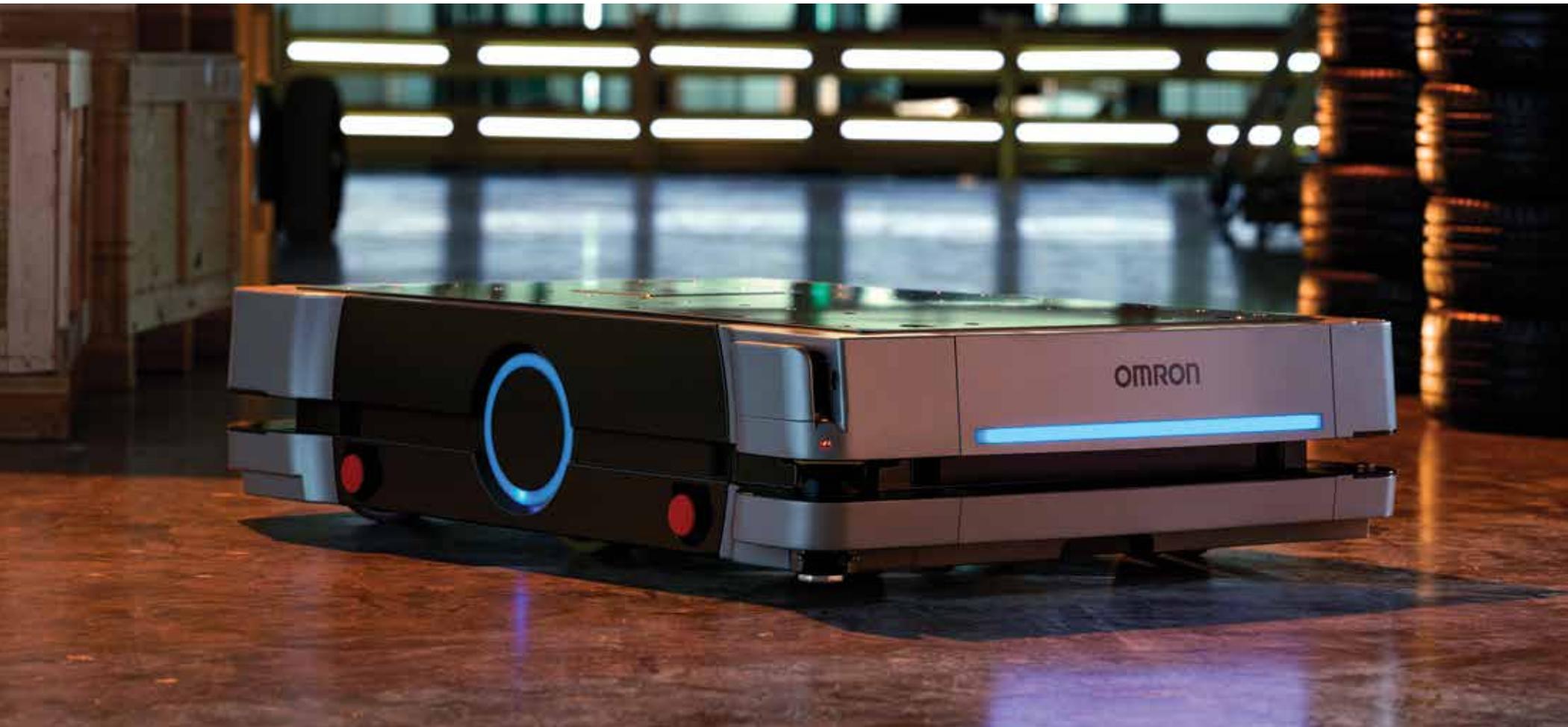


OMRON



Autonomous Material Transport
Omron HD-1500 AMR

The world's most innovative mobile robot solution

1933

Omron established

210

Locations Worldwide

1000s

of robots
deployed globally

20+

years of
robotics experience

OMRON mobile robots are autonomous mobile robots (AMRs) designed to dramatically increase productivity in manufacturing and logistics operations by increasing throughput, eliminating errors and improving material traceability.

