



«DELTA» COLOR PHOTOGRAMMETRIC SCANNER

"Delta" is a digital photogrammetric system which includes a high-precision color scanner and several workstations for 3D-mapping and orthophoto. All the stations are connected via network that allows to share scanner output effectively.

Scanning workstation

Color photogrammetric scanners are designed for photographs up to 470x320 mm large and for roll films up to 320 mm wide. The scanner is equipped with automatic or manual film roll system.

Standard model for films up to 250 mm wide and cut photos up to 260x260 mm



Specifications

Optical resolution	8 μ m
Geometric accuracy (RMS)	$\pm 2\mu$ m (high-precision model) $\pm 3\mu$ m (general purpose)
Maximum optical density	3.4D
Density range	2.7D
Radiometry	12/8 bits per channel
Scan area	470x320 mm (large format model) 260x260 mm (standard)
Film scanning	Up to 320 mm wide (large format model) Up to 250 mm wide (standard)
CCD-sensor	Tri-linear SONY 3x5300x8
Light source	Ultra-bright LED array IR LED array for dust & scratches removal
Output formats	Tiled TIFF, Plain TIFF, RAW, BMP Color 24bit, b/w 8bit

Typical scanning time

Pixel size μ m	Color mode (24bit)				Black-and-white mode (8bit)			
	230x230		300x300		230x230		300x300	
	Time min	Size Mb	Time min	Size Mb	Time min	Size Mb	Time min	Size Mb
8	30	2368	52	4024	12	788	22	1340
16	15	592	25	1006	6	197	12	335
32	9	148	15	252	4	49	7	84

Geometric parameters

The scanner provides a high optical resolution which is 8 μ m (3175 dpi).

Geometric accuracy of scanning is $\pm 3\mu$ m or better. This value is determined by scanning and measuring the control grid plate.

The scanner is supplied with a unit for scanning roll films in automatic mode.

Radiometric parameters

The scanner is equipped with SONY color linear CCD-sensor and a light source based on ultra-bright LED array that provide superior quality of output images and excellent radiometric stability.

Special dust and scratches removal mode with IR-masking provides scratches free color images for orthophoto.

Controller of the CCD-sensor provides an internal 12-bit processing for every color channel with hardware transformation to 8-bit output.

The scanner provides scanning of both color and black-and-white films and produces True Color (24 bit) and gray scale (8 bit) image files.

Scanning software automatically detects optimal values of exposition, contrast and gamma for every color channel as a result of prescan.

The scanner performs scanning in density linear and intensity linear modes providing optimal results for any photo of any quality.

Scanning software

Provides unattended film scanning with automatic edge matching and skipping of blank frames.

Supports scanning in TIFF (including JPEG compressed), BMP and RAW formats where the pixel size is multiple of CCD pixel: 8, 12, 16, 24, 32 ... 128 μ m.

Contains a powerful unit for correction, dodging and transformation of scanned images.

Large format model (470x320 mm)



Desktop model (260x260 mm)





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The scanning software package is a set of applications working in Windows 9x/2000/XP on an Intel-compatible computer. The software supports scanning both color and black-and-white films at various resolutions.

The scanner software

Automatic detecting the optimal parameters for scanning

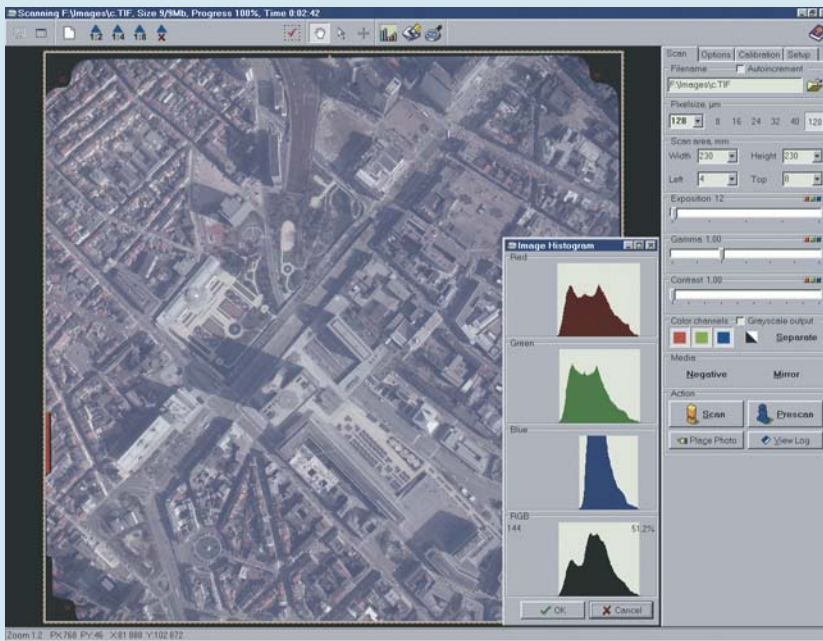
Quick prescan computes an image histogram and then automatically suggests the optimal settings for further scanning: exposition, contrast and gamma for every color channel.

