

digital film technology

# Scanity

high performance, cost-effective,  
multi-application film scanner



high performance film scanner

# Scanity >>>

Scanity is a film scanner that offers unprecedented speed, versatility, stability, and safe film handling.

It serves a variety of scanning applications including, archive film scanning, mass digitization, dailies, feature film mastering, EDL/conform scanning, low resolution browsing, archive and restoration, short-form commercials, as well as digital intermediate scanning.

A multitude of unique and first-to-market features provide users with cutting edge technology that addresses the challenges that many facilities are facing today. SCANITY enables facilities to

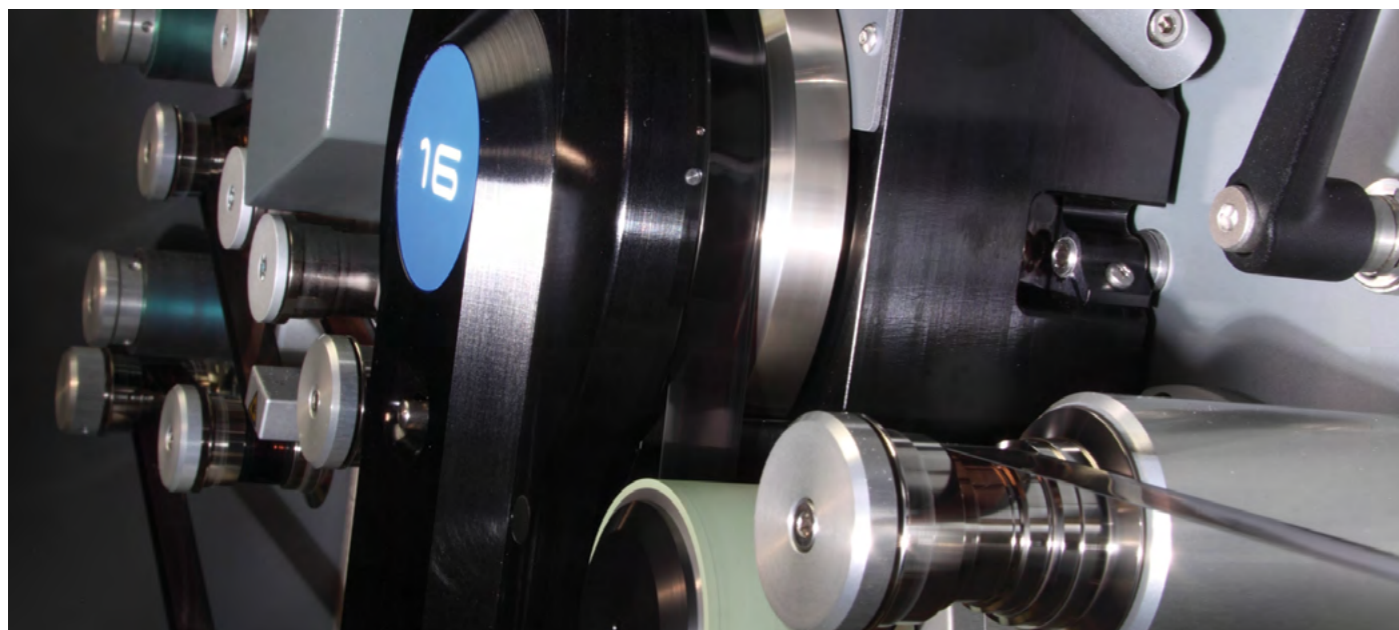
improve their ROI, enhance productivity, work effectively in data-centric workflows, and service their markets with a solution that reproduces the pristine quality of film and image quality they require.

Scanity uses efficient LED light sources, dedicated hardware processors, as well as fewer and less expensive third party components. This lowers initial costs as well as operational expenses. Its an unparalleled piece of technology that combines skilled engineering and precision manufacturing to deliver a high-speed, flexible, and versatile film scanner.

