



# The DATA CAPTURE Report

Since 1977, the premier management & marketing newsletter of automatic data capture: Bar Coding, RF and related technologies.

1572 Kuntz Road ■ Erie, PA 16509 ■ PH (814) 866-1146 ■ <http://www.scandcr.com>

December 14, 2007

## THIS JUST IN!

### **MOTOROLA AND INTELLEFLEX ANNOUNCE STRATEGIC RELATIONSHIP**

On Dec. 12, the RFID division of **Motorola's Enterprise Mobility** business and **Intellex** jointly announced a new strategic agreement to co-develop RFID platforms and offering based on the BAP (battery assisted passive) tag technology owned by Intellex. Motorola also announced it is co-leading a \$15.5 million, Series C, investment round in Intellex.

The investment by Motorola in this new and emerging technology is a vote of approval for what BAP has accomplished thus far and for the prospects of continued growth in what is a unique market. In the next issue of *SCAN/DCR*, we will have a full story on the announcement with comments from both companies. **SCAN**

### **BLUESTAR WINS TOP HONORS FROM MOTOROLA**

In other news from **Motorola**, as we were going to press, we received word that **BlueStar Inc.** has been named Motorola's *North American Enterprise Mobility Distributor of the Year*.

The Motorola award is presented to the distributor that demonstrates the ability to rapidly grow sales revenues and develop incremental sales through extended market coverage. In the next issue of *SCAN/DCR*, we will have an exclusive interview with BlueStar CEO Steve Cuntz. **SCAN**

## IBM Exec Sees Big Changes In RFID Sector

There's been a definite shift in the market adoption of RFID during the past 12 months, according to **IBM Corporation's** Brian Dalgetty, director, solutions development & global marketing, sensors & actuators EBO (emerging business opportunities). Like many of his industry peers, Dalgetty is cautiously predicting this could be the beginning of the big ramp-up waited for so long by RFID vendors.

"We know this is a high-growth market," said Dalgetty. "That is why we have invested several hundred million dollars on the technology. We are no strangers to RFID. Much of **Intermec's** RFID IP was purchased from IBM. We're trying to build a service platform...a standard architecture and infrastructure to offer the market. Then, customizing can be done as necessary."



**Brian Dalgetty**, director, solutions development & global marketing, sensors & actuators EBO, IBM Corporation.

"IBM will use all types of RFID and sensors in its solutions," Dalgetty continued. "We believe the technology can be used to monitor everything—people, trucks, items, assets. Our goal is strictly to determine how various forms of RFID can be used to positively affect business processes."

### **The buck stops here**

IBM—along with its Global Services Division—is probably one of the most well-known companies in the world. And when it comes to RFID at Big Blue, the buck stops with Dalgetty. There are three teams—solutions, marketing, and dedicated sales—that all report to Dalgetty.

"We see real opportunities in our end of the market," Dalgetty told *SCAN/DCR*. "Our interest is primarily in software. IBM's *WebSphere Premises Server* software can be used to manage the RFID data capture process, associate items with production run data, and generate serialization reports. On the services end of our business, we offer consulting, assessment, and systems design—all centered

around process improvement. We help our customers deploy the systems they need. For hardware, we have a huge ecosystem of partners that we work with to handle that side of a sale.”

---

**“IBM will use all types of RFID and sensors in its solutions. We believe the technology can be used to monitor everything—people, trucks, items, assets. Our goal is strictly to determine how various forms of RFID can be used to positively affect business processes.”**

**Brian Dalgetty, director, solutions development & global marketing, sensors & actuators EBO, IBM Corporation.**

---

### **View of the market**

IBM takes both a broad and a narrow view of the RFID market. It takes a broad view in the sense that it does not automatically rule out any opportunities for RFID use. In some ways, however, the company has a narrow focus in how it approaches RFID sales. “We do not focus on technology,” Dalgetty explained. “We focus on our customers’ needs. That may sound cliché, but I can assure you it’s a wise philosophy. Potential customers who approach us aren’t asking for the latest gadget. They’re asking us to solve their business needs.”