Users can set scanning parameters manually by clicking on a summary histogram or histogram of any color channel.

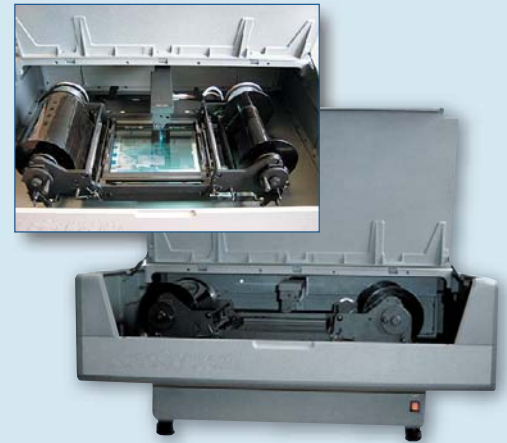
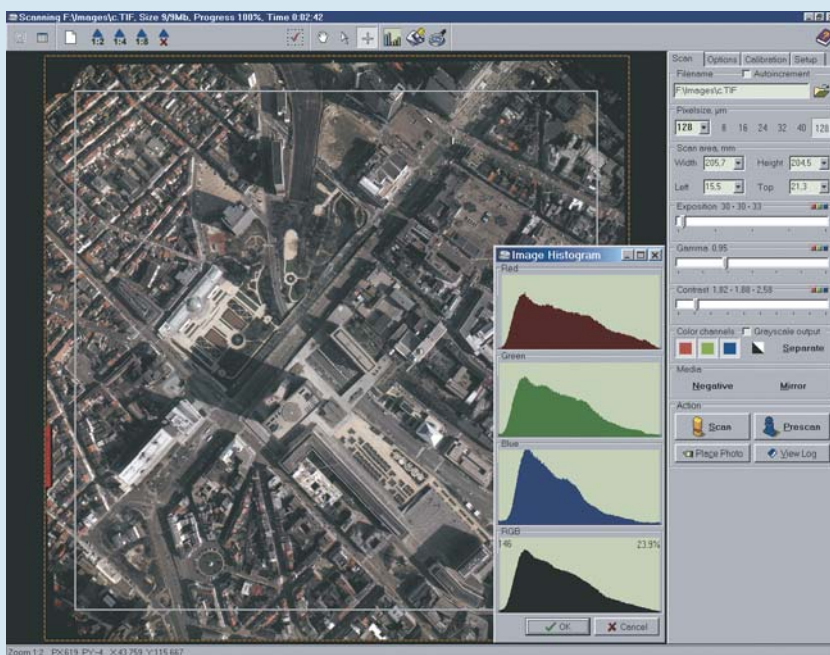
The software immediately reflects the changes on the image.

The program can compute histograms of areas defined by user and perform image correction based on these histograms.

A sample of a prescan image with improper color balance and low contrast



This result of scanning with automatically detected parameters



Scanning software capabilities

Automatic detecting the optimal scan settings for whole film or specified images.

Manual adjustment of scanning parameters and transformation tables (LUTs) for every channel separately.

Scanning in Tiled TIFF (with or without JPEG), Plain TIFF, RAW and BMP formats with the pixel size of 8, 12, 16, 24, 32 ...128 µm.

Density linear mode provides maximum detailing and uniform distribution of image intensity.

Scanning the positives and negatives in direct and mirror modes.

The use of digital filters when scanning to reduce the noise of the image.

Geometric calibration and accuracy control by measuring scanned control grid plate.

Improved radiometric calibration and dust & scratches removal mode for color images.

Masking of color channels and saving color channels in separate files.

Optional automatic creation of zoom pyramid for every scanned image.

Logging every scanning operation to be able to view and restore settings if necessary.

Post-processing software capabilities

Image analysis and histogram computing.

Image correction and filtering for a group of raster files in a batch mode.

Resampling images using any other pixel size.

Merging/splitting color channels from/into separate files.

Fast processing raster files up to 4Gb.

