

Axion Scanner Product Specification

Engineered for Excellence. Priced for Accessibility.

The need to preserve our shared history on film doesn't stop when budgets are tight. At CUI Imaging, we built this company from the ground up with a simple goal: to remove the barriers that have kept so many stories untold and unseen.

The Axion Scanner is the most affordable professional 8mm to 16mm film scanner on the market, giving archival institutions, preservationists, and commercial studios the tools to do serious preservation work without the hefty price tag.

Why Choose the Axion Scanner?

- **Professional 4K Image Quality:** Native 4K resolution with up to 12-bit dynamic range per color channel captures every grain and detail from 8mm, Super 8, 9.5mm, and 16mm formats.
 - **Ultra-Fast Workflow:** Digitizes film faster than real-time playback, with scanning speeds up to 60 fps.
 - **Archival-Grade Film Handling:** A highly flexible, reel-driven, sprocketless design ensures gentle, continuous motion with completely software-adjustable film tension.
 - **Scan Damaged Film with Confidence:** Features scatter-light optical pin registration with software-selectable perforation edges, enabling reliable scanning—even with damaged, shrunken (up to 10%), or irregular perfs.
 - **A Complete Ecosystem:** Includes full licenses for our powerful AxionDirect™ capture software and AxionFlow™ post-processing suite.
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Standout Features

Advanced Optical & Lighting System

Our pulsed, full-color RGB LED light source features true analog dimming and 12-bit color depth per channel, offering limitless control over brightness and hue. Short, rapid pulses minimize heat to protect delicate film. A built-in software color grading tool lets you optically correct dye fading *before* image capture, preserving maximum digital dynamic range for post-processing.

Next-Generation Audio Capture

We designed the Axion Scanner to offer unmatched audio quality without the high cost and complexity of capstan-based systems.

- **Magnetic Sound with SMDS 2.0:** Our 2nd generation Speed-Matched Dynamic Sampling technology dynamically samples the audio signal to match the exact speed of the film, drastically reducing wow and flutter. This results in smoother, more consistent audio reproduction that rivals or exceeds well-maintained magnetic sound projectors.
- **Optical Soundtracks (OST) Extraction Engine 2.0:** Our 2nd generation advanced optical sound extraction solution works directly with edge-to-edge scanned frames. AxionFlow™ automatically extracts, stitches, and synchronizes the audio directly from the image data, supporting both variable-density and variable-area soundtracks.

Integrated Film Cleaning & Wet-Scan System

Every scanner includes washable silicone rollers that gently remove surface dust before the film enters the gate. For heavily worn archival elements, the **Optional Wet-Scan System** automatically applies a controlled fluid layer right before the gate. This optically minimizes the visibility of non-emulsion surface scratches and abrasions, while an integrated drying fan safely removes residual fluid before winding.

The Software Suite (Included)

AxionDirect™ Capture Software

Put complete control at your fingertips with an intuitive interface designed for both everyday users and advanced professionals. Manage every aspect of the capture process, from precise image sensor settings and color correction of the RGB light source to film transport and film tension adjustment. AxionDirect™ allows you to switch scanning modes, operate the Wet-Scan pump, and monitor audio levels instantly. To optimize your workflow, the software supports capturing in **CRB**—our proprietary raw format designed for high-speed, lossless image storage that retains full quality at only one-third the file size of traditional uncompressed formats.

AxionFlow™ Frame Processing Software

Streamline your post-scan workflow with a cohesive, professional-grade processing engine. AxionFlow™ handles frame stabilization using advanced algorithms and user-definable features for precise control. The software automates audio-video synchronization for both optical and magnetic sound, including seamless extraction and stitching of optical soundtracks directly from

the scanned frames. AxionFlow™ also features an **SMDS resampling tool** for lossless post-scan SMDS adjustment and built-in **batch image format converters** that allow users to easily convert CRB files to other industry-standard formats. Designed for efficiency, the software supports task queuing across multiple projects and exports your work into a wide range of video formats for seamless integration into professional post-production pipelines.

