

What's Next for Gen 2?

RFID vendors move ahead with plans to offer tags and readers based on EPCglobal's newly ratified standard, but disagree on how quickly and smoothly adoption will happen.

By Jonathan Collins

Dec. 27, 2004—With [EPCglobal](#) having ratified its second-generation UHF Electronic Product Code (EPC) specification earlier this month (see [EPCglobal Ratifies Gen 2 Standard](#)), vendors across the industry have a green light to start manufacturing tags and readers that meet the new standard. But vendors are still split on a number of issues, including how quickly users will adopt the technology.

Without the Gen 2 standard, various vendors (and their end user customers) have adopted incompatible EPC technologies, including EPC Class 0, Class 1 and Philips UCODE EPC 1.19. The goal of the single Gen 2 global standard is to stimulate semiconductor and other radio frequency identification (RFID) equipment vendors to invest in developing products able to address one emerging global market for UHF RFID. For end users, that should mean greater vendor competition, which should push down tags and reader prices.

After the ratification of Gen 2, [Texas Instruments \(TI\)](#), a long-established maker of RFID semiconductors but a new entrant to the EPC market, announced it will produce its first Gen 2 chips in the first quarter of 2005, with sample quantities available in the second quarter. The company expects its EPC Gen 2 chips and inlays will be commercially available by the third quarter.

A host of other companies have similar plans. Fellow semiconductor giant [Philips Semiconductors](#) says sample quantities of its first Gen 2 chip will be available to label manufacturers and customers in the first quarter 2005, with full production beginning in the third quarter. Seattle-based passive RFID chip designer [Impinj](#) says that it has already completed trials of its Gen 2 tag design, ahead of the spec ratification, and that the company will begin manufacturing Gen 2 tags in January.

RFID systems developer [Intermec Technologies](#), which claims that its patented technology is key to Gen 2 application, says that it expects to buy the first Gen 2 chips in the second quarter and will be shipping its first products made with those Gen 2 chips late in the same quarter.

EPC Class 1 and Class 0 tag and reader manufacturers Symbol Technologies and [Alien Technology](#) have also announced their Gen 2 rollout plans. Alien says it will have its first Gen 2 chip commercially available in the first quarter of 2006 but expects that its customers won't look to implement the Gen 2 systems until the second quarter 2006. Symbol will start to provide Gen 2 readers, tags and terminals to its Gen 2 early adopter evaluation program customers starting in second quarter of 2005, and expects its Gen 2 hardware to reach full commercial availability at the end of the same quarter.

How quickly end users will adopt the technology, however, is uncertain. According to TI, key to the uptake of the new technology will be how soon companies that have yet to deploy RFID will need to comply with mandates from their customers to use the technology.

"A lot depends on how quickly Wal-Mart will expect its next 200 suppliers to join its RFID program. The first 137 had to use Gen 1, but the next 200 will start their deployments with Gen 2," says Tony Sabetti, global business manager for Texas Instruments RFID Systems.

Alien, one of the pioneers of products using EPCglobal's first-generation EPC standard, believes that companies, including those new to RFID, will continue to buy Gen 1 tags and readers throughout 2005. "To try and get started with RFID and also start with Gen 2 prototype products will be a tall order. We still expect to see customers starting with Gen 1 products until Gen 2 has been well shaken out and has started shipping in large quantities," says Tom Pounds, vice president of corporate development and product strategy at tag and reader maker Alien Technology, which is based in Morgan Hill, Calif.

Alien Technology maintains that adoption of Gen 2 tags and readers remains at least 18 months away. "While some companies are talking about selling Gen 2 products in the second half of next year, there will at least be another six months after that—as users wait for interoperability of the chips and then of the readers from different manufacturers—before Gen 2 equipment is deployed," says Pounds.

A number of other vendors, however, expect that end users will adopt Gen 2 products sooner than that. Symbol Technologies believes that some end user companies that have yet to adopt any type of RFID technology will move straight to Gen 2. "Europe has been waiting for a good UHF solution. They have played with UCODE EPC 1.19 and some ISO 18000 stuff, but mainly they have been waiting for Gen 2," says Larry Blue, VP and general manager of the RFID tag division at Symbol Technologies.

Philips, which produces the UCODE chips, believes American companies will move just as quickly as their European counterparts. "Metro Group in Europe has always said it would migrate to Gen 2 as soon as it becomes available, but companies in North America will adopt Gen 2 just as quickly," says Manuel Albers, Philips's director of business development and identification, Americas.

According to Intermec, pent-up demand exists for Gen 2 because many companies in the U.S. and Europe have held back their RFID deployments, waiting for the availability of Gen 2 readers and tags. "Gen 2 adoption will happen fairly rapidly because up to now, no one has really rolled out large-scale deployments with Class 1 and Class 0. Instead companies have used Gen 1 pilots to establish processes and test the technology," says Tom Miller, the president and CEO of Intermec.

"As soon as CPG companies can see a supply is secure, with several label and IC manufacturers and volume tags available, then they will adopt Gen 2," says Albers.

Many vendors, however, believe that the path to Gen 2 adoption will not be completely smooth (see Hiccups Expected for Gen 2). Even before the Gen 2 standard was ratified, many reader manufacturers had been shipping readers that they said were firmware-upgradeable to the new standard, although questions have been raised regarding the level of Gen 2 performance they will offer. Also, because the Gen 2 standard leaves room for companies to implement the technology in different ways, the first Gen 2-compliant products are unlikely to be interoperable with Gen 2-compliant products from other vendors.

"It's still not clear that the standard approved will be the one that will be used. The EPC community must not promise a full working standard immediately, as there are always changes. Over the next six months, Class 1 version 1 will still be the more reliable technology and will be the technology that users will buy," says Roy Apple, VP of business development at SmartCode, which is based in Tel Aviv, Israel.

Symbol believes that end user companies will wait until Gen 2 interoperability issues been addressed, pushing Gen 2 adoption out into late 2005 and early 2006, with European companies leading the way. Philips, however, believes that the process of resolving interoperability issues will not take long at all. "The burden is

on the reader manufacturers and systems integrators, but we don't foresee major problems as we have already worked on this in the standard process," says Albers.

Another unanswered question is how well Gen 2 systems will work once they are implemented. Although Gen 2's proponents maintain the technology will provide for faster data transfer rates as well as greater system reliability and robustness, some manufacturers of first-generation EPC readers and tags maintain that Gen 2 equipment is unlikely to bring increased performance.

"In practical applications, Gen 1 and Gen 2 hardware performance will be comparable. Gen 2 has gained a lot of intrigue and interest, but it hasn't changed the fundamental laws of physics. It is still UHF, with all the benefits and the drawbacks that that brings," says Alien's Pounds.

Other vendors are also uncertain about how well potential gains enabled by Gen 2 equipment. "We don't know any of the performance benefits of Gen 2 yet, but we do know it is an open standard that everyone is building to," says Symbol's Blue.

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