The HD-1500 offers industry innovations with

- 1,500 Kg large capacity payload
- Dynamic intelligent 360° safety
- Integrated automation controller

All Omron a complete family of collaborative mobile robots to provide scalability and large scale fleet management

- Best in class navigation and safety
- Best in class fleet management
- Easy integration and scalability



Large Capacity

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.



Dynamic Intelligent Safety

Omron HD-1500 features a marketing leading innovation with dynamic intelligent 360° safety system as well an optional 180° patented vertical scanners. The intelligent safety system dynamically shifts the 70 safety patterns based on navigation and operation.

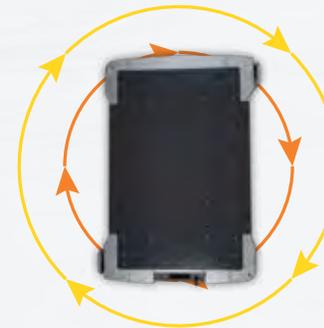
The dynamic intelligent safety benefits users with increased safety performance, increased speed, and reduced false speed reduction or stops.

Integrated safety system includes:

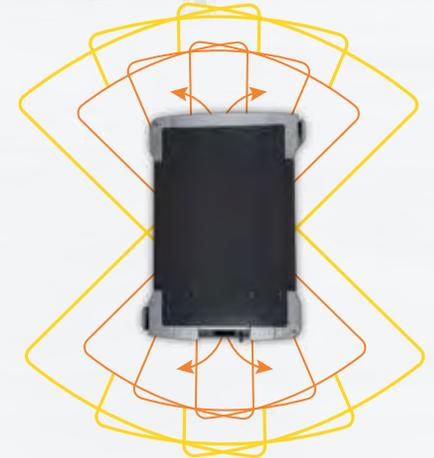
- PLd / SIL3 safety controller
- Static and moving obstacle avoidance
- Redundant safety motion control
- Expandable safety-rated system for additional I/O, scanners, and sensors



Front and rear safety patterns



360° in place safety pattern



Dynamic safety patterns based on speed and direction

■ Safety Zone

■ Warning Area

Onboard Automation Controller



Onboard the HD-1500 is the Omron NX1 automation controller with integrated safety, automation networks, IIoT connectivity, vision, and multi-axis coordinated motion control. This expands the capability and value to beyond just material transportation but to product transfer automation with motion control, tracking with RFID or Omron SMART vision inspection and smart vision/code reading, and coordinated communication with both plant floor system and enterprise systems.



Sensing



Control



Safety



Vision



Motion



Robotics



Data



- Microsoft SQL Server
- Oracle Database
- IBM Db2
- PostgreSQL
- MySQL
- Firebird

EtherNet/IP™

Safety over
EtherCAT®

OPC UA

IO-Link

Product Features

Safety Scanning Laser

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

Toe Laser

Long-range, surface level scanning, ISO 13849 certified, safety-related sensor.

User Access Panel

Cover plate for access to electronics connection.

WiFi Antenna

Side-Mount Optional Lasers



Front LED
Multi-color Status Light Strip.

E Stops
Emergency stop buttons.

Light Ring
Status and navigation indicator.



1

Optional side laser for vertical hazard avoidance is embedded into the mobile unit with a protective side shield



2

In the rear of the HD-1500 is the operator interface, E-stop release, and motion control pendant interface to enable easy manual operation.



3

Coming soon!

Option light acuity sensor provides additional navigation mapping of light sources. The sensor is embedded and flush mounted to the top of the AMR for impact protection

Safety Scanning Laser

Safety-rated laser used for navigation.

Operator Panel

Power on/off; emergency stop; brake button with 7-inch display monitor.

Payload Mount Points

Mounting locations for payload.