Technical Specifications

Film Transport & Handling

- **Film Gauges:** 16mm, Super 16mm, 8mm, Super 8mm, 9.5mm
- **Film Stocks:** Print, Negative, Interpositive, Internegative (Mono and Color)
- **Capacity:** 16-inch reel or 2300 ft
- **Transport System:** Continuous motion sprocketless reel-to-reel drive
- **Registration:** Non-laser fiber scatter optical pin registration
- **Run Speed:** Up to 60 fps (8mm or Super 8)
- **Wind Speed:** Up to 150 fps (8mm or Super 8)
- **Acceleration:** Up to 30 fps/s
- **Film Shrinkage Tolerance:** Up to 10%
- **Dirt and Scratch Reduction:** Cleaning rollers, wet scan kit

Imagery & Optics

- **Native Resolution:** 4200 x 2160
- **Exposure Time:** 11 - 500 microseconds
- **Pixel Format:** BayerGR8, BayerGR12
- **Light Source:** Pulsed full-color RGB LEDs with 12-bit analog dimming each channel
- **Imagery Optics:** Adjustable Focus, Adjustable Aperture F/2.8-32

Effective Resolutions

With Default Setup

- approx. 3166 x 1900 - Super 16
- approx. 2533 x 1900 - Standard 16
- approx. 1373 x 1030 - Super 8
- approx. 1133 x 850 - Standard 8
- approx. 2184 x 1670 - 9.5mm

With Advanced Setup

- approx. 3166 x 1900 - Super 16
- approx. 2533 x 1900 - Standard 16
- approx. 2533 x 1900 - Super 8
- approx. 2533 x 1900 - Standard 8
- approx. 2484 x 1900 - 9.5mm

Effective resolution represents the resolution of the cropped image area for a given film format.

Audio System

- **Optical Soundtrack:** Extraction from scanned image. Effective frequency range: 20 Hz - 12 kHz
- **Magnetic Soundtrack:** Tape head reading method (Replaceable tape head with service hour tracking). Adjustable azimuth.
- **Magnetic Frequency Range:** 20 Hz - 20 kHz
- **Noise Floor:** Up to -55 dB unfiltered (16mm), up to -75 dB (10 kHz filtered 16mm)

Software Outputs & Data Rates

- **AxionDirect Output:** CRB (CUI Imaging RAW), JPEG/JPEG 2000 sequence. Audio: CRA (CUI Imaging RAW), WAV up to 32-bit at 96kHz.
- **AxionFlow Output (Image Sequence):** DPX, PNG, TIFF, JPEG/JPEG 2000
- **AxionFlow Output (Video):** MPEG-2, H.264, H.265, VP9, AV1, ProRes, FFV1
- **Max Combined Data Rate:** 5.5 Gbps (687.5 MB/s)

System Requirements

- **OS:** Windows 10 or 11 (64-bit)
- **CPU:** Intel Core i7 10th Gen with 8 threads or equivalent AMD Ryzen processors minimum; Intel Core i7 / i9 (12th Gen+) or equivalent AMD Ryzen 7 / 9 recommended
- **RAM:** 16 GB DDR4 minimum; 32 GB DDR4 or DDR5 recommended
- **Graphics:** NVIDIA GeForce GPUs recommended
- **Connection:** USB 3.1 Gen 2 or 3.2 Gen 2 (10 Gbps) and above recommended

Physical Specifications & Operating Conditions

- **Dimensions:** 27.9" W x 20.6" H x 8.1" D (without reels/platters)
- **Weight:** 44 lbs (without accessories)
- **Power:** 100 - 240V AC, 120W Max
- **Temperature:** 10°C to 30°C (50°F to 86°F)
- **Humidity:** Maximum 65% non-condensing

Compliance & Certifications

- **Regulatory:** FCC Part 15 Subpart B Class A

(The Axion Scanner and its accessories are classified as professional equipment designed for trained operators in environments such as commercial, archival, and studio settings. They are not intended for home or general consumer use.)

Built for Professionals. Supported for Life.

At CUI Imaging, we stand behind our products with lifetime support. Whether you choose in-house service with a loaner unit or prefer to perform repairs yourself with our guidance, we ensure your workflow never stops.

- **1-Year Limited Manufacturer's Warranty** (Extended options available)
- **Lifetime Support:** Access to replacement components and expert guidance.
- **Service Loaners:** Loaner modules or scanners available to keep your project moving.