PhotoScan

INTERGRAPH

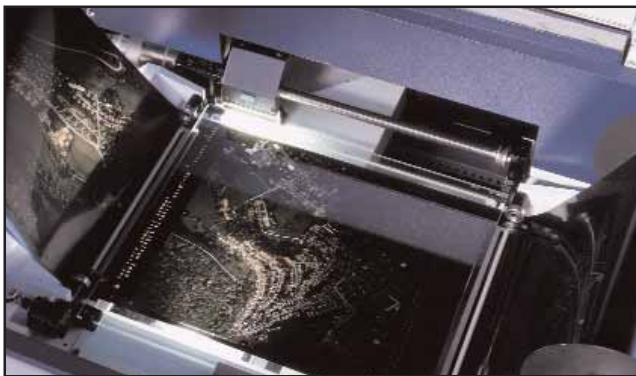*PhotoScan*

A Product of Z/I Imaging

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The complete photogrammetric scanning solution

Z/I Imaging® offers proven high-precision photogrammetric scanning solutions to meet your production digital scanning needs. PhotoScan provides superior quality and precision and gives you accurate images at a price and performance unmatched by the competition. The PhotoScan system incorporates scanning technology developed by Z/I Imaging and Carl Zeiss, a world leader in optics and mechanical systems.

Using PhotoScan's automated rollfilm system, you can rewind 150 meters of film in less than three minutes.

The optimum scanning workflow solution

PhotoScan provides extremely high scanning speed essential for the digitization of both black and white and color films. The system is a modular family that consists of:

- PhotoScan for scanning individual films
- PhotoScan with a roll feed system for scanning roll films
- AutoScan software for automatic, unattended scanning of original film rolls

PhotoScan is an open-ended system that makes it easy to transmit data to other image processing systems. The system allows you to:

- Scan original images from roll without cutting the film
- Digitize images automatically
- Process vast data quantities efficiently
- Exceeds photogrammetric requirements of superior geometric and radiometric accuracy without resampling

PhotoScan's integrity, ease of use, and speed provide you significant productivity gains. Combining the scanner's superior optical integrity and geometric accuracy with our high performance workstation provides incomparable results.

Scanner hardware: precision and quality

As a precision scanner with a high throughput rate, PhotoScan makes exacting demands on the optical, mechanical, and electronic components used.

The autowinder (11) is securely connected with the cast aluminum base of the scanner.

The image to be scanned – either film sheets or roll film – is placed between the platens of the photo stage (7).

The illumination arm, lens, and CCD module form the secondary carriage that scans the photo stage in a highly precise, combing movement.

The secondary carriage (4) continuously moves the CCD line in the scanning direction while the primary carriage (2) advances the line in steps defined by the swath width.

The swath width is 39.424 mm and permits a copy with a width of 236 mm to be scanned in 6 swaths. The image section is imaged on the CCD line by a mirror lens optics that is free from distortion and chromatic aberrations.

A lamp module and movable fiber optics with a diffuse cross-section converter are used to illuminate the image section corresponding to the swath width.

The light source is a highly stabilized 150 W halogen lamp.

