



The DATA CAPTURE Report

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

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April 9, 2004

THIS JUST IN!

PSION TEKLOGIX NAMES NEW VICE PRESIDENT AND GENERAL COUNSEL

On March 4, **Psion Teklogix** appointed Constance L. Crosby to the position of VP and general counsel. Crosby has acted as Psion Teklogix' external legal representative with her firm **Byrne Crosby** for 20 years, and was for many years a member of the Psion Teklogix board. Her responsibilities at Psion Teklogix include legal, corporate, and contract operations.



Constance Crosby, VP and general counsel, Psion Teklogix, Inc.

Crosby holds a law degree from **Osgoode Hall Law School** in Toronto and was admitted to the Ontario bar in 1982.

For more information: **Psion Teklogix, Inc.**, Mississauga, ON, PH (905) 812-6382, FX (416) 875-8052, Email: charmaine.dsilva@teklogix.com. **SCAN**

SCAN/DCR WEB SITE TOPS MILLION MARK FOR HITS

In just one year, the www.scandcr.com Web site has gone from zero to 1.1 million hits per month. In addition, the site had 45,000 unique visitors for March 2004. Within the past several months, we have added new informational categories and resource links. We have also expanded

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The China Syndrome

Let's not let the excitement of ongoing RFID projects dull our vision concerning major challenges that lie ahead.

The list of challenges facing the RFID industry is growing everyday. Of course there are the usual worries—standards and cost—but other major problems are lurking as well. Consider this; in late February, several states, including California and Utah, announced plans to regulate “RFID spying.” The laws were initiated to safeguard consumer privacy. Whether their concerns are real or imagined, this clearly shows the size of the problem facing RFID adoption. And although consumer privacy is definitely a major concern, it may pale when compared to problems brewing with China.

In mid-January, we began calling our main sources for comments on an article that ran in the *Wall Street Journal* (WSJ). In the article, author Charles Hutzler talked about how the Chinese government, along with a number of Chinese private companies, was about to use its clout to influence RFID standards. He noted that the government had formed an interagency group to draft standards for RFID tracking technology.

Potentially, this group could wield enormous power and influence in the standards arena. Think it's unlikely? If so, then let the facts speak for themselves. First, 70% of **Wal-Mart's** goods come—either directly or indirectly—from China. Second, China's \$438 billion in exports last year and its growing role as a worldwide manufacturing hub give the country a legitimate say in determining RFID standards.

In the past, the Chinese have been forced to adopt some technologies and standards that were developed outside their country. A good example is Wi-Fi. This meant they had to pay huge royalties. And, with the Chinese government, it's not just the money that matters; it's a matter of their pride. They're not going to idly stand by while U.S. retailers decide their future. And, that includes RFID.

In February, a team of Chinese bureaucrats and experts visited the United States and Japan to meet companies and government agencies promoting competing and potentially incompatible RFID standards. According to Chinese task

force member Edward Zeng, chairman of **Sparkice Inc.**, an electronic-commerce and Internet-cafe chain, Beijing was spurred into action by calls from international retailers Wal-Mart and **Metro Group AG** of Germany to begin applying RFID to goods exported from China, which could mean huge monetary outlays for Chinese manufacturers.

The *WSJ*'s Hutzler explained further, "China's interest in RFID is part of a broader push to determine technology standards and reverse the flow of royalties paid by Chinese companies to license foreign technology. In recent months, the government has announced domestic encryption standards for local wireless computer networks, and it is promoting or developing homegrown technical standards for next-generation DVD players, third-generation mobile-phone networks and household networks that will run entertainment systems and appliances. The campaign has drawn criticism from foreign industry executives who say China's standards won't produce viable, leading-edge technologies and are a form of protectionism.

"You have to look at this topic from a broad perspective. RFID standards adoption is an evolutionary process. Currently, there is tremendous support for EPCglobal. Eventually, EPC will coincide with ISO; it may take several years, but nobody really has an exact lock on the timeframe."

