

BAR CODE BUSTER?

An intelligent label that listens and talks could increase productivity throughout the supply chain. How does this new technology stack up to bar code labels?

Labels that “talk”? That may sound a little far fetched to people who have been using bar code technology. For years, bar code technology has been the standard means of identifying or tracking a product on its journey through the supply chain. But now, a new intelligent label with proven radio frequency identification (RFID) technology is just one step shy of actually speaking.

The new intelligent label combines RFID and bar code technologies. It offers two-way data communication (talk and listen capabilities); and now, the size of the parts that talk and listen is shrinking. The intelligent label is now small enough to fit between the face sheet and liner of a standard bar code label. It can even run through bar code printers and be printed with traditional bar code information. The new intelligent label remains compatible with a company's existing bar code system products, including printers, scanners, software and supplies.

What makes intelligent labels smart? The intelligent label is a device built into a pressure-sensitive label that transmits, receives and stores data. The intelligent label also contains electronic elements, including an RFID microchip, an antenna and a substrate (the medium to which the chip and antenna are attached).

The RFID chip is a paper-thin memory device about the same size as the head of a pin. The chip is much like a tiny PC floppy disk on which data can be stored, retrieved or even changed. The chip requires no batteries. Instead, it is powered by the external radio waves of a scanner or interrogator.

Attached to the chip is a miniature radio antenna. When energized by the external scanner or interrogator, the antenna permits the chip to receive, store or transmit information. The substrate is usually made of film and holds the pieces together as they are blended into the bar code label media.

Intelligent labels vs. bar code labels. The intelligent labels look virtually identical to bar code labels. However, there are three primary differences that separate the bar code label from the intelligent label.

First, bar code labels need a straight line of orientation and must not be obscured by dirt or grime. If dirt or grime blocks a clear view of the label, the scanner will not be able to read it. Intelligent labels need no special orientation, since the radio frequency portion of the label is what transmits the information. This information

can be read from two inches or 40 feet away, depending on the technology used in the label.

The second difference is that bar code readers typically read one bar code at a time. Intelligent label readers can read multiple labels at one time and up to 50 labels per second.

Third, bar code labels contain fixed information. If the contents of a bar-coded package change, a new label must be generated and affixed. The information in intelligent labels can be changed (up to 100,000 times) at any point along the supply chain route.

Using your intelligence. The design of the intelligent label and the radio frequency that is used are driven by the customer application. For instance, labels for transportation applications might be a little larger. The read range (the distance the interrogator must be from the chip to pick up and decipher the data) might be longer, as well.

Labels for items such as jewelry might be smaller and perhaps require shorter read ranges on a different frequency. Currently, chips use multiple frequencies to talk to scanners or interrogators, depending on the application. There is no single frequency that works best for every customer application because performance requirements determine the frequency selection. The frequency should be transparent to customers, just as it is with household remote controls for TV, stereo and garage door openers.

Many of the industrial applications – warehousing, distribution, logistics, inventory control, and asset tracking will keep using bar code labels. Though, at some point in the near future, these industries will be adding the RFID intelligent component to the label. That will speed data collection and the transfer of information. In turn, the label will make a wider variety and larger volume of information available to participants throughout the supply chain.

With the nature of the intelligent label, data can change as it goes from supplier to manufacturer, to seller, to consumer. That means more accurate information should be available more quickly at each point along with supply chain. That should improve productivity in many aspects of business.

The new RFID labels can add layers of information, productivity, and traceability to virtually every stop along the supply chain. The real question is not whether these intelligent labels will bring efficiency to the supply chain. It is how companies can apply the technology in innovative, creative, and intelligent ways to further business.