



KINEXON

INTRALOGISTICS GUIDE

Transform and Scale Your Fleet with Unified Communication Standards

The Benefits of VDA5050-Powered
Fleet Management and a List of
Compatible Robots

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Combining AMR and AGV systems of different types and from various manufacturers is a common practice in intralogistics. However, this not only creates opportunities but also challenges. Due to a lack of interoperability between systems, these are often managed manually or integrated with a high level of development effort to automate processes. The VDA5050 standard is designed to resolve this issue by laying the foundations for greater interoperability and composability in hybrid fleets. In addition, vendor-independent solutions, such as the Fleet Manager from KINEXON, simplify centralized control and orchestration. Last but not least, AI-enabled analytics allows huge amounts of operating data to be analyzed in real time and provide valuable insights.

This white paper aims to provide a compact overview of these aspects to support intralogistics professionals starting or enhancing their hybrid AMR and AGV systems.



Introduction

Running a Hybrid Fleet in Intralogistics



Automation on the Rise

The shift from manual to automated processes has become a global trend in the dynamic field of intralogistics. This development is driven by the quest for greater efficiency, safety and cost effectiveness in warehouse and distribution centers. At a technical level, the seamless integration of different AMR and AGV systems becomes more and more important.



Aligning Hybrid Solutions

Automation in intralogistics requires systems from different types and manufacturers to be seamlessly integrated, as in most cases not all use cases or customer requirements for mobile robots can be served by one single vendor. In contrast to single-source solutions, this often entails a hybrid approach that combines the strengths of various technologies. Composable solutions, which can be flexibly orchestrated according to individual needs, provide the foundation for this.





