

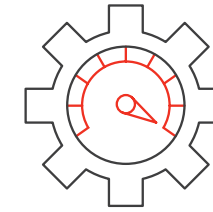
iWAREHOUSE® REAL-TIME LOCATION SYSTEM

OPTIMIZE YOUR OPERATION BY MANAGING THE MOVEMENTS
OF TRUCKS, PERSONNEL, AND ASSETS.

iWAREHOUSE®

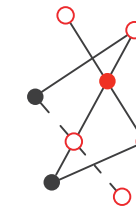
OPTIMIZE, CONNECT, AUTOMATE.

iWAREHOUSE Real-Time Location System is part of the iWAREHOUSE Intelligent Warehouse Solutions portfolio and Raymond's intralogistics capabilities – empowering companies to optimize, connect, and automate their operations with a variety of tools and services. We believe this approach is essential to improving your facility functions, as well as creating a culture of continuous improvement throughout your company. Through customized solutions that are the right fit for your business we provide you with a way to remain productive, efficient and competitive.



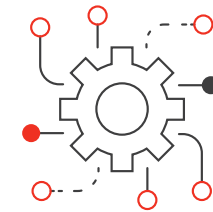
OPTIMIZE your operations, systems, assets, fleet and personnel to ensure everything in your facility provides the most value. Raymond applies the principles of lean management to help you achieve optimization, eliminate inefficiencies, and identify and solve challenges.

Solutions include Lean Management, Material Handling Equipment, Financing, Rentals, Virtual Reality Learning and Maintenance/Service.



CONNECT your facilities with innovative technologies. Smart technologies, like telematics, help operations gather and analyze data — providing actionable insights that can be implemented to deliver measurable business results.

Solutions include Telematics, Operator Assist Technologies, Labor Management Systems, Real-Time Location Systems, Object Detection and Notification Systems and Consulting







AUTOMATE your operations to make production and distribution processes efficient, easily repeatable, consistent and cost-effective. Automation will enhance processes, maximize existing labor and resources, as well as make your warehouse more scalable.

Solutions include Automated Guided Vehicles, Automated Storage and Retrieval Systems, Robotics and Consulting Services.

A TRACKING, LOCATING, AND MONITORING SYSTEM FOR ENHANCED SECURITY, EFFICIENCY, AND PRODUCTIVITY.

The iWAREHOUSE Real-Time Location System (iW.RTLS) lets you restrict and control the movements of lift trucks, and locate personnel and assets in your facility with +/- 3 feet accuracy – based on an object’s relative position to the anchors – through geofencing, zoning, and tracking capabilities.

FEATURES:

 GEOFENCING/ZONING	 FORKLIFT TRACKING	 PEDESTRIAN TRACKING	 ASSET TRACKING
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OPTIMIZATION AND COST SAVINGS OPPORTUNITIES

Customizable to your specific needs and the layout of your facility, iW.RTLS, when combined with iWAREHOUSE® Telematics, provides visibility, reinforces training, optimizes your processes, reduces operational costs, and delivers ROI by:

<p>REDUCING INVENTORY COSTS AND ENHANCING THROUGHPUT</p> <ul style="list-style-type: none"> + Optimize your facility layout and traffic flow by exposing and alleviating areas of congestion. + Quickly locate missing assets 	<p>LOWERING LABOR COSTS</p> <ul style="list-style-type: none"> + Streamline processes and avoid bottlenecks to enhance employee productivity, reduce unproductive hours, and ease labor requirements. + Understand operator movements and tasks to optimize utilization. 	<p>INCREASING CUSTOMER SATISFACTION</p> <ul style="list-style-type: none"> + Respond to changing demands more quickly with better traffic flows and material movement. + Strengthen customer relationships with faster, more accurate order fulfillment.
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+/- 3 FEET ACCURACY (X/Y)
 THROUGHOUT YOUR FACILITY

AN INDUSTRY-LEADING OEM SOLUTION

- + **Slow/controlled stop feature** for trucks leaving or entering specified zones.*
**in specified configurations*
- + **Single-source solution for mixed fleet operations**, offering compatibility with multiple truck brands. Contact your local sales representative for more information.
- + **Exceptional support services** provide complete installation and help you analyze the data and maximize your ROI.
- + **More data, more visibility** working in conjunction with iWAREHOUSE Telematics.