Jack Grasso, senior director of public relations, Uniform Code Council and EPCglobal.

"A bevy of standards needs to be worked out for RFID, from uniform frequencies and compatible signal-reading equipment to formats for data," he continued. "The United States and Japan are allocating different ultra-high frequency radio bands for RFID, potentially creating a headache for manufacturers that supply both countries."

When we first sent out our requests for feedback on this topic, most of the replies were fairly mild. Some even said the movement by the Chinese government was a sign of good things to come for RFID vendors. But, after a while, we became suspicious of what we were hearing. Although we don't want to be alarmists, it certainly seems like this is a bigger issue than people were letting on. Our first thought was that our sources didn't want to address anything that would dampen the exciting things going on in RFID. *SCAN/DCR* doesn't want to hamper the RFID movement either, but we also don't want to bury our heads in the sand.

The more we dug into this topic, the more it became clear that there is much more going on than most vendors and users were willing to let on. *SCAN/DCR* stumbled on to some interesting information that seemed very important to the

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- 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. 27, No. 7



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

RMG Enterprises, Inc.

5905 Beacon Hill Lane
Erie, PA 16509

PH (412) 480-5116

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

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future of RFID. According to our reading of the **United Nations**-sanctioned, **World Trade Organization (WTO)** rules, member nations/companies must use **ISO** standards for shipping goods. So, where does that leave EPC? And, how and why are global retailers and their suppliers—whose countries are presumably members of the WTO—ignoring the rules and creating their own standards through EPCglobal? [For a view of the rules in question, see sidebar below.]

With regard to these questions, most of our sources

would not comment on the record, and repeated efforts to speak with representatives at retail giants, such as **Procter&Gamble** and **Gillette**, were either ignored or met with a “no comment” reply. When we run into these situations, it sends up a red flag that something big is going on. If not, why the resistance?

There are other signs that the whole concept of the WTO is an important factor behind the scenes. Just consider how many RFID vendors are prepared [or are preparing] to offer both EPC- and ISO 18000-compliant technology. **Sato America** recently

THE WTO IMPACT—ISO OR EPC?

Here is an excerpt from the “**WTO: Multilateral Agreements On Trade In Goods—Technical Barriers**”. Of specific significance is clause 2.4 which states:

“2.4 Where technical regulations are required and relevant international standards exist or their completion is imminent, Members shall use them, or the relevant parts of them, as a basis for their technical regulations except when such international standards or relevant parts would be an ineffective or inappropriate means for the fulfillment of the legitimate objectives pursued, for instance because of fundamental climatic or geographical factors or fundamental technological problems.”

Additionally, clauses 3.4 and 3.5 regarding creation of relevant standards or regulation by national governmental and non-governmental bodies:

“3.4 Members shall not take measures which require or encourage local government bodies or non-governmental bodies within their territories to act in a manner inconsistent with the provisions of Article 2.

3.5 Members are fully responsible under this Agreement for the observance of all provisions of Article 2. Members shall formulate and implement positive measures and mechanisms in support of the observance of the provisions of Article 2 by other than central government bodies.”

In addition, regarding “conformity” please note clause 5.4 which states:

“5.4 In cases where a positive assurance is required that products conform with technical regulations or standards, and relevant guides or recommendations issued by international standardizing bodies exist or their completion is imminent, Members shall ensure that central government bodies use them, or the relevant parts of them, as a basis for their conformity assessment procedures, except where, as duly explained upon request, such guides or recommendations or relevant parts are inappropriate for the Members concerned, for, inter alia, such reasons as: national security requirements; the prevention of deceptive practices; protection of human health or safety, animal or plant life or health, or the environment; fundamental climatic or other geographical factors; fundamental technological or infrastructural problems.”

