

EPCglobal Awards First Gen 2 Interoperability Certifications

EPCglobal's testing partner, MET Labs, ran 12 products through a battery of interoperability tests, which they needed to pass to receive the interoperability mark. Eventually, all 12 did.

By Mary Catherine O'Connor

Sept. 14, 2006—RFID hardware interoperability—the ability of tags and interrogators made by different manufacturers to work interchangeably—has always been a main goal of the EPC Gen 2 RFID standardization and commercialization work of [EPCglobal](#), the not-for-profit organization set up by [GS1](#). The group has been planning to issue certifications of interoperability to Gen 2 products since before the Gen 2 protocol was ratified in late 2004. At the EPCglobal European Conference in Germany last week, the group announced the first companies to earn the EPCglobal Gen 2 hardware interoperability mark, certifying that EPC/RFID devices such as tags, readers and printer-encoders will interoperate with other certified devices. Knowing that a mix of Gen 2 products from different manufacturers will work well together should give users of those devices confidence in the performance of their RFID systems.

The chart below shows the products awarded the interoperability mark, as well as their manufacturer.

<i>Initial Recipients of EPCglobal's Gen 2 Hardware Interoperability Certifications</i>	
Datamax	<ul style="list-style-type: none">• DMX-A-4212, A-Class printer-encoder• DMX-H-4212X, H-Class printer-encoder• DMX-M-4208, M-Class printer-encoder
Impinj	<ul style="list-style-type: none">• Speedway interrogator• Monza tag
Intermec Technologies	<ul style="list-style-type: none">• IM5 interrogator module (used in IF4, IF5 and IV7 interrogators)• Large Rigid tag

Paxar	• 9855 printer-encoder (US/EU/JPN versions)
Raflatac	• G2 tag
Sirit	• Infinity 510 interrogator

Baltimore-based MET Laboratories, the official testing partner for the EPCglobal Hardware Certification program (which certifies Gen 2 hardware for conformance to the Gen 2 protocol) performed the first round of interoperability tests. MET started developing the testing specifications in November 2005, while EPCglobal's Gen 2 interoperability working group, part of the hardware action group, began gathering test-product submissions from vendors. To be considered for interoperability certification, any submitted RFID tag, interrogator or printer-encoders had to contain an integrated circuit or reader module that had already been awarded the EPCglobal Gen 2 conformance certification (thus far, 17 Gen 2 hardware products have been thus awarded).

In early August, MET began running the submitted products through the interoperability testing specifications it had written. "We ran a rather large series of test cases to verify the devices interoperated properly," explains Gaylon Morris, director of RFID programs at MET Labs. "The test cases were designed to exercise, as much as possible, the full functionality of the Gen 2 Class 1 specification."

In total, MET Labs carried out 267 test cases for each of the submitted tags and interrogators, as well as six for the printer-encoders, says Dusmantha Tennakoon, MET's RFID hardware conformance programs manager. A number of test cases are meant to ensure that an interrogator can write data to each portion of a tag's memory, so one test case might involve having the interrogator write a 96-bit EPC to the appropriate section of the memory of a Gen 2 tag. Another might be to write user memory to that portion of the tag's memory.

Once an interrogator was put through these encoded chores, its ability to lock and unlock data using a password was also tested. "In addition to testing all the things Gen 2 tags and readers are supposed to do to interoperate with each other, we also made sure they couldn't do what they're *not* supposed to be able to do," says Morris. For example, the Gen 2 protocol says an interrogator should be able to lock, unlock or erase ("kill") data on a tag only by using a specific password for the tag. If an interrogator could successfully use an illegitimate password of all zeros to unlock a qualified tag, for instance, that tag would fail the test because no tag should be able to be unlocked with such a password. The same would be true if an interrogator were able to unlock a tag's data by means of an incorrect password.

The smaller set of test cases for printer-encoders focused on the device's ability to write data to the inlay of a label being printed.

In order to achieve an interoperability certification, a tag had to pass all the test cases with each interrogator and each printer-encoder. Conversely, an interrogator or printer-encoder had to pass all the test cases with each tag. When submitting a device to be tested for interoperability, the manufacturer provided the frequency range within the UHF band at which it wanted the device tested. For example, Paxar submitted three versions of its 9855 printer-encoder: one optimized for use in the United States, where devices function at 915 MHz, another optimized for use in E.U. nations at 866 MHz, and a third in Japan at 960 MHz.

Not all submitted devices passed all the test cases the first time they were tested, says Morris. Although all the devices conform to the Gen 2 standard, some manufacturers interpret the standard slightly differently, preventing one manufacturer's tags, for example, from interoperating with all other Gen 2 devices even though they might fully interoperate with a reader from that same manufacturer. Some products that initially did not pass the interoperability tests were modified and resubmitted, says Morris, but eventually, all 12 submitted products received the interoperability mark. All of the testing was held at MET's Baltimore test facility.

Going forward, Morris states, MET Labs will test individual products submitted for interoperability with the established pool of certified products on an on-demand basis. "We anticipate many more [Gen 2-certified] products will be tested and found compliant to interoperability specification in the next few weeks," he adds.

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