Continuing, Dalgetty outlined some of the major applications that are showing real signs of growth in the RFID arena. “Retail gets a lot of attention but there are certainly a lot of other very promising applications,” he stated. “Track and trace is very big in the pharmaceutical sector. [See related story in this issue.] Industrial is very big. Both the aerospace and automotive industries are bullish on RFID adoption. In the automotive sector, we identified 13 different use cases. One good example is tracking parts containers. These containers are not only high value, they are also critical to keeping assembly lines moving. The aerospace industry is very concerned about tracking the lifecycles of its jet engine components.

“Work-in-process apps are also big. Honda is using RFID on its motorcycle assembly line to match components to VIN numbers. And once again, it reduces line stoppages. Active tag technology is proving very valuable because of its long-range readability. Chemical and petroleum companies use active tags because read rates are unaffected by liquids. Active tags are also ideal for tracking personnel and aiding with safety concerns. Chemical, petroleum, and nuclear power plants use active tags to locate trapped personnel in the case of accidents or fires.”

Data center asset tracking is yet another high-growth application for RFID adoption. “Companies are always losing notebooks and laptops,” said Dalgetty. “RFID can help

## **SCAN The DATA CAPTURE Report**

Since 1977, the premier management & marketing newsletter of automatic data capture, including:

- Bar coding, 1-D & 2-D symbologies
- Bar code printers, scanners, terminals, verification products and labels
- Wireless (RFDC & RFID)
- Magnetic stripe
- OCR products
- Voice recognition systems
- Vision systems, video scanners
- EDI
- Smart cards
- Biometrics
- Application software
- Peripherals or supplies for the above

---

**Vol. 30, No. 23**

**Editor:** Rick Morgan  
PH (814) 866-1146  
rickm@scandcr.com



**Founding Editor:**  
George Goldberg

**Publisher:**  
RMG Enterprises, Inc.  
4003 Wood St.  
Erie, PA 16509  
PH (814) 866-1146  
rickm@scandcr.com

---

**SCAN/DCR** is published 24 x per year, on the 2nd & 4th Fridays of the month, by:

**RMG Enterprises, Inc.**

4003 Wood St.  
Erie, PA 16509

PH (814) 866-1146

**Web Site** <http://www.scandcr.com>

**Copyright** © 2007 by RMG Enterprises, Inc. Federal copyright law prohibits unauthorized reproduction by any means including photocopying or facsimile distribution of this copyrighted newsletter. Such copyright infringement is subject to fines of up to \$25,000.

Because subscriptions are our main source of income, newsletter publishers take copyright violations seriously. Some publishers have prosecuted and won enormous settlements for infringement. To encourage you to adhere to this law, we make multiple-copy subscriptions available at a substantially reduced price.

**Subscriptions:** \$597 per year for electronic copies.

prevent these losses. RFID can be used as a locator, but it can also be used to monitor when something was moved and who moved it. It's great for inventory management."

### Wrap-up

Closing, Dalgetty told *SCAN/DCR*, "We're past the proof-of-concept stage. Everyday, we are seeing more initial deployment of RFID...deployment resulting from successful pilots. Companies are searching for ways to find more value from RFID use. Closed loop systems are really big and are setting the stage for rapid market growth. IBM will remain a leader in the RFID market and continue to help customers realize benefits from adoption of this great technology."

For more information: **IBM Corporation**, Armonk, NY, PH (914) 766-1849, Email: [nkaplan@us.ibm.com](mailto:nkaplan@us.ibm.com). **SCAN**

## IBM And TAGSYS Team On Pharma RFID

As some of our readers may know, starting January 1, 2009, all prescription drugs being sold in the state of California must bear a unique identifier that can be used to track products throughout the supply chain, making it easier to identify counterfeits and prevent them from reaching patients. To address this burgeoning market, **IBM** and **TAGSYS** have pooled their talent to create a new Serialization Pilot Kit that will help pharmaceutical manufacturers rapidly pilot and use RFID technologies for item level serialization in their packaging operations. Serialization is the first step towards compliance with California's drug pedigree regulations and the basis for improved supply chain performance.

