

making complexity simple

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Intelligence.

world
of solutions

Intelligence.



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Intelligence

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Dear ladies and gentlemen,
dear valued KNAPP partners,

it is unfortunate that we could not hold our annual *MOVE* event for customers as planned in our new KNAPP Innovation Center in Hart bei Graz this year. The current circumstances meant that we all had to avoid personal contact as best possible, but we sincerely hope that we could reach you with our online *MOVE* and the virtual tour through our showroom. If you haven't had the chance to take the tour, please contact your representative, as the presentations and tours can also be "streamed" in the coming weeks.

The events focussed on the challenges presented by the new urban supply chains, especially with respect to flexibilization, unceasing optimization and the interplay between different steps of the supply chain.

What we can do to help you keep improving your competitiveness is summarized under the term *KNAPP INTELLIGENCE*, which encompasses:

Process and control software, the flexible OSR Shuttle™ Evo 1D or 2D shuttles, new sorting and sequencing systems such as the pocket sorter system with automatic loading and unloading, the swarm intelligence of our Open Shuttles and on to the most innovative robot systems that function with networked machine intelligence. In addition, KiSoft Analytics and redPILOT offer ongoing optimization through dynamic scenarios that not only optimize your systems, but also employee scheduling – in both peak and off-peak periods. Absolutely error-free processes, thanks to Smartdesk, and absolutely faultless maintenance, thanks to Assist, and many more solutions for quality assurance represent essential building blocks for success.

We very much hope to be at your side as your partner for future projects ranging from the optimization of your existing infrastructure to new investments and software.

Cordially,
Gerald Hofer

Innovation is in our company DNA.

Innovation and technological leadership are the most important cornerstones of our success. We are investing heavily to monitor technologies and advance pilot projects with potentially disruptive technologies. As a KNAPP customer, you can be certain that you will get the latest and most suitable solutions.

Find out more



800
Employees in
research and development

In the research and development at KNAPP, around **800 employees** worked on new and further developments in the past fiscal year.

56 Mio. €
Spending
for innovation

In the past fiscal year, **5 percent** of the turnover – around **56 million euros** – was invested in research and development throughout the group.

509
Patents

The KNAPP group owns **509 active proprietary rights patents** and industrial designs.

Milestones since 1952

Everything started as a rather small affair: In the basement of founder Günter Knapp's home and with two employees. Günter Knapp developed a range of different innovations there, including the first picking machine for pharmaceutical wholesalers. Many things have happened since then, but two things have remained: The drive to grow and develop continuously and the enthusiasm for innovative technologies.

The biggest drivers of innovation in logistics



Urbanization



Scarcity of resources



Digital revolution



Globalization 2.0 and market volatility



Demographic and social change

1952

First patent for an oil burner

1960

The first picking machine for pharmaceutical wholesale

1970

The first IT control system

1980

The central belt system revolutionizes pharmaceutical wholesale

1990

Focus on software with innovations in electronics and IT

2000

The first picking robot for pharmacies

2002

Simple and ingenious: The first shuttle system

2010

Intelligent image processing for full control

2012

High-performance dispensing machine for mail-order pharmacy in the U.S.

2016

Pick-it-Easy Robot: The industry-compatible robot using artificial intelligence

2017

The OSR Shuttle™ Evo combines the advantages of all previous shuttle generations

2019

All information at a glance with KiSoft Analytics

2020

KNAPP Intelligence: The intelligent networking of information, systems and people

2021

New Urban Logistics: Ensures rapid supply for everyday life



The right decisions at your fingertips

4 Software tools for optimizing your logistics

In today's world, everything relies on information and this is of course equally true in logistics. Ours is a digital world: Every tiny sensor, every machine and even every human being is generating a plethora of data just waiting to be transformed into useful information and facts. At KNAPP, this is the reason why we are banking on comprehensive, fully integrated software solutions that not only run the systems, but also make intelligent maintenance and forward planning possible. Which software is suited to whom and for which application? Let's take an in-depth look at four of our software tools.



KiSoft Analytics

Making the right decisions for systems and supply chains

KiSoft Analytics is a versatile analysis tool, specially tailored for logistics. The application provides critical business information for executives, logistics managers, supply chain managers and operations teams. KiSoft Analytics gives these users a clear overview of the complex processes in the system as well as the overall supply chain. In doing so, KiSoft Analytics connects real-time data with logistics processes. All the information is provided in clear, concise dashboards, providing the help needed to make the right decisions: tactical in the short run, strategic in the long run.

- *When is the right time to conduct proactive maintenance in a system area?*
- *How can you optimize your warehouse workload?*
- *How well did the last peak go, and what can you learn from it for the next peak?*
- *When is the ideal time to start a new business model such as micro-fulfillment?*

Good to know

Even with all this useful information, people always play a significant role. Our logistics experts give you the support you need to make the right decisions, based on solid information provided by KiSoft Analytics.

