AND & OR®

HANDLING YOUR NEEDS

SINCE 1986

AUTONOMOUS MOBILE ROBOTICS

AMRs for the industry

COMPANY

Since 1986, AND&OR has been developing automation systems for the industry sector.

Market demand and its constant innovation, made AND&OR the ideal supplier for custom made solutions in process automation.

Autonomous vehicles rose as a sector request for automatic transport solutions in production plants.

Nowadays, our wide range of AMR (Autonomous Mobile Robots) allows all industries automating their end of line and implementing industry 4.0.

We strongly believe in a close collaboration with our customers during all phases of a project: design/engineering, manufacturing, start-up installation and after-sales service.

AND&OR TODAY

1986	Experience in automation since 1986
2,000	More than 2,000 machines installed worldwide, of our own design and manufacturing
90	Customers and after sales service in more than 90 countries
70	Exports represent more than 70% of AND&OR's turnover
4	4 branches worldwide
200	200 employees
80	More than 80 specialized technicians
13,500	13,500 m2 of assembly plant

Autonomous Mobile Robot

The Autonomous Mobile Vehicles, known as AMR, are automatic guided vehicles to handle and transport loads with no need of being manipulated by an operator, to its warehouse, directly bringing a productivity increase and a risk decrease.

AND&OR offers a wide range of these autonomous vehicles, which have the route previously set, and thanks to their design and operational flexibility, can be easily integrated into existing production plants, with no need of machine movements or civil works. They can transport pallets, boxes, bottles, layers, etc.

Operational solution

The project is developed in compliance with the specific technical requirements regarding the driving platform, navigation, battery, and power system.

INDUSTRY

AND&OR autonomous vehicles are designed to meet the demanding requirements of the industry, particularly, food and plastic sectors (beverage, food packaging, blow molding), where AND&OR is a reference.

SCALABILITY

Easy to increase the number of equipments and tasks according to the growth in the production plants.

FLEXIBILITY

Ideal solution for production plants which require flexible schedules as part of an intensive work and complicated production flows, as well as lay-out and production adjustments.

SAFETY

AND&OR keeps providing the highest safety standards in its autonomous equipment, to operate safely together with operators.

VERSATILITY

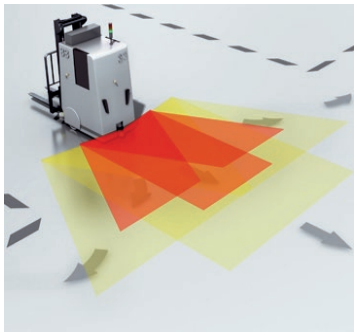
There are different models according to your needs. Moreover, each equipment has a multitude of customization options to adapt to application.

SAFETY

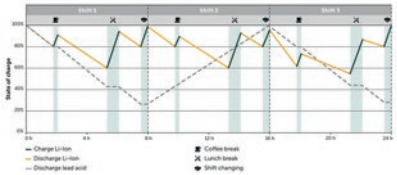
AND&OR vehicles are designed following **current safety regulations**, allowing them to work **collaboratively** with people and other manual equipment.

The vehicles are equipped with:

- Safety PLC
- Safety scanner
- Safety encoder
- Emergency stop



BATTERIES AND CHARGING SYSTEMS



LEAD-ACID	GEL CELL	LITHIUM
Best price/performance ratio	Suitable for areas where the vehicle is loaded and hydrogen emissions are not allowed (white rooms, explosive zones, nonventilated areas)	Longer life, no maintenance, no memory effect and suitable for fast loading
Optimal for complete loading and unloading cycles		Optimal for short load cycles
Battery exchange systems or external chargers		Online charging, making possible the continuous operation of the vehicle 24/7

Online charging by pads

- Lower cost
- Higher charging capacity

Online charging by induction

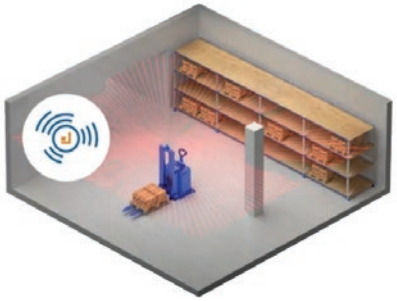
- Suitable for outdoor and demanding environments
- 0 maintenance
- Charging on its own working path

NATURAL NAVIGATION

It uses the own contours (walls or other static elements) of the working area to produce a map and know its position within said area.