"With regard to the new California RFID mandate, many pharmaceutical suppliers are asking: 'How do I get started?'," said John Del Pizzo, pharmaceutical track & trace solutions executive for IBM. "They also want to know what carrier to use. To help move things along, we have joined forces with TAGSY to create our new pilot kit. We used IBM's extensive knowledge of users' needs to determine the proper components of the kit. We will embed tags in the labels our customers need. It is an excellent, easy-to-use, and low-cost package."

The Serialization Pilot Kit, which is available now, includes:

■ **Tags:** 50,000 High Frequency (HF) TAGSYS tags, converted to the customer's label specifications and ready to be applied to the

product for item level serialization; and 1000 Ultra High Frequency (UHF) tags for case level serialization.

■ **RFID Hardware:** TAGSYS HF reader stations (based on the new L400 Long Range Reader) with integrated diverters that can be easily added to a packaging line, HF/UHF stations for associating items to cases, and a UHF RFID printer to print case labels.

■ **Software:** The IBM WebSphere Premises Server software to manage the RFID data capture process, associate items with production run data, and generate serialization reports.

■ **Services:** The necessary services to install and configure the system for optimal performance.

This offering can be deployed in under four weeks for \$125,000. With it, pharmaceutical

manufacturers can learn how easily and quickly RFID can be applied in packaging operations, evaluate the accuracy and reliability of the technology at production speeds, and make an informed choice on their path to item-level serialization. Since the hardware is provided for the duration of the pilot, clients can use RFID with minimal risk and expense.



*John Del Pizzo, pharmaceutical track & trace solutions executive for IBM.*

"We view this application as significant for the RFID industry and its global market," Del Pizzo told *SCAN/DCR*. "The ePedigree

programs in the U.S. market are State-driven. The **FDA**, which actually got the ball rolling, is watching closely to determine the success of the various programs. Europe is about 12-18 months behind the United States in adoption of RFID-enable systems. Most European track-and-trace programs are using 2-D bar codes. In all the programs, authentication is the big focus—even more than track-and-trace."

Although IBM has an extensive list of hardware partners, the only company included in the new package is TAGSYS. "TAGSYS is a true innovator," said Del Pizzo. "We've never had a customer come back and say something bad about the company. The TAGSYS reviews are always raving." [See *SCAN/DCR 11/23/07 for more on TAGSYS.*]

Closing, Del Pizzo told us, "IBM is in a unique position. As a business consultant, we can handle the strategy work and the implementation of software, readers, and tags. We also have a huge network of global partners. IBM is the closest thing to a one-stop-shop that users will find when looking for a track-and-trace RFID system. **SCAN**

# Blue Vector Wins Top Honors

In mid-November, **Blue Vector Systems** CEO Nancy Anderson was honored at the 4th Annual Stevie Awards for Women in Business, held in Las Vegas. The Stevie Awards honor women executives, entrepreneurs, and the companies they run worldwide. Chosen from more than 800 entries in 40 categories, Blue Vector was selected as Best Overall Company of the Year, based on its accomplishments during the past year.

Speaking to *SCAN/DCR* after the awards, Anderson was magnanimous in giving much of the credit for winning the award to Blue Vector employees. "I don't view this as an award for me...I view it as one for the company," she told us. "Our employees have come up with unique technology that enables us to do great things in the market. Our rapidly deployable sensor automation platform puts RFID, barcode, temperature, GPS, and motion sensors to work for leading businesses in the pharmaceutical, retail, distribution, and manufacturing industries.

"The beauty of our system is that it is plug-and-play," Anderson continued. "It is scalable but you don't have to customize the solution. Our edgware devices capture information, compare it to what is on file, and then determine if things are occurring as they are supposed to. For example, our devices can capture information about items on a loading dock, compare it to what is supposed to be shipped, and then make sure it happens—all automatically." [For more information on the Blue Vector solution, see *SCAN/DCR* 4/27/07.]

