DigitalFilmTechnology

SCANITY™

High Performance, Cost-Effective, Multi-Application Film Scanner

SCANITY™ is a film scanner that offers unprecedented speed, versatility, stability, and safe film handling. It serves a variety of scanning applications including, archiv 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.

SCANITY is an unparalleled piece of technology that combines skilled engineering and precision manu facturing to deliver a high-speed, flexible, and versatile film scanner.

High Speed Imaging

On 35mm 4 perf film, SCANITY scans film material in 4K resolution up to 15 fps, 2K up to 25 fps, 1K up to 44 fps, 0.5K up to 69 fps, and 0.25K up to 96 fps – depending on interfaces and receiving devices. SCANITY uses unique Time Delay Integration (TDI) line sensor technology, and dedicated FPGA image processing to deliver record-setting high-speed film scanning – all while handling film gently and safely.

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, 6µ pixel size relative to the film
- Independent from frame height - film frame aspect ratio is matched by the numbers of line
- 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
- Integrates seamlessly with FLEXXITY software tools

35mm Roller Gate with Optical Pin Registration and Continuous Motion Capstan Film Transport

Versatile and Flexible Scanner

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 170 mm (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 besides 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 also integrates seamlessly with FLEXXITY SW tools for dailies and post production. FLEXXITY helps users create workflows that are tailored specifically to individual needs.

Specifications

Film Transport	
Play / Record Speeds - depending on resolution	4K - 15 fps 2K - 25 fps 1K - 44 fps 0.5K - 69 fps 0.25 - 96 fps Speeds can be slowed down Speed depends on limitations of file system, workstation and SAN
Lens Gate Assembly for 35 / 16 mm	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 4-perf, 3-perf, 2-perf, 6-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 with 800 x 600 resolution For calibration, major film deck function, and low resolution image representation
Focus	Automatically, manually, in stop and in play
Framing	Coarse and fine
Film Length	On cores 2000 feet, 600 m A/B wind
Visible Navigation	Supported by proxy images from cache Cache keeps all images of a 2,000 foot film in 0.5 K 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 / 1102 lb
Transport Crate	2100 mm (width) x 1080 mm (height) x 1210 mm (depth) Weight: +- 150 Kg / 330 lb
AC Power Connections	
AC Power Supply	1-phase current 240V, 50Hz 2-phase current 208V, 60Hz 2-phase current 200V, 60Hz
Power Consumption	Approximately 1.5 kVA, typically

Technical specifications are subject to change without notice

Specifications continued

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
Scanner Calibration	Automatic
Workstation	
Workstation Hardware	HP Workstation 900 GB internal HD Dual port graphic board Operating system Suse Linux Enterprise Server Postgre SQL Database File format DPX according to SMPTE 268M-1994
Remote Interface	Script based via LAN
File Format	DPX according to SMPTE 268M-1994 Tiff A wide range of streaming formats and compressed formats through batch processing 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, Episode, Shooting day, Lab roll Note: The workstation is part of SCANITY and requires a connection to at least one disk array or a SAN storage via fibre channel 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

Technical specifications are subject to change without notice

Frequently Asked Questions

"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 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 seamlessly integrates with the FLEXXITY and FLEXXITY Dailies tools, which allow for multi-platform workflows and the use of one common database.

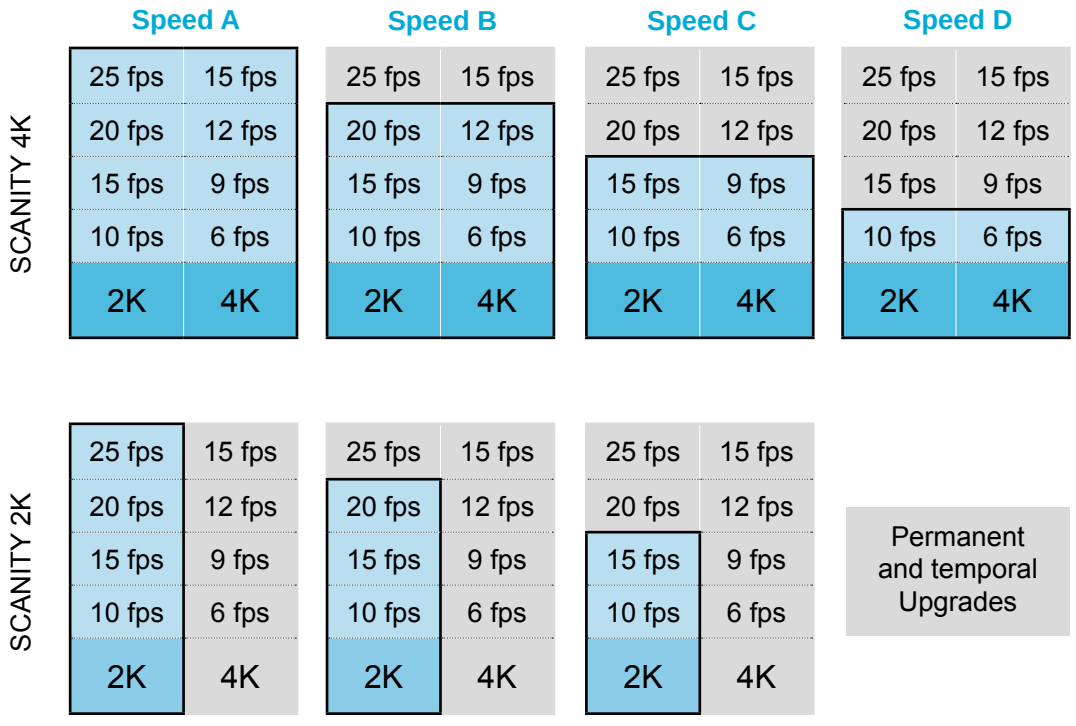
SCANITY 35 mm and 16 mm Lens Gate Assemblies

Ordering Information

000129561110	FS 4315	SCANITY Film Scanner, Speed A
000129561210	FS 4312	SCANITY Film Scanner, Speed B
000129561310	FS 4309	SCANITY Film Scanner, Speed C
000129561410	FS 4306	SCANITY Film Scanner, Speed D
000129561510	FS 2315	SCANITY 2K Film Scanner, Speed A
000129561610	FS 2312	SCANITY 2K Film Scanner, Speed B
000129561710	FS 2309	SCANITY 2K Film Scanner, Speed C
000129201210	FS 16 LGA-RG	16 mm Lens Gate Assembly
000129341410	FS IR-DIRT-O	IR dirt / scratch Option
000129343010	FS DIRT-CON-CEAL	Dirt/Scratch Concealment

000129343110	FS FISUPL	Set of Film Supporting Plates
000129341610	FS 2ND MON	2nd Monitor Set for SCANITY
002129561049	FS AEH	Air Exhaust Hood
000129342210	FS GC NODE	Grain and Contour Node
000129341910	FS Audio Base	Audio Base Option
000129342510	FS AUDIO-M16-O	Audio Head, 16 mm magnetic
000129342810	FS AUDIO-O35A-O	Audio Head, 35 mm optical, adjustable
000129342710	FS AUDIO-O16A-O	Audio Head, 16 mm optical, adjustable
000129341110	FS UPGR 4009	Speed Upgrade from D to C
000129341210	FS UPGR 4012	Speed Upgrade from C to B
000129341310	FS UPGR 4015	Speed Upgrade from B to A
000129341710	FS UPGR 2K/4K	Resolution Upgrade 2K to 4K

SCANITY Model Structure with various Speeds, Resolutions and Upgrades



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