# Scanity >>>

## Key Features :

- High quality multi-format film scanner that offers unprecedented speed, versatility, stability, and safe film handling
- High speed scanning - 4K scanning up to 15 fps, 2K up to 25 fps, 1K up to 44 fps, 0.5K up to 69 fps, 0.25K up to 96 fps (depending on hardware)
- Versatile multi-application scanner, archive film scanning, mass digitization, EDL/conform scanning, dailies, low resolution browsing, and highly suited for restoration and archiving, commercials and 'video-like' applications
- Customized high resolution optics – capable of resolving 8K equivalent image details
- Time Delay Integration (TDI) sensor technology for extremely fast and sensitive film scans - 4300 horizontal active pixels, 96 TDI lines, 6 $\mu$  pixel size relative to the film
- Independent from frame height - film frame aspect ratio is matched by the number of lines
- Over scanning in horizontal and vertical direction beyond image boundaries
- LED light sources with optimized spectral wavelengths, specifically designed for a variety of film stocks
- Precision roller gate avoids mechanical stress and risk and provides unparalleled smooth and safe film handling
- Continuous motion capstan film transport
- Optical perforation detection and touch free image stabilization to provide pin registered steadiness
- Highly integrated, dedicated and fast spatial image processing manages content scaling and formatting
- Dirt and scratch handling capabilities with diffuse illumination and IR channel, capable of dirt map generation for internal / external processing
- Audio scanning of optical sound tracks on 16mm and 35mm film and magnetic track on 16 mm film
- Long LED life provides stable and cost-effective illumination solution



### Versatile and Flexible

Scanity is an incredibly versatile and flexible scanner that serves a multitude of scanning applications. Its speed makes it ideal for archive film scanning, mass digitization and EDL/conform scanning of feature films, short-form commercial scanning, dailies scanning, low-resolution browsing, and applications that require the immediacy of live moving images. Scanity is an excellent fit for applications where film is scanned only once. The roller gate makes it perfect for sensitive and fragile film – in restoration and archiving applications.

### Gentle and Safe Film Handling

Scanity uses a completely new and uniquely designed film gate mechanism instead of skid plates. Film travels on the roller for approximately 170mm (7") during which the image and optical perforation scanning takes place. The film lies stable on the gate roller, and the high resolution tacho wheel (which is attached to the roller) provides control pulses to precisely manage the movement of the film supported by the optical perforation detection. This method is the most gentle way to transport and scan the film, and apart from the rollers, there are no mechanical parts

which are in contact with the precious film. The rubber-coated and newly designed continuous capstan drives the film smoothly and securely, and is a well proven concept that is used in the Spirit family of scanners.

### Stability and Steadiness

Scanity provides touch-free pin registration rather than mechanical pins to ensure excellent image steadiness. Several newly designed modules meet this goal and include:

- An optical perforation detection device with dedicated camera.



- A precision roller gate for mechanically stabilizing the film, which is controlled by a high resolution tacho and servo system.
- A continuous motion capstan film transport. And dedicated hardware for 4K image stabilization processing without delay.

With these key elements, Scanity combines steadiness with high speed and gentle film handling.

### Workflow Efficiencies

Scanity includes two control interfaces; a local touch-screen display, and a workstation with dual

displays. Through these two interfaces, users can control the scanner, perform image quality checks, and adjust a variety of technical settings. The workstation includes software tools for monitoring, calibration, image ingest, and executes scheduled batch processing during scanner idle times.

