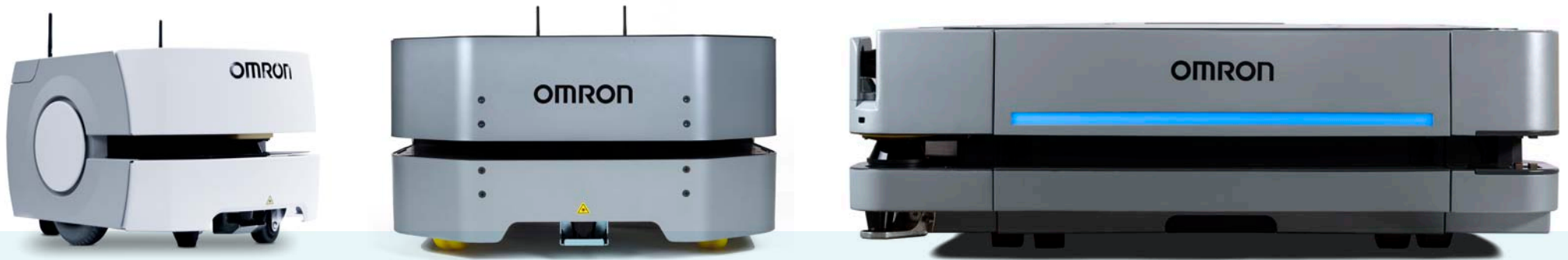


OMRON



Autonomous
Material
Transportation

YOUR TRUSTED PARTNER IN AUTOMATION



When you work with OMRON, you don't just get a robot—you get a fully integrated solution to meet the needs of your automated production.

Interactive

- One Fleet Manager controls up to 100 robots
- Intuitive setup on PCs and tablets
- Works safely with people

Integrated

- Integrates with custom payloads such as conveyors
- Compatible with other OMRON robots

Intelligent

- Optimizes routing
- Adapts to changing conditions on the fly

THE WORLD'S MOST POPULAR MOBILE ROBOT SOLUTION

OMRON is the original pioneer of industrial mobile robots, working closely with customers to develop best-in-class solutions.

10000s 1000s of robots deployed globally 40 Countries
1997 In business since 1997 150 Locations 20+ Years Experience

CASE STUDIES



GlobalFoundries



Location: Singapore

Industry: Semiconductor

Products: Semiconductor wafers

Date: 2013

Customer challenge: Improve productivity by providing more predictable delivery times and reducing human errors. Optimize the workforce and redeploy workers to higher-value tasks.

Application: 60+ LD robots integrated with handlers used for intra-bay loading and inter-bay transfer. Robots carry pods from one machine tool to another and move works-in-progress to various process areas within the fab. They have been running 24/7 since 2013.

OMRON equipment: OMRON LD-90 mobile robots.

Why OMRON was chosen: Customer explored AGVs but preferred OMRON AMRs because of flexible navigation and ease of installation, as well as LD's cleanroom rating.

Impact: GlobalFoundries improved labor productivity by more than 5%, a big jump in Singapore's productive semiconductor industry.



Škoda Auto



Location: Vrchlabí, Czech Republic

Industry: Automotive

Products: Transmissions

Date: 2018

Customer challenge: Demand increase led to higher capacity for the plants and more traffic in the production areas, leading to safety risks and fatigue for workers that had to continuously transport material from one part of the factory to another.

Application: The LD robot completes 120 trips per day and travels a total distance of 35 km between the mechanical measuring center and the processing machines.

OMRON equipment: OMRON LD-130CT mobile robots.

Why OMRON was chosen: Customer wanted to move away from magnetic tape to an autonomous system, and in particular liked MobilePlanner.

Impact: Škoda expanded production and improved worker safety without increasing labor cost at the plant.

➤ Škoda Auto is using the OMRON LD-130CT to automate material transport inside its Czech Republic factory.