Name	KiSoft Analytics
Level	Strategic tool
Function	Analyzes and visualizes
Ideal for	Executives, logistics managers, supply chain managers, operations teams
Information	Dashboards, long-term statistics, prognoses, benchmarking
Application	Mobile app, desktop
Advantage	With a clear overview of complex processes in the supply chain, you can identify changes in business early on and take specific actions based on the relevant information

Multi-Site Control Center

Intelligent 24/7 service for micro-fulfillment centers

The Multi-Site Control Center (MSCC) is an optimal control system for food retailers having several small systems at different locations – the so-called micro-fulfillment centers (MFC). The preventative, proactive solution checks all logistical and technical processes around the clock. This software solution is especially valuable for retailers with MFC concepts who have no infrastructure of their own and who cannot provide this type of support in their own control rooms.

Our team keeps an eye on all the warehouse locations. With the intelligent tool MSCC, our experts are able to control all processes, while detecting and correcting disruptions early on. If an error occurs that cannot be rectified remotely, the on-site technician is assigned the task. Specific directions are provided to the technician via video call.

All the KNAPP systems as well as the various customer systems are integrated into the Multi-Site Control Center. We check the software as well as the hardware. Specially developed index numbers (KPIs) continually provide real-time information on the condition of the system. This includes the following:

- *Transit times of customer orders*
- *Number of customer orders*
- *Picking performance*

Name	Multi-Site Control Center (MSCC)
Level	Strategic and operative service
Function	Proactive remote control center – to monitor, analyze and assist
Ideal for	Food retailers with MFC concepts
Information	Status information regarding the system condition. Communication on any incidents as well as on preventative measures.
Application	Remote support; information provided by telephone or email; proactive and preventative monitoring and troubleshooting
Advantage	24/7 monitoring of the system condition by experts; clear overview of all technical and logistical processes; dashboards, KPIs, long-term statistics and prognoses.

ivii.smartdesk

Digitalizing manual work steps in production.

Many manufacturing companies today are facing questions such as: *As a company, how can we retain the knowledge that our experienced employees have? How can we prevail when facing a shortage of qualified personnel? What can we do to prevent errors in the assembly processes, when customization keeps bumping up the number of parts?*

The answer: ivii.smartdesk. First, employees get specific feedback that makes their work easier and raises the quality. Second, the ivii. smartdesk provides production and supply chain managers with important information including optimized planning for purchasing and stock management.

Helpful tool for production workers and managers

The ivii.smartdesk is all about increased efficiency and error prevention. Modern image recognition and processing technologies check each work step, give real-time feedback, for example, if the wrong part is used during assembly, only allowing the next work step to be taken when the previous step is completed without error. The ivii.smartdesk therefore facilitates error-free assembly as well as seamless traceability. What's more, the ivii.smartdesk digitizes all the work steps in the assembly process, making them measurable. This provides important information to decision makers.

Name	ivii.smartdesk
Level	Optimized workflows
Function	Supports work process and planning for production
Ideal for	Logistics managers, supply chain managers, production managers
Information	Data for production planning, purchasing and parts supply; performance data, long-term statistics
Application	Desktop
Advantage	Reduces costs; increases quality and performance

redPILOT

Automatic suggestions for the best possible alternative action

The redPILOT Operational Excellence Solution is a modular software solution that helps logistics companies run their logistics systems optimally throughout every hour of operation. There are numerous applications in sustainable resource management. On the one hand, the software module CMMS (short for Computerized MAINTENANCE Management System) supports structured and scheduled maintenance measures in technical system operation. On the other hand, the additional modules PLANNER, OPTIMIZER, and IMPROVER enhance system operations, including automated staff scheduling and optimizations based on dynamic bottleneck detection.

Clever alternatives increase performance

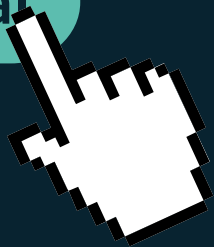
The performance of the overall system is often throttled by one or more components, creating a bottleneck. To solve this problem, redPILOT has developed an intelligent algorithm that can detect such inefficiencies. The system not only prepares data, it can compute the best possible scenario, and then adjust it when changes take place – just like a navigation system. If the goal is planned, a suitable route will be found. If the traffic situation changes or, in our case, the logistic parameters, the intelligent tool provides those responsible with an alternative action to take. All the data is saved for future planning, which means that with every hour of operation, the system is learning. This know-how allows companies to adjust to changes early on: System performance is increased.

Name	redPILOT Operational Excellence OPTIMIZER
Level	Operational tool
Function	Optimization
Ideal for	Planners, team leaders, on-site managers
Information	Alternative actions, raising efficiency
Application	Desktop
Advantage	Shows where the bottlenecks and excess capacities are. Suggests alternative actions, so inefficiencies can be quickly ironed out. Raises the performance of the overall system.

