

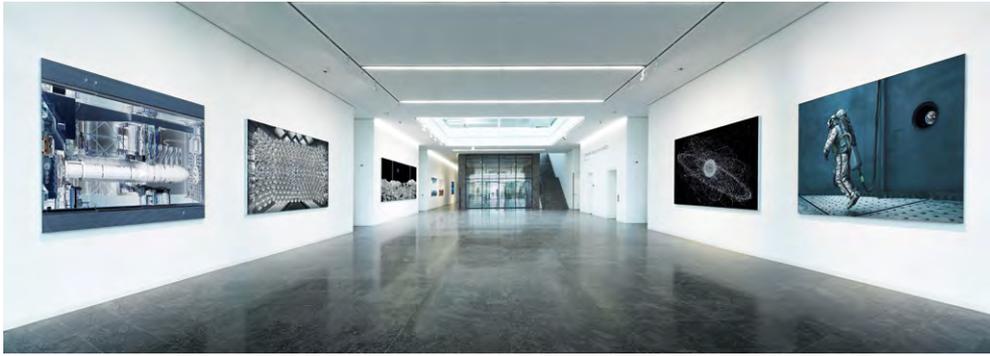
Team works | New shared responsibility at WITTENSTEIN alpha

A plus in performance | Small servo drive system redefined

Galaxie® | Milling-turning center performance improved several times over



**WITTENSTEIN Service Portal**  
One gate. All support.



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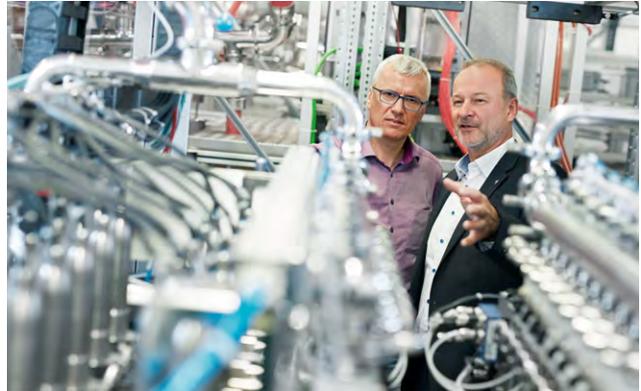
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# move #23

The magazine for customers and partners of WITTENSTEIN SE

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Dear readers,

On April 1, 2019 I took up office as CEO of the WITTENSTEIN Group. I won't deny that I could have managed very well without much of what has happened in the course of the last months. You don't need me to remind you that these are unprecedented times for all of us. Yet if we look confidently ahead to the future, there could be one useful lesson to be learned from the present situation: nothing bonds people like a challenge. The greater cohesion among our own employees is conspicuous – as is their willingness to get together in new ways, make more intensive use of digital channels and tread innovative paths together regardless of the exceptional circumstances.

We are also trying out new forms of cooperation daily with you, our customers and partners. Now, even more so than usual, you are at the center of everything we do. Our objective: to do everything in our power to provide you with simple, personal and practical support – where necessary and feasible – especially in those areas which are currently having to work flat out under constant pressure. In critical infrastructures, for instance, which depend on our drives in order to maintain production on their machinery and equipment. Food manufacturers, power producers and utilities or the makers of hygiene products are other examples. Our local subsidiaries around the world are doing their utmost to help overcome the crisis, always with an optimistic outlook for the aftermath.



The numerous typical applications described in this magazine show how we have supported you in the past – and will continue to do so in the future – with innovative solutions and excellent cybertronic drive products, no matter where you happen to be in the world. As you browse through this issue of *move*, you will notice that we have expanded several of our international manufacturing locations specifically with this goal in mind. We intend to be ready for the post-coronavirus era when it comes and in a favorable position to maintain our global growth trajectory. We are aiming to respond even more flexibly than before to the needs and requirements of our customers worldwide and emerge from this critical period stronger than ever. Digitalization will play a key role here, both in our production processes and in our products. That is why our cover story is dedicated to the new WITTENSTEIN Service Portal: connected smart services can now be accessed using our smart gearboxes with the cynapse feature. These services are fundamental for developing new, smart, data driven products which add significant value for our users. In the future, our customers will be able to produce even more reliably as a result and utilize their resources even more efficiently.

There is one more thing that I particularly want to say: I have come to know many of you personally over the last year during various visits to customers. Yet grateful as I am for today's virtual technologies, I can't wait to meet you again "live" as soon as possible.

Until then, please stay well!

Dr. Bertram Hoffmann  
CEO of WITTENSTEIN SE

**A plus**

*Small servo drive system  
redefined*

**in performance**

The new generation of WITTENSTEIN cyber motor's industrial small servo drive system convinces in all key areas. It provides optimal connectivity, is extremely compact and can be modularly configured. And if space on the machine is severely limited or decentralized control intelligence is called for, the cyber<sup>®</sup> dynamic system comes into play – as the ultra-space-saving, motor-integrated version.



Learn more about  
the new generation  
of our industrial  
small servo drive system.



## Intelligent motion control

All modular configurations of the small servo drive system provide users with a high degree of control intelligence, for example to enable autonomous positioning. For the cyber® dynamic system, this is a particularly important feature because individual machine modules can now be driven decentrally without having to communicate with the PLC every time. Motion control is transformed into an independent, field-level automation solution. Complex motion sequences can be represented and executed by the cyber® dynamic system directly in the form of motion tasks. The cyber® dynamic system simultaneously saves valuable space directly in the application.

The market sets the trends: increasingly modular machines, rapidly advancing automation intelligence on the field level, simplified connectivity and real-time capability as a must-have in more and more applications. In short, engineering is smartening up – and the new small servo drive system from WITTENSTEIN cyber motor is making an active contribution.

### Cost-cutting connectivity

The new cyber® simco® drive 2 series is probably more communicative than any other servo drive in this performance class. The Multi-EtherNet interface sets a new benchmark in this market segment. It allows users to choose between an EtherCAT, PROFINET or EtherNet/IP CIP Sync fieldbus – and in future also SERCOS III or a CANopen version – with one and the same hardware. This feature ensures proven, simple connectivity in real time in different control environments. One and the same material number, in other words the Multi-EtherNet differentiator of the cyber® simco® drive 2 reduces the normally much larger number of versions. This in turn saves time and cuts the costs for electrical design, procurement and item management as well as commissioning, customer service and maintenance.

### Compact with multiple configuration options

The new industrial small servo drive system combines small servo motors in four different sizes as well as inox, hygienic or standard (ball screw) design with intelligent servo drives in the cyber® simco® drive 2 series. They are about 30 percent more compact than their predecessor.

That means much more flexibility for users: even more versatility is now possible in motion control configurations. The modular principle enables solutions for a wide range of applications. The option of integrating a multiturn encoder, holding brake, gearbox or ball screw drive further extends the motor function. The motor-integrated version of the cyber® dynamic system moreover forms an ultra-compact unit that fits into even the tightest installation spaces and facilitates new drive concepts on the field level. A whole series of feature options for the small servo motors, suitable power supply units and preconfigured cables round off the “everything from a single source” approach of the small servo drive system, leading to what are arguably the highest-density motion control solutions currently available.

### Maximum dynamics and precision

Dynamics and precision are two further characteristics underlying this exceptional performance. The inertia-optimized motors, decentralized control intelligence and high overload capability result in highly dynamic motions with short cycle times. The use of absolute encoders with 12-bit singleturn resolution coupled with high current resolution of 14 bit simultaneously guarantees control with a high level of precision.

