SmartCode Readies RFID Production

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Dec. 1, 2003—SmartCode Corp., a Tel Aviv RFID systems provider founded by former Israeli intelligence RF experts, has unveiled a second-generation RFID tag assembly machine—dubbed FAST, for Flexible Area Synchronized Transfer—that it says can produce 10 billion units per year.
"We expect that 10 billion units per year will be sufficient until 2005. We are ready to scale up production as needed," says Roy Apple, SmartCode's VP of business development. "The FAST assembly line is scalable and can produce more than 100 billion tags per year" as the company deploys additional machines.

The FAST assembly process consists of two major steps. First, the machine places microchips in straps, or interposers, which are tiny modules that can be easily attached to an antenna. Then, it joins the strap to an antenna to create an RFID inlet—a chip and antenna mounted on a paper or plastic backing, ready to be integrated into a label or other packaging.

A roll-to-roll system feeds a spool of prefabricated flexible material containing the straps in a continuous stream through the FAST machine. SmartCode has developed a proprietary system for placing the chip with an accuracy of within one micron onto the straps.

Once a strap is created, the FAST machine attaches the strap to an antenna, which could be either conductive ink or etched antennas. One bottleneck in RFID production has been the time it takes to cure the adhesive used to attach the antenna. SmartCode has developed a special adhesive that cures in seconds without the need for an oven. That reduces a step and speeds the machine's throughput, which lowers the assembly costs and enables the company to use a wide variety of low-cost substrates that could not withstand the normal curing process and temperatures.

Apple says the FAST system uses advanced controllers and redundant systems to ensure the assembly line can operate around the clock. "We have also developed a set of quality-assurance procedures that will enable us to deliver very high-end results while increasing our line throughput," he says. "This is very important for mass production."

SmartCode is supporting the EPC Class 1 specification developed by the Auto-ID Center. It plans to make tags based on the Class 1, V2, protocol when that standard becomes finalized. The company is working with a fabricator to develop the chips based on these specifications. The second-generation FAST assembly line will be operational in the second quarter of 2004. The cost of the tags will depend on the volume purchased, but SmartCode says the FAST machine should cut the tag cost to half to two thirds compared with that of conventionally manufactured tags.

"The decision of Wal-Mart, the Department of Defense, Tesco and other key players to support EPC further emphasizes the unique value of low-cost RFID," says Apple. "As one of the pioneers in the market, we are fully committed to this vision."