SCANITY 2

The High-Performance Film Scanner

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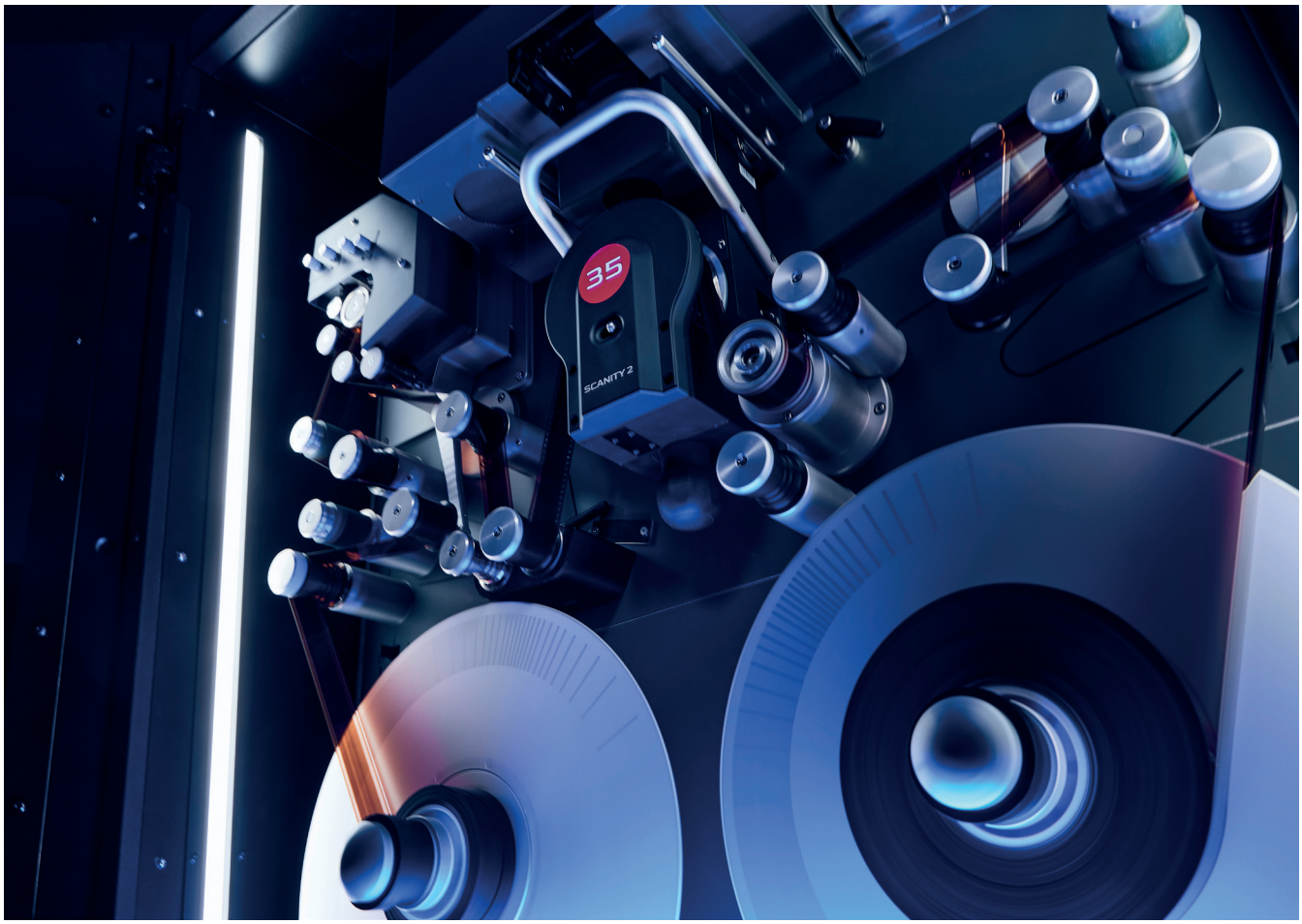


CONTENT

SCANITY 2

Market-Leading Quality at Real-Time Speed

Scanity 2 is the only scanner combining high-end 4K RGB-IR image quality with high-speed scanning performance, setting a new benchmark for preservation, restoration, and high-volume digitization workflows.

The High-Performance Film Scanner

High Quality, Speed, and Precision

Scanity 2 takes DFT's renowned Scanity series of film scanners to a new level of performance. Built on the proven platform of the original Scanity, its new imaging, lighting, and processing systems elevate Scanity 2 to unprecedented levels of speed, dynamic range, and precision.

