

Courtesy of



Settling Some RFID Rumors

RFID Switchboard Issue #252 | Oct. 28, 2010 | by Victor Vega

With so much RFID related discussion in the press recently, privacy seems to be ratcheting to the top of people's mind. This is intended to help educate those whom may be misinformed whether the contents and capabilities of RFID raise real privacy concerns.

No worries folks; passive RFID doesn't have a battery and the tags don't broadcast or transmit a signal. They rely on harvesting their energy from "readers," when in their vicinity. Much like a Wi-Fi system, you need to be within reasonable range for the tags to "reflect" the reader's signal back.

For example, the reader asks, "what value do you have in bit location 1?" to which the tag can either reflect the signal back – or not. If it reflects, it might represent either a "1" or a "0." It goes through this process until all the "bits" are received from the tag, i.e. "0110 1010 0010 1110 1010 1011 0010..."

Guess what that means? Correctly: nothing; unless you have a database that maps these 1's and 0's to something meaningful. The binary data get converted to other data formats useful to retailers and manufacturers. Not all that scary.

Some stories have confused people about the tags being really small. One story described it as the size of an ant. While that may be true of the "brain" or "IC" or "chip", the chip is useless without an antenna. A fully functional long range tag is significantly larger. Adjacent is a typical UHF RFID tag. The copper colored section is the antenna. If you look directly under the dime pictured to the right, you will see a tiny dark spec in the center of the tag antenna. This is the IC. So it is small, but obviously not when attached to the antenna. Smaller antennas certainly exist, but their read range is dramatically reduced.

So ignore those sci-fi rumors that someone can attach a "grain of sand" onto a person and that they can be tracked by satellites, or even across the street. This is completely untrue regarding RFID.

So if RFID tags can't give their location; are limited in read distance; and simply reflect a bunch of 0's and 1's (which are meaningless out of context); you're probably wondering why all the hoopla? You're right. These devices are really neat and can be very useful, but they're not quite the "trackers" some folks make them out to be.

Tags in the clothing store

There has been recent press about apparel being tagged. Some believe they will be tracked inside and outside of the retail store.

Let's think about this. The tag is typically part of a bar code label, which contains human readable information – a series of numbers representing what the product is. These too are meaningless unless you map them to a data base.

All standard retail barcodes for a particular product are the same – no uniqueness, so you can't use them for inventory management. RFID offers the uniqueness to help derive business benefit. Take a 150oz container of Liquid Tide for example. On one variety, the bar code has the following human readable print: 0 37000 23094 6. If you have the proper data base, you would be able to map the first six characters to the manufacturer (Proctor & Gamble in this case) and the next six

characters would map to the product (150oz Liquid Tide with Downy).

RFID has this exact same information, but appended to the end is a unique serial number, maybe #2203886, #1858427, #4594619, and #1058990. The system would read 4 unique items with the same “stock keeping unit” (SKU) number and have an inventory count of four. That’s it.

So let’s talk about a common question: “What if someone had a reader and read through your trash to see what you purchased – can they do that?” The answer is “maybe.” If they can map the 0’s and 1’s to an appropriate database, then guess what they have? The SKU! . . . the same thing that is written on the bar code.

One more point – unless the reader is purposefully set in “very short read range mode” to isolate each item, then it would be reading anything in the readers “illumination path.” Not that this is how the technology is being used, but as an analogy think of an overhead light in a retail store – assume the illumination from the light was the RF from a reader – they are similar in coverage. Assume only one light was on and assume the light was 20 feet overhead. It covers quite a bit of area, right? Assuming all of the illuminated items were able to be read, that might be representative of what would be associated with the shopper. As they move through the store they might be associated with over half the store. Not much use, is it?

On the apparel application, the tags are removable – often on what are termed “hang tags” (e.g. tags on a string). If you’re really concerned, simply pull them off and dispose of them before leaving the store.

Nothing’s really much different from the info read by the bar code reader or from the human readable information, it’s just that a sense of awareness has been raised and people tend to fear the unknown.

Those concerned may want to reconsider carrying their cell phones. Cell phones are capable tracking people across vast locations. Still, we tend to ignore things like this as the convenience generally outweighs the risk.

RFID Switchboard *Guest columnist Victor Vega, marketing director of Alien Technology, is a go-to resource for engineering answers.*

For more information on RFID in Manufacturing, please call:

Rich Bruce
RFID Business Unit
The Danby Group
321/953-1273