The references clearly indicate an obligation under the WTO agreement for member nations to require the use of applicable international standards and regulations (e.g. **ISO/IEC (International Electrotechnical Commission)**) as a means to eliminate barriers to international trade. This could have significant implications to **EPCglobal** and (more importantly) to **Wal-Mart** and similar companies involved in global trade. **SCAN**

announced that it is offering a multi-protocol/multi-frequency RFID printer. It was able to do so because of its alliance with **SAMSys**, an RFID vendor that helped pioneer multi protocol/multi-frequency readers. Both **Intermec** and **Texas Instruments** are working on ISO- and EPC-compliant technologies, as well.

Jan Svoboda, Sato product manager for hardware and RFID, told us, "We have to be prepared for whatever happens...for whatever applications surface. This means we have to offer ISO-compliant technology as well as EPC-compliant hardware. In Europe, Metro and **Tesco** used ISO-compliant tags produced by **Philips** for their pilot programs. Philips has said it can have an EPC UHFG2 chip ready by the end of this year. Obviously, it has parallel product development going on."

In a recent interview, **DoD** Assistant Deputy Under Secretary of Defense (Supply Chain Integration) Alan Estevez told us he believed Tesco was using EPC-compliant tags from **Alien Technologies** and that Metro was using EPC-compliant tags from **Matrics**. Since this didn't jive with what we had heard from Sato's Svoboda, we contacted Dirk Morgenroth, segment marketing manager for RF tag and label ICs, Philips. Morgenroth told us, "In the Metro pilot, only Philips chips were used. The tags were ISO 18000-compliant, because EPC products weren't available yet. For its rollout, Metro had said it will use EPC-compliant tags and ultimately will strive for UHFG2 adoption."



Alan Estevez, assistant deputy under secretary of defense (Supply Chain Integration), Department of Defense.

"Tesco used both Philips and Alien tags. The tags were EPC-compliant and based on Class 1 technology. Both Metro and Tesco will solicit RFPs (requests for proposals) from multiple vendors. To my knowledge, neither company has decided on one vendor."

Commenting on the whole subject of the WTO and EPC versus ISO, Morgenroth told *SCAN/DCR*, "When the **MIT Auto-ID Center** was formed, it mainly served U.S. retailers and their suppliers. But, when EPCglobal took over the commercialization process, the initiative took on a much more global perspective. The **UCC** and **EAN** have a long history in global standards work. We are a member of the UHFG2 Technology Working Group and are interested in developing global systems. Although we are a big supporter of

EPCglobal, we also support ISO standards. This is the only sensible way we can approach the market. We have to sell and support both technologies.

"With respect to the WTO topic, we believe RFID is a technology that will demand we look at everything from a global perspective. Philips has a group in China talking with both private companies and the Chinese government. We currently ship ISO-based products to Asia and elsewhere. The Chinese are demanding a dialogue on RFID standards, and to be honest, we're not sure how things are going to turn out. What we do know for sure is that RFID has reached the point where this topic has to be addressed."



Jan Svoboda, product manager for hardware and RFID, Sato America.

In addition to the EPC/ISO issue, Morgenroth said it is time we focus on frequency regulations. "In Asia, there are places where you cannot use UHF technology at all. We have to get the major worldwide governments to review these regulations and come up with a plan that enables a more-efficient global trade system."

After several weeks of trying to line up an interview with someone at EPCglobal, we received a call from Jack Grasso, senior director of public relations for the UCC and EPCglobal, just as we were putting the finishing touches on our story. Coming off a severe bout with the flu, Grasso told us, "You have to look at this topic from a broad perspective. RFID standards adoption is an evolutionary process. Currently, there is tremendous support for EPCglobal. Eventually, EPC will coincide with ISO; it may take several years, but nobody really has an exact lock on the timeframe."

"In the short term, the differences between EPC and ISO compliance may present a conundrum for the industry. But, in the longer term, I am sure we will see a convergence in the technology standards. The UCC and EAN have the ability to address the critical mass in the supply chain. We are focusing on user needs and have a clear understanding of the global supply chain business."