### Long lifetime, high safety

Industrial – a very apt description for this combination of robust design and built-in safety. Both the stainless steel housed motors and the drive modules and cyber® dynamic system are available in high protection classes and hence also suited for challenging operating

conditions. The motor encoders are highly immune to disturbances such as dust, shocks or vibration. The servo drives have a wide-range input on the supply side to mitigate voltage fluctuations. The electrical and controller connections between the motor and the drive are achieved using EMC shielded, single-cable technology. Thanks to the integrated Safe Torque Off (STO) function, all versions of the cyber® simco® drive 2 as well as the motor-integrated cyber® dynamic system meet even the highest safety requirements. In critical situations, STO interrupts the power supply to the drive and prevents automatic restarting. The small servo drive system additionally has NRTL certification: if a machine is approved for the North American market, a separate functional and safety acceptance test certificate is no longer required.

A plus in performance: small servo drive system redefined – the new generation from WITTENSTEIN cyber motor convinces in every respect.

## Small servo drive system

A multi-Ethernet interface, CIP Sync real-time functionality, a Safe Torque Off (STO) function and decentralized intelligence – the new small servo drive system from WITTENSTEIN cyber motor is exactly what the world of smart machine concepts was waiting for.



# TEAM WORKS

A change of management has taken place at WITTENSTEIN alpha: since summer 2019, Thomas Patzak and Norbert Pastoors, both of whom hold a degree in engineering, have shared responsibility for the company as joint Managing Directors – a closely coordinated team with ambitious plans.

**move:** *You're both well established at WITTENSTEIN alpha in the meantime. Bearing in mind that you didn't know each other before, what is your personal assessment after nearly a year of working together?*

**Patzak:** Very positive! We got along well together from the moment we met and that's still the situation today. The complex nature of our job and the organizational optimizations within the company mean we need to be in constant contact with one another. We generally see things the same way and share the same opinions, so that we work together in harmony and know we can rely on each other. And we're confident it will stay that way in the future. In line with the motto: A team is not a group of people who work together. A team is a group of people who trust each other.

**Pastoors:** I couldn't agree with you more: the chemistry's been right since the very first day – I'd also give top marks to our collaboration. We share the same attitudes and values as well as pragmatism founded on many years of experience, and that all adds up to a close, constructive and efficient exchange coupled with a coordinated approach and clearly defined organizational goals.

**move:** *The customer is always right – that's easily said, but what exactly do excellent customer relationships mean for WITTENSTEIN alpha worldwide with its enormous range of products and markets? Where do you see the greatest potential for WITTENSTEIN's oldest subsidiary in the medium to long term?*

**Patzak:** To begin with, I'd like to qualify that statement – that we've got an enormous range of products – because we mostly manufacture servo gearboxes, in other words we cater for a small niche of the gearbox market. The total market worldwide for non-automotive gearbox applications is in the region of 50 billion euros, so that we theoretically have huge potential for growth. We're currently working on ideas for new markets and products to consolidate our success in other segments too. We've been strong in Europe up to now, and our biggest growth potential clearly lies in America and Asia. What that means for us is that we must, and will, position ourselves even more than in the past as a global organization.





**Dipl.-Ing. Thomas Patzak**  
is Managing Director of  
WITTENSTEIN alpha GmbH  
with responsibility for sales  
and commercial operations.

**Dipl.-Ing (FH) Norbert Pastoors**  
is Managing Director of  
WITTENSTEIN alpha GmbH  
with responsibility  
for technology.

**move:** *Drive technology made by WITTENSTEIN alpha has a superb reputation in the global market. What product strategy are you pursuing to ensure that your gearboxes and motors continue not just to define the standard but to set it?*

**Pastoors:** We've always been pioneers when it comes to torque transmission and precision. Our products' superior quality and unique design are a reflection of their high value. Our aim is to preserve and develop these characteristics so that we can unlock new potential, particularly by increasing the power density. We are determined to consistently apply the system philosophy, namely the combination of gearbox, pinion and rack, and push ahead with the integration of motors into gearboxes in the form of servo actuators, which will enable our customers to benefit from overall optimization in terms of efficiency, productivity and usability.

We're also keeping a watch on developments linked to digital services in close consultation with our customers. In addition to our sizing tools, which our customers can now use to configure an optimized design for their application based on defined features, the WITTENSTEIN Service Portal provides relevant and current information, technical data, video tutorials on assembly and com-

missioning plus documentation for all of our products, which are shipped with a unique identifier. And that's not all – it won't be long now before our mechatronic drive systems and gearboxes are equipped with sensors that carry a clear message for IIoT environments. This connectivity will open the door for us to new markets and add even more value for our customers.

**move:** *Digital transformation is well under way in all branches of industry – whether in production processes or as digital services for customers. Where is this journey taking you at WITTENSTEIN alpha?*

**Patzak:** We started the journey with cynapse and we're now gathering feedback from customers who have received and tested our product to date. We can predict roughly what path the journey will take, but there are an awful lot of ideas in the making in industry right now. We want to get deeply involved here, to put ourselves in a commanding position in the market. In short, we intend to develop business and so-called value added models which are of benefit to both our customers and ourselves, so that we continue to be perceived as the number one choice in the market in the future.

## WITTENSTEIN Service Portal

# One gate. All support.



The new WITTENSTEIN Service Portal provides integrators, OEMs and operators with tailored services that add real value for each individual product. It thus makes a valuable contribution to the establishment of enduring customer relationships. The Service Portal also integrates a range of smart services that simultaneously build bridges to WITTENSTEIN components used in smart factories.

The WITTENSTEIN Service Portal can be accessed in various ways: e.g. by scanning the Data Matrix code on the product



There are many different online service sites – but none quite like the WITTENSTEIN Service Portal. Fun, not frustration – the WITTENSTEIN Service Portal turns customer service into a positive experience. Fitters, software developers, maintenance technicians and commissioning and service engineers now have quick, direct access to every WITTENSTEIN alpha, WITTENSTEIN cyber motor or WITTENSTEIN galaxie product shipped during the last few years along with the associated services.

### Easy access, tremendous possibilities

Getting started in the Service Portal is very easy: just enter the serial number or scan the Data Matrix code on the product – for instant access to Service Portal websites for each individual product. With smart cynapse gearboxes it's easier still – the electronic identification plate is read automatically. And no matter which device is used to access the portal, the website's mobile ready design means it adapts automatically to the notebook, smartphone or tablet representation.

As soon as visitors have signed into the WITTENTSTEIN Service Portal, a vast array of information about their particular product awaits them. Gearboxes, motors, actuators and drives – whatever the product, the Service Portal encompasses all kinds of useful services spanning the entire life cycle: users can access product information, technical data



or operating manuals there, inquire about successor or replacement products, download documentation, certificates or firmware files, watch video tutorials on assembly and commissioning, call up add-on components and accessories and – as a new feature – request smart digital services. The choice is immense! Even products returned for inspection or repair can be managed quickly and easily via the portal, which leaves virtually nothing to be desired. And if they do have any unfulfilled wishes, visitors to the WITTENSTEIN Service Portal can get in touch with the right contact person for their product directly.

**Digitalized processes in the background ensure efficient services**

With such an enormous range of services, the WITTENSTEIN Service Portal is also a very helpful digital portal for operators who have been using machines featuring WITTENSTEIN drive technology for years. These users can get instant online access to information on a specific component or call up quick replacement products simply by filling in a form based on the unique identification of existing motors, gearboxes, servo actuators or drives. This clear identification not only prevents mistakes in the portal service process as a result of choosing the wrong series, model or variant; it also significantly reduces the time for administrative activities. And thanks to the Service Portal, services such as inspections or repairs can be requested, agreed and provided promptly and in a targeted way. For example, the consignment note for returns to WITTENSTEIN is output directly in the portal together with the correct recipient address.



