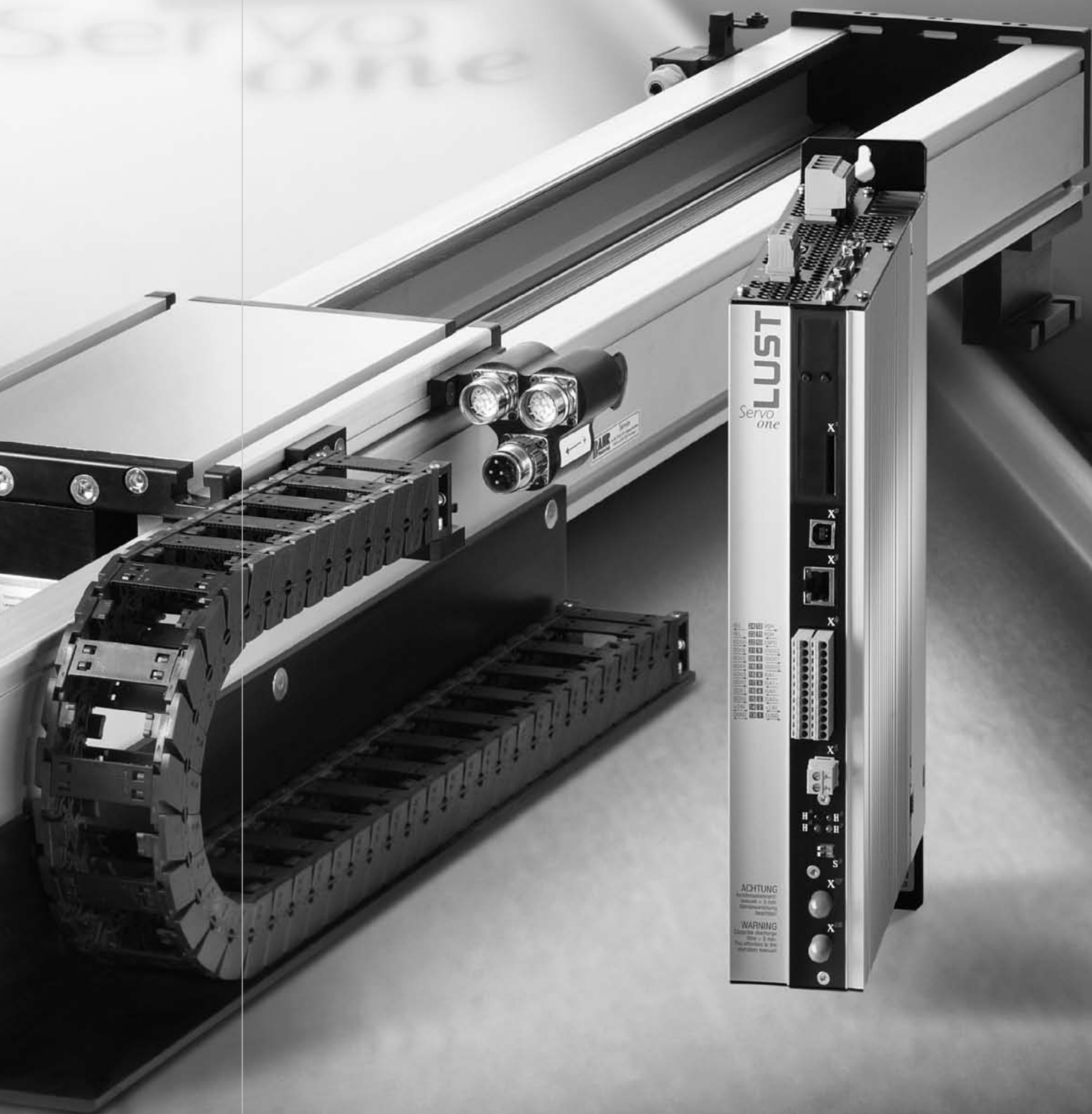


LUSTtec

No. 18
November 2006

ServoOne – The drive sets standards

read more on page 4 >>



Potential for innovations is far from exhausted

[Since the beginning of the 1990s, electrical drive technology has experienced rapid development as control equipment has moved into the digital age. Today's drive components effortlessly achieve an optimum combination of dynamics and precision. Machine mechanics are increasingly the only factor that prevents further improvements in the performance of current production machinery.]

Integrated service and diagnostic capabilities allow remote diagnosis and early detection of any defects, while digital bus systems enable seamless integration into a machine control concept and the IT infrastructure. All of this can be done at a cost level that nobody involved could have imagined in the early days of digital technology.

The question now is what will the next few years bring? What contribution can drive technology make to the required innovations in machine and plant engineering? What mega trends will influence developments in drive and automation technology?

Of course, there are plenty of interesting new developments, such as even more powerful new microprocessors, real time Ethernet systems with massive capabilities, more dynamic direct drives etc. But none of these things will revolutionise drive technology, engineering or automation, because we are already at such a high level of technological advancement today.

However, I am not suggesting for a minute that we have exhausted the potential for innovations in drive and automation technology. Increasingly, the key will be to optimise systems for parts of machines and by adopting a mechatronic approach. There is still major potential for improving functions, reducing system costs and optimising commissioning and servicing and the associated costs.

Skilful integration of sensors, actuators and electronics into the machine design enables both performance and efficiency to be improved and, in many cases, this opens up solutions that could not be realised using standard drive technology components.

As an example from our own company, I would like to mention the fully integrated door drive for lift doors, which is the first to combine all the required functions – drive, sensors, door control etc. Another example where a very specialised drive solution has enabled a totally new machine concept to be developed is a linear drive system for the carrier transport in a hard disk coating plant.

In order to develop solutions like these, we must be a system partner for machine and plant engineering companies and have the appropriate know-how in the key sensor, actuator and electronic components. We must be able to apply the technology, but we often also need to be able to modify the basic elements or even develop completely new solutions.