There's been a lot of talk in the industry about managing information at the edge of the enterprise, and Blue Vector maintains it has the only true edge-management system. But, where is the edge of the enterprise? According to Anderson, it can be a dock door, the trunk of a salesperson's car, or even a refrigerator for pharmaceutical supplies.

Working with Blue Vector, **ASD Healthcare**, a division of **AmerisourceBergen Specialty Group** recently announced a new solution that enables real-time tracking of specialty drugs used at hospitals. With the help of an RFID-enabled refrigerator, hospitals can handle issues such as pedigree requirements, supply chain verification, product monitoring, billing, and reordering. As drugs are removed from the medical refrigeration unit, an alert is sent back to ASD to enable rapid replenishment of low supplies. The system can also better manage unusual activity, assuring product availability and eliminating drug expiration. ASD has equipped over 50 hospitals and plans to actively market this solution

to other healthcare providers. Blue Vector appliances provide the alerts and network management, and **RF Code** supplied the tags and readers.



*Nancy Anderson,  
CEO, Blue Vector  
Systems, Inc.*

"This is an awesome use of RFID," said Anderson. "The solution provides all kinds of benefits to healthcare institutions. In addition to vendor monitoring of inventories, the system also handles billing. Hospitals are not charged for medications until two hours after the drugs are actually removed from the refrigerator. The two-hour delay is there to allow for returns. If a drug is returned to the

refrigerator during the delayed billing period, no charges are made to the hospital and the meds are returned to inventory."

## After the hype

Like so many of her peers in the RFID sector, Anderson is very optimistic about the state of the industry. "During the hype period, RFID didn't meet customer expectations," she explained. "As we begin to replace older RFID systems, we are finding that some only had a 60% read rate. The demand was there, but the technology wasn't ready. Even when Gen 2 was ratified, only **Impinj** had chips. This year, things have really changed. Working products became available, and **Intel** developed a reader on a chip paving the way for decrease infrastructure costs. Reader prices have been kept artificially high. Soon, we'll see RFID readers in the \$500 ranges.

"In 2007, we also have seen some real rollouts begin," Anderson continued. "RFID has proven itself, and I believe this is just the beginning of what will likely be a huge surge in sales."

## What customers want

Anderson believes in a no-nonsense approach to the market; give customers what they want. "Customers aren't interested in technologies or frequencies," Anderson told us. "They just want answers to their problems. We're not doing a lot with HF right now; it's just not as flexible as UHF and active technologies. BAP (battery-assisted passive) tags are really showing a lot of promise. They could be a big winner in the market.

"The next 18 months are going to be a lot of fun," Anderson continued. "Lots of changes will be going on. We'll all look back and say: 'Whoa, what happened?' Questions will disappear."

For more information: **Blue Vector Systems**, Palo

## Accu-Time Systems Acquires Biometric ID Assets

Recently, **Accu-Time Systems**, a long-time player in the time-and-attendance market, increased its clout with the acquisition of substantially all the assets of **BioMet Partners, Inc.** Founded in 1992, the Switzerland-based BioMet Partners developed and patented the three-dimensional, two-finger geometry biometric technology for use in applications such as workforce management (time and attendance, payroll, etc.), and security access.

“This is a great acquisition for Accu-Time,” company founder/CEO Peter DiMaria told *SCAN/DCR*. “We’ve actually been using BioMet’s technology for almost seven years. With the purchase, we have inherited BioMet’s IP and licenses and its manufacturing facilities. This technology is a differentiator in the biometric ID market.”

According to a company press release, two-finger geometry biometric products are currently sold under various trade names such as the popular *Finger Foto* and *Very Fast*. The technology has proven to be an attractive alternative to fingerprint and other biometric technologies due to the flexibility and robustness when compared against other biometrics for certain applications. “Now that we own the technology, we will be working to increase read and response reads,” said DiMaria.

We asked if that meant two-finger geometry systems were slower than other systems such as finger printing. “Not at all,” DiMaria responded. “Actually, they’re about the same. We simply want to improve on our product and make it better than the rest of the offerings in the market.”