To the WITTENSTEIN Service Portal

**Touchpoint for Industry 4.0**

The WITTENSTEIN Service Portal extends the technical and commercial benefits for machine construction companies and integrators as well as for their customers too. This applies equally to WITTENSTEIN drive components already in operation and to all those integrated in machinery or systems in the future. Particular attention has been paid to support for smart gearboxes with cynapse functionality.

The WITTENSTEIN Service Portal is hence ready today for Industry 4.0 and Service 4.0. Amongst other things, this is demonstrated by the access method using the electronic identification plate on cynapse gearboxes. This allows customers to display certain smart features like temperature and vibration checks via the Service Portal or request newly available smart services for their component.

The WITTENSTEIN Service Portal is thus able to function efficiently in manufacturer-independent IIoT scenarios; it enables more components to be connected if necessary and it is optimally prepared for use with artificial intelligence in the not-too-distant future.





## Close to customers throughout the continent



- 1) 115 employees at WITTENSTEIN's Bartlett (Illinois) site guarantee physical proximity, short communication paths and maximum customer support.
- 2) Tom Coyle, Director of Sales North America and a WITTENSTEIN employee of many years, provides support to numerous sales partners in the U.S.
- 3/4) Production employees work around the clock making sure emergency spares can be supplied within 24 hours via the speedline service.

The expanse of North America makes it a challenging region to support, and compounding the matter is the U.S. market's demand for speed, a critical success factor for business. To meet this challenge, WITTENSTEIN Group has a state-of-the-art facility in Bartlett, Illinois, staffed to accommodate the full range of customer support: sales, orders, technical expertise, product and delivery. This proximity to customers has fostered growth and a strong regional presence.



## WITTENSTEIN Holding Corp.

Headquarters:	Bartlett, Illinois
Founded:	1992 as "alpha gear drives Inc."
Company management:	Peter Riehle (CEO) and Brian Dunkel (CFO)
Employees:	115
Net sales:	\$60 million
Products produced in US:	75%
Facility size:	3+ acres
Strategic Business Divisions:	WITTENSTEIN alpha, WITTENSTEIN cyber motor, WITTENSTEIN aerospace & simulation, WITTENSTEIN motion control, WITTENSTEIN galaxie
Certifications:	Certified to the latest ISO 9001-2015 standard
Website:	<a href="http://www.wittenstein-us.com">www.wittenstein-us.com</a>

All in all, 115 people in the WITTENSTEIN alpha, WITTENSTEIN cyber motor, WITTENSTEIN aerospace & simulation, WITTENSTEIN motion control and WITTENSTEIN galaxie Strategic Business Divisions look after the needs of American customers from the headquarters in Bartlett (Illinois). Physical proximity and presence are vital here because, more than anywhere else in the world, the U.S. market insists on rapid responsiveness.

### Speed

Customers in the U.S. have access to WITTENSTEIN services along the entire value chain. More than 75% of all products are manufactured, machined, assembled, stored and shipped directly in Bartlett. For example, emergency spares can be supplied within 24 hours via the speedline service, thus ensuring customers maximum uptime and reducing disruptions to a minimum. President and CEO Peter Riehle and his team also act as points of contact and expert advisors in connection with product development projects as well as maintenance and repairs, providing fast and individually tailored support wherever necessary.

### Closeness

The land of opportunity is famous for its regional contrasts. Even industries tend to be strongly concentrated in different parts of the country: Michigan, for instance, is the heart of the automotive industry while the Midwest is a hub for food and beverage packaging and Florida is a top place for military simulation-based training. This tremendous breadth of customers and industries can't be served from the manufacturing facility alone, which is why multiple satellite offices have been set up, with teams in direct contact with customers in their respective territories. Project consulting, product training, new product development and much more take place on the customers' doorstep.

### Sales

Sales of industrial automation solutions probably represent the biggest difference between the U.S. and German markets. The majority of business in America is done through independent sales partners. These companies offer the local presence and specialist expertise demanded by individual states coupled with services such as product transportation, fitment and just-in-time delivery. WITTENSTEIN in North America, too, has formed strategic alliances with individual sales partners who share the corporate values of excellence and innovation, and support customers throughout the U.S.

### Customized solutions

This local presence makes it easier to adjust to, and meet, each customer's specific needs – which is particularly helpful when developing new products. For example, an integrated motorized roller for driving a conveyor was designed explicitly for the American market. The roller accommodates a motor and gearbox, which can be modified for different torques and speeds. Another product innovation originating in the U.S. is a corrosion-resistant gearbox with IP65 protection that is mainly distributed through WITTENSTEIN's channel partner Rockwell Automation. And from minor adaptations to drop-in solutions to intensive consultations on customized designs, the Simulation team are frequently assigned to work on the customer's premises in search of solutions conforming to highly precise requirements – such as a loading system developed for flight simulation.



Discover more about our U.S. production site at [www.wittenstein-us.com](http://www.wittenstein-us.com)



## A German Engineer with an eye for the U.S.

You can buy almost anything in America – apart from Swabian pretzels, that is. Peter Riehle, CEO and President of WITTENSTEIN in North America since 2013, has been living and working in the USA with his family for an awesome 23 years. In the meantime, he bakes those distinctive bread specialties himself in the kitchen of his home, and they're immensely popular with his colleagues and friends alike.



While “Riehle Pretzels” might not be as famous in the U.S. as Anheuser-Busch and Budweiser, they are definitely a fan favorite of employees at WITTENSTEIN’s regional headquarters in the U.S. However, the staff must wait for a holiday or special occasion to enjoy one of Peter Riehle’s special treats, as his schedule leaves little time to indulge in this favorite hobby. Fortunately, his passion for his work as President and CEO for WITTENSTEIN Americas gives him satisfaction as well.

If he isn’t visiting customers in Canada, the U.S. or South America, Peter is likely hosting delegations of industry leaders, academic professionals, journalists and even politicians at the 5-acre complex in the U.S. These delegates want to know how a small engineering firm with a German “parent” has developed into an exemplary model for dual study programs in the U.S. Mr. Riehle and his team guide the guests through the two main production buildings and the training workshop, where program participants share their training experiences as an industrial mechanic, mechatronics fitter or CNC operator.

The program is called ICATT (Industry Consortium for Advanced Technical Training), and WITTENSTEIN is one of its founding members. Established in 2015 by a coalition of German SMEs, U.S. companies, the state of Illinois and the German-American Chamber of Commerce, the program has gained international attention as a model for success. Peter Riehle is an ardent spokesman for the program, and his time and efforts led to his election in 2019 as Chairman of the Board for the entire AHK-USA German American Chambers of Commerce.

Attesting to the stature of the position, he notes, “It’s an enormous responsibility representing 2,500 German businesses with around 700,000 employees in the U.S. But our achievements speak volumes: we’re presently training more than 200 young people as qualified specialists at over 50 different companies – specialists that the industry desperately needs for these technically demanding production processes.”

The ICATT program synergizes well with the local production functions of the facility, a critical requirement for doing business in the U.S. The market demands for speed of both service and product mandate local proximity, so WITTENSTEIN has organized its production process to ensure a rapid and flexible response, manufacturing about 75 percent of all deliveries onsite.

In addition to local production, the region staffs a hard-working team of application engineers to support customers with design optimization, special projects, sizing evaluations and other technical support. Of course, German engineering is renowned in the U.S., so machine builders readily seek out WITTENSTEIN products and expertise, especially for complex systems like flight simulators, amusement park rides, surgical robots, pharmaceutical packaging, automatic guided vehicles and other applications requiring the highest levels of precision, performance and safety.

