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BER

Automation of intralogistics

IDEF



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YOUR PARTNER IN AUTOMATION OF INTRALOCISTICS

4IGV has been acting as an integrator and dealer of technologies designed for automation of intralogistics processes. We focus our attention to efficiency and safety of material flow and handling. We help companies deliver goods necessary for production and storage, lower the costs, increase safety and gain time. We offer intralogistics suitable both for smaller and big logistics centres.

Our products include the intelligently guided unattended vehicles (IGV) of ServisControl brand. The vehicles are suitable for production and storage facilities. SLAM, the extremely precise camera navigation, guides the vehicles in space. Their scanners help detect obstacles and drive units provide omnidirectional movement. We also offer the **high density intelligent automated warehouses.** We shall prepare this warehouse design for you to fit your facility. This concerns a solution where the robots load and unload the automated warehouse stacking system. Mainly: the modular system allows you to save a lot of space, which you would otherwise need for storage.

We shall be happy to show you and explain the specific benefits specifically for your operation in more details. So far, we have implemented a lot of successful solutions allowing us to offer you a reference visit to see it all in a place and ask our clients about their satisfaction and actual benefits.

Our assortment also includes automatic pallet stackers and aligners, including the

automatic storage and unloading system. We also offer the AMR autonomous vacuum sweeper equipped with SLAM navigation capable of integrating into the common fleet management for industrial cleaning and vacuuming floors.

We adhere to the principles that planning and preparation equals 50% success of your project.

In case that your are looking for an experienced partner for automation and maximize effectiveness in the production and storage facilities, you've just found him.

4GV

Contact us!

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ROBOMELKUS

flexible pallet AGV for intralogistics



PLEASE READ AS FOLLOWS

AGV low-lift vehicle designed for approaching, lifting and transport both euro and customer-owned pallets, also suitable for transporting other packages and products, if necessary modifications are taken. Pallets can be loaded within the handling space having at least 1.8m and it transports them in height at 250m. The cameras fixed to the lifting forks allow it to recognize the pallet being loaded. RoboMelkus combines the advanced technologies and industry-oriented design.





Flexibility

- The smart omnidirectional steering allows driving in the narrowest spaces.
- Omnidirectional free range of movement.
- The smart devices also control operation and diagnostics.
- Ease integration into the existing systems (REST API, MOTT, VDA 5050).
- SLAM navigation.



Features

- 4.3" touch panel.
- Status LED semaphore on the laser mast.
- Safety light arrow.
- Laser-supported pallet search.



Efficiency

- Transverse movement allows for shorter track.
- High-performance LiFePo4 batteries make possible 4 hours operation from full charge. Short charging times.
- Energy efficiency due to low nett weight.



Intelligence

- Laser scanner allows for high staff security.
- Compact automation solution by SIGMATEK.
- WLAN communication using the guidance system.
- The smart drive allows for careful material transport and low floor wear.
- Flexible tasks creation.





ROBOMELKUS II flexible pallet AGV for intralogistics



2D bar code reader

Assembly of other sensors

3D camera





Flexibility

- The smart omnidirectional steering allows driving in the the narrowest spaces.
- Omnidirectional free range of movement.
- The smart devices also control operation and diagnostics.
- Ease integration into the existing systems (REST API, MQTT, VDA 5050).
- SLAM navigation.



Features

- 4.3" touch panel.
- Status LED semaphore on the laser mast.
- Safety light arrow.
- Laser-supported pallet search.
- Other sensors on request (bar code reader, 3D camera, etc.).





Efficiency

- Transverse movement allows for shorter track.
- High-performance LiFePo4 batteries make possible 4 hours operation from full charge. Short charging times.
- Energy efficiency due to low nett weight.
- Wireless charging option.
- The freely suspended lifting fork facilitates load handling.
- High-performance LiFePO4 power sources include 1.8 kWh battery, 2x
- Always ready to use due to innovative wireless charging technology.



Intelligence

- Laser scanner allows for high staff security.
- Compact automation solution by SIGMATEK.
- WLAN communication using the guidance system.
- Careful material transport and low floor wear using the smart drive technology.
- Flexible tasks creation.