Scanity



Scanity

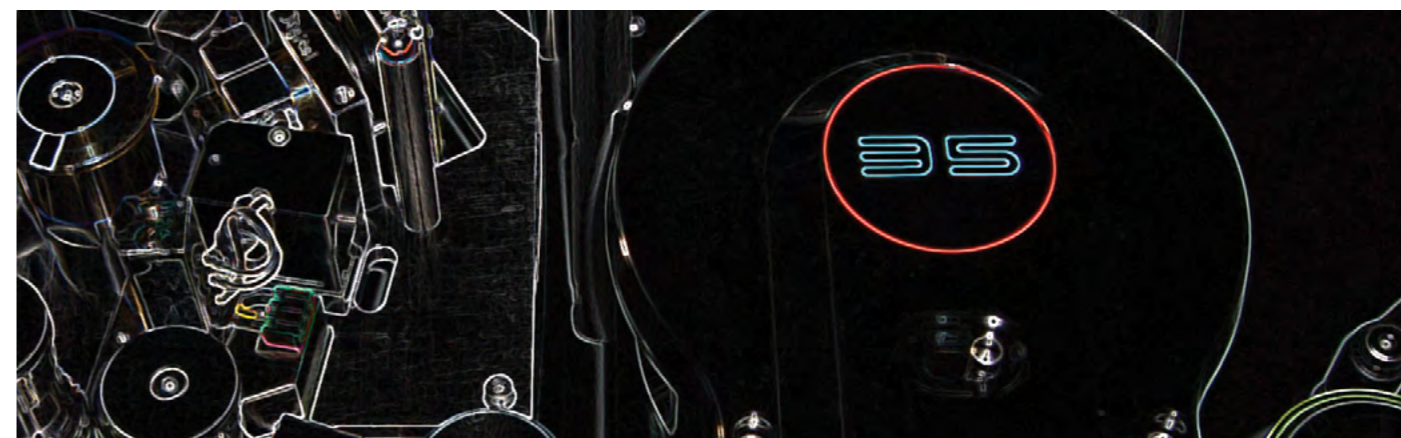
# Audio scanning >>>

Scanity is a film scanner that offers unprecedented speed, versatility, stability and safe film handling. It serves a variety of scanning applications including; dailies, feature film scanning, EDL/conform scanning, low resolution browsing, archive and restoration scanning, short-form commercials and digital intermediate scanning applications.

Scanity provides Audio Scanning, an option that allows facilities to scan analog optical mono or stereo audio tracks on 16 and 35 mm film and magnetic tracks on 16mm film. This feature eliminates extra and separate image and audio scanning passes.

The optional audio scanner uses components from SONDOR and is mounted in Scanity before the Lens Gate Assembly. The capstan-driven continuous film transport offers real-time audio scanning in conjunction with real-time 2K film scanning. The sound track is picked up by audio heads, converted into WAV files on the Scanity workstation and stored with the images. At this stage both the audio and image files are available for further processing or playout via 3rd party products.

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.



Many archive films contain optical or magnetic sound tracks. With combined features such as extremely gentle film handling and optical or magnetic audio scanning, Scanity is an ideal scanning solution for the film archive market.

The audio scanning feature seamlessly integrates with 3rd party software applications.

The optical audio scanner can be ordered as an option with a new SCANITY, or added to existing Scanity film scanners in the field.

Note : Scanity must be configured for scanning 35mm, 4-perf, 2K with 25 fps (Speed A).

Key technical features include

- High performance audio scanner for mounting in the

Scanity film scanner

- Audio components from SONDOR are seamlessly integrated and qualified
- Reads optical audio tracks on 16 and 35 mm positive film (print)
- Tracking and azimuth of optical sound heads can be mechanically adjusted
- Suitable for reading cyan-dye high magenta and silver optical tracks
- Variable area: Unilateral, bilateral, dual lateral
- Variable density
- Scans analog audio tracks and converts them into digital audio files
- Reads magnetic tracks on 16 mm film
- Eliminates extra and separate image and audio scanning passes

- Real-time audio scanning in conjunction with 2K resolution (Scanity version SPEED A required)
- Generates broadcast WAV files for automatic syncing of images and sound
- Integrates seamlessly with other 3rd party applications for image and audio syncing.
- Audio Base Option includes a platform for audio heads, wire harness and 19" 3RU electronics unit
- Compensates Audio Delays
- Pre-wired aligned and system tested
- Upgrading Scanity with audio scanner with adjustable heads in the field is possible

“How can the scanning speed be so fast and yet SCANITY does not need a high power light source?”

