is based on the Rec 709 image. When shooting in Log C, the false color exposure check will show a Rec 709 image. While the Rec 709 and Log C levels for the two middle values (pink and green) are almost identical, Log C has some additional range in the bright and dark image areas beyond what the false color exposure check indicates. Looking at it from the other side: if the false color exposure check indicates that you are OK in Rec 709, you are also going to be OK in Log C.

What	Signal Level	Color	
White clipping	100% - 99%	red	
Just below white clipping	99% - 97%	Yellow	
One stop over medium gray (Caucasian skin)	56% - 52%	pink	
18% medium gray	42% - 38%	green	
Just above black clipping	4.0% - 2.5%	blue	
Black clipping	2.5% - 0.0%	purple	

LOCK Button also Locks EVF-1 Buttons

The LOCK button on the camera body now also locks the EVF-1 'EVF' and 'CAM' buttons. Pushing LOCK will automatically close any open EVF menus.

EVF-1 White Point

The white point of the EVF-1 is set permanently to 6,500 degrees Kelvin.

Image Processing

EI 3200

The camera's sensitivity can now be set from EI 160 to EI 3200. The new line up of exposure indices looks like this:

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

Values behind the exposure index are the number of stops above and below 18% grey. These values are for Log C. Rec 709 and DCI P3 have 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.

New Color Processing

The color processing engine of ALEXA has been significantly enhanced. Log C is now available with film matrix off or on, Rec 709 has been improved and a DCI P3 option has been added. The new color processing is also the foundation for advanced features, like user looks in the camera, that will be available in future updates. Please note that the previous 'Log C (no matrix)' option is not available anymore.

As the new color processing has a slightly different look than that of previous SUPs, it is not recommended to change software during a show. Please also note that you will need new Look Up Tables (LUT) when working in Log C.

- 'Log C (film matrix off)' is a Log C signal with a wide gamut color space. This option gives the greatest flexibility in color grading, as it preserves the most color information in the recorded image. However, you should be aware that Log C is an intermediate color format and not designed as a display standard. Viewed on a regular video monitor, Log C image look flat and desaturated. When using Log C images, color grading becomes an obligatory post production step and for proper previewing, creation of dailies or editing proxies it is necessary to use Look Up Tables (LUT). LUTs for ALEXA can soon be downloaded from <http://www.arridigital.com/technical/lut>. For any further help with LUTs, contact digitalworkflow@arri.de.
- The new option 'Log C (film matrix on)' applies a color matrix that makes the resulting image resemble film negative scanned on an ARRISCAN. While this option somewhat reduces the color gamut in contrast to Log C (film matrix off), it provides an easy and fast way for colorists who are used to scanned film, thus speeding up color grading. It is also a great option when combining ALEXA images with film originated images. The same caveats as for Log C (film matrix off) also apply.
- The improved 'Rec 709' color processing shows a higher color saturation in highlights and more pleasing skin tones under tungsten light. Since Rec 709 is the international standard for displaying images on video monitors, Look Up Tables are not necessary to show these images on monitors or to create dailies or editing proxies. Additionally, Rec 709 images can be easily processed by most HD video postproduction gear in real time. While providing somewhat reduced choices in color grading, Rec 709 provides the fastest workflow when using an HD video based infrastructure.
- The new option of 'DCI P3' is suited for DCI P3 (also known as SMPTE 431-2) compliant displays. Those are primarily digital cinema projectors, but an increasing number of LCD displays supports DCI P3 as well. DCI P3 has a similar tone mapping to Rec 709 but a wider color gamut that is designed to approximate the color

gamut of print film. If you have a DCI P3 compliant monitor on the set or can see a DCI P3 compliant projection, this will give you a good idea what your images will look like in the digital cinema without having to use Look Up Tables.

Metadata

Metadata

Metadata will be included in the HD-SDI video output, the HD-SDI ARRIRAW T-link output, in the QuickTime metadata atom and in the FCP XML file on the SxS PRO cards.

Remote Control

No changes

User Interface

Single Frame Grabs

The GRAB button on the camera's right side will, when pushed, grab a still image from the REC OUT image path and store it on the SD card. This can be done at any time during standby, recording or playback. In the 'Framegrabs' menu a choice of file formats for these still images can be set: JPEG (.jpg), TIFF (.tif), DPX (.dpx).

Note: when REC OUT is set to ARRIRAW, no frame grabs are possible.

Superimposed Guides in EVF-1 and on MON OUT

ALEXA's ability to superimpose graphical guides over the EVF-1 and/or MON OUT images has been greatly enhanced. It is now possible to activate two frame lines, two user rectangles, a center mark and a surround view mask all at the same time.

