ARAPL RaaS
Robotic Warehouse Solutions

ARAPL RaaS

PRODUCT MANUAL

www.araplraas.com

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COMPANY OVERVIEW

We're a tech firm specializing in Warehouse Automation and Robotics. Our hardware-agnostic approach blends Intelligent Software (WCS, ECS, ROS, QR) with autonomous reach trucks, pallet jacks, forklifts, and AGVS, offering comprehensive warehousing solutions.

Our Al and ML-powered i-ware, boasting 8 patents and 3 software suites, seamlessly integrates with diverse robots, including our MobiWare line, ensuring swift integration and a rapid 'go live' experience.

PROBLEMS WE SOLVE

01 Autonomous Robots

a. Driverless reach truck with a vertical reach of 29 ft

b. Driverless Counterbalanced forklift for Truck Loading and unloading

c. Operater-less Pallet jack for ground to ground movement of Pallets

02 Reliability

No breaks / No absentees

03 Ease of Adoption

a. Easy of integration - minimal IT bandwidth required, can run with manual input in HMI / web UI

b. No change in current infrastructure / process

c. Try it - Like it - Buy it

04 Impressive Vertical Reach

It can lift materials and pallets to a staggering height of up to 9.5 meters, maximizing your vertical storage space

05 Cost Savings

Increase productivity while reducing cost and minimize the risk of human errors, saving you the money in the long run.

INNOVATION

Powered by :

A Proprietary AI and Ml based Intelligent system

iWare core modules

Navigation
For precise and efficient route planning and control, allowing robots to autonomously navigate through complex environments while avoiding obstacles and optimizing their paths.

WES
Warehouse Execution Systems (WES) serve as the operational orchestrators, optimizing warehouse processes for efficiency and accuracy. It integrate with other systems to create a cohesive ecosystem.

Fleet Manager
A centralized control system that supervises and coordinates multiple robots within a fleet, ensuring seamless task allocation, monitoring, and optimization of their operations in a warehouse or industrial setting

WAS
Warehouse Automation Systems (WAS) encompass technologies like AS/RS, conveyors, and robotics to automate material handling. Together, WES and WAS create a seamless and automated environment, meeting the demands of modern supply chain dynamics.

RCS (Robot Control System)
RCS is a specialized software system designed to control and coordinate the actions and behaviors of robots. It provides the necessary algorithms, logic, and communication protocols to facilitate robot movements

WCS Extend
The Warehouse Control System (WCS) holds a pivotal role in overseeing and coordinating automated systems, including robots, conveyors, and AGVs, within the warehouse. Its primary objective is to ensure the efficient flow of materials and optimal utilization of these systems.

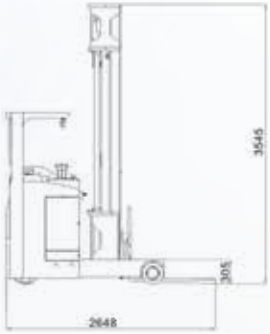
ATLAS – AR29

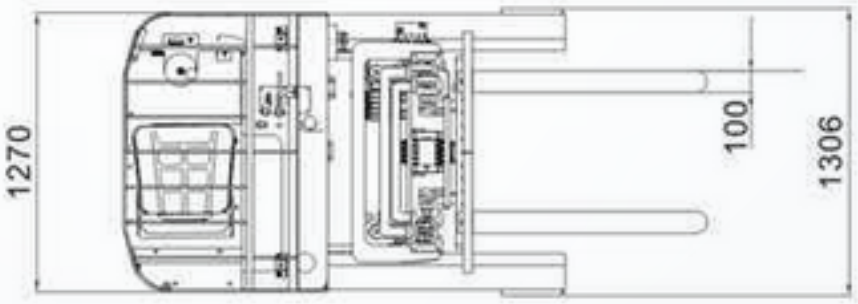
Autonomous Driverless Reach Truck

Are you ready to revolutionize your warehouse operations and take efficiency to the next level by effortlessly **handling pallets at a 29 Ft-height?** Look no further than the Atlas AR29 Autonomous Driverless Reach Truck AMR!"

