AFORMIC

Smart Factory Fleet Management Package & Customized Mobile Robots Solution

Integration of technology in manufacturing & logistics industries.

Flexible & Easily Reconfigurable Solution

Improved efficiency

Reduced labour costs

Real-time monitoring

Increased safety

Improved management

Convenient scalability

AFORMIC Intralogistics System

Aformic intralogistics system supports the goal of increased automation and reduced reliance on human labor in industrial processes. By using advanced technologies and data-driven decision-making, we can create more efficient and autonomous manufacturing and logistics systems.

We know how to use technology to optimize industrial processes, increase efficiency and productivity, and create more intelligent and interconnected systems.

Our technology has the potential to transform supply chain operations. AMRs, which are one of the components of our solution, move materials and products around a factory floor, adapting to changing production needs and minimizing the need for human intervention. They easily optimize warehouse and distribution center operations and enable more responsive and agile production processes. AFORMIC system enables a smooth transportation of materials in real-time, enabling just-in-time production, which can reduce inventory costs and improve production efficiency. It also enhances worker safety in industrial settings by automating hazardous or repetitive tasks, minimizing the need for manual material handling, and navigating hazardous or restricted areas.

Our Aformic F series robots are controlled by the Qursor system, which significantly improves work efficiency through streamlined task management. All this while maintaining the highest safety standards - by constantly monitoring the environment and operations, our advanced safety systems can immediately respond to anomalies and minimize the risk of collisions.

Designing such advanced automation solutions requires not only technical proficiency, but a team of experts with a shared commitment to excellence, fueled by talent, passion, and experience, and dedicated to defining the latest trends in automation.

We care about improving your business results. Discover Aformic F series transport vehicles designed to work continuously in a dynamic environment and use our approach to improve your business process.

QURSOR intelligent control system

Complete software platform with factory fleet management package

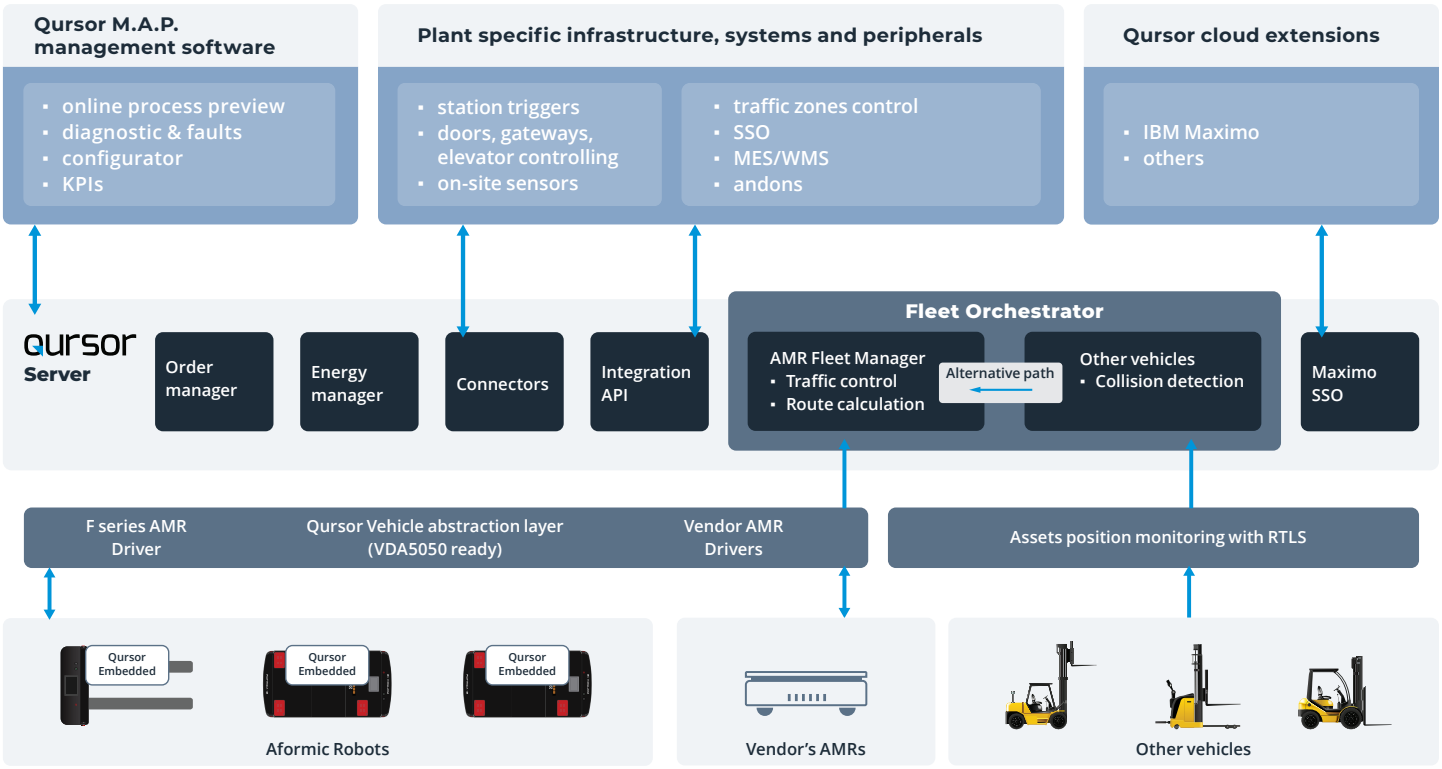
QURSOR is a fleet management system that deals with task allocation, path planning, navigation assistance, or system performance & KPI check, which enables the implementation of autonomous mobile robots in smart warehousing and manufacturing environments.