I believe that one of the major factors that will influence future developments in our industry will be the constant increase in the performance of microelectronics. Micro system technology will play an increasingly important role, as will network protocols for distributed systems or ad-hoc networks that allow spontaneous networking of objects in close physical proximity. The "Internet of things" and new forms of human-machine interaction that will enable us to deal with increasingly small yet extremely versatile computer intelligence without the need for a monitor, keyboard or mouse will also change system concepts and have a huge influence on the related drive and automation technology components.

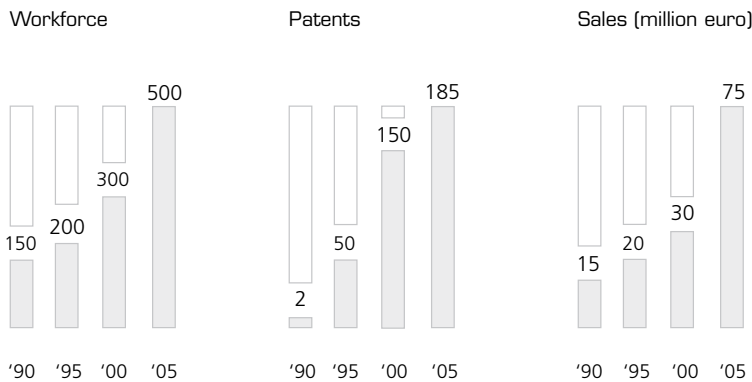


We need to come to terms with the fact that technologies originally developed for other, more mass market applications are rapidly gaining in importance in automation. In fact, the increasing convergence of disciplines and technologies is the major new challenge facing our company as we look to the future.

Karl-Heinz Lust

Efficient Technology and Patent Management to Safeguard Know-How

[The number of new applications submitted to the German Patent and Trade Mark Office (DPMA) each year has largely remained at a constant level in recent years. Since 1998, the figure has consistently been between 55,000 and 60,000. However, the importance of this “temporary monopoly” for innovative small and medium-sized businesses has definitely increased.]



The concentration of applications from an increasing number of “regular applicants”, discussions about the necessity or absurdity of SW patents and the increasing occurrence of trademarks with a low level of innovation (known as trivial patents) calls for more careful consideration of the topic.

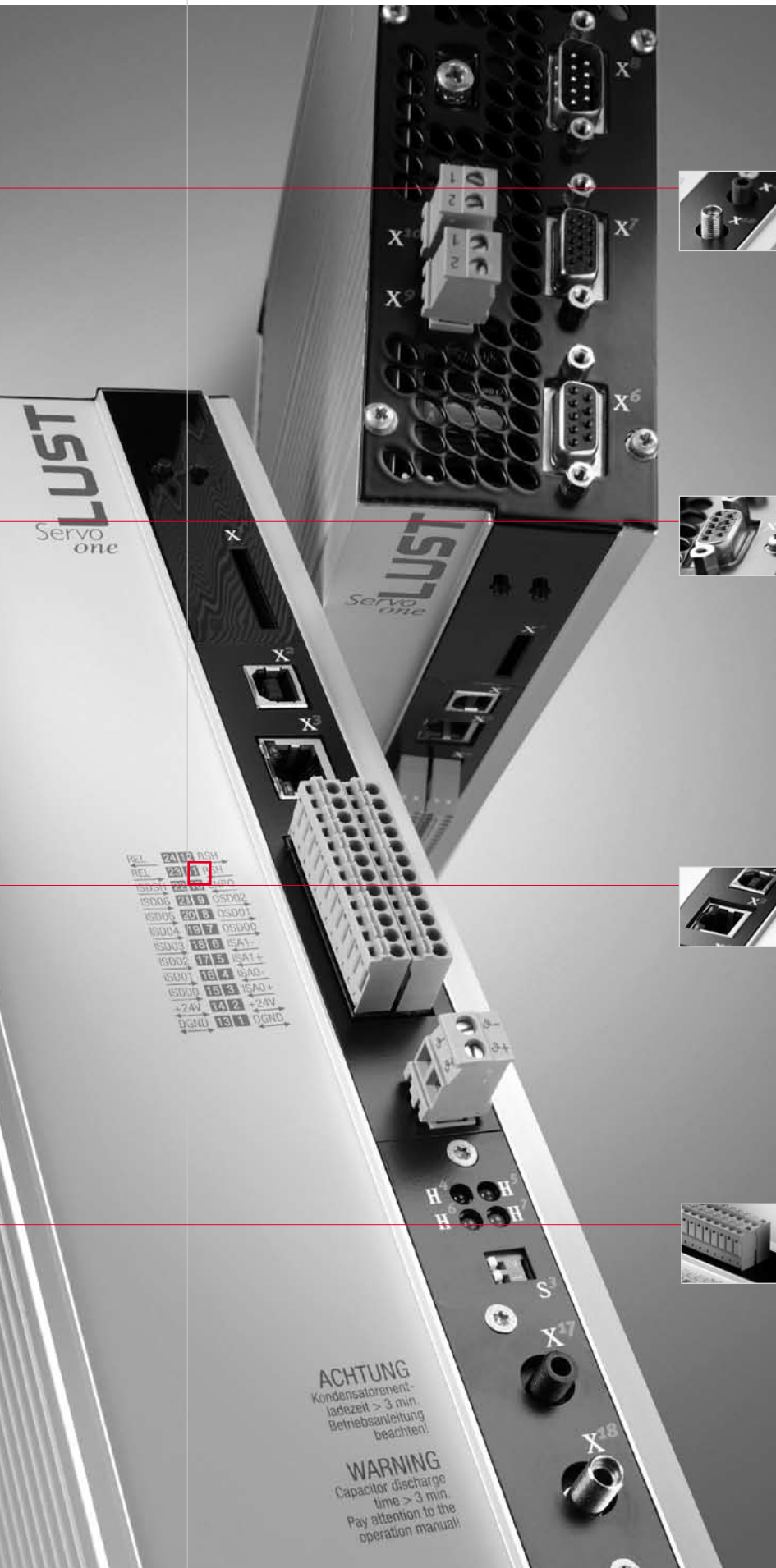
LUST has been well aware of the need to safeguard internal research and development results for many years and the company has a sizeable portfolio of patents in important fields of technology (see diagram). Continuing efforts to safeguard know-how using trademarks will remain an important strategic objective in the future.