Area of use

- Point-to-point load transport.
- Transportation within the restricted space.
- Material and workpieces transport within the production process.
- Logistic storage and transport to operating premises.



ROBOMELKUS

Driving surface finish (free of side scanners)





UIC

10

EUR

MELKUS G130 1 M



ROBOCADDY II

AGV/AMR autonomous vehicle with variable platform



These AGV/AMR vehicles are designed exactly according to the specific customer application needs. AGV/ AMR RoboCaddy II can be equipped with the robot, roller conveyor, belt conveyor or other superstructure type.

N/A

Towing device



SUPERSTRUCTURE TYPE

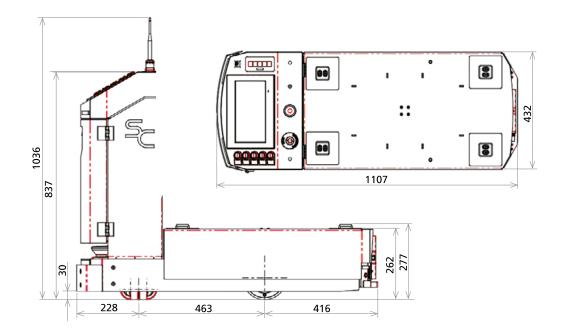
- belt conveyor
- roller conveyor
- robot





Example of customer vehicle.

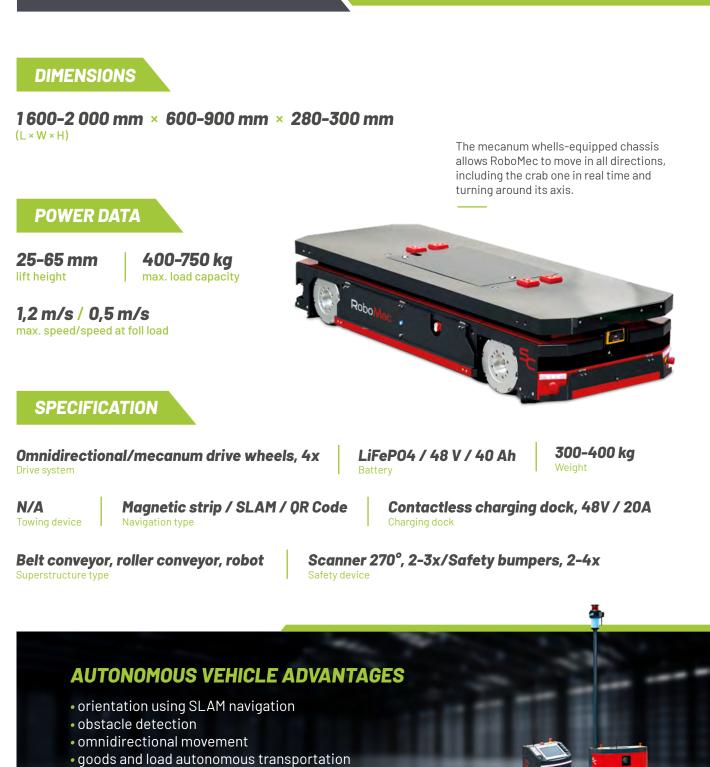
BASIC CONFIGURATION WIDTH 450 MM







ROBOMEC AGV/AMR autonomous vehicle with variable platform



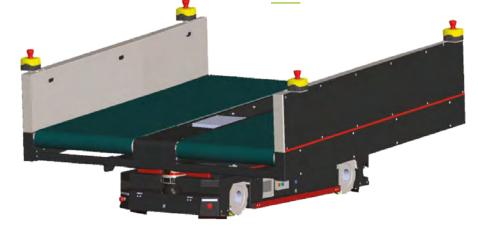
- load capacity up to 1300kg
- lift height 800mm
- LiFePO4 battery 4 hours operation at full charge



