ARRICORE

A new State of the Art RGB codec

W H I T E P A P E R

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1 Introduction

The ARRI brand stands for the highest product and image quality since 1917. To preserve as much of the image as possible, and to give filmmakers the greatest creative freedom in post, ARRI developed the uncompressed and unencrypted ARRIRAW format in 2008 for their digital cameras. This was followed by the ARRI Image Software Developer Kit (SDK), which allows third party vendors to easily incorporate the highest quality of ARRIRAW processing into their products. Both ARRIRAW and the ARRI Image SDK have been continuously improved since then to meet the quality demands of filmmakers worldwide. To continue meeting these high standards in the future, ARRI has developed a proprietary codec that combines all the advantages of ARRIRAW with maximum flexibility and a reduced data rate: ARRICORE.

ARRICORE is a next-generation RGB codec developed with high dynamic range encoding in mind. It delivers pristine image quality and post-production flexibility while maintaining a low data rate. The ARRICORE workflow on set and in post remains consistent with existing workflows. Like ARRIRAW, ARRICORE includes the same ARRI Look File ALF4 files, ARRI Textures, MXF wrapper, metadata, and audio handling.

The ARRI Reference Tool, both in its GUI and command line tool version, supports ARRICORE. Most third-party tools have successfully implemented our SDK as well and therewith gained ARRICORE compatibility within their pipeline.

2 ARRICORE in detail

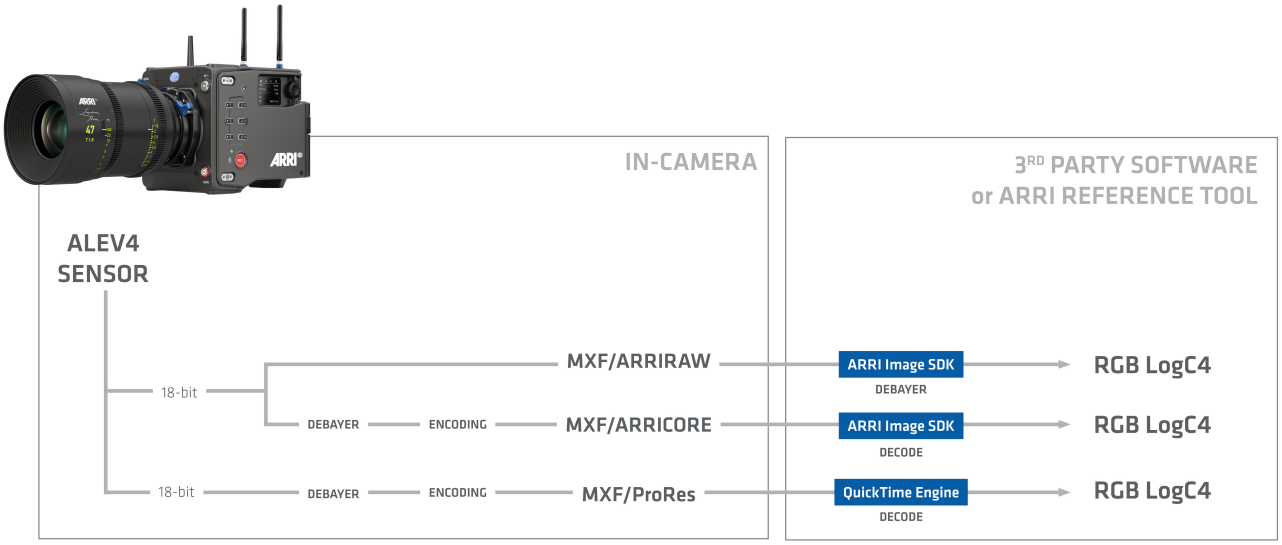
2.1 ARRICORE main features

- Futureproof RGB codec optimized for ALEXA 35's 17 stops of dynamic range and beyond
- 18 bit linear image data from the ALEV4 sensor stored in a RGB file in a logarithmic coding (we call it "Sensor Log")
- Enabling higher in-camera speeds in ALEXA 35 Xtreme with up to 330fps in regular or up to 660fps in Sensor Overdrive mode
- Flexible adjustments in post-production of exposure index, white balance and tint
- Fast proxy modes for speedy preview processing
- Full support through the ARRI Image SDK within the ARRI Partner Program
- MXF essence wrapping documented in SMPTE RDD 61:2025 – ARRICORE

2.2 Cinematic RGB, engineered for flexibility

ARRICORE marks a significant advancement in ARRI's imaging pipeline while building upon the legacy of ARRIRAW. Leveraging the 18-bit image processing pipeline inside the camera, the image from the sensor is debayered into an RGB image and then encoded by a proprietary process to an MXF-wrapped file.

Thanks to a constant bitrate implementation, ARRICORE enables precise estimation of the remaining recording capacity on the storage medium – a critical factor for real-time system planning and data management.



