



Information



Canada's Office of Consumer Affairs

Radio-Frequency Identification (RFID) in the Retail Marketplace What Canadian Consumers Need to Know

RFID stands for Radio Frequency Identification—a technology whose use is growing fast, and which has major implications for consumers, particularly with regard to privacy.

What is RFID technology?

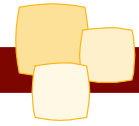
As its name implies, RFID is an ID—identification—system. It relies on a small chip that is implanted in a tag. The chip can record and store data, such as a serial number, price or purchase record. The tag can be attached to all sorts of things: merchandise, shipping containers, vehicles, even pet or animal collars. Then, an electronic scanner can use radio signals to read or track the ID tag.

For example, a warehouse worker might use a hand-held RFID reader to check inventory. The data on the tags scanned might only be numbers, but once scanned, the numbers can be checked against a computer database, and the company will know exactly what it has on hand.

RFID technology was created during the Second World War to identify friendly aircraft, but it is only recently that its use has been commercialized—and has virtually exploded in popularity. Chances are that you have already encountered quite a few RFID-enabled products. These might include:

- car keys with an anti-theft chip, that need a valid code to start your car;
- automated highway tollbooths that can automatically read transponders installed in the vehicles of frequent users (these are in use on Toronto's Highway 407); and
- the *Speedpass™* keychain, which automatically debits your bank account or credit card when you pump your own gas.





It is important for consumers to know about RFID, particularly because it is the technology used by the Electronic Product Code (EPC) system. EPC is replacing bar codes, those parallel bars and spaces found on products and price tags, which are scanned at a store's cash register.

What is the difference between a traditional bar code and an RFID/EPC tag?

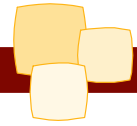
While their basic uses are similar, there are some important differences between the old and the emerging product code systems:

- *Item rather than product-level tagging.* Because RFID/EPC tags have a computer chip with its own electronic memory, each tag can have its own individual identification code—this is beyond the capacity of the traditional printed bar code symbol. Thus, RFID/EPC tags can separately identify and track every individual item. Bar codes, on the other hand, can only identify the product class that an item belongs to. For example, a stack of DVD players sitting on a store shelf could all be the same model, in the same kind of box, and sell at the same price. At present, they would all have the same bar code printed on their boxes or labels; this would indicate merely that they were all the same type of DVD player. In the near future, each could have its own unique RFID/EPC tag, and carry an individual identity code. The store will accordingly be able to track exactly which DVD player is where.
- *Increased scanning power.* Traditional bar code technology uses a light-based reader that must shine directly on a tag to be read by the scanner. Because RFID technology uses radio waves, the tag's signal simply has to be within a certain distance, for the reader to make the scan—and reader and tag do not have to make an individualized connection. This means that:

- More than one RFID/EPC tag can be read at the same time;
- The reading can be done even if the tag is inside a box or implanted into a product; and
- The reader can be fixed to a wall, since it does not have to be in direct line of sight with, and “see,” a specific tag. Therefore one strategically located reader could replace several, even many, old-style bar code scanners.

Not all retail tags are RFID-based

Not all electronic tags on retail goods are RFID/EPC tags. They may instead be radio frequency (RF) security tags. RF security tags do not have a unique identification number, and do not store data or allow linkages to other databases. These use radio signals to send a code to the store's security system, and trigger an alarm when a product leaves the premises without the tag having been deactivated.



How is RFID now being used in retail?

At present, RFID tags and systems are relatively costly, and are not yet found on inexpensive items. However, some interesting retail pilot projects are already under way:

- Continuous “live” store inventory. Retailers can gain real-time detailed information on their stock through an on-going automatic scan system in warehouses and stores. This is much more efficient than having an employee manually check inventory on shelves, and could eventually cut costs and improve consumers’ experiences in stores, through better stocking and supplies.
- Simultaneous “one shot” scanning of goods at the cash. For example, everything in a consumer’s grocery cart can be scanned all at once, while still in the cart—no need to remove items for check-out. This could speed things up at the grocery store.

Other uses

Use of RFID isn’t limited to the retail sector. The pharmaceutical industry is already exploring how RFID tags could help identify counterfeit, and potentially harmful, drugs. Some have suggested that RFID monitoring of seniors’ nutrition habits or use of appliances could make it easier for people to keep living in their own homes, instead of moving to care facilities before they actually need to. Airports may also find a use for RFID tags, to automatically detect luggage loading errors before bags go astray. Further investigation is required before any of these uses could actually become common.

RF emissions and your safety

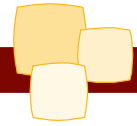
According to the European Commission, RFIDs are relatively low powered, compared to other wireless applications such as cellphones, broadcast media, and radar. Thus RFIDs may pose a lower level of risk to health than most other common wireless devices. With respect to consumer products, harmful health effects that may result from exposure to wireless magnetic fields have not been documented at this point, however controversy exists in this field.

How could RFID affect privacy?

RFID technology poses some challenges for consumers.

RFID tags can be very small, and the reader can be located where you can’t see it. This can make it hard for a consumer to even know that RFID is being used by a store.

When you do find an RFID tag on your purchase, you can’t tell by looking at it whether the tag is still communicating its data, or has been turned off. It is theoretically possible that a tag can continue to be read, even after a product is paid for and taken from the store.



An RFID tag used for inventory control might contain only information about the product concerned. However, the potential exists for a computer system to link this product data with personal information, as it is collected with every swipe of a credit, debit or loyalty card. RFID technology could make possible the creation of a detailed profile of an individual consumer's buying habits.

RFID is a new and unfamiliar technology, and it is understandable that consumers might have questions about it, or be to a certain degree uncomfortable with it. Consumers should not hesitate to ask for more information and clear explanations from retailers who use the technology.

What is being done to protect my privacy?

Your privacy rights are protected by Canada's privacy legislation, which will apply to any future RFID applications that hold or become linked with personal information.

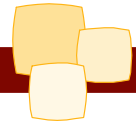
Under the federal *Personal Information Protection and Electronic Documents Act* (PIPEDA), there are ground rules that govern how organizations may collect, use or disclose personal information gained in the course of commercial activities. Those living in Québec, Alberta and British Columbia can also refer to their jurisdiction's provincial personal information Act.

Ongoing discussions are also taking place, in Canada and internationally, about technological standards for RFID tags and systems; such standards could offer further protections for consumer privacy.

Adopted in January 2005, Canadian EPC voluntary public policy guidelines have several rules for businesses that use RFID/EPC tags on consumer products. The guidelines include the following:

- Consumers should be told when EPC/RFID technology is being used;
- Consumers should have the choice of allowing the tag to remain activated, or of turning off and disposing of the tag after purchase; and
- Consumers should have control over the information that the store's computer system retains about them.





As the use of RFID technology expands, so will consumers' questions about it. This article has been an introductory overview only—Canadians should keep asking for further information from governments, consumer organizations, and businesses.

For further information, start by having a look at the following websites.

Office of the Privacy Commissioner of Canada (www.privcom.gc.ca)

Information and Privacy Commissioner of Ontario (www.ipc.on.ca)

Guidelines for EPC on Consumer Products (www.epcglobalinc.org)

Canada's Office of Consumer Affairs encourages you to be an informed consumer!