Autonomous Mobile Robots (AMRs)

Intelligent vehicles that navigate the warehouse independently to automate and streamline the internal transport of goods

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Autonomous mobile robots (AMRs) are vehicles designed to move loads between two points independently. They navigate the warehouse freely based on dynamic routes generated by intelligent software. This software optimises the AMRs' movements, assigning the ideal route for each task. Equipped with state-of-the-art sensors and scanners, AMRs can identify and avoid obstacles. They operate safely in collaborative environments alongside other machines as well as people.

AMRs are highly versatile devices that integrate seamlessly into all types of warehouses and require no modifications to existing infrastructure.

Implementing AMRs expedites and streamlines internal flows of goods in multiple intralogistics operations, boosting warehouse productivity and efficiency.

Advantages

AMRs are the intelligent solution designed to optimise multiple intralogistics operations.

Autonomous
AMRs move freely, orienting themselves by means of virtual maps. They are not confined to predefined paths or closed-loop, delineated navigation circuits.

Intelligent
They follow routes generated by navigation software, which calculates the most efficient path. These robots detect and avoid all kinds of obstacles — fixed or moving — readjusting their route in real time.

Flexible
AMRs adapt perfectly to the warehouse layout, making for a fast, easy implementation.

Scalable
The fleet can be expanded simply by adding new robots to accommodate operational growth or seasonal demand peaks.

Efficient
Fleet management software oversees robot traffic and anticipates routes to assign each job to the ideal AMR.

Accurate
These machines execute their tasks with the highest precision, significantly reducing errors and boosting warehouse performance.

Safe
They operate safely in highly complex scenarios involving people, goods, storage systems and other machines. A series of highly accurate collision avoidance sensors and scanners make all AMR movements stable and reliable.

Applications

AMRs streamline material flows in warehouses, distribution centres and production facilities. They automate various logistics processes for companies across numerous industries.

Person-to-goods picking

AMR robots simplify order picking in warehouses that employ the person-to-goods method, acting collaboratively with operators. AMRs guide them through their tasks while optimising routes and reducing physical strain (e.g. eliminating the need for picking carts).

Goods-to-person picking

AMRs adapt to goods-to-person order picking strategies by automating the transport of products from storage areas to pick stations. They cut down significantly on operator travel in the warehouse and raise productivity.

Pallet flows

AMRs are used to transport palletised goods internally. These machines replace or complement traditional solutions such as forklifts, conveyors and electric monorail systems. They enhance flexibility and safety in a facility by limiting the presence of manually operated handling equipment.

Order dispatch

Autonomous mobile robots speed up internal movements of filled orders by connecting pick, consolidation and packaging stations with the shipping area.

Production supply

Mecalux's versatile AMR series features models for moving both light and heavy loads. These robots are an ideal solution for automating the supply of parts, components and raw materials to workstations and assembly stations on production lines across various industries.

AMR models

These robots adapt to multiple intralogistics transport requirements. Thanks to their versatility, the AMR line covers a broad spectrum of loads, ranging loads of up to 1,500 kg.

AMR 100 Box

• Ideal for transporting boxes, totes, bins, trays and packages. This AMR is equipped with a completely configurable upper conveyor for load transfers.

AMR 100 Multi-Box

• Integrates perfectly with collaborative picking scenarios, supplying pick stations and accompanying operators (follow-me mode).

Characteristics		
Maximum speed	1.6 m/s	1.6 m/s
Robot weight	130 kg	110 kg
Max. load weight	100 kg	100 kg
Battery	Li-Ion NMC 51.8 V / 29 Ah (1.5 kWh)	Li-Ion NMC 51.8 V / 29 Ah (1.5 kWh)
Range	• 8 hours (with payload) • 10 hours (without payload)	• 8 hours (with payload) • 10 hours (without payload)
Charge time	< 60 minutes	< 60 minutes
Runtime ratio	10:1	10:1
Turn radius	0 mm	0 mm
Dimensions	Width: 640 mm / Length: 780 mm Height: 793 mm*	Width: 647 mm / Length: 780 mm Height: 1,663 mm
Movements	• Autonomous navigation • Load transfer	• Autonomous navigation

*Variable: 593–993 mm

AMR 600 Rack

• Specifically developed to transport racking units for shelf-to-person picking.