Peter Riehle not only supports customers in the region, he supports his team as well. He is an approachable boss, who frequently takes the time to chat with staff throughout all divisions of the company. In fact – he’s not above grilling the sausages himself at company luncheons. He views it as a show of support for the hard-working staff, and a symbol of the relaxed and friendly atmosphere that prevails at American firms.

This atmosphere carries over into customer engagements, as well. “They invariably welcome you with open arms, from the first time you meet them. It’s all very spontaneous and flexible – and that’s exactly what you need to succeed in the U.S. American culture is driven by speed. WITTENSTEIN holds the industry benchmark for quality, however to retain the leadership position we must satisfy the market’s demands for lead time and delivery wherever possible.” says Riehle. He and his team do their utmost to satisfy precisely these wishes.

“When TRUMPF, my former employer, offered us the chance to go to America back in 1997, my wife and I agreed without hesitation that that was what we wanted. And none of us – including our two daughters, who were aged 8 and 12 at the time – have ever once regretted that decision. Time and time again, the ‘land of opportunity’ has opened up new perspectives and new horizons for us; it’s a melting pot of cultures and traditions with opportunities and challenges in equal measure. And the endless open spaces leave their mark on the people who live there.”

Peter Riehle  
CEO and President of WITTENSTEIN in North America



- 1) Numerous institutions contact Peter Riehle asking for information on ICATT, the dual training program.
- 2) The way production is organized in America means Peter Riehle and his team can provide a rapid and highly flexible response to customers.
- 3) Peter Riehle is an approachable boss who is not above barbecuing the sausages himself at the staff party, for instance.





Half a century after Neil Armstrong became the first human being to set foot on the moon, a German photographer is plotting the next conquest of space: Michael Najjar. For his new exhibition "Beyond the Horizon" the 53 year old photo artist chose a venue which is a fitting home for his artistic topos, namely technical innovations and their impacts on the future of humanity: the Innovation Factory of WITTENSTEIN in Igersheim.

### Michael Najjar

German photo artist, adventurer and future astronaut. He travels to the world's most remote places in search of inspiration. And he attends training camps as part of his preparation to become the first artist to fly into space.

For more information on the artist, see [www.michaelnajjar.com](http://www.michaelnajjar.com)

He has found his "alter ego" in Manfred Wittenstein, entrepreneur and patron of the arts. The two men are united by a fascination for the arts and technology. One – the engineer Manfred Wittenstein – is Past President of the German Engineering Federation (VDMA) and a recipient of several lifetime achievement awards. A courageous and visionary pioneer, he transformed his own family firm into a global player for innovative drive technology. A man for whom sustainable entrepreneurship – coupled with a commitment to society – is something to be taken for granted.

The other – photographer Michael Najjar – is among the vanguard of artists taking a complex, critical look at the technological forces that are currently shaping and drastically transforming the early 21st century. Whose photo and video works draw from an interdisciplinary understanding of art. Who fuses science, art and technology into utopian visions of future social orders that are spawned by cutting-edge technologies.

The exhibition at the WITTENSTEIN Innovation Factory specifically revolves around technological progress in space travel, which could change the future radically. In addition to 20 large-scale photo compositions, Najjar's most comprehensive solo "outer space" exhibition to date also includes a video installation called "terraforming".





### ignition (2019)

Visualizes the exact moment when a Soyuz launcher left the launch pad on April 5, 2019. To capture this unique image, a sound-triggered camera was installed a mere 80 meters away.



### serious anomaly (2015)

Is a digital composition based on an extensive number of individual photographs of the "SpaceShipTwo" spaceplane, which crashed in October 2014; it is arranged analogously to Caspar David Friedrich's iconic 1824 painting "The Sea of Ice – The Wreck of Hope".



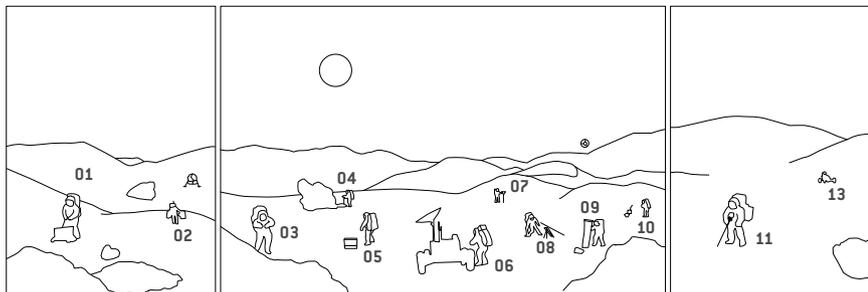
### liquid gravity (2013)

Shows Najjar during his cosmonaut training under water in an original spacesuit. The picture was taken at a depth of 12 m and subsequently one element was digitally added – the Earth is "looking" through the porthole.



### space debris I (2012)

Visualizes the defunct objects now in various orbits around the Earth. The work was realized in collaboration with the Institute of Aerospace Systems / TU Braunschweig, Germany, the world's leading authority on the tracking of space debris.



- 01 Neil Armstrong, Apollo 11
- 02 Buzz Aldrin, Apollo 11
- 03 John Young, Apollo 16
- 04 Edgar Mitchell, Apollo 14
- 05 Charles Duke, Apollo 16
- 06 James Irwin, Apollo 15
- 07 Alan Shepard, Apollo 14
- 08 David Scott, Apollo 15
- 09 Pete Conrad, Apollo 12
- 10 Alan Bean, Apollo 12
- 11 Harrison Schmitt, Apollo 17
- 12 Eugene Cernan, Apollo 17

### lunar explorers (2019)

(Fold-out page) Is a homage to the first moon landing fifty years ago showing the twelve moonwalkers, who in this composition appear to be walking and working together on the lunar surface. Only four of them are still alive today.



Learn more about all of the pictures on show as well as opportunities for public visits.





Output shafts can now be completely machined on the STAMA-built MT 733 two in a single setup – from blank to finished part – whether for complex milling and turning operations or for highly precise fine machining (right: STAMA Managing Director Crispin Taylor).

The WITTENSTEIN team under Dr. Lars Aldinger (left), Head of Corporate SCM Technology, made this possible.



## Galaxie® improves performance several times over STAMA's new milling-turning center

### Galaxie® convinces with extraordinary inner values

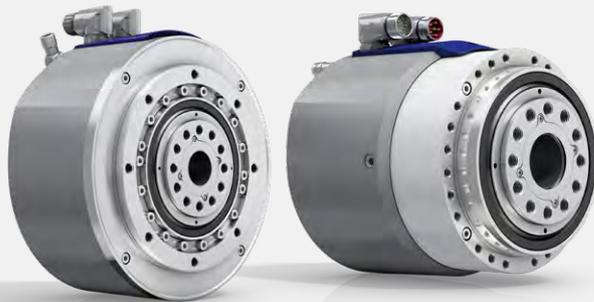
Galaxie® is a completely new gearbox class which sets benchmarks when it comes to freedom from backlash, synchronous running, stiffness, torque density and overload capacity. This extraordinary performance has been confirmed in numerous industrial applications – including STAMA: the zero backlash, extreme torsional rigidity and high repeat accuracy ensure precise positioning of workpieces swiveled via the B axis during machining processes. The high power density is no less impressive: owing to the compact design, access to the work space is easier and the turning spindles seated on the X slide can move even closer together.

The specific machine control algorithms developed by STAMA and WITTENSTEIN together with Siemens for integration on the control side were adapted to the Galaxie® Drive System's mechanical behavior and integrated into the Siemens Solution Line control world.