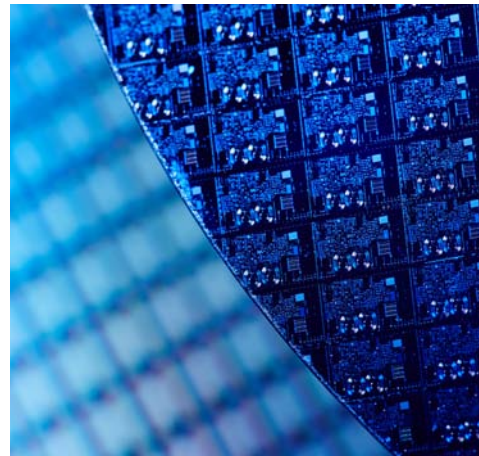
MADE FOR INDUSTRY

With the largest install base in the world, OMRON mobile robots are deployed in thousands of applications across multiple industries.



Automotive

- Tire Assembly
- Automotive Electronics
- Automotive Accessories
- Assembly and Inspection



Digital

- Semiconductor Wafer Fabrication
- Semiconductor Packaging and Test
- Mobile Device Manufacturing
- Data Center Environmental Surveillance



Food and Consumer Products

- Stockroom Transport
- Transport Goods to Assembly and Sorting Stations



Medical

- Sterilization Room Transport
- Laboratory Sample Transport

FLEXIBLE FUNCTIONALITY



OEM Solution

Cart transporter

LD (ESD)

LD-60/LD-90

LD-250 (ESD)

HD-1500

Build Your Own

Collaborative robot solution

Mobile manipulator with OMRON TM collaborative robot

Conveyor top

Courier with lock box

OMRON's mobile solutions are extremely versatile and can be adapted to perform a wide variety of tasks and applications. We're also scalable, so we can grow with your business.