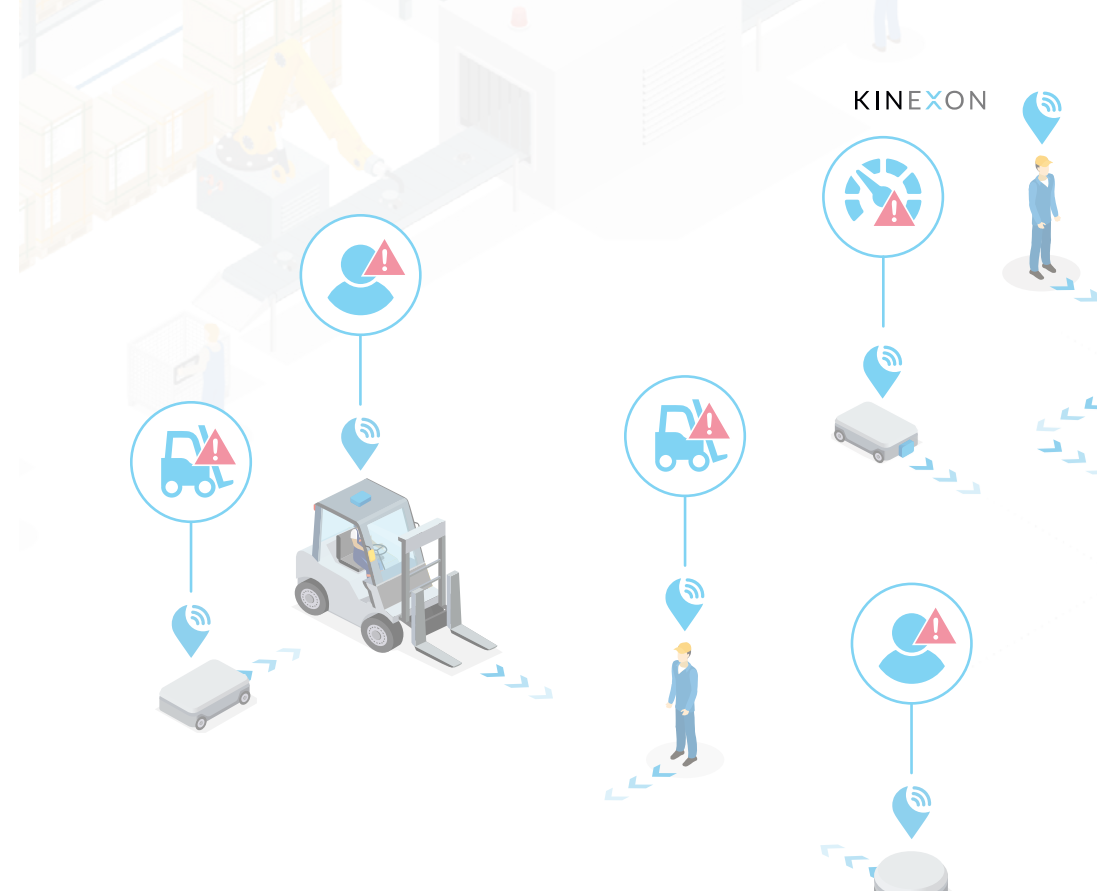
Interoperability Is Key

Interoperability between different ecosystems is crucial for sustainable, end-to-end automation. Maximum efficiency, safety and reliability in intralogistics can only be achieved if AMR and AGV systems are managed centrally and communicate in real time. Plus: Interoperability enables businesses to innovate much faster and more efficiently.



Rethink Fleet Management

As modern intralogistics becomes increasingly complex and extensive, the manual management of different systems reaches its limits. With an integrated, scalable and vendor-independent approach to fleet management, businesses will be able to align technologies of different types and manufacturers to boost productivity and safety.



Key Takeaways

- Quest for greater efficiency, safety and cost effectiveness is driving automation.
- Automation requires seamless integration of hybrid AMR and AGV fleets.
- Interoperability is crucial for the seamless interaction of different ecosystems.
- Future-proof fleet management is integrated, scalable and vendor-agnostic.

The Challenge

Orchestrating AMR and AGV Systems from Different Manufacturers



Downsides of Manual Processes

Manual control of vehicles and robots is still common practice in intralogistics. However, as the number of moving units on the shop floor grows, this approach reaches its limits. The effort and risk associated with human failure rises, as does the need for fleet management automation. This presupposes different systems seamlessly working together.



Silos of Proprietary Systems

In practice, each AMR and AGV system comes with its own proprietary control system and infrastructure. Proprietary standards create silos that make interoperability between fleets from different manufacturers difficult or even impossible. In many cases, the seamless integration and alignment of different fleets involves a great deal of customisation.





Bridging the Interoperability Gap

Many manufacturers have recognised the problem of proprietary siloing and are seeking improved interoperability with third-party systems. However, even if AMR and AGV systems offer standard interfaces (APIs), bridging the gap is often associated with a high level of integration effort in order to establish coherent workflows and data exchange mechanisms.



Higher Operating Costs

Aligning AMR and AGV systems of different types and manufacturers is much more than a one-off project. Recurring adjustments and changes to software and infrastructure may be necessary to ensure continuous interoperability of the systems involved. This can result in additional efforts that are difficult to calculate and increase the total cost of ownership.

Key Takeaways

- Manual processes reach their limits with increasing complexity in intralogistics.
- Proprietary systems complicate seamless integration of hybrid AMR and AGV fleets.
- Bridging the gap is often associated with a high level of integration effort.
- Aligning hybrid fleets can entail ongoing customisation and change efforts.

The Solution

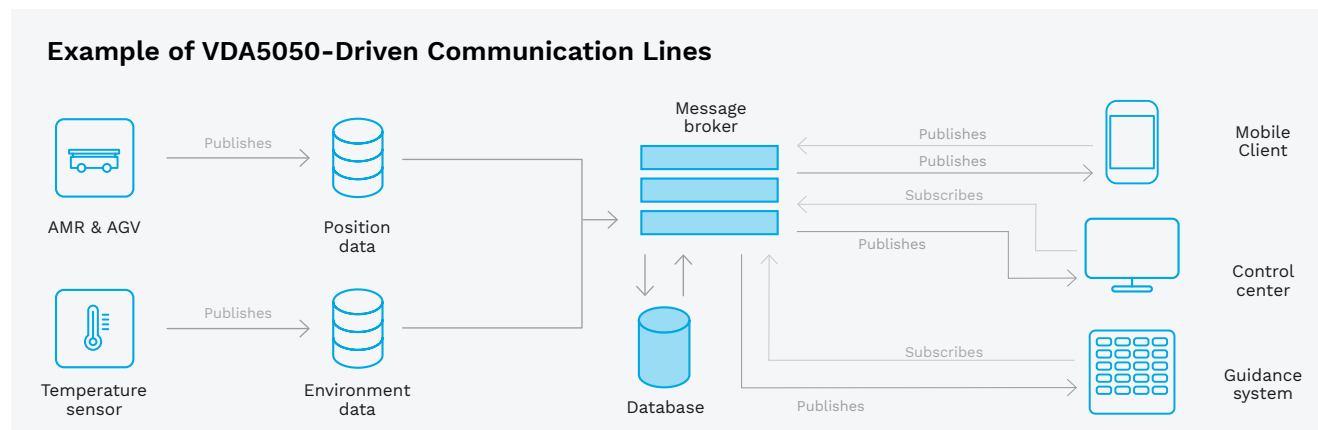
Centralizing Fleet Management, Orchestration, Integration and Automation