Continuing, DiMaria stated, “There’s not as much objection to two-finger geometry as there is to finger printing. Whether it makes sense or not, people still have a stigma about finger prints and law enforcement. We’ve had good success with casual users of two-finger geometry technology. Event management is a good market. People who hold season tickets to sporting events are using the technology. Health clubs are also using it for access control. It’s really very easy to use. You take a picture



**Peter DiMaria, CEO,  
Accu-Time Systems.**

of a person’s knuckle pattern and that’s pretty much the registration process. We are also targeting amusement and theme parks.”

### **Stats on biometric ID**

When asked about pricing, DiMaria said two-finger geometry is equivalent to finger print technology, with perhaps a 10% premium on certain offerings. At least a third of all Accu-Time time-and-attendance sales now incorporate some form of biometric ID. DiMaria said that number will soon reach 50%.

“Some of our partners only sell biometric ID systems,” DiMaria confided. “We’re all going to see increased use of biometric ID in the near future. In commercial applications, it will be used to start cars or serve as an access control system on computers. In 10 years, biometric ID will be everywhere. I’m not certain what technology will win out, but it is definitely here to stay.”

### **Positive news**

Before closing, DiMaria told us, “This is a great time for the company. We just finished doing the numbers for our fiscal year, and sales are at an all-time high. We also have the biggest order backlog in our history. Our global service business is about to really take off as we open new facilities around the world. I couldn’t be more optimistic about Accu-Time Systems’ future.”

For more information: **Accu-Time Systems, Inc.**, Ellington, CT, PH (860) 870-5000,  
Email: mglynn@Accu-Time.com,  
Web site: www.accu-time.com. **SCAN**

## New Standards Reliably Verify 2D Data Matrix Codes—Part 2

*By Carl W. Gerst III, Cognex Corporation, senior director & business unit manager, ID Products*

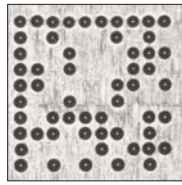
### **A Standard for the Real World**

Even with an optimal image, another problem crops up when analyzing the histograms in 15415. Because they are created by independent processes, histograms of actual DPM (direct part marking) codes do not generally exhibit equal-sized or symmetric distributions for foreground and background.

So how do you distinguish between the foreground and the background?

**ISO/IEC 15415** relied on an overly simplistic method based on the mid-point between the histogram’s darkest value (minimum reflectance) and its brightest value (maximum reflectance). Of

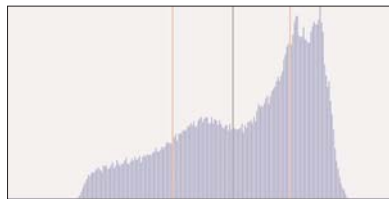
course, this method would only yield the correct threshold if distribution of both peaks was identical, which never happens—not even for paper labels. This problem is exacerbated if you include all of the pixels in the symbol region. Ideally, an image of a good code contains only three types of gray-value distributions—foreground, background, and edges. “Edge” pixels divide the foreground from the background.



**Fig. 1** Original image of a dot-peened code marked directly on a part that has a milled surface.

The gray values in this region change rapidly. As you move across it, they transition from the foreground dark value to the background bright value. The edge pixels contribute to the histogram region between the two peaks, leaving the peaks less distinct than they should be, potentially compromising any information extracted from the code. Using information only from the center of the foreground and background modules yields a grid-center image.

The histogram that corresponds to such an image—a grid-center histogram—contains no edge pixels at all.



**Fig. 2** Histogram showing the grayscale values (0 = pure black, 255 = saturated white) of all pixels in the symbol and quiet zone of the code. To decode the symbol, the grayscale values of the dots are determined to be 1 or 0 based on which side of the threshold (center vertical line) the value falls on. Grayscale values close to the threshold are more difficult to determine consistently.