Your Ticket to Digital Transformation

Digital transformation at its core involves digitizing analog contents and digitalizing work processes. Today, digital transformation is often seen as an opportunity, but also poses tremendous challenges to companies and society. For many people, the digital world is already an integral part of their lives, like an ever-present invisible net. Many companies have already digitalized their processes and successfully completed their first digitalization projects. For KNAPP, digitization and digitalization are more than just buzzwords, they constitute central elements in our concepts.

go digital



Digital transformation as a chance for SMEs

For small and medium-sized enterprises (SMEs) in particular, it may be difficult to almost impossible to get a grip on digitization and digitalization. KNAPP has understood SMEs' need for digital transformation and provides the opportunity for them to get started with the DIGITAL2GO platform.

What is DIGITAL2GO?

DIGITAL2GO is a smart online platform for high tech products and represents the shortest path between technology manufacturers and business customers into digitization. The platform offers stand-alone tools that simplify digital transformation and its processes. Using a configurator, the plug-and-play technologies can be customised to suit the needs of your particular company.

A helpdesk is also available to provide support for any questions you might have. This way, you can use the best from both the digital and analog world. If you are interested in finding out more, we regularly publish online posts to provide inspiration on your own digital transformation.

MultiScan, a product scanner for master data acquisition



ivii.photostation, a system for digital photo documentation



High-Tech IoT Device for Productivity Analysis of Industrial Trucks





Good to know

Würth offers more than 125,000 articles ranging from fastening materials and tools to chemical-technical products and protective clothing. The company supplies around 55,000 customers including craftsmen's workshops and industrial enterprises which are supported by over 500 sales representatives. The extensive portfolio is available in over 55 Würth stores throughout Austria as well as on the company's online shop. Würth Austria, founded 1962 in Vienna, was the company's second foreign subsidiary. In 1999, the company headquarters was moved to Böheimkirchen in Austria. The company has around 900 employees and achieved an annual turnover of 220 million euros in business year 2019.

Innovative. Intelligent. Expandable.

A modern solution for future growth at Würth Austria

Working with our long-standing partner, Würth, we expanded the existing logistics center at the Böheimkirchen location. This resulted in a modern, innovative solution, with the goal of perfecting the processes and providing customers with the highest quality and best service.

Würth's steady growth at the Böheimkirchen location completely exhausted the existing warehouse storage capacities. Together, we created the necessary conditions that would enable Würth to offer their customers the best possible service in the future. Würth stores across Austria are now supplied with goods from the modernized logistics center within a very short time. Thanks to the intelligent solution, orders are processed more efficiently and productively and are delivered to the customers within a day. About 600,000 shipments leave the distribution center each year.



Productivity

More automation means greater productivity. Thanks to fully and semi-automatic warehouse processes, orders are processed quickly and efficiently over the long run with consistently high quality. The new technologies ideally support the employees in their daily work.



Innovation

It takes innovative solutions to be prepared for changing customer needs and market requirements. New logistics concepts with intelligent automation solutions strengthen the company's position in the market and are necessary for the strategic advancement of the company's logistics.



Ergonomics

Innovative technologies and automated processes support the employees in their everyday work. The ideal ergonomic working conditions and a pleasant work environment raises the employees' motivation and satisfaction. Strenuous and monotonous tasks are taken over by robots so that employees can concentrate on value-adding tasks.

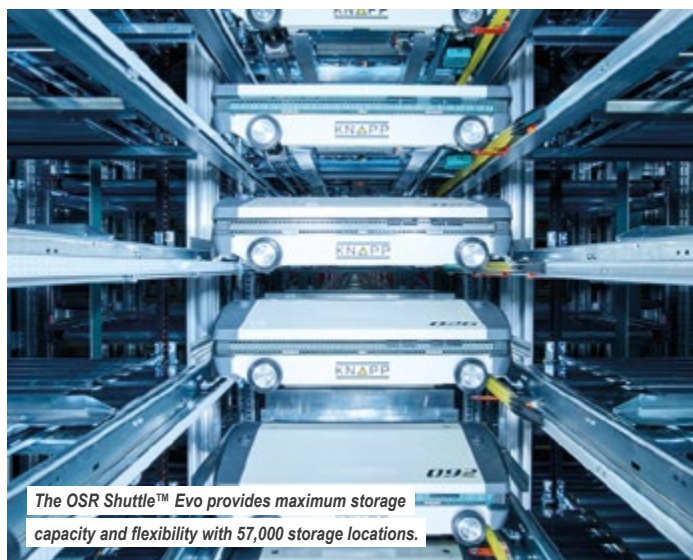


Forward-looking

Würth is well-prepared for future growth thanks to the expansion of the logistics solution. The concept is designed so that size and performance can be flexibly scaled.



Employees repack goods intended for storage in the OSR Shuttle™ Evo into storage containers.