However, the companies in the Lust Group have committed themselves to practicing good “patent hygiene”, which they would actually do in any case, by signing a declaration on “Spirit of invention and patent ethics” drawn up by Patentverein e. V., an association of small and medium sized businesses in the automation technology sector.

Jürgen Rühl
Lust Antriebstechnik GmbH

[]

Contents	
ServoOne	4
Magneto sensors from Lahnau in the medicine of the future	6
Founder K.-H. Lust turns 60	7
Open day in Unna	8
LUST at Fairs	10
CDB3000 packs raw eggs	13
LUST gets things moving	14



Dynamic _ Control technology that's out of this world



Precision _ Spot on target



Communication _ A good connection every time



- EtherCAT
- SERCOS

Safety technology _ Optimally integrated



- IEC61508

ServoOne incorporates the most advanced control algorithms that have yet been devised, in order to satisfy the highest demands for dynamic response and smoothness. So it comes as no surprise that the ServoOne can drive a wide spectrum of motors, from synchronous servomotors through asynchronous motors to linear and torque motors. High control sampling frequencies of 16 kHz for the current and 8 kHz for the speed and position lead to minimum dead times and thus guarantee optimum motor control. If the profile instruction cycle time is longer than 125 μ s ServoOne offers

Flexible and modular encoder concepts together with electronics immune to interference, coupled with mature software, form the basis on which ServoOne performs high-precision movement control duties. ServoOne is able to evaluate a wide spectrum of encoders. Of course this includes resolvers such as sin/cos single and multi-turn encoders. Axis synchronism and positioning accuracy are optimised by various different compensation and correction processes. They include the patented LUST GPOC synchronism improvement process. This checks the analog encoder

Modern communication interfaces support the motion control functions and are part of the basis of the ServoOne. Rapid multi-axis movements are performed using the SERCOS II or EtherCAT motion control busses. These permit synchronous control of the ServoOne with a cycle time of 125 μ s and axis synchronisation with a jitter of less than 1 μ s. Connections to other field bus interfaces such as CANopen or PROFIBUS permit integration into a very wide range of automation solutions.

Integrated operational safety functions permit additional external hardware components to be eliminated, thus reducing the wiring requirements. The „Safe Stop“ function to EN954-1 category 3 (equivalent to PL-d or SIL2) is incorporated in the unit as standard. This ensures protection against uncontrolled movements.

the options of interpolating the position quadratically or cubically. Predictive pre-control structures for speed and torque lead to optimum control behaviour. Higher order filters dampen the mechanical vibrations induced by resonant frequencies. Automatic commissioning and control optimisation even whilst the drive is running allow consistently high manufacturing quality.

signals directly for offset, phase, gain and eccentricity errors, and corrects those errors. Motor cogging torque compensation reduces the static and dynamic torque ripple and thus also contributes to optimum synchronism. Smooth quadrant transitions are ensured by frictional torque correction. As a final feature, the correction of mechanical shaft manufacturing tolerances is direction-specific, thus increasing the absolute positioning accuracy.

Within a self-contained ServoOne axis combination, horizontal communication is available on an EtherCAT basis at 180 MBaud usable data rate. Setpoint coupling between axes can thus be achieved within a single control cycle. For PC-supported commissioning and diagnostics a USB interface is provided for simple „Plug and Play“ use. The additional integral Ethernet interface permits all this even within a networked system.

In the future, further safety functions to IEC61508 such as „Safe speed limitation“ and „Safe Shut-down“ will be available on request.

A Robotic Beetle for Detecting Cancer in the Stomach and Bowel – Magneto Sensors from Lahnau in the Medicine of the Future –



[Photo: Innovent e.V.]

[The idea sounds revolutionary, but it could become part of everyday clinical practice in the near future: an actively controllable miniature capsule endoscope equipped with an optical system and operating instruments, which can be used not only to detect stomach and bowel cancer in the early stages but to actually treat it at the site. From the initial draft sketches, it resembles a beetle with legs and gripping tools and it will now be developed using the latest in micro and nanotechnology.]

This is the VECTOR research project, supported by the European Union and launched on 01.09.2006. Its stated objective is „Eliminating gastrointestinal cancers through breakthrough medical microtechnology“ and

it will involve the development of intelligent capsules that will be taken orally and will then look for early stage cancers in the digestive tract. Unlike existing capsule endoscopes, the VECTOR capsules can be actively controlled by the doctor and, like a beetle, have legs for moving around in the stomach and bowel. The VECTOR capsules have optical sensors for detecting diseases – these analyse the tissue, greatly improving early detection of cancer. The VECTOR capsules will also be able to treat early stage tumours, as they are equipped with grippers and operating instruments that can be used to remove diseased tissue or destroy it inside the body.

