swisslog
Member of the KUKA Group

INSPIRATION

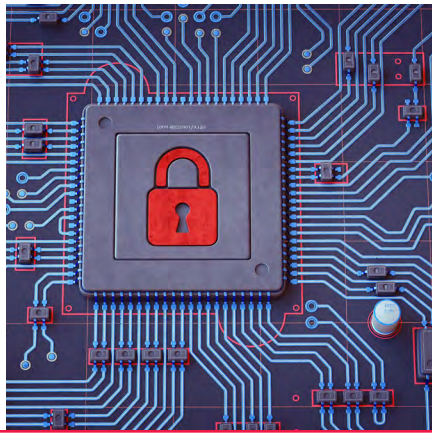
SWISSLOG WAREHOUSE & DISTRIBUTION SOLUTIONS
GLOBAL MAGAZINE ISSUE SIX

INDUSTRY 4.0: THE POWER OF DIGITALIZATION

PLUS:

MIDDLE EAST // RETURNS LOGISTICS // SMART FACTORY // NEW TECH // PERSONALISATION

WE SHAPE THE FUTURE.



WELCOME

Welcome to the latest issue of our Inspiration magazine. Every time we stop to consider how the future is shaping, it always seems to be changing amazingly fast.

In recent months, Industry 4.0 has begun to take hold in the public's consciousness - I guess that's what happens when you get world leaders taking a look!

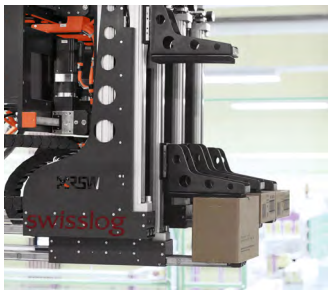
We understand the benefits the inter-connected, robotic world has to offer.

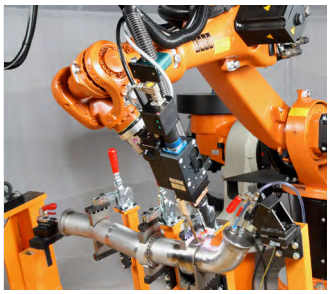
This magazine is about those benefits and the achievements already made. We are undoubtedly leading the way and shaping the future.

With the strong backing of our parent company, the KUKA Group, Swisslog is a major pioneer in state-of-the-art Industry 4.0 production processes, and I am certain there are many yet to come. Until then, we hope you enjoy the magazine!

Dr. Christian Baur
Swisslog Warehouse and Distribution Solutions

SWISSLOG & KUKA: THE AUTOMATION POWERHOUSE





ONE YEAR ON

CEO CHRISTIAN BAUR REFLECTS ON A YEAR OF COLLABORATION

After a whirlwind few months, the dust is settling on our newly integrated business.

Now is a great time to be involved in automation, and an even better time to work for Swisslog, as we look to shape the best structure and approach for future success. Of course, our success has been given a huge boost by becoming part of the KUKA group.

KUKA is a globally active automation company with sales of around 2.9 billion euro and a workforce of about 12,000 worldwide. KUKA offers its customers around the globe automation solutions ranging from components and cells to fully automated systems. The company is one of the world`s leading suppliers in the fields of robotics, automation and systems engineering.

SETTING STANDARDS

KUKA`s technologies set standards the world over. In addition to its headquarters at the production and development site in Augsburg, Bavaria, KUKA is internationally represented with about 100 subsidiaries. Working with KUKA has allowed Swisslog to develop technologies such as Automated Item Pick (AutoPiQ). Our human-robot picking solution was awarded the 2016 INDUSTRIEPREIS at last year's Hannover Messe.

AutoPiQ was chosen as the winner in the "Intralogistics & Production Management" category for its outstanding economic and societal benefits. It's just one example of our recent work. Another great achievement is the launch of CycloneCarrier.

What does it mean for customers? We will leverage our joint processes and know-how to create and develop intralogistics solutions of the future.

Together with KUKA we are shaping the future of intralogistics by introducing a new era of robotic, data-driven and flexible automated solutions that create exceptional customer value. This is what we believe in, we are not only playing in the field of robotics, we are shaping the future!

http://swisslog.com/

Dr. Christian Baur, COO Swisslog Group & CEO Swisslog Warehouse & Distribution Solutions.

"This award recognizes our pioneering role in integrating advanced human-robot collaboration solutions in logistics. The cooperation between Swisslog and KUKA delivers synergies at every level. Ultimately, it is the customers who benefit from intralogistics solutions that are more efficient, flexible and intelligent."

Facts and Figures

20%

Machining time is reduced by up to 20% in factories fitted with KUKA robots.

24 hours

In KUKA's own production a robot extends the operating time of a machining centre from 16 hours a day to 24 hours, without extra manpower.

± 0.08mm

The KR360-3 robot has incredible precision, and can move items up to 500kgs to within a fraction of a millimeter.

INDUSTRY 4.0 TAKES HOLD

PERSONAL SERVICE

GRANOLA TO CARS: NEW TECH TAKES PERSONALISATION TO THE NEXT LEVEL.

The world has changed profoundly over the last couple of years. New technologies stride ahead, changing our lifestyle and also evolving many business models. Industry 4.0 is opening up completely new possibilities for us to offer innovative solutions and services. At the same time, our customers are confronted with increasingly complex challenges in technology and business, to an extent that they have never faced before.

The concept of Industry 4.0 influences more and more in intralogistics. Swisslog's Industry 4.0 concept brings transparency and efficiency to your warehouse so you can secure tomorrow's intralogistics processes today. Over the years, the Internet has evolved into a space of sheer limitless possibilities. Whether granola, notebooks or a new car, there are so many everyday things that we can already customize online. What is more, the Internet is gradually breathing intelligence into commonplace objects in our daily lives. For example, researchers have been working for some time on the development of a smart refrigerator that uses modern camera technology and sensors to monitor consumption habits and independently places an order as soon as an essential item runs low. In addition, cars are being tested that navigate through traffic completely autonomously while the driver, for example, leisurely peruses their e-mail.

