

As a California-based business and a leading RFID technology innovator, Alien Technology is pleased to provide our comments about the benefits of RFID for your consideration as you prepare your final report for the California legislature.

RFID has a wide span of applications, and is commonly used in many areas, including the following:

- Access control: Identity badges granting access to buildings, parking lots, structures, resorts, amusement parks, and special events.
- Libraries: managing books and small items loaned to the public.
- Smart Cards: secure electronic payments
- Passive Anti-Theft systems: integrated within automotive key heads to limit ignition systems to authorized owners.
- File Management: identifying, locating and managing medical, legal, insurance and other key files.
- Identifying infants, elderly or ill with ID bracelets in controlled environments.
- Asset management: assisting in managing capital equipment, vehicles, computer equipment.
- Supply chain: for product visibility through the system.
- Toll ways: to automate toll ways through toll booths.
- Anti-counterfeiting / Brand protection: to assist in curbing market diversion, and unauthorized product.
- Containment: used to assist in product recalls, identifying lots with certain characteristics or born-on dates.
- And many more

Privacy:

Detailed information about the tagged items can either be localized to the host (common practice), or distributed and contained within the RFID silicon (not common practice). For most applications, the tagged item is merely a structured unique ID number, and must rely on a host to provide further information or to identify content hence, privacy issues are really only a facade. If of concern, the more popular Gen2 protocol offers the ability to “kill” the tags – rendering them useless. Of course, if users prefer, tags may also be removed from purchased products. Read range is limited to the distance at which the tag can be “illuminated” by the reader antenna. Myths of people being ‘read’ (RFID) by “satellites” are simply not possible – tags need to be in the vicinity of the reader to be operational. Under absolute perfect conditions, distances of up to 30 or so meters are possible (100 feet) for tags in a sweet-spot, in free space and with a clear line of site, but this is the exception – most read distances are limited to about 5-7 meters under optimum conditions, and much less under normal conditions. For very secure financial applications, such as a smart card, personal information is retained on the silicon, but these products include very secure encryption, worthy of retaining financial information. Their read ranges are typically either contact, or very short (within inches).

RF Exposure: RF devices are already part of everyday life, such as:

- Wireless telephones
- Cellular phones
- Walkie-Talkies
- Wireless access points
- Wireless networks
- Bluetooth devices
- Remote controls
- Electronic Articles Surveillance Systems (EAS) (for theft deterrence)
- Wireless security systems

And as with the above, as long as the systems are regulatory compliant, and used as intended, health and safety issues should not be of concern. Safety issues can be referenced by the FCC Office of Engineering and Technology (OET) bulletins #56 and #65.

Security: Depending upon the application, the technology can range in security from none to high. For example,

- None: for most applications, such as supply chain compliance, for a library book or a medical or legal file, a simple unique ID is assigned to an asset, and a host is required to determine the contents.
- Some: in some situations, a higher degree of security may be required, for example, employee Access Control badges. In most of these instances, the particular facility is provided with an "electronic key" whereby the data is 'scrambled', and encoded/decoded – any invalid keys are ignored.
- Medium: Some tags offer additional user memory, in addition to the publicly available data. This portion of the memory can be restricted only to those with authorized access. Cryptography / encryption is also a viable option for RFID tags. Also, when arranged with silicon vendors in advance, special Read Only Memory can be programmed within the silicon to prohibit duplication of tag ID's with readily available tags (this entails customized silicon wafers for specific customers).
- High: some applications, such as SmartCards - facilitating monetary transactions – include sophisticated encryption engines which offer extremely secure data protection.

Advantages: When used properly, the technology offers many features over traditional bar codes, such as the following:

- Non-line of sight: may read items in various orientations with minimal item re-orientation.
- Data contents can be locked, unlocked, killed, erased, reprogrammed, changed or appended to.
- Provisions are available for additional user-assessable data, in addition to generic "publicly" seen data.
- Provisions are available for inclusion of encryption for higher levels of security.
- Silicon can contain much more data than traditional bar codes – some contain more than 514K bits of user data.
- Range can be controlled by the reader and or the tags. Near-field versions limit range up to approximately 1 wavelength (about 13 inches for UHF frequencies), and tags can be designed to operate at even less distance, if required. On the other hand, with full power, and efficient tags/silicon, read ranges of several meters are also feasible.
- Without requiring line of sight, tags buried within files, books, cases within pallets, etc. can be read, making efficient utilization of the technology.

In summary:

- RFID can be designed to operate at very close range (inches) or up to 100feet-range, depending upon the application needs.
- RFID tags generally only contains a unique number, which needs a host to identify the contents, but can also contain distributed data if desired.
- Data can be locked.
- Encryption is a feasible option.
- The technology can enhance productivity and efficiencies by reducing line of sight/orientation alignment.
- Several companies successfully implement a legal file management system today, using commonly available Gen2 tags. Their systems utilize randomly programmed ID's on the documents, and relies on the host to keep track of the contents.
- Alien Technology provides RFID products and services for physical assets and not for use in humans.

About Alien: See attached PDF

Sincerely,

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