Technology Brief

Bilcare Technologies' Singular ID solution gives objects unique "fingerprints". This provides an extremely powerful tool for preventing counterfeiting, parallel marketing or simply for product tracking.

Giving objects "fingerprints"

Background - Just as each human fingerprint is unique, so too are naturally occurring objects unique – think, for example, of the pattern of bark on a tree. Similarly each piece of metal, plastic or ceramic is disordered and unique when viewed on the microscale (one millionth of a meter) or nanoscale (one billionth of a meter). Consequently each object has its own inherent fingerprint which can be used to uniquely identify it. Until now, however, identifying the characteristic microscopic or nanoscopic features of objects has required extremely expensive and sophisticated equipment.

Singular ID Concept - More than four years of research and development culminated in the 2006 launch of the Singular ID enterprise brand security system (see Figure 1). The system comprises of labels each containing its own unique fingerprint. Figure 2 shows an example of such a material. The material consists of randomly distributed features. Since the distribution arises from a random natural process, not even we are able to duplicate any pattern that we make. However, the material's unique fingerprint can be read using an inexpensive scanner (see Figure 3). As each label is produced, its fingerprint is read and stored on a secure database. When the label needs to be verified, a handheld scanner is used to read the fingerprint, and the resulting signal is then transmitted to the database where its identity is verified.

Fingerprint Flexibility - The Singular ID system includes labels or tags that can be attached to items of value. However, Singular ID fingerprints are unusual in that they can be embedded directly into numerous materials (e.g. metals, plastics, glass or even leather) and consequently into the product itself.

The Identification Process - Singular ID fingerprints are identified using a process similar to human fingerprint recognition. When a fingerprint is made, it is read and its unique signal is stored in a secure database. Later the fingerprint can be recognized by reading its signal again, and comparing it with the original signal stored in the database. This can be done from virtually anywhere in the world by communicating back to a remote database using a mobile phone or computer connected to the Internet.

Remote Database - The database provides the brand owner with a very high level of flexibility and control over its products. Different scanners can have different access privileges to the data – for example an authorized distributor
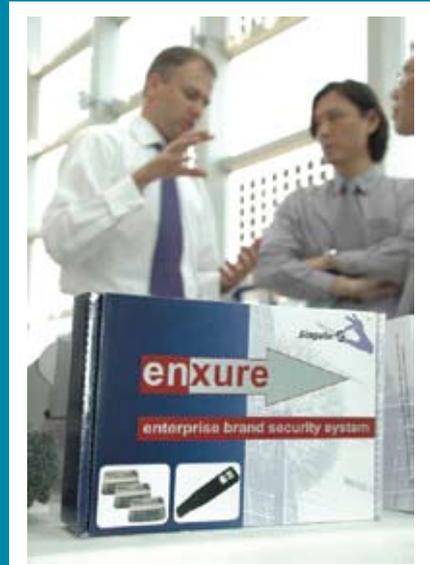

Figure 1. Bilcare Technologies' Singular ID brand security system allows secure authentication from virtually anywhere in the world.
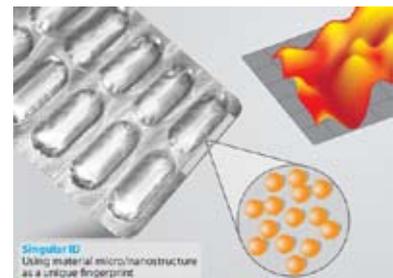

Figure 2. Bilcare Technologies' Singular ID fingerprint. The fingerprint consists of micro- or nanoscale features embedded within a material. Each fingerprint produces its own unique signal (top right) and even we are unable to reproduce a fingerprint.

Figure 3. A handheld Singular ID scanner which connects to a standard mobile phone to access the remote database.

may be allowed to view certain limited information about the products upon a successful scan, whereas a company inspector may be allowed to view much more extensive information. The database also tracks in real-time all the scans being made, which label was scanned, which scanner read the label and where (i.e. which country) the scan was being made from. This and other tracked information is combined to provide the brand owner with unparalleled data about when and where its products are being sold or returned.

Furthermore, unlike conventional systems, the database allows scanners and/or individual labels to be instantly "deactivated" if they are stolen or lost. Information on the database can also be updated after the product has been shipped, thereby allowing the brand owner to keep product-specific information completely up to date.
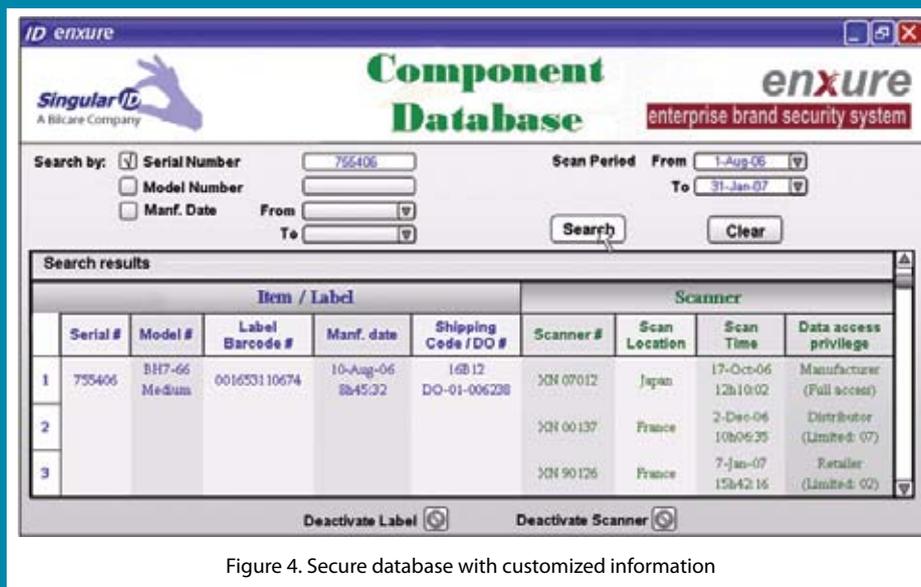

Figure 4. Secure database with customized information

Summary
Our Singular ID system is prohibitively difficult to forge and yet can be inexpensively integrated into a range of products and packaging formats. Used in conjunction with a scanner and database system they provide an unparalleled anti-counterfeiting and brand protection solution. In addition, the system can provide manufacturers, distributors, vendors and customers with extremely valuable, customized information.