THE INTERNET OF THINGS PUTS THE VALUE CHAIN ON TRACK

Machine control systems and sensors are connected with classic production and intralogistic applications like WES or WMS and exchange information, independent of their location, through software services. Thanks to this merge, Industry 4.0 technology optimizes the entire value chain of a company.

Simply put, Industry 4.0 technologies open the door to creating a digital image of reality that can be used as a basis for optimizing physical processes. This transformation process is often referred to as a "digital shadow." These digital shadows are not only tremendously beneficial for the future of industrial production, they also bring transparency and efficiency into all processes along the value chain. In Swisslog's Industry 4.0 concept, they ensure that warehouse processes run reliably and at optimal performance even under constantly changing conditions. It is unrealistic to expect that warehouse logistics will undergo rapid, radical changes in the age of Industry 4.0, but we think big and take the small steps first - to be able to scale fast.

In Swisslog's understanding of Industry 4.0, this change is an ongoing process whose initial steps are to collect and analyze data and optimize individual warehouse components. The next development stage will be devoted to the entire warehouse. After that, more and more boundaries will successively be overcome, allowing optimization to propagate from production to the higher level supply chain.

www.swisslog.com/WDS

Dr. Kerstin Höfle, IP & Strategy Manager, Swisslog

In recent years the Internet of Things has become more meaningful in industrial processes leading to the wide adoption of terminology like Industry 4.0 and Advanced Manufacturing. The underlying idea is the end-to-end digitalization of intralogistics and production.

THE JOURNEY HAS BEGUN

Many Swisslog customers have already started their ascent up the rungs of the Industry 4.0 ladder, and some without even recognizing it.

Cockpit Manager (above), 3D Visualization, Virtual Reality, Condition Monitoring and Event Notification are just some of the I4.0 concepts Swisslog has already brought to life, improving profitability for a wide range of businesses.

These are just the first steps for further Industry 4.0 solutions realized by Swisslog.

4.0 IN PRACTICE

IN A FEW SHORT YEARS, THE SMART FACTORY HAS GONE TO FROM AN IDEA INTO REALITY. HOW HAS IT HAPPENED?

As a visionary and pioneer of fully integrated and digitalized logistics processes, Swisslog is already at the starting gate, ready to offer its customers future proven solutions.

To promote economically efficient facility operation, Swisslog focuses on the real-time optimization of all data gathered from the logistics systems.

THE JOURNEY INTO THE SMART FUTURE HAS BEGUN

State-of-the-art sensors, data collection methods, and optimization algorithms based on big data analysis are the cornerstones of a new service portfolio that could monitor all Swisslog facilities throughout their entire lifecycle.

Because Swisslog places maximum value on the modular structure of its logistics facilities, Industry 4.0 technologies deliver optimal performance even when the requirements in a world driven by ever higher customer demands are constantly changing.

INDUSTRY 4.0 BRINGS EFFICIENCY TO LOGISTICS

Predicting today what will most likely happen tomorrow is of great interest to supply chain and management professionals. Swisslog supports this process with state of-the-art methods. It's Smart Logistics approach relies on the analysis of a wealth of historical and future forecast data.

The underlying idea is simple: In the age of Industry 4.0, logistics systems themselves are becoming clever organizational talents.

Recording all movements in the warehouse, for example, makes it easy to detect risks early on to avoid conducting facility maintenance during peak times. The list of benefits new Industry 4.0 technologies offer for warehouse operations goes on and on.

Major events that attract media attention could deliver forecast data relevant for the handling of relevant merchandise. For example, if an underdog team manages to climb towards the top in a sports tournament, this approach makes it possible to respond to changes in demand early on.

Many a company can even use the current weather forecast to their advantage – for instance to determine as accurately as possible tomorrow's demand for rainwear or swimsuits.

Through the interplay of latest Industry 4.0 technologies, state-of the-art software, and many integrated warehouse operation services. Swisslog's Industry 4.0 solution portfolio is already considered a pioneer of flexible, forward-looking, and highly efficient value-added processes.

More than anything else, securing a competitive advantage through Industry 4.0 technologies is dependent on choosing the right partner and making the right management decisions. With this in mind, Swisslog is eager to start a dialog with its customers on this very topic. Direct exchange is vital in order to find innovative solution approaches, collaborate on expanding the solution portfolio and fully understand all influencing factors and individual requirements.

ACHIEVE MAXIMUM FLEXIBILITY WITH SWISSLOG SOLUTIONS

Behind every Swisslog Industry 4.0 activity there is a promise: As a provider of leading automation solutions, Swisslog is committed to supporting its logistics facilities over their entire lifecycle with maximum flexibility and future security.

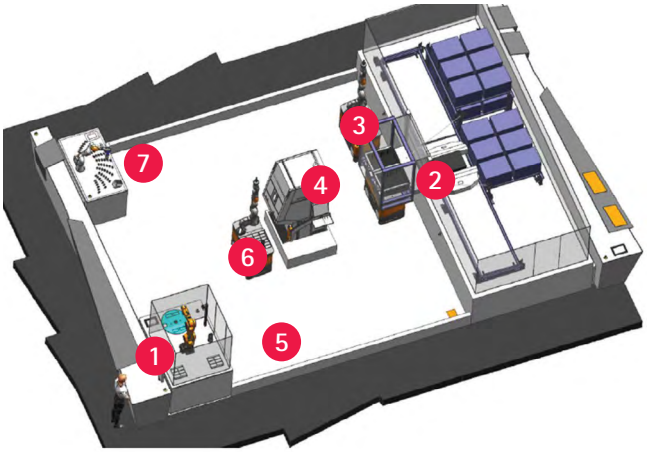
> "IN THE AGE OF INDUSTRY 4.0, LOGISTICS SYSTEMS THEMSELVES ARE BECOMING CLEVER ORGANIZATIONAL TALENTS."