“  
 The performance  
 of the Galaxie® Drive System  
 in the new complete  
 machining centers in our 733 series  
 exceeds all expectations.

”

Crispin Taylor  
 Managing Director of STAMA



## From an idea to a limited liability company

The new subsidiary – WITTENSTEIN galaxie GmbH – set up by WITTENSTEIN SE on April 1 will enable the radically innovative Galaxie® Drive System to be positioned in the market and strengthened in an even more targeted way in the future. Tobias Burger, previously responsible for establishing technology and production within the company's "Start-Up Galaxie" division, has been appointed Managing Director.

It was a conscious decision by the Group to set up a new subsidiary for this promising business segment. The Galaxie® Drive System is now optimally placed for the future with new, in-house serial production and several different product variants: "We have created the platform we need in order to offer our customers prompt, direct support as a competent partner with our own development, production & logistics, quality management and sales functions", said Tobias Burger.



The big day finally arrived: STAMA celebrated the world premiere of its new MT 733 milling-turning center series at the AMB 2018 exhibition. This innovative machining center allows highly precise output shafts with a thread, holes and special contours to be completely machined on six sides in a single setup. The four models belonging to the modular MT platform set new standards in terms of stability and precision. Our Galaxie® System is integrated in the B axis and makes a decisive contribution here with its superior stiffness, freedom from backlash and positioning accuracy. This challenging project took place in the framework of a technology partnership between STAMA and WITTENSTEIN. The cooperation culminated in an MT 733 prototype, which has also been tested at WITTENSTEIN.

### STAMA trusts in complete, turnkey machining

STAMA is a technology driver for complete machining on multi-spindle milling-turning centers. More than 500 innovative machining solutions with 5-axis, 6-side milling and turning from barstock or the chuck have been implemented by the company for its customers. New, high performance materials, more complex machining processes and the trend towards more power density mean a demand for increasingly stable and flexibly configurable machine concepts.

### New series is a technology trendsetter

STAMA's new MT 733 series meets the demands for the highest possible dynamics, stability and precision. In short, it is a technology trendsetter. The switch to a more stable fixed gantry concept – with much

shorter levers compared to a traveling column – as well as vertical milling spindles is a decisive innovation leading to significantly better milling performance from the installation space. STAMA swivels the short bars via the B axis of the milling spindles – for example, in order to drill inclined holes or for simultaneous 5-axis machining – and the design of this axis was therefore crucial.

### The prototype was also used at WITTENSTEIN

As part of the preparation for SOP, WITTENSTEIN tested the prototype MT 733 two for several months itself – and had very positive experiences with it. Complex components were completely machined in a single setup from blank to finished part. Manufacturing precision – expressed in manufacturing tolerances and baseline dimensions – was reproducible to less than one hundredth of a millimeter. The main time was reduced by 40 percent thanks to complete machining. All of the hoped-for improvements simultaneously materialized: shorter throughput times, lower internal transport and storage costs, simplified setting-up and alignment, reduced stocks of semifinished products and above all greater process reliability.



Learn more about  
 the application with  
 our customer STAMA.

# TP<sup>+</sup> gearboxes

enable precise machining of profiles  
for the Louvre Abu Dhabi

The Louvre Abu Dhabi is one of the most spectacular museum complexes anywhere in the world. Its aluminum elements form a seemingly weightless dome. The modules for this canopy-like structure were manufactured on SBZ 151 Flexium<sup>+</sup> five-axis profile machining centers from elumatec AG. TP<sup>+</sup>050 low-backlash planetary gearboxes in the WITTENSTEIN alpha Advanced Line ensured the high precision and repeat accuracy that laid the foundation for accurate, exact-fit machining of approximately 500,000 profile parts.



## TP<sup>+</sup>050: The ideal planetary gearbox for the job

The TP<sup>+</sup> 050 low-backlash planetary gearbox meets all requirements for the X axis in elumatec's profile machining center. The maximum torsional backlash of less than 3 arcmin and the specified torsional rigidity of 145 Nm/arcmin assure the required positioning accuracy of 0.1 mm and repeat accuracy to match. A maximum movement speed of 66 m/min and acceleration dynamics of up to 1.5 m/s<sup>2</sup> are achieved by the gearbox in the machining unit, which can weigh as much as 3.5 t. This outstanding performance is possible thanks to the maximum 660 Nm torque as well as the maximum input speed of 6250 min<sup>-1</sup>. The high-quality helical toothing provides smooth running at the output and minimizes the influence of mesh frequencies. This combination results in 96 percent efficiency – coupled with low-noise operation.



**elumatec – global market leader  
for profile processing machines**

With more than 740 employees as well as subsidiaries and dealers in around 50 countries, elumatec AG – at home in the small town of Mühlacker in south-west Germany – is a global market leader in the manufacture of machines for processing aluminum, PVC and thin-walled steel profiles. Its customers range from small, quality oriented craftsman's businesses to industrial profile processors such as automotive suppliers, sports goods manufacturers, yacht and sailing boat builders or wagon and facade construction companies.

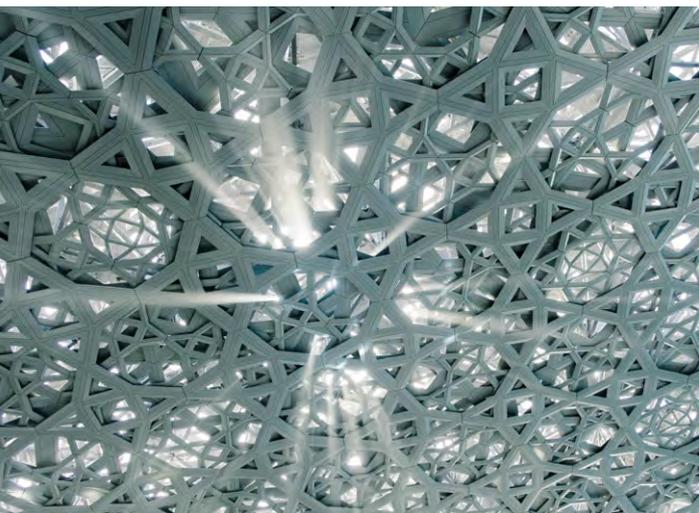
**Profile machining center achieves very high  
positioning accuracy and repeatability**

A rack-and-pinion system moves the machining unit of the SBZ 151 along the profile in the X direction together with the integrated tool changer and stops it at every single machining point. For example, if threads have to be made for screwing individual elements together later, the machine first drills all of the required holes prior to changing the tool and then cuts threads in them one at a time.

Even this relatively simple process clearly illustrates the importance of maximum possible positioning accuracy and repeatability for precise profile machining. Furthermore, both the acceleration of the tool unit from one machining point to the next and deceleration and positioning are executed with very high dynamics, in order to optimize the machine's output and reduce the machining costs per profile to a minimum.



Learn more about  
the application  
with our customer  
elumatec.



**The Louvre Abu Dhabi**

The Louvre Abu Dhabi art museum unites traditional Arab architecture with modern 21st century styles. The architectural ensemble on Saadiyat Island consists of 55 flat-roofed cubic structures arranged adjacent to and on top of one another, which together with the pathways between them and the ponds surrounding them are intended to give the impression of an Arabian medina. The Louvre Abu Dhabi's striking dome, (picture left) designed by French architect Jean Nouvel with a diameter of 180 meters covering the entire 24,000 square meters of museum space, is an eye-catcher that in the daytime also acts as a shading canopy over the light-filled ensemble. At night, it forms a tapestry of 7850 stars.

