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TROLLEYPONDER/ECOTAG RFID Newsletter

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Your latest copy of our regular newsletter keeping you up to date with developments.

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Technical breakthrough - UHF in credit card sized antennas

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Passive RFID transponder technology is driven by the need for RF efficiency as wasted energy means larger readers, and less range; while local regulations limit reader's power and hence system performance. Trolley Scan have been world leaders in the past in developing extremely low power RFID technology for very low cost RFID transponder systems, primarily through their patented EcoTag(r) technology. The measure of success used to monitor progress is a factor called "RF sensitivity", that is how much RF energy has to land in the antenna aperture of the transponder for it to operate reliably. For a typical dipole based transponder at 915MHz the aperture is 134sq cms.

The reasoning for using RFsensitivity is RFreader power is proportional to RF sensitivity/(Range\*range)

Therefore improving the RFsensitivity by a factor of say 10 means the range of the system will be 3.15 times more OR the reader power can be reduced by a factor of 10 meaning smaller readers and longer battery life. As a benchmark a 5volt logic circuit attached to dipole antenna on a transponder would need 55 milliwatts to be collected in its antenna aperture to operate. In the past we have reported on our 0.27mW dipole version that we have been able to read over 9.5 meters. A perceived disadvantage of UHF RFID by some potential users has been the length of the antenna. Typically the length is 160mm at 915MHz (slightly longer for 869MHz for the EU) but this is needed in order to get high efficiency. Taking a 160 mm long dipole and cutting off 40mm from each end would throw away 94% of the efficiency of the system, that is the standard benchmark transponder would need 726mW to operate - obviously not a practical solution.

The wonders of EcoTag technology now come to the rescue for Trolley Scan licensees. Using EcoTag patented technology, Trolley Scan have developed a simply designed 80 mm long antenna system THAT OPERATES ON AN AMAZING 0.4mW (comma four milliwatt) RF sensitivity, a 1815 times power improvement compared to the shortened dipole, or 137 times improvement even compared to the full length dipole. The design allows the entire transponder to be packaged in an 80 by 27mm area, and particularly into the standard ISOcard formats that are requested by users particularly for access control cards or smart labels. (Credit card sized) The new antenna design means that it is quite practical to read an ISOcard sized transponder at 9 meters. The design of the transponder is very simple, being two strips of foil and a single chip leading to low cost, small and very low power transponders that can simply be produced in very high volume. It impacts the future of 13.56MHz technology as with the same size advantages as the older technology, UHF transponders can offer 20 times range advantage while being simpler and cheaper to manufacture than the older technology.

These developments are available to Trolley Scan licensees. Users can expect them to be available commercially by the middle of this year in UHF RFID transponders produced by Trolley Scan licensees. (PS Despite offering 9 meter range the sensitivity is so low that the new EcoTag ISOcard transponder operates 1000 times below the power levels recommended in the RF health guidelines).

An image of the physical size of the new transponder is available at

<http://trolleyscan.com/>

and issues of sensitivity are detailed at

<http://trolleyscan.com/sensitiv.html>

Under development

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Following a recent tour by a director of Trolley Scan to Europe, developments have started on a new version of EcoTag particularly for the garment/ clothing/ dry cleaning industries. The challenge is to make a transponder that has a very thin antenna suitable for sewing into the garments, can survive the chemical cleaning and washing temperatures, and yet offering the RF sensitivity and features that are included in all the EcoTag products. One of the important ultimate applications of this technology, besides the obvious applications in logistics, sorting, identification and retail, will be the household washing machine where by adding "vision" to its processor, the machine can decide on the optimum washing cycle for the garments being cleaned. To achieve this we need a low cost transponder suitably packaged for the rigours of the washing machine. Trolley Scan develop technology for others to manufacture. Licences to use their patents and technical support are available to companies wishing to produce and sell products based on this technology. Trolley Scan manufacture an evaluation system allowing users and producers to test out the technology on their specific application while waiting for production versions.

Trolley Scan and retail systems

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>From the very outset, Trolley Scan have been developing their technology for the ultimate application of scanning supermarket trolleys/carts without the need for unpacking. A key issue in UHF RFID transponder technology is the protocol, that is the ability of one reader to manage and read many transponders in a zone using a single frequency. The founders of Trolley Scan developed the original protocol that was demonstrated by a trolley of 38 items being read in a supermarket in a Pick 'n Pay in Pretoria South Africa in 1994. At this time they worked for the South African Government who own their developments. In 1998 Trolley Scan developed a new protocol that they called the Trolleyponder protocol. This allows up to 1000 very low cost transponders to be read at a time on a single frequency.

A feature of the Trolleyponder protocol is that it also allows all the transponders to have an IDENTICAL IDENTITY, such as would happen when you use RFID to replace barcoding and label 50 boxes of Kellogg's Rice Krispies. Trolleyponder was extended to cater for 3D scanning, such as happens when goods are randomly orientated in a trolley. Trolleyponder includes a controllable EAS feature for antishoplifting. Trolley Scan assisted with the development of a concept checkout which has become known as "Branders". This allows a shopper to use a self service booth to have their trolley scanned, pay the amount due, and have trolley checked on departure using the EAS features. Branders ensures both the shopper and store owner are happy using self service checkouts.

<http://trolleyscan.com/branders.html>

All these features are available from a single chip measuring less than 1mm square attached to some metallic foil, and being able to be read at distances as far as 9 meters. For RFID this is the ultimate application but obviously all these features have application in almost every situation where giving a computer system 9 meter "vision" helps productivity.

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More information about Trolleyponder technology can be found at the Trolley Scan website <http://trolleyscan.com> Interested parties are encouraged to join the User Group so that they can be kept informed of developments with the regular newsletter. (See forms at end of <http://trolleyscan.com/brochure/index.html>)

Trolleyponder(R)/EcoTag(R) has been designed to be "A barcode replacement technology"

Regards

Mike Marsh

"Trolleyponder" & "EcoTag" are the registered trademarks of Trolley Scan. "TinTag" is the trademark of Trolley Scan.

Trolley Scan site detailing Trolleyponder(R)/EcoTag(R) RFID is located at <http://trolleyscan.com/>

Mirror sites in case of overload are also located at

<http://trolleyscan.co.za/> and

<http://rapidttp.com/trolley/> and

<http://rapidttp.co.za/trolley/>