The OSR Shuttle™ Evo provides maximum storage capacity and flexibility with 57,000 storage locations.



Employees pick customer orders at six ergonomically designed Pick-it-Easy work stations.

The solution

Goods-in. Decanting. Order start.

In decanting, the delivered items are separated and repacked. The containers then move on towards the OSR Shuttle™ Evo where they are stored until needed for further processing.

When a customer order comes in, the dispatch cartons are prepared automatically by a carton erector. The machine prepares cartons in two sizes, for different sizes of orders. Deliveries made internally to Würth are made in reusable containers. They are erected automatically during order start and fed into the system. Every carton or container receives a label, allocating it perfectly to an order. This is not only necessary for transport through the warehouse, but also for all other processes in the warehouse.

Picking

Our latest shuttle generation, OSR Shuttle™ Evo and the innovative Pick-it-Easy Evo work station combine maximum efficiency and productivity in an ergonomic design.

OSR Shuttle™ Evo: Efficient processes thanks to dynamic storage

Our OSR Shuttle™ Evo supplies the connected work stations with goods just in time. Every work station has access to every item in the system. Available space is optimally used thanks to the flexible rack system and streamlined design. Our shuttle system is also designed with future expansion in mind: The number of shuttles and lifts can be scaled to adjust the performance of the system.

With three rack line systems across 41 levels, our shuttle system can store about 57,000 cartons and containers. Not only are storage containers held in the system, dispatch cartons also find a temporary home there. More than 100 shuttles bring containers and cartons to wherever they are needed in the moment. The OSR Shuttle™ Evo flexibly supplies the connected work stations and dispatch robot with sequenced load units.

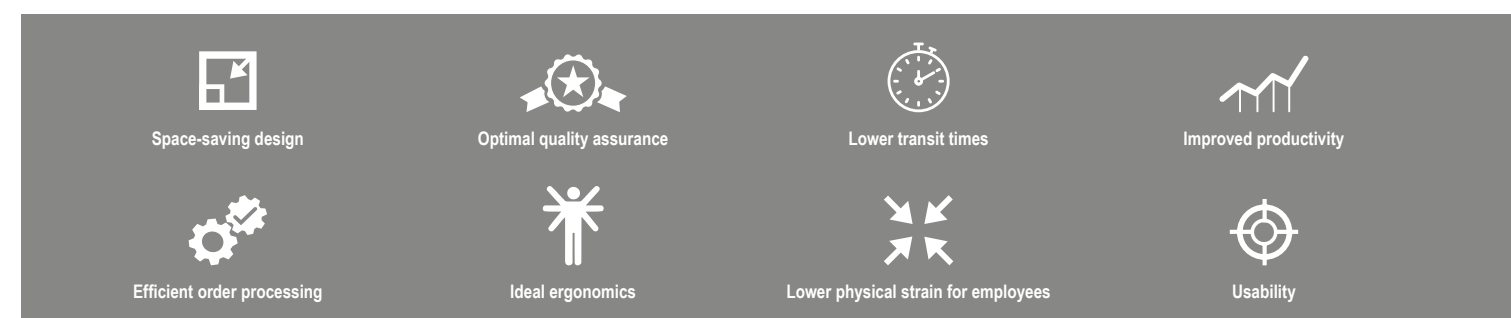
The right retrieval sequence is crucial for picking and dispatch. Our KiSoft software, using the data from the orders, sends containers and cartons to picking or dispatch in just the right sequence. Dispatch processes are supported by our powerful Streamline conveyors.

Pick-it-Easy Evo: Ergonomic design and pleasant working conditions

Customer orders are prepared at one of six Pick-it-Easy Evo work stations. LED displays and touch screens with intuitive easyUse interfaces and add-ons for quality assurance create a one-of-a-kind user experience. KNAPP designed the work stations with the customer's specific processes in mind. From the OSR Shuttle™ Evo, goods are conveyed directly to the employee, automatically and in the right sequence.

For many years, KNAPP has been our go-to partner when it comes to new logistics solutions. The expansion was necessary because after 20 years it was time for us to move forward. Our existing capacities were insufficient and we had exhausted our resources. Working with KNAPP, we were able to develop a future-proof solution. This solution allows us to organize our orders more efficiently and productively, which is why we are now well prepared for future requirements.

*Stefan Gugerell
Mitglied der Geschäftsleitung und Prokurist
Logistik und Innendienst bei der Würth Handelsges.m.b.H.*



The relationship between Würth and KNAPP is a constructive, goal-oriented and cooperative partnership marked by mutual trust and understanding. We work together on perfectly optimizing and refining the logistics concepts to continue to meet future requirements in the best possible way. This means that we can grow successfully together.