1.2 m/s
250 kg
600 kg
Li-Ion NMC 51.8 V / 29 Ah (1.5 kWh)
• 7 hours (with payload) • 9 hours (without payload)
< 60 minutes
-
0 mm
Width: 840 mm / Length: 1,160 mm Height: 375 mm
• Autonomous navigation • Load lifting and rotation

AMR 1500 Pallet Conveyor

• Designed for safe, controlled in-house pallet movements. This AMR is equipped with an upper conveyor for transferring loads.

1.5 m/s
500 kg
1,500 kg
Li-Ion LFP 48 V / 60 Ah (2.88 kWh)
• 9 hours (with payload) • 12.5 hours (without payload)
< 60 minutes
12:1
0 mm
Width: 1,235-1,435 mm Length: 1,520 mm / Height: 565 mm**
• Autonomous navigation • Load transfer

**Variable: 615–995 mm

AMR 1500 Pallet Lifter

• Transfers pallets using a lifting platform integrated into the robot's upper surface.

1.5 m/s
500 kg
1,500 kg
Li-Ion LFP 48 V / 60 Ah (2.88 kWh)
• 9 hours (with payload) • 12.5 hours (without payload)
< 60 minutes
12:1
0 mm
Width: 1,100 mm / Length: 1,520 mm Height: 621 mm
• Autonomous navigation • Load lifting

Components

Thanks to a series of high-tech tools, Mecalux's AMRs adapt easily and quickly to all types of environments. Moreover, they work safely and efficiently in scenarios of varying operational complexity.

Lights
The AMRs are outfitted with clearly visible multicoloured lights. They indicate the robot's status, operating mode and certain manoeuvres, such as changes in direction.

Wheels
Each AMR robot is equipped with two drive wheels in the centre and four freewheels at the corners. This configuration ensures stable movements and smooth changes in direction.

LiDAR scanner
The laser scanner surveys the surroundings with a high degree of accuracy to provide an exact map of the AMR's operational environment. It allows the vehicle to move independently and safely by determining its positioning and detecting obstacles that could obstruct its path.

Depth camera
This detection device identifies objects along the AMR's path. It complements the LiDAR scanner to cover areas outside its scanning plane, reinforcing the robot's collision avoidance system by extending the obstacle detection range.

Battery
The AMRs use high-performance lithium batteries with extended autonomy, supporting uninterrupted operation to maximise robot availability.

Charging station
Located in a separate area of the facility, the AMRs automatically connect to this station when positioned on top. The vehicles feature a high-efficiency wireless induction charging system.

Top module with conveyor
The AMR 100 Box and AMR 1500 Conveyor integrate with conveyor systems to transfer loads from the vehicle to other storage solutions. Several conveyor models are available to suit different needs.

Emergency stop buttons
These safety stop buttons are positioned in clearly visible, easy-access locations for use in emergencies. When pressed, the AMR comes to a complete stop.