When we pointed out that many RFID vendors are supporting both technologies, Grasso said he understood that every company has to pursue what is best for its own business model. "Ultimately, our goal is to have one standard," said Grasso. "In the meantime, we'll all have to do our best to make things work within our current capabilities."

Focusing on user needs is obviously a good thing, but in our conversation with Sato's Svoboda, he pointed out that if vendors try to incorporate too many benefits into a single tag, the cost could become prohibitive. Grasso said he believes many technologies will coexist, and that applications will determine what technology—at what cost—will make sense.



Dirk Morgenroth, segment marketing manager for RF tag and label ICs, Philips Semiconductors.

Finally, we asked Grasso about the EPC network database. It is our understanding that EPCglobal will maintain a database containing descriptions to match the license plates on item-level RFID tags. In a typical example of how the system would work, a user would scan an RFID tag. There would be a pointer system that sends a request from the retailer's computer system to the EPC database for information about the number on the tag. We believe many retail giants will never stand for a system that could possibly expose so much of their proprietary information.

Grasso said some retailers will demand an in-house system; some will use an outside database; and some will use a combination of the two. "Once again, this is an evolutionary process," said Grasso. "All these issues will be solved. It will just take time."

Comment: We believe that, in the coming months, this story will become increasingly important to the industry. Although we are not at liberty to divulge details, we do know that several Chinese companies are involved in serious talks with U.S. RFID vendors and standards consultants. Watch for more details in the future.

The Chinese have enormous power when it comes to the shipment of consumer goods. To ignore this, would be a grave mistake. In addition, as a member of the WTO, they have the ability to pressure other governments. With elections going on in the United States, we doubt either political candidate will want to snub the UN-sanctioned WTO.

As we said, we are not trying to be alarmists...but we also do not believe it is in the best interest of the AIDC industry to ignore these major issues. There are many great things going on in RFID that we can all be happy about. If we want to keep these major initiatives moving forward, we must always be in the problem solving mode. Like statistical process control (SPC), we must anticipate where problems will occur and solve them before they hurt us.

For more information: **EPCglobal**, Lawrenceville, NJ, PH (609) 620-0200, Email: JGrasso@uc-council.org, Web sites: <http://www.epcglobalinc.org>, <http://www.epcglobalus.org>; **Philips**, Gratkorn, Austria, NA Inquiries PH (508) 851-2203, Email: Dirk.Morgenroth@philips.com; **SATO America**, Charlotte, NC, PH (704) 664-1650, Email: jsvoboda@satoamerica.com. **SCAN**

MARKET UPDATE—PART ONE

New Apps, New Requirements To Drive Imaging Scanner Sales

Every image-scanner vendor in the market is saying the same thing; this technology has yet to see its best days. **Venture Development Corporation (VDC)** predicts the overall handheld scanner market will grow at a 6% CAGR from now until 2007, but the imaging sector is slated to grow at a 19% CAGR. Clearly, imaging is taking market share from laser technology.

On March 22, **Symbol** announced a new image scanning engine, the SE 4400. In addition to using the engine in its own handheld devices, such as the PDT 8100 and the MC 9000, Symbol is offering the engine to OEMs. The announcement is a good indication that imaging sales are ramping up. Symbol's competitors note that the Holtsville, AIDC giant has a history of sitting on technology, only to jump into a market when sales opportunities are ripe. A good example is Symbol's RFID strategy. For several years, Symbol abandoned its RFID efforts, but it was able to jump back into the market without a hitch when it became apparent the **DoD** and **Wal-Mart** were going to adopt the technology.

Pat Mauro, Symbol senior director of scanning product marketing, told **SCAN/DCR**, "Imaging is not a new technology for Symbol. We've had imaging products for years and hold a number of patents in this area. Symbol has spent a lot of time improving the technology, including faster read rates, greater read ranges, improved performance, and of course lower costs. This new product has a very small form factor [approximately the size of a fingertip]. For its size, this product can capture more information than any other engine on the market."