Early cancer detection using endoscopic capsules could help to drastically increase the

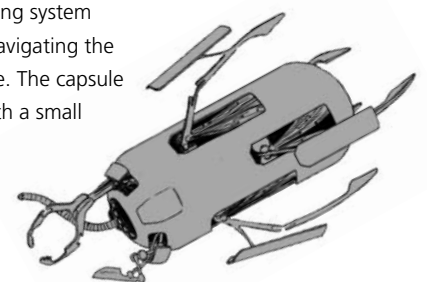
currently low level of acceptance of the examinations. More than 30 million people worldwide should be examined for bowel cancer every year because of genetic disposition or initial symptoms, but less than ten percent of them currently visit the doctor, although bowel cancer can be cured relatively easily if diagnosed at an early stage.“

The VECTOR consortium includes Sensitec GmbH and 17 other leading European research institutions and companies, as well as the Korean Institute of Science and Technology. Sensitec GmbH and Innovent e.V., Jena, will be working on the use of a jointly developed magnetic monitoring system for locating and navigating the endoscope capsule. The capsule will be marked with a small

magnet and located using external MR sensor modules, ensuring that neither the patient nor the doctor will be exposed to harmful radiation (e.g. X-rays) during the examination.

*Dr. Joachim Hölzl
Sensitec GmbH*

[]



Founder Karl-Heinz Lust Turns 60

[On 2nd September, it was time for Karl-Heinz Lust, the founder of the Lust Group, to celebrate his sixtieth birthday. As President of the IHK in Wetzlar and a member of the advisory board to the German research ministry, his work has stretched far beyond his own company.]

In the morning, representatives of local business, friends and acquaintances congratulated the successful entrepreneur on his birthday. In the evening, he celebrated the milestone with his close family.

Employees also took the opportunity to thank their boss for the great years at the company in the past and to wish him all the best for his birthday and for the future. Joachim Achenbach, a long-time friend and Managing Director of Sensitec GmbH, passed on best wishes for the future on behalf of all the Group's employees. He was keen to point out that alongside all his other qualities such as kindness, restlessness and reliability, loyalty is a crucial part of the birthday boy's character. He has shown his loyalty to his region and to his employees – and all of the well wishers wanted to thank him for that.

Of course, a special birthday always calls for a special present. The employees had thought long and hard about how they could find something to properly represent Karl-Heinz Lust's ideas, energy and enthusiasm for technology.

Finally, the secret was revealed and the "Polyeder Occulus Innovatio" (multi-faceted eye of innovation) was unveiled.

Every company in the Lust Group had chosen a symbolic product and these had all been incorporated into the Polyeder Occulus (a cuboid cast in acrylic). The Polyeder illustrates the diverse creative developments that have made a crucial contribution to the 35-year history of the LUST companies.

The message from all of the employees in the Lust Group to Karl-Heinz Lust was their hope that this creativity and persistence in implementing good ideas will continue for many more years to come.

*Anni Tonigold
Lust Antriebstechnik GmbH*



Spotless and already almost too small

[On 29th April 2006, Lust DriveTronics GmbH showed off its new premises on Heinrich-Hertz-Straße in Unna at an open day.]



The offices and production facilities were all open to interested visitors throughout the day. They could take a tour to find out about sales, hardware and software engineering, production, training, renewable energies and the test bench. All of the departments presented their working areas – at some points visitors were able to discover some very unusual applications.



“Highlights” included the heat image camera and the “singing” motors in the development department. A controller was used to transfer position setpoints to the ServoOne via the SERCOS field bus system in the form of pieces of music at a frequency of 4 kHz, causing the motor shaft to move in a similar way to a speaker diaphragm. By using a watering can as a resonance body, the mechanical vibrations were converted into acoustic signals.

Dressel GmbH’s production and application departments were also open to visitors. The specialist in process automation, control engineering and switchgear production also moved into the new location.

Presentations by senior managers from both companies gave visitors an insight into all the interesting details of the companies’ history, technology and applications. At the end of the day, there was live music and a children’s programme in the marquee.



The evening beforehand, there was a huge company party, to which the employees from Dressel GmbH and Lust Antriebstechnik GmbH in Lahnu were also invited. A barbecue, performances by a hip-hop show dance group, an acrobatic fire show and good music made for a thoroughly enjoyable evening for the 250 guests.

*Ines Schonert
Ralf Prectel
Lust DriveTronics GmbH*

[]



From coil to X-ray stand with the CDB3000



[Part of the control room for the pipe plant in Malaysia]

[A Malaysian manufacturer of pipes needs a pipe transportation system with fully automatic control to convey pipes from one processing stage to the next.]

The plant produces water pipes with a diameter of up to 2.10 m and a length of 11 m. The individual roller conveyors are driven by 443 1.5 kW gear motors. Some of the conveyors are operated in multi-motor mode with an open loop system and some with a

closed loop. The entire plant is controlled via PROFIBUS-DP with three Simatic X S7 317F and a total of 84 c-line DRIVES CDB34.017 (7.5 kW) frequency inverters from LUST.

The length of the entire control room is 60 m.

Peter Burger
Lust Antriebstechnik GmbH

[]

New computers from LUST thrill primary school children

[The pupils at the Waldgirmes primary school were ecstatic – each of the 11 classes received two brand new flat-screen monitors, computers and a laser printer.]

They had Lust Antriebstechnik GmbH to thank for this generous donation. Karl-Heinz Lust, an enthusiastic engineer himself, used his 60th birthday as an occasion to awaken and promote an interest in new media and technology in young people.

The 10 % of its employees on training schemes, the high number of graduates from the "StudiumPlus" technical training programme and representation in various training organisations underline the importance attached to training at LUST.

Staff from our IT department installed all the new equipment and, now the teachers have been successfully trained in the basic features, the children can make full use of the new technology.

To thank them for the donation, the school presented the Lust family with an interesting picture of all the pupils.

Anni Tonigold
Lust Antriebstechnik GmbH



[from left: Dr. W. Lust, K. Lust, D. Fischer (headmistress), G. Braem (deputy head), K.-H. Lust with pupils while presenting the donation]

□ The Netherlands



[At the Aandrijftechniek & Factory Automation trade fair in Utrecht, Electro ABI, the Dutch agent for LUST, presented the ServoOne in a highly dynamic application featuring one linear motor and one torque motor.]