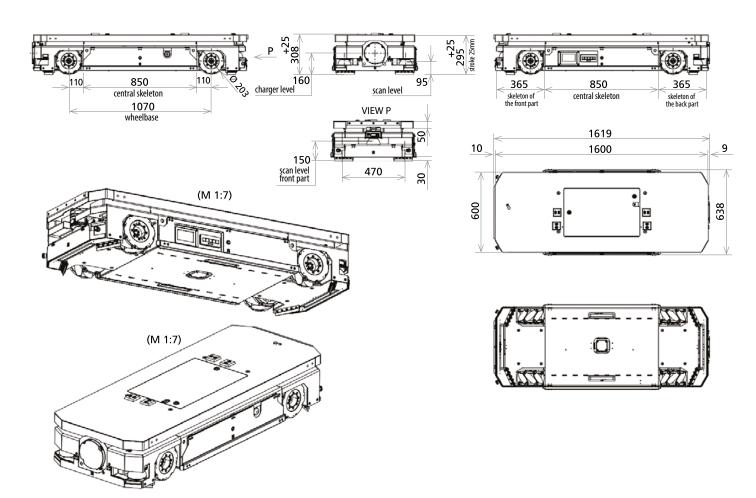
SUPERSTRUCTURE TYPE

- belt conveyor
- roller conveyor
- robot

These AGV/AMR vehicles are designed exactly according to the specific customer application needs. AGV/AMR RoboMec can be equipped with the robot, roller conveyor, belt conveyor or other superstructure type.



WODTH BASIC CONFIGURATION 600MM





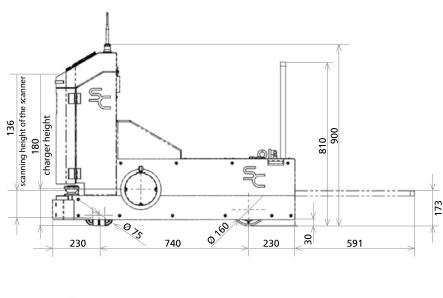
ROBOTRUCK

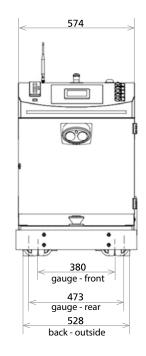
AGV/AMR autonomous vehicle designed for towing the wagon sets

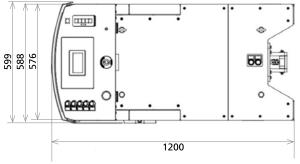




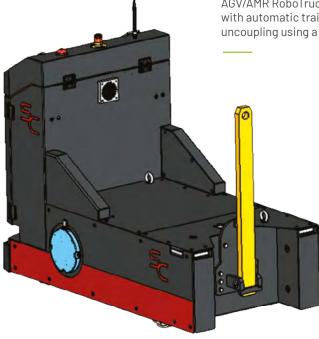
BASIC CONFIGURATION







AGV/AMR RoboTruck can be modified according to the customer's needs. AGV/AMR RoboTruck can be retrofitted with automatic train coupling and uncoupling using a camera.





ROBOCLEANER

AMR flexible floor sweeper suitable for logistics, industry, public areas, etc.







AUTONOMOUS OPERATION

• Cleaning robot operation is completely self-sufficient even without connecting to WIFI network.



NAVIGATION USING BUILT-IN SOFTWARE PLATFORM

- The unique software interacts with the sensors providing high navigation stability and reliably prevents collisions.
- The machine, as one of the few on the market, meets the requirements of EN IEC 63627.



AREAS OF USE

- Industrial production operations.
- Logistic centres.
- Public buildings.
- Sports hall.



USER INTERFACE

- The intuitive touch screen, operated even by a worker without much knowledge, controls the system.
- It is equipped with the multilingual user interface.
- The cleaning programmes are capable of automatic launching for individual days of the week. If needed, the staff can manually run any washing programme.



SUITABILITY FOR INDUSTRIAL USE

- The cleaning robot has undergone CE certification for industrial use.
- It is equipped with the high-quality components, stainless steel parts, maintenance-free brushless motors.



CLEANING CLOSE TO THE EDGE

• The additional brush sweeps dirt and particles towards the main roller which transports them into the collection container.





FULL AUTONOMY WITH STOP IN THE SERVICE STATION

- Battery automatic charging.
- Automatic replenishment of clean water.
- Automatic waste water discharge.



