

# Automated Image Quality Analysis System

# IAS<sup>®</sup>-1000



QEA's IAS<sup>®</sup>-1000 automated image quality analysis system takes the subjectivity out of print quality evaluation, delivering consistent, quantitative, operator-independent measurements. The IAS-1000 objectively analyzes any printed page quickly, easily, and reliably. For printing on any scale and in any technology, professionals worldwide – from manufacturers of printers, print engines, and components to suppliers of print media, ink, and toner– rely on this system. The IAS-1000 plays a vital role in applications including:

- Application engineering
- Competitive benchmarking
- Product specifications, design and development
- Design verification
- Process development
- Process monitoring and control
- Product qualification and acceptance
- Problem solving
- Customer support
- Total quality management

A typical IAS-1000 system consists of multiple digital cameras with optics, a computer-controlled X-Y positioning stage with a vacuum table for anchoring the test sample, and optional image quality sensors. In automated testing mode, the user places a test print on the positioning stage and initiates the test cycle. IASLab<sup>®</sup>, the IAS-1000 control software, uses fiducial marks to accurately locate the test sample. Once any necessary coordinate adjustments are made, IASLab executes the user-selected test sequence that defines the regions of interest, analyses to be performed, the order of the analyses, and results to be output. At the conclusion of the test, results are displayed in the IASLab software and saved in a Microsoft Access<sup>®</sup> database. A quality report is generated in Excel<sup>®</sup> or other application software.

Speed and automation are the hallmarks of the IAS-1000. With this system, the most complex test sequences for comprehensive analyses are completed in a matter of minutes. Flexibility is another key strength. A wide range of optics modules with different resolutions and illuminations, as well as optional instrumentation such as spectrophotometer and glossmeter are available to meet different application needs. This powerful hardware combined with the user-friendly sequence design tool eliminates all limitations on the test sequences that can be run. Sequence programming with IASLab is very straightforward with even minimal training.

The IASLab control software includes a powerful set of image quality analysis tools. This toolset covers all aspects of objective image quality analysis and satisfies a broad range of application requirements in R&D and production QC. The tools are based on international quality standards such as ISO-13660 and ISO-12233. International standards are key to obtaining consistent results and enabling unbiased data-comparison between users the true benefit of an objective analysis system.

For total quality management, QEA's IAS-1000 is the tool of choice, providing critical information for real-time or off-line quality analysis, trending, and reporting. "Turn Adjectives into Numbers" with this powerful system and "Make it Right the First Time."



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# IAS<sup>®</sup>-1000

## System Specifications

### FUNCTIONS AND FEATURES

- Automated or interactive analysis utilizing IASLab<sup>®</sup>, QEA's advanced image quality analysis software platform
- Analysis of real-time or saved images in a wide range of image file formats (optional PDF input module available)
- Sequence programming with a graphical user interface
- All measurements in calibrated, physical units including spatial dimensions, reflectance, optical density and color
- Numerical results output to database or text files and images to bitmaps
- Profile, histogram, and dot size distributions tools
- Various results formats, zoom and color channel display
- Integrated spectrophotometer, gloss meter, optical encoder, and ADF options

### ANALYSIS TOOLS AND ATTRIBUTES

- Dot (blob) and halftone quality analysis (size, shape, x-y locations, line screen, dot%, and screen angle)
- Line, edge, and text quality analysis (line width, blurriness, raggedness, density, contrast, fill, location, and orientation; line attributes analyzed per ISO-13660 where applicable)
- Solid area attribute measurements (density, reflectance, L\*a\*b\*, tone reproduction, gradient, graininess, mottle and background; area attributes analyzed per ISO-13660 where applicable)
- Noise Power Spectrum (NPS) and Banding (power spectrum with Visual Transfer Function filtering)
- Spatial Frequency Response (SFR or MTF) using the Slant Edge method per ISO-12233
- Color registration using the Slant Edge technique
- Reflectance profile analysis (graphs and statistics)
- Colorant area coverage analysis
- Point-to-point distance and angle measurements
- Optical character recognition (OCR) option

### TYPICAL APPLICATIONS

#### Electrophotographic Printing

- Density, color, tone reproduction
- Halftone, line and text quality, background, ghosting, image deletion, graininess, mottle, streaking, banding, fusing quality, color registration, and motion quality

#### Inkjet Printing

- *Media:* Wicking, feathering, inter-color bleed, raggedness, color gamut, graininess, mottle and coalescence
- *Print heads:* Jetting straightness, dot position accuracy, drop size, satellites, dot placement accuracy
- *Printers:* Color, density, tone reproduction, line and text quality, color registration, motion quality, streaking, banding, graininess and mottle

#### Thermal Printing:

- Print uniformity (heater uniformity and consistency)
- Density, color, tone reproduction, line and text quality, voids, print registration, motion quality, media handling issues

#### Offset, Flexo, Gravure, Screen or Letterpress Printing:

- Dot gain, halftone, density, color and toner reproduction
- Line and text quality, barcode print quality
- Graininess, mottle, banding, color registration

### SYSTEM HARDWARE (MECHANICAL AND OPTIONS)

- Computer-controlled XY table with fan-table hold-down; A4 standard size; open frame design
- Positioning using stepping motors with micro-stepping
- Motion control electronics, cables and connectors
- Options (*consult factory*):
  - A3 or custom table sizes
  - Automatic document feeder (ADF) for A4 table
  - X-and Y-optical encoders (1µm precision & 5µm accuracy)
  - Mechanism for integrating spectrophotometer or glossmeter

### CAMERA, OPTICS AND ILLUMINATION

- Standard package includes two visible optics modules
  - *High resolution optics module:* Resolution ~3.2µm/pixel; Field of View ~3.3mm × 2.5mm; and USB2.0, XGA camera with a 1024x768pixel sensor
  - *Low resolution optics module:* Resolution ~37µm/pixel; Field of View ~24mm × 18mm; USB2.0, VGA camera with 640x480 sensor
  - Built-in white LED illumination, 45°/0° ring geometry
- Optics modules with other specifications (resolution, illumination geometry, and illumination such as UV & IR) available as options

### MINIMUM PC REQUIREMENTS (CUSTOMER SUPPLIED)

- Operating System: Windows<sup>®</sup> 7 to 10, 64-bit
- RAM: 8GB or more
- CD-ROM drive
- Two USB 2.0 ports

### APPLICATION SOFTWARE (CUSTOMER SUPPLIED)

- Microsoft Office Professional<sup>®</sup> 2007 (Including Excel 2007 and Access 2007) is recommended

### SYSTEM PERFORMANCE

- Line spacing accuracy: High Resolution ±3µm; Low Resolution ±5µm
- Line Width Inter-Instrument Agreement: High Resolution ±3µm; Low Resolution ±7µm

### ELECTRICAL REQUIREMENTS

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

### OPERATING ENVIRONMENT

- Temperature: 10 to 32 C (50 to 90 F)
- Relative humidity: 20% to 80% (non-condensing)

### DIMENSIONS AND WEIGHT (MAIN UNIT)

- Main unit (A4 or Letter Size):
  - 104cm (W) x 101cm (D) x 78cm (H) (41" x 40" x 31")
- Approximate weight of system: 100 kg (220 lb)

### DOCUMENTATION

- User's Guide

\*\* Specifications subject to change without notice. Rev. 160223



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