This can be through software updates, modular facility expansions or with the help of technological innovations such as add-ons designed to optimize processes. Swisslog also offers alternative financial models that are future-proof and flexible.

Changing customer needs are always the main drivers of innovation. This is the approach Swisslog took in developing flexible intralogistics concepts, new robot solutions and its comprehensive portfolio

THE SMART FACTORY CONCEPT

Here we demonstrate how Swisslog & KUKA can seaslessly connect your manufacturing and warehousing. This example from our recent exhibitions allows total traceability - as customers can track and trace personalized phone cases from beginning to end, in real time. Here we explain the elements of how this was achieved:



Swisslog and KUKA continue the concept "Hello Industrie 4.0" and presented solutions to digitalization in various industries at the recent HMI and Automatica Fairs.

1. Customer order registration
   - Order confirmation, printing of a ticket with QR-code
   - Time estimation for order completion
2. Replenishment of trays from Swisslog's shuttle CycloneCarrier to Buffer Shelves on KMP 400 (Robot)
3. Delivery of raw cases to Laser through KMR iiwa (Robot)
   - Order releasing from pool, transport assignments to KMR iiwa
   - Pre-announcement to Laser-Engraving device
4. Engraving (Device works autonomously and communicates only with KMR iiwa)
6. Sample taking at Quality Station
5. Transport of finished give away to 'Handover Shelf'
   - Drop-off into shelf or 'Overflow Bin'
   - Email or text message notification to customer
7. Customer scans ticket at Pickup Desk to get case

of facility related services. Rigid logistics is a thing of the past. Swisslog's Industry 4.0 concept is centered on adaptability. This is the key to making intralogistics processes more efficient, based on individual requirements.

CONDITION MONITORING FOR PREDICTIVE MAINTENANCE

Making warehouse operations more efficient using the means available today starts with collecting and analyzing information.

A variety of optimization algorithms gives warehouse operators the ability to make the best decisions possible. Swisslog offers services for the full breadth of warehouse management.

Services such as condition monitoring and 3D warehouse visualization provide real-time data. These services make it possible to simulate overall operations in a logistics facility in real time and create a digital shadow of the actual physical processes.

Swisslog's predictive maintenance service, the next component in its Industry 4.0 concept, additionally uses the data supplied by the facility sensors.

All automation sensors communicate with and learn from one another, helping to identify service and maintenance times with pinpoint accuracy and to optimize machine operations overall.

The next stage will focus on using forecast data to supply warehouse operators with important information on the future facility situation, performance, and warehouse utilization.

www.swisslog.com/industry4_0

GET IN TOUCH

Industry 4.0 workshops organized by Swisslog's dedicated team of professionals have proven to play a key role in defining the specific needs of different facilities and business models.

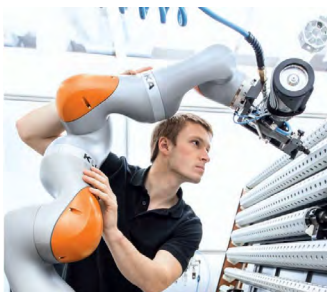
If your business is ready to take advantage of tomorrow's solutions today, find out more about Swisslog's smart solution portfolio and arrange a bespoke workshop by contacting your local Swisslog representative.

Customer around the world are already profiting. Get in touch with our experts and start your get Industry 4.0 journey today!

ROBOTICS MEETS HUMANS

HELP AT HOME

Additional mobility is already enabling initial solutions in the area of professional service robotics – for use in both the work environment and at home.



TEAM PLAYERS

WHAT ROLE WILL HUMANS PLAY IN THE FACTORY OF THE FUTURE?

Without robots, efficient production of electronic products or cars would be impossible. Will this trend extend across all manufacturing? Will the "smart factory" become the "dark factory?" And what competitive advantages will companies have? Kirk Laeske has answers...

It seems logical to predict that in the wake of Industry 4.0 industrial robots will become the hub of the entire value chain.

The logistics center of the future requires highly dynamic processes. Humans, machines, robots and conveyor systems are interconnected to efficiently control material flows. Through sensors and networked IT systems, each component is able to make the right decision at the right time along the entire supply chain. Workflows can be optimized as a result, and companies will be able to respond much more quickly to changes in demand. The interaction between man and machine provides a unique opportunity to make sustainable, positive changes to industrial processes, for example making it far easier to switch from large-scale production to smaller lot sizes, boosting demand for individualized and personalized products.

NETWORKED, DYNAMIC PROCESSES

Recurring tasks such as unloading pallets, stacking bins or filling pallets continue to be the traditional domain of industrial robots, are for physically demanding or 'undesirable' roles. Our aim is optimizing intralogistics processes to enable safe, barrier-free interaction and collaboration between humans and robots.

The Automated Item Pick station (AutoPiQ) is the first solution developed this way and is made possible with the help of an advanced image processing system which is integrated into the application and easy to commission. The goal of the application is to help humans with simple recurring tasks, such as gripping items. This allows workers to focus on value added services such as packaging or personalizing picked items. Humans are then able to respond flexibly to whatever the current demands and needs are in the picking process.

IMPROVED EMPLOYEE AND CUSTOMER SATISFACTION

Meaningful collaboration with robots allows humans to perform tasks that are more interesting and varied. Processes can also be handled by fewer employees who show a higher level of satisfaction, combating employee turnover and preventing work-related stress. More stringent European regulations and employee demands for greater protection also makes robotics more desirable. The use of robotics brings about quality improvements, which in turn helps minimize errors and lower costs across the overall process. Initial estimates suggest that the use of – and support by – robotics will cut the costs per pick in half in the next two to three years.

