



Socket and RFID

Technology Brief and Position Statement

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Radio Frequency Identification (RFID) is a frequent topic in the news today. The hype is a little surprising when you consider that RFID was first invented in 1948 and is currently being used in one way or another by most of us — the microchip embedded under the skin of your dog or cat, the corporate ID card used as an electronic door key, and the automated toll collection transmitter in many cars are all based on RFID technology.

Socket Communications has a strategy to establish itself as a major supplier of RFID products to the mobile computing market. Consistent with our core expertise, these products will be based on our existing Mobility Friendly™ CompactFlash Card, SDIO Card and *Bluetooth*® wireless technologies and will supplement our existing line of laser and imager-based bar code scanner products. Socket's RFID products will take multiple forms, will support multiple frequencies as well as major tag protocols within those frequencies, and may include multi-function combination products.

Socket prides itself on developing products that conform to established communication and interoperability industry standards, and we will continue to follow this corporate philosophy as we enter the RFID market. At this time, more than 30 separate RFID frequencies exist, almost all of them proprietary to some extent. Only two of these frequencies have achieved universal acceptance and certification as industry standards (127–134 kHz and 13.56 MHz), and two others are still evolving toward this status, including the 900 MHz frequency dictated by Wal-Mart and the DoD to support EPC (Electronic Product Code) applications. While Socket is anxious to participate in the RFID market, we will proceed cautiously in those frequencies where the standards have not yet been finalized.

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Socket's initial RFID product is an extended CompactFlash card design that supports the 13.56 MHz frequency and all related standard tag protocols. Developer and pilot units and related Software Developer Kits (SDKs) will be available in the near future. The reader will be supported in all Pocket PC 2002/2003 devices. Subsequent products on the roadmap include an SDIO card supporting the 13.56 MHz frequency and a CompactFlash card reader supporting the 900 MHz frequency.

One of the claims often heard is that RFID will replace bar codes as the Auto ID technology of choice. Most experts familiar with both technologies strongly disagree with this contention for a number of reasons. There are several significant obstacles that must be overcome to enable the widespread adoption of RFID technology. The first is the reader technology — while reading a single RFID tag at close range on an asset, ID card or pallet is relatively easy, accurately reading multiple tags (i.e.: pallet, carton & item tags on a single pallet) is much more complicated. It will take many years to realize the dream of a shopper passing by an RFID scanner that reads all the items in the grocery cart accurately enough for reliable retail implementation.

Another technical obstacle involves the simple physics of radio waves — an RFID tag on any metal object requires special separating insulation to prevent grounding (even by proximity) of the tag. The radio signals of an RFID tag are absorbed by liquid, creating special requirements for tags on paper, plastic or glass containers of liquid.

Another major challenge is the cost of RFID tags. Currently, tag prices range from about 25 cents to over \$2, even in very large quantities. Adding even the cost of a 5 cent tag to the manufacturing cost of a can of soda, after adding typical distribution and retail markups, can result in a doubling of the price to the end customer — certainly too much to justify the convenience of a faster checkout! Tag prices will need to be in the range of one-tenth of a cent to be cost effective at the retail consumer level. It is important to remember that the cost of a bar code included as part of the retail package label is zero!

Finally, probably the most significant obstacle to the implementation of RFID technology, as it has been to bar code technology over the past 30 years, is the software infrastructure necessary to support it. As mentioned before, the reading of, and even writing to, RFID tags is relatively easy. It will take many years, however, to develop and deploy the software applications needed to accept, manage and benefit from the additional information provided by RFID technology. The costs of implementing software applications to support RFID at the corporate level are huge, and the benefits and ROI needed to justify such investments are still on the distant horizon.

By way of comparison, bar codes were invented in 1949, the retail UPC code certified in 1973, and the first commercial bar code scanner (by NCR) released in June 1974, yet today only 60% of all retail outlets use the technology, and entire industries, such as healthcare (where the use of bar codes would help prevent deaths from medication errors) are just beginning to adopt it. While almost everyone agrees that RFID is an exciting technology that represents a potential new standard to uniquely identify products, it is generally acknowledged that the significant obstacles described above will delay the widespread adoption of RFID systems for even longer than it has taken for bar codes. We will be living in a world where bar codes and RFID tags co-exist, and RFID tags will never completely replace bar codes.

Socket Communications has a proven track record of developing and marketing innovative products. We are extremely excited about the RFID market and believe we are well positioned to provide this technology to the mobile workforce. Our new RFID products are excellent examples of Socket's continuing commitment to monitor, anticipate, and deliver solutions to meet the needs of mobile computing users.