

SCAN OPTICS

ACCUTEST

The choice for high-stakes scoring.

Scan-Optics has been a leader in the test scoring marketplace since 1999 with the release of our development of grayscale Optical Mark Read (OMR) technology originally called AccuScore. This technology was developed specifically to read bubble marks on student test forms using image density recognition. AccuTest expands on the functionality provided with the AccuScore OMR engine, resulting in a comprehensive and robust solution for high stakes test scoring in an OMR environment.

OMR is a technology that has been used for data collection in a number of different application areas besides test scoring; surveys, voting ballots and warranty cards to name just a few. In many applications, conventional bi-tonal images do not possess the necessary fidelity, and gray scale or color imaging is required. Based on the luminance level of the mark, the application determines how to record the mark. Because erasures and other extraneous marks can and do occur on these critical documents, gray scale and color images enable the application to differentiate between a valid mark attempt, an erasure, an errant mark or an attempt to mark two or more responses to a single request. The ability to read gray scale and color images is critical to test scoring accuracy. Scan-Optics' AccuTest can accurately sense the density of a mark up to 16 darkness levels.

Conventional OMR forms are developed using a "grid" concept. Typically, "timingmarks", the thick black bars on the edge of the form, are used to identify row(s) of the grid that the OMR uses for reference. The columns of the grid are evenly spaced, starting at a fixed distance from the timing marks. This concept was developed to accommodate OMR scanners that used sensors vs. images for recognition. Using forms in this construct typically requires precision printing to hold the vertical and horizontal dimensions. This also means a higher cost for the forms: up to three times the cost of conventionally printed forms.

Scan-Optics' AccuTest provides an alternative to these rigid printing rules. Timing marks are removed and 3 or 4 "reference marks" are added to the form. Reference marks placed at the corners of the document are used to determine the coordinate of a mark target. Reference marks allow greater freedom in the form's design and recognition process -- no longer are marks required to be placed on the "grid". Now they can be placed anywhere on the form. This eliminates the dependency on the black timing marks found on the edge of typical OMR documents processed on conventional hardware, which in turn eliminates restrictions and/or limitations on the design of OMR documents.



AccuTest equals greater flexibility at a low cost

- NOT dependent on precision printed forms
- Need only three reference marks vs. timing tracks
- Easy editing via image workflow. No more printing reports and spending time going back to the paper to edit
- Use of images keeps your entire test scoring process electronic
- Leverages AccuScore* OMR, the industry's premier image-based OMR software

AccuTest provides:

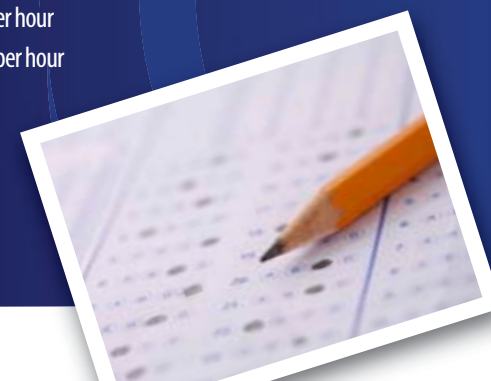
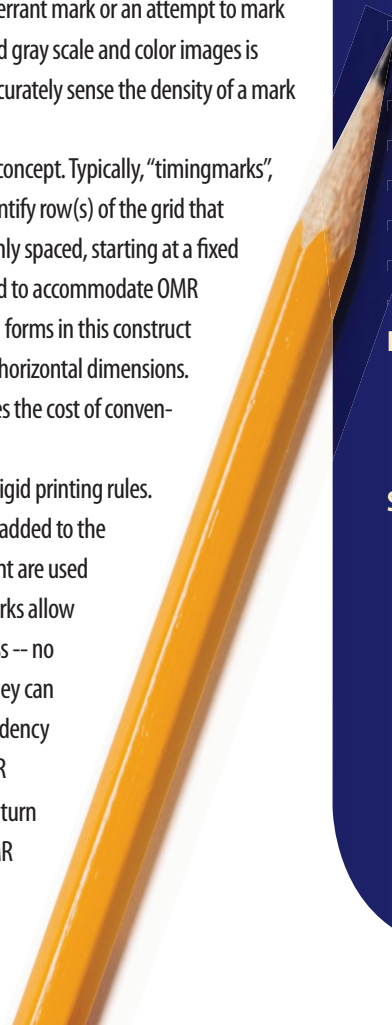
- Ability to scan using inexpensive color or grayscale scanners
- Positive Page Identification using
 - Skunk codes
 - OCR
 - OCR/ICR, Barcodes Recognition
- Booklet Integrity checking and repair
- AccuScore* OMR
- Editing via image workflow
- Export to host systems with image archive

Easy to use

- Standard Microsoft-based environment
- Easy-to-follow screens for scanning and editing
- Built-in calibration procedures to ensure image quality