Product Parameters

Rated Capacity	: 3300 lb/ 1500 kg
Lifting height	: 29.5 Ft / 9000 mm & 32 Ft / 10000 mm
Aisle Width	: 10.8 Ft / 3300 mm (For 40”x48” Pallet)
Dimensions	: (8.6’X 4.2’ X 11.6’ ft)/ (2648 X 1306 X 3545mm)
Max Traveling Speed	: (2.23/2.68 mph)/ (1/1.2 m/s) _ Loaded / unloaded
Stacking Aisle	: 10.8 FT / 3300 mm (for 48”X48” Pallets)
Navigation method	: Laser navigation
Positional Accuracy	: (+/- 0.4”) / (+/- 10 mm)
Fork ground clearance	: (1.7”)/ (45 mm)
Battery type	: Lithium Phosphate
Max Gradeability	: 5% / 8% (loaded/ unloaded)
Body Weight	: 8179 lb / 37100 kg
Battery Capacity	: 58V/ 560AH
Charging Mode	: Manual/ Automatic
Charging/ Working Time	: 1.5/ 8 hr





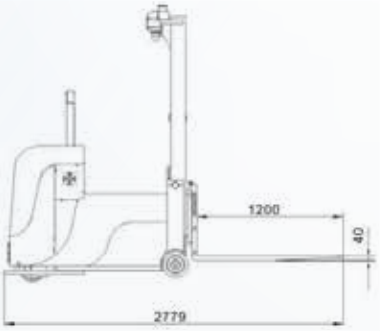
ATLAS – AC1500

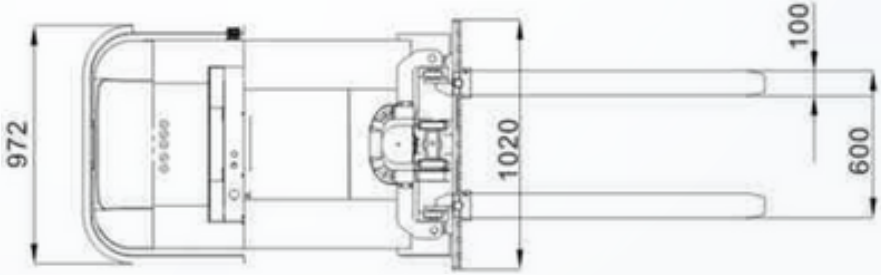
Autonomous Counterbalanced Forklift

Experience a new era of warehouse and logistics automation with the Atlas AC1500 Autonomous Counterbalanced Forklift AMR. This cutting-edge technology is designed to **load and unload materials from trucks,** boosting your operational efficiency to unprecedented levels.

Product Parameters

Rated Capacity	: 3300 lb/ 1500 kg
Lifting height	: 14.7 Ft / 4500 mm & 8.2 Ft / 2500 mm
Aisle Width	: 11.3 Ft/ 3450 mm (For 40”x48” Pallet)
Dimensions	: (10’X 4’ X 6.4’ ft)/ (3048 X 1219 X 1951 mm)
Max Traveling Speed	: (3.4 mph / 1.5 mph) (Loaded / Unloaded)
Stacking Aisle	: 10.8 FT/ 3350 mm (for 48”X48” Pallets)
Navigation method	: Laser navigation
Positional Accuracy	: (+/- 0.4”)/ (+/- 10 mm)
Fork ground clearance	: (1.7”)/ (45 mm)
Battery type	: Lithium Phosphate
Max Gradeability	: 5% / 8% (loaded/ unloaded)
Body Weight	: 7000 lb/ 3175 kg
Battery Capacity	: 24V / 200AH
Charging Mode	: Manual / Automatic
Charging/ Working Time	: 1.5/ 6 hr





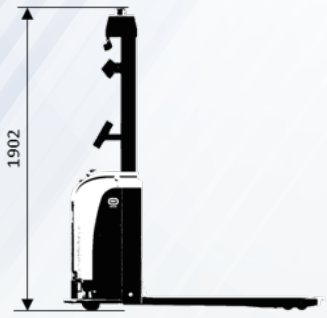
MAIA-M1500

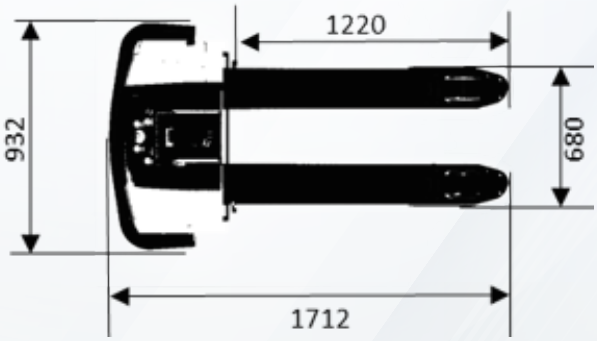
Autonomous Pallet Truck

Welcome to the future of warehouse automation! Introducing the Maia-M1500, Autonomous Pallet Truck AMR, meticulously designed for **seamless ground-to-ground transport of open & closed base pallets.**