# Selective drive control cuts costs

Less complex drives, more efficient use of space and more economical drive solutions – these were the development goals behind WITTENSTEIN's new cyber® motor select switch. The module allows selective control of several different motors using a single servo drive.



Thanks to the cyber® motor select switch, up to four motors from WITTENSTEIN cyber motor's industrial small servo drive system can be selectively controlled using a single servo drive.

The motor select switch is a special kind of switch that allows selective control of several different motors using a single servo drive. Both the motor phases and the encoders are connected to the active motor without compromising functionality or performance – and with a very short switching time of no more than a few tenths of a second.

### **Machine drives are often not all active at once**

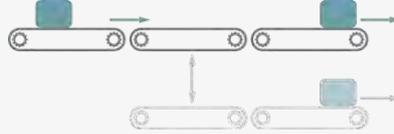
How many of a machine's electric drives are actually in use at once? With robots or machine tools the answer is easy: usually all of them. However, there are plenty of other applications involving motion where this is not the case. Machines with an automatic format adjuster are a good example here. The machine is adjusted at the start of the batch to specific product geometries, machining depths or filling quantities.

The format adjustment drives are deactivated during the production process. Their influence on the machine's cycle time is therefore only minor and they do not have to be highly dynamic – especially as they simply take the place of actuators that have traditionally been operated manually. Material flow lines which convey workpieces or loading devices frequently consist of multiple segments and include switches as well as lifting units. By activating only the drives that are genuinely required, it is possible to manage

## Possible target applications

### Drive optimization in stationary and mobile material flows

For example, the cyber® motor select switch can be used in material flow lines where the drives for belts, switches and lifting systems are not all in use at once.

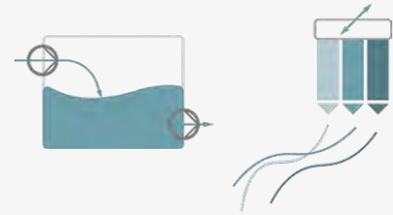


The cyber® motor select switch enables lift tables to be driven while loading and unloading from an automated guided vehicle system.



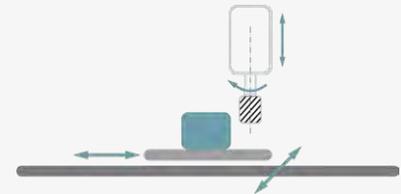
### Smart drive solution for packing, bottling, labeling and dosing

The cyber® motor select switch is also ideal for pumping and dosing. A tank could be filled by one drive, for instance, and pumped dry by another (left) or several beads applied one at a time using a single dosing head (right).



### Sequential processes in machine tools

The cyber® motor select switch can additionally be used for sequential processes such as positioning workpieces or feeding and changing tools.



“

The cyber® motor select switch is a new technology. Function and application possibilities must first be known on the market. We are therefore pleased to receive application ideas and are happy to support pilot users in machine integration.

”

Dr. Oliver Barth  
Deputy Head of Development Electronics & Software  
at WITTENSTEIN cyber motor

with fewer servo drives and at the same time cut energy consumption.

#### Less is more

Reducing the number of drives in the machine enables more powerful, more energy and cost efficient drive solutions that make more efficient use of space. The motor select switch thus supports the goal many manufacturers have of minimizing the machine footprint, in other words the amount of space required to install

the equipment. The current trend towards miniaturization is particularly evident when it comes to autonomous transport solutions – from classic automated guided vehicle (AGV) systems through compact automated guided carts (AGC) to autonomous mobile robots (AMR). Not only are these vehicles and mobile platforms getting smaller; they are also increasingly multifunctional. Here, as in stationary robotics, the credo is to “offload ballast” – also with a view to saving kinematic energy.

#### Interested?

The motor select switch opens up considerable potential for rationalization. However, since the technology is new, a detailed analysis is essential for every application. WITTENSTEIN cyber motor’s team of highly qualified application engineers are ready and willing to assist here.



# Building for the future

The expansion of various international manufacturing locations reflects the WITTENSTEIN Group's growth strategy

## **WITTENSTEIN Romania**

The new production shop at our manufacturing plant in Sibiu went into operation at the beginning of the year. The expansion of WITTENSTEIN's Romanian facility as a center of competence for mechatronic drive components and stators within the WITTENSTEIN Group is now complete.

The second construction phase which ended a few months ago duplicates the existing building and creates space on site for up to 160 people. The production area has been doubled to 2400 square meters overall as a result.

WITTENSTEIN SRL in Romania has been manufacturing gearbox components and stators for WITTENSTEIN's mechatronic drive systems ever since 2008 and meanwhile employs 80 people.





### **WITTENSTEIN Switzerland**

The machining expertise available at WITTENSTEIN Switzerland and the excellent conditions that prevail there were fundamental aspects in the decision to further enlarge the Grüşch facility. Following the successful establishment and expansion of rack manufacturing, the second phase entailed the construction of a modern production shop for high-precision high-tech-components to meet intra-Group demand.

Inside the building, apart from a production area of 1150 square meters and offices for administrative activities integrated with production, the 70 or so employees in Grüşch particularly profit from spacious new recreation rooms.

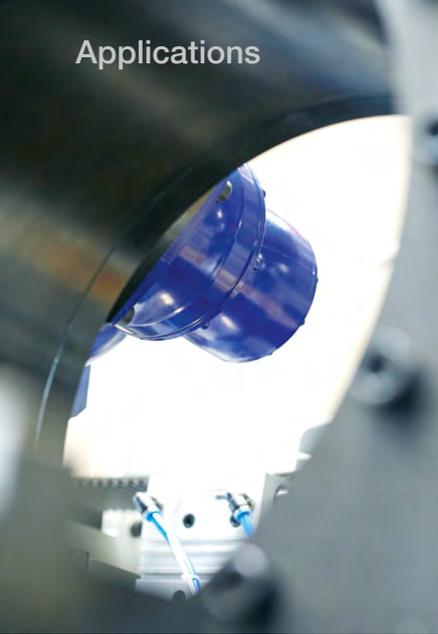


### **WITTENSTEIN talent arena**

The extension of WITTENSTEIN's in-house training center represents a clear commitment to Igersheim-Harthausen as a business location and a conscious investment in the future: following a construction phase lasting just 8 months, the 600 square meter annex of the WITTENSTEIN talent arena was officially opened in fall 2019.

The talent arena now provides total of 3050 square meters for workshops, training and seminar rooms as well as a large communal area for trainees and students. The work and training areas are designed to enable optimal learning – both theoretical and practical – according to the latest pedagogical insights.

All in all, 203 talented youngsters are currently doing training or a dual study program at WITTENSTEIN in 21 different commercial and technical professions – and the number is rising.



### WITTENSTEIN alpha's low-backlash planetary gearboxes make a big impression all along the line

High positioning accuracy and reproducibility as a result of reduced backlash and high torsional rigidity, coupled with the option of individual optimization for special mounting conditions – these features of the planetary and right-angle gearboxes in WITTENSTEIN alpha's Advanced and Premium Lines were what particularly convinced the developers at J. Neu GmbH. The gearboxes can be found in their 6-axis tube machining centers, where they score with high machining speed, precise 2D and 3D forming of tubes and profiles and extraordinary efficiency.



TP+  
SP+  
TK+  
XPK+

## Maximum precision for J. Neu tube machining centers

Several planetary and right-angle gearboxes are incorporated into J. Neu's freeform bending machines.

