RFID Label Printing

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Even though the adoption of RFID technology has slowed somewhat in its initial natural habitat of supply chain management, manufacturing and distribution, due to the pressures brought on by the current economic climate, a marked rise in RFID's use has been noted in several new areas such as energy production, libraries, textiles, hospitals, baggage handling and even government.

The broader range of applications brings about a need for printers to be more versatile and be able to meet new requirements like handling RFID inlays and labels of many different sizes, This comes with demands to perform more challenging verification tasks, for example, verification that the transponder has been encoded correctly with the appropriate data and to pick up on any failures in encoding the inlay.

RFID printers have traditionally been thermal printers. Aside from the standard printing components, they consist of an encoder to program the label with information which will need to be re-read in transit. The labels they print consist of the classic bar code and a human-readable description while at the same time they encode the inlay, or more correctly, the microchip built into it. Due to the dual action of encoding or programming while printing the label, the process is slower than printing alone.

The RFID tag is made up of a chip and a metal antenna (usually aluminum, copper or silver) bonded to a synthetic backing. Also called an inlay, the tag is produced as a roll of tags and supplied to the label manufacturer who affixes it to the back of the label. It is this combination of inlay and label, collectively called a 'smart label' which is fed into the RFID printer.

The added bulk of the label has been a cause of problems in the past, such as the thickness of the inlay hindering the action of the print head, resulting in poor printing, or inlays not being positioned exactly in line with the printer's encoder, resulting in delays or failure to encode. Other problems include inlays being faulty already at the point of adhering to the label, or getting broken during the physical printing process.

Fortunately, as RFID printer technology improves, these problems are being overcome and today, good printers can consistently and accurately encode, print and verify labels. Many now also have the important ability to void bad or incorrectly encoded inlays.

The continued rise in reliability and performance of RFID printers is dependent not just on improved properties of the inlay and the better mechanical and electronics

performance of the printer but also on the development of intelligent and appropriate software and its integration into the printers.

Standards, compliance and the Future

In an evolving area, standards play an important role to avoid customer confusion and incompatibility of equipment. Current RFID standards include ISO 14443, ISO 15693 and ISO 18000-6. The latest EPC Gen 2 for UHF is expected to be the standard which will advance interoperability between different hardware and software.