The drive and control systems of the moving carriages comprise precision guideways, precision spindles, linear encoder, and DC motors. They ensure the exceptional geometric accuracy of 2 microns RMSE.
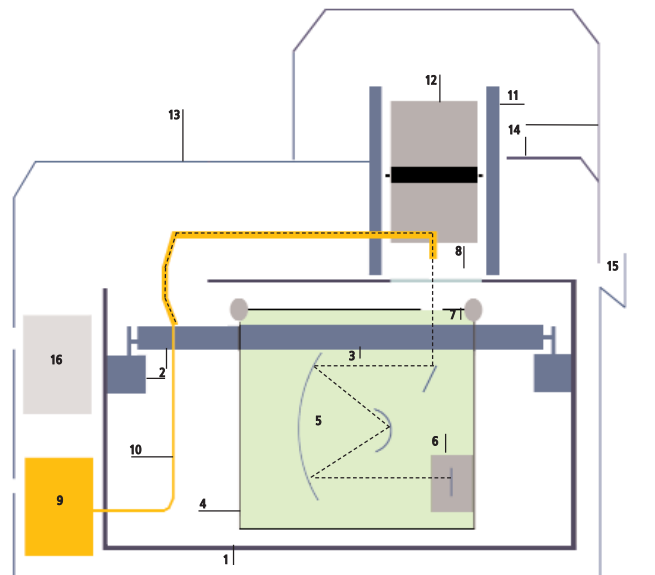
(1) *Cast aluminum enclosure*
(2) *Primary guideway and primary carriage with (3) linear encoder*
(4) *Secondary carriage with (5) mirror lens and (6) CCD module*
(7) *Photo stage for scan copy and (8) glass cover plate*
(9) *Lamp module with (10) glass fiber optics*
(11) *Autowinder with (12) film roll (14) instrument enclosure with cover and (15) control panel*
(16) *Electronics module*

With the PhotoScan, you can easily perform routine maintenance items yourself. Items such as changing the halogen lamp, and performing geometric calibration can be easily handled without requiring maintenance support. Very efficient radiometric calibration is automated on a periodic basis. This helps to ensure that your scanner is up and running to meet your production demands.
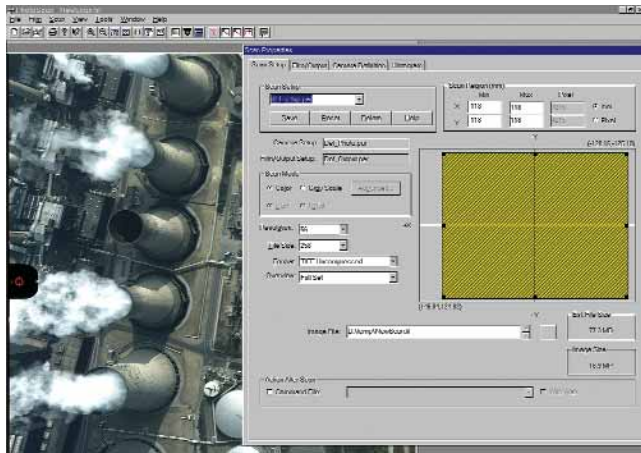
Using our PhotoScan software, you can easily set up the parameters of your scan.

Autowinder – the key to automatic scanning

The autowinder is attached to the cast aluminum enclosure and permits fast traversal of the film roll and accurate positioning to selectable photos. It is also designed to scan original film and eliminate costs of making film diapositives. The glass cover plate is lifted and lowered automatically. With this arrangement, only the carriage has to move. There is no need to move the entire film roll. The film is moved in the autowinder by two motorized reels. For scanning, the film is placed on the photo stage. Both the glass cover plate and the film are lifted for film transport. The film is guided only at its edges by deflection rollers installed at a distance of approximately 8 mm from the photo stage.

The film can be rewound in both directions at a maximum speed of one meter per second – this means that about 2.5 minutes are required for a film of 150 meters in length. An electronic frame counter enables automatic positioning to preselected photos. Even partially rewound film can be loaded and removed. The autowinder accommodates full rolls of film and is designed for careful, automatic handling so the film cannot be damaged.

An option is available to support 70 mm, 5" and 7.5" roll film (other formats on request).

Powered by a modular Z/I Imaging workstation

The PhotoScan system includes an integrated 19 inch, rack-mount host workstation. The computer is manufactured by Z/I Imaging with selected components optimized for a very high data throughput and optimized for scanning. It is a completely integrated solution that reduces the total cost of ownership.

The workstation is Intel-based and includes the Microsoft Windows operating system. Up to eight bays can be used for peripherals like floppy disk drive, CD drive/writer, hard disk drives, and tape drives. The workstation is mounted in a cabinet underneath the scanner table, housing the scanner hardware controller and minimizes the scanner footprint. A complete display system, including a 21-inch monitor, is included. Integrated JPEG compression software (both Intergraph JPEG and TIFF

6.0 JPEG formats) keeps up the pace of your demanding workflow. Optional features are available to further enhance your system.

