Automated Image Analysis System

IAS-1000™

The IAS-1000 is an automated high-resolution print quality evaluation system that takes the subjectivity out of print testing, providing consistent, operator-independent, quantitative measurements. The computer-controlled hardware and user-friendly software provide all the tools you need for capturing, displaying, processing, and analyzing printed images. With this system you can analyze any printed page quickly, easily, and reliably, quantifying output on any medium. The IAS-1000 is the first commercially-available image analysis system to incorporate the ISO-13660 international print quality standard. Used in R&D and manufacturing, it is the best means available for monitoring and improving product quality.

Overview

A standard IAS-1000 system consists of a cabinet with positioning stage, CCD camera, high-resolution optics, and light source. A PC running the Microsoft Windows®-based control software also houses the frame-grabber. In a typical session, the user places a test print on the positioning stage and initiates the test cycle. The system executes a user-selected macro (test sequence) specifying the regions of interest, the measurements to be made, and the analyses to be performed. At the conclusion of the scan, the IAS-1000 saves the scan data and automatically prints a report in Excel® or other software. Speed is a key feature of the system, and even complex test sequences are executed in a matter of minutes.

The software functions provided with the system are very powerful and also very expandable. The system comes with a library of standard test sequences, and the user can program additional test sequences with minimal training. Test sequences can be programmed to perform a single measurement or many measurements and analyses. The test sequence for a given scan type can be stored and reused indefinitely. The system can be run in interactive mode for the greatest flexibility in investigating an image, or in automatic mode for optimizing efficiency in standard print testing. A built-in data-logging feature facilitates performance tracking. Scan results can be accumulated over time and exported to other software for further analysis and archiving. Integrated options include color CCD camera, spectrophotometer, gloss meter, transparency table, A3 table, and others.

Built-in Test Functions

- Dot quality measurements
- Line/text attribute measurements
- Solid area attribute measurements
- Color measurement (option)
- Gloss measurement (option)

Typical Applications

- Media, ink, toner, printer and component development
- Product evaluation and quality control
- Acceptance testing

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System Specifications*

IAS-1000™

Typical Applications

Electrophotographic Printers

- Backgrounding, ghosting, tone reproduction, area coverage, banding

Inkjet Printing Products

- *Media:* Inter-color bleed, wicking, feathering/raggedness, color gamut (with optional spectrophotometer), coalescence
- *Print heads:* Jetting straightness, drop size, satellite characterization
- *Printers:* Banding analysis, line/text quality, color registration

Thermal Printers

- Print uniformity (heating consistency), line/text quality, void characterization, print registration

Print Quality Attributes

- *Dots:* Size, position, area, density
- *Line:* ISO-13660 characteristics including position, width, raggedness, blurriness, voids
- *Large Area:* ISO-13660 characteristics including density, mottle, graininess, voids
- *Color (with optional spectrophotometer):* Lab, XYZ, LCh, gamut, fade, spectral reflectance curve
- *Gloss (with optional gloss meter):* At 20°, 60° and 85°
- *Banding:* Reflectance profiles, FFT data, weighting for human perception

Calibration

- *Camera resolution:* Automatic magnification calibration
- *Camera density:* Automatic, using step density target provided
- *Spectrophotometer (option):* Automatic, using white ceramic tile

System Hardware

- Instrumentation; data acquisition and control hardware
- All necessary interface electronics, cables, and connectors

Positioning Stage

- Range: Letter and A4, standard; other sizes available
- Step Size: 16 µm (0.0006 in)
- Maximum Linear Speed: 5.1 cm/sec (2 in/sec)

Camera

- 2/3 inch format solid state monochrome CCD, standard; others, including color CCD, available
- 640 (H) by 480 (V) active picture elements, standard; others available
- C-mount lens adapter

Lens and Optics

- Zoom or fixed focal length lens with macro-focusing, standard; others available
- Resolution to 4µm pixel size with a 2/3" - 640 x 480 CCD camera, standard; others available

Frame Grabber

- High accuracy analog-to-digital converter, 8-bit per channel, standard; others available
- Many user-programmable input control functions

Illumination Light Source

- Cool white fluorescent lamp, standard; others available

Vacuum Generator for Sample Hold Down

- Vacuum pump included

Control Software

- Control software provides all measurement, data acquisition, and data analysis functions

Computer Configuration (customer-supplied)

- Pentium PC
- One full size PCI slot (at least 32 cm)
- Two additional PCI slots
- Microsoft Windows® 2000
- Microsoft Excel® 2000

Electrical Requirements

- 110 VAC±10% @ 50/60 Hz or 230 VAC±10% @ 50 Hz

Maintenance and Operating Environment

- Requires good maintenance practices typical for laboratory equipment
- Temperature

  Operating: 10° to 32° C (50° to 90° F)

  Storage: 0° to 35° C (32° to 95° F)
- Relative humidity

  Operating: 20% to 80%

  Storage: 10% to 95% (non-condensing)

Dimensions and Shipping Weight

- Approximate dimensions, standard letter/A4 configuration
  Main Unit (L,W,H): 119 cm x 94 cm x 127 cm (47"x37"x50")
  Camera accessories: 68 cm x 73 cm x 91 cm (27"x29"x36")
- Approximate total weight, standard letter/A4 configuration (2 pieces): 200 kg (440 lbs)

Documentation