VDA5050: Communication Standard for Hybrid Systems

VDA5050 is a common communication standard designed to bridge the gap between ecosystems from different manufacturers. It provides the technical foundation for centralized traffic management for different types of AMR and AGV systems and the fast, efficient onboarding of new mobile units on the shop floor.

Benefits of the VDA5050:

- Easily integrate new vehicles and robots into an existing control center instead of tedious integration. Adding mobile robots to a fleet becomes a matter of configuration.
- Simplify the integration of new AMRs and AGVs into an existing (hybrid) fleet.
- Enable parallel operation of systems from different manufacturers in one environment.



Good to know

VDA5050 follows the pull principle. This means that the involved systems are not “on hold” until they are instructed to perform an action. Instead, they have to request, process and execute valid topic actions themselves. AMRs and AGVs that operate on a push principle must be modified accordingly in order to support the VDA5050 standard.

Fleet Management: Centralized Control and Orchestration

Modern AGV & AMR fleet management systems provide businesses with centralized control for effective real-time coordination and orchestration of fleet operations with single or multiple asset types. These fleet management systems operate fully vendor-agnostic and support industry standards such as VDA5050. They are the core of hybrid intralogistics fleets.

Checklist: Key requirements for hybrid fleet management systems

- ✓ **Interoperability:** Support the interaction of a wide range of AMRs and AGVs, regardless of their type or manufacturer. Communicate effectively with different systems via VDA5050 or other industry standard interfaces.
- ✓ **Flexibility:** Host different types of vehicles and robots with different capabilities, sizes and functions. Customisable and configurable to adapt to specific operational requirements and environments.
- ✓ **Scalability:** Fleets can grow in size and complexity without compromising performance or efficiency. System supports seamless integration of new robots and additional features or functionalities as required.
- ✓ **Centralized control:** Simplifies management tasks and provides a comprehensive overview of the entire fleet. Enables real-time monitoring, status updates and remote control of individual robots or groups of robots.
- ✓ **Integration with existing systems:** Seamlessly integrate with existing WMS and ERP systems as well as other components of the system landscape. This enables data to be shared and workflows to be harmonized.
- ✓ **Analytics and reporting:** Deliver real-time insights into the performance, productivity and efficiency of the entire fleet. Provide detailed metrics, analytics dashboards and customisable reports to identify areas for improvement and make informed decisions.
- ✓ **Security and reliability:** User authentication, data encryption and access controls help to protect sensitive information. Built-in redundancy and failover mechanisms ensure seamless operation.



Good to know

Next generation systems such as KINEXON's AMR & AGV Fleet Management solution fully meet these requirements by providing an open, vendor-agnostic and highly scalable platform. Supporting the VDA5050 standard, KINEXON lays the foundation for future-proof composable fleet management. Find out more about it below or at kinexon.com.

AI-powered Analytics: Cross-system Process Automation

Generative AI and Large Language Models (LLMs) such as ChatGPT become an integral feature of fleet and workflow management in modern intralogistics. Utilizing these technologies in combination with structured location and operational data takes the management and automation of mixed AGV & AMR fleets to the next level.

How AI-driven analytics is driving cross-system process automation



Provide unified data insights: Pool data from different AGV and AMR systems on one central fleet management platform, analyze it in real time and provide comprehensive insights into shop floor traffic.



Reduce manual processes: Automate repetitive tasks and analyses, reducing the need for manual intervention in system analysis and control. This streamlines workflows and increases efficiency and process quality.



Continuous optimisation: Ongoing data analysis to identify patterns, detect anomalies and optimize operations in real time. This iterative approach enables automated systems to respond to changing dynamics and business requirements.