*Gerd Pirsterer
Head of Key Account Management Würth
bei KNAPP Systemintegration*

Quality checks. dispatch preparation

To ensure correct deliveries and happy customers, a quality check is run on the customer orders at several stations prior to dispatch. On the way towards the automatic lidding machine, each completed carton passes through the ivii.photostation. A sophisticated image recognition technology takes a snapshot of the carton content to detect whether all items are safely stowed in the carton. If not, the system diverts the orders automatically to a check station, where dunnage is added.

Our Open Shuttle also plays a central role in achieving correct delivery of the customer orders. Cartons deviating at the weight check undergo further inspection at a check station. The Open Shuttle handles this transport, freeing up the employees and reducing their workload. The free-moving robot does its job with complete autonomy.

After the quality checks, the dispatch cartons are ready to be palletized and delivered to customers. Once the delivery note is inserted automatically, the cartons are conveyed to the fully automatic lidding machines. The folding machine checks the height of the content and folds the carton mechanically to the minimum height. This adds up to significant space savings.

The last step is automatic lidding. As soon as the dispatch and dangerous goods label are applied, the carton is ready for shipping. Depending on dispatch planning, the completed carton may be buffered in the shuttle system for a while or conveyed directly to the dispatch robot.

Fully automatic palletizing. dispatch

In dispatch, two articulated arm robots palletize the cartons and reusable containers automatically. This takes a huge load off employees. Each robot works with 8 dispatch pallets and builds the pallets space-effectively and in the correct sequence. Up to 7,000 packages per hour are placed on dispatch pallets that go out to customers all across Austria.



The Open Shuttle moves to the check station autonomously.



Two robots palletize the customer orders fully automatically in the dispatch area.



Solution highlights

OSR Shuttle™ Evo

with around 57,000 storage locations for multiple-deep storage of containers and cartons, sequencing, picking and buffering dispatch cartons

6 ergonomic Pick-it-Easy Evo work stations for efficient order processing based on the goods-to-person principle

2 robots for palletizing dispatch cartons

Open Shuttle that autonomously transports cartons to the check station

ivii.photostation for quality checks and documentation of dispatch cartons



SAP® EWM by KNAPP

Efficient, flexible and future-proof storage process mapping

The increasing complexities in today's production and distribution are posing ever-increasing challenges to companies. To guarantee smooth operation despite these complexities, software is required that maps all processes in an efficient, flexible and future-proof way. We have been an SAP partner for 8 years. Since many companies rely on an end-to-end SAP® IT strategy, as an implementation partner, alongside our own logistics software KiSoft we also offer SAP® EWM to our customers.

An SAP partner since 2012

With around 100 SAP® EWM specialists working at our subsidiary KNAPP IT Solutions, we provide comprehensive services for SAP® EWM including concept creation and development, testing, start-up and support (with a 24/7 hotline) and have successfully implemented over 75 projects.

"Customers have the opportunity to do the programming and make adjustments themselves. This way, they get a comprehensive SAP® solution with less investment while having access to the intralogistics expertise of the KNAPP group. Since 80 percent of all warehouse processes in an industry are identical, proven solutions have already been preconfigured. The focus of a project then is to develop and implement the specific processes. This minimizes the implementation time as well as the project risk", says Gerald Lassau, Managing Director of KNAPP IT Solutions GmbH.

Well-oiled production supply

Mass customization and made-to-order are replacing classic serial production more and more, giving rise to complex processes and structures. Companies are realizing the significance of production intralogistics and the potential it holds for greater efficiency. In this area, a software solution that covers all the processes optimally gives a competitive advantage. This is often not the case with standard solutions. In addition, the best-of-breed approaches – where each process is supported by its own suitable software and integrated with the overall solution through interfaces – make integration difficult and are often not the ideal solution. SAP® provides a number of benefits: It features standardized software with IT modules that can be individually and transparently adapted. For example, there is a production supply module in EWM (Extended Warehouse Management) that can manage the storage and material supply in connection with the manufacturing and process orders.

"In our experience, about 70 – 80 percent of production companies are using SAP as an ERP system", says Christian Brauneis, Vice President of Industry Solutions at KNAPP.

Best practice – ENGEL Austria GmbH



ENGEL Austria, the global market leader in injection moulding machine manufacturing, installed an automated production logistics system with integrated SAP® EWM. A central shuttle warehouse was built to store small parts but also to connect the spatially separated goods-in and picking areas. Additionally, an integrated warehouse management and material flow system was implemented that would replace the control computer for the existing high-bay warehouse and seamlessly integrate the existing SAP® ERP features into the new software solution.



Your options with the SAP® EWM portfolio



Spotconsulting & Safeguarding:

Through SAP® EWM spot consulting, we help you to optimize existing or ongoing EWM implementations. And even if you are implementing your solution with another EWM partner, we can still help you with safeguarding.



Automation and integration:

We work with you in expansion projects for automation and integration in existing SAP® EWM solutions.



Template & Rollout: Working together with you, we create the template and help you roll it out internationally. You can profit from our extensive experience rolling out SAP® EWM.



