



## **Covert and invisible data mark reading**

A new level in brand and document authentication

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***[www.uvreaders.com](http://www.uvreaders.com)***

**InData Systems**

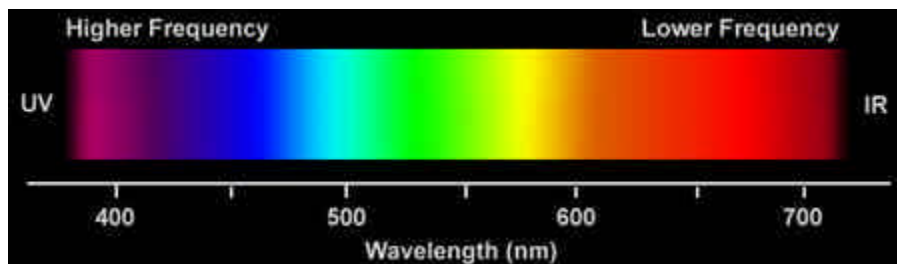
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# Secret and Invisible Marking

For years, there have been various means of writing an invisible message to be read later only with the aid of certain chemicals, heat or special lighting. Many will remember as kids how they were shown how to write a secret message on paper with lemon juice or a baking soda solution with water and, once it had dried, thought they had the “perfect” hidden message. It could only be read later, if one were to put it over a hot lamp which then would discolor the paper first where the “ink” had been written! This was such a thrill and thought provoker for the “secret agent” in everyone that it only seemed logical that some would consider marking our current valuable objects with “invisible marking” that could only be seen later with special heat or lighting.

Several manufacturers of inks and printing media figured out that certain chemical compositions would glow with a visible light when exposed to a deep blue, nearly-invisible, light. Ultra Violet (UV) lighting has been used for years to bring out colors and images not usually visible to the human eye. From the glow-in-the-dark Halloween decorations, to the “genuine” brand marking of various tags found on some clothing and other consumer products, there are lots of applications that can (and do currently) use the fluorescing properties of special chemicals and elements to mark their products.



**Visible Light Spectrum**

The US Postal Service mail sorting stations currently use some of these nearly invisible inks to print a new style of bar code on mailed envelopes to give routing information used by their mail handling equipment later in the delivery process. ... see for example [http://en.wikipedia.org/wiki/Invisible\\_ink](http://en.wikipedia.org/wiki/Invisible_ink). Several major companies are now printing bar coded batch and lot control information on their products with this invisible ink to provide an indicator that the product is a legitimate one, as well as not clutter their well designed packaging with another “ugly” bar code. The data contained in the bar code mark further verifies that the item is legitimate as well as not black market distribution, when the data is sent back to the manufacturer from the distribution channel.

While the chemistry has been present for years to make marks that humans could see and interpret in the presence of special lighting, it is only in the last year that commercially feasible hand held readers have become available to read the “invisible” bar code marks. Previously, machine-mounted cameras in specially illuminated enclosures had been used to read products as they come down a conveyor line in a pharmaceutical house, for example, when they wanted to mark their product for product labeling later. This reading of the “invisible codes” was difficult to implement, though, in the rest of the distribution and consumer areas.

## Counterfeit documents and products – a serious problem

Hand held bar code scanners and portable bar code data terminals have been used over the last 10-20 years for reading UPC marks on most retail items (such as those scanned at the grocery or larger retail stores) and tracking inventory in production facilities and warehouses. But there was little available to authenticate that a product or document was genuine, or trace production lots without perceived “ugly” markings on the package. Holograms have been used on some products, such as software licenses and serial number labels on frequently counterfeited items to attempt to make it more difficult for the counterfeiters and gray marketers to distribute their products. But more frequently the counterfeiters are using similar sophisticated markings to mimic the genuine product’s markings. Smuggling of legitimate products, illegal production overruns and product diversion have infiltrated the market with good product for which the proper manufacturer or resale channel does not properly get compensated. Warranty fraud and other forms of theft also severely hurt the quality product manufacturer profitability as well as causing “brand erosion” for the owner of the product.

Only recently has the emergence of high resolution bar code printing, combined with the special fluorescing properties of certain dyes, enabled companies to go to the “next level” in authentication marking. Printing is accomplished by various non-impact printing and thermal transfer processes that allow easily read marks (most frequently a compact bar code type called “data matrix”), to be applied with invisible ink precision dye or taggant based printing supplies.