ROBOSWEEPER

AMR flexible floor sweeper suitable for logistics, industry, public areas, etc.







AUTONOMOUS OPERATION

- Fully automated vacuum sweeping robotic system is equipped with service station used to charge the robot batteries. In addition, the system offers automatic disposal of swept dirt that can be dumped into a standard container.
- The vacuum sweeping robotic system was specially developed for logistic and industrial areas to effectively remove coarse dirt in big halls or warehouses.
- The vacuum cleaner turns on the spot and it can also be used for cleaning in the confined spaces.
- The robot is capable of overcoming the ramps with a slope of up to 20%.



AREAS OF USE

- Industrial production operations.
- Logistic centres.
- Public buildings.
- Commercial centres.
- Car parks.





TRANSPARENT ACTIVITY DOCUMENTATION

- After each use of the service robots, the fully automated reporting facilitates documentation and service verification for billing purposes, preparation of performance records or audits.
- The possible monitored quantities of cleaning, washing time and other details.
- The cleaning documentation has been certified and meets the data protection requirements.



DATA PROTECTION IN ACCORDANCE WITH GDPR*

• Privacy protection - the cleaning robot contains neither personalized nor environmental data. *General data protection regulation 8



HIGH LEVEL OF SAFETY

- A combination of different smart sensors ensures navigation high stability and brings collision avoidance to a performance level that corresponds to IEC 63327 safety standard.
- This increases independence and autonomy of ADLATUS systems and ensures safety even in the environment where many people are present.



AGV/AMR ensures transportation of goods and loads using the autonomous unmanned handling machinery. The use, maintenance or new configuration allows the machinery fleet to be easily and seamlessly distinguished.

ADVANTAGES OF ROBOTIC DEVICES

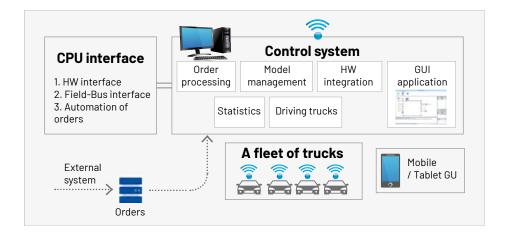


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TRAFFIC CONTROL SYSTEM

- The TCS fleet management system manages the shipping orders from the external system, for instance ERP and converts them to AGV.
- The AGV traffic control system ensures processing the orders as quickly and efficiently as possible.
- It has also been capable of communicating with the external hardware, such as fire doors, sliding door, PLC installed base, etc.



AGV/AMR SPECIFICATION AND PROPERTIES



SAFETY SENSORS

- AGV/AMR meets all the safety standards according to EN 3691-4, EN 12100, EN 13849-1, EN 13850 and EN 13855AGV. Sensors number as needed.
- We, as a manufacturer, can adjust the vehicle safety according to needs and application.



FLEET MANAGEMENT

- The safety PLC (ready for VDA 5050 protocol) controlled industrial fleets.
- Optional wireless safety communication in PL d category.
- Fleet sensor management using the logistic advanced features.
- Communication and connection with the other systems at the customer.



COMMUNICATION WITH THE CUSTOMER NETWORK

- Our system communicates using the customer network via Wi-Fi or 5G. An option to use encrypted communication along with TLS data exchange.
- We can generally meet the most stringent customer's IT requirements.



SUPERSTRUCTURE FOR AUTONOUS VEHICLES

- The customer superstructure according to needs and application - lifting mechanism, robot, conveyor, special system.
- Moving and driven parts powered and controlled directly from AGV/AMR.



CERTIFICATE

ServisControl s.r.o.

hereby certifies that 4IGV s.r.o., Czech Republic

It has been capable of providing tutorial, installation and support services for ServisControl, as well as a commitment to continuous education, therefore it has been certified as **ServisControl PARTNER** for 2024.

> Zdeněk Šibrava ServiceControl, s.r.o. Company Executive

Issue date: August 01, 2024



WHERE TO MEET US IN PERSON

There have been a lot of opportunities to meet us. You will get more familiar with our technologies at all meetings. We will be happy to visit you or we can talk during the events, such as logistics conferences, where we and other experts will provide you with an overview of the up-to-date trends in the field of logistics.