ACCURATE | SCALABLE | INTERCONNECTED





GEOFENCING & ZONING

By providing zones, speed control, and stop functions, iW.RTLS enhances the security efforts of your facility and reinforces operator training – keeping your trucks in the right place at all times and minimizing vehicle/pedestrian interaction.

The flexibility and scalability of the system lets you create zones tailored to your unique layout and application – such as keep-in and keep-out and slow and stop zones, and assists in proper equipment utilization.

Within certain zone configurations, the system will recognize violations and alert operators if they drive their truck into or out of a specified area and trucks can be programmed to slow down or come to a controlled stop when specific zone violations occur.

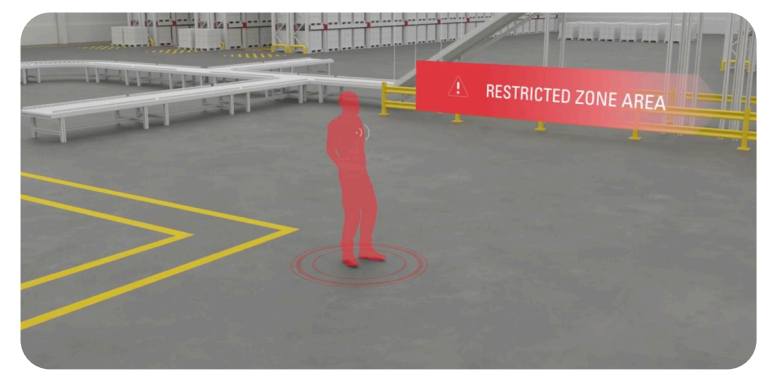


Truck-mounted iMONITOR plays an audible tone and displays a visual alert whenever a zone violation occurs.

ZONE VIOLATIONS:

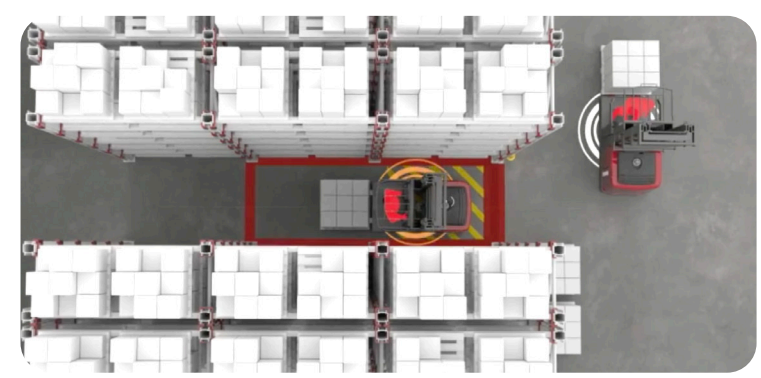
- If a violation does occur:
- + Operators receive an audible and visual alert when they enter or leave a zone.
 - + Operators remain in control and can continue to drive the truck, but truck travel speed may be speed limited until they are back in an authorized area, or have cleared the zone.

APPLICATIONS



PEDESTRIAN AREA ZONES:

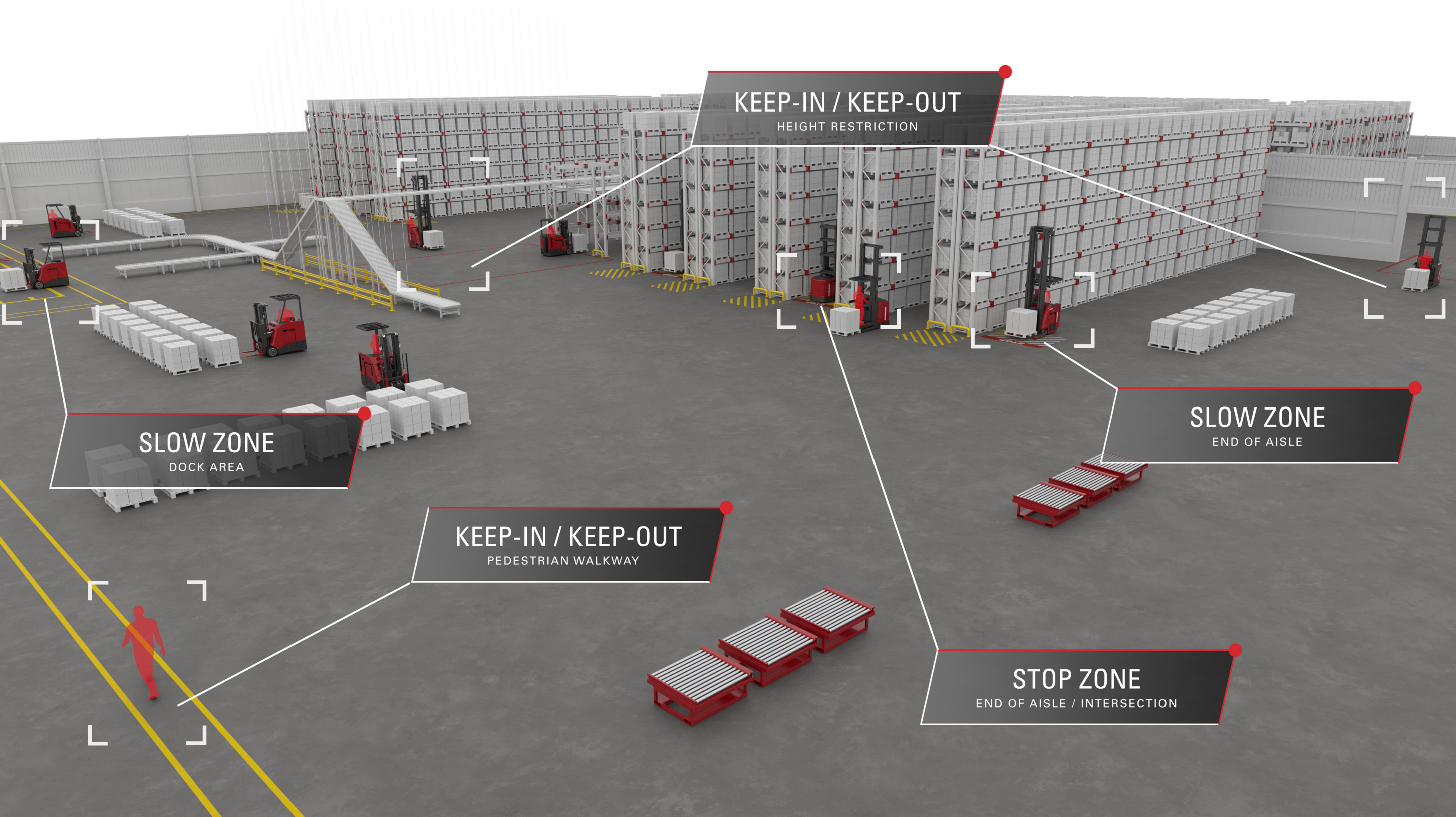
- + Create keep-in/keep-out zones:
 - alert operators if their truck enters a pedestrian zone or walkway
 - alert pedestrians if they leave a specified zone



FACILITY ENVIRONMENT ZONES:

- + Create slow/stop zones near doorways, intersections, or ends of aisles
- + Create keep-in/keep-out zones for:
 - height-restricted areas for groups of trucks based on their OACH
 - the entrance to a narrow aisle, freezer or other areas
 - using specific trucks for indoor/outdoor use