The vehicles equipped with this technology allow:

- An immediate start up
- An high flexibility to change
- To execute complex paths

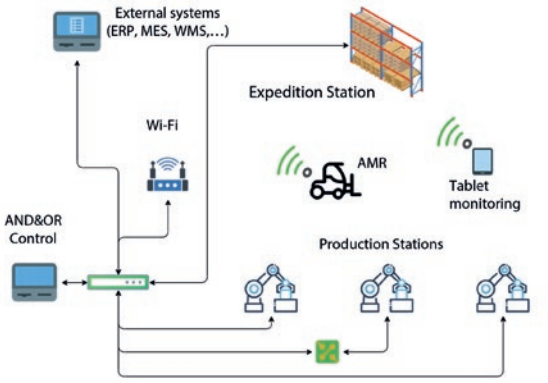


COMMUNICATIONS & ARCHITECTURE

All AND&OR vehicles are equipped with **Wi-Fi** communication system. Their control and monitoring can be carried out from a central PC in the IT room or from a panel in the plant.

To communicate with the customer's machines, AND&OR teams implement different protocols such as :

- Modbus
- EthernetIP
- S7
- OPC-UA



It is possible to install pre-configured interface boxes (gateway), which will exchange digital signals with the existing plant machinery and send the corresponding information to the AGVs (Automatic Guided Vehicle)/ AMRs via Wi-Fi.

In architectures where the AGVs/AMRs **work independently**, the **AND&OR Control** brings together the information from the different devices, managing the operations carried out by the vehicle.

AND&OR Control can also make decisions based on the information it obtains from the client's IT systems such as ERP, MES, WMS, etc. Thataway, for example, it can execute different operations according to the product batch, group products according to shipments, warehouse organization, etc..

The main features are:

- Work distribution and station management
- Vehicle location and status management
- Battery charge optimization
- Integration with ERP, MES, WMS,...

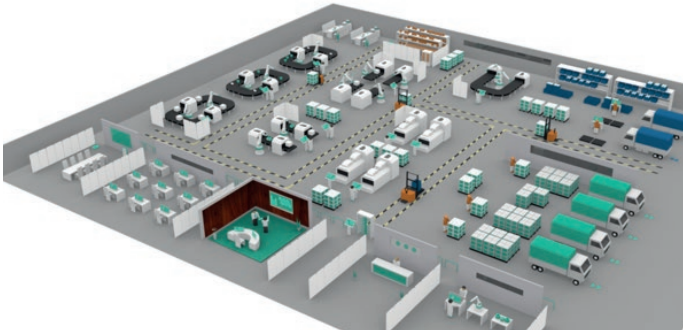
In addition to fixed control stations, integration into mobile devices such as tablets is also possible, with AMR up-to-date information available at any times.

FLEETS

For facilities where several vehicles are performing tasks in a **collaborative way**, we have our fleet management software. This software carries out the distribution of the tasks to be executed by each vehicle in an optimal way, reducing downtime and maximizing their production.

In addition to the characteristics seen above, we can add:

- Centralized configuration of all vehicles
- Monitoring of each vehicle's work queue
- Prioritization among tasks
- Optimal path selection based on traffic
- Identification of blockages and selection of alternative paths
- Optimization of the battery recharging of the vehicle set
- Operation simulation



P SERIES

INTELLIGENT PLATFORM AMR

Our P series platform AMR combines omnidirectional or differential movement abilities with reduced height, providing high maneuverability in limited space areas.

Equipped with the latest technologies, this model is easily configurable based on customer needs. It can integrate different loads handling systems.

Model available in 1 or 2 positions.

CHARACTERISTICS

COLLABORATIVE: Safe and reliable interactions with operators and connected elements (end of lines, robotic cells, wrapping machines, etc.).

