

Moving Toward Gen 2 RFID

How to make your implementation a success.

Sept. 26, 2005—The leadership of [EPCglobal](#), combined with the collaborative efforts of others throughout the industry, has set the stage for real-world implementation of Gen 2 technologies compliant with the newest EPCglobal RFID specifications for the UHF band centered around 900 MHz. Gen 2 solutions will overcome many limitations of older Class 0 and Class 1 technologies. Adoption of Gen 2 will provide a standards-based framework for enhanced features and significant process improvements, including robust operation in high-density reader environments, compliance with global spectrum regulations, superior tag throughput and improved accuracy.

In the coming months, the increasing availability of Gen 2 tags, readers (interrogators) and printers, along with the impetus of compliance mandates from global corporations, will tempt many companies to make quick decisions on Gen 2 deployment. To successfully implement Gen 2, however, you must resolve a number of special challenges that range across the entire spectrum of strategic and tactical arenas that are best addressed through a disciplined and comprehensive approach. The following considerations are critical to the success of any Gen 2 RFID implementation project.

Always Start From Where You Are

Gen 2 is ideal for organizations that have not yet made any investments in RFID. Without any legacy RFID issues to consider, those with a clean slate can leverage a single learning curve to go straight to new standards-based Gen 2 technologies—and with intelligent planning, they can assure themselves of long-term value and maximum return on all RFID investments. For such companies, one major advantage of Gen 2 will be the ability to leverage standards-based interoperability between tags, interrogators, printers and so on, right from the outset. This, in turn, will help spur competition among suppliers and bring down overall implementation costs.

The migration of existing RFID systems to Gen 2 can involve significant retooling, retraining and costs of obsolescence for organizations with Class 0 or Class 1 programs already in place. Therefore, companies that have invested in RFID technology need to plan their transition to Gen 2 carefully, so as to avoid unnecessary conversion expenses and/or disruption of ongoing operations. For example, suppliers already meeting their customers' compliance requirements with Class 0 or Class 1 technologies need to plan the migration process in conjunction with their customers' needs.

Recent announcements about competitive pricing of inlays will be an important factor in driving demand for the Gen 2 product, but end users must look for aggressive pricing on finished RFID labels because the inlay is only a component of the finished solution, and several steps must be taken to complete the conversion of an inlay into a finished, tested Gen 2 RFID label.

Buyers should also be wary about claims regarding current-generation interrogators that can supposedly be upgraded to Gen 2 via firmware. Even after the upgrade, some of these readers may still be unable to operate in dense mode. Readers using software-based radio technologies may have the flexibility to migrate to Gen 2 dense mode, but a careful cost analysis is needed to determine if the extra expense of such capabilities is

justified today, or if it is better to wait for market forces to bring down the cost of Gen 2 readers in coming months.

Depending on the specific circumstances, some companies will find it advantageous to become early adopters. As the interoperability of Gen 2 grows to a leveling factor, some predict that overall costs will come down during the first year by as much as 10 to 20 percent, due to rising availability and competition among suppliers.

Maintain the Proper Mindset: Investment vs. Expense

When considering the deployment of Gen 2 RFID, it is important to maintain a proper mindset. With the procurement clout of global companies such as Wal-Mart and large government entities like the U.S. Department of Defense driving compliance requirements, most of the attention has been focused simply on using EPC RFID tags to align supply chains and help connect trading partners. Under such conditions, it is all too easy for a company to look at Gen 2 as just another incremental expense of marketing and sales.

This mindset can lead to a shortsighted "check off" type of approach, in which the organization simply strives to fulfill the threshold RFID capabilities needed to meet external compliance requirements. As a result, a business can miss out leveraging Gen 2 technologies to deliver significant internal operational improvements, such as better traceability, fewer process bottlenecks and optimized inventory levels.

Going into a Gen 2 implementation purely from an expense-oriented mindset can lead to suboptimal choices intended to minimize costs rather than maximize return on investments. For example, it is important to choose interrogators with strong radio capabilities and software/firmware upgradeability that can support future operational needs. The objective is to buy a reader once, rather than to replace your RFID infrastructure as your requirements grow and expand. Similarly, prior to selecting a printer technology, you should not be married to only one type of antenna.

Focus on Process-Reengineering Issues:

Leave RFID Technology to the Experts

Above all, keep in mind that Gen 2 is a technology with widespread implications that can positively impact many processes throughout the organization. Every RFID design and implementation program should start from a core business process perspective by comprehensively identifying all points in the process where data is generated, classified, collected, communicated and/or acted upon. Such an internal audit provides a solid foundation for planning both the near-term and longer-term objectives for Gen 2 implementation.

The biggest mistake most companies make is to jump directly into low-level tactical evaluation of available RFID technologies without first doing their homework on big picture strategic and operational issues. The most successful implementations begin by assembling an interdisciplinary team of internal stakeholders responsible for the key operational areas, as well as outside experts able to provide experience and knowledge regarding the underlying RFID technologies and tradeoffs. This approach is especially important at the current inflection point in RFID technology evolution, where the shift toward Gen 2 creates unique opportunities and risks.

While the specific makeup of the internal team will vary from situation to situation, it's important to include representatives from every group that might benefit from and/or participate in the RFID implementation. Typically, the team should include personnel responsible for IT, logistics, finance, warehouse and/or operations, as well as quality/compliance. In addition, if the Gen 2 RFID implementation includes customer compliance issues, it is a good idea to have ongoing involvement from sales and/or marketing.

By bringing independent outside expertise into the internal team, an organization can gain a broader

perspective on available RFID technologies, while reducing the risks of suboptimization and finger-pointing between vendors of specific products. The internal team members don't need to reinvent the wheel by educating themselves on all of the low-level bits, bytes and radio technologies involved with Gen 2 RFID. Instead, they should focus on defining how Gen 2 will impact operational areas and act as change-agents to assure successful adaptation of the organization to streamline integration of the new processes.

Don't Neglect Critical Training and Change-Management Issues

Deploying Gen 2 technology will fundamentally change how a company conducts business, so it's critical to manage the implementation process carefully. Even the best-designed architecture can fail if the key participants don't clearly understand the "what" and the "why" behind the changes. Some key guidelines include starting small, over-communicating with all participants and carefully monitoring results every step of the way.

After all elements of the system have been evaluated and selected, set up an active test environment at your site to mimic a real-life scenario. This lets internal team members become familiar with the systems, and can be a great opportunity to bring in and train key front-line operational staff who will help sell the project's merits to their coworkers.

The next step is to begin the live rollout, if possible with a limited end-to-end pilot project integrated with existing operations. Again, monitoring the results is the key to success, and it's important to define results in a broad sense—include not only the empirically measurable technology parameters, but also such intangible factors as employee attitudes toward the process changes and customer acceptance of the technology.

The bottom line for many manufacturers is that Gen 2 represents both an imperative they must comply with and a major opportunity they can leverage to improve costs, operational efficiency and competitiveness. The key to success is to start with an overall understanding of the business process implications of Gen 2 before jumping into any tactical decisions on technology. Building on this foundation of process knowledge and using a multidisciplinary, team-oriented approach can yield optimal results and minimize risks by tailoring emerging Gen 2 technologies to meet the needs of internal stakeholders and comply with external customer requirements.

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