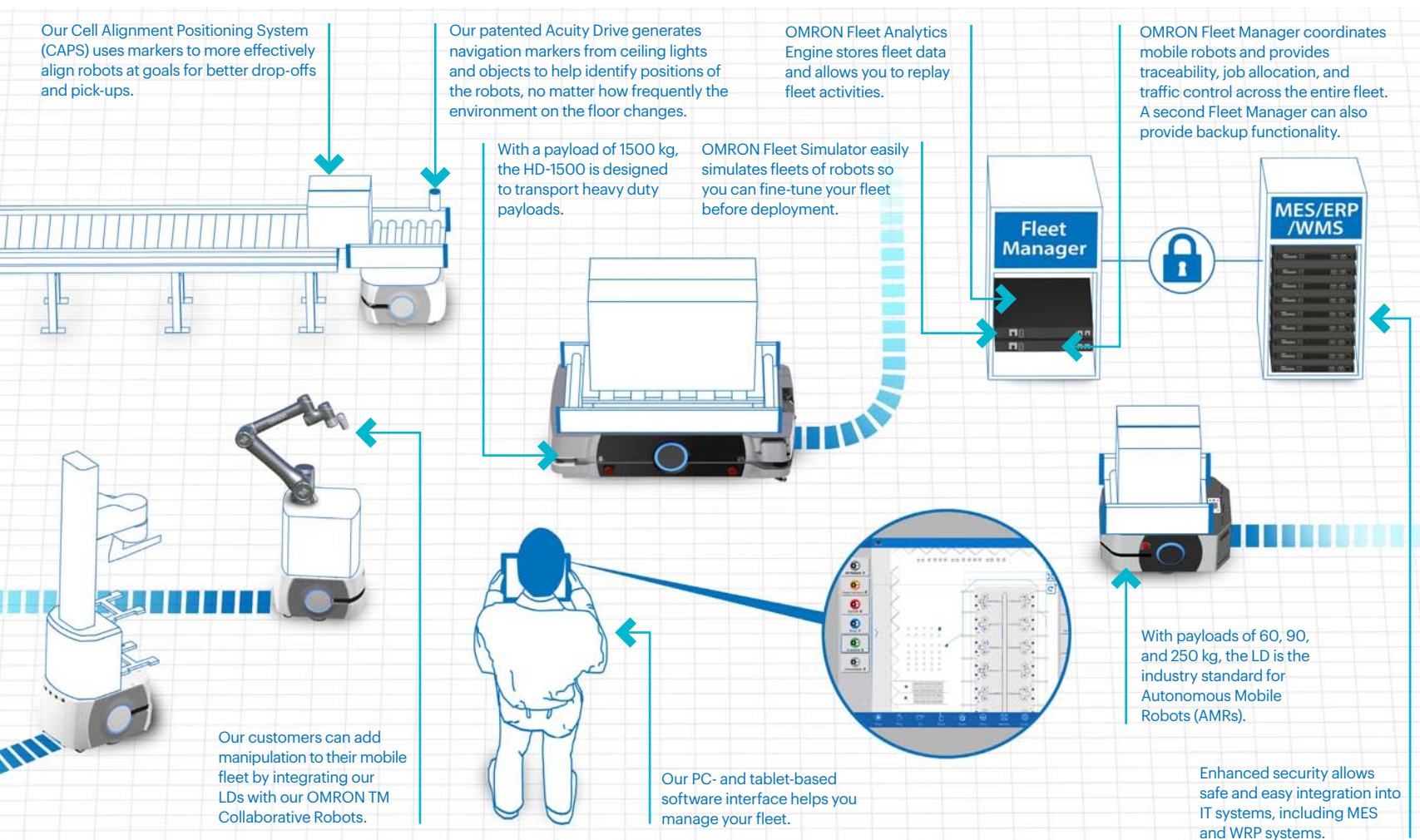
Grow Your Business

- Modify layouts to optimize production

Adapt to Changing Environments

- Assembly stations
- Clean rooms
- Order fulfillment
- Loading docks
- Stock rooms

OMRON MOBILE SOLUTION



Robots are built for performance. OMRON's mobile robots handle the performance of simple transport, delivery, and routing chores so your employees can perform higher-value jobs.

OMRON supplies more than robots. We deliver a full ecosystem of automation technology to provide the best solution from one source. Welcome to Fleet Operations Workspace (FLOW).

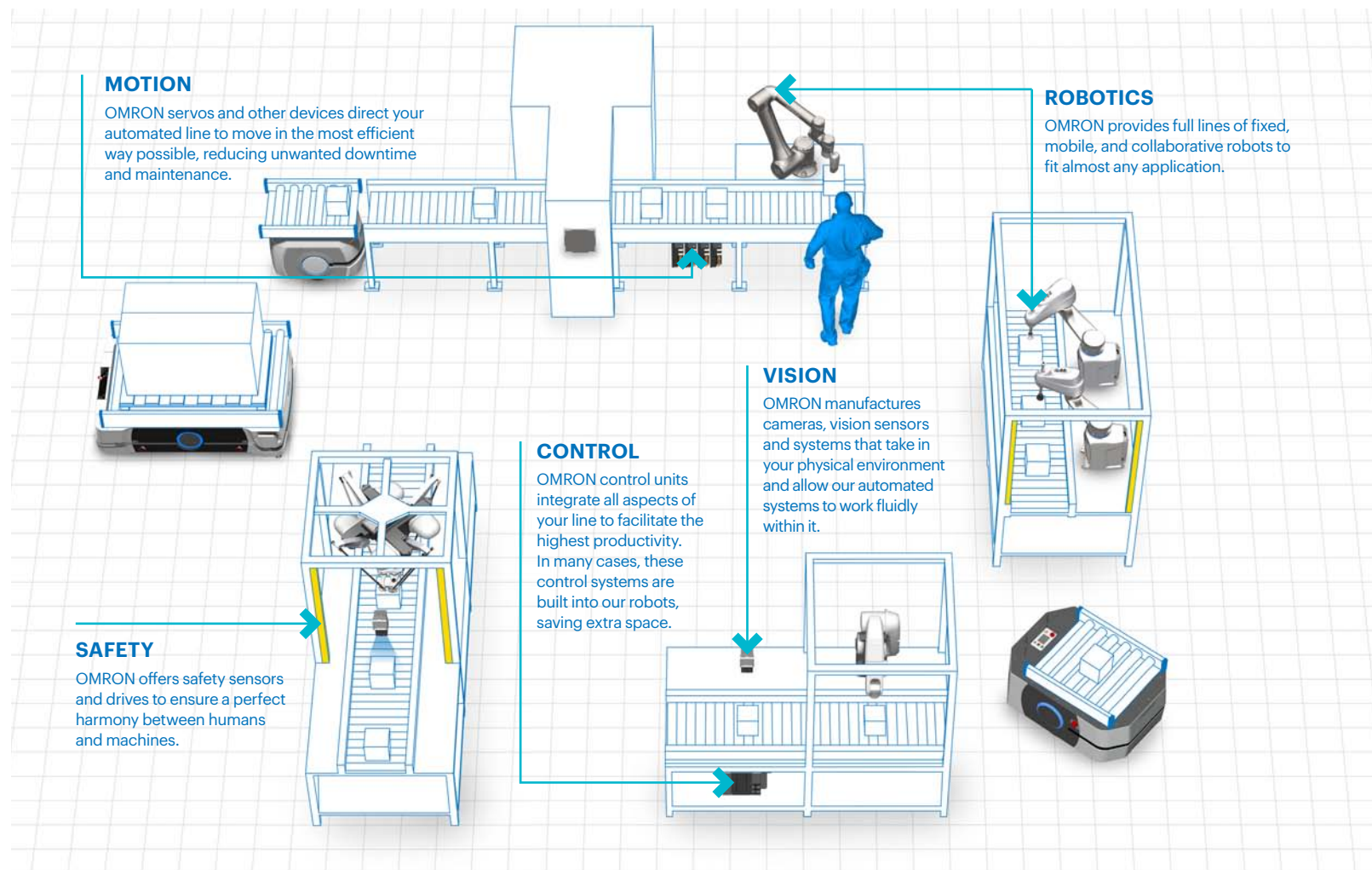
Fleet Operations Workspace puts you in complete control, improving productivity, throughput, and traceability.