Part of the reason Symbol is making more of an effort to capture share of the imaging market has to do with the company's emphasis on "enterprise mobility." Symbol's main marketing pitch is that it

can not only help users capture information, it also provides the ability to move and manage data. Technologies such as RFID and imaging enable the company to increase its capture portfolio. Then, the AIDC vendor can offer devices and wireless networks to help move and share information.

With respect to new applications, Mauro told *SCAN/DCR*, "We are seeing new applications for imaging every day. Parcel carriers are looking at imaging to help with signature capture. We also see opportunities in robotic motion. In the retail world, there is interest in using imaging in interactive kiosks. Imaging scanning can offer clear advantages when it is used outside the realm of linear bar code scanning."

Mauro added that some applications can be handled by either laser or imaging. "In those cases, laser is often the better choice" he stated. "It's better to focus on marketing imaging technology where it can do things laser cannot."



**Mike Ehrhart, CTO,
HHP.**

HHP CTO Mike Ehrhart agrees the trend toward major adoption of imaging scanning continues to show new life, although he definitely disagrees that it should only be used in applications outside linear bar code scanning. HHP believes there are clear opportunities for both linear and area imaging scanners. "With any technology, there is always a chasm between early adoption and broad acceptance," said Ehrhart. "Imaging technology has crossed that chasm. We now are seeing adoption by mainstream customers in retail, transportation, and package delivery markets. In the early stages, most of our sales were to niche markets. Our current volume of sales shows that imaging is really catching on."

"The nice thing about imaging scanners is they enable customers to 'future proof' their purchases. Customers usually buy products with an eight-year life cycle in mind. Just because they are not doing signature capture today, doesn't mean they won't need to do it a year from now. The same goes for 2-D Matrix codes. Customers currently may be using linear bar codes, but decide to use 2-D codes later. In either case, an area imager will cover all the bases."

Most of the AIDC industry has noticed that, since RFID has started to receive major attention from potential users, RFID vendors are coming out of the woodwork. The same thing is happening in the imaging market. This phenomenon is another sign

that imaging is about to explode. This comes as good news to imaging vendors, but there are some pitfalls. "Of course we like to see the market growing," said Ron Caines, president/CEO of Canadian-based **Symagery Microsystems**. "The danger is that the technology will become a commodity. It's kind of a double-edged sword."

"There are two huge market drivers for imaging technology that will change our industry," Caines continued. "First, the U.S. government's AIT II contract expires in July. Intermec won the first AIT contract and Symbol won the second. [See *SCAN/DCR* 7/30/99, ed.] The coming AIT III contract will provide huge opportunities for imaging vendors."

"The second major driver will be the new **USPS** contract coming up," said Caines. "In 1997, when **Lockheed Martin** won a major order for the USPS, it subcontracted a \$100 million order to Symbol for over 300,000 PDCTs (portable data collection terminals). [See *SCAN/DCR* 9/12/97, ed.] The new USPS RFP (request for proposal) requires the ability to read Data Matrix codes, and that can only be accomplished with an imaging scanner."



**Ron Caines,
president/CEO,
Symagery
Microsystems.**

Oddly enough, the reps from the three companies we talked with said they thought RFID could help imaging sales. This is how the thought process works: RFID tags can hold more information than bar codes, they don't need a line of sight to be read, and users can write information to the tags as goods travel through the supply chain. But, most pundits agree that bar codes will have to coexist with RFID tags for many years.

Since bar codes are going to be on the same label that contains the embedded RFID tag, users will still need scanners. So, if users must have bar code scanners in addition to RFID interrogators, why not purchase an imaging scanner that could not only read a bar code, but also take a picture of a signature, the back end of a loaded truck, an invoice, or even a damaged package? With RFID and an imaging scanner, users could handle almost any supply chain function.

In 1996, at the former **ID Expo** show in Philadelphia, HHP and **Metanetics** [which was eventually acquired by Symbol as part of its Telxon acquisition] were touting their imaging products. Also on hand was an OCR (optical character recognition) company called **Parascript**. The buzz

was how imaging scanners could capture text from forms and how OCR technology would enable users to manipulate the text once it had been captured. For some reason, the plan was never pursued. But now, Caines sees new possibilities for this type of application. "I believe this could be a lucrative market for our industry," said Caines. "Some of our customers have already expressed interest in using imaging with OCR."

