



## Industry Week's **RFID Strategy**

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### **RFID Explained – Technically Speaking**

*A short discussion of the various technologies and components that comprise radio frequency identification*

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RFID (radio frequency identification) is a series of hardware and software components that are designed to work together. Each is chosen based upon the project goal to be achieved and the numerous conditions present that would impact reading the tags. RFID tags (or chips) requirements are designed and selected based upon the following attributes:

- Power Source -- Active tags contain a battery, and passive tags use the radio energy from the reader to generate power for sending responses to an inquiry.
- Frequency -- ultra high frequency (UHF), high frequency (HF), low frequency (LF) or microwave (MW). Each frequency is used in different conditions, which includes moisture and humidity of the environment and product, metal packaging present, and numerous other factors.
- Antenna -- Attached to chips to send and receive communications from a reader.
- Encoding method -- Tags can be factory encoded as read only, write once/read many, or read/write depending on the application. Reusable totes in the chemical industry might use read/write so that each time the tote leaves the building, the tag can be updated with information specific to that shipment. Case or pallet labels might be read only, since they are sent with an outbound shipment to a customer and will not be re-used internally.

Another component is the RFID reader that broadcasts a signal and is capable of reading many tags simultaneously. Readers can be fixed or mobile, depending upon the function and use.

RFID middleware is the software that interprets the data received from the readers and can apply business logic, summarize the data, and initiate workflows for further processing in external software. The middleware requires the most effort to deploy because it is customized for each project and desired user interface. The middleware has to recognize the readers and various tags in use and relate the tags to a system function so that workflow can be initiated in other applications.

#### **Then There's EPCglobal**

Finally, there is EPCglobal Inc., a member-driven organization that is developing standards for data synchronization and communication of RFID data. EPC (or Electronic Product Code) is the unique number assigned to each passive RFID tag, and EPCglobal allows a manufacturer to share the specific product data assigned to each EPC number

so that it can eventually be accessed and used by a packaging company, wholesale distributor, retailer and even a point-of-sale system. Once fully in use, it should allow consistent and accurate data synchronization on a global basis.

Not all RFID is EPC-related, although much of the RFID news you read about related to Wal-Mart, the Department of Defense and various retailers refers to passive, EPC encoded tags. There are many other types of tags and depending on their use may or may not have an EPC encoded.

I will discuss EPCglobal in greater detail in a future column.

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**\*Chris York's RFID column appears twice monthly in IndustryWeek's RFID Strategy newsletter and on IndustryWeek.com. Click [here](#) to register for the newsletter.**