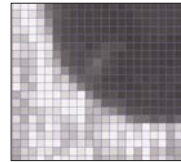
An additional image-processing step consists of applying a low-pass filter, referred to as a synthetic aperture with an aperture size that is a certain fraction of the nominal cell size. Using a synthetic aperture prior to computing the grid-center histogram helps to make the grid-center pixels more representative of the actual module by eliminating hot spots and background noise such as machining marks.

A simple yet elegant algorithm to determine the correct threshold examines every gray-scale value from the grid-center histogram, calculating the variance to its left and its right. The point where the sum of those two variances reaches a minimum represents the optimum separation point between the foreground and background peaks.

Another issue with 15415 was that it established a fixed synthetic aperture depending on the application, determined by the smallest module size that the application encountered. The synthetic

aperture was created to connect dots of a dot-peen code so that they appeared connected after binarization. Although this approach was not optimal in achieving that goal, it provided other benefits, such as reducing hot spots.

Nevertheless, the synthetic aperture should not remain fixed, but rather take on an appropriate value for each mark being verified. Two values were selected for the new standard because marks and surfaces that create a significant amount of



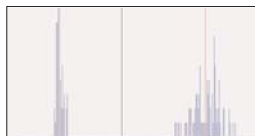
**Fig. 3** Close up of a single dot in the symbol illustrates how “Edge” pixels exhibit rapidly changing grayscale values.

background noise, like dot-peen codes on a cast surface, work better with a larger aperture. Smaller apertures better address the requirements of well-marked codes.

Determining optimal aperture size is difficult. Based on empirical analysis, we selected two values - 50% and 80% of nominal cell size.

The nominal cell size changes from mark to mark and hence the synthetic apertures were dynamic instead of fixed as in 15415. The manufacturer performs the entire verification process with both aperture sizes and selects the one that produces the better result.

The optimal image was obtained using an iterative process by analyzing the grid center histogram after applying the synthetic aperture. The imaging system was adjusted iteratively so that the mean of the bright pixels would approach an empirically determined value of 200 plus or minus 10% (on an 8 bit grayscale camera). The beauty of this approach is that it works regardless of the marking method, material, or surface characteristics. The camera settings may not be the same across marks, but it takes on the order of milliseconds to adjust to the proper dynamic range for the camera. Once the optimal image is obtained, the metrics must determine the mark’s quality. Some marks may require some extreme light energy for this process to succeed. The minimum-reflectance metric was created to track this very aspect. The metric is graded based on the light energy required to adjust



**Fig. 4** Histogram (excluding edge pixels using synthetic aperture noted in Figure 6) of only the centers of each of the dots in the code shows good separation between the 1 and 0 values compared to Figure 2.

the bright pixel mean to 200 compared to the light energy required for a standardized white target such as a **NIST** calibration card.

## Standard Verification Metrics

We now have an optimal image, a well-formed histogram representing the gray-scale value for each

cell, and an optimal global threshold. We can finally start analyzing different aspects of the mark. ISO/IEC 15415 took a significant leap in the right direction. It contained a number of good metrics. However, the inflexibility of the surrounding conditions reduced their usefulness. The computation methods for these metrics also exhibited limitations that would create problems for both DPM marks and paper labels.

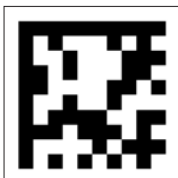
The following metrics and methods comprise the AIM DPM standard for assessing a mark's overall quality:

■ **Decodability** - This pass/fail metric uses a reference decoding algorithm that the AIM DPM standard has improved to address and decode marks that have disconnected finder patterns. The reference decode algorithm is responsible for establishing the grid center points required for verification.

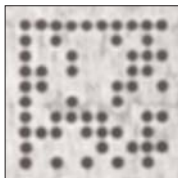
■ **Cell Contrast (CC)** - The name changed from symbol contrast in 15415 to reflect significant differences in what it measures. Instead of determining differences between the brightest and darkest values (which are highly variable), CC measures the difference between their means. The ability to distinguish between a black and a white cell depends on the closeness of the two distributions in the histogram.