iW.RTLS ZONING OPTIONS AND USE CASES

	ZONE TYPE		
	SLOW	KEEP IN/ KEEP OUT	STOP - NO AUDIO ALERT
IDEAL USES	<ul style="list-style-type: none"> - End of aisle - Intersections - Doorways - Crosswalks 	<ul style="list-style-type: none"> - Keeping trucks within or outside of facility designated areas of use - Height-restricted areas - Freezers - Very narrow aisles - Keep pedestrians in walkway 	<ul style="list-style-type: none"> - End of aisle - Intersections - Doorways - Crosswalks
ALERT TYPE	Audible & visual	Audible & visual*	Visual
TRUCK REACTION	The truck will decelerate to 1 mph using a pre-determined rate. Travel speed will be limited until the truck is brought to a stop.	The truck will decelerate to a stop using a pre-determined rate. Travel speed will be limited to 1 mph until the zone is cleared.	The truck will decelerate to a stop using a pre-determined rate. Travel speed will be limited to 1 mph until the zone is cleared.

* For pedestrian badges, it will also trigger an alarm and message on the badge.

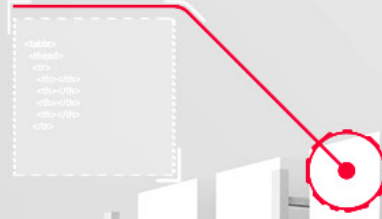
Information Zone available: Does not produce any truck reactions but collects data within the server software.

All zone types can be applied to all, individual, or groups of trackables. Examples of group creation are truck type, truck height, etc.



A SINGLE-SOURCE SOLUTION FOR MIXED-FLEET OPERATIONS

iW.RTLS can be added to all current Raymond® lift trucks, including automated and non-automated vehicles. Talk to us about compatibility and functionality with legacy models and other forklift brands.



DEEPER INSIGHTS. HIGHER PERFORMANCE.

iW.RTLS positioning data can be integrated with most other technology systems (WCS, WMS, and LMS) for greater operational visibility and business efficiency.

FORKLIFT, PEDESTRIAN AND ASSET TRACKING

iW.RTLS allows you to track, locate, and monitor your equipment by showing where your trucks are at all times, where they have been, and how they have been utilized. It also helps identify misplaced assets by knowing which employee or truck last handled them.

BENEFITS OF FORKLIFT TRACKING

Identify areas of congestion, improve travel paths, and adjust your facility layout for:

- + Faster throughput
- + Better use of equipment and space
- + Minimized unproductive hours
- + Impact management

BENEFITS OF ASSET TRACKING

Reduce lost inventory and downtime spent searching for assets for:

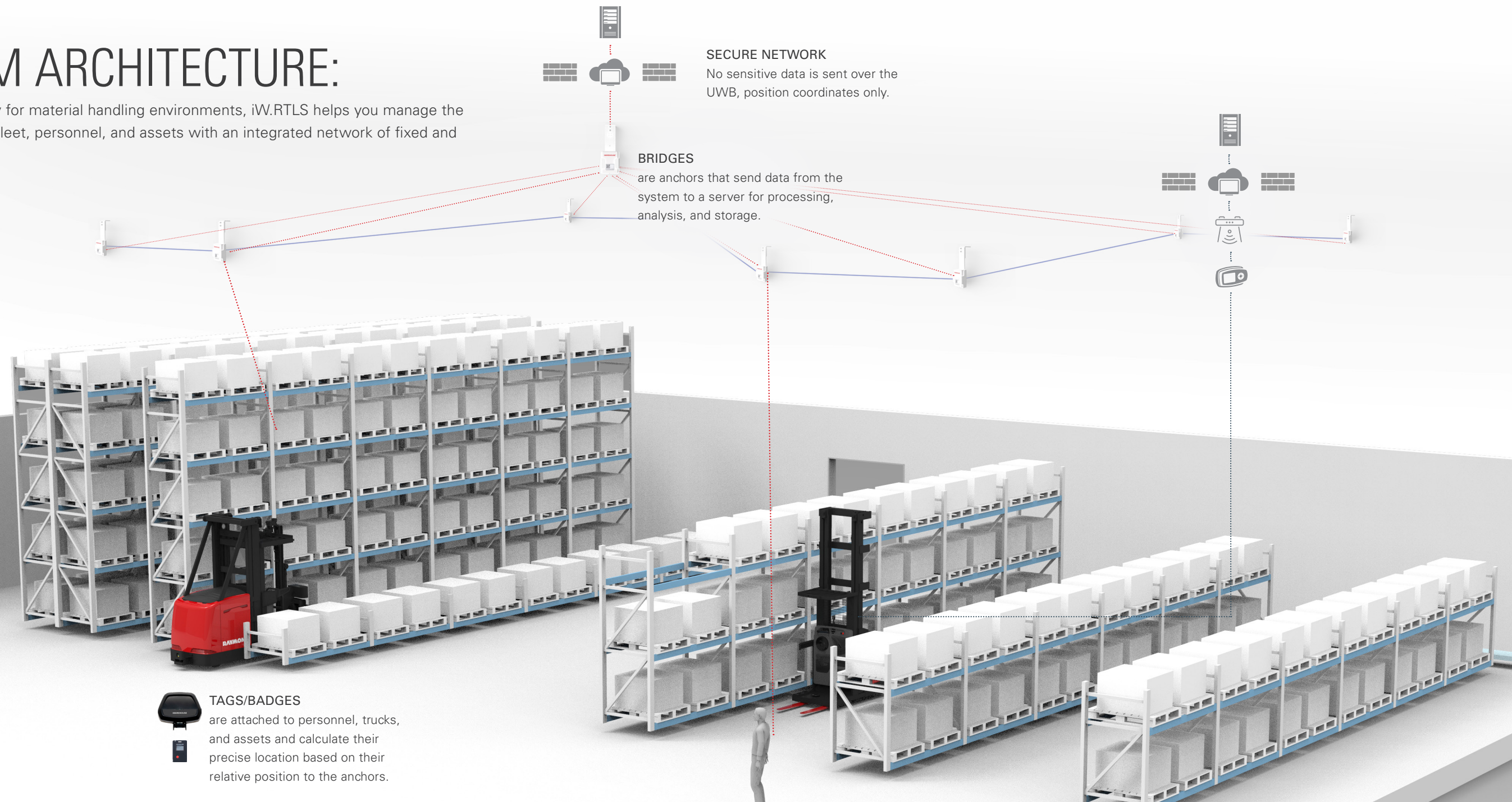
- + Lower lost inventory costs
- + Reduced need for safety stock
- + Faster and more accurate deliveries

SYSTEM ARCHITECTURE:

Designed specifically for material handling environments, iW.RTLS helps you manage the movements of your fleet, personnel, and assets with an integrated network of fixed and mobile components.



ANCHORS
are fixed in various locations around the facility to establish the reference framework and allow the system to track tags.



SECURE NETWORK
No sensitive data is sent over the UWB, position coordinates only.

BRIDGES
are anchors that send data from the system to a server for processing, analysis, and storage.

TAGS/BADGES
are attached to personnel, trucks, and assets and calculate their precise location based on their relative position to the anchors.

REQUIREMENTS

iW.RTLS is designed to address industry pressures within multiple areas of a site. A Site Survey is required. The Site Survey assists in creating an accurate Site Plan prior to an on-site audit, ensuring the iW.RTLS team of experts address your needs, every time.

Following the completion of a Site Survey, an on-site validation would need to be performed by a trained professional from the iW.RTLS Application Engineering team.

iWAREHOUSE® Telematics and Server Version 2.1.10 or higher.

APPLICATION CONSIDERATIONS

RTLS System Temperature Range	-4F to 158F	Operator Display	4.3 in. Color Touch Screen or 7 in. Color Touch Screen (iWAREHOUSE Evolution units)
Truck Tag Temperature Range	-40F to 131F	Truck Tag IP Rating	IP66
RTLS System Operating Humidity*	0-100%	Power Draw	Truck tag: 12-60V, 25W
Truck Tag Operating Humidity* <small>*non condensing</small>	10-100%		Charging the RTLS backup battery: 350-450 mA (rare)
Truck Tag Operating Shock	40g		Battery charged: 100-200 mA (vast majority of the time)
Truck Tag Ratings	UL Label Type E and EE		Anchor: 6-60V, 1.08W
Power Source	The truck is to provide power to the truck tag	Compliance	ANSI, FCC, IC

Installations can vary in size.