PhotoScan scanning software

Our PhotoScan system provides native Windows software that offers flexible and efficient menus to adjust scan parameters. With our scanning software you have access to a wide-range of features, such as:

- Fast overview scans which allow for quickly setting up the scan
- On-line tonal correction for perfect color quality
- Image file contains all scanning parameters for production documentation
- Geometric calibration report to verify quality
- TerraShare™ Aware which means that you can easily implement an enterprise wide solution to manage your imagery

Image courtesy of Scankort, A/S, Taastrup, Denmark.

PhotoScan provides you the option of scanning at a range of 7 to 224 microns.

The software also includes online histogram manipulation tools and features to control the scanning workflow. The register photo function is an automated tool to select the scan area and reduces the set up time for scanning sheet film. The offset of the scan area is automatically adjusted.

PhotoScan standard software includes user look-up tables, partial histograms, and batch files after scan. You can select either an 8,12, 24, or 36 bit output format (8- or 12-bit histograms are displayed for each band). It is possible to scan any original film, including masked color negative film. The scan parameter setup allows different modes for look-up table generation: transmissive mode (linear LUT), density mode (logarithm LUT), scan gamma mode, color adjust mode and user-defined LUT.

The integration time is adjusted via software. An image rotation can be performed as a post process. It is possible to execute batch files after the scan to perform tasks such as file format conversion, image transfer over the network, or any user-defined request. Using this feature, your PhotoScan system can be integrated into your corporate environment and fully adapted to the individual workflow.

Add AutoScan for automated scanning

Z/I Imaging's AutoScan software enables your PhotoScan to scan multiple images from film rolls unattended. With a user-friendly interface, AutoScan lets you easily set up the scanning job, select the functions to be performed during scanning, and report on scan results. Because AutoScan offers such high throughput, it enables increased productivity for lowered production costs. Super wide angle images can automatically be scanned with the panoramic rollfilm feature. For each frame on the roll, AutoScan automatically performs many tasks that previously were done manually, including:

- Film control (advance, skip, rewind)
- Precise frame registration
- Fiducial measurement (automatic interior orientation)
- Automatic digital dodging
- Management of file names by project
- Panoramic image scan with automatic image stitching

Our AutoScan software provides a set of utilities that can be executed after the scan to perform automatic interior orientation (AIO), digital dodging, or image pyramid generation. You can generate user-defined utilities for individual tasks. These powerful tools improve the total workflow and increase the productivity of the scanning system.
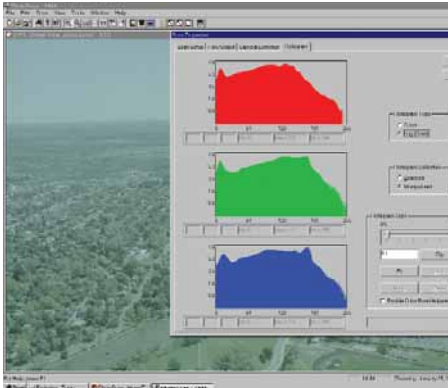

With PhotoScan, you can analyze the color data to modify and rescan with improved color settings.

Image courtesy Dr. Eisler of the Zoological Institute University of Tuebingen, Germany.
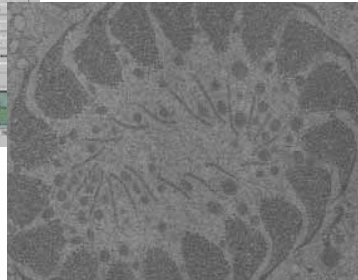
Image courtesy of Kucera International Inc., Willoughby, Ohio, USA.