OMRON INDUSTRIAL AUTOMATION SOLUTION

You need more than a piece of advanced hardware equipment; you need an autonomous material transport system flexible enough to evolve with changing needs. The OMRON full family of automation technology fills in your entire production line.

As the leader in industrial automation, OMRON offers products that help manufacturers fulfill the needs of mass customization, and address issues related to rising labor costs and labor shortages.

Along with mobile robots, OMRON provides a variety of automation equipment and devices that range from control components and vision sensors to controllers and servomotors, as well as an array of safety devices and fixed robots.



POWERFUL FLEET MANAGEMENT

OMRON Fleet Operations Workspace (FLOW) Core

The OMRON Fleet Operations Workspace (FLOW) solution provides an intelligent fleet management system that monitors mobile robot locations, traffic flow, and job requests, ensuring your factory operates at peak efficiency.

By automating robot tasks, our FLOW Core solution also reduces programming in your manufacturing execution system (MES) or enterprise resource planning (ERP) system.

- Displays robot location and status
- Displays job queue
- Prioritizes important jobs
- Selects fastest routes based on human and robot traffic
- Identifies blocked paths and creates alternative routes
- Optimizes job assignments
- Optimizes battery charging



The OMRON Fleet Manager, running with FLOW Core software, can manage fleets of up to 100 robots in any configuration.

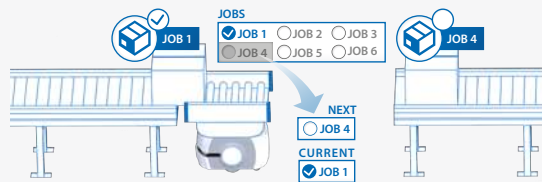
OMRON

FLEET MANAGER

Optimize Efficiency

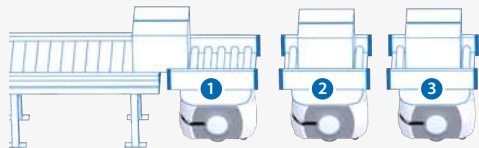
1. Intelligent Job Assignment

Reduces wasted time and movement by continuously looking ahead to anticipate which robots will be best positioned for upcoming tasks.



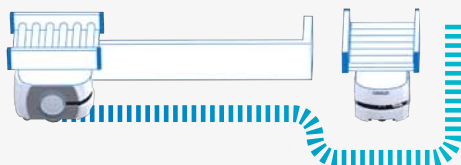
2. Managed Motion

Ensures smooth operations in busy environments by coordinating traffic flows and efficiently sequencing pick-up and drop-off at target locations.



3. Traffic Control

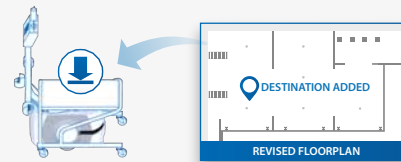
Notifies converging robots of their predicted paths, allowing them to re-calculate and avoid collision in the most efficient way.