Toe Laser

Long-range, surface level scanning, ISO 13849 certified, safety-related sensor.

E Stops

Verify ESTOP functionality.

Flexible Functionality

Omron's mobile robot 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.



LD Cart Transporter

LD-60/90 (ESD)

LD-60/90

LD-250

HD-1500

Collaborative robot solution
3rd party Collaborative Robot shown

Mobile Manipulator (MoMa)
Shown with Omron TM collaborative robot

Conveyor top
Shown with Motorized Drive Roller (MDR) integrated solution

Open/Closed Courier
Closed Courier shown with RFID Lock box

Standard Solutions

Build Your Own Integrated Solutions

Best in class Navigation

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 rear sensors allow our robots to detect obstacles in their path and prevent collisions.

Safety Features

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



Omron AMRs easily navigate complex and high volume traffic areas with both people and other mobile vehicles



In collaborative work areas the Omron AMRs can safely adjust navigation and maintain map location



Even with moving people or equipment the Omron AMR's have advanced trajectory intelligence



Omron AMRs can interact with facility doors, elevators, and machine equipment

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.



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.

Key Performance Capabilities

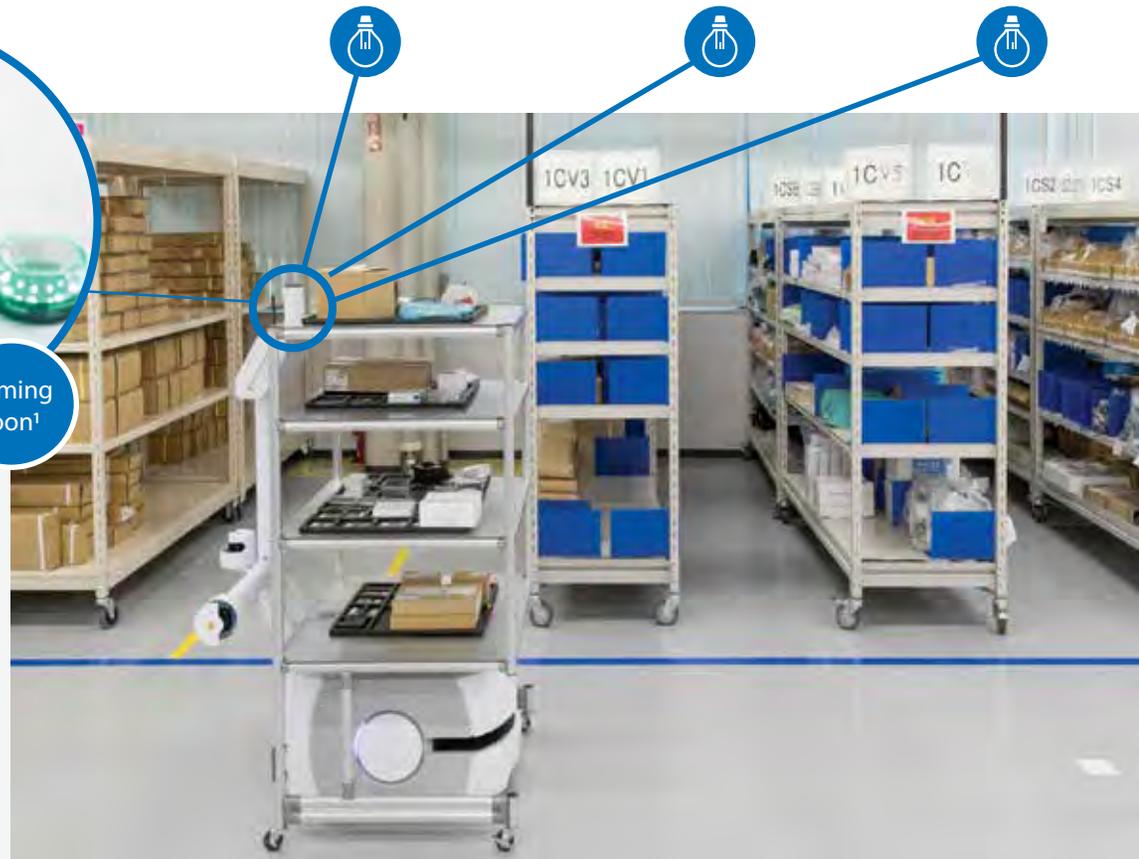
- Dynamic obstacle avoidance
- Faster navigation times
- Smoother driving
- Fast goal approach speeds
- Superior alignment at goals