VERSATILE: Easy adaptability to any industrial environment, thanks to its different configurations according to the project needs.

AGILE: Reduced dimensions and differential movement system making it highly maneuverable and suitable for limited space areas.

SMART: Equipped with natural navigation, based on the characteristics of the environment, capable of selecting the most efficient route from the signals received from the workstations.

ADVANTAGES

- Automation: it connects production lines with warehouses/ shipping areas, without needing auxiliary elements, with a friendly natural navigation environment.
- Optimization of space and resources
- Quick start-up
- Efficiency: Efficient design with optimal energy management
- Traceability: virtual tracking or integrated label reader

P series model

MODEL	MOVEMENT	MAX. LOAD CAPACITY	TURNING RADIUS
D350	Diferential	350 kg	360º
D1000-1P		1000 kg	
O2000-1P O2000-2P	Omnidirectional	2000 kg	

F SERIES

INTELLIGENT BIDIRECTIONAL FORKLIFT AMR

Our F series stacker AMR is designed for palletized load handled by forks.

This pallet handling system allows itself to have a great versatility when picking and delivering pallets in different positions: on the floor, on conveyor, on shelves.

CHARACTERISTICS

SAFE: Safety PLC and advanced configurations which ensures a completely safe automatic performance.

ROBUST: Designed to work in industrial environments with high production demands.

VERSATILE: Able to pick up and deliver loads at different stations heights and types.

SMART: Equipped with natural navigation, based on the characteristics of the environment, able to select the most efficient route from the signals received from the workstations.

ADVANTAGES

- Flexibility: Connects production lines with warehouses/shipping areas
- Optimization of space and resources
- Integration with many systems (pallet labelling machine, WMS, ERP, …)
- Scalability: integrated fleet manager to add as many vehicles as required
- Quick start-up
- Efficiency: Efficient design with optimal energy management
- Traceability: virtual tracking or integrated label reader

F series model

MODEL	DRIVING BASE	MAX. LOAD CAPACITY	RISING HEIGHT
F-SPE120	Standard stacker	1200 kg	4800 mm
F-SPE160		1600 kg	6000 mm
F-SPE200		2000 kg	4050 mm
F-OSE120-CB	Counterbalance stacker	1200 kg	4150 mm
F-SPE140-S	Stacker with straddle	1400 kg	5400 mm

R SERIES

RETRACTABLE FORKLIFT AMR

Our R series AMR (Autonomous Mobile Robotics) adjusts to most demanding logistics processes in terms of weights and heights.

The equipment, with reduced height, allows to work between shelves and reaches up to 8.5 m.

Equipped with numerous sensors and actuators, it allows to manage loads with total safety.

CHARACTERISTICS

SAFE: In addition to safe system for people, the equipment includes sensors to guarantee the loads are correctly handled in every situation.

ROBUST: Developed to work in warehouses, being available 24/7.

VERSATILE: Reduced dimensions to drive in complex situations and reach speeds up to 2m/s.

SMART: Equipped with natural navigation (based on the environment characteristics), it can select the most efficient route from the signals received from warehouse management software.

ADVANTAGES

- Optimization of space and resources
- Integration with many systems
- Easy extension
- Improve global safety facilities
- Efficiency: Efficient design with optimal energy management
- Fast Payback: Low investment and operation cost

R series model

MODEL	DRIVING BASE	MAX. LOAD CAPACITY	RISING HEIGHT
R-RRE120B	Retractable forklift	1200 kg	7000 mm
R-RRE140B		1400 kg	8500 mm
R-RRE160B		1600 kg	8500 mm

APPLICATIONS

Each production plant, line or warehouse is different, for that reason, AND&OR provides intralogistics solutions with mobile robotics based on customers' needs.

These equipments allow to easily introduce changes in production lines or distribution design, low investment and operation costs, and to supply a fast payback and productivity improvement.

Loading and unloading:

Transfers made by motorized table, lift and stacker.

In order to avoid slowing down or blocking up the process chain, AND&OR mobile robots execute loading and unloading tasks by an efficient and controlled method.

They are powerful and energy efficient systems for any needs. With multiples and variant options to adapt to all applications conditions.