■ **Cell Modulation (CM)** - As noted above, a well-marked code requires a tight distribution for both light and dark values. If the standard deviation of each peak increases, some center points will approach the threshold and may even cross over. Cell modulation analyzes the grid center points within the data region to determine the proximity of the grayscale value to the global threshold after considering the amount of error correction available in the code. Typical problems that lead to poor modulation include print growth and poor dot position.

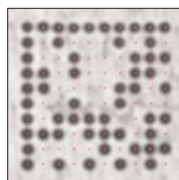
■ **Fixed Pattern Damage (FPD)** - This metric resembles cell modulation, but instead of looking at the data region itself, it analyzes the finder "L" and clocking patterns as well as the quiet zone around the code. The first step in reading a code is finding it. Problems with the finder pattern or the quiet zone will reduce the fixed-pattern damage score.



*Fig. 5 Binarized image having values only 1 or 0 is obtained using the threshold (center vertical line) in Figure 4 histogram.*



*Fig. 6 Synthetic apertures of 50% and 80% of nominal dot size are simultaneously applied to the original image to average out grayscale values.*



*Fig. 7 Red dots show the sampling grid center points to obtain a 1 pixel per cell image.*

■ **Grid Non-Uniformity (GNU)** - qualifies the module placement by comparing to a nominal evenly spaced grid.

■ **Axial Non-Uniformity (ANU)** - describes the modules' squareness.

■ **Unused Error Correction (UEC)** - Data Matrix incorporates Reed/Solomon error correction.

Every grid center point should fall on the correct side of the global threshold. If so, the binarized image will look like a perfect black and white representation of the code. It is not uncommon for some center points to fall on the wrong side. Any such bit is considered a bit error that requires processing through the Reed/Solomon algorithm. The amount of error correction needed increases with the number of bit errors. A perfect mark that requires no error correction would achieve a UEC score of 100%. The more error correction, the lower the UEC score. A code with a score of 0 would not be readable with one additional bit error.

■ **Minimum Reflectance (MR)** - The NIST-traceable card that is used to calibrate the system creates a calibrated system reflectance value. The image brightness is adjusted on a new part, after which this calibrated value is compared with the reflectance of that part. Parts that are less reflective than the NIST standard card will need more light energy for the camera to achieve the appropriate image brightness. MR is the ratio of the parts reflectance to the calibrated reflectance. Every part must provide at least some minimum level of reflectance.

■ **Final Grade** - Like ISO/IEC 15415, the code's final grade is the lowest of the individual metrics. Because the grading system uses letter grades, users often feel compelled to achieve the best possible grade (as college students do). In this case, however, grades of D or better denote perfectly readable codes. In fact, most readers on the market today can reliably read codes graded F. Companies that demand grades of - say - B or better are incurring very high additional costs with little benefit. When using the AIM DPM guideline, we recommend passing marks that score C or better and pass but investigate any code that gets a D.

*Comment: We want to thank Carl Gerst for sharing his knowledge and understanding of the new AIM guideline and the DPM market in general. For another great source of information on this burgeoning market, pick up Roger Palmer's Fifth Edition of The Bar Code Book. The book can be ordered by going to the following Web site:  
<http://www.trafford.com/07-1286>. SCAN*