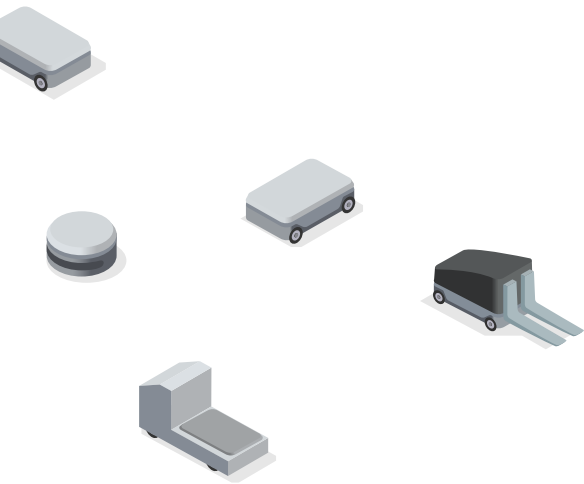
Increase operational efficiency: Enabling organizations to optimize cross-system processes in intralogistics, reduce friction and the need for human intervention to achieve better business results.

Key Takeaways

- The VDA5050 industry standard ensures interoperability in hybrid fleets.
- Modern fleet management systems enable centralized control and orchestration.
- AI-driven analytics makes cross-system automation smarter and more efficient.
- Manufacturers adopt the VDA5050 standard to make their systems interoperable.

VDA5050-Compatible Robots: A Market Overview

How do you find the right systems for a hybrid fleet? The good news is that more and more manufacturers are adopting the VDA5050 standard to make their AMR and AGV systems interoperable. The overview below provides all systems that can be smoothly integrated into hybrid fleets, centrally controlled by fleet managing systems like KINEXON.



Vendor	VDA5050-ready models
Addverb Technologies	DYNAMO 100 DYNAMO 200 DYNAMO 500 DYNAMO 1000 DYNAMO 2500 Veloce Zippy 6 Zippy 10 Zippy 25 Zippy 40 Zippy Tug Zippy X
AIUT (Aformic)	FL0-15 FL0-15-S FP8-10 FP3-2 FP9-8 FP16-10 FP18-20 FP23-55
Artisteril	AMR ROTATIONAL
Bär Automation	ConTrax Mobile Robot 4.0 FiFi Mobile AGV Platform

Vendor	VDA5050-ready models
Bosch	Rexroth Active Shuttle
Continental	AMR IL 1200
DS Automotion	AMADEUS AMADEUS low AMADEUS wide AMADEUS grip AMADEUS counter ARNY ARNY HD CONVEYOR CONVEYOR double FLEXIHAULER LUCY OSCAR OSCAR omni SALLY SALLY courier
EK Robotics	COMPACT MOVE FAST MOVE HEAVY MOVE MEDI MOVE

Vendor	VDA5050-ready models
EK Robotics	SMART MOVE VARIO MOVE X MOVE
Grenzebach	L600 L1200S FF1200S
Idealworks	iw.hub
Jungheinrich	arculee M arculee S ERC 213a/217a EKS 215a EZS 350a EKX 514a/516ka/516a ERE 225a
Kivnon	K03 Twister K05 Twister K10 One-Way K10HP One-Way K11 Two-Way K11HP Two-Way K10P One-Way

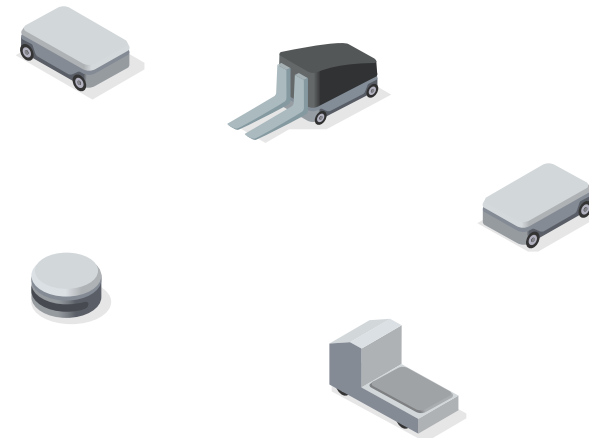
Vendor	VDA5050-ready models
Kivnon	K11P Two-Way K32 Tractor K41 Omnidirectional K55 Pallet Mover K55A Pallet Mover
Knapp	Open Shuttle 50 Open Shuttle 100 Open Shuttle Electronics Open Shuttle Fork
Magazino	SOTO TORU
MIR Mobile Industrial Robots	MiR250 MiR600 MiR1200 Pallet Jack MiR1350
MLR System	AGV Heavy Duty AGVi AGVii Caesar Series Caesar Heavy Duty

