

Supply Chain Management

RFID (Radio Frequency Identification) Inventory Tracking Systems

Inventory control is an important component of the supply chain management process.

This is even more so for an asset-intensive organization that carries large volumes of expensive, high turnover specialized equipment.

Whether required by just-in-time inventory levels or to manage the tools signed out from the stock room, an RFID-oriented approach offers granularity and automated tracking beyond what is available in traditional barcoding solutions.

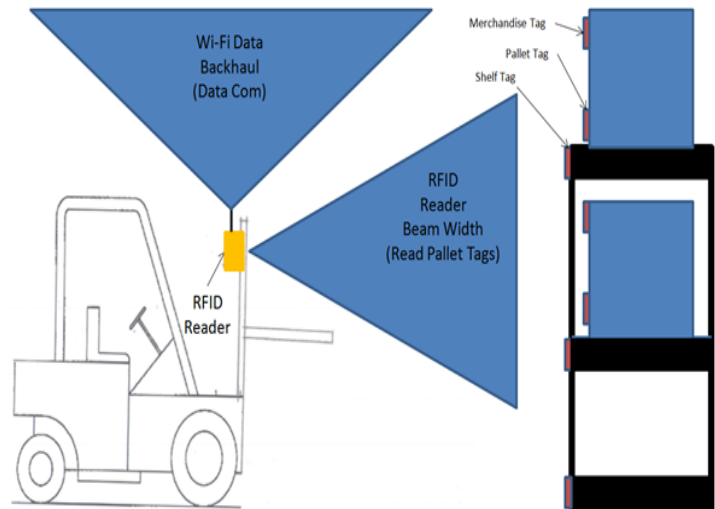


Figure 1: Forklift RFID Baseline Design

“Taking it to the next level involves having an instantaneous and accurate line of sight of your inventory levels and turnover.”

The Challenge

In the case of one company, a multinational retail corporation that owned several discount department and grocery stores, its operations team had implemented an RFID inventory control system but was dissatisfied with its 85% average accuracy. The company, facing the potential choices of either living with an inadequately performing system, abandoning it and starting anew, or ideally, finding a cost-effective solution to improve the current system, decided to bring in the radio frequency expertise of the professionals at fcgEnergy.

The Approach

For this retailer, the existing RFID system was based on a single-antenna design, which is adequate for single-point reads (e.g. something used in the check-out system in a library), but less so for the complex and high-volume designs found at most of its warehouse environments.

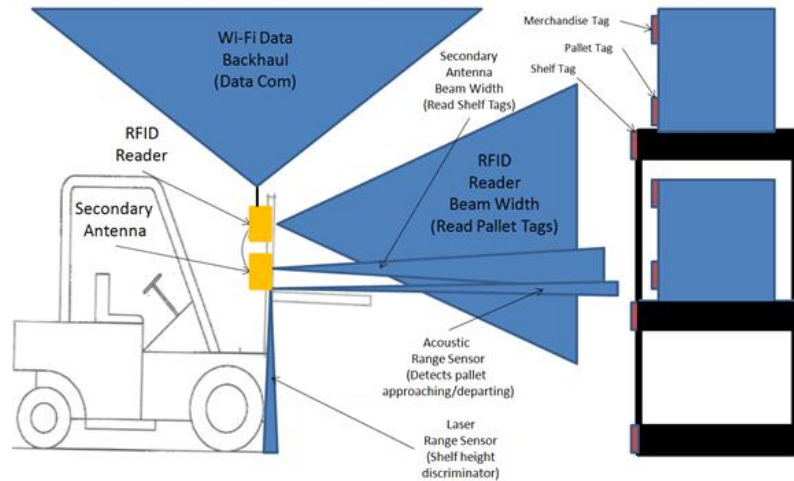


Figure 2: RFID and Sensor Component Parts

Drawing upon their background and expertise not only in RFID, but also in radio frequency and wireless communications, our staff engineered a multi-sensor design for the company that was compatible with its existing system. They found that installing additional sensors, positioned on multi-tier shelving and selected to support single-pallet identification with multiple cases, would provide a greater than 95% locational tracking accuracy.

They conducted a detailed site survey to highlight current and future problem areas and developed a design and action plan that leveraged the following sensor technologies:

Existing primary sensor that made the initial RFID read, but resulted in insufficiently accurate data transmission and shelf location, therefore requiring a:

Secondary antenna to increase data transmission accuracy and along with a new:

Acoustic range sensor to detect the approaching or departing of pallets plus a new:

Laser range sensor to detect shelf height

The retailer then coupled these additional sensors with a wi-fi network at multiple access points to process the raw tag reads, using a wi-fi backhaul system to process and transmit information to the larger system, while also tuning down transmission speeds to manage any data contamination issues in the noisy communication environment of the forklift.

The Results

During a subsequent proof-of-concept test period, the updated system performed at over a 99% locational accuracy, allowing the client to leverage their initial design with minimal cost. After the test period, they replicated the design globally in their other warehouses.

Key Takeaways

- RFID tags are just one element of the overall technology solution; more critically, it is how the RFID tags are sensed that drives the read accuracy rate
- The operating environment will determine the best installation approach, making the initial site assessment a critical first step
- Numerous vendors are available, some good, some better (when measured by cost, reliability, and warranty), and technology is improving at high speed with additional vendors entering the market or merging with competitors and others exiting it
- A sound business plan with clear goals and performance metrics provides a solid road map to justify the initial investment and identify future hardware, software, and process improvement opportunities

RFID technology is a very powerful solution to manage people and equipment in the asset-intensive energy and utility sectors. However, RFID also requires a well-conceived plan to ensure that the best products, vendors, and technologies are selected for the applicable environment and tailored for its implementation.

To continue this discussion and learn more about how fcgEnergy can work with your team, please feel free to contact us at info@fcgEnergy.com.