We visit both the customers and, of course, companies where we introduce our technologies. After the presentation, we shall go straight to the production plant and, on the spot, we shall tell you whether the technology is suitable or not for your company. We offer the solution directly tailored to you. To make a final decision, we shall individually process the relevant details with clearly quantified benefits for you.







For instance, you could meet us at the Trends in Automotive Logistics conference.

Our 4IGV company regularly attends the EASTLOG logistics conference.



You can also visit our exposition at the International Engineering Fair, Brno.



We also organize our own conferences.





For more information, please visit our website



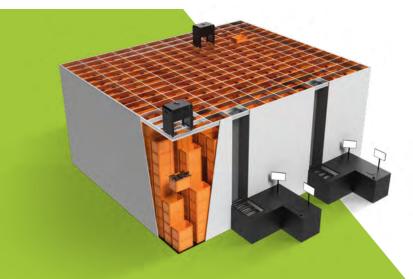
AUTOMATED WAREHOUSE

THE ROBOTIC WAREHOUSES SAVE THE TIME, SPACE AND NEED FOR HUMAN INTERVENTION



SPECIFICATION

- We shall personalize both the structure and number of robots following the season and current workload.
- Less inter-warehouse transfers, less energy.
- Operation 24/7.
- We have been capable of converting up to 90% warehouse cubic capacity to logistic system and thus double its capacity.



CONSTRUCTION

- Aluminium profiles network which fits together using the locks. The structure top rails enable the movement of the robots.
- The installation has been tailored to the warehouse size and capacity.
- Structure/grid up to 8.2m + space for robot.
- This allows you to add and remove the new profiles.
- Easy adaptation to the season requirements.

ROBOTS

- They operate on the fixed structure top.
- They move boxes similar to the elevator.
- They charge independently and operate 22 hours per day





TRANSFER AREA

- IN/OUT as much as you need.
- Within the transfer area, all movement can be monitored and recorded in the real time.
- The box itself never has to leave the structure.
- The number and transfer areas location are flexible
- The open table allows easy goods handling.
- Full integration into the control system.



- The robots can work with any boxes.
- We shall provide your systems with the EAN codes enabling you manage according to the specific products categories.
- DIMENSIONS: 600mm × 400mm.
- Variable Height: 120-420mm.
- The mounting plate can be adapted for a specific box type.
- The possibility of using own boxes.
- The KLT boxes can leave the automated storage system.





CONTROL SYSTEM

- It passes instructions to robots.
- It optimizes the processes and integrates into your ERP.
- It monitors and saves all data in real time.
- The wireless connection operates even without Wi-Fi.
- It enables remote configuration, service and support as well.





HIGH-DENSITY STORAGE BENEFITS

- maximum grid height: 8.2m + space for robot
- variable height for boxes in a single column: 120-420mm
- the boxes can leave the automated storage system
- the possibility to use own boxes
- the number of transfer areas as needed
- robot load capacity up to 30kg





CERTIFICATE

IDEA STORAGE SERVICES s. r. o.

confirms that 4IGV s. r. o., Czech Republic

demonstrates the competence to provide consultation, installation and support services for IDEA STORAGE SERVICES, as well as a commitment to further education, and is therefore certified as an IDEA STORAGE SERVICES SYSTEM INTEGRATOR for the year 2024.

Release date: December 1, 2023

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JUDr. Rudolf Blažek CEO



AUTOMATED PALLET STACKER FOR PALLET EFFECTIVE FLOW

We offer the separate automated pallet stacker units that automate handling empty pallets at the floor level. This significantly streamlines the entire stacking and unloading procedure and, at the same time, protects employees from health risks related to manual lifting of heavy objects. Moreover, the pallets are inserted and removed from the lower level which enables the automated vehicle (or the operator-controlled one) that with an operator) not to waste time with lifting the forks.



• Capacity 15 or 25 pallets

(this comprises a wide range of pallets: all wooden, plastic and metal four-way pallets, no matter their dimensions).