- Two frame lines (Frame Line 1 and Frame Line 2) can be activated simultaneously from the 'Monitoring>Framelines' menu. Both will be visible in the EVF-1 and on the MON OUT output. Each can be chosen from a list of a maximum of 15 frame lines in the camera's non-volatile memory.
 - This list always contains five 'default frame lines': 1.33:1, 1:66:1, 1.78:1, 1.85:1 and 2.39:1.
 - Up to ten user frame lines can be added to the frame line list from XML files in the frame lines folder on the SD cards. These XML files can be edited directly with a text editor on a computer. Alternatively, the web based ARRI Frameline Generator can be used to create them at <http://www.arridigital.com/technical/aflc>.
- Two 'user rectangles' can be activated and adjusted in position and size in the 'Monitoring>Framelines' menu. These are rectangles that can be used as extra frame lines or place holders for logos or other content.
- The center mark (a cross or a dot) can be activated independently from the frame lines and user rectangles. The center mark can also be activated individually for EVF and/or MON OUT.
- When surround view is on, the surround view area is always marked to clearly indicate the boundary of the recorded 16:9 image. Surround view on/off and the type of surround view marking can be set individually for the EVF-1 and for the MON OUT output. Use the 'Monitoring>Electronic Viewfinder>Surround mask' or the 'Monitoring>MON OUT>Surround mask' menus to choose the type of marking (black line, color line, mask 25%, mask 50%, mask 75%).

Fps Info Screen

A new FPS INFO screen shows a summary of all frame rates in the camera: Sensor, Project, REC OUT, MON OUT, SxS 1 max fps and SxS 2 max fps.

Fps Screen

The Fps screen is accessed by pushing the 'Fps' soft button in the home screen. The Fps screen now shows the currently set SxS codec, maximum SxS fps (with that codec) and REC OUT frame rate above the labels of the lower 3 screen buttons. By pushing one of those buttons, these settings can also be changed.

Accessories

No changes

Service/Manufacturing

No changes

Known Issues

This is a list of known issues for this particular software update packet. For a listing of answers to frequently asked questions please look on the web at <http://www.alexadigital.com/alexa/faq>.

Imaging

Extreme Overexposure

An area that is overexposed more than eight stops above clipping can appear darker than its surroundings.

QuickTime/ProRes

Additional Corrupt Frames At End Of Clip

In rare cases there can be a number of extra corrupt frames after the last recorded frame in a QuickTime clip. The clip still plays properly and no frames are lost during recording.

Outputs

No known issues

Inputs

No known issues

Electronic Viewfinder

No known issues

Image Processing

No known issues

Metadata

Handling Of Incompatible Frame Rate Warning With ExtTC/Regen

If the camera is set to ExtTC/Regen and a time code is supplied to the camera that has a wrong framer rate or an incompatible frame rate, the camera shows a warning "W: External TC: Incompatible frame rate!". If then the frame rate is changed on the TC generator to fit the camera settings the warning does not go away until the TC cable is unplugged and replugged.

Timecode Reset after Reboot

On very rare occasions, Timecode will reset to 00:00:00 after a reboot.

Display of COUNTER/JAM SYNC Menu Item

Even though jam syncing is not possible in Int TC mode, 'Generator: Jam Sync' is shown as an option in the menu. This has no influence on the camera functions.

Remote Control

EXT Sync with 3G Output

When two cameras are synchronized using EXT sync and the REC OUT is set to 3G single link on both cameras, the REC OUT signals of both cameras may not be in sync after changing frame rates. You may need to reboot several times until the outputs are in sync.

EXT Sync with Asynchronous Frame Rates

If the sensor is set to a different frame rate than the HD output (REC OUT or MON OUT) a manual sync trigger (from the System > EXT Sync menu) may be required to get the HD outputs of both cameras synchronized.

EXT Sync Only Works Above 1fps

The sensors of two cameras can only be synchronized via an EXT sync cable at or above 1fps.

Web Remote Allow Changing Of Settings During Recording

The web remote does not block access to the sensor parameters during recording. Changing these parameters via the web remote while recording may cause the recording to stop due to a frame timeout error.

Web Remote Is Slow in Internet Explorer

Some of the web 2.0 technologies used by the ALEXA's web remote GUI are not compatible with Internet Explorer. The remote GUI is still displayed in Internet Explorer, but live updating is slow and usability is generally not as good as in Firefox, Chrome, or Safari.

User Interface

Rapid Scrolling In Playback List Goes To Live Image

When scrolling up and down rapidly in the clip list of the playback screen the HD outputs may eventually go back to the live image while the GUI is still in the clip list. If this happens the only way to restore playback capability is to eject and re-insert the SxS PRO card or to reboot the camera.

Circle Take Marking Not Recorded in Playback With Synchronized Cameras

If the 'CIRCLE CLIP' button is pressed in the PLAY screen when two cameras are synchronized via settings sync the circle clip information is not saved properly to the SxS PRO card. It does work properly during recording.

Frame Line Names Can Be Too Long

It is possible to create an XML file on the SD card with frame line names that are too long for the ALEXA camera display. This is ugly but does not stop you from choosing the frame lines and has no influence on any other camera functions.

Accessories

No known issues

Service/Manufacturing

No known issues

Updating Instructions

Download and Registration Process

You have to register your ALEXA camera by serial number to download Software Update Packets (SUP). SUPs can then be uploaded to the camera either from an SD card (described in detail below), or from a computer via the ALEXA Ethernet/RJ-45 Cable KC 153-S (3.00m/9.8ft, order number K2.72021.0).