The use of a new sensor technology – Time Delay Integration (TDI), enables a scanner sensitivity that has never been achieved before. TDI sensors accumulate the charges of up to 96 lines in the sensor and increase the sensitivity by a factor of more than 50 compared to a single line CCD sensor. The result is that an LED based light source can be used, and the diffused light from an integration sphere can be utilized. There is also enough light headroom for individual light adjustments in Red Green and Blue images. Furthermore, TDI technology enables the use of a lens design that has a small aperture and consequently a large focal depth which makes focusing an easy task.

“How stable is the LED light source and how long does it last?”

LED light sources are known for their long life and are cost effective compared to other illumination solutions. However, LEDs require clever controls to ensure that they continuously reproduce a precise spectral

response and compensation for the slight decrease in efficiency over years of use. SCANITY has been designed to hold sufficient light headroom in all three color channels to always correctly calibrate the scanner and ensure reproducible levels. It is important to ensure a constant spectral response, therefore the light output is controlled via Pulse-Width-Modulation and the different spectral curves of the dyes of different films are taken into account by the LED light source, which can be adapted in its spectrum. This adaptation is automatically triggered by the film stock selection.

“What is the advantage of using optical methods for image steadiness?”

Stabilizing the image with mechanical pins is a worthy and proven method, yet it has limitations in speed and versatility. Mechanical pin scanning leaves marks on the film and wears the film if scanned repeatedly. Optical film scanning has many advantages, including the fact that this scanning method does not physically touch the edges of the perforations and is therefore a wear free and safe method of scanning. With optical scanning

and continuous film transport, speed is not an issue as long as image processing capacities are sufficient. Dedicated processing is capable of performing high-speed scanning beyond real-time and fast shuttling to browse the content of the film is also possible. A further advantage includes the ability to scan shrunken films without any concern about the integrity of vintage film.

“What operational costs should I consider?”

Due to the LED illumination system advantages, there is no frequent replacement of the light source, unlike with tubes or bulbs. Also, the TDI sensor technology provided by Dalsa, is proven and long-lasting with



Scanity GUI

insignificant running costs. Since components can break, SCANITY has been built around a modular and simple mechanical design, which allows easy exchange of parts on-site. The only moving parts in the gate are rollers, so you can expect a very low level of maintenance.

“What features does the SCANITY workstation and software offer?”

The Scanity workstation and software provides a platform for image ingest and monitoring, data management

and direct access to standard IT file systems through Linux FS. It supports all major SAN systems (CVFS, Store Next, CXFS) and can be backed up to standard IT devices. The workstation uses off-the-shelf IT hardware, which can be easily adapted when technology progresses. The software executes batch processing where scanned images can be further processed, e.g. look-up tables, color manipulation, format and size transformation, and grain reduction. Scanity can seamlessly integrate with the prior DFT products like

FLEXXITY and other 3rd party software solutions, which allow for multi-platform workflows and the use of one common database.

Film Transport

Play / Record Speeds - depending on resolution	4K - 15 fps (4 perf) 2K - 25 fps (4 perf) 1K - 44 fps (4 perf) 0.5K - 69 fps (4 perf) 0.25 - 96 fps (4 perf) Variable speed control : - speeds can be slowed down according to requirements Speed depends on the limitations of clients file system, workstation and SAN solution
Optional Lens Gate Assemblies S35mm / 35mm S16mm / 16 mm New S16mm / 16 mm / S8mm, 8mm (Coming Soon)	Roller gate with reference edge on which the film travels Optical perforation recognition and evaluation Pressured air supported film gate No parts where the film might slide or wear
Film Format 35 mm	Maximum scan width: 25.8 mm; Pixel pitch 6.0 μm; 2-perf; 3-perf, 4-perf, 8-perf (VistaVision); Cinemascope Fixed settings for Full Aperture (Super35) and ACA (Academy Camera Aperture)
Film Format 16 mm	Maximum scan width 12.9 mm; Pixel pitch 3.0 μm; S16 mm or 16 mm Fixed settings for S16 mm, N16 mm
Key Code Reader	For 16 mm and 35 mm films Film stock recognition and film stock memory recall, metadata generation
Local Control	Touch screen display For calibration, major film deck functions, and low resolution image representation film ingest task monitoring and status indication
Focus	Automatically, manually, in stop and in play
Framing	Coarse and fine
Film Length	On cores 2000 feet, 609 m; A/B wind
Visible Navigation	Supported by proxy images from cache; Cache keeps all images of a 2,000 foot film in 0.5K resolution
Step with Image	Instantly from cache (if filled)
Shuttle with Image	Visible forward live and supported by cache (if filled); Backwards supported by cache (if filled)
Spooling w/out Image	2.2 m/sec = 120 fps on a 4 perf 35 mm film
Mechanical Dimensions	
Cabinet	984 mm (width) x 1943 mm (height) x 811 mm (depth) - including door handles Weight: ±320 Kg / 705 lb
Transport Crate	2100 mm (width) x 1080 mm (height) x 1210 mm (depth); Weight: ±150 Kg / 330 lb