Product Parameters

Rated Capacity	: 3300 lb / 1500 kg & 2200 lb / 1000 kg
Lifting height	: 4.7”/ 120 mm
Aisle Width	: 10.1 Ft/ 3100 mm
Dimensions	: (5.6’X 3’X 6.2’ Ft) / (1712 X 932 X 1902mm)
Max Traveling Speed	: (1.56/ 2.23mph)/ (0.7/1.0 m/s) _ Loaded/ unloaded
Stacking Aisle	: 6.3 FT / 2100 mm (for 48”X48” Pallets)
Navigation method	: Laser navigation
Positional Accuracy	: (+/- 0.4”)/ (+/- 10 mm)
Fork ground clearance	: (3.8”)/ (98 mm)
Battery type	: Lithium Phosphate
Max Gradeability	: 5% / 8% (loaded/ unloaded)
Body Weight	: 576 lb/ 260kg
Battery Capacity	: 48V / 46AH
Charging Mode	: Manual / Automatic
Charging/ Working Time	: 1/ 8 hr





HERCULES

Autonomous Pallet / Rack Picking Robot

Hercules is a SLAM navigation based automated guided vehicle (AGV) robot equipped with a range of sensors and payload options. It can achieve a maximum speed of 2m/sec and carry a payload of 500-2000Kg. It is also able to manage the fleet movement of up to 100 robots.

Product Parameters

H500 : Payload upto	: 1102 Lbs / 500 kg
H2000 : Payload upto	: 4409 Lbs / 2000 kg
Max Speed	: 3.4 Mph
Max Playload	: 2646 Lbs / 1200 kg
Rated operating time in one charge	: 8 Hr
Dimension in Inch	: 55.11 X 39.3 X 23.6 (L x W x H)
Navigation method	: SLAM Navigation
Positional Accuracy	: ±0.3
Charging Mode	: Battery swapping / Auto charging

Zeus

Bin Carrying Robot

Zeus is a Robot equipped with QR Code Based Automated Guided Vehicles. It can be used for single as well as double-depth storage systems. It can achieve a max speed of 1.5m/sec, and carry a payload of 200 to 350Kg. It can have four shelves (2m) or nine shelves (4.2m).

Product Parameters

Number of Bin Storage	: ≤ 9
Maximum Picking Height	: 181.1inch
Dimensions L*W*H	: 70.8 X 39.3 X 196.8 inch
Bin Type	: Plastic / Carton
Battery Type	: Lithium phosphate
Load Carrying Capacity	: 495 Lbs / 225 kg
Tote/bin Dimension	: (11.81 - 24.0) x (11.81 - 16.02) x (7.87 - 13.7)
Lifting Speed (Mph)	: 1 Mph
Traveling Speed Max (Mph)	: 3.4 Mph
Navigation Method	: QR Code
Positional Accuracy (mm)	: ± 0.3
Charging Mode	: Battery Swapping / Auto charging
Rated Operating Time In 1 CHRG	: 8 Hr

SAFETY FEATURES

01

LiDAR Sensors – Scanning

Equipped with sensors, cameras, and LiDAR systems to detect obstacles and people in their path. They can slow down or stop to prevent collisions

02

E Stop Buttons

Equipped with emergency stop buttons and systems that can halt the vehicle's motion in case of a safety breach or emergency

03

3D Camera

Designed to detect obstacles in their path and take evasive action to avoid collisions, such as stopping, changing direction, or backing up

04

LiDAR Sensors – SLAM

Programmed to operate within specific zones, and they can be configured to slow down or stop when entering restricted areas or high-traffic zones

05

Lithium phosphate batteries

Typically exhibit enhanced safety features such as lower risk of thermal runaway and reduced susceptibility to overcharging compared to other lithium-ion battery chemistries

AFTER SALES & SERVICE

Assigned Service Dealer
Every client will be assigned to the nearest authorized service dealer, ensuring a local point of contact for any service needs.

Comprehensive Training
We offer comprehensive training programs to help clients and their in-house teams better understand the maintenance and operation of our autonomous forklifts.

Regular Maintenance Programs
Clients can opt for regular maintenance programs, tailored to their specific needs, to proactively address potential issues and optimize forklift performance.

Stocked Spare Parts and Batteries
Each service location will maintain an inventory of readily available spare parts and batteries, reducing downtime and ensuring quick replacements when needed.

Service Reports and Documentation
Clients will receive detailed service reports and documentation after every service visit, providing transparency and ensuring that all service activities are well-documented.

Remote Diagnostics
Our forklifts are equipped with remote diagnostic capabilities, allowing our service engineers to identify and resolve certain issues remotely, further reducing downtime.