DFT's award-winning engineering team has advanced Scanity to once again set a new standard for high-end film scanning. The result is a film scanner of exceptional performance, combining advanced high-performance technology, superior optical resolution, high-density image reproduction, and outstanding throughput while preserving the qualities that made Scanity 1 the internationally recognized benchmark for film scanning.

Innovative Core Technology

A high-performance imaging system and cutting-edge data-processing technology provide high-end dynamic range and unprecedented speeds. Scanity 2's advanced multi-stage TDI sensors are highly sophisticated systems that can be configured to meet specific requirements in dynamic range and speed.

At maximum dynamic range, the sensors operate at speeds of up to 20 fps (native 4K RGB-IR, 35 mm 3-perf). At standard dynamic range, they reach up to 56 fps (native 4K RGB-IR, 35 mm 3-perf).

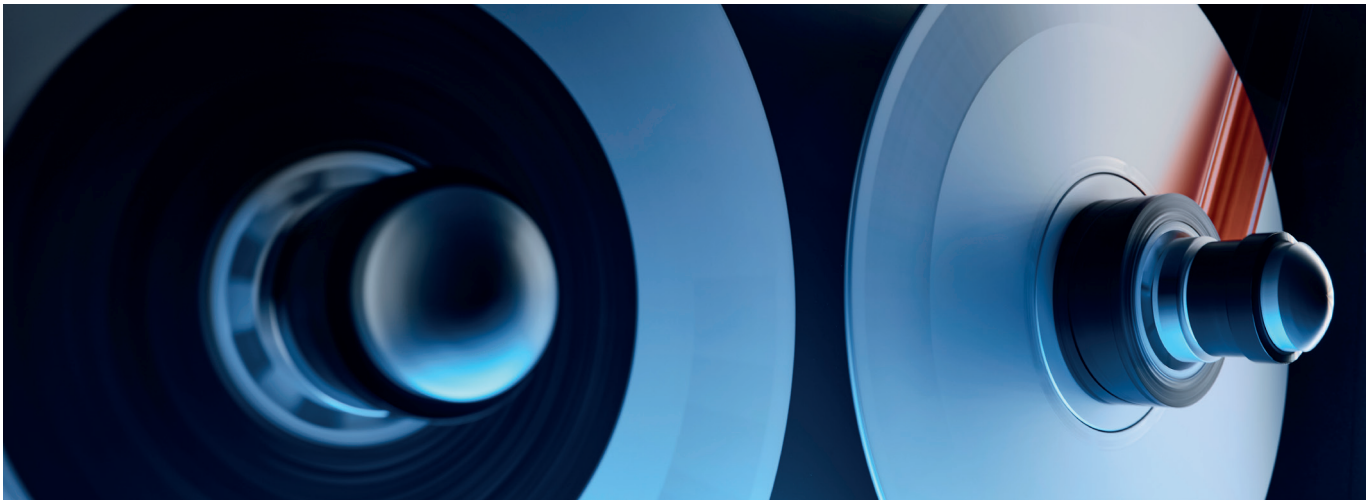
Modular and Future-Proof Platform

The mechanical and optical components of Scanity 2, together with its embedded electronic control units, are designed to deliver peak performance throughout the scanner's service life.

While modern data-processing technologies are highly durable, their performance and capabilities may be surpassed as processing power, interfaces, and computing standards evolve. Scanity 2 addresses this challenge through its modular architecture, allowing critical processing components to be easily upgraded as technology advances. Scanity 2 is designed for scalability, long-term upgradeability, and extended service life.

Key Benefits

Key Feature	Technology	Benefit	Key Advantage
Speed	High-speed, native 4K concurrent RGB and Infrared (IR) scanning	Achieves throughput speeds of up to 56 fps at full native resolution (35 mm, 3-perf).	Eliminates the traditional trade-off between image quality and speed, allowing preservation facilities to meet demanding commercial throughput requirements without compromising resolution or color accuracy.
Dynamic Range	Dual-array TDI sensor architecture coupled with an advanced HDR operating profile	Captures 24 bits of density data per color and pixel to resolve extreme density ranges in a single scan pass, dramatically minimizing dark noise.	Delivers the uncompromising performance of a high-end HDR system at significantly higher speeds, resolving the deepest blacks of challenging archive stocks.
Image Stability	Touch-free OPR (Optical Pin Registration) applied at full scanning speed using a massive parallel GPU processing architecture	Precisely detects perforation hole positioning to electronically correct horizontal and vertical frame alignment as the film moves through the gate.	Delivers flawless frame positioning without physical contact and any rescaling, offering absolute safety for fragile archival stocks while eliminating the effort of post-scan digital stabilization.