When you need an extremely reliable, ultra-precision scanner – that can work 24 hours, 7 days a week, PhotoScan is the only choice.
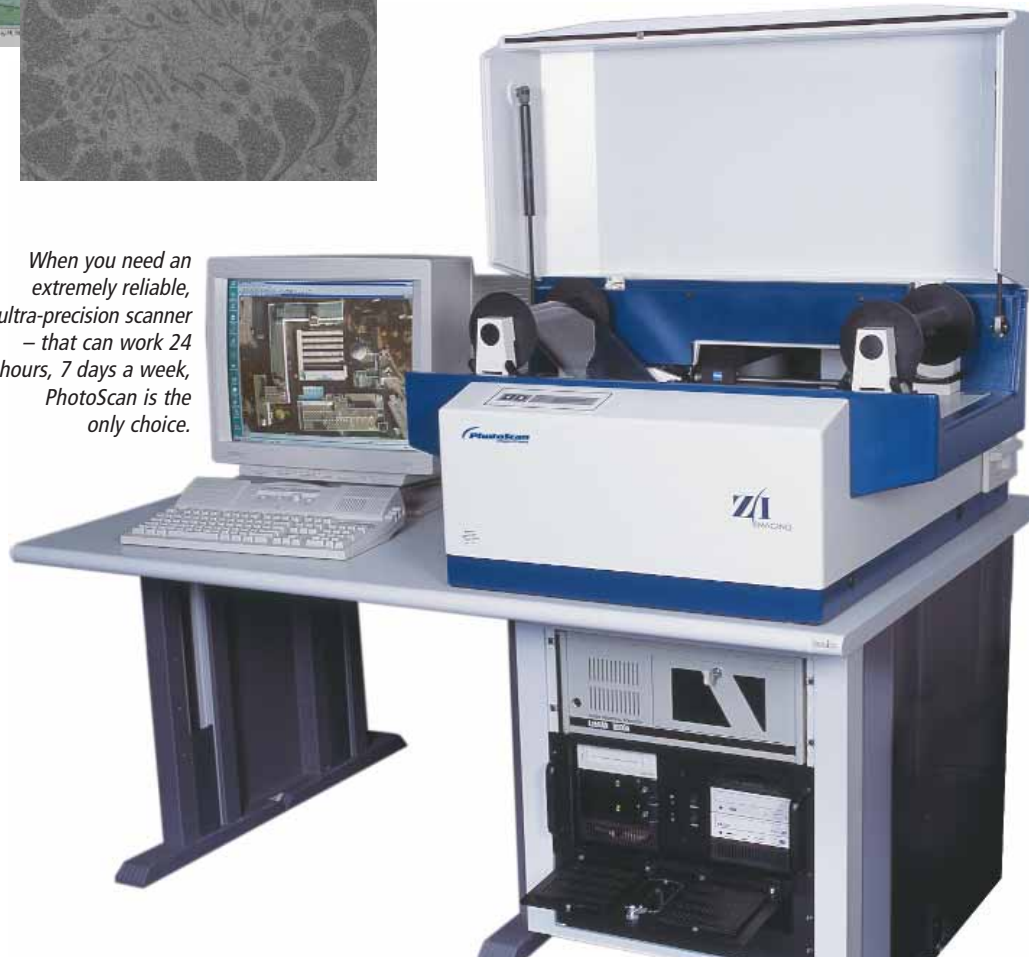
PhotoScan applications

Due to its proven performance and accuracy, professionals in industries that demand high-resolution scanning use PhotoScan. Customers depend on PhotoScan to deliver accurate and reliable imagery to meet their needs. The following are a few industries that depend on PhotoScan:

- Photogrammetry for scanning aerial photography.

- Macro molecular biology for scanning Transmission Electron Micrographs.

- Automobile industry for scanning UMK images for close range application.

- Reconnaissance for scanning photographs taken with airborne reconnaissance cameras.