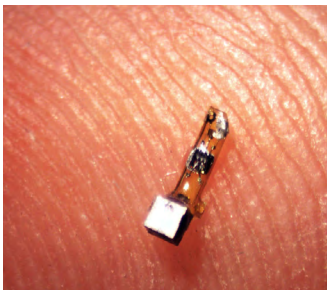
www.swisslog.com

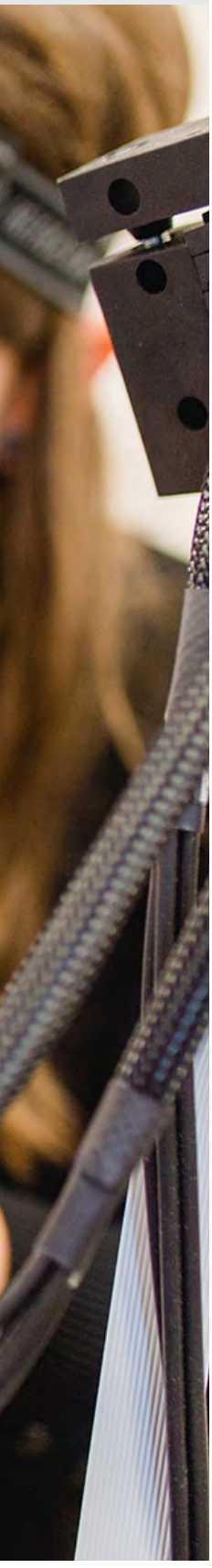
Kirk Laeske, Product Manager Robotic Solutions, Swisslog

"Robotic solutions must be scalable and integrate easily and seamlessly into existing processes. Intralogistics is focusing more on flexible robot systems in conjunction with automated guided vehicle or shuttle warehouse systems to increase flexibility and handle greater complexity."

HOW NEUROSCIENCE IS SHAPING INDUSTRY 4.0

The Fraunhofer Institute for Industrial Engineering delves inside the mind at the Neurolab. Opposite, the neural dust implant.





BRAINWAVES

NEUROSCIENTISTS ARE SHAPING INDUSTRY 4.0 BY UNVEILING SECRETS OF THE MIND

"If we want to bring the brain-computer interface out of the medical context and into the work environment, we must focus on people" says Kathrin Pollmann and Dr. Mathias Vukelic, Neurolab researchers.

Processes in the human brain have fascinated neuroscientists for decades. In 2015, the Fraunhofer Institute for Industrial Engineering unveiled its "Neurolab" which, led by Pollmann and Vukelic, is conducting an experiment into what happens in the brain when people use technical equipment.

Now they are beginning to reveal the brain's secrets. The lab employs electroencephalography (EEG) and functional near-infrared spectroscopy (fNIRS) as well as recording muscle activity, such as in the face, which allows researchers to identify the direction users are looking in or to detect when users screw up their eyes or smile.

The scientists expect that one day, this research will lead to the development of an interface that recognizes certain brain states such as stress or pleasure and adapts the behavior of assistance systems accordingly.

MINDREADING MACHINES

Attempting to devise machines that effectively read people minds is notoriously difficult. Initially scientists believed the brain to be far too complex for any technology to even begin to decode our thoughts. Today, we have bionic limbs, restored eyesight and other brain-linked technologies.

What is safe to predict is that Industry 4.0 will bring productivity increases, around 78 billion euros by 2025 according to the Fraunhofer Institute for Industrial Engineering IAO, and that is after looking at just six economically important sectors. Prof. Wilhelm Bauer, its managing director, believes digitization will change our life and work massively.

"We are with the "Internet of Things and Services" at the beginning of the next industrial revolution, which we call industry 4.0. In practice this means that manufacturing companies on the one hand digital enriched products, we are talking about cyber-physical systems, develop. And these products are produced in smart factories that produce automated getting smarter digital and networked production systems, the new products. Digital platforms support the production of smart products throughout the value creation process."

www.www.fraunhofer.de

FOOD FOR THOUGHT

- In 2005, researchers identified a specific neuron in a patient with its activity levels tied to the actress, Halle Berry.
- A 2013 study into how we perform mathematical calculations by Stanford University School of Medicine scientists, positioned packets of electrodes against the exposed brain surface, allowing them to "eavesdrop on the brain in real life."
- New research, led by the University of Southampton, has demonstrated that a nanoscale device, called a memristor, could be used to power artificial systems that can mimic the human brain.
- Neuro-marketing researchers found that the vast majority (76 per cent) of US grocery shoppers make their purchase decisions in-store, and that shoppers using non-cash payment methods are most likely to make impulse purchases.
- Researchers at the MIT working with carmaker, BMW, found that robot-human teams were about 85 per cent more productive than either alone.
- A tiny implant, dubbed "neural dust" can connect computers to the human body without the need for wires or batteries, opening up a host of futuristic possibilities. They could potentially be used to prompt the immune system into action or reduce inflammation.

"I think the long-term prospects for neural dust are not only within nerves and the brain, but much broader." Neural dust co-inventor, Professor Michel Maharbiz, University of California, Berkeley.

MIDDLE EAST DELIGHTS

DUBAI'S STRATEGIC IMPORTANCE FOR LOGISTICS OFFERS GREAT POTENTIAL, BUT WHAT'S THE LIFESTYLE LIKE?

Swisslog Middle East designs, develops and delivers best-in-class intralogistics automation solutions for forward-thinking customers in the UAE, Saudi Arabia and bordering regions.

In establishing Swisslog Middle East LLC in Dubai, Swisslog Warehouse & Distribution Solutions has further increased its presence in the region, as it has in developing automation markets.