Understand the capabilities and features of your lift truck before operating it. It is imperative that lift truck operators and pedestrians follow their training, be vigilant and aware of their surroundings, make eye contact with pedestrians and other lift truck operators and always look in the direction of travel.

PERFORMANCE SPECIFICATIONS

iW.RTLS is a patented technology that uses ultra-wideband (UWB) for determining positions of tags on lift trucks and pedestrian badges and is accurate to within +/- 3 feet, based on the tag's relative position to the anchors in fixed locations around the facility.

iW.RTLS IS AVAILABLE AS PART OF THE iWAREHOUSE® INTELLIGENT WAREHOUSE SOLUTIONS SUITE, THE INDUSTRY'S MOST COMPREHENSIVE AND SCALABLE TELEMATICS SOLUTION.

TRACKING TECHNOLOGY AND SYSTEM SOFTWARE

Engineered around three innovative, integrated technologies, iW.RTLS offers the most precise and reliable tracking solution on the market.



Ultra-wideband (UWB) Technology

enables higher precision tracking and signal reliability than other technology options such as Wi-Fi, Bluetooth or cellular networks.



Server Software

provides an intuitive control center, allowing you to define zones, view reports, and manage your overall system.



iWAREHOUSE GATEWAY™

capture and display truck data in customizable dashboards for exceptional visibility into your fleet and operators.

ULTRA-WIDEBAND (UWB) TECHNOLOGY

For optimum precision, reliability, and affordability. iW.RTLS uses ultra-wideband technology to communicate between components (anchors, tags, and badges). Accurate to within three feet (X/Y), the system offers exceptional range and scalability, ideal for warehousing, distribution, and other material handling operations.

SERVER SOFTWARE

The server gives you a single, intuitive interface to manage, configure and control your iW.RTLS system, trucks, personal and assets. Through customizable heat maps, spaghetti diagrams, and other reporting capabilities, the software offers a real-time visualization of your facility and allows you to identify inefficiencies, correct bottlenecks, and enhance productivity.

iWAREHOUSE TELEMATICS

The most comprehensive and scalable telematics platform in the industry. iWAREHOUSE Telematics allows you to record and analyze any truck-related iW.RTLS actions and issues. Data can be reviewed and analyzed on any web-enabled device—anywhere, anytime—using the customizable dashboards in iWAREHOUSE GATEWAY.

MORE DATA. MORE INSIGHT. MORE DECISION-MAKING POWER.

Offering benefits above and beyond identifying which trucks are where in your operation, when working in conjunction with iWAREHOUSE Telematics, iW.RTLS leverages a high degree of position accuracy, for the ultimate visibility.

This technology equips facility managers with increased visibility to:

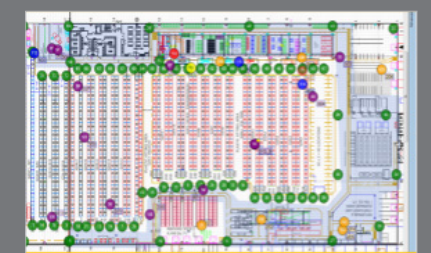
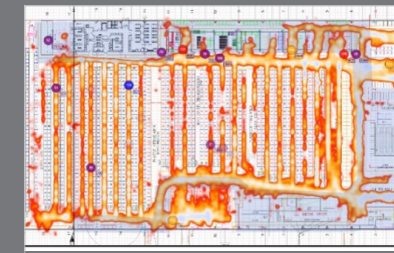
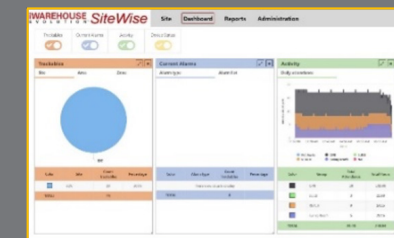
- + high-traffic areas of congestion for enhanced route optimization
- + summarized zone violations to reinforce operator training
- + impact management, locations of locked out equipment and location of frequent idea time
- + operator performance metrics