Scalable to meet volume requirements

- AccuTest is available in four tiers, based on the scanner speed required
- 32 ppm 1,920 per hour
- 60 ppm 3,600 per hour
- 100 ppm 6,000 per hour
- 240 ppm 14,400 per hour



Built to work with industry standard scanners

- AccuTest works with the industry standard image format, TIFF.
 - Large selection of scanners available
- Supports JPEG, JBIG and CCITT G3/4 image compression
- Works independent of image capture resolution
- Supports color, gray scale and bi-tonal images
- Scan-Optics' solution for 240ppm includes its awardwinning SO Series Scanner, enabling the company to supply the entire system

Configurable, secure and built on industry standards

- Define and configure each job within system
- Perform statistical reporting for all activities
- Menu options by operator
- Outputs industry standard image and data formats
- Based on the industry standard components of Microsoft

AccuScore - image-based OMR engine

- Reads "Bubble" Forms from images
- Uses advanced grayscale "Mark Sense" technology
- Reads and interprets rows and/or columns
- Distinguishes light and dark marks (erasures)
- Easily handles different size/shape targets
- Provides extremely high accuracy rates
- Anticipates and corrects for image distortion

OMR Edit/Repair

- No more printing reports and spending time going back to the paper to edit. AccuTest presents images of test pages and fields containing errors, multi-marks and double-marks, to an operator for resolution. Edits are accomplished immediately
- Zoom and Rotate available and selections remembered from page to page
- All operator corrections logged before and after repair

Accuracy

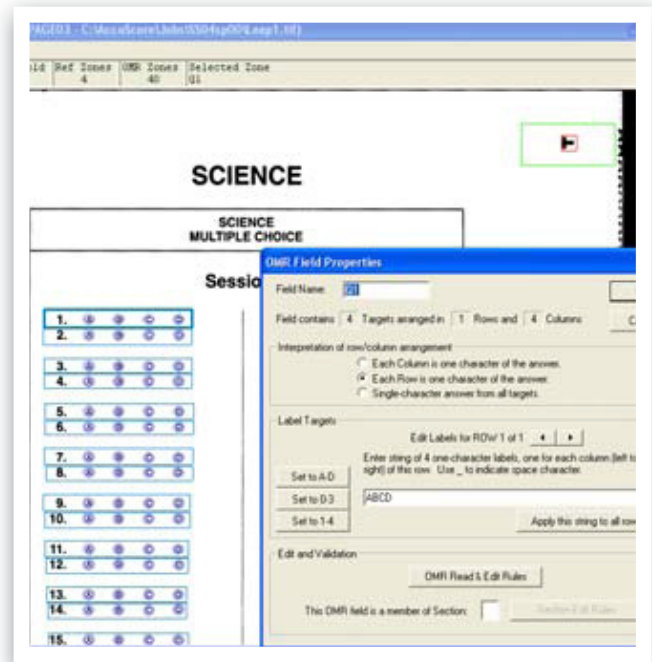
- Accurately locates each individual target; competitors require "timing marks" and special high-quality paper. Scan-Optics does not; uses Reference Marks
- Accurately senses the darkness of each target: 16 darkness levels computed by pixel averaging

Forms Definition Tools

- Easy to use to define locations and interpretations of each bubble target
- Graphical User Interface
- Locates targets for you
- Labels the targets and defines Edit Rules

Image Distortion Correction

- Images are subject to the "4 S's" (from both the printing and scanning processes)
 - Shift Distortion - up/down, left/right
 - Skew Distortion - image slightly rotated
 - Scale Distortion - stretched or compressed
 - Slant Distortion - parallelogram effect
- Jitter Technique - positions fully on the target
- Non-blank targets are "jittered" around the local neighborhood to find the darkest mark



Some examples of documents which cannot be processed with traditional OMR readers, but which can easily be handled by AccuTest are: non-precision printed forms, obstructions covering timing tracks (i.e. students drawing on timing tracks, seals, etc.), and OCR for page identification. Publishers are moving to non-precision printed forms to gain greater freedom and value in their assessment publishing and there is now a solution which offers the same freedom for scanning and capturing answers accurately - it's called AccuTest!

When you need accurate test scoring for non-precision printed forms, AccuTest is the right software solution. To learn more about Scan-Optics' data capture solutions call us at (800) 745-6001 or visit our website at www.scanoptics.com.

Scan-Optics, LLC is a leader in applying technology to highspeed imaging, recognition, data capture, and archive and retrieval solutions. The growth of the company's product line and the diversification of its services since its incorporation in 1968 reflects Scan-Optics' ability to respond with innovation and technical expertise to the rapidly changing business requirements of its customers. Scan-Optics' ability to offer customized and integrated system solutions has helped companies all over the world meet their productivity and profitability objectives. Offices and service representatives to support Scan-Optics products are located throughout the United States, and supplemented worldwide by select distributors in over forty countries.

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