Heading up the Dubai office is Frédéric Zielinski, General Manager of Swisslog Middle East LLC who joined the business in 2004. We asked him, what makes the Middle East such an exciting marketplace...

WHAT KIND OF A REGION IS IT LIKE TO WORK IN?

The first word which comes into my mind is dynamic. Talking specifically about the UAE, about 95% of Dubai's Gross Domestic Product is not oil-based and it has therefore become a more diversified economy. With Dubai winning the bid to host the Expo 2020, this provides another boost to its economy and is triggering opportunity for Swisslog Middle East.

HOW IS LIFE IN THE MIDDLE EAST? WHAT ARE THE CHALLENGES? DO YOU MISS HOME?

Dubai is definitely a good spot for hotels and vacation but due to temperatures reaching up to 50 degrees Celsius in the summer, I tend not to spend my summer vacation here!

I don't often go to the beach, I prefer to visit the seven Emirates composing the UAE such as Abu Dhabi, Al Ain or Fujairah, which are very different to Dubai. I also travel with my family to other countries in the region. An exciting family trip was attending the wedding of our Project Manager, Alain Kaddoum in Lebanon!

Frédéric Zielinski, General Manager of Swisslog Middle East LLC

Age: 38
Nationality: Swiss
Family Status: Married

"We have seen a lot of development in a short space of time... the pace of change is incredible and it's a really exciting time for the region."

WHAT IS SWISSLOG'S STANDING IN THE MIDDLE EAST?

Both our divisions, (Warehouse & Distribution Solutions and Healthcare Solutions) have a presence in the Middle East and our customer service in Dubai is responsible for our activities in the Gulf region.

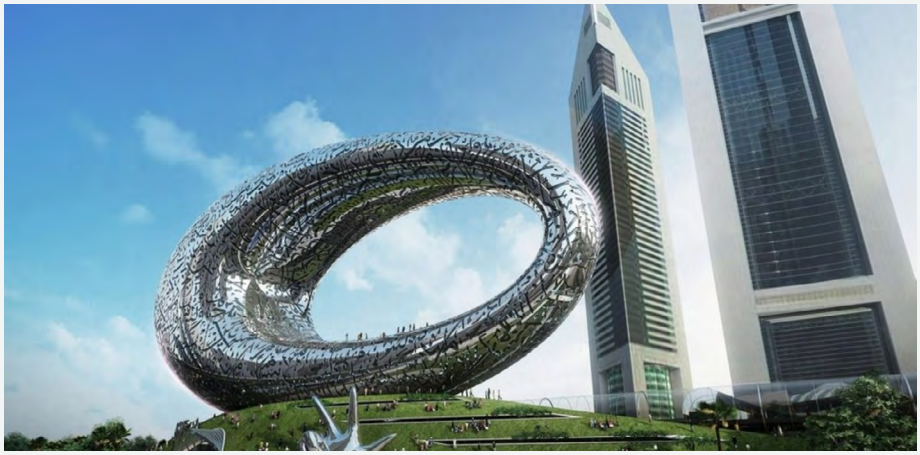
Located in Business Bay, Dubai, I lead the Swisslog Middle East team. We are a close-knit team and like to get together from time to time to enjoy good food and socializing. Additionally, we can count on our specialists within the wider Swisslog and KUKA Group network.

WHAT IS YOUR BIGGEST SUCCESS IN THE MIDDLE EAST TO DATE?

The award of the first contract was an extremely proud moment for me. Developing a new market requires patience and hard work, but this was possible thanks to the support of the local team and local partners, as well as support from our HQ.

I'm also proud that we are now developing the local team to help us with the further projects we have won recently. We are looking forward to welcoming both a PLC engineer and a system designer in the near future. One of them is the 21 Million US Dollar automation project for Mai Dubai, the leading bottled water provider in the region.

www.swisslog.com/middle-east



BACK TO THE FUTURE

A decade of high oil prices has left exporters in the Middle East with roughly US$2.5trillion in accumulated sovereign wealth funds and they better other oil exporting rivals such as Venezuela and Nigeria.

No wonder then, there are many ongoing investment initiatives in the Emirates designed to prolong the region's success, including the Expo 2020 in Dubai. The government is driving the adoption of future technologies, with one example being the Museum of the Future, where Swisslog's CarryPick was exhibited this year.

Launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, the Museum will become a unique platform for futuristic innovations and designs. "The Museum of the Future will be an incubator for ideas, a driver for innovation, and a destination for inventors and entrepreneurs from around the world," said Sheikh Mohammed.

FACT FINDING

- New record: Dubai plans to build the longest indoor ski slope and biggest fountains area
- It is very common to play the national anthem before events and corporate conferences
- Saudi Arabia doesn't have any rivers
- Saudi Arabia has a law to employ a certain percentage of local people in its businesses
- The Burj Khalifa, the tallest man-made structure in the world, is named after a living person – the President of the United Arab Emirates Khalifa bin Zayed bin Sultan Al Nahyan
- The Dead Sea, which borders Jordan, is actually a lake

SOFTWHERE, WHEN AND HOW

WAREHOUSES CAN SAY GOODBYE TO THE PERILS OF INTEGRATING SOFTWARE PACKAGES. A SINGLE FLEXIBLE PLATFORM IS HERE...

Tim Eick, Vice President of Software & Controls Development, Swisslog.

"SynQ provides the software platform that future hardware will rely on. To get the most out of automation and robotics we are increasingly reliant on data and interconnectivity. It's what is driving Industry 4.0 forward and allows users to deliver on promises to customers in the smartest way possible."

SynQ

Traditionally, warehouse operations have applied software with resource planning systems at the top, followed by the WMS, then the material flow control system, and finally the automation control systems.

This layered structure can create obstacles when it comes to introducing new technology, but Swisslog has the answer.