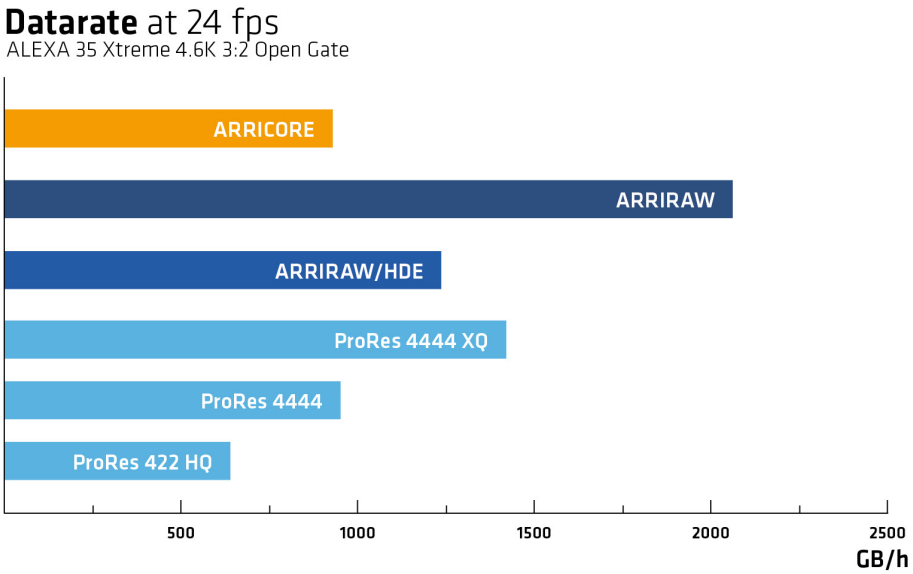
Although ARRICORE is not a RAW format, it retains the essential post-production flexibility of ARRIRAW: ARRI's Image SDK decodes the RGB Sensor Log image for a REVEAL workflow to enable changes in exposure, white balance, and color tint non-destructively after capture. REVEAL ensures maximum creative and technical control through delivering a RGB LogC4 image to the software including the SDK.

REVEAL color management and it's look file (ARRI Look File 4), introduced with ALEXA 35, remains unchanged throughout the pipeline, ensuring visual and technical consistency from acquisition to post-production where ARRICORE replaces ARRIRAW.

ARRICORE is also fully compatible with ARRI Textures, allowing cinematographers to define the image's structure and character at the point of capture. As with ProRes and ARRIRAW, the ARRI Textures are baked into the image.

2.3 ARRICORE data rate

Through efficient image data encoding, ARRICORE reduces the data rate by 50% compared to ARRIRAW, while preserving the same high level of image quality.



2.4 ARRICORE Metadata

ARRICORE embeds metadata directly within the file header, encapsulated in the MXF wrapper. All metadata elements are formally defined, documented, and maintained in accordance with official SMPTE Registered Disclosure Documents (RDDs). The mapping of the ARRICORE bitstream and its associated metadata into the MXF container is specified in SMPTE RDD 61, while SMPTE RDD 55 defines metadata elements that are independent of the codec.

2.5 ARRICORE and the ARRI Image SDK

Rather than introducing a separate toolset, the existing SDK is being extended to include ARRICORE functionality. ARRICORE is fully supported by the ARRI Image SDK v9.0.0 and higher. This ensures seamless integration into existing tools, with no limitations in availability or processing capabilities. In addition to full-resolution decoding, the ARRI Image SDK provides functionality for proxy file generation directly from ARRICORE footage. Hereby the implementation facilitates lightweight preview versions appropriate for editorial, dailies, or remote collaboration workflows.

The ARRI Image SDK is provided to our software partners free of charge in the ARRI Partner Program.

3 ARRI Reference Tool

To ensure reliable playback, review, and rendering of ARRICORE material at any stage of production, the latest ARRI SDK has been integrated into the **ARRI Reference Tool (ART) v. 1.8.0 and higher**. ART is a standalone application designed for playback, look management, and metadata inspection of ARRICORE, ARRIRAW, and ProRes clips recorded with ARRI cameras.

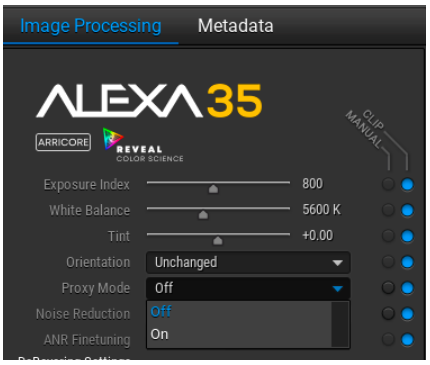
ART is available for macOS, and Windows, and can be used via a graphical user interface (GUI) or command-line interface (CMD, also available for Linux. Version 0.4.0 and higher). The tool is available free of charge for download from the ARRI website.

4 ARRICORE workflow integration

All post-production tools that utilize the ARRI Image SDK will support ARRICORE natively, once the SDK is updated within the respective software. The overall workflow remains consistent with ARRIRAW, ensuring a smooth transition for existing pipelines.

Creating proxies is especially fast with ARRICORE, as the ARRI Image SDK can easily render a lower resolution image from a full resolution ARRICORE image.

When Proxy Mode is activated in the ARRI Reference Tool (GUI version), the maximum proxy resolution is automatically upscaled to the recording resolution so that the maximum image quality and best proxy image quality have the same resolution.



Please note: HDE (High Density Encoding) is not available for ARRICORE. Mixed recordings – such as ARRIRAW and ARRICORE clips captured on the same recording medium – are fully supported and passed through without workflow disruption.

5 Feedback and general contact

In case you have feedback, questions or recommendations, please don't hesitate to contact our Workflow Team via digitalworkflow@arri.de.