Without a simplified bar code reader that allows reading of these covert marks, it has not been possible to “close the loop” on authentication. With statistics indicating that between 5 to 8% of ALL WORLD COMMERCE is being transacted with counterfeit or illegally distributed (black market or gray market) items<sup>1</sup>, counterfeit products have become a world-wide issue affecting safety, and assuring genuine quality. Counterfeit drugs are being produced around the world under extremely unsanitary environments and sold as if they were the clinically-tested genuine pharmaceutical products that they appear to be. International efforts have been ongoing to shut down these counterfeit drug (and other product) manufacturers, as deaths have occurred from receiving improper medications unknowingly substituted for the ones that they appear to be. See, for example, “Dangerous Doses” by K. Eban, <http://www.amazon.com/Dangerous-Doses-Counterfeiters-Contaminating-Americas/dp/0151010501>.

Major corporations have lost billions in sales due to inferior and alternately manufactured goods illegally produced by others. International estimates range up to \$600 billion annually<sup>1</sup>, with US businesses alone losing over \$200 billion due to counterfeiting according to the FBI. This has caused some brands to lose the confidence of the consumer public due to the perceived lack of quality of that brand name product. Many companies are hesitant to invest in the development of new products, only to have illegal manufacturers start making cheap copies of their product which robs them of their proper rewards for their developments. Actually, many companies are hesitant to inform consumers that the low-quality fake products were counterfeits, since they’re worried they’ll lose even more sales... brand erosion vs. brand confidence is no easy choice.

<sup>1</sup> reference PIRA, International Chamber of Commerce, Interpol and World Customs Organization

# Scanning Products now easy to use

Only recently has a company developed a full range of bar code scanners and portable data terminals capable of reading these “covert”, invisible bar code marks with a patented optics system. The wide range of interfaces for these scanners and terminals as well as the ability to customize the illumination and return filtered optics to highly secure inks and dyes has opened a new era for companies to provide a brand authentication or document validation level not realized previously.

A US manufacturer, InData Systems of Skaneateles, NY offers corded as well as cordless hand held bar code scanners, fixed position “presentation” scanners and ruggedized Microsoft Windows Mobile portable data terminals that have “WiFi” Wireless LAN connectivity. Security based agencies, high profile consumer goods distribution and service channels, as well as the whole pharmaceutical structure from manufacturing point through distribution to the local pharmacy, can now confirm the quality and authenticity of products and documents or ID’s. InData Systems’ patent pending design to “unplug” their special optics enabling the user to also scan “regular” bar codes used in inventory and production provides an eco-system focused on productivity and security.

The printing industry has had fluorescing inks for years which cost no more than other high quality inks and thermal transfer ribbons, but have only been able to either put a distinguishable mark that the human eye can recognize or a bar code that can only be read in the controlled production line environment.

Try using a black light on some of the newer US and international currencies. Try also looking at your Visa or MasterCard in that light as well. There are visibly recognizable marks that can be seen in that light – but there is no way to trace the authenticity of the mark. The counterfeiters of the world are getting more and more sophisticated with their ability to forge markings on items that they wish to pass off as genuine.

By using confidential data encoding in the bar code to confirm that the object is not a duplicate or fake, the agency or company now has the tools to assure the genuine aspects of the item marked.

InData Systems has formed relationships with many of the leading inkjet and thermal ribbon manufacturers to offer a cohesive, secure solution for brand owners to provide a rapid, authentication tool to verify that product in the field is of the quality and source that it is supposed to be. This can provide the consumers AND the manufacturers the vehicle that they have needed to assure the quality (and the return on investments) that they deserve.

## Ultra Violet (UV) Optics

The InData Systems scanners, using their patented optics, are very easy to carry around and use verifying brand authentication bar codes. They utilize the Adaptus™ technology from Hand Held Products, but uses a patent pending, interchangeable optic assembly, with a near-Ultra Violet illumination (or other light spectrums) and enhanced filtered optics to see the “invisible” bar code marks printed with the fluorescing inks. UV inks are used to mark items with marks that are not noticeable except when illuminated in Ultra Violet “Black Light”. The Optic is able to read several types of fluorescing marks depending on the wave length attuned to the particular ink.



InData Systems LDS4620 with UV optics



InData Systems patented UV optic illuminating “invisible” data matrix bar codes on a label. A bottle cap with UV bar code is directly behind the labels

In Summary, InData Systems has developed and continues to refine optics to read low contrast, UV (ultra violet) and other wavelength fluorescing bar code symbols. Our organization welcomes working with resellers, end customers and etched mark producers to improve the ease of reading direct part marks in a variety of environments. Our optics are available on hand held scanners, Bluetooth wireless scanners, fixed mount readers, and Portable data terminals for the most dynamic uses in the field. Please contact InData Systems for a reseller in your area who will provide assistance in solving your toughest challenges in covert bar code mark reading.

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**John R. Hattersley, P.E.**, is the president of InData Systems and is one of the principle inventors of the InData Systems Fluorescing (UV and others) bar code optics systems. He is a certified professional engineer and founded the company over 20 years ago to provide unique bar code data collection solutions to industry.

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