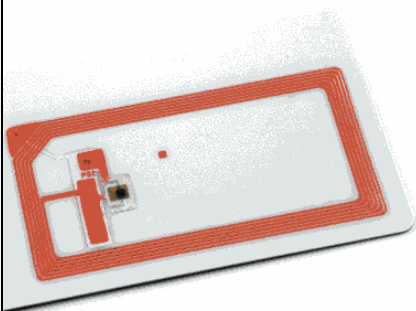


RFID yes, UPC no and probably not

Radio frequency identification (RFID) is a method of remotely storing and retrieving data using devices called RFID tags.

An RFID tag is a small object, such as an epoxy disk or adhesive sticker, that can attach to or incorporate into a product. RFID tags contain antennas that enable them to receive and respond to radio-frequency queries from an RFID read/write head (transceiver).

After data arrives from a carrier, typically a PLC or PC analyzes it and determines the appropriate control for the application.



RFID tags are an enhanced alternative to UPC bar codes.

Simply put, RFID provides real-time wireless detection of data and helps improve workflow to increase production while eliminating manufacturing errors.

RFID tags are an enhanced alternative to UPC bar codes, having a number of important advantages over the older bar-code technology.

RFID codes are long enough that every RFID tag may have a unique code, while UPC codes are limited to a single code for all instances of a particular product. The uniqueness of RFID tags means one may individually track a product as it moves from location to location, finally ending up in the consumer's hands.

Additionally, many workflows beyond enhanced bar-code applications are being automated for passive (non-battery) and active (battery powered)

RFID technology.

Technologists are implementing and envisioning RFID applications in virtually every vertical industry and across industries.

Four factors decide if an RFID system is suitable for an application: distance, speed, data quantity, and ease of integration into the existing system.

RFID systems should be fast and secure, as well as being robust, and insensitive to every type of interference and extreme temperature influences.

READ/WRITE technology

Legacy bar-code technology is limited to the amount of information it may represent. A bar code may represent a line of products or items, but it cannot represent individual products.

This is becoming detrimental to industrial applications, like automobile manufacturing, where customized and specified products often prevail. Bar codes also cannot read, write, or store data.

RFID uses EEPROM and FRAM memory technology to read and write data to the carriers. Generally, the FRAM data carriers can be processed by a power of 10 faster than the EEPROM data carriers and withstand 1010 operations in comparison to EEPROMs 105 operations. At this rate, FRAM memory will last 30 years.

Tags are available using different speeds of transmission based on the manufacturer, but many companies are opting to follow ISO 15693 standards for 13.56 MHz, as it provides direct power to the data carrier via the RF field and is outside the range of industrial interference fields.

RFID popularity increased after Wal-Mart required suppliers to put tags on cases and pallets of goods. In June 2003, it told its top 100 suppliers they would need to begin putting tags on shipments in January 2005. One reason Wal-Mart chose this approach was to solve the chicken-and-egg problem. If the giant retailer's top suppliers began buying tags, it would drive the price down thus making the technology more affordable for everyone. Then volumes would

increase and prices would fall further.

Wal-Mart's push to use RFID in the open supply chain is a big reason why the technology is hot today. But it is not the only reason. Several important factors have come together around the same time. One is the advances in ultra-high frequency RFID systems. UHF systems are able to deliver the read range needed for supply chain applications, such as scanning tags on products as pallets move through a dock door or scanning cases on a high shelf in a warehouse.

Another factor was the movement to develop a system that is low cost and based on open standards. These are prerequisites for the use of RFID in open supply chains, where a company puts a tag on a product, and it is read by other companies in the supply chain.

The Internet is an important and often overlooked factor. The Internet can enable companies to share information about the location of products within the supply chain.

ABOUT THE AUTHOR

Nicholas Sheble (nsheble@isa.org) edits Automation Basics. He is senior technical editor at *InTech*. Information for this dispatch was compiled from a series of reports.

Terminology

EEPROM is electrically erasable programmable read-only memory a non-volatile storage chip used in computers and other devices. Unlike an EPROM, an EEPROM someone can program and erase multiple times electrically.

FRAM: Ferroelectric random access memory (RAM) is a system using memory cells containing a layer of crystals of zirconium/titanium, oxygen, and lead, which form a tiny transistor. It is supposed to be 20,000 times faster than flash memory.