Our approach is designed to give you the ability to operate the robot of your choice, regardless of the manufacturer. By utilizing VDA5050 and vendor-agnostic protocols, you have the flexibility to combine multiple vehicles and interfaces on your shop floor. This allows you to customize your AGV delivery system to meet your specific needs and preferences.

We designed and developed a digital platform that automates and optimizes logistics and warehouse functions. The software can be integrated with Manufacturing Execution System (MES) and Warehouse Management System (WMS).

The smooth incorporation of the Qursor system into the factory software system allows for effective management of AGVs and AMRs from multiple vendors via its workflow manager and fleet orchestrator (including other vehicles monitored by RTLS).

Our platform provides full analytics, KPIs, and reports based on metrics gathered from logistic processes, AGVs, AMRS, and factory environments.



- Management & coordination of AMRs and AGVs with other autonomous vehicles in real-time
- Support for real-time location system
- Support of 3rd party AMR/AGV protocols
- Immediate reaction and resolution of production issues
- Traffic rules and zone control to reduce the risk of congestion or accidents
- Easy integration with other applications and services
- The energy manager controls AMR charging based on logistic process settings

Why choose QURSOR?

Logistic system performance of up to 500 logistic tasks with 20+ AMRs in only 8 hours!

It is not the quantity but the quality of our fleet management that counts. The advanced fleet manager algorithm enables to control 20+ AMRs which enables the simultaneous scheduling of large projects, ensuring optimal robot performance and efficiency. Our solution offers dynamic optimization of AMR paths to avoid obstacles and congestion and ensures complete control of the fleet for efficient operation without conflicts among multiple robots.

Multiple applications for your comfort!

The custom software package provides access to a wide range of data, including on-line process visualisation, real-time information on stations, AMRs and currently executed operations.

Qursor M.A.P. Management Application

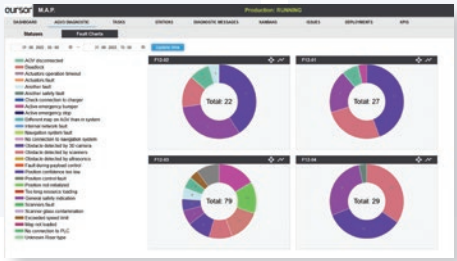
▪ remote control and overview of AMRs ▪ process visualisation with the current position of AMRs, stations, and available paths ▪ full insight into KPI modules (statistics, particular steps of the delivery) for current performance control of the system ▪ complete diagnostic - causes of errors, AMR status check, availability of stations, location status, heatmaps, fault charts ▪ tasks preview ▪ AMR operation in zones

