Rack and Container Tracking Solution

OVERVIEW

Zebra Technologies is the market leader in providing solutions for tracking and managing assets, people and events through critical points in the supply chain. The Rack Tracking module of Zebra’s Material Flow suite focuses on providing a digital voice to the physical reusable racks and containers used in manufacturing to provide real-time, actionable information about the location, status, and condition of multiple asset classes. Instant access to this information improves efficiency for production scheduling, material handling, quality and maintenance personnel throughout manufacturing. This solution has the potential to dramatically improve operational efficiency and reduce expenses by millions of dollars per asset class across the life of a single vehicle program.
KEY BENEFITS

Reduce unscheduled production changes: Understanding the location and status of racks (e.g. full, empty, partial) gives production scheduling the ability to create accurate schedules that match downstream need without compromising efficiency. Understanding actual rack and container inventories allows for less fluctuation in the daily schedule due to unexpected shortages.

Eliminate or dramatically reduce manual audits: By automatically changing status of racks and providing real-time location data for them, the system can provide instant and accurate reports of rack inventories, eliminating the need to have employees physically count empty and full racks and containers.

Reduce search time: The system can report and map all tagged assets, providing users with the physical locations of the racks they are seeking.

Ensure receipt of complete rack fleet: Racks that are fitted with RFID tags at the fabricator are read upon arrival giving an auditable receipt confirmation of which racks have been delivered to a facility.

Reduce downstream down-time: As upstream manufacturing becomes more efficient, downstream processes are affected less. If situations do arise, the ability to quickly locate full racks of product minimizes impact.

Minimize part damage: By maintaining proper revision, maintenance and condition information, employees can avoid using damaged or out-of-revision assets that could result in part damage.

Reduce the need for expedited shipping of racks: When production has real-time information about the location and status of racks, they can make better decisions about situations and avoid expensive emergency shipments.

Improve management of rack and container fleets: Tracking usage of assets provides a data-driven basis for the analysis of rack fleets that can inform current management methods and future purchasing criteria.

Value Proposition

STREAMLINE MANAGEMENT OF REUSABLE RACKS AND CONTAINERS

Today’s automotive plants are complex and dynamic environments, with thousands of reusable packaging assets that need to move rapidly across the supply chain. These assets move around inside a plant, outside a plant, to service depots and sometimes, to suppliers. They can be misplaced, misused and sometimes lost, stolen and damaged. The costs associated with keeping track of them can be very high.

As companies have employed Lean techniques in logistics, they have also looked for ways to extend this to reusable packaging. Zebra has studied this problem, we realized that tracking and managing reusable racks and containers poses several challenges that include visibility, management, movement and maintenance.

To help address these business challenges and reduce waste associated with reusable packing, Zebra developed a solution that provides best-in-class visibility using auto-identification technology in concert with software specifically designed for managing racks and containers. The solution provides up-to-date location, status and condition data for all racks and containers within the plant operations.

By monitoring these assets more closely and being alerted when they fall out of standard operation, rack-related issues can be resolved before they cause downtime.

Visibility of the assets and their parts
- Asset: Location, status, condition and revision of each rack or container.
- Parts: Condition (e.g., good, rework, scrap, etc.).

Management and analysis of the assets
- Dwell / Cycle Time: Amount of time assets spend in each process step
- Availability: Number of racks available for use by production

Directing movement of these assets within a facility and across facilities.
- Replenishment: Requesting additional empty or full assets
- Shipping: Moving assets between stamping, departments or facilities

Maintaining the assets proactively and reactively
Solution Architecture

Zebra’s Rack and Container solution is built upon several layers of time-proven, industrial-grade technology. Depending upon your environment and requirements, our solution can help you track these assets using the most appropriate auto-identification technology, whether that is active RFID, passive RFID or barcode.

Once a rack or container is tagged, event data is generated by the infrastructure and sent up into our Visibility Server Software (VSS) for filtering and aggregation. This data is then exposed to the Material Flow application suite. At this level, we keep track of asset statuses and conditions that are then used by each application (e.g., Rack, Container, Replenishment). Each application consists of several modules, some of which are core and others are optional. All the auto-identification technologies that Zebra employs comply with industry standards.

**SOLUTION MODULES**

The Rack and Container solution consists of two modules and their associated functionality, ensuring that Zebra can help address your challenges at your level of need.

<table>
<thead>
<tr>
<th>Module Name</th>
<th>Highlighted Functions</th>
<th>Base</th>
<th>Premium (Feature Roadmap)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visibility</td>
<td>Rack inventory including status and condition Change the status and condition of a rack / container Change the condition of parts in a rack / container Receipt of rack / container from fabricator Location of racks / containers</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td>Replace a tag on a rack / container Revision level history Out of revision racks / containers Schedule of maintenance and preventative maintenance Tag maintenance</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td>Float analysis Dwell time analysis Real-time rack availability (supports production scheduling)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Shipping</td>
<td>Trailer visibility Request for shipper</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
KEY FEATURES

- **Easy association of tag to rack:** Tag and rack association data can either be imported into the system with a CSV file or updated on the floor using the Windows Mobile Handheld.

- **Receipt Audit:** When tags are affixed and assigned at the rack fabricator, the system provides an audit trail of first arrival (receipt) of the racks as they come in the door. This allows for delivery confirmation as well as a history of which ones have never arrived on-site.

- **Automated rack status change:** Using business rules, location and/or reader information, the load status (Empty, Partial, Full), condition (Good, Damaged, Out of Revision), and location (Facility / Zone / Actual) of a rack are kept up to date as the racks are moved through the system.

- **Catalog maintenance and/or engineering changes:** The system keeps not only the current revision level of the rack but in the future will also support a history of revision changes and maintenance performed. This aids in the identification and location of racks needing to be updated.

- **Float and dwell time analysis:** The Float Analysis tool provides a data-driven basis for the analysis of current state vs. planned state of rack fleets to inform replacement purchasing decisions.

- **Availability Report:** Support the creation of a production schedule with a real-time view of rack or container status, condition and location.

- **Reporting:** Create and view reports and charts on asset receipt, status, usage, dwell, location, wrong location, etc.

- **Manual audit and update of rack status:** Using a mobile device, a user can verify and / or change statuses of racks.

PLANNED ENHANCEMENTS

- **Generate a shipper:** When tags are affixed and assigned at the rack fabricator, the system provides an audit trail of first arrival (receipt) of the racks as they come in the door. This allows for delivery confirmation as well as a history of which ones have never arrived on-site.

- **Schedule maintenance tasks:** Set regular schedules for recurring preventative maintenance or schedule work that needs to be completed.

YOUR PARTNER IN BOOSTING PRODUCTIVITY

Zebra Technologies’ Location Solutions organization has been helping automotive OEMs and their trading partners realize increased operational efficiency and faster revenue streams with its range of technologies since 1998. This experience has helped us develop industry specific solutions for a wide range of applications. We take care of the project planning and deployment from end-to-end, often as the turnkey solution provider. Our experience includes a multitude of deployments, ranging from single plant operations to multiple plants across the globe. Zebra Technologies Corporation (NASDAQ: ZBRA) gives customers visibility of critical assets, people and events through a broad range of printing and location technologies. Our bar code, card, kiosk and RFID printers as well as real-time location solutions have made us a recognized global leader in the automotive market.

FOR MORE INFORMATION ABOUT ZEBRA’S SOLUTIONS, VISIT WWW.ZEBRA.COM