Maximize Uptime

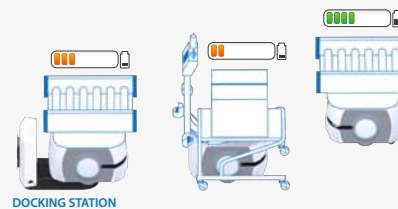
4. Automatic Updates

Performs updates automatically across the entire fleet.



5. Charge Management

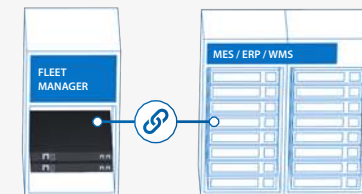
Tracks battery power of the entire fleet, directing robots to their nearest available, or preferred, docking station on a schedule that ensures continuous fleet operation.



Increase Flexibility

6. Easy Integration with IT Systems

Fleet Manager can connect to your MES, ERP and WMS so that jobs can be propagated automatically to the fleet in real time.



7. Skill Administration

Understands the capabilities of each vehicle in the fleet, and always makes sure that the right job is assigned to the right robot.



PRECISE PERFORMANCE

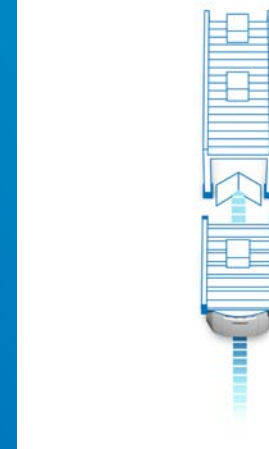
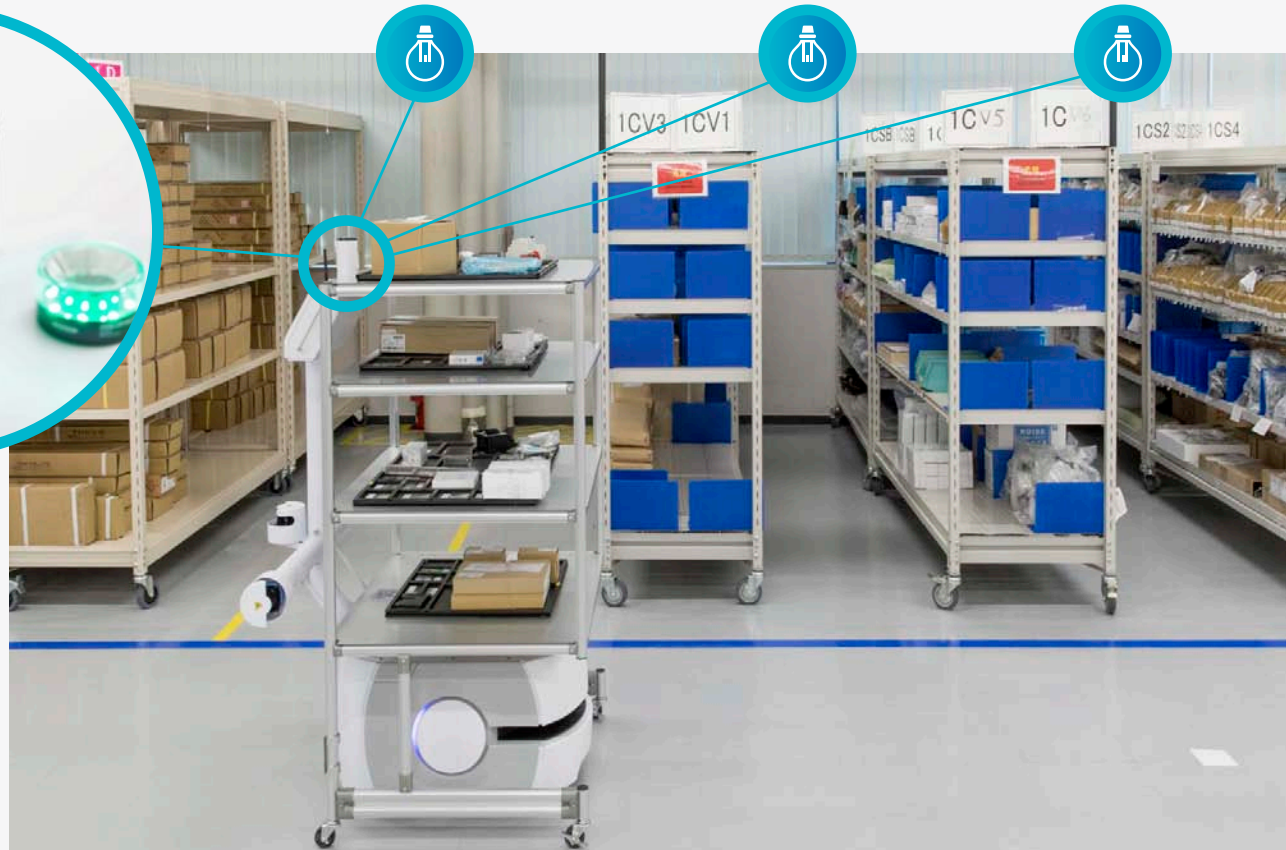
Our safe and intelligent navigation leads the industry in speed and accuracy. Using multiple systems, our robots learn to become even more efficient after they're installed. Every robot in our fleet acts as a sensor to map out the most challenging environments and optimize its performance, from navigating tight aisles to planning the most efficient routes.

