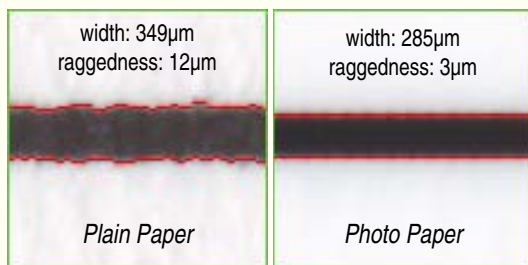# Scanner Based Image Analysis System
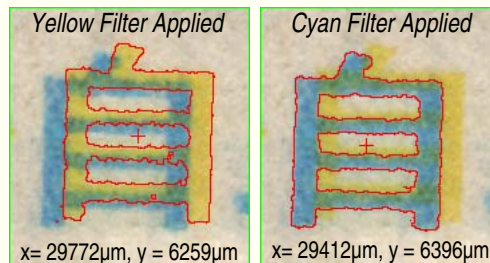
SCANNER IAS®
Image Analysis System

The Scanner IAS combines custom print quality analysis software, system calibration, and a commercially available flatbed scanner to provide a complete solution for print quality analysis. The system can measure a multitude of metrics for printed elements like dots, lines, area, banding, mottle, and many more. Measurements can be made for a variety of applications where the quality of a printed sheet needs to be determined. These applications range from printer component testing to media testing to complete printer testing. The Scanner IAS provides valuable objective measurement data in many places in your organization; R&D, QC, Production, and Marketing.

The Scanner IAS can be used in a fully automated mode to analyze print test targets. This hands-off operation generates simple reports indicating the quality of the printed target. Based on this information, production processes can be adjusted or R&D products can be fine-tuned. A three-tiered password system restricts access to key system parameters to keep the Scanner IAS running well in a production environment. The optional spectrophotometer allows true density and color measurements to be made and included in the measurement database.

The Scanner IAS also includes a powerful interactive mode for making quick measurements without needing to create a measurement sequence. This interactive mode includes a graphical user interface and on-screen results. The area to be analyzed can be selected with the mouse and one more click on an analysis tool gives the PQ metrics desired.


width: 349µm
raggedness: 12µm

Plain Paper

width: 285µm
raggedness: 3µm

Photo Paper

- *Plain paper shows a larger line width and higher edge raggedness due to poor ink holdout.*

Yellow Filter Applied

Cyan Filter Applied

x= 29772µm, y = 6259µm

x= 29412µm, y = 6396µm

- *Color registration: Centroids are offset in x by 360µm and in y by 137µm.*

- *Measure mottle and graininess.*

Range = 15%, standard deviation = 2.3%
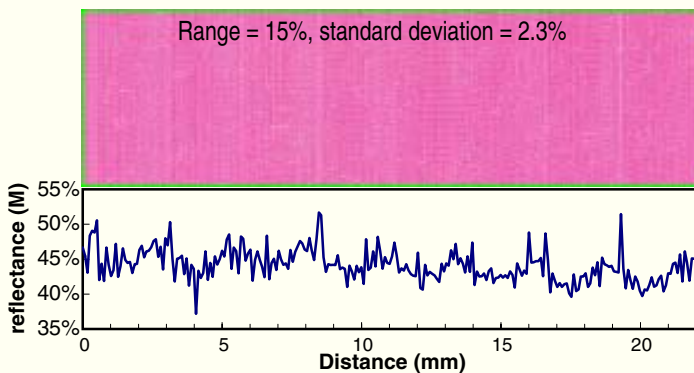
- *Banding analysis shows light and dark streaks.*

QEA PQ Product Family

- **Personal IAS**: Handheld, battery-powered, low cost, auto-calibrating, 5µm/pixel (5080dpi)
- **Scanner IAS**: Flatbed scanner-based, large measurement area, high-speed, 10.6-84.5µm/pixel (300 to 2400dpi)
- **IAS-1000**: Fully automated modular camera-based, vacuum sample holder, X-Y stage, optional ADF, integrated spectrophotometer and/or glossmeter, with high-res option 1-10µm/pixel (2540-25400dpi)

Typical Applications

- *Printer Manufacturers*: Quality control for banding, color registration, tone reproduction, dot quality, paper feed jitter, head speed jitter
- *Media Manufacturers*: Line edge quality (raggedness, wicking, bleeding), intercolor bleed, mottle (coalescence), tone reproduction, dot quality
- *Print heads, cartridges, and components*: QC the performance by measuring patterns of dots, lines, or solids designed to reveal PQ problems
- *Commercial Prints* (*Offset, Gravure, Flexography, Screen Printing, Letterpress, Intaglio):* Examine dot size, shape, % dot, lpi, screen angle, and color registration
- *Marketing Benchmarking*: Quantitatively compare your products to your competitors

Print Quality Attributes

- *Dots*: Diameter, position, halftone (AM or Stochastic), area, density, circularity, aspect ratio, orientation, perimeter, HSL (hue, saturation, lightness), sharpness
- *Lines*: Width, density, raggedness, blurriness, line breaks, using ISO-13660 methods
- *Diagonal Lines*: Special tool for measuring deviations in the edges of diagonal lines
- *Large Area*: Density, reflectance, mottle, graininess, using ISO-13660 methods, and HSL and histograms
- *Banding*: Reflectance profiles, standard deviation, and filtering with the human visual transfer function (VTF).
- *Reflectance Profile*: In either the horizontal and vertical axes

System Hardware

- Many scanner options available. Typical scanner: A4, 1600dpi scan area of 216×297mm (8.5×11.7") or A3, 2400dpi scan area of 310×437mm (12.5×17.7").
- Density and resolution calibration targets.

Calibration

- Resolution and density calibrated with an automatic procedure.

Computer Configuration (customer supplied)

- PC with 4GB RAM (recommended)
- High speed scanner interface
- USB port (for security)
- Microsoft Windows® 7 64-bit
- Microsoft Excel® 2007 or higher
- Microsoft Access® 2007 or higher

Product Options

- Spectrophotometer interface module
- Glossmeter interface module

Software

- **Two different modes of operation**

  Interactive

   Flexible interface, on-screen results

  Automated Sequence

   Unattended operation, results in database

- **Multilevel data reporting**

  Raw database (MS Access® database)

   Comprehensive data including metrics for each dot or line.

   Direct database creation from Scanner IAS software.

  QC database (MS Access® database)

   Averaged data based on user selectable "Analysis Groups "

  PQ-Reports (MS Excel® workbook)

   Report generated based on a user-created Excel template.
   Quick reporting. No SQL knowledge necessary.

- **Special tools**

  Fiducial compensation

   Automatic compensation for mis-positioned samples.

  Dot filtering

   Dots can be automatically be excluded from the analysis based on either size or color characteristics.

  SPC Chart

  Pass/Fail Limits

  Easy to use interactive mode

   On-screen mouse-based ROI drawing
   Automatic zooming to selected ROI
   Automatic relative thresholding on each dot

Electrical Requirements

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

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

- Scanner (A4/letter size)
  66×43×28cm (26×17×11"),12kg (26.4lbs)

Documentation

- User's Guide