Greenfield : Start a new project with us using SAP® EWM including MFS.



Retrofits: We offer retrofit projects when replacing non-SAP® WMS or WCS systems.



Quick and efficient – Healthcare Model Company

With our Healthcare Model Company, we offer preconfigured, installation-ready and end-to-end software modules that broaden the SAP standard and are tailored to the special requirements of the healthcare sector. Project management according to the SAP®ACTIVATE principle:



Realize: During this phase, we configure the software and implement developments. Using emulation and simulation models and working with our customers, we can test all the processes without a real warehouse. This minimizes the testing and ramp-up phases of the logistics system and keeps the project risk to a minimum.



Prepare: Based on our expertise and years of experience in the healthcare sector, we suggest reference processes. These include specific requirements from pre-wholesale, pharmaceutical wholesale and online pharmacies – whatever fits your business model.



Deploy & Run: During all of project management, you work closely together with our implementation team until everything is running like clockwork.



Discover: This phase lets you get acquainted with the SAP functions provided.



Explore: Using a fit-gap analysis, we determine together which processes are missing and which modules can be rounded out.



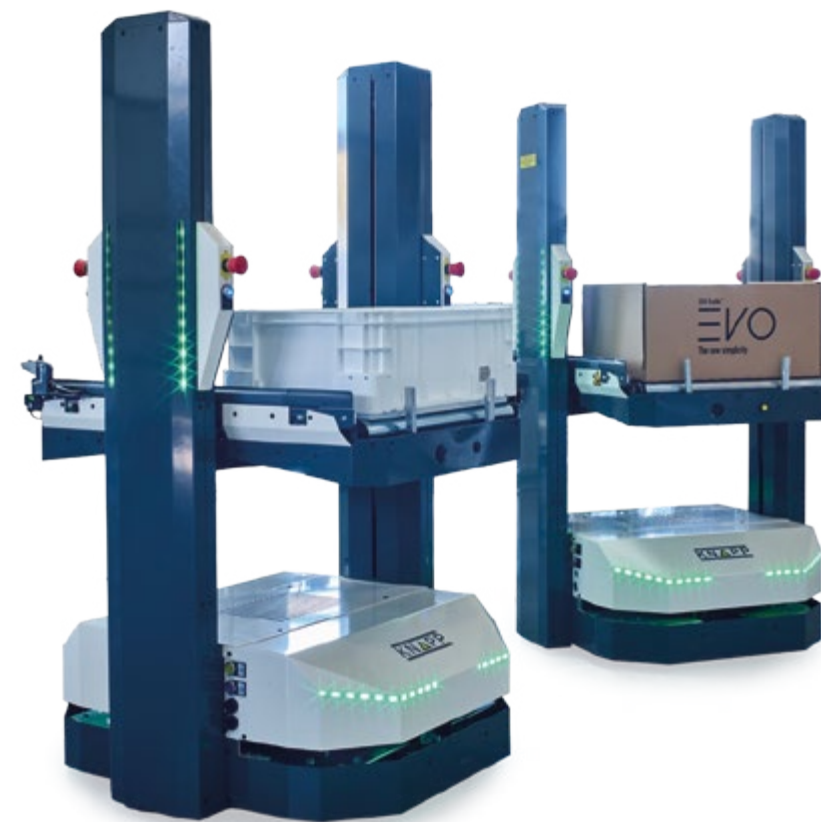
7/24 Hotline Support: After startup, our Hotline provides you with support, 24/7 in ongoing operation.

Open Shuttles increase efficiency in electronics industry

At Siemens, autonomous mobile robots link production systems flexibly and efficiently.



Perfectly organized and highly automated, the electromechanical and electronics manufacturing sector is pioneering digitalization. To gain ground in production efficiency, Siemens looked to perfecting the links between the individual production steps and optimal use of resources. Autonomous mobile robots ironed out the transport processes, increasing flexibility and efficiency. For this project, we play the role of business partner to our supplier Siemens, optimizing the transport solution at their Amberg location.



The CE certified base vehicle of the Open Shuttle and the different load-handling devices (LHD) are produced in Austria. A selection of LHDs allows the transport of containers, cartons, trays, magazines and more.

Special requirements demand flexible solutions

Pick-and-place machines are used in electronics manufacturing to place very small electronic parts onto circuit boards in a highly efficient and automated process. These parts are provided on tape reels that must be stored and supplied to the pick-and-place machines just in time. The finished printed circuit boards are stored and transported in magazines. In electromechanical production, automatic assembly machines handle the manufacturing of components such as sensors and switches. Transport tasks in these areas are extensive, including not only bringing materials to and from these areas but also transporting the semi-finished and finished pieces and empty load carriers.

In electronics manufacturing, every available surface area is used as efficiently as possible. Production lines are often re-arranged, resulting in a dynamic environment. Therefore, static conveyor lines to supply production lines are not an option. Any automated system for in-house transport must be flexible and adapt quickly to new conditions. The **Open Shuttles** are an ideal solution to these requirements.