Coming soon¹

Acuity

Omron's patented Acuity sensing system generates navigation markers from ceiling lights and objects, since these are more likely to remain fixed. Using these ceiling features along with the standard floor level map, the system can identify the robot's position no matter how frequently the environment on the floor changes.



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.

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

Key Functions

- 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



Omron Fleet Manager

Optimize Efficiency

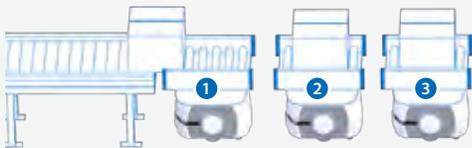
1. Intelligent Job Assignment

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



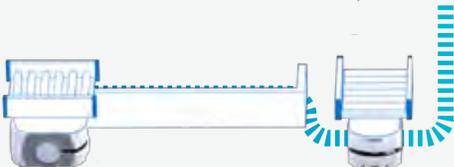
2. Managed Motion

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

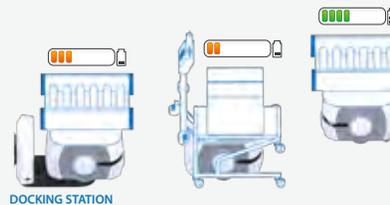
4. Automatic Updates

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.



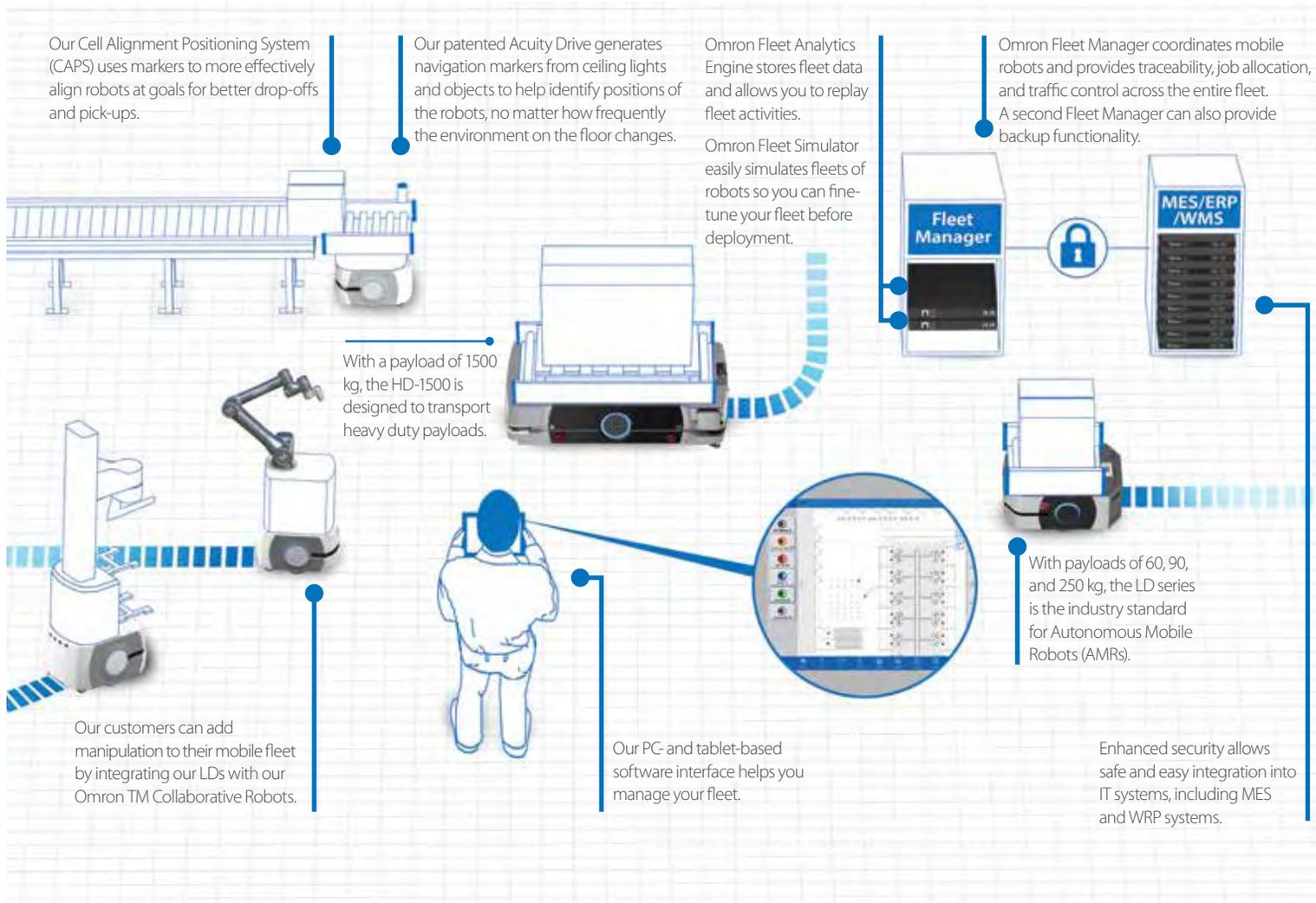
7. Skill Administration

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



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.