Registration

- If you have not registered yet, go to the ALEXA downloads web page at <http://www.arri.com/goto/alex-dl>. When the page loads there will be a selection of downloads. Please go to section 'ALEXA Software Update Packet 3.0' and click on 'Please -> register to get an account.' The ALEXA customer registration page will be opened.
- Fill in the relevant data and make sure to put in the serial number(s) of your camera(s) in the format of K1.71000.0-2xxx. Don't forget to agree to the registration terms at the end of the page
- When you hit the 'create account' button the system will send you an acknowledgement email with a link for the activation of your account. After following the link a welcome mail is sent to you containing the login credentials. Please login at <http://www.arri.com/login/login.html> and navigate to the downloads again.
- Most of the downloads, such as technical information and manuals, are downloadable now. To access the software package downloads you have to apply for the activation to be entitled to download software by clicking on '-> Apply for activation to access this file'. A pop-up window will ask you to 'Apply for activation' - please do so.
- The activation process is a manual procedure so this might take up to one workday. You will receive a mail when your software download has been activated.
- Upon access of the software package download you will be asked to agree to the terms and conditions of this download. If you agree to these terms the download link is released.

Camera Update Procedure via SD Card

Using the SD card for updating is the easiest method. This method updates the ALEXA camera as well as the Electronic Viewfinder (EVF-1), as long as the viewfinder is connected to the camera.

Precautions

- Make sure the power supply of the camera is stable. The best way to achieve this is by using a mains power supply attached to the battery socket. We strongly recommend against updating an ALEXA that is powered through a battery.

Preparing the SD Card:

- Have a FAT16 or FAT32 formatted SD-Card ready
- Create the following folder structure on the SD-Card
 - folder named 'ARRI' in root of SD card
 - folder named 'ALEXA' inside the 'ARRI' folder
 - folder named 'Firmware' inside the 'ALEXA' folder
- Take the update package 'xxx.pkg' file and copy it to the 'Firmware' folder on the SD card.

Performing the Update:

- Turn the camera on.
- Insert the SD card into the SD card slot of the camera. The slot is located below the display on the bottom of the camera. The direction how the SD card has to be inserted is shown on the camera housing.
- A card icon will show up in the notification area of the camera display. If not, the card is not recognized by the camera.
- Go into the INFO screen by pressing the 'INFO' button.
- Save a camera log file onto the SD-Card by pressing 'SAVE TO SD'.
- Press the MENU button.
- Turn the wheel until you select 'System', then press the wheel.
- Turn the wheel until you select 'Firmware' then press the wheel.
- The Firmware screen shows you which packet is currently installed (Current version: xxx).
- Press the wheel to select the update file.

- The list shows you all firmware files that are available on the SD card.
- Choose the desired package and press the two lower outer screen buttons simultaneously to start the update.
- DO NOT REMOVE THE SD CARD WHILE THE PACKAGE IS BEING COPIED TO THE CAMERA!
- When the copy dialogue screen disappears, you can remove the SD card if desired.
- The update process will take 10 to 20 minutes. Wait until the update process has finished. This is indicated by a green screen informing you that the update process is completed.
- After the update, turn the camera off and on again, and perform a factory reset (located in the 'User Setups' menu).
- When updating from software package 1.0 to any later package, the camera's display shows 'Success' for APIC, CMC, and ACOM at the end of the update process. The camera must then be rebooted manually even though the screen still says 'Update in progress – do not power off the camera!' This is done by pressing the ON/OFF button until the camera switches off, then pressing the button again. This is not necessary anymore when updating from SUP 2.0 or later versions.
- Please note that User Setup files cannot be used across software packet updates, i.e. a User Setup file created with SUP 2.1 is not compatible with SUP 3.0.
- The camera firmware is now updated and you can use the camera.
- If the update process fails, repeat the update procedure. A failure would be indicated by a red screen.

Updating only The Electronic Viewfinder EVF-1 with a Computer

In case that the ALEXA electronic viewfinder (EVF-1) has not been updated with the camera, it is possible to update the EVF-1 separately by using a computer.

- Download the Software Update Package and place it in a folder on your computer. For information on how to obtain the SUP see 'Download and Registration Process' above.
- Connect the Ethernet port of the computer to the camera with the ALEXA Ethernet/RJ-45 Cable KC 153-S (3.00m/9.8ft, order number K2.72021.0).
- Connect the EVF-1 to the camera.
- Open a web browser on the computer and enter the following URL: <http://alexaXXXX.local/update.html> (where XXXX is the camera's serial number) to access the update web page.
- In the 'Camera Update' section select the Software Update Package by clicking the 'browse' button and selecting the path to the downloaded package on your computer.
- Click the 'Update EVF' button in the 'EVF Update' section.
- You can watch the progress of the update on the screen.
- When the update is done, the last line on the screen reads `successfully updated Evf`. The update is now finished even though the web browser continues to refresh the page. This is normal. The viewfinder is up to date.
- Depending on its software version the camera will state a 'software error – reboot camera' on the camera display. This is normal. Please reboot the camera.