Learn More About RFID Technology and Waste Management Solutions

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RFID Maximizes Waste Management and the Efficiency of Recycling

With costs rising at all points in the waste management process, shrinking landfill space, and growing consumer interest in recycling, RFID enables waste haulers in cities and towns across the country to foster recycling while improving the efficiency of their waste operations.

By automating the collection of all waste, RFID can assure that individual bins have been collected, providing verification of service. In addition this information can be used to optimize management decisions on truck usage and routes. With a fully automatic data collection system based on RFID, versus manual methods, service verification, asset tracking, route efficiencies and customer billing processes can be streamlined and more accurate. Taking advantage of RFID's ability to reliably identify individual receptacles and their location, municipalities can create incentive-based recycling programs that accurately reward customers for the amount they recycle, while minimizing the amount of trash headed for the landfill.

Automated accuracy in all aspects of collection and disposal is a primary reason the recycling and waste industry provides means and process.

Incentive-Based Recycling: A handful of forward-thinking municipalities are already using RFID tags for incentive-based recycling. One recent example is the city of Wilmington, DE partnership with Recycle Bank. Wilmington residents receive a bin fitted with a low frequency (LF) RFID tag that identifies each household. Recycling trucks are outfitted with a scale and a RFID reader. On recycling pick up day, a resident's bin is placed on a scale, identified by the RFID tag and reader, and then weighed. The Recycle Bank system tracks how many pounds of recycling each household produces per month, and the households then receive Recycle Bank Rewards Dollars. Residents can redeem rewards dollars with more than 300 retailers.

Bill by Volume: Depending on the city or town, trash collection pricing structures vary from flat fee, pay-as-you-throw and pay-by-weight. As recycling efforts become more mainstream, municipalities may turn away from flat fee-based systems and charge customers according to the amount of waste they generate. RFID technology improves the accuracy and efficiency of bill-by-volume waste collection. As the fully automated truck lifts the RFID-tagged bin to empty it, the tag's ID number is read and eventually processed into individual customer invoices. Trucks fitted with scales can add weight data for pay-by-weight billing as well.

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Why Use RFID's Low Frequency Half-Duplex for Waste and Recycling Management

Choosing the right technology such as high, ultra-high or low-frequency (LF) radio frequency identification (RFID) technology for automated waste and recycling management usually comes down to the requirements of the application. Factors to consider when making the decision include how the RFID tag performs in the environment where it is being applied, its read-range, signal strength and durability. LF's long radio frequency wavelength isn't absorbed by moisture as much as UHF's small and compact waves. Where LF tags will continue to function when exposed to rain and the elements, UHF tags will stop functioning. Here are some additional reasons to consider LF:

It's been in the trenches: TI LF applications are tried and tested. The form factor for LF transponders already exists with a rigid overmolded or glass encapsulated tag that is compatible with waste disposal units. As well, the animal tracking industry, rife with uncontrollable variables such as weather, unpredictable terrain and other obstacles, has used LF technology for more than 15 years. It's rugged, field-proven technology. The longevity of LF tags is comparable with that of the containers.

Listen before you speak: An LF air interface communication scheme called half duplex frequency modulation means the reader pauses during the tag's response to retain signal strength. Other LF products transmit and respond at the same time (a full duplex frequency system), thereby weakening the signal strength. Consider that the motor and the control lines of the waste truck can also interfere with the reader and transponder, and the need for a strong signal becomes apparent.

LF loves metal: LF signals are magnetic, small and direct, meaning they don't bounce off the truck's metal walls and they don't interfere with the signal between the LF tag and reader thereby creating more accurate reads. They are also not affected by water (rain or snow), dirt or mud.

One man's trash is another man's … trash?: LF has a suitable read range especially in communities where trash disposal units are lined up in close quarters. Should UHF be deployed, its large read range can mean one can's capacity could be measured while another is being identified, resulting in credits being allocated to the wrong residence. For example, if the Smith's 50 pounds of recyclables are read as the Jones's, then the Jone's family gets credit for it. It's already hard enough to keep up with them without help from inaccurate trash readings.