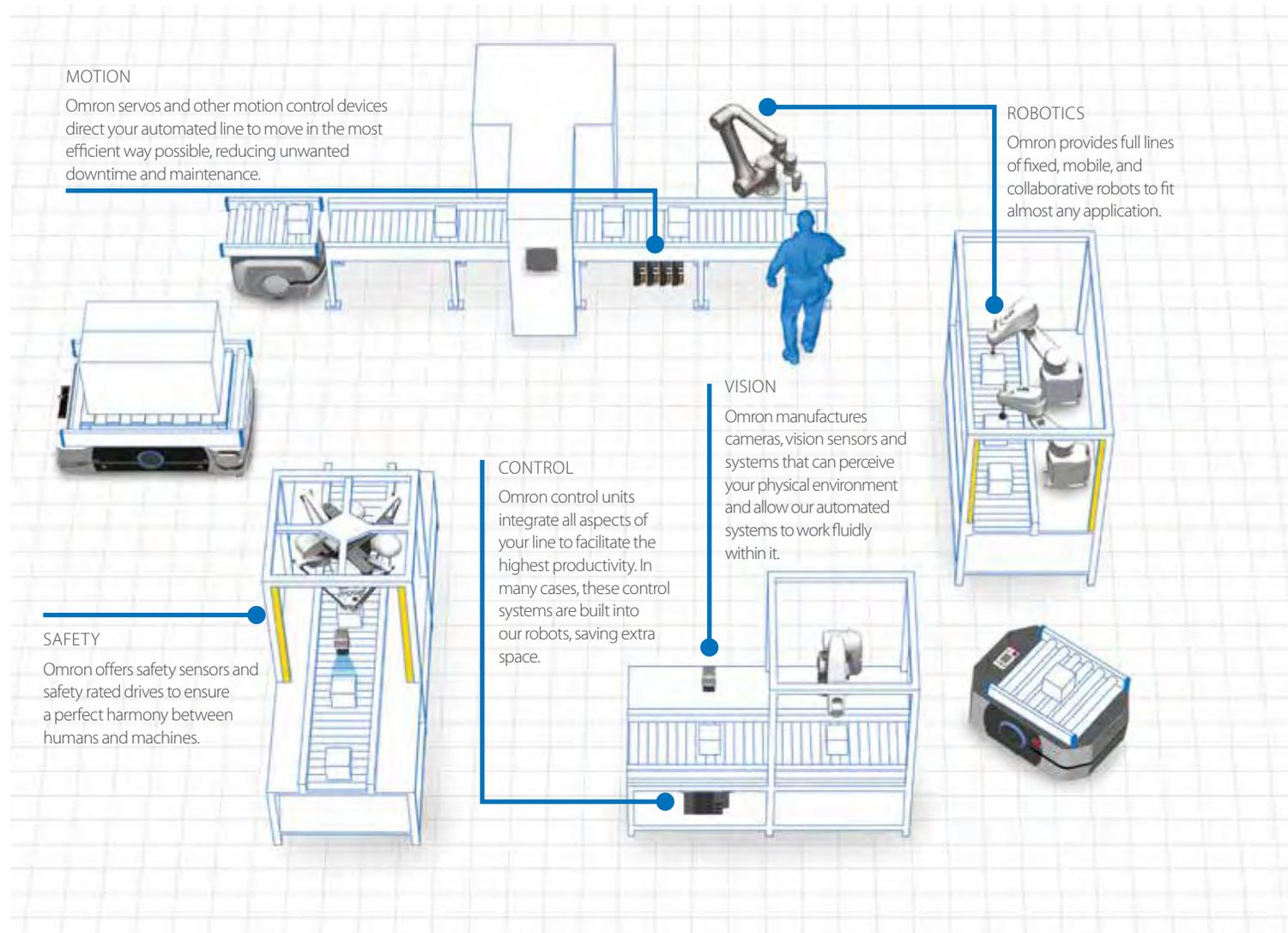
Fleet Operations Workspace is the software platform that puts you in complete control of your mobile robot workforce, improving productivity, throughput, and traceability.

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.