- Dynamic obstacle avoidance
- Faster navigation times
- Smoother driving
- Fast goal approach speeds
- Superior alignment at goals



Acuity

OMRON's patented Acuity generates navigation markers from ceiling lights and objects, since these are more likely to remain fixed. Using these ceiling features, it generates an additional map to identify the fleet's position, no matter how frequently the environment on the floor changes.



Cell Alignment Positioning System (CAPS)

CAPS evaluates real-world features to effectively align robots for high accuracy drop-offs and pick-ups.



High Accuracy Positioning System (HAPS)

HAPS allows our mobile robots to move along fixed paths in applications that require tight tolerances.

EASY INSTALL

OMRON mobile robots are easy to get up and running, requiring no construction such as the installation of magnets, and minimal programming. In addition, our software integrates with your other systems so you can get the solution up and running in minimal time.

- No construction required
- Easy integration with MES, ERP, and WMS
- Enhanced security to comply with IT systems
- Autonomous navigation doesn't require preset routes, magnets, or beacons
- Automatic software updates across fleet while maintaining continuous work flow

1

UNBOX

The complete mobile solution comes with everything you need for quick setup.

2

MAP

After a short tour through your facility, the robot will make a custom map of your floor plan.

3

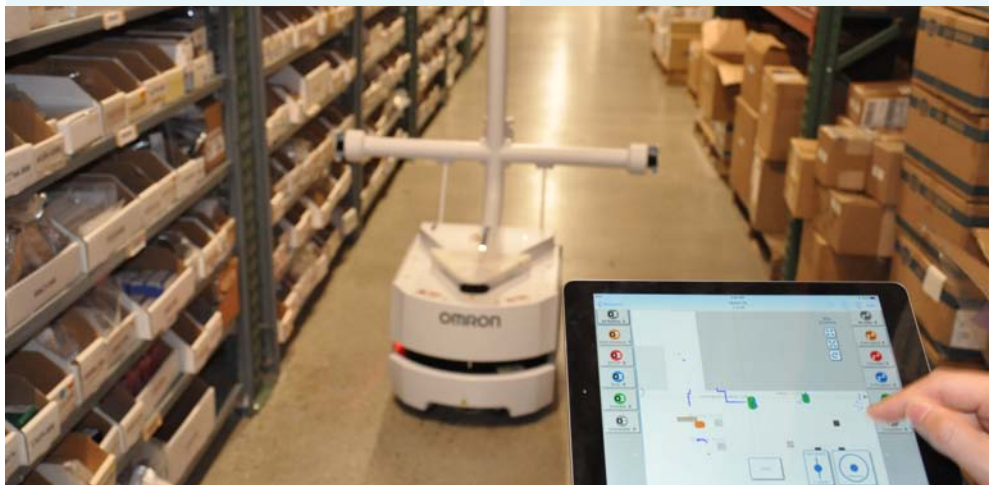
SET GOALS

Use simple commands to set up goals for pick-ups and drop-offs.