Key Feature	Technology	Benefit	Key Advantage
Sensor Uniformity	State-of-the-art single-die CMOS TDI sensors spanning the full width of the gate	Provides highly consistent sensitivity across the entire width of the film.	Eliminates the need for extensive calibration procedures. Sensor artifacts and sensitivity variations are minimized, cutting calibration downtime to a fraction of previous systems.
Full-Perf Overscan	Native 8.2K trilinear RGB sensors providing sufficient resolution to support native 4K output while accommodating extensive overscan	Captures the full active image area along with the entire perforation area, extending almost to the edge of the film.	Provides archives with ultimate workflow flexibility, ensuring that vital edge data, metadata, and maximum spatial resolution are captured in a single pass to ensure long-term usability of the digital asset.

Flexibility like never before: Three Operating Modes

To give users the optimal choice of speed and dynamic range for each project, Scanity 2 offers three distinct operating modes. Whether the priority is maximum dynamic range, maximum throughput, or the optimal balance between the two, all modes are easily accessible via simple GUI commands.

Scanity 2 Operating Modes		
Performance Mode	**MaxHDR Mode**	**Speed Mode**
The Balanced Standard	***Maximum Dynamic Range***	***Maximum Throughput***
▪ Ideal for most applications ▪ Fast and high-quality digitization ▪ High-quality 4K RGB-IR at real-time speed	▪ For film with very high densities ▪ Master scans ▪ Native 4K RGB-IR at very high dynamic range	▪ For film with non-critical densities ▪ Dailies ▪ Cataloging ▪ High throughput up to 56 fps

Performance Mode

The Balanced Standard

Performance Mode delivers the optimal balance for standard operation, combining exceptional dynamic range with very high scanning speed. It enables pristine 4K scanning at real-time speeds, making it the preferred choice for most archival and digitization projects.

Technology:
- TDI sensor architecture, dual-readout
- Extended HDR sensitivity ratio

Delivers:
- Scanning speeds at real-time rates (21 – 28 fps)
- Dynamic range comparable to Scanity 1

In Performance Mode, Scanity 2 is 5 to 10 times faster than scanners of comparable image quality.

Scanity-quality, faster than ever before –
Speed advantage compared to other scanners

Example: Feature Film, 100 Minutes		
Scanner	**Scanning Speed (at 4K RGB)**	**Approximate Scanning Time**
Scanity 2	**21 – 28 fps**	**114 min (1 h 54 min) – 86 min**
Scanity 1	15 fps	167 min (2 h 47 min)
Other scanners	4 – 6 fps	625 min (10 h 25 min) – 403 min (6 h 43 min)

MaxHDR Mode

Maximum Dynamic Range

MaxHDR Mode is engineered for high-end preservation workflows that prioritize image quality over scanning speed. It maximizes the scanner's dynamic range to capture the highest possible density information from very dense black-and-white or color film stocks. By maximizing dynamic range and suppressing dark noise in a single pass, MaxHDR Mode prioritizes maximum image fidelity over scanning speed.

Technology:

- TDI sensor architecture, dual-readout
- Maximum HDR sensitivity ratio

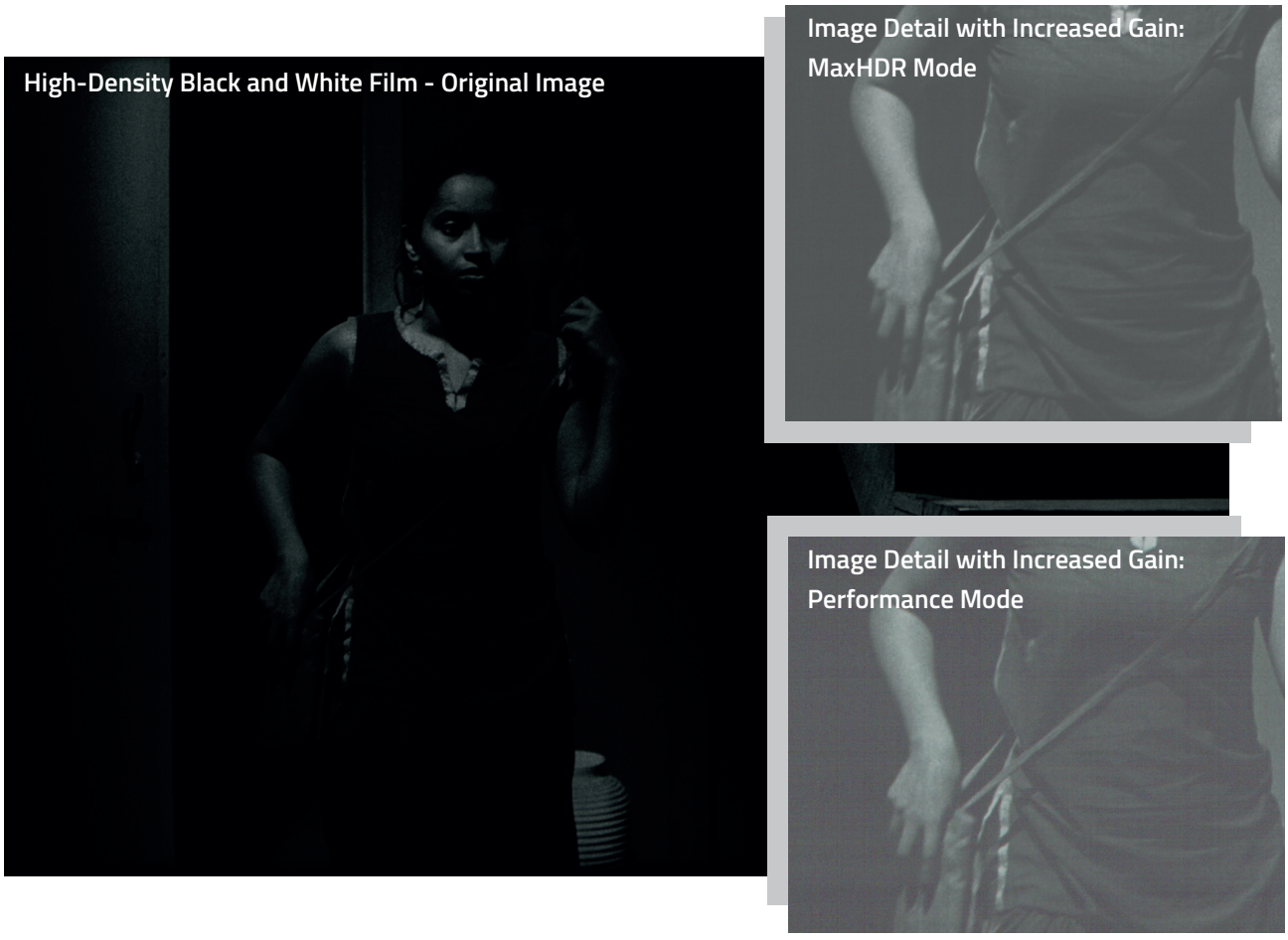
Delivers:

- Fast 4K HDR scanning (15 – 20 fps)
- Very high dynamic range comparable to other high-end film scanners

Speed advantage compared to other scanners with high-end dynamic range capabilities

Example: Feature Film, 100 Minutes		
Scanner	**Scanning Speed (at 4K RGB)**	**Approximate Scanning Time**
Scanity 2	**15 – 20 fps**	**160 min (2 h 40 min) – 120 min (2 h)**
Other scanners	1.2 – 2.2 fps	2.083 min (34 h 43 min) – 1.136 min (18 h 56 min)

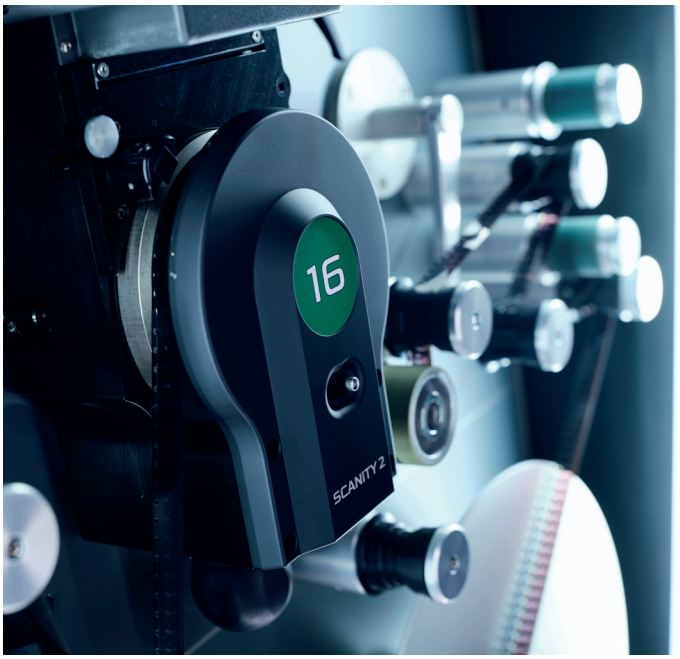
Scanity 2 in MaxHDR Mode is 5 to 10 times faster than other high-end scanners.