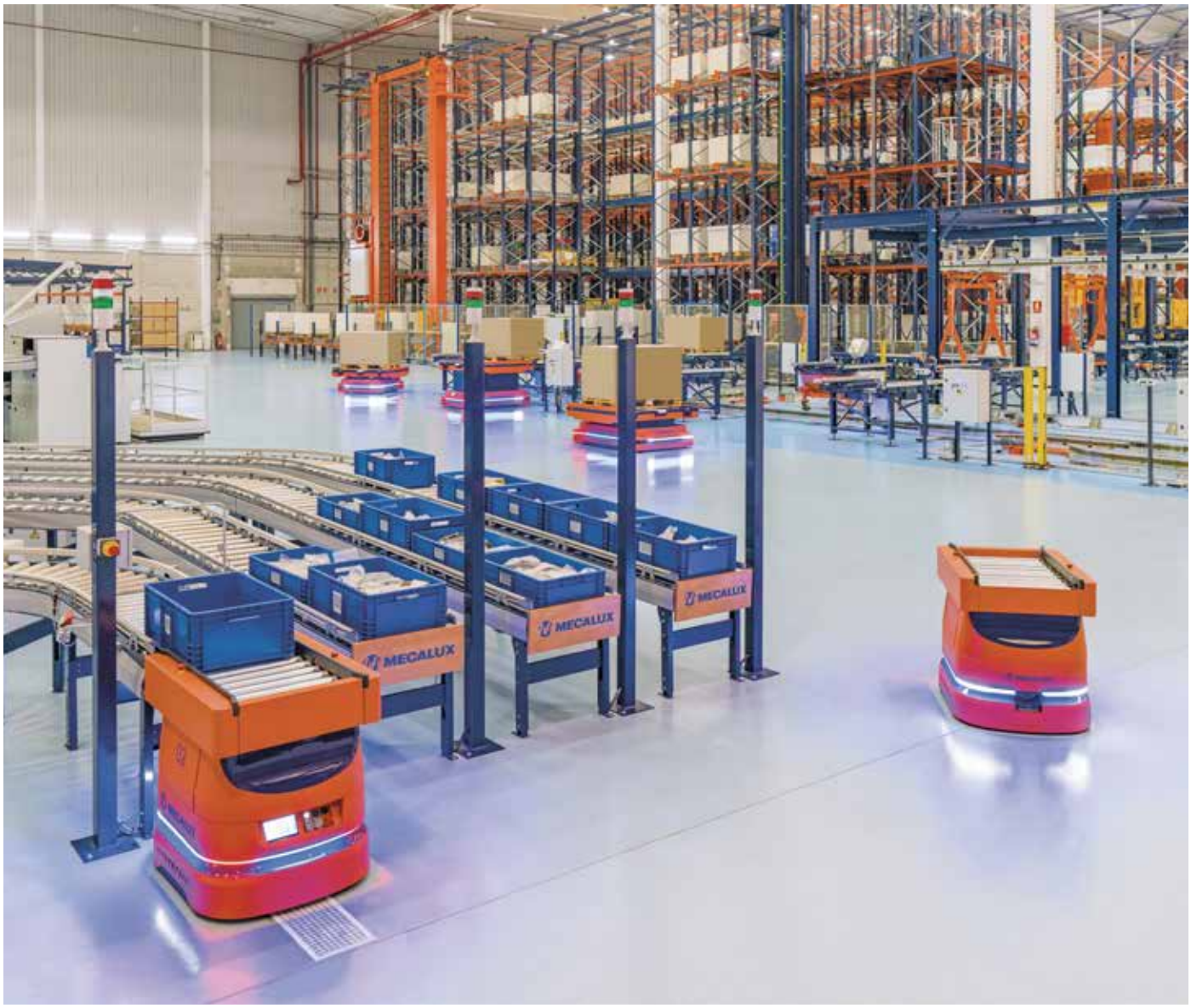
Touchscreen
Each vehicle has a touchscreen equipped with a simple, intuitive interface. This enables users to inquire about the robot's status and manage specific maintenance tasks.

Lifting platform
The AMR 600 and AMR 1500 Pallet Lifter models incorporate a platform on the vehicle's upper surface that lifts goods slightly for controlled, efficient load transfers.

Navigation software
Integrated into every robot in the fleet, this tool dynamically calculates the best path for each task, selecting the most efficient route. Likewise, the software responds to obstacle detection by readjusting the vehicle's trajectory in real time to ensure uninterrupted operation.

Fleet management software
This program oversees robot traffic and manages task assignment. It distributes jobs among the AMR robots according to variables such as planned routes, distances to cover and availability. The software monitors the AMRs' battery charge levels and organises charging cycles that adapt to the fleet's workload. It can also manage third-party AMRs.

Warehouse management system (WMS)
This software supervises inventory in the facility, ensures product traceability and issues goods-in/goods-out commands to the fleet manager. This manager can communicate with various WMS solutions and is optimised for seamless integration with Easy WMS, Mecalux's warehouse management system.



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