Numerous meetings during the fair confirmed that the ServoOne will be the drive system of the future for dynamic and precise multi-axis applications in the Netherlands. The KMF motors from Electro ABI operated in conjunction with c-line Drives, particularly the CDB3000, also attracted a great deal of interest. The KMF motors are now available in an exceptionally tough stainless steel design with IP67 protection.

Electro ABI not only presented some forward-looking products, it also focused on its own future. Electro ABI is a family company and, with Jolanda de Bie, the fourth generation will be in charge from November this year. Her father Paul de Bie has already started handing over his responsibilities, ensuring that the future of the drive specialist and motor manufacturer is in safe hands.

LUST wishes Jolanda de Bie every success and is looking forward to continuing our excellent co-operation in the future.

*Jens Thielmann
Lust Antriebstechnik GmbH*

□ Austria



[From 10th to 13th October, SSL Steuerungstechnik Linz, the sales partner for Austria, invited the Austrian public to experience current developments in drive technology at VIENNA-TEC.]

Meetings during the exhibition revealed particular interest in positioning solutions with CANopen and integrated safety functions – an ideal task for the CDB3000 and CDE3000 positioning drives.

The new ServoOne multi-axis servo system with the SERCOS and EtherCAT bus systems was presented for the very first time in Austria. Some customers have already decided to fit their next generation of machines with these bus systems to further increase the speed and productivity of the machines.

SSL and LUST are ready to support their customers with further innovations to ensure a successful future.

*Jens Thielmann
Lust Antriebstechnik GmbH*

□ Greece / Spain



[The EWEC (European Wind Energy Congress) and PowerExpo are two of the most important events in the wind energy sector.]

The three-day events in Greece (Athens) and Spain (Zaragoza) both gave us the opportunity to hold constructive discussions with customers, potential new customers and, of course, with other companies in this market.

These trade fairs once again showed that the know-how in our industry is definitely concentrated in Germany and is increasingly developing into a major source of exports. Our visitors came mainly from Central and Southern Europe and from Asia.

In Zaragoza, we had the opportunity to appear as a secondary exhibitor alongside Bachmann electronic. We would like to express our thanks again to the Bachmann team for their outstanding organisation at the event.

Jochen Heuveloop
Lust DriveTronics GmbH

□ Italy



[Many visitors expressed their surprise to see LUST directly represented at an Italian trade fair and our literally gleaming stand attracted plenty of interest during the event at BIAS in Milan.]

We were keen to demonstrate our comprehensive product range, our know-how and our capabilities to customers. An especially impressive attraction was the ball-shooting machine, featuring the ServoOne, which synchronises a linear motor with a torque motor.

The multi-axis drive system ServoOne with its new real time Ethernet communication in particular makes us very confident that LUST has a successful future in Italy.

Aldo Bucci
Lust Servosistemi srl, Italy

[]

Fair	Date/Location	Exhibitor
 <p>SPS/IPC/DRIVES International Exhibition and Conference for Electric Automation www.mesago.de</p>	<p>28th to 30th November 2006 hall, stand 246 hall, stand 145 Nürnberg</p>	<p>Lust Antriebstechnik GmbH Lust DriveTronics GmbH Levitec GmbH</p>
 <p>SCS Automation & Control International Show for Systems and Solutions www.scs-automation.com</p>	<p>5th to 8th December 2006 hall 5A, stand G148 Paris, France</p>	<p>transtechnik S.A. (Sales Agent of Lust Antriebstechnik in France)</p>
 <p>Hannover Messe World Fair for Technology, Innovation and Automation www.hannovermesse.de</p>	<p>10th to 16th April 2007 Hannover</p>	<p>Lust Antriebstechnik GmbH Lust DriveTronics GmbH Levitec GmbH</p>
 <p>ewec 2007 European Wind Energy Conference & Exhibition www.ewec2007.info</p>	<p>7th to 10th May 2007 stand C012 Milano, Italy</p>	<p>Lust DriveTronics GmbH</p>
 <p>SENSOR + TEST 2007 International Exhibition for Sensorics and Measuring www.sensor-test.com</p>	<p>22nd to 24th May 2007 Nürnberg</p>	<p>Sensitec GmbH</p>

LUST Offering Thirteen Young People Qualified Training Places Again This Year



[Our new trainees with trainers Catrin Günther, Stefan Elmshäuser and Jürgen Schnorr]

[In September the new intake of trainees started work at Lust Antriebstechnik in Lahnau and Unna, and at Levitc and Lust HybridTechnik. They will train as "Electronic assemblers for devices and systems", as "Mechatronics fitters", "Industrial management", "Energy system electronic assemblers for drive technology" and "Microtechnology designers".]

On 1st July, our new "StudiumPlus" student started his first practical placement at Lust Antriebstechnik in Lahnau.

In the LUST Group of Companies, we are aiming for a successful future. But we recognise that this success will only come if we have motivated and highly qualified employees, and that is why we attach such great importance to our trainees.

We wish the new employees every success and a perfect start to their professional careers.

Catrin Günther
Lust Antriebstechnik GmbH

Electronics from Wutha-Farnroda/ Subsidiary of Lust Hybrid-Technik

[Lust Hybrid-Technik GmbH, based in Hermsdorf/Thuringia produces a range of products that are very successful throughout Germany.]