Transport and traceability:

In an efficient and safety way.

Energy and costs efficiency for more safety in processes: these are the transport requirements in the Industry 4.0 era.

For that, individual solutions for an optimal movement of products are required, all controlled in a smart and safety way.

Connection with warehouse

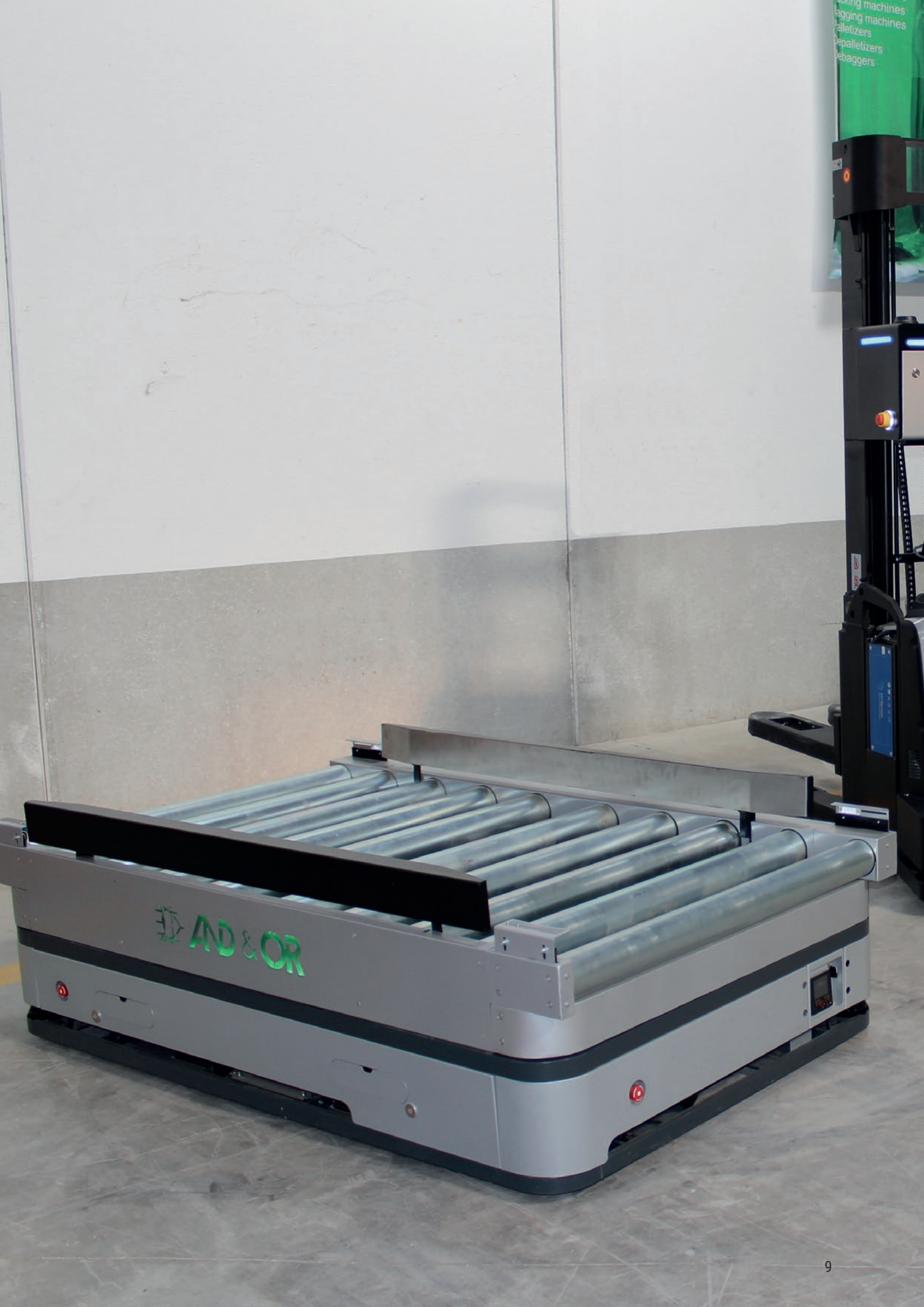
Improve your warehouse organization thanks to mobile robotics.

