EPC STANDARD

EPC standards are being developed by collaboration between EANInternational and UCC – Universal Code Council. The EPC is the next generation extension of the Universal Product Code (UPC) bar code. This new standard will be rapidly deployed as large retailers such as Wal-Mart are mandating their suppliers provide all goods to Wal-Mart and Defense Department with RFID tags incorporating the Auto-ID Center EPC standard by 2006.

The EPC Standard incorporates a 96-bit number that consists of four distinct elements as shown in the example below.

05. 0000X99. 00122R. 999903AG1

- **Header**

The Header is 8-bits and defines the length of the message, in this case being an EPC Type 1 number, which is 96-bits in length. The EPC standard was initially developed as a 64-bit number or referred to as Type 0.

- **EPC Manager**

The EPC Manager is 28-bits and is most likely be assigned to manufacturer of the product the EPC is attached to, for can of Coca-Cola it would be Coca-Cola Company.

- **Object Manager**

The object class is a 24-bit field that refers to the family type of product. This is most likely to be the Commodity Number - SKU.

- **Serial Number**

The serial number is a 36-bit field. This number is the unique number provided to the object (a can of Coca Cola) that will allow this can to be tracked throughout the Supply Chain.

RFID tags and readers

The EPC standards call for 5 classes of tags. The following table outlines the roadmap for the EPC tag class type.

EPC Class Type	Operation
0	Read Only
1	Write Once, Read Many
2	Read / Write
3	Read / Write Battery Enhanced for Long Range
4	Read / Write Active Transmitter

Although the standards talk of 4 class types only 2 are being actively developed

Class 0: 868/925/2450MHz for UHF.

Class 1: 13.56MHz for HF.

The difference between Class 0 and 1 is in the data structure (length) and operation. Class 0 tags are read only. Class 1 tags are one-time writeable.

Readers

RFID readers use a variety of methods to communicate with tags. The most common method for reading passive tags at close range is called inductive coupling. Simply put, the coiled antenna of the reader creates a magnetic field with the coiled antenna of the tag. The tag draws energy from this field and uses it to send back waves to the reader, which is turned into digital information - the tag's Electronic Product Code.

Information Systems Network

EPC has defined information system standards that can be applied for global tracking. The standard consists of three major components:

1. **Object Name Service (ONS) –**Locates information on the Internet or local network about any object carrying an EPC. ONS is similar to the Internet's Domain Name System (DNS). The ONS takes the EPC code and returns a Web address or Uniform Resource Locator (URL) where all information about that object resides.

2. **Physical Markup Language (PML) –** Language for describing physical objects. I will be based on the eXtensible Markup Language (XML). Together with the EPC and ONS, PML completes the fundamental components needed to automatically link information with physical products. The EPC identifies the product; the PML describes the product; and the ONS links them together.

3. **Savant –** Interface between the RFID reader data and the application software. Savant handles data interpretation, management and forwarding. Savant uses distributed architecture; meaning it runs on different computers distributed through an organization, rather than from one central computer.