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.



Integrated

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

Intelligent

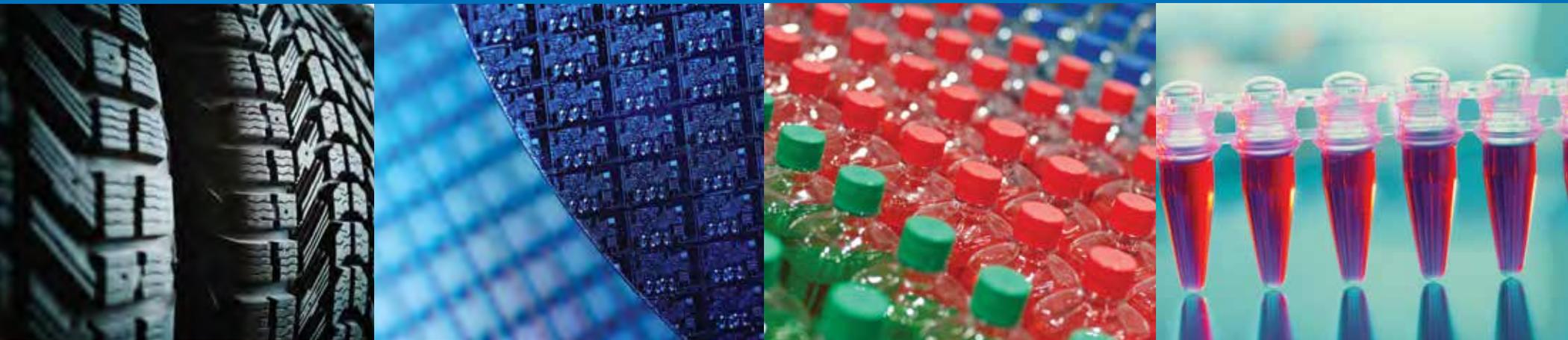
- One fleet manager controls up to 100 robots
- Intuitive setup on PCs and tablets
- Works safely with people