4

SEND JOBS

Simple integration between the OMRON Fleet Manager and your MES and WMS allows you to get your robots working immediately.



SAFE BY DESIGN

OMRON mobile robots are fundamentally built to serve human workers.

Designed to meet the industry's latest requirements, our mobile robots interact with people to promote a collaborative, safe working environment. Safety lasers and sonar allow our robots to detect obstacles in their path and prevent collisions.

Safety Features

- Avoids static and moving obstacles
- Additional E-stops easily added
- Complies with ISO EN1525, JIS D6802 and ANSI B56.5 safety standards

REAR SONAR

Detect rear obstacles using sonar.

LIGHT DISCS

Status indicator is located on both sides.

FRONT BUMPER

Stops when in contact with obstacle.



SAFETY SCANNING LASER

Safety-rated laser used for SLAM (simultaneous localization and mapping) and safety functionality.

LOW FRONT LASER

Obstacle sensor detects low-profile objects when moving forward.

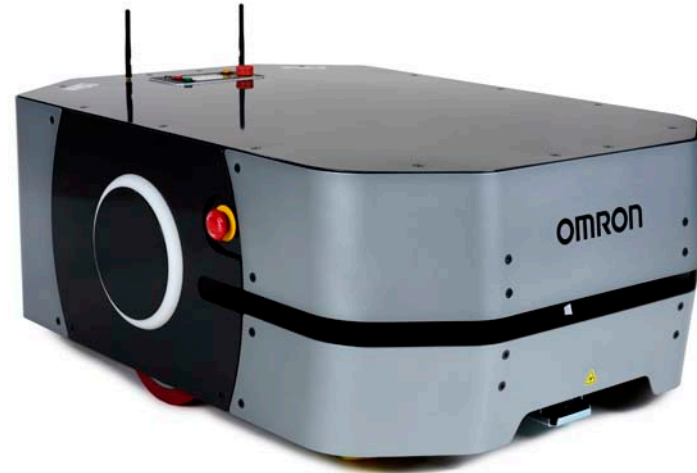
MID-SIZE CAPACITY

Meet the mid-size member of OMRON's family of mobile robots.

OMRON is proud to announce the release of the LD-250, our mid-size mobile robot with a payload capacity of 250kg.

The LD-250 is based on the same tested-and-proven technology used in the industry-leading LD-90, with a higher payload capacity and tougher metal skins. Customers can now load more onto robots, or make fewer trips with heavier batches, ultimately doing more with less equipment.

Working seamlessly into an integrated OMRON mobile fleet, the LD-250 can allow customers to optimize their traffic management, battery management, and routing of vehicles with a more diverse fleet.



HEAVY DUTY TRANSPORT

Meet the strongest member of OMRON's family of mobile robots

OMRON is proud to announce the release of the HD-1500, our latest automated mobile robot with a heavy duty payload capacity of 1500kg.

The higher payload capacity allows customers to automate new tasks that were not previously possible, such as the transport of pallet-size loads, engine blocks, and other heavy goods and equipment. The HD-1500 can also automate tasks that are traditionally completed with forklifts, reducing the risk of injury.

Working seamlessly into an integrated OMRON mobile fleet, the HD-1500 allows customers more options in terms of developing the most customizable mobile solution for your factory.

Key Features

- 1,500 kg payload capacity.
- Based on the same proven technology used in our LD series.
- 360° safety coverage with LiDAR technology
- 35 minutes for full battery charge
- Sturdier metal skins withstand heavier impacts and more demanding tasks.



AMRS vs AGVs?

The difference is flexibility

Conveyors have been used by factories and warehouses for over 100 years, but they are expensive and can be very difficult to modify when products or processes change.