The SynQ Intelligence Network, the new software platform from Swisslog, addresses the challenges warehouses are facing when introducing modern technology to their outdated layered models.

ERP INTEGRATION

By integrating all of the layers below the Enterprise Resource Planning (ERP) system in a modular platform, operations can now achieve the flexibility required to keep up with the pace of advancement in modern technology.

SynQ, short for Synchronized Intelligence Quotient, builds on Swisslog's proven WM 6 warehouse management software—without leaving current users behind - while expanding its capabilities beyond the scope of traditional WMS systems.

It is a best-in-class intralogistics software platform that encompasses warehouse management, material flow and automation control systems functionality, along with an array of business intelligence tools, in a single platform.

GOODBYE INTEGRATION, HELLO FLEXIBILITY

Instead of purchasing and attempting to integrate multiple software packages, while using only 60 percent of the capabilities of any of them, SynQ provides a single platform with the flexibility to install the exact functionality for specific operational needs.

In addition to core functionality that extends across the operation and supporting business intelligence capabilities, SynQ features a Single Point of Control and simplified host integration.

The Single Point of Control provides a standard, easy-to-use interface across the platform so operators and managers have a familiar and consistent way to interact with equipment across the operation. Host integration capabilities provide proven, standardized interfaces to WMS and ERP systems, including SAP.

ADDED CONTINUITY

SynQ even includes Swisslog services and expertise, delivered as SynQ modules, so users have both the software and support needed to enable insights, optimization and agility in all operations.

"SynQ functionality, services and crucial supporting processes are organized around three pillars: Collaboration Platform, Operational Services and Intelligence Services," explains Swisslog's VP of software & controls development, Tim Eick.

"Collaboration Platform modules provide continuity no matter the level of automation the business has installed, while Operational Services deliver industry-standard processes and high-speed automation for maximum performance. Finally, Intelligence Services allow smart growth in a dynamically changing market."

FIVE GREAT REASONS FOR GETTING IN SYNQ

1. SynQ is adaptive. When software and hardware aren't in harmony, it's harder to anticipate and manage swings in demand. SynQ features our Automation Concept, which provides interface protocols and architectural guidelines to ensure our own and third-party subsystems collaborate with SynQ to achieve maximum performance.

2. Its service-based architecture embeds intelligence throughout the user's operation, which along with its business intelligence tools and the Single Point of Control, help warehouse managers better anticipate and respond to changes in throughput without overinvesting in people or processes.

3. SynQ is data smart. SynQ recognizes the role data can play in optimizing processes and adapting to fluctuations in demand. It includes a suite of easy-to-deploy business intelligence tools, supported by our team of skilled data scientists, that give users the power to transform data into intelligence and insight.

4. SynQ is future ready. The convergence of connectivity, low cost sensors, big data and advanced robotics is creating the cyber-physical production systems that will be the hallmark of Industry 4.0.

5. With its modular architecture and intelligent, automation-centric design, SynQ helps warehouses adapt to industry changes—and capitalize on the opportunities—that are emerging as Industry 4.0 evolves. Yet, SynQ is also fully compatible with our WM 6 system.

THE STORING SO FAR

AWARENESS OF THE ROLE TECHNOLOGY PLAYS IN SHIFTING, STORING AND RETRIEVING ITEMS IN THE WAREHOUSE IS HIGHER THAN EVER.

Ideas, the origins of which stretch back to the start of the twentieth century, have come to fruition and are highly in-demand.

Together with the popularisation of the concept has come the availability of the technology.

Automatic Storage and Retrieval Systems (AS/RS) are no longer confined to the largest distribution centers, but are now available at all levels of the supply chain.

The question today's logistician asks is "which one right for me?" Typically, the journey begins with a measure of pallets to be stored and throughput demands. These dictate the scale of the system and its potential impact on the bottom line, essential for the calculation of the Return on Investment (ROI).

Conventional wisdom would suggest a manual system could cope in situations where throughput of below 50 pallets per hour are required.

However, the type of picking operation may be all important here, as trying to achieve that from a warehouse with, say, 100,000 pallet locations or more, would make it incredibly demanding.

POWER STORY

Easily retrofitted into existing facilities, PowerStore's approach is multi-faceted, based upon two fundamental ideas:
1. Maximum storage density with total control of the SKU
2. Simultaneous throughput balance, to prevent bottlenecks in the operation or shipping segment of your supply chain.

The heart of the system is a piece of equipment called the row-rail cart. The primary goal was to make this module easy to maintain and simple to use.

The cart goes into a sleep mode when not in use, so as a result, energy consumption and maintenance is kept extremely low. The unique and patented design of the aisle and row carts is complemented by the lifts utilized to deliver pallets to the correct levels.

Similarly, a small number of pallets stored, but a relatively high level of single item picking or order throughput, and again the task becomes even more difficult. Back in the larger warehouses, Swisslog's Vectura cranes are used to accommodate a broad range of requirements.

From 200 to 3,500 Kgs loads, with single and double mast options, and speeds of up to 5m per second, the ability to deal with high throughputs and high SKUs makes the system one of the most popular of its type in the world. The efficiencies available in these 'big sheds' were not lost on low-to-medium throughput operations.

Midmarket organizations with medium-to-small storage position requirements, used their flexibility and agility to compete with these big boys, but scalability, as a result, would often prove elusive.

Huge, purpose-built warehouses are, of course, less available at this level, and building layouts are perhaps less than ideal. What these companies need is a low-cost and easily implemented system that could improve their operations at today's levels, but be adaptable enough to grow with them.

SALES CHANNELS

Step forward, PowerStore. A robotic storage and retrieval system designed for deep lane storage of palletized loads. The PowerStore is tailored to provide an attractive ROI for companies with small, medium and large storage needs.