Scalable Fleet Management:

Access Control, Electronic Checklists, Impact Management, Utilization and Reporting

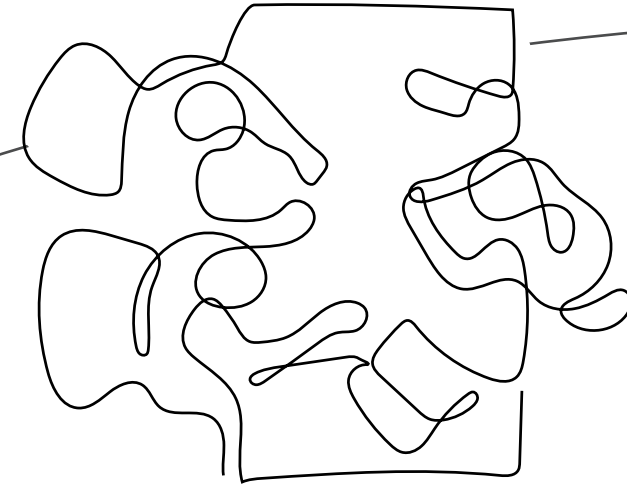
Visual Truck Location Reports:

Heat Map, Spaghetti Diagram, Route Playback and Active Time



A SYSTEM WITH EXPERT SUPPORT SERVICES

The iWAREHOUSE Real-Time Location System purchase isn't another piece of bolt on hardware. It's a tailored solution to reflect your unique application while addressing your operational challenges, and our team of experts are here to support you every step of the way:

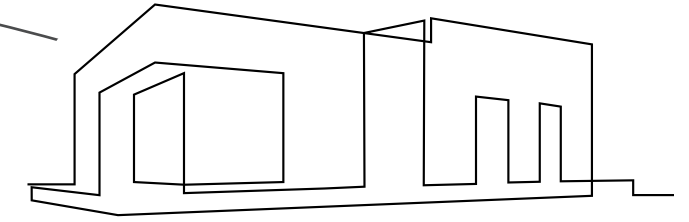


...FROM INSTALL:

iW.RTLS APPLICATION ENGINEERS

work with your organization to understand your expectations and problems to solve. Our Application Engineers determine the right solution by developing customized layouts and tailored deployment plans to ensure a proper and successful implementation.

- + Pre-visit information gathering
- + Define equipment and support requirements
- + Determine implementation strategy
- + Define coverage areas/types, identify proposed zone locations
- + On-site visit and validation



...TO POST IMPLEMENTATION SUPPORT:

iWAREHOUSE PROFESSIONAL SERVICES

can help you get the most value out of your iW.RTLS investment by evaluating the data and visibility the system provides, and making recommendations that drive towards increased accountability and operational efficiencies.