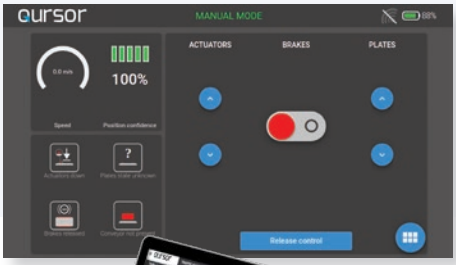
Qursor M.A.P. AMR HMI application

▪ graphical data presentation and control of AMRs ▪ information about alarms, position status, speed, battery levels, and other functions of the AMR ▪ HMI control panel accessed from a web browser or the LCD located on Aformic robots

Qursor Configurator

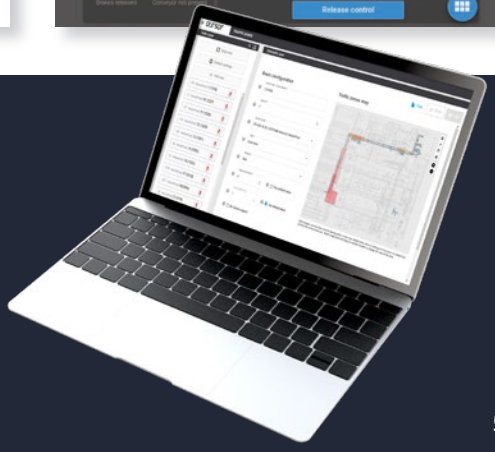
▪ logistic process configuration ▪ AMRs and conveyor settings ▪ management of environment and map files ▪ smart charger settings ▪ traffic zones configuration ▪ application parameters





System simulation & virtual commissioning

Virtual simulation of the solution prior to the physical implementation of the system using simulation software tools (e.g. Plant Simulation). Digital mapping of the system's work environment and processes allows us to virtually test the system before its actual implementation and further optimization. This is of key importance in the process of modeling routes or robot design.



F series smart robots - always on, ready to roll

Aformic solution offers highly developed AMR robots that use advanced sensors and mapping technology to adjust real-time maps of the environment and modify their paths in response to changes in the environment, such as obstacles or new paths. Our robots are implemented using process simulation to test and optimize their behavior in virtual environments. Then, during the process of environment mapping, a digital model of the environment is created. The Qursor software allows for comprehensive management and control of all operating parameters of the system and its components.

Process simulation

based on the client's layout covering the current site map, paths, and obstacles

Environment mapping

to gather measurements during the manual ride and determine paths and their parameters (e.g. max.speed, direction, zone type)

System management

to control operating parameters and for precise tracking of materials and current AMR status

Flexibility

No need for expensive infrastructure such as magnetic tape, wires, or markers on the floor. AMRs can operate in dynamic environments without the need for significant reconfiguration of the workspace.

Scalability

Our robots are not dependent on fixed paths or infrastructure. This makes it easier to add new robots to the fleet or to modify the layout of the workspace. Our system can facilitate scheduling for various types of robots, such as forklifts and underrides within the same system.

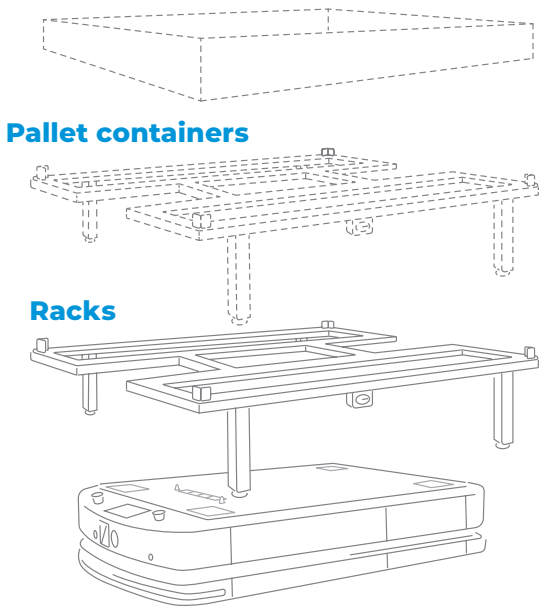
Safety

The system is double secured thanks to dedicated, security-certified devices to control both the AMR environment and the activities performed, and implement appropriate emergency actions as necessary.