Speed Mode

Maximum Throughput at Twice Real-Time Speed

Speed Mode is the high-throughput complement to MaxHDR. Speed Mode prioritizes high-speed throughput over increased dynamic range. Utilizing the massive 128-line TDI stage to keep high-speed noise remarkably low, it is engineered specifically for time-critical, high-volume commercial projects that demand rapid turnaround without compromising native resolution.



Technology:

- TDI sensor architecture, single stage
- High-speed readout

Delivers:

- Full-resolution native 4K RGB-IR scans
- Twice real-time speed at 42 – 56 fps

Speed advantage compared to other high-speed scanners

At twice real-time speed, Scanity 2 in Speed Mode delivers the industry's fastest native 4K RGB scanning performance. Even when compared to fast non-RGB scanners, Scanity 2 provides significantly higher throughput.

Example: Feature Film, 100 Minutes		
Scanner	**Scanning Speed**	**Approximate Scanning Time**
Scanity 2	**42 – 56 fps**	**57 min – 43 min**
Scanity 1	15 fps	167 min (2 h 47 min)
Other scanners (in 4K RGB)	6.2 fps	403 min (6 h 43 min)
Other scanners (in 3K/2K RGB)	7 fps	357 min (6 h)
Other scanners (non-RGB)	25 – 30 fps	96 min (1 h 36 min) – 80 min (1 h 20 min)

The Science behind Scanity 2

Advanced TDI Sensor Technology

Scanity 2 uses advanced TDI (Time Delay Integration) sensors with one sensor dedicated to each channel: red, green, blue, and infrared. With a 128-stage main TDI array and a secondary 64-stage array, each line of film is sampled up to 192 times as it passes through the gate.

By integrating those up to 192 samples into a single signal, Scanity 2 significantly reduces sensor noise, providing precise low-noise brightness data. This high level of light integration provides substantially greater sensitivity than conventional sensors, enabling high-speed scanning performance with exceptionally low noise.

High Dynamic Range (HDR) Capture

The scanner's TDI sensor architecture allows for native capture of a wide dynamic range. By combining two separate TDI arrays within one sensor, Scanity 2 can simultaneously capture the bright highlights and deep blacks of the dynamic range.

Dynamic range on par with other high-end HDR film scanners is achieved by capturing all color channels and exposure levels simultaneously. This full parallelization of the capture process is the key to delivering a high dynamic range at substantially higher speeds.

Optical Pin Registration (OPR)

Modern high-end film scanners utilize pin-less film transports and Optical Pin Registration (OPR) to achieve precise frame positioning. OPR is a completely touch-free system that optically detects the position of each perforation hole in real time.

Harnessing the scanner's high-speed GPU processing platform, the system instantly calculates and electronically adjusts horizontal and vertical image stability without any rescaling applied. The result is flawless pin-registration accuracy across the entire scan, eliminating physical film wear and any need for post-scanning digital stabilization.

GPU-Based Processing Platform

In Scanity 2, the fixed-function hardware processors of earlier scanner generations are replaced by a high-speed GPU-based processing platform.

Graphics Processing Units (GPUs) are particularly well suited for film scanning because their parallel processing architecture enables very fast and efficient image processing. The Scanity 2 GPU processes the stream of high-resolution image data from all four sensor channels at full sensor speed.

Beyond its raw benefit in performance, the GPU architecture is a modular concept, making Scanity 2 future-ready by design: as technology advances, the platform is easy to upgrade. Keeping the computing power of Scanity 2 up to date as technology advances can be as simple as exchanging the scanner's GPU.

Customized Precision Illumination

Scanity 2 uses a high-performance LED light source. The red, green, blue, and infrared LEDs are each tuned to align precisely with the sensitivity characteristics of the corresponding film dye layers. The light source is paired with a sophisticated high-performance optical assembly that directs the light to the film gate with exceptionally even intensity across the full width of the film frame. Light loss along the optical path is minimized for high power efficiency.

The Scanity 2 cameras are equipped with narrow-band optical filters allowing only the wavelengths of the respective light color to pass into the cameras.

This results in perfect color separation, accurate density reproduction, and a minimum of unwanted secondary densities at very high scanning speeds. Besides color reproduction faithful to the original film, low heat emission and long operational life of the LEDs ensure safe handling of archival materials and low running costs.