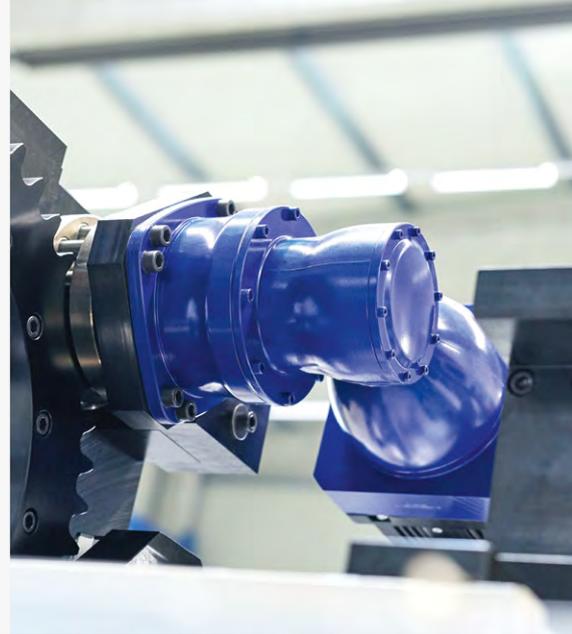
Photo (from left to right): Lothar Kummermehr, Sales, and Jörg Neu, General Manager (both J. Neu GmbH), with Michael Stutzer, Sales Engineer (WITTENSTEIN alpha).





Photo left:  
The machines can bend nearly anything, for example automotive parts, baby swings or stirring hooks for sausage and baking machines.

Photo right:  
To achieve the highest forming accuracy, J. Neu uses WITTENSTEIN gearboxes combining very low backlash with high torsional rigidity and torque density in its freeform bending machines.



### Planetary and right-angle gearboxes for all axes and requirements

The WITTENSTEIN alpha portfolio extends from Basic and Value segments to Advanced and Premium, covering the most diverse technical and commercial performance requirements. Manufacturers can thus implement their respective applications with a technically appropriate solution that also makes sound economic sense. J. Neu GmbH is an excellent case in point here: high quality and power density – expressed, among other things, as minimal torsional backlash, torsional rigidity, dynamics, torque and compactness – were the decisive parameters specified for the gearboxes for its 6-axis tube machining centers. The gearboxes which were chosen for this purpose ensure that tubes and profiles are bent on the machines with the highest possible dimensional accuracy in 2D and 3D.

### J. Neu: Pioneer and protagonist of a special, patented bending method

J. Neu specializes in the development, design, manufacture and supply of tube and profile machining centers. Its customers come from the automotive industry, refrigeration and heating or furniture making, for example. Over the years freeform bending has emerged as the firm's principal sales driver. In contrast to rotary draw bending, symmetrical and asymmetrical parts are not bent around a fixed die but pushed through a bending head. Almost all parts must be manufactured with the highest possible precision and tolerances are given in hundredths of a millimeter.

### Gearboxes for all axes from a single source

Several planetary and right-angle gearboxes are incorporated into the five axes of the tube machining centers for feeding the workpiece and retracting the mandrel. The high torsional rigidity and positioning accuracy were compelling arguments from a process perspective for using the TP\* 110 gearbox with output flange in the bending head.

Since tubes and profiles made from mild or high strength steels, stainless steel or aluminum have to be formed on the tube machining centers with an outer diameter of up to 90 mm, it must be possible to control very high forces safely and reliably in the feed axis for the material. J. Neu therefore synchronized two SP\* 210 gearboxes in a gantry configuration in order to produce the required torques and the resulting feed forces. Two SP\* 140 gearboxes ensure precise and dynamic adjustment of the bending head both vertically and laterally. Customer and application-specific modifications were made to the TK\* 110 right-angle gearbox on the axis for

retracting the mandrel. Owing to a planetary roller screw integrated by WITTENSTEIN alpha into the flanged hollow shaft there on the output side, the gearbox can be connected to the retract axis without any additional components.

A Premium Line gearbox – the XPK\* – is installed on the torsion axis, with which a part can also be formed around its own axis during the bending process if need be. The output interface is a highlight of the XPK\*. It was developed with very high torques in mind and enables improved power transmission far exceeding the industry standard.



Watch this video to see exactly what J. Neu's tube machining centers are capable of.

“  
The WITTENSTEIN alpha gearboxes ensure that tubes and profiles are bent on the machines with the highest possible dimensional accuracy in 2D and 3D.  
”

Lothar Kummermehr  
Sales, J. Neu GmbH

Small servo drive systems

## Precise dosing of liquids for six million pads per day

20 small servo drive systems mounted parallel to one another at the liquid stations drive the dosing augers.

### Our system simply makes more things possible

The small servo drive system also impresses with its ability to optimize the dosing precision separately for each dosing auger. The discharge behavior can be adapted to different product viscosities in this way. For example, the developers programmed a short reverse rotation of the auger in the servo drive, so that if a product strand forms between the discharge opening and the cavity, it is automatically cut off. This simultaneously prevents too much product from being dosed into individual pads and there is no contamination of the future sealing surface. If the dosing augers have different discharge rates and tolerances, they can thus be compensated in the process, as can different product properties. Thanks to the small servo drive systems, it is even possible to run different products on the machine at once.



It was a complex challenge: liquids of varying viscosity needed to be dosed into pads efficiently and precisely in a dishwasher pad forming machine at Harro Höfliger GmbH – up to six million times a day. Harro Höfliger's developers put their trust in small servo drive systems from WITTENSTEIN cyber motor, which are made from 100% stainless steel and hence resistant to corrosion.

The compact, lightweight design likewise won the customer's enthusiasm straight away owing to the significant space saving. Moreover, the web server integrated in the servo drive provides "always on" connectivity, so that the dosing stations and each individual dosing drive can be accessed at any time for optimization or servicing.

#### Harro Höfliger: Innovative packaging solutions for customized products

Harro Höfliger develops and manufactures innovative high-tech packaging equipment, product solutions and specialized services for its customers. At home in the small South-West German town of Allmersbach, the company employs around 1300 people; its operating performance in 2018 was 259 million euros, and with exports accounting for more than 80 percent of turnover Harro Höfliger is a leading global packaging partner for the pharmaceutical and medical technology sectors as well as the chemical, food and consumer goods industries.

#### Corrosion-resistant small servo drive system controls dosing augers

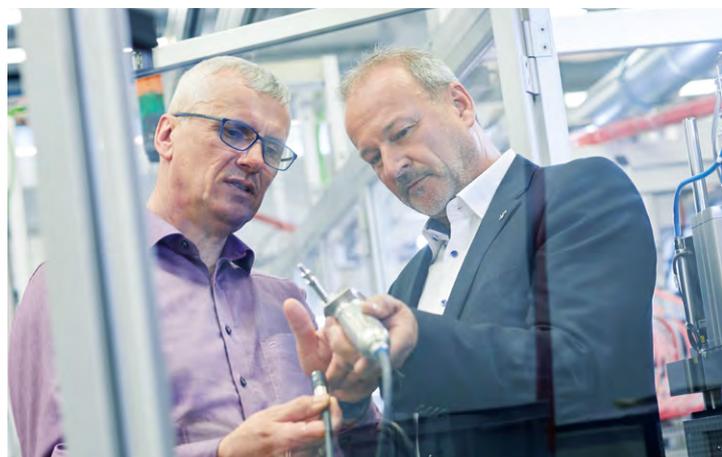
Size d40 (outer diameter in mm), stainless steel small servo drives in the dynamic line with a ratio  $i=30.67$  are installed in two dosing stations of the product forming machine for dishwasher tabs along with SIM2010D compact servo drives in the cyber®simco®line with IP20 protection and a ProfiNet interface.

Full stainless steel was chosen because if the product leaks, the detergent substances have a corrosive effect on surfaces and, what's more, the equipment can be cleaned externally. It is clearly a big advantage here that the complete gearbox is integrated in the stainless steel housing – in other words, with no seal to the motor.