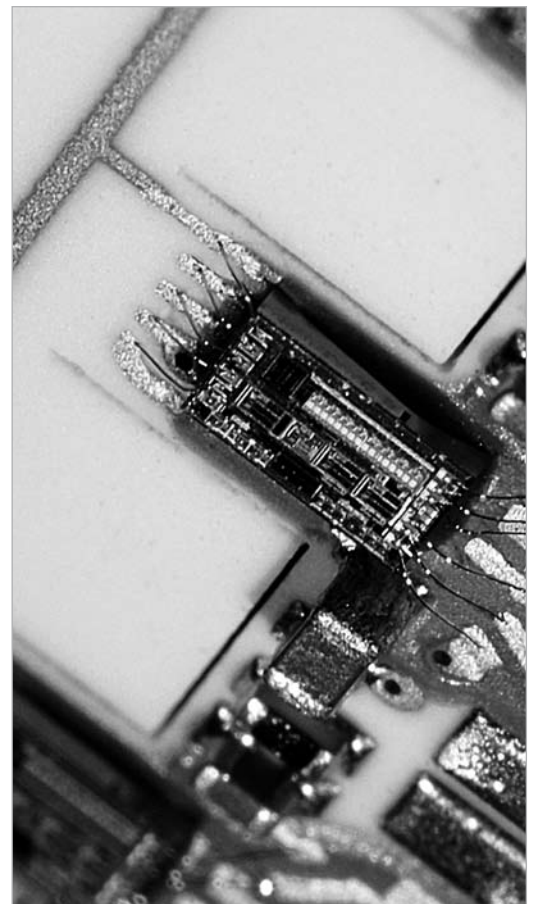
LUST's activities focus on developing cost-effective, innovative and reliable electronic components in response to customer requirements, using the technical and technological advantages provided by hybrid, SMD and COB technology. Their services cover everything from development to prototype production through to production of the final, tested component. LUST supports its customers' products throughout the product life cycle. Customers include well-known companies from the automotive supplier industry, sensor manufacturers, manufacturers of medical equipment and industrial electronic applications, and many more.

The quality management system is certified to DIN ISO 9001. LUST also has an environmental management system certified to DIN EN ISO 14001.

The plant in Wutha-Farnroda has belonged to Lust Hybrid-Technik GmbH since the beginning of this year. At present, the production location has 19 experienced employees, who are working on high quality plant technology to the same high quality standards as the parent company.

Frank Hofstedt
Lust Hybrid-Technik GmbH

[]



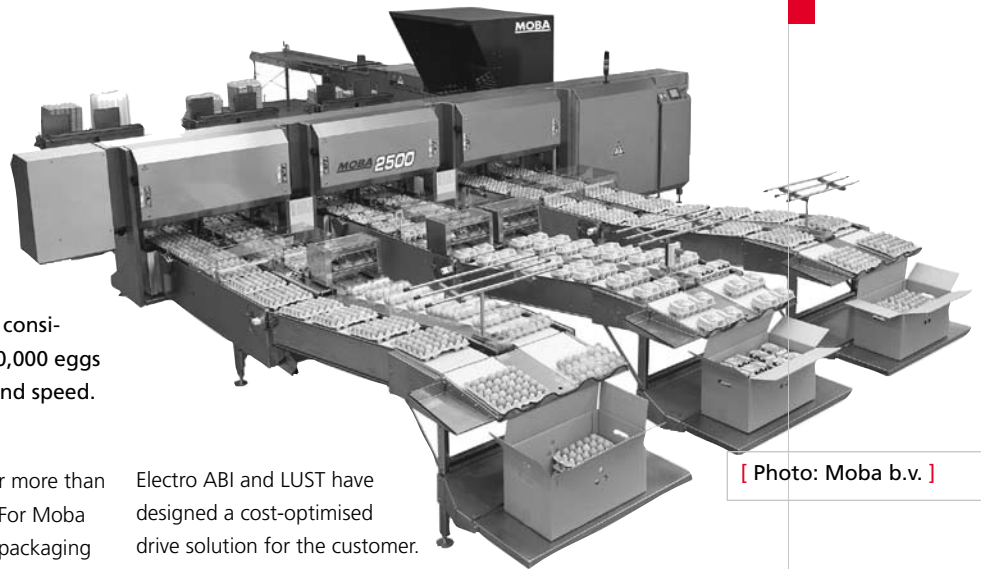
CDB3000 Sorts and Packs 25,000 Raw Eggs Every Hour

[Everyone knows that handling raw eggs calls for considerable care. When it comes to handling up to 180,000 eggs an hour what is needed is a combination of care and speed. The alternative is scrambled eggs.]

Electro ABI – LUST’s sales partner in the Netherlands for more than 20 years – is also the Dutch motor manufacturer KMF. For Moba b.v., the largest manufacturer of egg grading and egg packaging machines in the world, Electro ABI developed an extremely compact KMF asynchronous motor with integrated TTL-sensor system and built-on PLE planetary gear. The capacity of this packaging machine runs up to 25,000 eggs an hour and can be extended up to 180,000 eggs.

Sorting and packing is a positioning task. The CDB3000 positioning drive is responsible for the positioning. The CDB3000 works dynamically yet still controls with jerk limiting. This prevents excessive forces from acting on the eggs.

The CANopen bus system is used between the drive and the controller. The “Interpolated Position Mode” is selected to co-ordinate multiple axes with one another. The controller also manages the different packaging formats. Format changes can be made quickly and easily at the push of a button and are transferred directly to the drive via CANopen.



[Photo: Moba b.v.]

Electro ABI and LUST have designed a cost-optimised drive solution for the customer.

The CDB3000 positioning inverter replaces a servo controller and allows a more economical controller to be used. This is because it is no longer the controller but the CDB3000 that is responsible for positioning. The KMF motor is extremely tough and works for more than 20,000 hours without maintenance.

This complete solution from a single source demonstrates that the CDB3000 can achieve servo performance with an asynchronous motor. It controls the dynamics so perfectly that even after 600,000 eggs a day there is no danger of them ending up scrambled.