- Either fully automated or semi-automated stacking and unloading procedure.
- Insertion or removing pallets using the stacking vehicle, forklift vehicle, AMR or
- IGV (1–5 pallet, 1+1 pallet two in a row according to the stacker type).
- It requires 230V power supply.
- It works entirely on alternate current or compressed air.
- The stackers powered by alternate current are also suitable for handling pallets in cold storages with a temperature of **up to -25°C**.
- It also uses the photo sensors for detection.
- The interface with the touch screen enables switching among the stacking and unloading modes.
- The feature is capable of setting:
 - removing stack of 15-25 pallets is inserted into the stacker and afterwards they are fully automatically removed,
 stacking one pallet after another is inserted into the stacker, 15-25 pallets are automatically stacked and the entire stack can then be unloaded.

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OUR UP-TO-DATE TECHNOLOGY REPRESENT OUR ADVANTAGE



3 STEPS TO DYNAMIC PRODUCTION AND LOGISTICAS

 Are you looking for a solution to effectively digitalize your production and logistic processes?

• Would you like to get the most out of your human resources and be ready to transform into a full automation?

 Cooperate with us. Cooperation with a wide portfolio of our expert partners will allow us to prepare a solution which will really help you increase logistic and production efficiency and in the end it will bring savinas!



The current state analysis by DMAIC method

We shall analyse the current state of your company by DMAIC method according to your needs.

• DEFINE

We shall define the process critical areas (KPI's, COPQ, Costs, Losses, Process Flow, VSM, etc.) based on the available data and information. The output report comprises the rough draft of problem solution.

• MEASURE

This phase includes the team defined by partners and our experts, who will carry out detailed data collection for rootcause analysis, process measurements and will prepare the actual VSM and other support steps.

ANALYSE

All available data then undergo analysis along with preparation of optimal solution. The output VSM includes the future and calculated potential improvements of processes - Calculation of investment and return.

IMPROVE

We shall analyse the time requirement and cost of implementation on the hardware and software side (connection to enterprise software and infrastructure).

CONTROL

We shall verify both correctness and process management from the point of view of comparing the input requirements.



Dynamic material flow draft and solution development

To prepare the analyse, we shall propose a solution to meet your requirements, including critical processes improvement in regards to the difficulty and return of investment and, above all, the possibility of expanding the entire solution.











shelf towers

Autonomous robot RoboMelkus

E-ink digital displays

Indoor localization



ρ-ΚΔΝΒΔΝ



Autonomous warehouse system



"Turnkey" project implementation

Thanks to experience, we can offer the best conditions for delivering the entire project to our clients. This means, that we shall analyse a complete order, design or develop, install and implement the whole solution, which also includes follow-up service.



CASE STUDIES



AGILOX AUTONOMOUS TECHNOLOGY **ALSO IMPLEMENTED IN VITESCO TECHNOLOGIES CZECH REPUBLIC**

Lean logistics has become a trend having the elements which the production companies are trying to implement into their own operations when needing to save space. Automation interferes with this in a significant way. In Vitesco Technologies Czech Republic, Trutnov, they have implemented the autonomous handling technology. In the company, they are planning a number of other system solutions in the field of storage and transport. For instance, automatic scanning of goods immediately upon receipt has been one of the plans.

IN GREINER PACKAGING. THE AGILOX VEHICLES MAXIMIZED EFFECTIVITY AND SIGNIFICANT SAVINGS

In Greiner Packaging, Louka u Litvínova, where plastic packaging, mainly crucibles for food industry are produced using K1 technology, they focus on intralogistics and process automation. The implementation of four fully automated Agilox vehicles by 4IGV has been one of the last projects bringing the significant savings.



THE FULL SCOPE ARTICLE



THE AUTONOUS VEHICLES **IMPLEMENTED IN THE DATART** LOGISCIC CENTRE, JIRNY

The Agilox vehicles by 4IGV are currently being put into service in the DATART logistic centre, Jirny, driven by HP TRONIC, Zlín. This system-controlled handling technology in DC6 production facility helps increase effectiveness and safety as part of warehouse operations of different vendors belonging to HP TRONIC Zlín. Specifically, the shipments to DATART and ETA network have been shipped from this distribution centre.

"Must have"





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