

# RFID TECHNOLOGY MOVES BEYOND RETAILING

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Commercial applications of radio frequency identification (RFID) technology have been used for decades to track inventory in distribution and retail settings. RFID is viewed by industry insiders as one of the most functional and economical ways to connect tangible items to the digital world. In 2016, more than 8 billion RFID tags were sold worldwide, with 60% used in the retail market.<sup>1</sup>

RFID uses radio waves to read and capture information stored on a tagged object. The tag is embedded with a transmitter and a receiver and contains a unique serial number for the object. A reader emits a signal to the tag, and the tag provides information stored in its memory chip. The RFID tag can be read from several feet away and does not need to be within direct sight of the reader.<sup>2</sup>

RFID tags help track inventory with greater accuracy and prevent theft. They can signal when an item is purchased so that it can leave the store without setting off an alarm. RFID tags can closely track and trace luxury items such as handbags, shoes and leather goods. They provide added protection against counterfeiting as their unique marker validates an item's authenticity.<sup>3</sup>

Although the cost of RFID readers remains relatively high, the price of passive RFID tags has dropped to just a few cents each when purchased in bulk.

This has led to the widespread use of RFID technology in retail applications where merchandise passes through an exit checkpoint.

Retailers have expanded use of RFID technology for retail display compliance. RFID enables immediate inventory checks and the ability to easily locate the last piece of a particular style available in a store. Macy's has committed to tagging 100% of its inventory with RFID tags in all stores by the end of 2017.<sup>4</sup>

## NEW APPLICATIONS FOR RFID

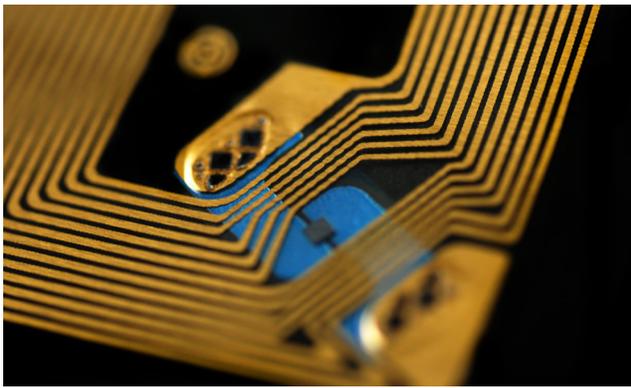
Wide area RFID systems are new applications using base readers mounted overhead to monitor the movement and location of inventory. The expansion of low-energy Bluetooth (also known as BLE) beacons and readers enables companies to track inventory as it moves through an individual site or supply chain.<sup>5</sup> BLE also can be used to help navigate people or objects through a location.

One company has developed a hands-free RFID tracking system using antenna readers. It is partnering with Microsoft on a combined blockchain and RFID solution that will enable members of an enterprise supply chain to track transactions by reading RFID tags and linking them to blockchain-enabled contracts.<sup>6</sup>

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Other new RFID applications are being tested in a variety of industries:<sup>7</sup>

- **Smart manufacturing** — Automotive companies are moving toward the “industrial internet,” which uses RFID as an enabling technology to track parts and processes through the production cycle.
- **Oil and gas production** — RFID is being used for inventory management of equipment used in contracted services that require transportation to a range of locations. The tags validate proper equipment use and ensure required maintenance is performed.
- **Distribution** — Using RFID to tag cargo provides transportation companies with more accurate information for inventory tracking. Delta Airlines is beginning to use RFID to track baggage and is investigating its use to streamline the inventory tracking of safety equipment.

- **Healthcare** — In addition to tracking expensive and restricted drugs in healthcare settings, RFID tags are being used to track surgical instruments, IV pumps and other specialized equipment. RFID is even being tested to track patient movements in healthcare settings to ensure proper care.<sup>8</sup>
- **Intelligent wearables** — Researchers are exploring ways to seamlessly integrate RFID into textiles and clothing with electronic elements such as microcontrollers, sensors and actuators. A smart shirt or pants will allow the wearer to effortlessly open locked doors, turn on appliances, track physical activities, and monitor health data.

**To discuss these topics in more detail, please contact your PNC Relationship Manager.**

<sup>1</sup> “RFID Trends: What’s Ahead in 2017, Part 1,” by Jennifer Zaino, *RFID Journal*, Jan. 8, 2017. Available at: <https://www.rfidjournal.com/purchase-access?type=Article&id=15491&r=%2Farticles%2Fview%3F15491>

<sup>2</sup> “What is RFID?” definition found at: <http://www.epc-rfid.info/rfid>

<sup>3</sup> “New Opportunities in Usage And Challenges to Embed RAIN RFID Tags into Product and Packaging,” RAIN RFID Alliance, 2016. Available at: <http://rainrfid.org/wp-content/uploads/2016/06/New-Opportunities-in-usage-and-challenges-to-embed-RAIN-RFID-tags.pdf>

<sup>4</sup> “RFID Trends: What’s Ahead in 2017, Part 1,” by Jennifer Zaino, *RFID Journal*, Jan. 8, 2017. Available at: <https://www.rfidjournal.com/purchase-access?type=Article&id=15491&r=%2Farticles%2Fview%3F15491>

<sup>5</sup> “Barcoding expands RFID, provides top trends for 2017,” blog post on Fleetowner.com, Jan. 11, 2017. Available at: <http://fleetowner.com/technology/barcoding-expands-rfid-provides-top-trends-2017>

<sup>6</sup> “Mojix’s New Reader Antenna, App and Blockchain Aim for Real-Time Visibility,” by Claire Swedberg, *RFID Journal*, Jan. 13, 2017. Available at: <http://www.rfidjournal.com/articles/view?15524>

<sup>7</sup> “RFID Trends: What’s Ahead in 2017, Part 1,” by Jennifer Zaino, *RFID Journal*, Jan. 8, 2017. Available at: <https://www.rfidjournal.com/purchase-access?type=Article&id=15491&r=%2Farticles%2Fview%3F15491>

<sup>8</sup> *RFID Journal*, Healthcare applications page containing a roundup of articles. Available at: <http://www.rfidjournal.com/healthcare>

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