*With the kind assistance of Moba b.v. The Netherlands
www.moba.nl*

*Chris van Veen, Electro ABI b.v., The Netherlands []
Jens Thielmann, Lust Antriebstechnik GmbH*

Girls' Future Day at LUST – Girls Investigate Jobs in Electronics

[The Girls' Day was held for the sixth time this year, on 27th April. The event, which ran throughout Germany, allowed schoolgirls to gain an insight into occupations and academic courses that girls seldom consider when it comes to choosing a career.]

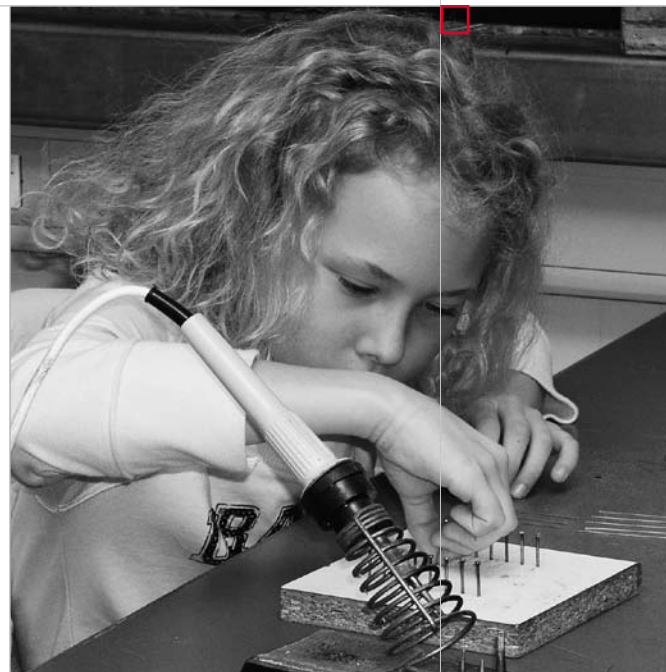
Lust Antriebstechnik was once again keen to get involved in the event and five enthusiastic schoolgirls between the ages of 10 and 13 took part on the day.

Along with Mrs. Lust, Dr. Hackenberg from the IHK was on hand to find out how the schoolgirls had received and used the opportunity.

“To ensure that we have the required number of specialist staff in the future, we will need an increasing number of women to train for technical professions and study engineering”, Karin Lust explained.

Lust Antriebstechnik will be participating in the initiative again next year, as young women in Germany receive an excellent level of school education and this day helps to broaden their career horizons. At the same time, the involvement of companies, colleges and training organisations helps to safeguard the future of the regional economy.

*Jürgen Schnorr
Lust Antriebstechnik GmbH*





LUST Runners on the Victory Podium

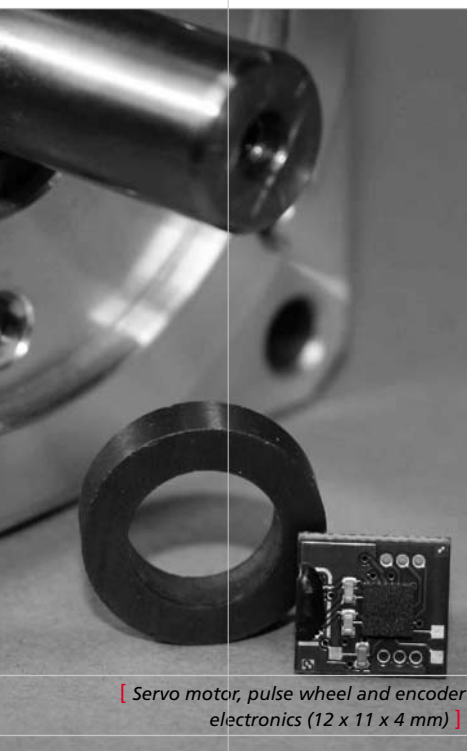
[With a total of nine teams entering this year's Wetzlar bridge race, the Lust Group of Companies once again proved that its slogan "LUST gets things moving" is not just idle talk.]

In glorious summer weather and a great atmosphere, 32 highly motivated runners from Lust Antriebstechnik, Sensitec, Levitec, Lust Hybrid-Technik and, for the first time, Lust DriveTronics in Unna raced through the centre of Wetzlar and, for every lap of the 2 km course they completed, raised five Euros for youth welfare projects in the city of Wetzlar. The best team from LUST was ultimately the "Speed Team" from Lust Antriebstechnik (Matthias Wagner, Jürgen Schnorr, Stefan Schneider), which finished in an outstanding 3rd place among the 130 company teams that started

the race! Next in the internal LUST rankings were the newcomers from Unna with a notable 11th place finish. However, even those who didn't get onto the podium had a lot of fun and could be sure that their efforts had been for a good cause.

The race itself was followed by a dinner for everyone who had taken part, and the relaxed atmosphere gave the runners a chance to catch up with old acquaintances and make some new ones. Overall, from LUST's point of view the event not only benefited the youth of Wetzlar, it gave a major boost to the feeling of togetherness among the various Lust companies.

*Pia Wilhelmi
Lust Antriebstechnik GmbH*



[Servo motor, pulse wheel and encoder electronics (12 x 11 x 4 mm)]

New Integrable Encoder

[Magneto resistive measuring systems are small, reliable and immune to interference – this makes them ideal for integration into applications such as servo motors, which previously required an external encoder.]

The new integrable encoder system from Sensitec has a size of just 0.5 cm³ but provides two magneto resistive (MR) sensors and one interpolation ASIC. The MR sensors scan a magnetic pulse wheel without contact and, with the standard pulse wheel and ASIC configuration, generate a quadrature signal with 4096 signal edges and one index pulse per revolution. The number of signal edges and the position of the index signal in the ASIC are freely programmable in 256 steps.

The compact dimensions of the encoder electronics are possible because the highly integrated interpolation ASIC has almost no external components. In addition to quadrature signals, the ASIC can optionally generate up/down and increment/direction counter signals, as well as commutation signals for a three-phase DC motor.