Multiple handling equipment options

We can customize the design of AMRs to suit specific types of material handling equipment, like racks, pallet containers, or any containers of non-standard shapes, ensuring seamless integration and optimal performance.

This flexibility allows us to provide tailored solutions to meet the unique needs of each customer. The type of supported equipment depends on the size and weight, as well as the nature of the load it is carrying.



Natural navigation

Aformic F series robots operate using SLAM navigation with safety laser scanners. It allows the robot to determine its location and orientation within the environment based on the map prepared during the project implementation. The map is uploaded to all robots operating in the environment. As the robot moves through the environment, the navigation program takes into account changes in the dynamically changing environment. Optionally, the system enables the functionality of obstacle detection.

Real-time mapping

Adaptability

Improved accuracy

HMI support & user safety*

LED panels serve as status indicators, alarms, warnings, and directional displays.

Touchscreen for direct access to the device and manual control of individual machine elements. Accessed remotely on mobile devices.

3D camera - precise distance measurement supporting the operation of safety scanners.

Buzzer emits appropriate soundtracks to indicate incoming AMR, alarms, AMR component movement, traffic, etc.

Black-box stores AMR operation visual data for troubleshooting, optimization, safety, and analyses.

Ultrasounds support the work of safety scanners by detecting objects above and below the scanning line.

E-stops quickly and safely stop the robot in case of an emergency.

Safety bumpers stop the AMR in the event of a collision with an obstacle when scanners are not active or the obstacle is located beyond the scanning line.

Blue spot projects a blue light onto the floor to increase safety and visibility.

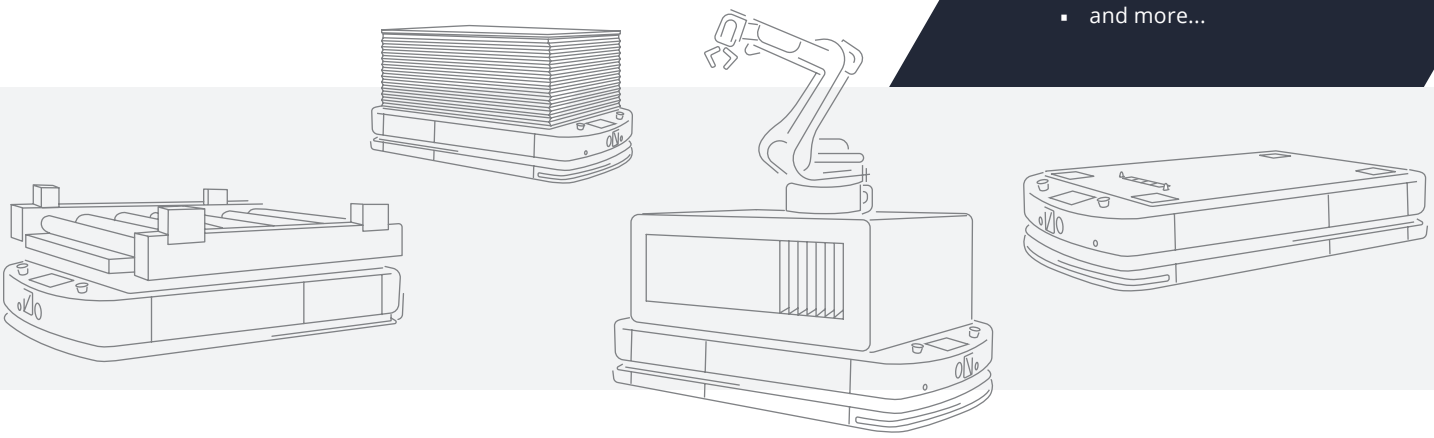
Safety laser scanners (LIDAR) used to detect objects in a danger field of the vehicle (depending on many parameters such as speed, load, etc.), which significantly reduces the risk of collisions and other accidents. In addition to the safety function, the microScan3 scanners act as measuring devices for the navigation system, providing information about the environment and enabling current updates and reliable map navigation.