AND&OR equipment's are designed to optimize storage:

ERP connection provides precision and avoids errors.

Natural navigation allows to leave the minimum space between your products rows.

Results: a warehouse in order, with optimization and traceability.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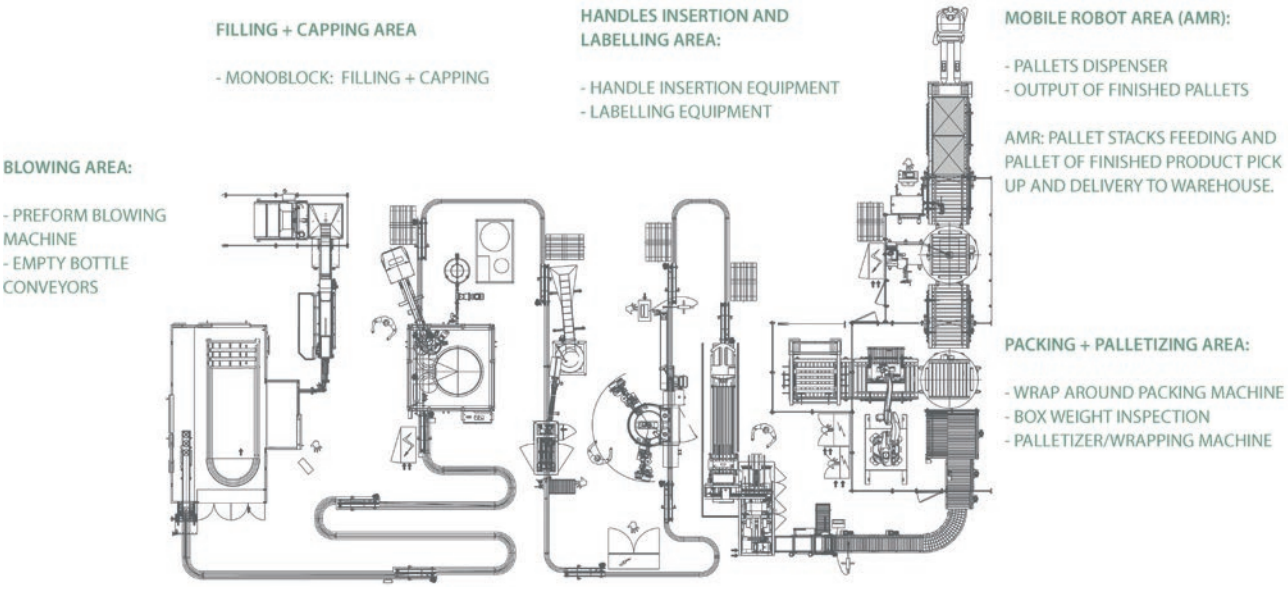
PRACTICAL CASES

Bottling plant



Application areas

1 From palletizing to wrapping

2 From wrapping to warehouse

3 From warehouse to shipping area

4 From warehouse to production lines (lines supply)

1. In bottling plants, workers accessibility to different production lines is important. Connecting each line with one same wrapper, using a P series AMR, a higher accessibility is achieved, and it generates work lanes allowing to pay a better attention to production lines. Suppressing driving forklifts in this work environment, where people and forklifts coexist, means an important improvement in the safety level of work plant.