Precision Optical System

The optical system of Scanity 2 is specifically designed to deliver maximum resolution and image sharpness across every color channel.

A fundamental challenge in any optical system is chromatic focus deviation: different wavelengths of light – red, green, blue, and infrared – are refracted slightly differently within the lens, causing the focus points of each color to deviate.

In conventional scanning systems, this chromatic aberration forces a compromise focus position that can only be optimal for one color channel. Scanity 2 overcomes this constraint by precisely aligning each of its four cameras along the optical axis, placing every sensor at the exact focus position of its specific wavelength. With perfect, uncompromised sharpness in every color channel, the full resolving power of the optical system can be utilized in every frame.

True RGB Capture

Most digital color cameras and film scanners use a single image sensor equipped with a Bayer color filter array, where each pixel captures only one color and the missing color values are interpolated from neighboring pixels. Bayer color filters have broad spectral bandwidths to maximize light throughput at the cost of a significant overlap between channels, resulting in color crosstalk and reduced color accuracy.

Scanity 2 uses four dedicated line-scan cameras with narrow-band color filters that cleanly separate the red, green, blue, and infrared channels without any overlap. Every pixel represents directly measured data – no interpolation, no crosstalk. Combined with the spectrally matched LED light source, each channel captures only the information it is intended to record, delivering color reproduction of exceptional purity and full spatial resolution in every channel.

Features and Options

Digital Optical Audio Capture

Scanity 2 leverages its extended image sensor capabilities and GPU-based processing platform to capture and process optical audio tracks in real time, entirely within the normal scanning workflow. As the film passes through the gate, the audio track area is captured as part of the full-width image data stream, with no separate scan pass required. The optical audio image data is extracted and converted to digital audio in real time during scanning. The resulting audio file is stored alongside the image data as part of a single, unified workflow.

This integrated approach provides a significant practical advantage: image and audio are captured simultaneously in one pass, avoiding the effort and handling risk associated with running the film through a separate audio reader. The result is a clean, synchronized digital audio file derived directly from the optical track at the full precision of the Scanity 2 imaging system.

Sondor Soundhouse Audio

The renowned Sondor Soundhouse audio option of earlier Scanity models is also available for Scanity 2. The Sondor Soundhouse provides an audio scanning option enabling direct digitization of analog optical mono or stereo soundtracks from 16 mm or 35 mm print and magnetic tracks on 16 mm film. The Sondor Soundhouse eliminates the need for separate image and audio scanning passes.

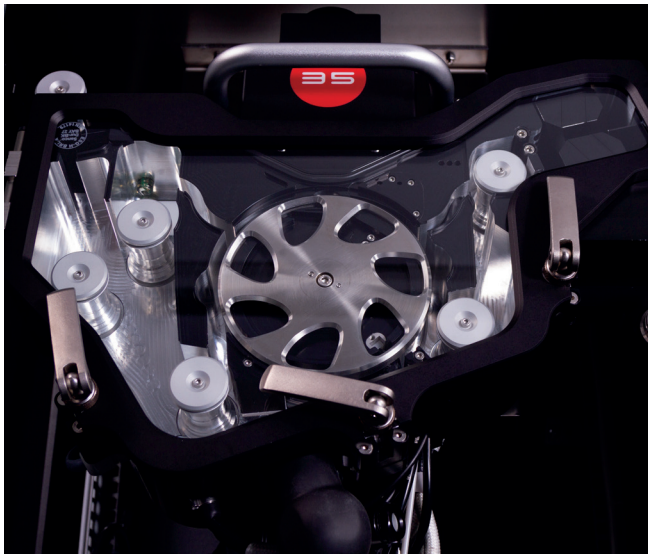
The soundtrack is picked up by the analog audio heads and converted into digital audio files on the Scanity 2 workstation. The resulting audio file is stored alongside the image data as part of a single, unified workflow. Internal processing within the audio scanner compensates for any audio delays that are introduced, as well as any pitch changes due to film shrinkage or other factors.

Gate Options

Scanity 2 is designed as a multi-format scanner, supporting typical professional motion picture film gauges by means of interchangeable lens gate assemblies. Gates are available for the 35 mm and 16 mm film formats, with the 16 mm gate optionally also supporting 8 mm film.

Each gate is precisely optimized for the geometry and optical characteristics of its respective format. The gates are based on the same fundamental design principle: the precision roller gate avoids mechanical stress and risk, providing exceptionally smooth and safe film handling.