*The supplied accessory may vary and depends on the customer's requirements.

Flexible coupling system

Our robots are delivered with various coupling systems, which makes them highly flexible and easily adaptable to new tasks and changing requirements.

- Retractable Pin System
- Lift Table System
- Roller Conveyor System
- Towing with Lifting
- and more...



Multi-machine support

Our system integrates multiple types of AMRs, such as underride, forklifts, or tow tractors, into a single system to manage their movement and scheduling. This can help to increase productivity, reduce downtime, and improve overall efficiency in industrial and logistical settings.

Certifications

Our robots comply with domestic and international safety regulations:

ISO 3691-4:2020 Industrial Trucks - Safety Requirements and Verification - Part 4: Driverless Industrial Trucks and Their Systems
ANSI/RIA R15.08-1-2020 Industrial Mobile Robots - Safety Requvirements - Part 1: Requirements For The Industrial Mobile Robot
ANSI/ITSDF 56.5-2019 American Standard Safety Standard for Guided Industrial Vehicles

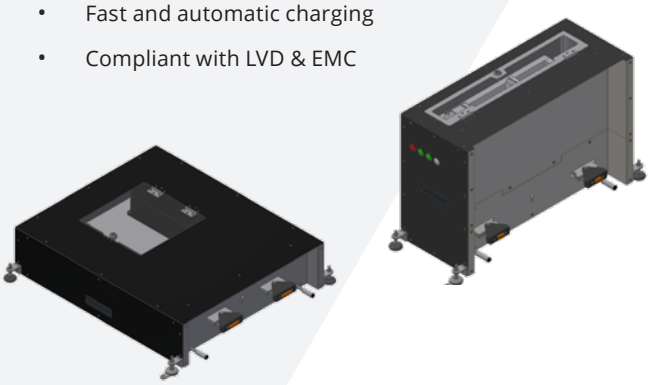
Smart charging

Our system monitors the state of the battery and adjusts the charging process accordingly. Once the battery level of the AMR is low, the robot automatically heads to a charging station after completing the currently executed task. All that without any human intervention.

The charging parameters are flexible and can be configured according the customer's needs, maintaining a balance between battery life and work efficiency. The integrated BMS system optimizes the use of energy by controlling the charging rate and charging time of the AMRs and provides a detailed diagnostic and safety of the battery.

Docking stations (automatic chargers)

- Vertical or horizontal modes
- Fast and automatic charging
- Compliant with LVD & EMC