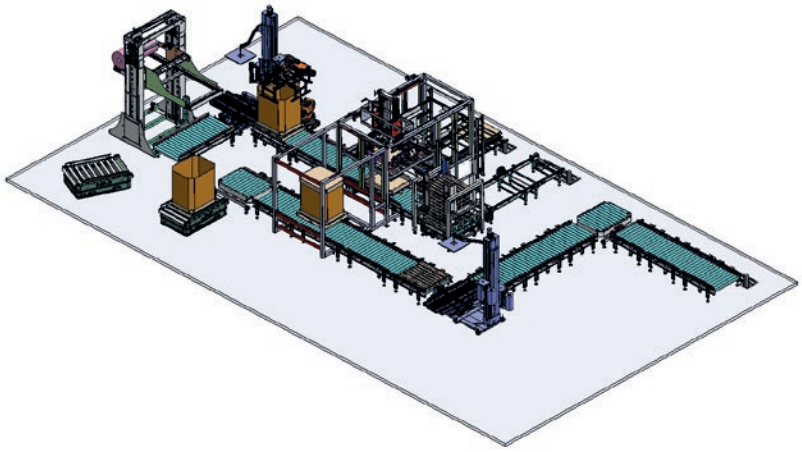
2. Once the product is wrapped and labelled, transport automation to warehouse by an F or R type AMR, allows to guarantee a better product traceability, avoiding human errors, and that everything is automatically connected with IT systems (ERP, WMS, …).

3. The AMR system not only manages and transports products from wrapper to warehouse, it also prepares the shipping area. This vehicle fleet management is commanded by one software only, allowing to prioritize and manage the pending tasks in an optimal way, getting the highest efficiency of the vehicle fleet available in the plant.

4. Supplying production lines with raw material could also be done by P, F or R type vehicle (depending on application).

INJECTION PLANT

Octabin/boxes formation, flow automation from injectors to palletizing area/warehouse.



AMRs are the appropriate equipment for your intralogistics flows automation in injection plants (preform, caps, etc.).

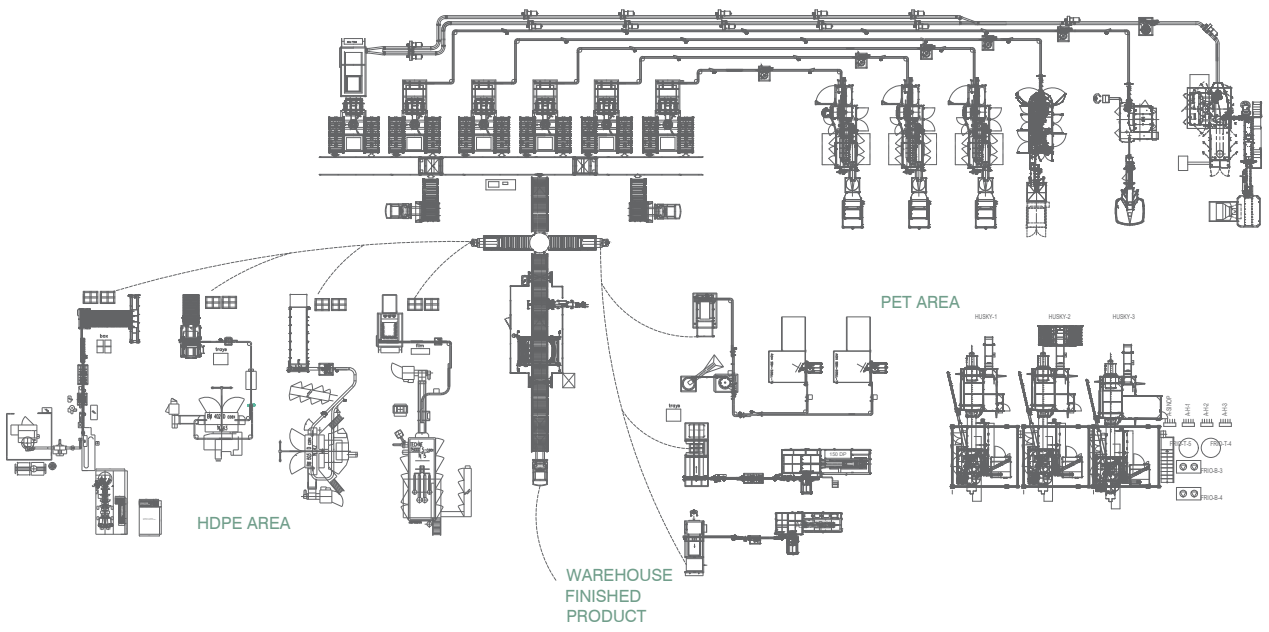
AND&OR provides complete plant automation, with the required equipment's and secondary machines to complete the process efficiently and providing our customers with a complete solution.