Vendor	VDA5050-ready models
MLR System	Mayestro Series Phoenix Series
NOVUS HI-TECH	NOVUS Carry Series NOVUS P-MOVER (ABOPT) STACKER
Omron	HD-1500 Series LD-60/90 Series LD-250 Series MD Series
Safelog	AGV L2 AGV M4 AGV M4-C AGV S3 AGV X1 1500 AGV X1 tt
Seegrid	Palion Lift CR1 Palion Lift RS1 Palion Pallet Truck Palion Tow Tractor
SEW Eurodrive	MAXOLUTION Series

Vendor	VDA5050-ready models
Sherpa Mobile Robotics	SHERPA-B SHERPA-D SHERPA-F SHERPA-P
SSI Schäfer	Weasel Weasel Lite
Stäubli	FL1500 MRS90 PF3 PF3 OMNI PF6 PF10 PF30 PF80
Still	EXV 14-20 iGo FM-X iGo LTX 50 iGo MX-X iGo OPX 20-25 iGo neo OPX-L 12 iGo neo OPX-L 20 iGo neo

Vendor	VDA5050-ready models
Still	OPX-L 20 S iGo neo
Symovo	move-one
Versa Box	VERSABOT 500 VERSABOT 1500

This information is without guarantee.
Please contact the vendors for detailed information.



About KINEXON

Next Level Hybrid and AI-Supported Fleet Management

KINEXON provides the leading AI-powered IIoT platform for businesses to connect and automate operations in manufacturing and logistics. With a strong focus on multi-vendor AMR and AGV fleet management; KINEXON offers a vendor-agnostic and AI-supported solution that enables leading companies to integrate and manage robots from different manufacturers seamlessly with an out of the box integration.

KINEXON's AMR & AGV Fleet Management solution provides a unified interface for managing, monitoring, and controlling various robots in real-time. This allows users to optimize their mobile robot fleet by selecting the most suitable robots for each task, regardless of the manufacturer. In addition, KINEXON supports the VDA5050 standard, ensuring interoperability between different robotic systems.

By following a LowCode/NoCode approach, traditional coding barriers are eliminated, empowering users to rapidly translate concepts into reality. This fosters a culture of innovation and accelerates solution adoption - The next level of hybrid fleet management for intralogistics.

KINEXON has demonstrated impressive achievements with Continental, including a strong ROI of over 250% within less than 5 years. The systems facilitate high-volume production, processing over 350,000 orders annually per site. Additionally, our solutions ensure a fast payback, with an average break-even achieved in less than 2 years.



+20 Market-Leading AMR & AGV Integrations



SAP® Endorsed App
Premium Certified

KINEXON

As global technology leader in indoor location services KINEXON's real-time locating system and AMR & AGV Fleet Management offer solutions across automotive, manufacturing, and aerospace sectors to achieve real-time visibility and traceability of moving assets, along with actionable insights to drive automation.

Leading customers such as BMW, SIEMENS, Airbus, Continental, or MTU Aero Engines utilize KINEXON's solutions to digitize and orchestrate physical processes, thereby enhancing efficiency, productivity, and quality while preparing for AI-supported operations.

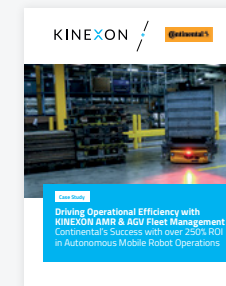
Headquartered in Munich, Germany, with another office in Chicago, USA, over 250 employees drive innovation in the IoT landscape. For more information, visit www.kinexon.com.

Are you ready to automate your operations?
Talk to one of our Master of Robots.

Schedule a Meeting

Learn more about how KINEXON is driving operational efficiency at Continental and explore Continental's success with over 250% in AMR operations in just 5 years.

Read the Case Study



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