Open Shuttle – the new flexibility

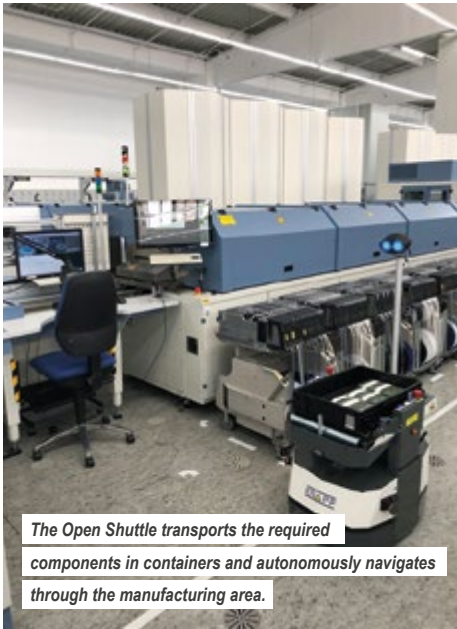
Because of their flexibility and their ability to work as an intelligent swarm, the autonomous mobile Open Shuttle robots are very handy when it comes to various production and distribution tasks. The Open Shuttles can transport a variety of small load carriers (containers, trays, electronics magazines, component rolls). They have an integrated lifter to pick up and deliver small load carriers at different heights.

The Open Shuttles don't require any artificial landmarks or other aids, instead they move around freely using intelligent software and sensor technology. This means nothing has to be built or changed before installing the system. Adjusting the transport paths for new processes and work stations is also easy and can be done at any time. The Open Shuttles can be just as easily integrated into an existing system as into an overall system design.

With their special load-handling device, the Open Shuttles can handle magazines, containers and trays. Their integrated lifter allows them to pick up and deliver at different heights.

KNAPP and Siemens develop industry applications together

KNAPP and Siemens have had a solid business partnership for three years. In close cooperation with the Siemens factories, they worked out a solution to perfect the in-house transport together. Here, the Open Shuttle transport solution was optimized for the requirements of the electronics industry.



The Open Shuttle transports the required components in containers and autonomously navigates through the manufacturing area.

© Siemens



The containers are automatically released to a parts station at the production lines.



If there are no orders available, the Shuttle autonomously returns to the charging station.

The Open Shuttle transports the parts needed for the SMD production from the transfer point of the automatic material supply system to the line and transfers them at the station. When there are no orders for the shuttles, they use the time by independently driving to the charging point and charging themselves.

Open Shuttle supplies four SMD lines in electronics manufacturing

1. Parts needed at the production lines are picked into containers (600 mm x 400 mm) and lifted from the material supply system to the conveyor line exit (lifter).
2. At the same time, the shuttle receives a transport order and picks up the container from the transfer point.
3. The transport path is 30 meters long. The Open Shuttle navigates this path autonomously, dynamically avoiding people, as well as any other obstacles.
4. The containers are released automatically to a parts station at the production lines. Employees take the parts from there, supplying the system.
5. Empty containers are picked up at the parts station by the Open Shuttle, which brings them back to the transfer point where they are automatically returned to the material supply system.



The Open Shuttle picks up containers or tray stacks at the material supply system.

© Siemens

Open Shuttle supplies six automatic assembly machines in electromechanical production

1. The production materials needed to supply the automatic assembly machines are picked to a tray stack or a container (600 mm x 400 mm) and lifted from the material supply system by lift to the conveyor line exit.
2. The Open Shuttle simultaneously receives a transport order and takes up the tray stack or the container at the transfer point.
3. The transport path is up to 60 meters long. The Open Shuttle navigates this path autonomously, dynamically avoiding all obstacles, including people.
4. The tray stack is transferred directly to the transfer point of the assembly machines.
5. As needed, the automatic assembly machines request that the Open Shuttle picks up empty containers or finished pieces.
6. The Open Shuttle transports the empty container or finished pieces back to the material supply system.



Then, the Open Shuttle autonomously transports the containers or tray stacks to the automatic assembly machines.



The Open Shuttle directly transfers the tray stack to the automatic assembly system.

The Open Shuttle transports the required parts in containers or tray stacks to the automatic assembly machines, where these are directly transferred and then accepted (put and get connection).

As a complete solution provider, we are helping Siemens factories to make continual progress in digitalizing manufacturing. As the business relation grows, we will expedite further innovations in the transport solution and the use of system platforms together.

About Siemens

Siemens AG (Berlin and Munich) is a leading international technological company that has stood for technological performance, innovation, quality, reliability and internationality for 170 years. Siemens is one of the largest manufacturers of energy-efficient and resource-conserving technologies worldwide.





The Pick-it-Easy Robot

It works.