Software Updates
Regular software updates are available to enhance forklift performance and ensure the latest features and improvements.

Online Knowledge Base
Access to an online knowledge base with resources, guides, and FAQs to assist with common issues and questions.

Dedicated Automation Engineer
Our authorized service dealers have dedicated automation engineers who specialize in our autonomous forklift technology. They are trained to provide rapid and accurate service, maintenance, and troubleshooting.

Choice of Service Vendor
Clients have the flexibility to choose their preferred service vendor for any service resolution, with a commitment to a 6-hour turnaround time (TAT) to minimize disruptions to operations.

Feedback Mechanism
Clients are encouraged to provide feedback on the service experience, which is valuable for continuous improvement and enhancing customer satisfaction.

HOW IS IT GOING TO WORK?

Process Steps

1

Initial Configuration

When the AMR arrives at the warehouse, the first step is to establish its initial configuration. This typically involves designating a starting position, which often corresponds to a charging station.

2

Map Generation

- To create a comprehensive understanding of the warehouse layout, an engineer will manually guide the AMR throughout the facility for the initial mapping process.
- The robot's sensors, such as LIDAR or cameras, collect data to generate a detailed map that includes crucial information like paths, docking stations, potential obstacles, and hazard zones.

3

Zone Definition

With the generated map in place, specific operational zones can be defined. This may involve marking areas as "no-fly zones" to prevent the AMR from entering certain locations, as well as designating picking and dropping points for material handling.

4

Mission Assignment

- Once the operational areas are clearly defined, tasks or missions can be assigned to the AMR. These missions can be initiated through either the Human-Machine Interface (HMI) or a computer (PC).
- Depending on the specific requirements, missions may involve single or multiple pick-up and drop-off locations.

5

WMS Integration

- In situations where tasks involve Zone-to-Zone material transfers, it's essential to ensure integration with the existing Warehouse Management System (WMS).
- The AMR system must communicate seamlessly with the WMS to receive and execute tasks efficiently.

6

Scalability and Reuse

An important advantage of this installation process is its scalability and ease of expansion. When adding another AMR to the fleet, there is no need to regenerate the warehouse map. The existing map can be employed, simplifying the integration process.

FREQUENTLY ASKED QUESTIONS

01 What does the truck do?

It is designed for material handling, especially in high-rack storage environments (upto 29FT) These vehicles can autonomously lift, move, and stack pallets, and they are equipped with safety features and advanced navigation systems to operate safely in shared spaces.

02 What does client need to do to make it work?

No need of any existing process change or infrastructure change, if any infrastructure changes will be required then it will be mention in the purchase agreement

03 Basically, how will the Forklift know that there's pallets to put away?

- In a designated staging area, ground numbering (location ID) will be assigned for defined pallet locations.
- After palletization, the operator will input a floor number using their handheld device, mapping the location to a specific pallet or material ID.
- Once pallet mapping is completed, the location data will be automatically transmitted to the Warehouse Management System (WMS).
- The system is then prepared to initiate the mission, either as directed by the WMS or manually through the Human-Machine Interface (HMI).

04 If we choose not to utilize our WMS for the demo, can the AMR still successfully transport a pallet from receiving area and place it in a rack?

Certainly, the use of WMS is not required for the demonstration. Missions can be assigned using Excel input during the demo.

FREQUENTLY ASKED QUESTIONS

05 What is the recurring cost?

- 1st year covers under comprehensive warranty
- 2nd year onwards technology fees will be 10% of product cost
- All automation spares i.e 2D LiDAR sensors, 3D cameras & master controller will be under technology fees.
- SMC starts from 2nd year for $5000 per year

06 Does it need QR codes on the floor?

QR codes on the floor are not required as the system operates on SLAM navigation.

07 What are the benefits of using autonomous forklifts?

Enhanced Productivity : Autonomous reach trucks decrease the reliance on human operators. Organizations can reallocate labour to more value-added tasks or use the cost savings to invest in other areas of the business.

Precision and Accuracy : Autonomous reach trucks provide precise and consistent material handling, reducing the likelihood of product damage.

Real-Time Inventory Management : AGVs can help improve inventory accuracy by providing real-time tracking and updating of inventory levels. This prevents stockouts and overstock situations and enhances inventory control.

Integration with Systems : Autonomous reach trucks can integrate with warehouse management systems (WMS) and enterprise resource planning (ERP) software, streamlining material handling processes and order management.

Optimal Space Utilization : They are designed for vertical reach, making them efficient in maximizing the use of vertical storage space in warehouses. This can lead to a better utilization of available space.

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