As the imaging market continues to grow, competition grows as well. Oddly, all three of the executives said they welcomed a competitive market. "If imaging wins in the handheld market," said Ehrhart, "HHP will win in the imaging market."

Caines wouldn't go so far as to agree with Ehrhart, but he did tell us, "HHP has been much more aggressive in its pricing, and the company is certainly helping to grow the [imaging] market. But, we believe Symagery has some clear advantages. Mainly, we are strictly an OEM supplier. We never compete with our customers. In addition, our customers help us design technology by letting us know exactly what they and their customers need. This differentiates us from the rest of the players in the industry."

Mauro also welcomed the competition and said that, like his counterparts, he believes competition will grow sales more quickly. He did add however that he doesn't believe imaging is always the best technology. "There are still many applications where a laser scanner is better suited," he stated. "We should let the customer and the application determine the technology, not a bunch of industry hype and distorted facts. Some companies have tried to scare customers by telling them horror stories about how laser scanners are dangerous."

So where is the market headed? VDC estimates that, by 2007, the handheld scanning market will surpass the \$1 billion mark. And as we pointed out, imaging will be taking an increasingly larger share of the market each year. Mauro believes customers will expect performance similar to what they receive with their cameras. "They'll want our devices to be smaller, lighter, and to produce clearer color," he told *SCAN/DCR*. "I also believe customers will want to have several devices in one unit. It may take several years, but I believe we will eventually see both a laser and an imager scanner in one unit."

Ehrhart stated, "This market will grow quickly, but we'll all have to keep working on technological improvements to sustain the movement. We have to decrease read times and continue to drive costs down. We no longer have to explain the technology, but we still have to sell it."

Getting in the final word, Caines told us, "We are extremely excited about the future. We're not just seeing interest in imaging in North America, we're seeing it on a global basis. Imaging is very popular in Asia, for example.

"Color imaging will certainly play an important role in new sales growth, as will education. Customers generally understand what imaging technology is, but we still have to show our sales people and partners how to fully explain the benefits. We have to show them how to position the technology and how to promote it."

All agreed that the best times for the imaging market are ahead. In the next issue of *SCAN/DCR*, we'll have a follow-up including interviews with several other pioneers of imaging technology.

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Continued from page 1.

our Technology Center to include all the top AIDC product lines.

SCAN/DCR has initiated relationships with several large end-users and will soon be adding to the list. Through these alliances, as well as our alliances with a number of AIDC industry groups and analyst firms, we continue to add value and increase traffic to the site.

SCAN/DCR is constantly adding information of value to our Web site visitors and to our subscribers. Within the next couple of weeks a sales lead generation tool will be implemented on the site. Subscribers will have the ability to receive emails when a lead is posted in their area of interest.