This fully automated system is very adaptable in size and shape and can therefore be implemented using existing space to maximize density and efficiency in your current warehouse. The simultaneous

use of automated storage and retrieval devices, along with lifts performing work independently means that PowerStore has the ability to make your warehouse the world's most efficient with the highest density and throughput in the industry (80 to 160 pallets per hour per module).

The system provides a warehouse where vertical lifts work in conjunction with automated row and aisle pallet retrieval and the delivery systems store and deliver palletized loads to the dock without the need for a forklift.

Cutting-edge technology, such as the use of batteries and laser positioning, assures performance, accuracy and economic return whilst a short stroke of only two inches is needed to lift and carry the pallet out of or into the rack.

Whatever the type of system, Swisslog is on hand to talk you through the right option for your business.

Balancing the sometimes contrary demands of the finance, operations and managing director once made the logistics manager's life a difficult one.

Today, providing the least cost-per-pallet-handled while maintaining customer satisfaction in quality and reliability can be done.

Utilising space and reducing the number of times a pallet has to be handled before getting to the customer also means the lowest product damage, and highest order accuracy, coupled with on time delivery and correctly sequenced pallets.

For those willing to embrace the technology, the result is no matter what size the business; every operation can take advantage of the power of automation.

http://www.swisslog.com/PAS

> "PROVIDING THE LEAST COST-PER-PALLET-HANDLED WHILE MAINTAINING CUSTOMER SATISFACTION IN QUALITY AND RELIABILITY CAN BE DONE."

TO FIND OUT MORE > SEE THE POWERSTORE CASE STUDY

swisslog.com/PAS

LIFE IN THE FAST LANE

MICHELIN PRODUCES ALL KINDS OF TIRES; FOR CARS & TRUCKS, MOTORCYCLES & AIRCRAFT. STAYING AHEAD MEANS STAYING FOCUSED.

In 2010, work started at Michelin on a plan to cope increased volumes and service demands. This was followed by a thorough procurement process for a new automated warehouse system near Gothenburg and the associated software.

"In 1991, we built a highly-automated warehouse facility in Kungälv, Gothenburg, Sweden," says Patrik Oskarsson, Michelin's Logistics Manager for the Nordic region.

"By 2004, the decision was made to centralize all our Nordic distribution to Kungälv. It was the start of an expansion, and ten years later, a powerful modernization of the facility."

The modernization plan was much needed as the equipment was no longer able to manage inventory production fast enough nor efficiently enough during production peaks. The production team's worst fears were the materialising in the shape of bottlenecks. "It was high time to modernize the facility. Our existing AGVs were unsuitable for the large and rapid goods-flows and unable to handle the increased volumes. They became a bottleneck in the flow during our peak seasons. In addition, it was getting difficult to get spare parts for both cranes and AGVs." A large part of the equipment in the warehouse - including cranes and AGVs – was installed by Swisslog as early as 1991, during completely different market conditions. In tough competition with several of the major players, Swisslog was selected and commissioned to quickly and professionally carry out the modernization of the facility.

A WELL-EXECUTED PROJECT

The work focused on replacing the facility's existing eight stacker cranes with new, highly efficient cranes. A fixed conveyor system was also installed, which replaced the previous AGVs. Patrik Oskarsson says that the biggest challenge was to make the improvements whilst having minimal impact on the daily warehouse operations. The highbay warehouse had to close completely for eight weeks to allow replacement cranes to be installed, and when the new conveyor system arrived, an external warehouse supplemented the facility during low season. "In retrospect, I can say that it was a very well executed project. Swisslog understood our challenges and managed to plan and carry out the modernization with minimal disruption to our daily production. The modernization and crane replacement went smoothly and we succeeded with our most important

> "STRONG CUSTOMER FOCUS IS A CORNERSTONE OF MICHELIN. THEREFORE, FAST, EFFICIENT AND SERVICE-ORIENTED LOGISTICS IS CRUCIAL FOR US."
>
> Patrik Oskarsson, Logistics Manager at Michelin Nordic AB

The newest project will consist of automating warehouse operations including receiving, tire selection and sequencing, shipping, Warehouse Management Software and controls software. The project is expected to be fully operational in 2019.

assignment; to get the tires to the recipients at the agreed time," says Patrik.

The tires supplied to the Nordic market are produced at factories in Europe, mainly in Germany, France, Spain, Poland and Russia. The majority of import flows is warehoused in Kungälv for distribution to different types of customers; tire repair shops, automotive companies, wholesalers and retailers throughout the Nordic region.

THE ROAD AHEAD

The new conveyor system has resulted in a completely new layout and significantly improved capacity thanks to the new modern cranes. The high level of automation is supplemented by around 55 staff, over half in the warehouse - around 20 of which work in administration, IT, and production and delivery planning.

Certain key processes remain manual, such as certain labelling that must be done by hand. Employees in the distribution center also monitor the operation, handling of incoming and outgoing flows as well as the everyday maintenance. The upgrade also makes it possible to maintain a high level of delivery service and avoid bottlenecks associated with the seasonal peaks that occur during June to October and January to March.

To secure a continuous operation Michelin has a support and service agreement with Swisslog, enabling the cranes to be serviced on a regular basis, three times a year. By working together to develop a climate of trust, and with regular meetings and discussions about the current operation and future needs, Swisslog demonstrates a 'Customer Centricity' focus and together with Michelin ensures the whole show stays firmly on the road.

"Our modernized facility makes it possible to carry out our assignment - to deliver the right product, at the right time to the right customer - at the same time that we have a good capacity for further growth in the foreseeable future," says a pleased Patrik Oskarsson.

www.michelin.com

Facts and Figures

170

Michelin is active in 170 countries worldwide

150m

More than 150 million tyres and 10 million maps and guides produced a year

€14.8bn

Annual sales of €14.8 billion

www.swisslog.com

THE CHALLENGE RETURNS

RESEARCH SUGGESTS ANNUAL GLOBAL RETURNS WILL SOON COST BUSINESSES OVER £500BN.