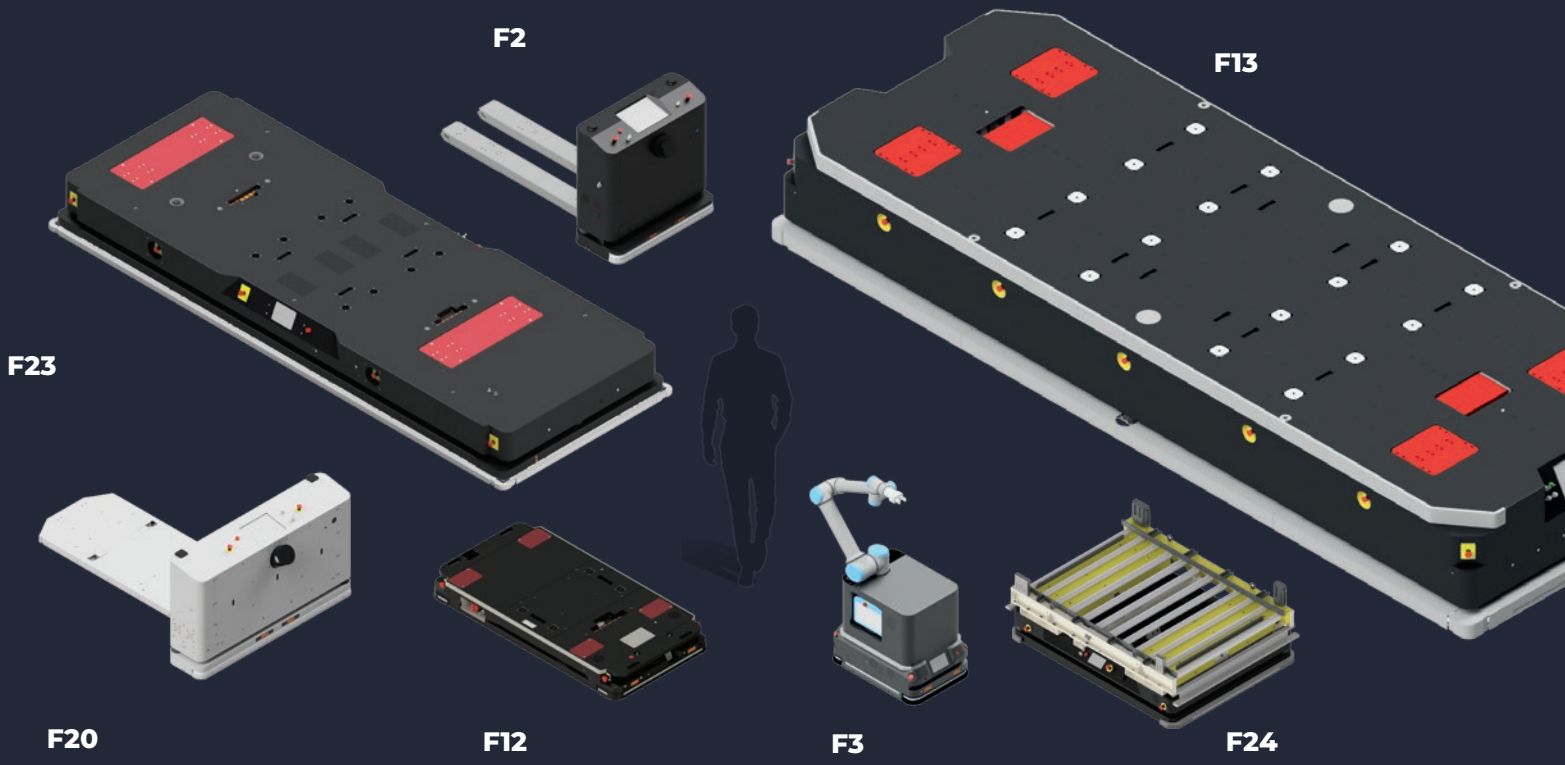


Versatility for your comfort

The F series is a family of tailor-made devices designed to meet the customer's needs, taking into account the different tasks, goals, needs, and conditions at the customer's location.

Our products are reshaped to adapt to new technologies on the market while maintaining high performance and reliability. So far we have designed several devices tailored to the requirements and needs of the client.

We stay flexible, constantly developing new solutions that provide answers to the growing demands of the market.



Join our fleet and sail toward success!

F1

Efficient and safe transportation in warehouses and on production sites.

- Simple in design,
- Flexible and low-cost,
- Compact and maneuverable

Technical Parameters

- **Type:** underride
- **Direction of drive:** forward/backward
- **Maximum payload:** 1000 kg (2200 lb)
- **Maximum speed:** 2 m/s
- **Rotation:** 360°
- **Charging time:** 5.5 hrs
- **Battery lifetime:** 8-10 hrs
- **Battery type:** Li-Ion NMC
- **Charging method:** automatic / manual

F2

Powerful robot for automatic transportation of various pallets.

- Heavy-load transportation robot
- Ground-level, self-loading function

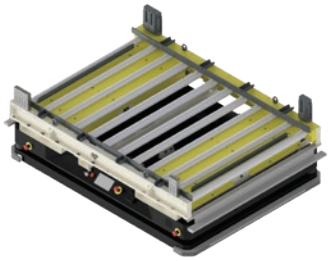
Technical Parameters

- **Type:** forklift
- **Direction of drive:** forward
- **Maximum payload:** 1000 kg (2200 lb)
- **Maximum speed:** 1.5 m/s
- **Rotation:** 360°
- **Charging time:** 5.5 hrs
- **Battery lifetime:** 8-10 hrs
- **Battery type:** Li-Ion NMC
- **Charging method:** automatic / manual

F series - exemplary customization

F12

- Height minimization
- Maximized security
- Additional equipment - 3D cameras, strain gauges, side scanners