The motors and drives are connected using single-cable technology that is integration-friendly and compatible with drag chains. No parameterization is necessary because the motor and servo drive are synchronized via their electronic identification plate (plug & play), so that commissioning the equipment is a simple matter. The high current resolution of the servo drive enables dynamic and highly precise control of the small servo motors, which are designed with optimized mass inertia. The motors act directly on the dosing augers, which in turn ensure high, repeatable dosing precision with just a few grams of liquid per pad.

The single-source availability of the motor and the servo drive means technically optimized solutions at any time with no interface risks.

Photo: Hubert Rypalla, Project Manager at Harro Höfliger (left), and Jörg Mückeley, Sales Engineer at WITTENSTEIN cyber motor (right).



“

Repeatable dosing precision is enormously important, both in the interests of a reliable process and to ensure uniform product quality.

”

Hubert Rypalla  
Project Manager at Harro Höfliger



Learn more about  
the application  
with our customer  
Harro Höfliger.

# DEBUT

Classical Singing Competition  
celebrates an important anniversary

DEBUT, the international Classical Singing Competition, will be celebrating its first round number birthday this year: in September 2020, numerous young opera singers will be appearing for the tenth time before a distinguished judging panel and captivating large audiences with their voices.

Connecting business, technology and culture has always been a matter close to the heart of DEBUT initiator Dr. Manfred Wittenstein (Chairman of the WITTENSTEIN SE Supervisory Board), and this is reflected in the Classical Singing Competition which he founded in 2002. His longstanding commitment to provide opportunities to young soloists starting out on a musical career, network them together and introduce them to a broad public has since been emulated by a good many other sponsors in the lovely Tauber Valley – which is why this tenth edition of DEBUT, like its predecessors, will be staged without any form of public funding. From September 13 to 19, 2020 Weikersheim Castle, the Deutschordensschloss (Castle of the Teutonic Order) in Bad Mergentheim and – for the first time – the TauberPhilharmonie in Weikersheim will be the venues for this globally acclaimed Classical Singing Competition, which serves as a kind of launching pad for young singers of opera music aged 32 (female) or 34 (male) or under in five vocal categories: soprano, mezzo-soprano & alto, tenor, countertenor and baritone & bass.

#### **Packed calendar for the anniversary season**

The DEBUT 2020 season will kick off with a matinée at the Deutschordensschloss in Bad Mergentheim on September 6. The question “Quo vadis, singing? – The most human of all art forms as a reflection of our times” will be critically examined during an open round table discussion. The DEBUT week will also include a lieder recital



You can find all important dates here  
as well as information on advance ticket sales.



#### Masthead

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Phone: + 49 7931 493-0  
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Responsible for the content:  
Steffen Scheuermann,  
Head of Marketing & Communications

Editorial office:  
Julia Riedmeyer

Authors:  
Dirk Heyden  
Thomas Holstein  
Sabine Maier

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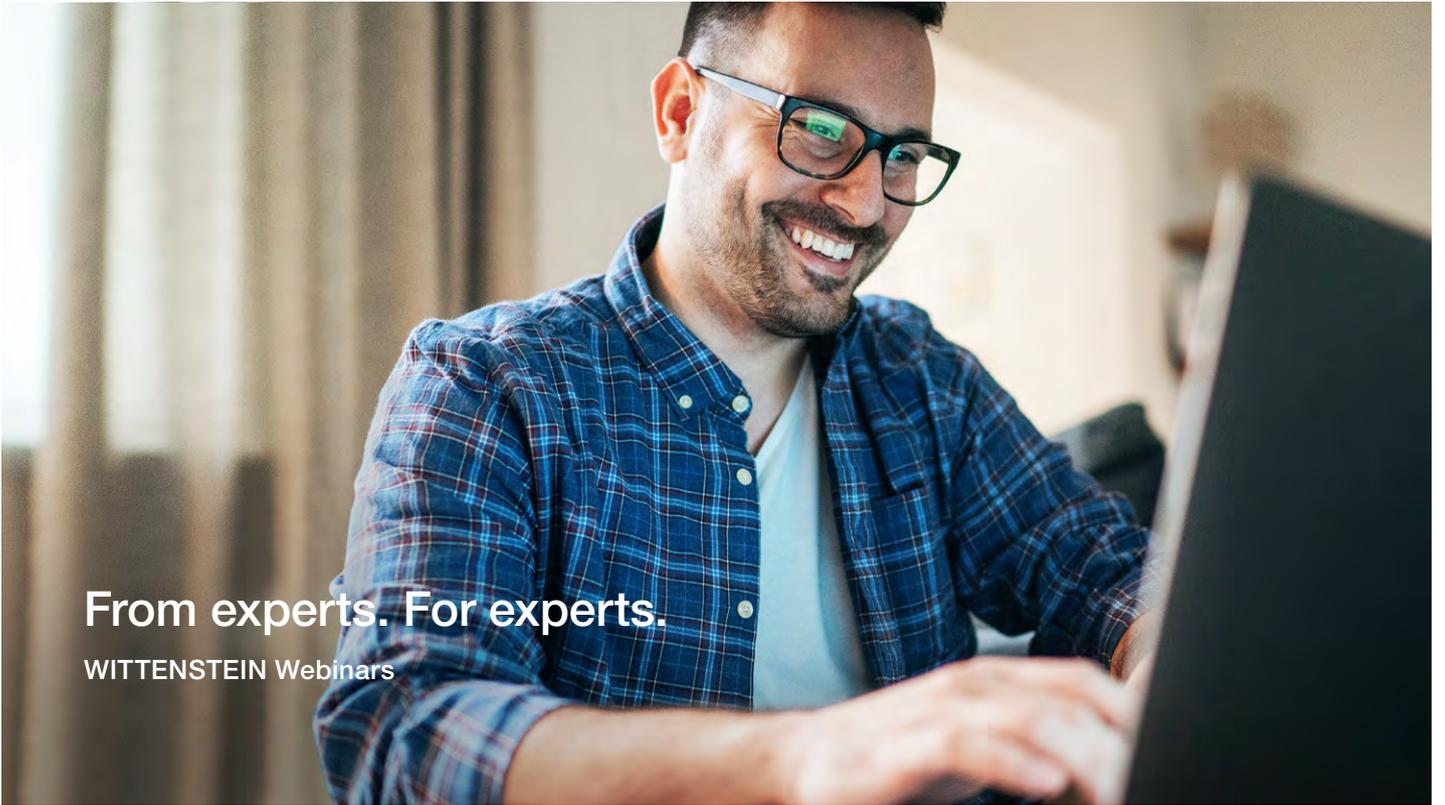
on September 17 and a gala concert on September 19, during which talented young people will once again compete for several cash and engagement prizes. DEBUT 2020 will culminate on December 4 with a big anniversary concert at the TauberPhilharmonie in Weikersheim. Under the artistic direction of Clarry Bartha, a selection of DEBUT finalists from past years will give some very varied performances in what, by all accounts, will be an exceptional program.

The masterclass originally planned for April 2020 with Brigitte Fassbaender, the world-famous singer, stage director, theater manager, festival director and Kammersängerin, has unfortunately had to be postponed until spring 2021 owing to recent developments surrounding the coronavirus. "We deeply regret this, of course, but our duty of care towards the singers takes priority. We're keeping a close watch on events as they unfold and will adapt our plans for the competition accordingly. However, as things stand today, we hope that DEBUT will be able to go ahead as scheduled", said Edith Wittenstein, Managing Director of DEBUT Concerts GmbH.



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**WITTENSTEIN**