Returning goods is not a new phenomenon, but the rise in E-commerce has seen a change in consumer buying habits.

Having the option to buy a selection of items, trying them on in the comfort of your own home, then sending back what you don't want, has proven to be an attractive option for consumers.

How can businesses cope with what many see as a growing menace?

A GREAT DISTURBANCE IN THE FORCE

Of course, the challenge for business is not simply the idea of the customer 'getting it right' or forcing customers to keep unwanted items. The true challenge arises in the warehouse where logisticians are left to pick up the pieces.

One area where the inventory manager and the consumer agree is on the need for speed. The consumer wants to be able to return goods easily and freely, and receive their refund as fast as possible. Retailers strive to re-sell the item which may be subject to expiration dates or seasonal demands. Reintroducing the stock for re-picking and repurposing items where necessary helps to maintain stock value and reduce overall supply chain costs.

The management of returns is a critical function for any retailer no matter what sector they operate in. Retailers need the returned items back into stock as soon as possible; any stock that can be resold that is not available for picking is taking up resource and costing the business money.

THE DROIDS YOU ARE LOOKING FOR

Within the warehouse, automation can often provide the support necessary to streamline the returns management process. Businesses should ensure that both manpower and equipment are sized to cater for the additional capacity that returns require.

Solutions using random put away, a reverse picking process using smart storage solutions and automated movement of totes should be considered by e-tailers and omni-channel retailers alike, looking to optimize their returns processes.

James Sharples, managing director for Swisslog UK says: "Automation gives retailers cost benefits. Handling returns is an expensive process. You haven't just got to handle the return - you've picked something and sent it and you are going to lose the money on that."

"Anything that can be done to reduce the cost of handling returns is going to be beneficial. In addition, anywhere there is a volume of returns if you look at automating that process of putting it back into stock and making it available for picking there will be a big benefit."

James Sharples, managing director of Swisslog UK

> "HANDLING RETURNS IS AN EXPENSIVE PROCESS. YOU HAVEN'T JUST GOT TO HANDLE THE RETURN - YOU'VE PICKED SOMETHING AND SENT IT AND YOU ARE GOING TO LOSE THE MONEY ON THAT."
>
> James Sharples
> Swisslog UK

READ THE WHITEPAPER

RETURNS: THE DARK SIDE OF E-COMMERCE
And How to Find The Light

Facts and Figures

€542bn

The annual cost of returns is €542 bn according to retail analyst firm IHL Group.

45%

45% of online purchases were expected to be returned following Christmas 2015, according to independent retail analyst Richard Hyman.

3-5x

The cost of handling returns is typically three to five times higher than original shipping costs.

30%

Almost a third, roughly 30%, of multichannel women's fashion purchases are returned.

85%

According to Harris Interactive, 85% of customers say they will stop buying from a retailer if the returns process is a hassle.

95%

The same study showed 95% of customers will use the same retailer again if the returns process is convenient.

5%

A German study in 2014 saw wildly varying rates for returned goods, including 5% of washing machines!

www.swisslog.com/ecommerce

AN EYE ON TOMORROW

DR. CHRISTIAN BAUR, COO SWISSLOG GROUP & CEO SWISSLOG WAREHOUSE & DISTRIBUTION SOLUTIONS.

SO CHRIS, WHAT DO YOU KNOW ABOUT MIDEA?

The story of Midea is very impressive. It has operations around the world and a global turnover of over US$22 billion.

There are around 100,000 employees globally, and the Midea brand is rising. So a very successful, growing company. It's not a robotics producer or an expert in this area, but it does have considerable expertise in complementary industries, so potentially a fantastic strategic investor.

WHY DO YOU THINK MIDEA AND KUKA IS A GOOD FIT?

As a major shareholder already, they have seen the potential in our business and believe in the strategy and capabilities. So it will be a really strong strategic partnership which can help to strengthen our own growth strategy.

It opens new doors for us in terms of better access to different customers in industry, logistics and robotics. It also increases our understand of the supply chain as a whole to make us an even stronger player in the market.

WHAT WILL STRONGER CONNECTIONS TO CHINA MEAN?

Midea is a strong player in the Far East, particularly China. KUKA has complementary strengths in Europe & North America, so it is a good fit. Success overseas ultimately means success at home, so growth for KUKA in China will lead to additional roles in Europe and North America too.

They have made it clear they would like to invest in the company, people, and products. They know our ambitious growth plan for China - to grow to 1mrd - and they see great potential in helping us to push this and support KUKA.

WHERE DO YOU SEE THE ADVANTAGES FOR SWISSLOG?

There is huge potential for Swisslog. Regardless of Midea's planned investment, Swisslog remains part of the KUKA group and together we continue in our shared vision of becoming an Automation Powerhouse.

That said, Midea has a strong presence in different areas to us, and the possibility of increased access to new markets and customers is incredibly exciting. The business also has a strong presence in the production and process industry, so Swisslog's intralogistics expertise can help build a bridge across the whole supply chain.

SWISSLOG HAS ALSO CHANEGD ITS SOFTWARE APPROACH. WHAT CAN YOU TELL US ABOUT THE NEW SYSTEM?

SynQ is the consequential advancement of our proven WM 6 architecture with an installed base of over 100 customers. The SynQ platform however is more than software: it connects and orchestrates automation, robotics, people and processes to put the needs of your business in the center – more than ever before.

Facts and Figures

100,000

The number of Midea employees globally.

1968

Midea was founded in 1968 in China's southern Guangdong province, is one of the country's largest home-appliances makers.

35%

More than one-third of its sales are outside China, thanks to sales of air-treatment products, air-coolers, kettles and rice cookers.