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SCAN/DCR MARKET WATCH

For April 1, 2004

AIDC Public Company Names	Phone	Exchange	Symbol	Close Price	52-Week High	52-Week Low	Dividend Yield	P/E Ratio	EPS Last 12 Months
Agere Systems	(866) 243-7347	NYSE	AGRa	3.30	4.14	1.29	N/A	N/A	-0.15
Astro Med	(401) 828-4000	NASDAQ	ALOT	11.52	18.94	3.21	1.37	17.65	0.66
Avnet Convergent Technologies	(480) 643-7291	NYSE	AVT	25.00	27.52	10.24	N/A	144.06	0.17
AXCESS Inc.	(972) 407-6080	NASDAQ	AXSI.OB	2.08	3.00	0.56	N/A	N/A	0.00
Brady Corporation	(414) 438-6880	NYSE	BRC	38.10	43.46	27.55	2.21	31.47	1.21
Bull Run (DataSouth)	(704) 523-8500	NASDAQ	BULL.PK	0.50	0.00	0.00	N/A	N/A	0.00
Checkpoint	(800) 257-5540	NYSE	CKP	19.08	22.45	9.77	N/A	22.50	0.84
3Com Corporation	(877) 463-6326	NASDAQ	COMS	6.87	9.34	4.56	N/A	N/A	-1.15
Cisco Systems, Inc.	(408) 526-8890	NASDAQ	CSCO	23.74	29.39	12.80	N/A	38.64	0.61
CSP Inc.	(508) 663-7598	NASDAQ	CSPI	6.00	7.00	2.45	N/A	N/A	-0.34
Danaher Corporation	(202) 828-0850	NYSE	DHR	92.90	96.20	64.10	0.11	27.71	3.37
Datalogic (Euros)	39 051 3147011	MILAN	DAL.MI	14.62	15.45	13.40	1.27	24.83	0.60
EMJ Technologies, Inc.	(770) 729-6510	NASDAQ	ELMG	20.51	26.31	10.00	N/A	23.37	0.82
EMJ Data Systems Ltd.	(519) 837-2444	TORONTO	EMJ.TO	6.30	7.50	3.50	2.54	15.75	0.40
Itron	(509) 924-9900	NASDAQ	ITRI	18.89	24.16	16.25	N/A	38.77	0.48
Kronos	(617) 890-3232	NASDAQ	KRON	31.50	43.65	23.36	N/A	29.04	1.12
Lockheed Martin Corporation	(607) 751-2690	NYSE	LMT	46.00	55.00	43.10	1.93	19.50	2.34
Metrologic	(856) 228-8100	NASDAQ	MTLG	23.25	33.56	3.39	N/A	32.50	0.72
NCR Corporation	(937) 445-5905	NYSE	NCR	45.09	46.11	18.21	N/A	72.23	0.61
NeoMedia Technologies Inc.	(941) 337-3434	NASDAQ	NEOM.OB	0.08	0.43	0.01	N/A	N/A	-0.12
Optimal Robotics Corp. (CAN \$)	(514) 738-8885	NASDAQNM	OPMR	7.47	9.67	5.70	N/A	N/A	-0.41
Paxar	(914) 697-6814	NYSE	PXR	14.84	15.34	9.30	N/A	19.16	0.77
Printronix	(714) 221-2924	NASDAQ	PTNX	13.55	20.69	9.39	N/A	49.27	0.30
Proxim, Inc.	(650) 526-3619	NASDAQ	PROX	1.74	2.90	0.47	N/A	N/A	-1.10
Psion Canada Inc. (CAN \$)	(416) 875-8000	TORONTO	PON.TO	1.55	2.55	0.90	N/A	N/A	-0.77
Robotic Vision Systems Inc.	(516) 273-9700	NASDAQ	RVSI.OB	3.48	7.90	0.75	N/A	N/A	-4.55
SAMSys Technologies Inc. (CAN \$)	(905) 707-0404	MONTREAL	SMY.V	3.00	4.55	0.51	N/A	N/A	-0.24
ScanSource	(864) 288-2432	NASDAQ	SCSC	49.46	55.81	18.27	N/A	25.63	1.87
Sirit	(905) 949-4404	TORONTO	SI.TO	0.75	0.92	0.12	N/A	37.00	0.02
Symbol Technologies, Inc.	(631) 563-2400	NYSE	SBL	13.92	19.37	8.44	0.11	1380.00	0.01
UNOVA (parent co. of Intermec)	(818) 992-3000	NYSE	UNA	21.57	26.63	5.26	N/A	N/A	-0.19
Zebra Technologies	(847) 793-6735	NASDAQ	ZBRA	70.82	72.84	38.33	N/A	36.13	1.92

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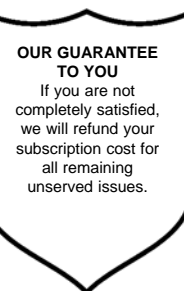
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