SPECIFICATIONS:

Scanner: PhotoScan with or without automated rollfilm subsystem

Resolution: 7 micron optical, digitally aggregated 14, 21, 28, 56, 112, 224 microns

Scan format: 275 mm x 250 mm, scannable

Media: Single frame (roll feed optional), positive or negative, b/w, color or infrared transparency

Scan approach: Fixed-position film stage, moving camera/illumination
Scanning is performed independent of film roll movement

Radiometry: 10 bits/channel digitization with transmissive, density, or gamma-adjustment modes of operation over 0.001 to 3.3 OD, with a dynamic range of 2.5 OD

Output data: 8-bit or 12-bit monochromatic, or 24-bit or 36-bit color output

Geometric accuracy: Less than 2 microns per axis RMS error, uncorrected

Geometric precision: 1 micron

Sensor: Tri-linear CCD, fully compensated, all elements functional

Optics: Custom reflective lens system designed by Carl Zeiss

Illumination: Fan-cooled tungsten halogen bulb (150 W)

Throughput: Less than 6 minutes for a 14 micron color or b/w scan of a typical 235 mm x 235 mm photo

Table: Dimensions: 1.6 x .72 x 1 meters (included) (63 x 28.5 x 39 inches)

Options: Geometric grid plate for users who wish to perform their own calibration

Roll-feed field upgrade for non-roll-feed PhotoScan

70 mm, 5", and 7.5" rollfilm option (other formats available on special request)

TerraShare Aware

PhotoScan is TerraShare Aware, meaning it has the functionality to scan directly into TerraShare, our image management, storage, and distribution software family. TerraShare is a modular, client-server system designed to address the image management and distribution problems of geoimaging producers and distributors. TerraShare manages terabytes of geoimaging data from acquisition to exploitation to storage to distribution. Because TerraShare is an open-architecture software family that is integrated into the Microsoft Windows® Explorer environment, users are immediately productive.

TerraShare provides data management tools that present data in units that are logical to the application or user as opposed to data that is logical for the operating system – that is Windows files. TerraShare also manages large amounts of physical data that exists in the enterprise. TerraShare keeps track of all the physical files and provides tools to import existing physical files into the system (to create new TerraShare files) as well as tools to export/relocate images across the enterprise's network of servers.

Integrated solution

PhotoScan is an integral part of the ImageStation® digital photogrammetric software product family. Z/I Imaging provides a comprehensive suite of products from AT to compilation and DTM collection through orthorectification to meet your production needs. The following modules are available:

- ImageStation Photogrammetric Manager
- ImageStation Model Setup
- ImageStation Stereo Display
- ImageStation Feature Collection
- CADMAP®
- ImageStation DTM Collection

Choose the optimum scanning solution

The integrity, ease of use, and speed of PhotoScan configurations combine to give you a significant productivity boost. With the scanner's superior optical integrity and geometric accuracy, and high performance workstations, the result is incomparable. If you're ready to improve productivity, image quality, and precision, it's time to turn to Z/I Imaging.

The PhotoScan offers high-precision scanning for aerial photography.

Built on a history of leading technology

PhotoScan is built on technology proven in previous systems which include the PhotoScan PS1, Zeiss SCAI, PhotoScan TD, PhotoScan 200x, and Z/I Imaging's current PhotoScan model. Our new photogrammetric scanner takes advantage of our latest evolution of software and operational tools providing you more powerful real time computing. Employing our advanced technology, PhotoScan scans color films nearly ten times faster than our original photogrammetric scanner, while maintaining its quality and accuracy in producing digital images.

Today, Z/I Imaging continues to lead the world in innovative technology with our new generation of solutions including the Digital Mapping Camera (DMC™), ImageStation, ImageStation SSK, PhotoScan, ImageStation Automatic Triangulation, and our TerraShare suite of products.

Z/I Imaging is committed to providing our customers best-in-class imaging solutions from acquisition to exploitation to digital distribution. We are dedicated to continuing our role as the industry's premier provider of total customer service and committed to long-term mutually beneficial relationships.

For more information about Z/I Imaging, please contact us:

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