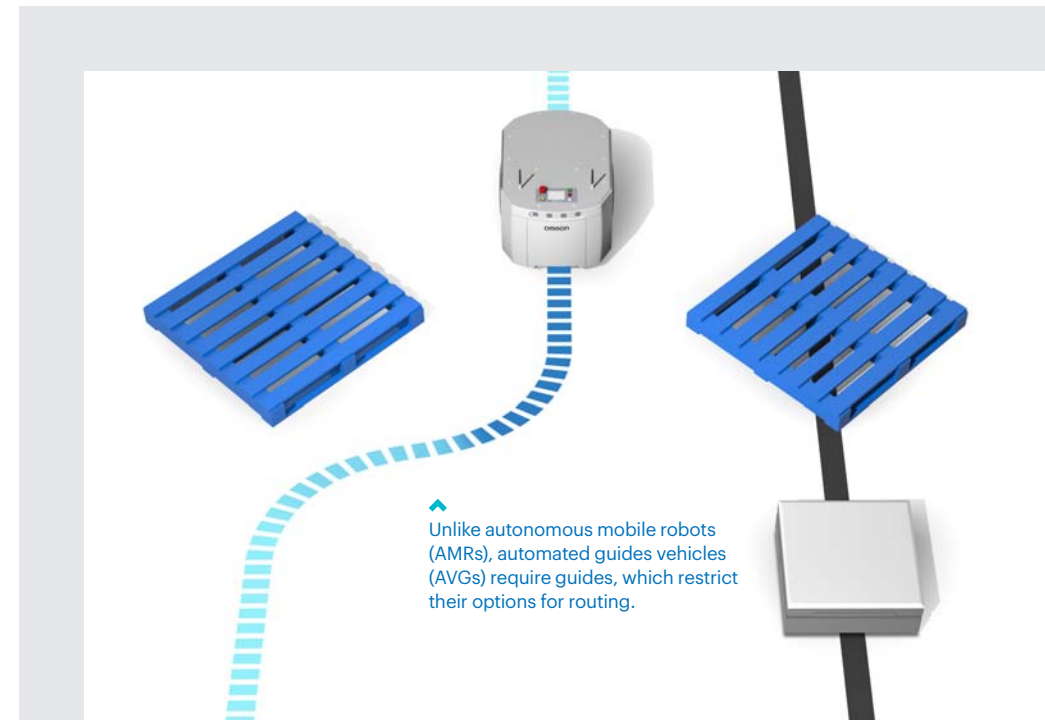
About a decade ago, automated guided vehicles (AGVs) became an alternative to conveyors for material handling. So what is the difference between an autonomous mobile robot (AMR) and an AGV?

AGVs require a predefined path to follow, either a network of magnetic lines on the floor or beacons on the walls. So although AGVs allow modifications to production lines, facilities will need to install new equipment every time the AGV path is changed, leading to downtime and extra costs.

AMRs can safely navigate without the use of floor magnets or wall-mounted beacons. An AMR will first create a baseline map of a facility using built-in sensors, then will constantly detect its surroundings. When processes change, AMRs can easily change as well, creating networks of new routes or being reassigned to new tasks.

Unlike AGVs, which will stop at obstacles indefinitely, AMRs avoid stationary or moving obstacles and automatically reroute themselves when necessary. AMR paths automatically change without human intervention, making operations more flexible and decreasing total cost of ownership.

| | OMRON AMR | AGV |
|------------------------------|--|--|
| Set Up | Ready to go after simple mapping | Requires navigation guides |
| Navigation | Navigates autonomously and safely without physical guides | Needs guides, such as floor magnets or beacons |
| Obstacles | Safely avoids obstacles without stopping | Stops at obstacles and remains still until obstacles are removed |
| Map Change | Easy | Factory modifications |
| Changing Destinations | Easy | Factory modifications |
| Scalability | Easy | Factory modifications |



OMRON Corporation Industrial Automation Company

Kyoto, JAPAN

Contact: www.ia.omron.com

OMRON EUROPE B.V.

Wegalaan 67-69, 2132 JD Hoofddorp
The Netherlands
Tel: (31)2356-81-300/Fax: (31)2356-81-388

OMRON ELECTRONICS LLC

2895 Greenspoint Parkway, Suite 200 Hoffman Estates,
IL 60169 U.S.A.
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.

No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON ROBOTICS AND SAFETY TECHNOLOGIES, INC.

4225 Hacienda Drive, Pleasanton, CA 94588 U.S.A.
Tel: (1) 925-245-3400/Fax: (1) 925-960-0590

OMRON (CHINA) CO., LTD.

Room 2211, Bank of China Tower, 200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

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