AC Power Connections

AC Supply	1-phase current 240V, 50Hz 2-phase current 208V, 60Hz 2-phase current 200V, 60Hz
Power Consumption	Approximately 1.5 kVA, typically

Scanning Front End

Illumination	LED illumination system with dedicated spectral response, Automatically adjusted according to film stock and manually adjustable (overwrite) Integration sphere for diffuse light film illumination for dirt and scratch compression
Beam Splitter	Splits into Red, Green, Blue and IR
Image Sensors	3 TDI sensors (Time Delay and Integration) for Red, Green, Blue Image, 1 TDI sensor detection IR light to generate a dirt and scratch representing image, Resolution 4300 pixels x 96 lines, 7 μm square pixel size resulting in a 6 μm raster on the film level in 35 mm, and 3 μm raster on the film level in 16 mm
Camera	3 or 4 cameras comprising preamps, ADC, and binning circuitry Camera link interface to image processor
Image Processing	Signal processing: look-up table, matrix, lock-up table, factory and custom settings, Spatial processing: for image formatting in scanning speed, including anamorphic unsqueeze 2:1; Processing quantization: 16 Bit
HDR (Optional)	High Dynamic Range - Simultaneous Triple Exposure for Black and White Film material , upto 5ND
Scanner Calibration	Automatic

Workstation

Workstation Hardware	Latest generation HP Workstation Internal HD - 300 GB SAS NVIDIA Dual port graphic card Operating system Suse 11+ Service Pack 2 Linux Enterprise Server Postgre SQL Database File format DPX according to SMPTE 268M-1994 High Definition 24LCD - GUI Monitor, *Optional - Dual Monitor
Remote Interface	Script based via LAN
File Format	10 bit LOG / LINEAR DPX according to SMPTE 268M-1994 16 bit LINEAR TIFF A wide range of streaming deliverable formats and compressed formats through batch processing, please refer sales for latest details. Presets for various image resolution
Components and Packing	3 x 10 bit, RGB, filled to 32 bit with padding at bits 0 and 1 4 x 8 bit, RGBA packed to 32 bit Alpha (A) = space("0") 4 x 16 bit, RGB 3 x 16 bit, RGB 2nd workflow step rendering on multiple SCANITY workstations Supports data backup drives

Software, GUI

Ingest Page	Scanner front end control Transfer window Time bar Monitor and Monitoring Metadata window EDL or key code list based data capture Frame counter, feet and frame, time code, key code, log list
Monitor, Monitoring	Image monitoring display characteristics selectable via display look-up tables Monitoring: parade or super-imposed waveform, vector, histogram, detail tool
Batch Processing Page	3D look-up tables Primary color correction Transform
Production Set-up	Structure: Project Note: The workstation is part of SCANITY and requires a connection to at least one disk array or a SAN storage via fibre channel ( Dual 8Gb F/C) Note: The achievable data transfer speed depends on the overall system performance and might be subject to variations. Parameters like the connected storage, connections between storage and host and the file system make an impact



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