Robotics and artificial intelligence have long been gaining ground in our everyday lives. Logistics is no exception, and industry-compatible robotics solutions have become increasingly important in the sector. The days are gone in which robotics systems were considered extravagant toys or costly investments. This is a good thing because we know: It works!

Equipped with artificial intelligence from the AI start-up Covariant, we have developed an industry-compatible solution with our Pick-it-Easy Robot – a fully automatic commissioning robot that has no equal in logistics.

But how does the Pick-it-Easy Robot learn? Why are KNAPP and Covariant the perfect match when it comes to the development of robotics solutions

that can be successfully used in everyday industrial applications? And the most important question for us is: How happy are our customers with the Pick-it-Easy Robot's performance? To answer these questions and introduce you to the exciting world of our robot's artificial intelligence, we caught up with our experts.

The Pick-it-Easy Robot in action

We are proud that the newest generation of the Pick-it-Easy Robot is already delivering a successful performance at our customer Obeta. Obeta is a German wholesaler of electric devices with headquarters in Berlin and boasts 28,000 customers and 64 locations across Germany. With the help of the Pick-it-Easy Robot, they pack thousands of customer orders every day. Michael Pultke, Head of Logistics, Obeta, provides some insights:



What tasks does the Pick-it-Easy Robot perform at Obeta?

Michael Pultke: We pick a diverse range of products from our OSR Shuttle™, which has 78,000 storage locations for small load carriers. The products come in different packaging and quantities and have to be carefully gripped and packed into dispatch containers or cardboard boxes, both quickly and continually. The Pick-it-Easy Robot takes the load off the manual picking stations by handling the routine picks. Our goal is to make the picking process as smooth and efficient as possible.

In your view, what added value does the Pick-it-Easy Robot offer?

Michael Pultke: It's definitely the seamless operation and continuous monitoring of storage processes that represent the added value. Automating our warehouse operation is one of Obeta's top priorities and the Pick-it-Easy Robot helps us achieve this goal.



Pick-it-Easy Robot insights

Peter Puchwein, Vice President of Innovation, is convinced: Innovation is an integral part of our company DNA. It's a motto that Peter and his team live by. Considerable expertise combined with a great deal of passion and fascination for robotics has enabled the team to take the AI of the Pick-it-Easy Robot to a whole new level.



How would you explain artificial intelligence? How does the Pick-it-Easy Robot learn?

Peter Puchwein: It may seem funny, but you can compare artificial intelligence with raising a child. We reward kids for their good habits and help them give up bad ones. Artificial intelligence is no different: If the Pick-it-Easy Robot picks a new product correctly at the first try, we reward it with bonus points. The better the pick, the more bonus points it gets. The system learns non-stop and autonomously. Improvements are automatically integrated into the basic model and distributed to all robots. The Pick-it-Easy Robot does not only learn to improve itself, but also to improve its bionic *siblings*. Transferred to the real world, you would only have to educate one child to automatically achieve the same effect in the siblings. When one child makes a mistake and learns from it, the siblings won't make it in future. In the virtual world, we have access to the brains of all Pick-it-Easy Robots and can improve their content with software updates. This is exactly the added value we offer to our customers. Whenever one robot acquires new knowledge, it is immediately available in all the other robot stations.

What is the story behind your partnership with Covariant?

Peter Puchwein: We formed our partnership with Covariant after our Robotics and Machine Learning teams participated

in the GTC – an important AI conference in Silicon Valley – at which Pieter Abbeel, the co-founder of Covariant, gave a talk. From the get-go, the chemistry was right both content-wise and on a personal level. We decided to conduct some tests together to challenge Covariant's artificial intelligence. The results were astonishing, so we decided to become partners and combine our expertise in robotics and logistics with Covariant's AI brain.



Ted Stinson, COO, Covariant, is also delighted about the partnership

Ted Stinson: Our vision was to build a cognitive system for a robot, so we asked ourselves, "Where are the opportunities to bring this sort of AI robotic capability to the market?" Along the way, we

met our now very good friends and partners at KNAPP and understood the enormous potential a partnership between the two companies would have. At first, it was a process of discovery, of trying to see: Is it possible to have the core strengths of Covariant and the capabilities of KNAPP come together in a set of solutions?

Today we couldn't be more thrilled about the partnership with KNAPP and are very excited about the first product we have brought to the market together – the new generation of the Pick-it-Easy Robot.

If you think about the modern warehouse, KNAPP has done amazing work. Pretty much everything that could be automated to prevent people from trudging long distances in the warehouse has been automated thanks to KNAPP's ideas and pioneering innovations of the last couple of decades. What remains to be solved are the precise tasks of the human hand.

And this is where we come in: The essence of the intelligent Covariant software is a system that learns. Just think of the modern warehouse. There are tens of thousands, hundreds of thousands, sometimes even over a million different products, all of which are changing on a very regular basis. The robot has to learn rapidly and accurately.

See how it works.