Sensitec manufactures and calibrates the MR sensors and encoder electronics itself. Combined with a pulse wheel tailored to the specific application, the customer thus receives an optimised and integrable encoder system from a single source.

*Joachim Achenbach
Sensitec GmbH*

Series Production of Magnetic Bearing Systems at Levitec

[In previous issues of LUSTtec, we have reported regularly on the latest products at Levitec. However, new products must be accompanied by continuous development of the processes in production.]

In tough day-to-day industrial operation, it is not only the newly developed components that are proving their worth, it is the way that these components combine perfectly to form an overall system allowing maximum performance.

Faced with increasingly demanding customer requirements Levitec was quick to position itself as a system supplier in the market. Our motto is "Everything from a single source", and we can provide everything that customers need when it comes to high speed drive systems – from development, design and production of the individual drive, bearing and mechanical components through to delivery of a sophisticated completely assembled and tested system.

The complexity of these systems results from the interaction of the different sensors, some of which require complex pre-processing of signals, the actuators for the magnetic bearings and the motorised drive, the mechanical components (stators, rotors, safety bearings) and the micro controller that performs the control, adjustment and monitoring tasks.

It is not just the development and design of the systems that calls for extensive specialist expertise from the technicians and engineers; we also need to achieve efficient production under series conditions. Because of the continuously increasing quantities, a dedicated production area has been created for series production of compo-

ponents and complete systems. In this area, exceptionally well qualified and comprehensively trained staff guarantee reliable production of products that meet the highest technical demands. Constant monitoring and safeguarding of our high quality standards is of critical importance. As some of our products are used in markets such as medical, pharmaceutical or vacuum technology and in machine tools, absolute reliability and optimum quality are indispensable.

*Matthias Kroll
Levitec GmbH*



[Series design of a magnetic bearing fan]

LUST Shows Commitment

[Eight employees from Lust Antriebstechnik GmbH were involved in the second Volunteer Day in Wetzlar.]

This time, they were planting bushes and flowers around the neighbourhood centre. But that was not all – the hard-working helpers also constructed a wooden signpost, cast it in concrete and built a wooden roof for a memorial.

On a sunny day in June, around 200 helpers from companies in Central Hesse completed 25 community projects. At the thank-you ceremony late that afternoon, they were warmly praised for their efforts. The patrons, Mayor W. Dette and President of the Chamber of Commerce, K.-H. Lust, thanked all of the volunteers for their commitment, commenting that everyone had clearly enjoyed themselves and the day had definitely done a lot to promote team spirit.

We will definitely be taking part again next year!

*Anni Tonigold
Lust Antriebstechnik GmbH*

[]



[from left, standing: R. Barfels, T. Stach; P. Wilhelmi, A. Burkhard, N. Feuser, from left, kneeling: B. Uhl, J. König, A. Wenzel]

Production Fit for the Future

Book Recommendations

TIME – The Stuff That Life is Made Of Stefan Klein

In our hectic day-to-day lives, what can we do to make the most of our time? The bestselling author shows us how we can learn to not only experience the moments that make up our lives, but to actually enjoy them.

S. Fischer Verlag, ISBN 3-10-039610-3

systemInnovation

Designing the New World

Bruno Weisshaupt

The author demonstrates how a new way of thinking and taking a systematic view can release innovative potential. This book deals with all areas of social and economic life and looks at all of the major issues of modern times: urbanity, identity, interaction, globalisation etc.

orell füssli Verlag, ISBN 3-280-05199-1

NC/CNC Handbook 2005/06

Hans B. Kief

The handbook is one of the most successful reference books in NC technology. Its success is based on a combination of understandably written texts, excellent illustrations of the basic principles, outstanding value for money and constant updates through regular new editions.

Hanser Fachbuchverlag, ISBN 3-446-40039-7

Bus Systems in Automation and Process Technology

Gerhard Schnell, Bernhard Wiedemann

This reference book deals with the most important bus systems used in automation and is primarily aimed at engineers who have to deal with these bus systems in their practical automation work.

Vieweg Verlag, ISBN 3-8348-0045-7



The new soldering plant on its way into the production hall

[Lust Antriebstechnik GmbH managed to ensure that all current frequency inverters and servo controllers were being produced in line with the RoHS Directive on time on 01.07.06. As soon as the EU Directive was announced in 2003, a timetable was set out for conversion in 2006. Everybody was aware that it would be an involved project that could not succeed without major investments.]

The first stage was to convert the surfaces of all PCBs to a nickel/gold coating free of hazardous substances. We then turned our attention to all of our electronic and mechanical components. We asked our suppliers to notify us when RoHS compliant components would be available and made sure our ERP system was ready for the changeover.

At the same time, we were working intensively on the automated SMT and THT soldering processes and manual soldering. We were able to convert the SMT process based on the existing equipment with no problems. However, extensive soldering tests with manufacturers of soldering machines quickly showed that the new solders in the THT process without a high lead content could only be reliably processed at high temperatures and with much more effective preheating. Therefore, in mid-2005, a year before the RoHS Directive was due to

come into force, we decided to install a new wave soldering plant. After extensive tests, we chose the Powerflow tunnel soldering plant from Erska. Erska Wertheim installed and commissioned it for us in April 2006.

This meant that our production was fit for the future in good time by 01.07.2006 and can continue to manufacture all of our company's innovative high-grade products at high quality and without harming the environment.

Eberhard Schmauch
Lust Antriebstechnik GmbH

[]

Imprint

Publisher

Lust Antriebstechnik GmbH
Gewerbestraße 5-9
35633 Lahnau
Germany
Fon +49 (0) 6441/ 96 6-0
Fax +49 (0) 6441/ 96 6-177
Mail Info@lust-tec.de
www.lust-tec.de

Responsible for content
Anni Tonigold

Layout / Design
Julia König