# SCAN/DCR MARKET WATCH

## For December 7, 2007

Astro Med	(401) 828-4000	NASDAQ	ALOT	10.09	8.31	12.12	2.10	20.14	0.50
Avnet Convergent Technologies	(480) 643-7291	NYSE	AVT	37.10	24.42	44.68	N/A	12.91	2.87
AXCESS Inc.	(972) 407-6080	NASDAQ	AXSI.OB	1.60	1.01	1.96	N/A	N/A	-0.34
Brady Corporation	(414) 438-6880	NYSE	BRC	39.07	30.50	44.46	1.50	19.26	2.03
Checkpoint	(800) 257-5540	NYSE	CKP	21.98	18.19	30.50	N/A	16.99	1.29
3Com Corporation	(877) 463-6326	NASDAQ	COMS	4.51	3.22	5.11	N/A	N/A	-0.24
Cisco Systems, Inc.	(408) 526-8890	NASDAQ	CSCO	27.45	24.82	34.24	N/A	21.80	1.26
Cognex Corp.	(580) 650-3353	NASDAQNM	CGNX	20.67	16.68	25.87	1.60	36.39	0.57
CSP Inc.	(508) 663-7598	NASDAQ	CSPI	7.01	6.19	11.88	N/A	7.51	0.93
Danaher Corporation	(202) 828-0850	NYSE	DHR	87.08	69.11	89.22	0.10	20.64	4.22
Datalogic (Euros)	39 051 3147011	MILAN	DAL.MI	6.07	5.75	7.03	N/A	N/A	0.00
Dover Corporation	(212) 922-1640	NYSE	DOV	46.72	44.34	54.59	1.70	16.13	2.90
EMS Technologies, Inc.	(770) 729-6510	NASDAQ	ELMG	32.42	18.00	32.80	N/A	13.42	2.42
Intermec Inc.	(818) 992-3000	NYSE	IN	21.98	20.13	30.16	N/A	142.73	0.15
Itron	(509) 924-9900	NASDAQ	ITRI	84.34	47.80	112.92	N/A	N/A	-0.45
Lockheed Martin Corporation	(607) 751-2690	NYSE	LMT	111.01	88.86	113.74	1.50	16.12	6.89
Motorola	(800) 262-8509	NYSE	MOT	16.30	15.61	21.50	1.20	81.09	0.20
NCR Corporation	(937) 445-5905	NYSE	NCR	24.41	22.56	57.50	N/A	12.38	1.97
NeoMedia Technologies Inc.	(941) 337-3434	NASDAQ	NEOM.OB	0.01	0.01	0.08	N/A	N/A	-0.12
Printronic	(714) 221-2924	NASDAQ	PTNX	15.45	11.02	16.25	2.60	23.16	0.67
Psion Tekloxix (UK P)	(416) 875-8000	LONDON	PON.L	90.50	86.00	179.50	N/A	N/A	0.00
ScanSource	(864) 288-2432	NASDAQ	SCSC	36.69	25.22	39.50	N/A	21.46	1.71
Sirit	(905) 949-4404	TORONTO	SI.TO	0.26	0.16	0.53	N/A	N/A	0.00
Zebra Technologies	(847) 793-6735	NASDAQ	ZBRA	37.39	32.93	42.50	N/A	25.80	1.45

Check out the [www.scandcr.com](http://www.scandcr.com) Web site with its newly revised end user center.

### Subscription Order Form for RMG Enterprises, Inc. Newsletters

5905 Beacon Hill Lane • Erie, PA 16509 • Phone (412) 480-5116 • Fax (412) 291-1352 • <http://www.scandcr.com>

#### Document Imaging Report

Business Trends on Converting Paper Documents to Electronic Format

1 year (24 issues)

- electronic copy @ \$597  
 paper copy @ \$670

#### SCAN: The DATA CAPTURE Report

Premier Management & Marketing Newsletter of Automatic Data Capture

- electronic copy @ \$597  
 paper copy @ \$670

#### OUR GUARANTEE TO YOU

If you are not completely satisfied, we will refund your subscription cost for all remaining unserved issues.

Name \_\_\_\_\_ Title \_\_\_\_\_

Please  enter /  renew the following subscription.

Company \_\_\_\_\_

Payment Enclosed (Remit to: RMG Enterprises, Inc., 5905 Beacon Hill Lane, Erie, PA 16509.)

Street \_\_\_\_\_

Charge My Credit Card (Charge will appear as RMG Enterprises.)

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

\_\_\_\_ AmEx \_\_\_\_ Visa \_\_\_\_ MC \_\_\_\_ Discover \_\_\_\_\_ card number \_\_\_\_\_ expire date

Phone (\_\_\_\_) \_\_\_\_\_ Fax (\_\_\_\_) \_\_\_\_\_

Bill My Organization (Purchase order # optional.) \_\_\_\_\_

E-Mail \_\_\_\_\_