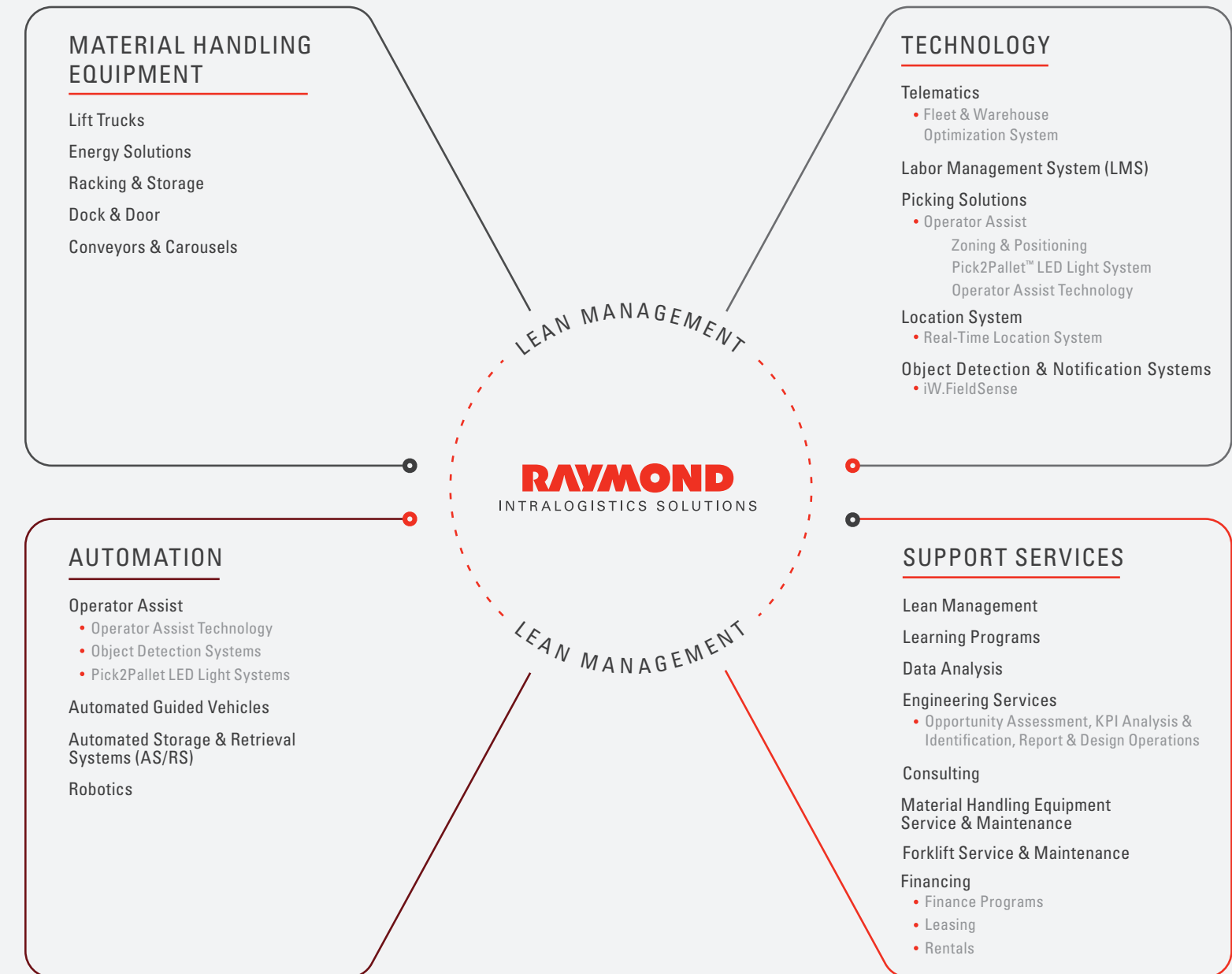
- + Data analysis with follow up action items to identify process improvement
- + Help you visualize trends and opportunities, and recommend solutions to optimize your operations and processes
- + Develop key metrics/KPIs to measure ROI and simplify planning/budgeting
- + Provide a broader and deeper view into people, plant, process and possibilities



YOUR COMPLETE INTRALOGISTICS SOLUTIONS PARTNER

Raymond is your single source for complete intralogistics solutions – offering customers the technology and know-how needed to provide warehouse operations, distribution centers and manufacturing facilities with a competitive edge. Our innovative solutions can help you optimize, connect, and automate your operation to cut lead times, reduce waste, minimize downtime, and improve quality.

By combining industry expertise and lean management principles with advanced material handling equipment, intelligent warehouse technology, labor management tools, automation, and support services, we can provide tailored solutions that optimize your people, processes, and facilities, and drive your business forward.





For 100 years, The Raymond Corporation has helped companies be the best at what they do through an intense focus on innovation, quality and service. That focus has never wavered, only grown. Today, Raymond is global and local. Forward-thinking and experienced. Focused on specific offerings and total solutions. As part of the Toyota Industries Corporation (TICO) family, Raymond offers the breadth and depth of systems, technologies and experience to be your global material handling resource. And as a full-service partner, we offer a total-solutions approach that empowers you with smarter, more efficient and more effective processes and technologies.

If you're looking for a partner with the tools and experience to help you run better and manage smarter, let's talk.

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