F24

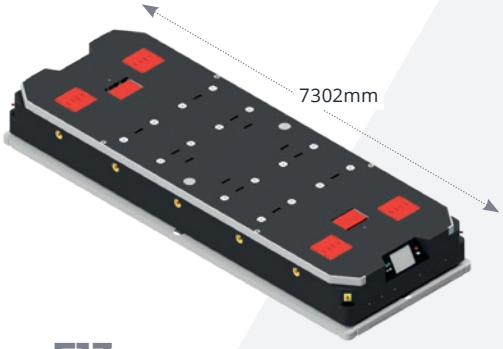
- Roller conveyor system
- Increased dimension of transported material

F3

- Compact design
- Integrated with cobot arm
- Adaptable for cobot or conveyor integration

F23

- Increased payload capacity (5500 kg)
- Increased dimension of transported material
- Drive in any direction, also to the side (4 independent rotary drives)



F13

- The highest payload capacity (6500 kg)
- Increased dimension of transported material
- Drive in any direction, also to the side (4 independent rotary drives)

F2

- Swivel wheels in the fork to improve the mobility
- Additional scanner at the front

F2 long

- Transport of oversized goods
- Additional scanner at customized angle protecting against protruding elements such as forks

F20

- Designed to tow large racks
- Very wide spacing of scanners
- Additional scanner at the front

F2 stainless steel

- Solution for the food industry
- Stainless steel housing
- Additional sensors for two containers
- Extended forks

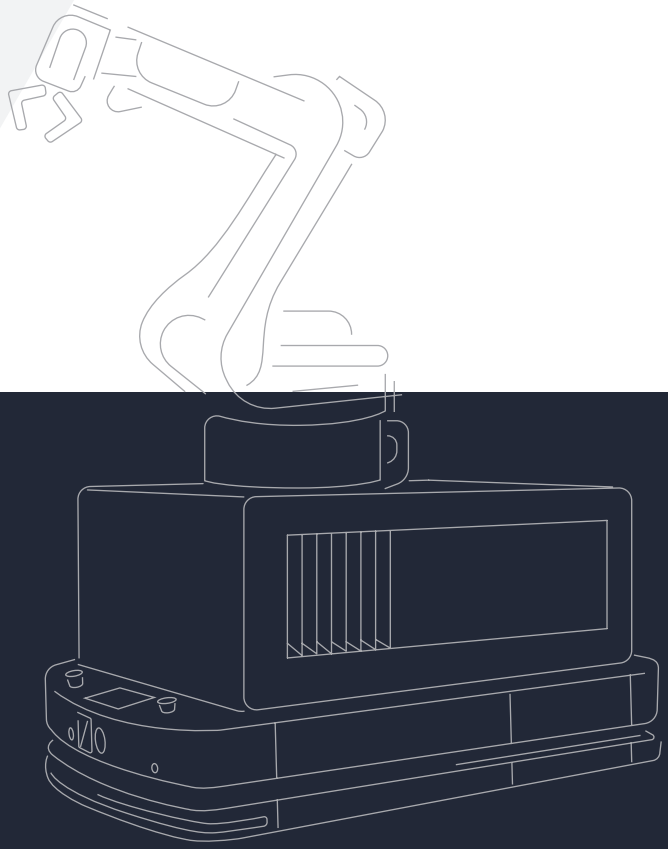
AFORMIC Team

We specialize in the automation of logistics processes in manufacturing plants and warehouses.

We are part of the **AIUT Group**, one of the leading suppliers of industrial automation and robotics systems to the global market. The company has been a trusted and experienced technology partner to global industrial and manufacturing leaders for more than 30 years.

AFORMIC designs and implements innovative integrated intralogistics solutions based on AMR robots. AFORMIC's unique strategy is to fully customize our system and AMR F robots to meet the needs of our customers. As a result, our solution provides increased transportation efficiency, optimized production processes, and significant cost reductions for your business.

AFORMIC teams of experienced engineers support our customers 24/7 directly from locations in North America (Canada, USA: Michigan, South Carolina, Indiana, Kentucky), Europe, and Asia to ensure the continuous and uninterrupted flow of your processes.



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