For 35mm film, the gate supports all common perforation pitches – 2-perf, 3-perf, 4-perf, and 8-perf (VistaVision) – as well as Full Aperture (Super 35) and Academy Camera Aperture framing. The 16 mm gate covers both Standard 16 mm and Super 16 mm formats and, with the 8 mm option installed, also Super 8 and Regular 8 mm. Changing the gates is quick and straightforward.



WetGate Option

Optical Restoration at the Point of Scanning

The optional WetGate system for Scanity 2 provides a proven and powerful solution for scanning film with surface damage that would otherwise require extensive post-processing to be corrected. Usually, scratches and other surface imperfections scatter light during scanning and appear as visible defects in the resulting image. WetGate addresses this challenge at the source: The film is immersed in a fluid which has the same refractive index as the film base. As surface irregularities are filled during scanning, they become invisible to the sensor.

The WetGate system consists of two main components: the Lens Gate Assembly (LGA), available for both 35 mm and 16 mm film, and a supply unit housing the fluid tank, filters, pumps, and control units.

The film passes through three stages: a pre-chamber for removal of air bubbles and dust particles; the scanning area, where the fluid-immersed film travels through the gate on a glass roller; and finally a drying unit removing remaining fluid from the film's surface. The WetGate is a sealed fluid enclosure that is automatically filled and drained as needed.

Switching between wet and dry scanning only requires exchanging the gate assembly, making the WetGate a flexible addition to the Scanity 2 workflow rather than a dedicated configuration. While scanning speeds in WetGate operation need to be adjusted to drying requirements, all other Scanity 2 features – including OPR, full-perf overscan, and dynamic range – remain fully active in WetGate operation.

Integrated Storage

Scanity 2 introduces an optional integrated storage solution through the DFT Workstation built directly into the scanner. In earlier Scanity models, the full scanning speed could only be sustained if the connected external storage or network infrastructure could receive data at the same rate. Scanity 2 resolves this dependency by allowing scan data to be written directly to high-speed internal NVMe SSD storage at full scanning speed, without any external bandwidth requirements during the scan itself.

Project data can be transferred to a post-production workstation or central storage infrastructure during idle periods or in a background process at whatever bandwidth the existing network allows. Decoupling scanning and storage infrastructure allows facilities to fully leverage the high-speed performance of Scanity 2 without needing to upgrade their existing IT setup – a significant advantage, particularly for high-volume digitization environments.

Output Encoding

Scanity 2 features an integrated encoding engine that converts scan data directly into the file formats required for downstream post-production and archive workflows – eliminating the need for a separate transcoding step after scanning. Supported formats include industry-standard codecs such as ProRes, OpenEXR, and other lossless compression formats, covering the full range of requirements from high-throughput dailies and digital intermediate workflows to long-term archival storage.

Depending on the characteristics of the codec, encoding is either handled in real time during the scan itself, with finished deliverable files written directly to storage as the film moves through the gate, or processed in a fully automated batch operation immediately following the scan, requiring no operator intervention. In both cases, the encoding workflow is seamlessly integrated into the Scanity 2 software environment, keeping the overall digitization pipeline as efficient and streamlined as possible.

KeyKode Reader

The optional KeyKode reader allows Scanity 2 to read the machine-readable code printed on the edge of motion picture film during the scan. Developed by Kodak, KeyKode is an industry-standard system that encodes the film manufacturer identification, film stock type, roll number, and a precise footage and frame counter into a code that runs along the film edge. The KeyKode reader captures this information in real time as the film passes through the scanner and feeds it directly into the metadata of the resulting scan files.

Film Transport

Lens Gate Assemblies S35/35mm S16/16mm (with optional S8/8mm)	Roller gate with reference edge on which the film travels Optical Pin Registration (OPR) Pressurized-air-supported film gate No contact points that could cause the film to slip or wear
WetGate for 35 mm and 16 mm	Optional Full-Immersion WetGate System for 35 mm and 16 mm
Film format 35 mm	Maximum scan width 31.8 mm, pixel pitch 6.0 µm; 2-perf, 3-perf, 4-perf, 8-perf (VistaVision); Cinemascope Fixed settings for full aperture (Super 35) and ACA (Academy Camera Aperture) for easy operation
Film format 16 mm	Maximum scan width 14.1 mm, pixel pitch 3.0 µm; S16 or 16 mm, fixed settings for S16, N16
Film format 8 mm	Maximum scan width 8 mm (edge-to-edge), pixel pitch 3.0 µm (2K native resolution) Max8, S8 or 8 mm, fixed settings for standard formats
KeyKode reader	For 16 mm and 35 mm films Film stock recognition and film stock memory recall, metadata generation
Shrinkage	Horizontal: up to 3.9% (35 mm, depending on film condition) Vertical: not limited
Film protection support	Teflon-based scratch protection (TSP) on gate surface (optional) Required for support of, e.g. film with extended notches or high horizontal shrinkage
Film length	On cores 609 m / 2000 feet; A/B wind
Shuttle speed	2.2 m/s = 120 fps on a 35 mm 4-perf film