In the specific case of preform production, AND&OR offers the **complete automation of octabin formation**, its transport to injectors and following pick-up of these once they are filled with product, as well as its labelling and wrapping up to its arrival at the warehouse.

The automation of this process not only implies a **saving in direct labor costs**, but also an **increase in the quality** and traceability of the product during its manufacturing process.

BLOW MOLDING PLANT

In a blow molding plant, it is possible to have many production lines, with low/medium speed. It is common to think that the pallet flows automation is not necessary, even when the previous processes of packing and palletizing are not fully automated. However, most of the time invested by the operators is sometimes spent moving pallets from the production area to the warehouse, leaving the lines unattended during this process. The use of AMRs to automate the process of transporting pallets between production lines, wrapper, and warehouse, offers an improvement in the safety of the plant (avoiding coexistence between forklifts and people), the traceability and order of the product in the warehouse, as well as a saving in the production costs. Thanks to its flexibility, it does not involve investing in factory infrastructure, nor occupy or require large workspaces to operate, adapting to environments with limited space.



GUIDED CARTS / SHUTTLES

AND&OR guided carts are ideal for end of line with straight/fixed lines, where flexibility in the future is not required, and with a high production rate.

These equipments are less scalable and flexible than Autonomous Mobile Robotics, but in case of not requiring flexibility, they could be a good solution for your production plant.

- Rail guided carts
- Supply by catenary, or induction charge from the floor

OTHER EQUIPMENT'S AND SOLUTIONS

Take out systems

Strapping and / or wrapping

Bottles or packs conveying

Finishing

Quality control

Handle applicators

Foil into caps applicators

Tray and box packing

Bagging

Palletizing

Pallet labeling

Mobile robotics

INDUSTRY 4.0

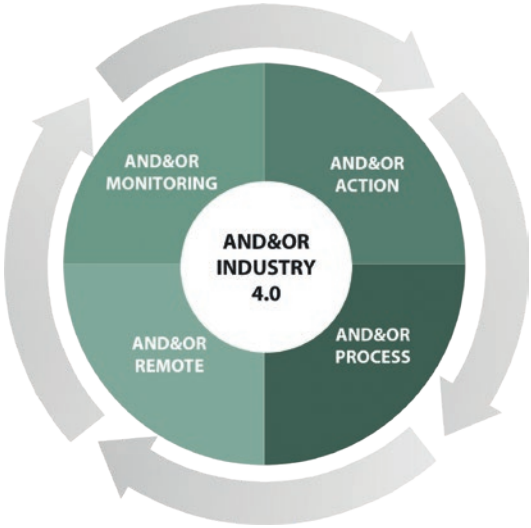
In the current context of industry digitization, AND&OR offers **AND&OR INDUSTRY 4.0** solution, for our customers to **increase** their production lines **efficiency**, resulting in better economic results.

AND&OR, as an engineering machinery manufacturer with more than 36 years of experience, relies on demonstrated capacity for design and programming, start-up, installation, and support of INDUSTRY 4.0 solutions, obtaining a connected factory with higher **safety** which improves the efficiency of your production processes.

AND&OR INDUSTRY 4.0 is a technology solution which integrates, through an IoT platform and digital tools, different services:

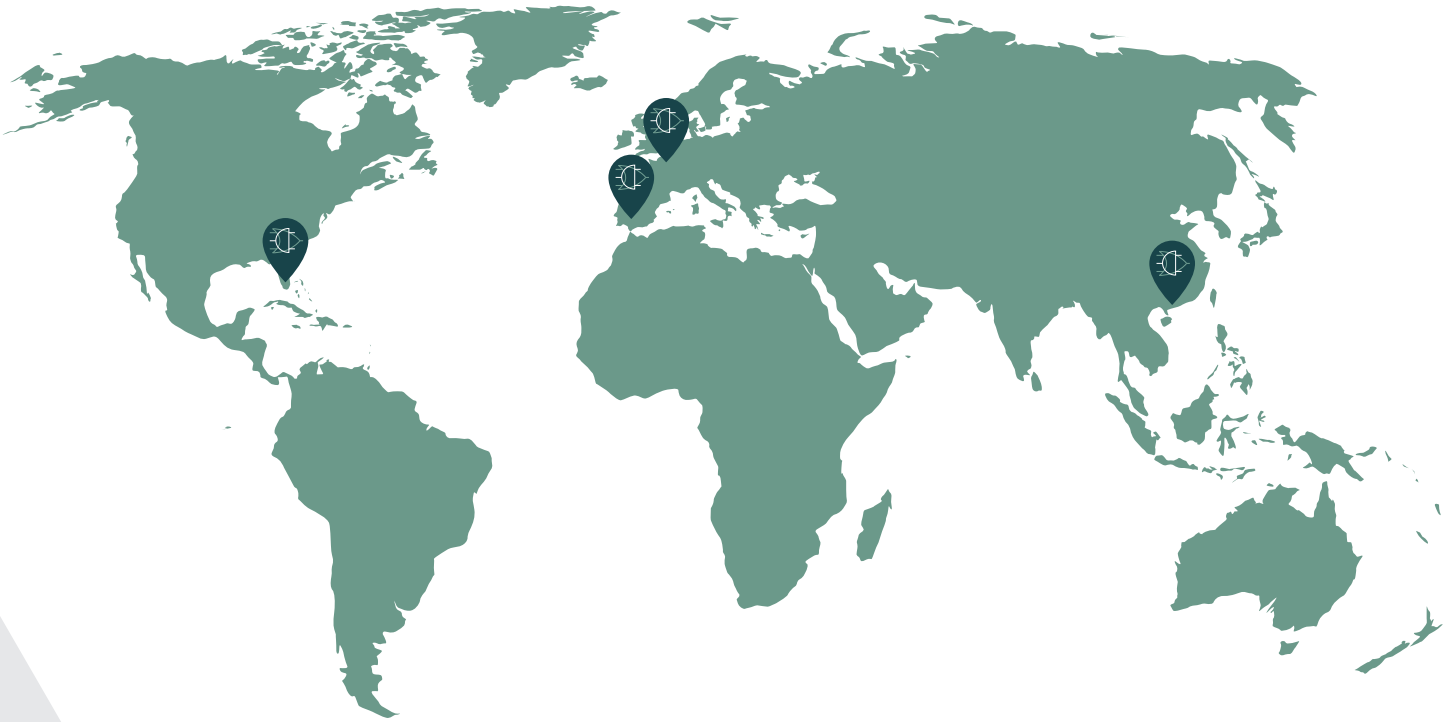
- AND&OR REMOTE
- AND&OR PROCESS
- AND&OR MONITORING
- AND&OR ACTION

The digital tools can be supported by different multi-device: PC, Tablet, Smartphone, Smartwatch or Smart Glasses (free hardware).



ADVANTAGES

- Improvements in work safety
- Time reduction for problem resolution
- Best service and customer support
- Reduction of production costs
- Monitoring and control of resources and assets
- Productivity improvement
- Quality improvement and error reduction
- Paper removal
- Real time information
- Better information analytics



AND&OR SPAIN:
Headquarters and factory.
Av. De Europa, 6 – PI El Limón
41928 Palomares del río
(Sevilla) SPAIN
Phone: +34 954 779200
andyor@andyor.com

AND&OR 2 SPAIN:
Specialized plant for quality control and assembly.
Calle de la Tecnología, 25
41120 Gelves (Sevilla) SPAIN
Phone: +34 954 872590
andyor@andyor.com

SPAIN: FDA FACTORY
Calle de Sevilla, 2 28341 Valdemoro
Madrid – SPAIN
Phone: +34 918762000

AND&OR AMERICA:
2204 NW 82nd Ave 33122,
Doral- FL – USA
Phone: +1 (786) 602-4187
usa@andyor.com

AND&OR BELGIUM:
Rue des Anciens Etangs 40,
1190 Brussels, BELGIUM
Phone: +34 680 575 411
europe@andyor.com

AND&OR CHINA:
Innovation Center, Office 03-115
No.69 Jiuzhang Road
21500 SIP, Suzhou, CHINA
Phone: +86 15921186417

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