Interactive

- Optimizes routing
- Adapts to changing conditions on the fly

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

Consumer products

- Stockroom transport
- Transport goods to assembly and sorting stations

Medical

- Sterilization room transport
- Laboratory sample transport

Case Studies

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



Global foundries



| | |
|----------------------|--|
| 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. |



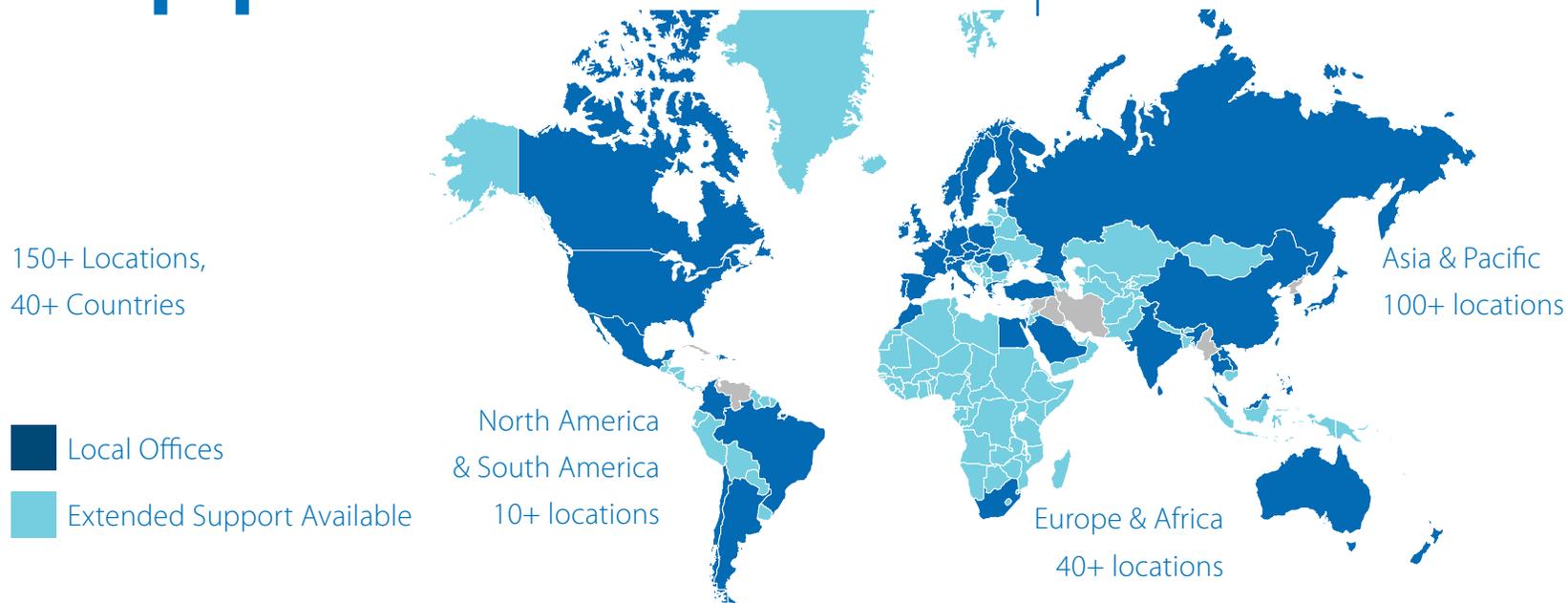
Škoda Auto



| | |
|----------------------|--|
| Location | Vrchlabí, Czech Republic |
| Industr | 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. |

Global service and support network

Omron offers service and support for its mobile solutions almost anywhere in the world, ensuring our solutions will run with minimal unwanted downtime.



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