Image Capture System

Light source	RGB-IR LED, cold diffuse light source
Image sensors	Multi-stage high-resolution TDI sensors (Time Delay Integration) for red, green, blue, and IR channels
Image processing	Processing quantization: 16 bit Highly customizable signal processing path: look-up table – matrix – look-up table Factory and custom settings, spatial processing for image formatting at high scanning speeds, including anamorphic unsqueeze 2:1
Focus	Automatic and manual focus Manual focus with focus aid using the TDI sensor in field array mode
Density setting	Auto-D min setting for automatic light adjustment of color channels

Scanning Performance

Dynamic sensitivity and speeds — All modes and speeds operate at full-resolution 4K RGB-IR

Operating Mode	Application	16 mm	35 mm 3-perf	35 mm 4-perf
Performance Mode	Increased dynamic range[1) 2)]	25 fps	28 fps	21 fps
MaxHDR Mode	Maximum dynamic range[1)] (maximum spread of exposure ratios)	25 fps	20 fps	15 fps
Speed Mode	Standard dynamic range at maximum speed	50 fps	56 fps	42 fps

1) Integrated simultaneous HDR (High Dynamic Range) technology

2) Performance Mode provides a dynamic range equivalent to earlier Scanity models

File Output

File format	8 bit LOG / LINEAR TIFF / DPX 10 bit LOG / LINEAR DPX 12 bit LOG / LINEAR DPX 16 bit LOG / LINEAR TIFF / DPX All DPX output file formats according to SMPTE 268M Batch processing supports a wide range of streaming and compressed deliverable formats Presets available for various image resolutions
Components and packing	Y-only: 8, 10, 12, 16 bit (single channel) RGB: 3 x 8 bit 3 x 10 bit, filled to 32 bit (DPX only, two padding bits: DPX methods A or B) 3 x 12 bit, packed (DPX only) 3 x 16 bit RGBA: 4 x 8 bit 3 x 10 bit + 2 bit, filled to 32 bit (DPX only, two Y bits: DPX methods A or B) 4 x 16 bit RGB + A: 3 x 8 bit + 1 x 8 bit (two separate files, DPX only) 3 x 16 bit + 1 x 16 bit (two separate files, DPX only)
Output color space	RAW, presets, user-definable settings

Audio

Sondor Soundhouse (optional)	Digitization of analog captured optical and magnetic audio-tracks Available soundheads: 16 mm and 35 mm optical, 16 mm magnetic
Digital Optical Sound Extraction (optional)	Digital audio film soundtrack extraction via main camera system Supported formats: silver halide, high magenta, and cyan dye tracks for prints and negatives

Workstation and Storage Solutions

DFT Workstation	Intel Xeon Gold 16 Core CPU Ubuntu OS, LTS version NVIDIA RTX Pro Blackwell GPU Redundant system drives Dual Port Gigabit network interface 100 Gb Ethernet (default) or 32 Gb Fibre Channel network interface
Storage option	On-board NVMe storage solution; 16 TB, 32 TB or 64 TB

Mechanical Dimensions and Weight

Dimensions	Scanner unit: 984 mm (width) x 1943 mm (height) x 811 mm (depth) - including door handles WetGate supply unit (option): 600 mm (width) x 1700 mm (height) x 750 mm (depth) WetGate controller box (option): 500 mm (width) x 400 mm (height) x 220 mm (depth)
Weight	Scanner unit: approx. 320 kg / 705 lb WetGate supply unit (option): approx. 93 kg / 205 lb WetGate controller box: approx. 15 kg / 33 lb
Dimensions of transport crate	Scanner transport crate: 1220 mm (width) x 2210 mm (length) x 1080 mm (height) WetGate supply unit: 770 mm (width) x 2140 mm (length) x 960 mm (height)

AC Power Connections

AC supply	1-Phase mains connection 230 V, 50 Hz 2-Phase mains connection 200 V-220 V, 50/60 Hz 2-Phase mains connection 100 V-120 V, Class 1 wiring

Disclaimer: Specifications, dimensions, features, and other product information are subject to change without notice due to continuous improvement and product development. Information in this brochure is believed to be accurate at the time of publication. Product appearance and specifications may vary.

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